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# We know your needs

*Lindab is a modern and innovative corporation with great experience and expertise within its field. With us you will be well equipped to meet the challenges and demands of the future.*

## Lindab - an international success

Lindab is an international Group that develops, manufactures, markets and distributes products and system solutions primarily in steel for simplified construction and improved indoor climate. The company was founded in Sweden in 1959 and the business is carried out within three business areas, Ventilation, Building Components and Building Systems. Worldwide the corporation has approximately 4,500 employees distributed throughout more than 100 branches in 31 countries. Our management system has been certified by ISO 14001 and ISO 9001 standards.

## The success of our clients is our future

Today Lindab is one of the world's leading suppliers to the ventilation business, and we want to continue to be so. We will continuously develop and strengthen the abilities we possess today: knowledge, logistics, design and dialogue - and in doing so, we will make the difference to ensure our customer's continued success.

Simple.

# We make a difference in the indoor climate

*A good indoor climate is far from a natural part of daily life - although it should be. Now, however indoor climate has been put on the agenda of the public debate. This makes demands on you, and Lindab can help you meet them.*

## Lindab puts indoor climate on the agenda

Not all your customers think about the underlying factors for a good and energy efficient indoor climate. Lindab does. Our many years of experience has given us an in-depth knowledge of how to create the best conditions for a good indoor climate - and an understanding of what it means for both health and well-being. We put that knowledge, and our experience in developing energy efficient products and solutions, at your disposal, when you choose Lindab as your business partner.

## We help to secure a good and energy efficient indoor climate for everyone

We don't just make a difference with regards to the indoor climate - but also in the co-operation with our customers. It is not by coincidence that our products are integral parts of the majority of the world's ventilation systems. Right from the design through production to the final delivery, your needs are front and centre. It is by working together that we can achieve success. How? That is just what we will give you an insight to on the following pages.



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# Knowledge

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*Knowledge is about being in possession of the necessary competence and insight, which makes it possible to develop the right solutions and systems. It is also about having the necessary understanding for the customers and the co-workers, who are able to offer technical advice and support, as well as develop and design these solutions.*

2

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## We can document our solutions

When you implement a solution, you must be able to trust its quality. That is why documentation and new technology plays an important role for us in our work to find the most intelligent solutions and functional products. These are continuously tested in our own laboratories to insure the highest quality. Our product programme is carefully described and documented – in catalogues and the programme CADvent, which is a part of Lindab’s extensive software package, for the design and calculation of complete ventilation plants, climate simulation and selection of air terminal devices and silencers.

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## Lindab laboratories ensure a high quality

Quality is the key in choosing us as your business partner. Consequently, all our products are tested in our own air- and acoustic laboratories, where we combine the customers’ ideas and views with our abilities and experience - before production begins. The laboratories enable us to conduct full-scale testing offering you a direct advantage.

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# Logistics

*Your time is valuable, and therefore it is crucial that we always deliver components on time. Never too late – and not too soon.*

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## Delivery from hour to hour

To deliver on time – often from hour to hour – is a priority with Lindab. The key to our effective logistics system is our fully integrated online sales- and production system, which connects Lindab’s divisions throughout the nation. That means, that your local Lindab division for all purposes will function as your main warehouse, and that you can order or pick up any components you may need from your local division.

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# Design

*With a selection of more than 25,000 standard components and the possibility of specialized solutions which can meet any need, Lindab helps secure a good indoor climate for everyone.*

## Good indoor climate is also design

If we want to make sure thousands of people have a good indoor climate, insuring their well-being every day of the year, it is not only a matter of delivering a product, which is efficient and economical. It is as much a matter of design.

## We co-operate with architects and designers

Lindab knows that is it not enough that our solutions are efficient, they have to be beautiful and in harmony with the surroundings in which they are placed. Consequently, we have throughout many years had a dialogue with our customers. Through a close co-operation with a number of renowned architects and designers, we have shaped diffusers and other visible and important details. One architect and industrial designer is Knud Holscher, who has won the Industrial Design award for his design of our diffusers.

## We offer our clients special treatment

We are always up to the task. Besides our standard programme, we can design and produce components and solutions to suit your every need. We have divisions, who specialize in bespoke solutions. Tell us which component you need, and we will produce it. That is the only way we can achieve the perfect solution – every time – together.

# Dialogue

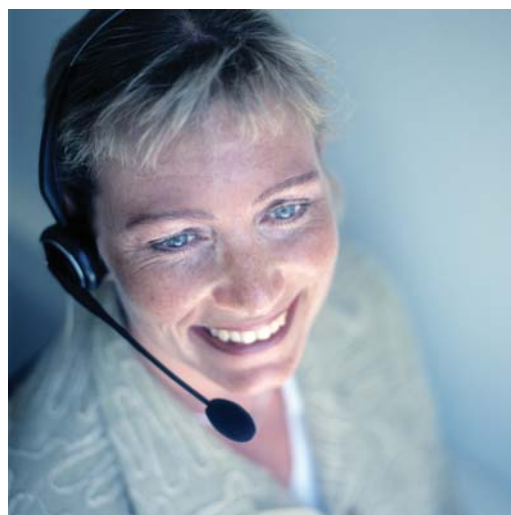
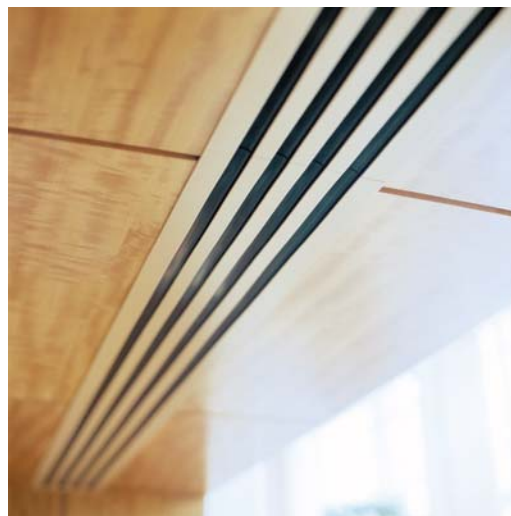
*Dialogue is the heart of our corporation. It is the dialogue with our customers and our suppliers – and that between co-workers – which is the central axis of all, that we do.*

## Dialogue is an important part of everyday life

It is the daily contact, which makes us better at: servicing our customers, co-operation, and developing new innovative products. Lindab is not just a supplier – we also function as the technical advisor, with regards to our product's function and we have to be able to fulfill the very different needs and wants of our customers.

## We develop through close dialogue

It is only through the close contact with our customers that we are continuously able to develop better solutions. It takes two parties to keep a dialogue going, and Lindab never just sits waiting by the phone. In active co-operation, we follow up on your expectations. How else would we be able to meet them?



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# Product range



## Lindab Safe

- 1 Circular duct
- 2 Bend
- 3 Reducer
- 4 T-piece
- 5 Female coupling

## Silencer

- 6 Circular straight low-built silencer
- 7 Circular straight silencer
- 8 Circular curved silencer

## Access doors

- 9 Access door
- 10 Access cap

## Damper & Measure

- 11 Regulating damper
- 12 Constant-/variable flow damper
- 13 Damper with flow meter

## Flexible ducting

- 14 Semiflexible duct
- 15 Multi layer flexible duct (Combi)
- 16 Flexible duct (PVC)
- 17 Flexible duct insulation/insulation sleeve

## Comfort

- 18 Exhaust air valve
- 19 Diffuser VERSIO
- 20 Supply air beam
- 21 Pressure control valve
- 22 Diffuser
- 23 Diffuser COMDIF

## Hoods

- 24 Roof hood
- 25 Roof hood

## Rectangular

- 26 Rect to round transition
- 27 Rectangular duct
- 28 Rectangular bend
- 29 Rectangular straight silencer

## Installation equipment

- 30 Suspension clamp
- 31 Suspension threaded rod
- 32 L-fastener with vibration damper
- 33 Cantilever

## Smart tools

- 34 Leakage tester
- 35 SR Cutter
- 36 SR Roller
- 37 Trolley
- 38 SR Handle

## Other products

- 39 Insulation
- 40 Duct fan
- 41 Fan
- 42 Fire damper
- 43 Filters

## IT solutions

- 44 TEKNOsim
- 45 DIMsilencer
- 46 DIMcomfort
- 47 CADvent



## Air Duct Systems

The Air Duct Systems product area consists of a range of circular ducts and fittings, complemented by e.g. rectangular duct products and hoods. The products are used for the construction of ventilation systems and are the business area's core business.

## Comfort

The Comfort product area includes three product programs – Air systems, Water systems and Acoustics – all contributing to create a pleasant, healthy and productive indoor climate.

**Air systems** – products for supplying and extracting air to and from a ventilated area – such as diffusers, grilles and VAV systems – in order to achieve the required demands for the indoor climate.

**Water systems** – products that use water for achieving the required indoor climate, such as chilled beams, chilled panels, induction units, heating panels and regulation equipment.

**Acoustics** – a complete range of silencers which provide the basis for a quiet and pleasant ventilation system.

## Ventilation Products

Some of our markets offer a network of branches, or One Stop Shops, where we keep a wide assortment of our standard products on stock, as well as all the tools and accessories needed for installation of ventilation equipment.

At Lindab branch shops we aim to offer our customers everything they need, all collected at one place.

## IT solutions

Lindab offers a large range of intelligent and rational tools and services that make your day-to-day work easier. We want to give you the opportunity to develop optimal, reliable and economical ventilation solutions in the shortest possible time.

One part of our offer is a software package for the design, calculation, quantification and planning of complete ventilation and indoor climate systems.



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# IT solutions



What if we could help you shorten your design and installation phase, minimizing the risks, and creating better designs? Would that give you improved client satisfaction?

We know that your time is expensive. We offer a large range of intelligent and rational tools that make your day-to-day business work easier, and with us as your partner you can benefit from more than 40 years' experience within ventilation. In short, we want to give you the opportunity to develop optimal, reliable ventilation solutions in the shortest possible time.

## CADvent

CADvent is an AutoCAD© application with a complete toolbox for drafting, dimensioning, calculation, quantification and presentation of complete HVAC installations. Our criteria for developing CADvent always start from the basic needs of the draughtsman or engineer.

CADvent provides you with:

- quick and easy drafting, both in 2D and 3D
- improved productivity through design visualisation and instant collision feedback
- correct product data which can be used in the whole project.
- embedded calculations for pressure, noise and balancing, reports easily exportable to Excel and PDF.
- visualisation/presentation tools that lets you present the project in an attractive and more realistic manner towards your client
- production model creation, connected to our business system for pricing, delivery planning and suborder scheduling
- CADvents production modul is based on real-life product information such as measures, connections an technical data, providing BIM information

## DIMcomfort

DIMcomfort is based on Lindab's supply and exhaust air terminal device range, and provides calculation and design of diffusers based on the specified requirements.

DIMcomfort offers:

- fast and easy product selection based on the specified requirements
- dimensioning and positioning of the products
- calculation support for noise and temperature
- simulation of flow patterns and velocity from diffusers
- adjustments of air flows to optimise the comfort level
- printing drafts of rooms and diffusers as well as reports with data for chosen diffusers
- integration with CADvent

## DIMsilencer

Based on the specified requirements DIMsilencer provides quick, professional noise calculation as well as simple product selection combined with a high degree of user-friendliness.

DIMsilencer offers:

- fast and easy product selection based on the specified requirements
- room-module makes it possible to simulate sound calculations adapted to the conditions in the room
- complete system calculation from unit to room
- quick and easy drafting
- verified, guaranteed properties – data is based on measurement values according to a new standard
- printing of reports with data for chosen products
- integration with CADvent





## TEKNOsim

TEKNOsim is our software for climate simulation. It is user-friendly and provides you with clear, understandable results. You can easily see the consequences of altering various parameters, and you can rely on the software's brand-neutral results.

### Easy to use

- all data entered can be selected by means of dialog buttons
- the software contains a large variety of pre-defined, completed designs for walls, windows, ceilings and floors
- the results are presented in easily understood diagrams and tables
- all of Lindab's water-borne climate control products are included in the software
- includes a guide to help new users start their climate simulations quickly and easily

### Accurate and reliable

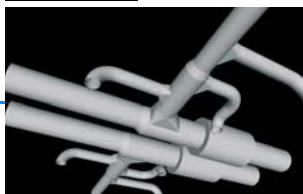
- TEKNOsim is based on many years' experience of data-based climate simulation
- the software takes into account every significant parameter affecting indoor climate
- fast, accurate calculations that minimize the risk of oversizing your climate control system
- verified by Chalmers Industriteknik, CIT, Sweden.

### Brand neutrality

- allows the calculation of the heating and cooling effect of various climate control systems

### See the results

- the results are presented as clear tables and diagrams
- by changing various parameters, it is possible to study building and installation dynamics
- the software can be used at all stages, beginning with the early stages of planning



## Project Support

With Lindab as your partner you can benefit from more than 40 years' experience within ventilation. This means that you can get support from the first draft, to the finished drawing and all the way through quotation and order process.

- Calculations
- Pricing
- Preproduction engineering
- Order handling
- Product selection
- Conversion of rectangular to round duct systems
- 2D/3D CAD model conversion to CADvent

Additional information is available at [www.lindabventilation.com](http://www.lindabventilation.com) or the site of your local Lindab company. Or contact us by mail: [itcenter@lindab.com](mailto:itcenter@lindab.com)

## Training and Support

Our software package is easy to learn, but our philosophy is that all users should invest in our basic training program.

We offer training and support on all our software:

- basic introductory course
- support during installation and start-up
- advanced training courses
- seminars/courses held at your company

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*Turning Torso, Malmö, Sweden*



*Hotel Marriott, Copenhagen, Denmark*



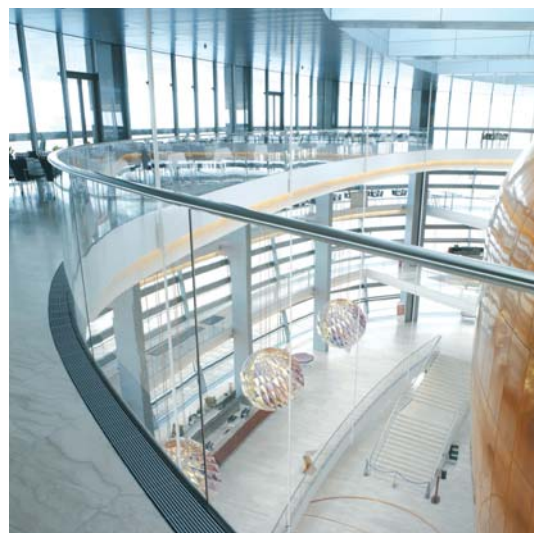
*DESY research centre, Hamburg, Germany*



*Shopping centre, Stockholm, Sweden*



*Tenpin bowling hall, Sweden*



*The Opera house, Copenhagen, Denmark*



# References



*Ejsdal arena, Leksand, Sweden*



*University of Edinburgh, UK*



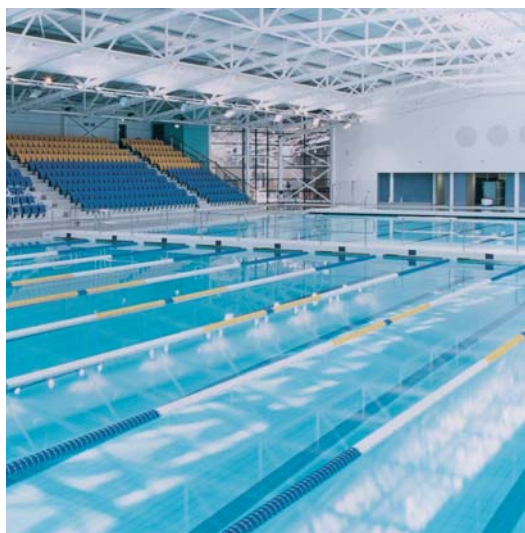
*Pareto print, Tver, Russia*



*Brussels Airport, Belgium*



*Hospital, Copenhagen, Denmark*



*Tollcross Park Leisure Center, Glasgow, UK*

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# General information and theory



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# Dimensions

## Designations and examples

These designations and dimensions of ducts and fittings are adapted to CEN standards.

Lengths are given in mm.

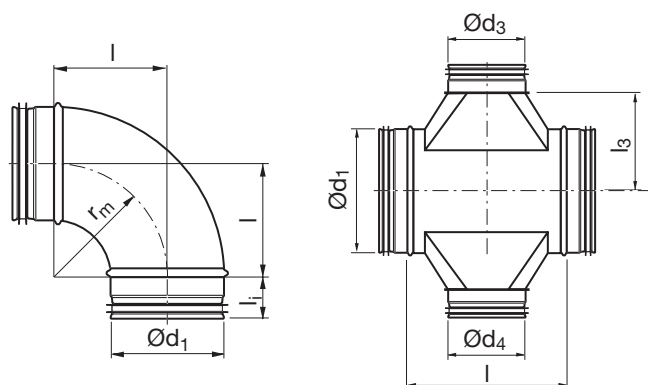
Angles are given in degrees.

Fittings with  $\text{Ød}_1 - \text{Ød}_4$  fit inside ducts and fittings with  $\text{Ød}$ .

Duct and female dimension .....  $\text{Ød}$

Connector dimension .....  $\text{Ød}_1, \text{Ød}_2, \text{Ød}_3, \text{Ød}_4$

Sheet metal thickness .....  $t$



Installation length .....  $l, l_1, l_2, l_3$

Bend radius .....  $r_m$

Insertion length .....  $l_i$

Eccentricity .....  $cc$

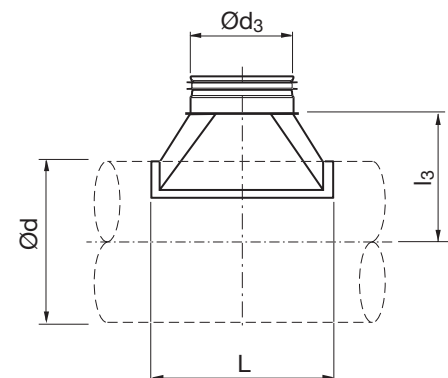
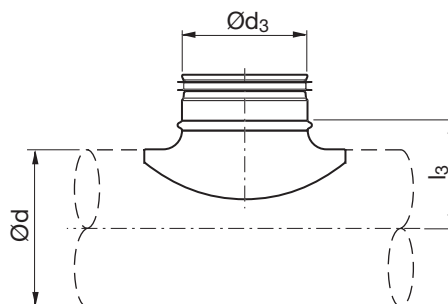
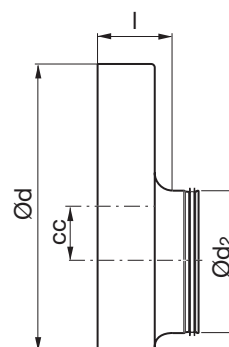
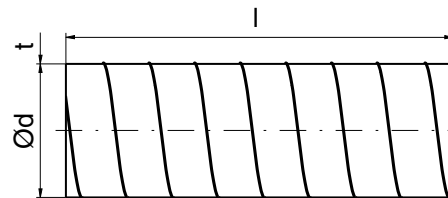
Component length .....  $L$

Circumference .....  $O$

Cross-sectional area .....  $A_c$

Mass .....  $m$

Linear mass .....  $m_l$



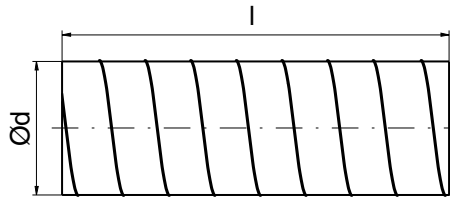


# Tolerances

The measures on this page are principally applicable to our "old" range of products mainly manufactured of sheet metal. The measures cannot unreflectingly be regarded as valid for "any" product e.g. flexible ducts.

**Bold face denotes standard dimensions.**  
Standard face denotes intermediate dimensions.

## Ducts



According to EN1506

| Ød nom      | Tolerance range        |
|-------------|------------------------|
| <b>63</b>   | <b>63,0 - 63,5</b>     |
| <b>80</b>   | <b>80,0 - 80,5</b>     |
| <b>100</b>  | <b>100,0 - 100,5</b>   |
| 112         | 112,0 - 112,5          |
| <b>125</b>  | <b>125,0 - 125,5</b>   |
| 140         | 140,0 - 140,6          |
| 150         | 150,0 - 150,6          |
| <b>160</b>  | <b>160,0 - 160,6</b>   |
| 180         | 180,0 - 180,7          |
| <b>200</b>  | <b>200,0 - 200,7</b>   |
| 224         | 224,0 - 224,8          |
| <b>250</b>  | <b>250,0 - 250,8</b>   |
| 280         | 280,0 - 280,9          |
| 300         | 300,0 - 300,9          |
| <b>315</b>  | <b>315,0 - 315,9</b>   |
| 355         | 355,0 - 356,0          |
| <b>400</b>  | <b>400,0 - 401,0</b>   |
| 450         | 450,0 - 451,1          |
| <b>500</b>  | <b>500,0 - 501,1</b>   |
| 560         | 560,0 - 561,2          |
| 600         | 600,0 - 601,2          |
| <b>630</b>  | <b>630,0 - 631,2</b>   |
| 710         | 710,0 - 711,6          |
| <b>800</b>  | <b>800,0 - 801,6</b>   |
| 900         | 900,0 - 902,0          |
| <b>1000</b> | <b>1000,0 - 1002,0</b> |
| 1120        | 1120,0 - 1122,5        |
| <b>1250</b> | <b>1250,0 - 1252,5</b> |
| 1400        | 1400,0 - 1402,8        |
| 1500        | 1500,0 - 1502,9        |
| <b>1600</b> | <b>1600,0 - 1603,1</b> |

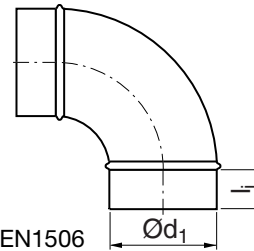
## Length

| l, l <sub>1</sub> , l <sub>3</sub> , etc | Tolerance |
|--|-----------|
| 0-15                                     | +0<br>-2  |
| 16-100                                   | +0<br>-5  |
| 101-                                     | +0<br>-10 |
| L  | ±5        |

## Angle

| α | Tolerance |
|---|-----------|
|   | ±2°       |

## Fittings



According to EN1506

| Ød <sub>1</sub> , d <sub>2</sub> , d <sub>3</sub> , d <sub>4</sub> nom | Tolerance range        | l <sub>i</sub> nom |
|--|------------------------|--------------------|
| <b>63</b>  | <b>61,8 - 62,3</b>     | <b>40</b>          |
| <b>80</b>  | <b>78,8 - 79,3</b>     | <b>40</b>          |
| <b>100</b>   | <b>98,8 - 99,3</b>     | <b>40</b>          |
| 112  | 110,8 - 111,3          | 40                 |
| <b>125</b>   | <b>123,8 - 124,3</b>   | <b>40</b>          |
| 140  | 138,7 - 139,3          | 40                 |
| 150  | 148,7 - 149,3          | 40                 |
| <b>160</b>   | <b>158,7 - 159,3</b>   | <b>40</b>          |
| 180  | 178,6 - 179,3          | 40                 |
| <b>200</b>   | <b>198,6 - 199,3</b>   | <b>40</b>          |
| 224  | 222,5 - 223,3          | 40                 |
| <b>250</b>   | <b>248,5 - 249,3</b>   | <b>60</b>          |
| 280  | 278,4 - 279,3          | 60                 |
| 300  | 298,4 - 299,3          | 60                 |
| <b>315</b>   | <b>313,4 - 314,3</b>   | <b>60</b>          |
| 355  | 353,3 - 354,3          | 60                 |
| <b>400</b>   | <b>398,3 - 399,3</b>   | <b>80</b>          |
| 450  | 448,2 - 449,3          | 80                 |
| <b>500</b>   | <b>498,2 - 499,3</b>   | <b>80</b>          |
| 560  | 558,1 - 559,3          | 80                 |
| 600  | 598,1 - 599,3          | 80                 |
| <b>630</b>   | <b>628,1 - 629,3</b>   | <b>80</b>          |
| 710  | 708,0 - 709,3          | 100                |
| <b>800</b>   | <b>798,0 - 799,3</b>   | <b>100</b>         |
| 900  | 897,9 - 899,3          | 100                |
| <b>1000</b>  | <b>997,9 - 999,3</b>   | <b>120</b>         |
| 1120   | 1117,8 - 1119,3        | 120                |
| <b>1250</b>  | <b>1247,8 - 1249,3</b> | <b>120</b>         |
| 1400   | 1397,3 - 1398,8        | 150                |
| 1500   | 1496,9 - 1498,5        | 150                |
| <b>1600</b>  | <b>1596,5 - 1598,2</b> | <b>150</b>         |

## Weight

±10%

## Sheet metal thickness

As in sheet metal standard EN 10143:1993.





# Material

1

## Sheet metal quality

Fittings and ducts from Lindab Ventilations standard programme are manufactured from zink coated sheet metal. This means that the base material shall be hot dipped zink galvanized steel sheet metal with a yield point of approx. 200 N/mm<sup>2</sup>, and that the galvanization shall be minimum as class Z 275. This surface treatment corresponds to the corrosivity category C2.

2

A surface treatment to class Z 275 means 275 g zink/m<sup>2</sup> double sided. Z 275 thus tells the total amount of zink on both sides of a 1 m<sup>2</sup> sheet metal plate. The thickness can thus be calculated as

$$\text{Zinc thickness} = \frac{\text{zinc weight}}{\text{number of sides} \cdot \text{zinc density}} =$$

$$= \frac{0,275}{2 \cdot 7140} \cdot 10^6 = 19 \mu\text{m}$$

3

4

5

6

## Sheet metal thicknesses

Other thicknesses of sheet metal can be supplied. You will have to expect some changes to the product range, however. For example, an increase in thickness in the ducts of 0,5 mm means that the internal diameter falls by 1,0 mm, which means in turn that standard fittings do not fit, and will have to be specially made for these ducts.

7

8

## Corrosivity categories

| Corrosivity category | Sheet metal material                                     |
|----------------------|--|
| C2                   | Galvanized steel sheet metal Z 275                       |
| C4                   | Aluminium sheet metal                                    |
|                      | Plastic HB-polyester coated galvanized steel sheet metal |
|                      | Plastic epoxy+PE-painted galvanized steel sheet metal    |
|                      | Aluzink sheet metal AZ 185                               |
| C5                   | Stainless steel sheet metal                              |

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## Material

- The following material is used in the standard range:
- Ducts and hand made fittings are made with material to EN 10327 – D×51 D.
- Pressed fittings are made with material to EN 10327 – D×54 D.

Other material than galvanised can also be supplied, for example

- **Stainless steel** to EN 1.4404 or AISI 316 or EN 1.4301 or AISI 304. Complies with the requirements of corrosivity category C5. Some fittings which are normally pressed have to be hand made and swaged together.
- **Aluminium** to ISO/DIS 209-1. Complies with the requirements of corrosivity category C4 without surface coating. Some fittings which are normally pressed have to be hand made and swaged together.
- **Plastic coated products**

Products are made, as standard, from hot dip galvanised steel sheet and then powder coated internally and externally with a mixed powder consisting of epoxy and polyester (PE) to a thickness of 80 µm.

Plastic coated products as above complies with the requirements of corrosivity category C4.

Standard colours are white NCS S0502-Y 30 gloss units according to Gardner 60° and brown NCS S7010-Y70R 45 gloss units.

**NOTE!** For ducts of Ø<100, the maximum length is 1,5 m for internal coating.

Products can optionally be coated on only the inside or outside.

Powder coating can be optionally obtained in thicknesses of up to 200 µm.

Products painted with mix powder, epoxy plus polyester, can after some time of exposure to UV radiation receive changes in colour. Hence storage in sunlight ought to be avoided.

- **Aluzink** with surface treatment to AZ 185 means 185 g aluzink/m<sup>2</sup> double sided, which complies with the requirements of corrosivity category C4. The sheet metal is treated with ALC (Anti-fingerprint Lubrication Corrosion). Some fittings which are normally pressed have to be fabricated and swaged together.



# Materials

The measures on this page are principally applicable to our "old" range of products mainly manufactured of sheet metal.

The measures cannot unreflectingly be regarded as valid for "any" product e.g. flexible ducts.

| Product  | Material/type                           | Operation         |                  |              |                  |
|--|---|-------------------|------------------|--------------|------------------|
|  |   | Continual         |                  | Intermittent |                  |
|  |   | Temperature limit |                  |              |                  |
|  |   | min °C            | max °C           | min °C       | max °C           |
| Pressed and seam welded                            | Galvanized steel sheet metal            |                   | 200 <sup>1</sup> |              | 250 <sup>2</sup> |
|  | Aluminium sheet metal                   |                   | 200 <sup>3</sup> |              | 300              |
|  | Stainless steel sheet metal             |                   | 500              |              | 700              |
|  | PVC coated sheet steel metal            |                   | 80               |              | 120              |
|  | PE/EP coated products                   |                   | 150              |              | 200              |
|  | Aluzink sheet metal                     |                   | 315              |              |                  |
| Swaged, spot welded and/or blind interlocked joint | Acrylic mastic                          | -40               | 70               |              |                  |
|  | Silicone mastic                         |                   | 150              |              | 200              |
| Safe gasket and damper blade seals                 | EPDM rubber                             | -30               | 100              | -50          | 120              |
|  | Silicone rubber                         | -70               | 150              | -90          | 200              |
| Damper blade seal at Ø80                           | Silicone cell rubber                    | -50               | 200              |              |                  |
| Foam rubber seal                                   | EPDM rubber                             | -30               | 100              | -50          | 120              |
| Foam plastic gasket                                | Polyester                               | -40               | 70               |              |                  |
| Measuring nozzle                                   | Plastic                                 |                   | 70               |              |                  |
| Damper shaft bearings                              | Polyamide                               | -30               | 150              | -50          | 200              |
|  | Brass                                   |                   | 300              |              |                  |
| Damper actuator                                    | Electric                                | -30               | 50               |              |                  |
|  | Pneumatic                               | -5                | 60               |              |                  |
| Duct filter  | Polyester                               |                   | 120              |              |                  |
| Drain hose   | Ethylene vinyl acetate and polyethylene | -45               | 65               |              |                  |
| Insulation   | Glass wool                              |                   | 200              |              |                  |
|  | Rock wool                               |                   | 700              |              |                  |
| Silencer   | Polyester                               |                   | 130              |              | 180              |

<sup>1</sup> Discoloration occurs at about 200 °C in galvanized steel. This is mostly an appearance problem and does not mean impaired corrosion protection in a normal environment.

<sup>2</sup> If the temperature rises to about 300 °C, the adhesion of the zinc is impaired, which means poorer corrosion protection.

<sup>3</sup> Aluminium sheet will soften after a couple of years at 200 °C.





# The SI system

## Units

The SI system (Système International d'Unités) is used in this catalogue, in accordance with international practice. Units may be given in the "technical system" in diagrams and tables, in parallel with the SI system.

## Some basic units

|                      |            |    |
|----------------------|------------|----|
| For length           | metre      | m  |
| For mass             | kilogramme | kg |
| For time             | second     | s  |
| For electric current | ampere     | A  |
| For temperature      | kelvin     | K  |

## Some derived units

|   |        |    |                               |
|---|--------|----|-------------------------------|
| For frequency                               | hertz  | Hz | 1 Hz = 1/s                    |
| For force                                   | newton | N  | 1 N = 1 kg · m/s <sup>2</sup> |
| For pressure,<br>mechanical stress          | pascal | Pa | 1 Pa = 1 N/m <sup>2</sup>     |
| For energy, work                            | joule  | J  | 1 J = 1 N · m                 |
| For power                                   | watt   | W  | 1 W = 1 J/s                   |
| For electric potential,<br>electric tension | volt   | V  | 1 V = 1 W/A                   |

## Some additional units

|                 |        |     |   |
|-----------------|--------|-----|---|
| For time        | minute | min | 1 min = 60 s                                    |
|                 | hour   | h   | 1 h = 3 600 s = 60 min                          |
| For flat angles | degree | °   | 1° = 1/360 of a circle                          |
| For volume      | litre  | l   | 1 l = 1 000 cm <sup>3</sup> = 1 dm <sup>3</sup> |

## Some multiple prefixes

| Index             | Designation | Des. | Example       |        |
|-------------------|-------------|------|---------------|--------|
| 10 <sup>12</sup>  | tera        | T    | 1 terajoule   | 1 TJ   |
| 10 <sup>9</sup>   | giga        | G    | 1 gigawatt    | 1 GW   |
| 10 <sup>6</sup>   | mega        | M    | 1 megavolt    | 1 MV   |
| 10 <sup>3</sup>   | kilo        | k    | 1 kilometre   | 1 km   |
| 10 <sup>2</sup>   | hecto       | h    | 1 hectogramme | 1 hg   |
| 10 <sup>1</sup>   | deca        | da   | 1 decalumen   | 1 dalm |
| 10 <sup>-1</sup>  | deci        | d    | 1 decimetre   | 1 dm   |
| 10 <sup>-2</sup>  | centi       | c    | 1 centimetre  | 1 cm   |
| 10 <sup>-3</sup>  | milli       | m    | 1 milligramme | 1 mg   |
| 10 <sup>-6</sup>  | micro       | μ    | 1 micrometre  | 1 μm   |
| 10 <sup>-9</sup>  | nano        | n    | 1 nanohenry   | 1 nH   |
| 10 <sup>-12</sup> | pico        | p    | 1 picofarad   | 1 pF   |



# The SI system

## Conversion factors

Tables for conversion to other dimensions are given for some of the units commonly used in the industry.

### Pressure, p

| Pa<br>pascal<br>N/m <sup>2</sup> | mm wc<br>mm Aq<br>mm H <sub>2</sub> O | mm Hg<br>(at 20 °C) | in wg<br>" wg<br>in wc | psi(g)<br>ibf/in <sup>2</sup> | bar         |
|----------------------------------|---------------------------------------|---------------------|------------------------|-------------------------------|-------------|
| 1                                | 0,102                                 | 0,007 53            | 0,004 02               | 0,000 145                     | 0,000 010 0 |
| 9,79                             | 1                                     | 0,073 7             | 0,039 4                | 0,001 42                      | 0,000 097 9 |
| 133                              | 13,6                                  | 1                   | 0,534                  | 0,019 3                       | 0,001 33    |
| 249                              | 25,4                                  | 1,87                | 1                      | 0,036 1                       | 0,002 49    |
| 6 895                            | 704                                   | 51,9                | 27,7                   | 1                             | 0,068 9     |
| 100 000                          | 10 215                                | 753                 | 402                    | 14,5                          | 1           |

### Length, l

| in<br>inch | ft<br>foot | yd<br>yard | m<br>metre | mile        |
|------------|------------|------------|------------|-------------|
| 1          | 0,083 3    | 0,027 8    | 0,025 4    | 0,000 015 8 |
| 12,0       | 1          | 0,333      | 0,305      | 0,000 189   |
| 36,0       | 3,00       | 1          | 0,914      | 0,000 568   |
| 39,4       | 3,28       | 1,09       | 1          | 0,000 621   |
| 63 360     | 5 280      | 1 760      | 1 609      | 1           |

### Area, A

| in <sup>2</sup><br>sq in | ft <sup>2</sup><br>sq ft | yd <sup>2</sup><br>sq yd | m <sup>2</sup><br>sq metre | ar           | ha<br>hectare   |
|--------------------------|--------------------------|--------------------------|----------------------------|--------------|-----------------|
| 1                        | 0,006 94                 | 0,000 772                | 0,000 645                  | 0,000 006 45 | 0,000 000 064 5 |
| 144                      | 1                        | 0,111                    | 0,092 9                    | 0,000 929    | 0,000 009 29    |
| 1 296                    | 9,00                     | 1                        | 0,836                      | 0,008 36     | 0,000 083 6     |
| 1 550                    | 10,8                     | 1,20                     | 1                          | 0,010 0      | 0,000 100       |
| 155 000                  | 1 076                    | 120                      | 100                        | 1            | 0,010 0         |
| 15 500 031               | 107 639                  | 11 960                   | 10 000                     | 100          | 1               |

### Volume, V

| in <sup>3</sup><br>cu in | l<br>litre | US gal<br>gallon | UK gal<br>gallon | ft <sup>3</sup><br>cu ft | yd <sup>3</sup><br>cu yd | m <sup>3</sup><br>cubic metre |
|--------------------------|------------|------------------|------------------|--------------------------|--------------------------|-------------------------------|
| 1                        | 0,016 4    | 0,004 33         | 0,003 60         | 0,000 579                | 0,000 021 4              | 0,000 016 4                   |
| 61,0                     | 1          | 0,264            | 0,220            | 0,035 3                  | 0,001 31                 | 0,001 00                      |
| 231                      | 3,79       | 1                | 0,833            | 0,134                    | 0,004 95                 | 0,003 79                      |
| 277                      | 4,55       | 1,20             | 1                | 0,161                    | 0,005 95                 | 0,004 55                      |
| 1 728                    | 28,3       | 7,48             | 6,23             | 1                        | 0,037 0                  | 0,028 3                       |
| 46 656                   | 765        | 202              | 168              | 27,0                     | 1                        | 0,765                         |
| 61 024                   | 1 000      | 264              | 220              | 35,3                     | 1,31                     | 1                             |

### Velocity, v

| ft/min<br>fpm | km/h<br>Bz | ft/s    | mile/h<br>mph | knot<br>kn | m/s      |
|---------------|------------|---------|---------------|------------|----------|
| 1             | 0,018 3    | 0,016 7 | 0,011 4       | 0,009 87   | 0,005 08 |
| 54,7          | 1          | 0,911   | 0,621         | 0,540      | 0,278    |
| 60,0          | 1,10       | 1       | 0,682         | 0,592      | 0,305    |
| 88,0          | 1,61       | 1,47    | 1             | 0,869      | 0,447    |
| 101           | 1,85       | 1,69    | 1,15          | 1          | 0,514    |
| 197           | 3,60       | 3,28    | 2,24          | 1,94       | 1        |



# The SI system

## Conversion factors

### Volume flow, $q_v$

| ft <sup>3</sup> /h<br>cfh | l/min  | m <sup>3</sup> /h | ft <sup>3</sup> /min<br>cfm | l/s      | m <sup>3</sup> /s |
|---------------------------|--------|-------------------|-----------------------------|----------|-------------------|
| 1                         | 0,472  | 0,028 3           | 0,016 7                     | 0,007 87 | 0,000 007 87      |
| 2,12                      | 1      | 0,060 0           | 0,035 3                     | 0,016 7  | 0,000 016 7       |
| 35,3                      | 16,7   | 1                 | 0,589                       | 0,278    | 0,000 278         |
| 60,0                      | 28,3   | 1,70              | 1                           | 0,472    | 0,000 472         |
| 127                       | 60,0   | 3,60              | 2,12                        | 1        | 0,001 00          |
| 127 133                   | 60 000 | 3 600             | 2 119                       | 1 000    | 1                 |

### Mass, m

| oz<br>ounce | lb<br>pound | kg<br>kilogramme |
|-------------|-------------|------------------|
| 1           | 0,062 5     | 0,028 3          |
| 16,0        | 1           | 0,454            |
| 35,3        | 2,20        | 1                |

### Mass flow, $q_m$

| lb/min | kg/s     |
|--------|----------|
| 1      | 0,007 56 |
| 132    | 1        |

### Density, $\rho$

| kg/m <sup>3</sup> | lb/ft <sup>3</sup> | g/cm <sup>3</sup> | lb/in <sup>3</sup> |
|-------------------|--------------------|-------------------|--------------------|
| 1                 | 0,062 4            | 0,001 00          | 0,000 036 1        |
| 16,0              | 1                  | 0,016 0           | 0,000 579          |
| 1 000             | 62,4               | 1                 | 0,036 1            |
| 27 680            | 1 728              | 27,7              | 1                  |

### Force, F

| N<br>newton | lbf<br>pound-force | kp<br>kilopond |
|-------------|--------------------|----------------|
| 1           | 0,225              | 0,102          |
| 4,45        | 1                  | 0,454          |
| 9,81        | 2,20               | 1              |

### Torque, M

| lbf · in | Nm    | lbf · ft | kpm     |
|----------|-------|----------|---------|
| 1        | 0,113 | 0,083 3  | 0,011 5 |
| 8,85     | 1     | 0,738    | 0,102   |
| 12,0     | 1,36  | 1        | 0,138   |
| 86,8     | 9,81  | 7,23     | 1       |

### Energy, work, E

| J<br>joule<br>Nm, Ws | Btu<br>British thermal unit | kcal<br>kilocalorie | kWh           |
|----------------------|-----------------------------|---------------------|---------------|
| 1                    | 0,000 948                   | 0,000 239           | 0,000 000 278 |
| 1 055                | 1                           | 0,252               | 0,000 293     |
| 4 187                | 3,97                        | 1                   | 0,001 16      |
| 3 600 000            | 3 412                       | 860                 | 1             |



# The SI system

## Conversion factors

### Power, P

| Btu/h | W<br>watt<br>Nm/s, J/s | kcal/h | hk<br>metric<br>horsepower | hp<br>UK, US<br>horsepower |
|-------|------------------------|--------|----------------------------|----------------------------|
| 1     | 0,293                  | 0,252  | 0,000 398                  | 0,000 393                  |
| 3,41  | 1                      | 0,860  | 0,001 36                   | 0,001 34                   |
| 3,97  | 1,16                   | 1      | 0,001 58                   | 0,001 56                   |
| 2 510 | 735                    | 632    | 1                          | 0,986                      |
| 2 544 | 746                    | 641    | 1,01                       | 1                          |

### Temperature difference, temperature change, $\Delta T$ for K; $\Delta \vartheta$ for $^{\circ}\text{C}$

| K<br>kelvin | $^{\circ}\text{F}$<br>degree Fahrenheit | $^{\circ}\text{C}$<br>degree Celsius |
|-------------|---|--------------------------------------|
| 1           | 1,80                                    | 1,00                                 |
| 0,556       | 1                                       | 0,556                                |
| 1,00        | 1,80                                    | 1                                    |

### Associated temperatures

| K           | $^{\circ}\text{F}$ | $^{\circ}\text{C}$ | Physical state                   |
|-------------|--------------------|--------------------|----------------------------------|
| <b>0,00</b> | -460               | -273               | Absolute zero                    |
| 255         | <b>0,00</b>        | -17,8              | Mixture of sal ammoniac and snow |
| <b>273</b>  | 32,0               | <b>0,00</b>        | Melting point of ice             |
| 293         | 68,0               | 20,0               | Standard atmospheric temperature |
| 311         | <b>100</b>         | 37,8               | Normal temperature of human body |
| 373         | <b>212</b>         | <b>100</b>         | Boiling point of water           |

### Conversion between temperatures

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9 \quad ^{\circ}\text{C} = \text{K} - 273,15$$

$$^{\circ}\text{F} = ^{\circ}\text{C} \times 9/5 + 32 \quad \text{K} = ^{\circ}\text{C} + 273,15$$

### Greek letters

Greek letters are used in technical and scientific texts to denote physical units.

Minor variations in the shapes of the letters can be tolerated, on condition that this does not cause any risk of confusion.

| Name    | Lower case  | Upper case | Name    | Lower case | Upper case |
|---------|-------------|------------|---------|------------|------------|
| alfa    | $\alpha$    | A          | ny      | $\nu$      | N          |
| beta    | $\beta$     | B          | ksi     | $\xi$      | $\Xi$      |
| gamma   | $\gamma$    | $\Gamma$   | omikron | $\omicron$ | O          |
| delta   | $\delta$    | $\Delta$   | pi      | $\pi$      | $\Pi$      |
| epsilon | $\epsilon$  | E          | ro      | $\rho$     | P          |
| zeta    | $\zeta$     | Z          | sigma   | $\sigma$   | $\Sigma$   |
| eta     | $\eta$      | H          | tau     | $\tau$     | T          |
| teta    | $\vartheta$ | $\Theta$   | ypsilon | $\upsilon$ | Y          |
| jota    | $\iota$     | I          | fi      | $\phi$     | $\Phi$     |
| kappa   | $\kappa$    | K          | ki      | $\chi$     | X          |
| lambda  | $\lambda$   | $\Lambda$  | psi     | $\psi$     | $\Psi$     |
| my      | $\mu$       | M          | omega   | $\omega$   | $\Omega$   |



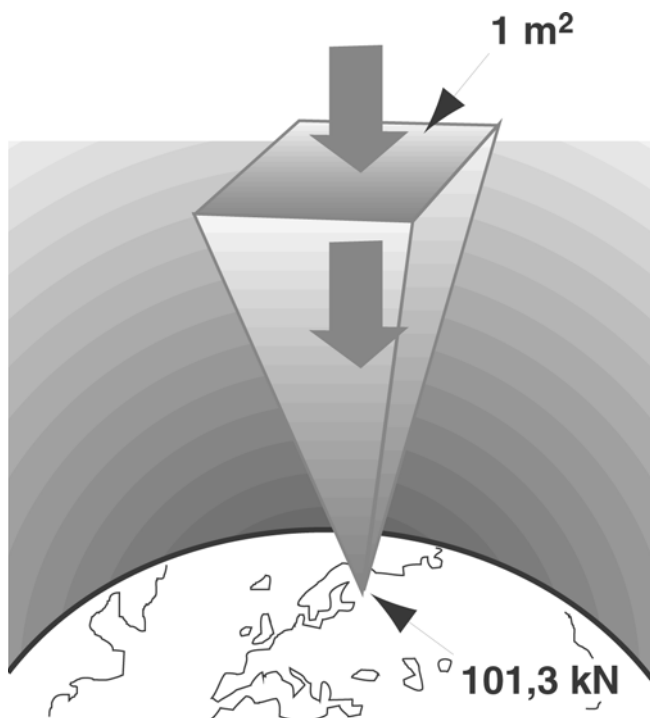
# Pressure

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18

**Total pressure = dynamic pressure + static pressure**

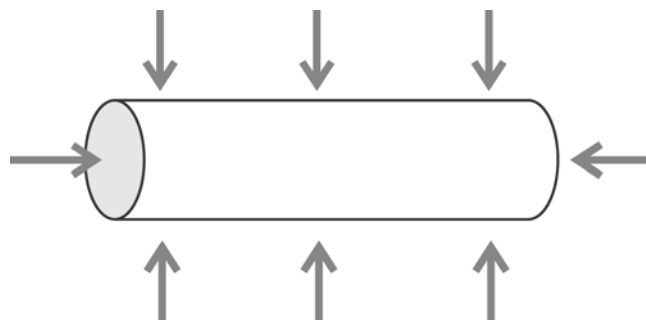
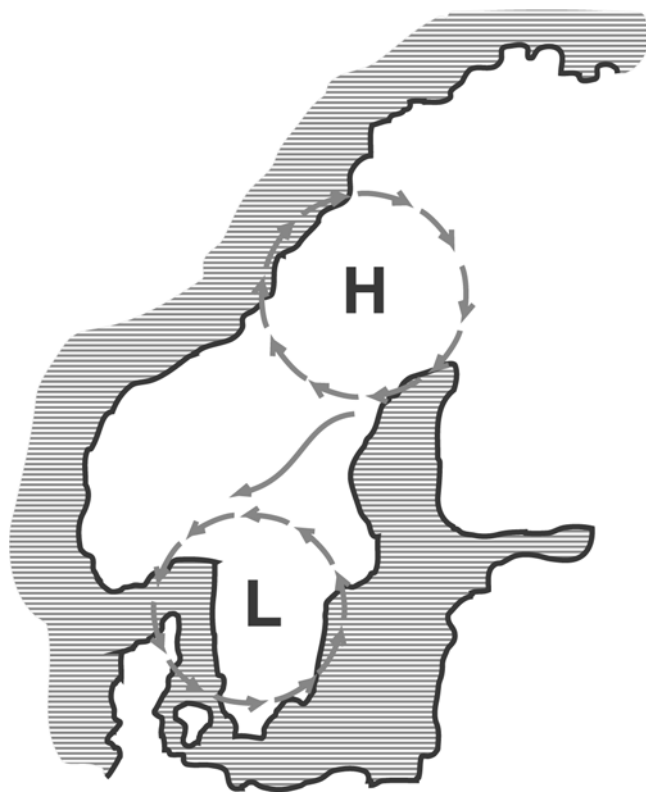
The static pressure in the atmosphere varies with the weather - high pressure or low pressure - and with the height above sea level. The standard pressure, atmospheric pressure at sea level is:

101,3 kPa = 1,013 bar = 1013 mbar  
 (= 1 atm = 760 mm Hg)



At one particular point, such as in a ventilation duct, the static pressure comes from all sides.

In a ventilation system, the static pressure is related to the ambient atmospheric pressure outside the duct system; the static pressure can thus be positive - higher than ambient atmospheric, or negative - lower than ambient atmospheric pressure.

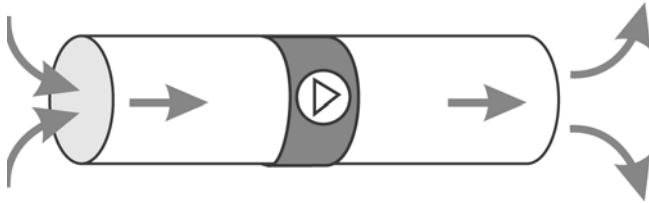




# Pressure

## Pressure drop

If you produce a static pressure difference in an open duct system, you can get the air to flow from a point of higher pressure to a point of lower pressure - from the atmosphere via the inlet grating to the suction side of the fan, and from the supply side of the fan via the supply terminals back to the atmosphere. The pressure difference is converted into kinetic energy.



**Dynamic pressure** is a measure of the kinetic energy of the moving air. The connection between pressure and energy is easy to see if you use SI system units

$\text{Pa} = \text{N}/\text{m}^2 = \text{Nm}/\text{m}^3 = \text{J}/\text{m}^3$  i.e. energy (in J) per unit volume (in  $\text{m}^3$ ) of the flowing air.

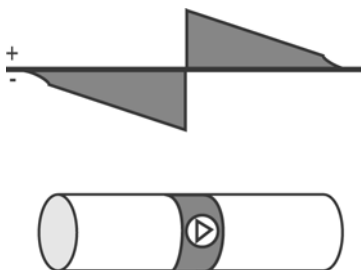
The dynamic pressure depends on

$$p_d = \rho \cdot \frac{\bar{v}^2}{2} \text{ with the units}$$

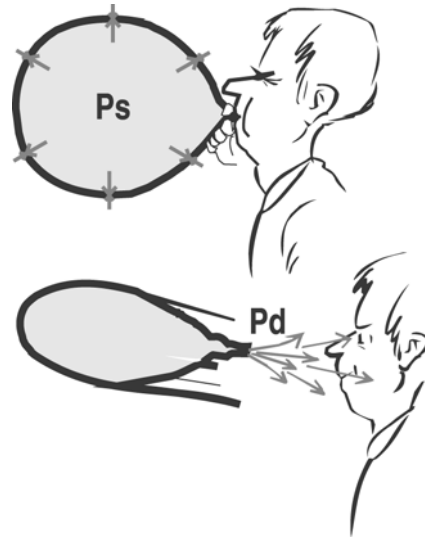
$$\frac{\text{kg}}{\text{m}^3} \cdot \left(\frac{\text{m}}{\text{s}}\right)^2 = \frac{\text{kg}}{\text{m}^3} \cdot \frac{\text{m}^2}{\text{s}^2} = \frac{\text{kgm}}{\text{s}^2} \cdot \frac{\text{m}}{\text{m}^3} = \text{N} \cdot \frac{1}{\text{m}^2} = \frac{\text{N}}{\text{m}^2} = \text{Pa}$$

Flow in a duct system is normally not free of loss. Friction losses occur and the air is forced to change direction. It requires pressure (i.e. energy) to manage both dynamic and static pressure - the sum of these two is referred to as total pressure.

$$p_t = p_s + p_d$$



Since  $p_s$  will be negative in relation to atmospheric pressure (on the suction side of the fan), this means that  $p_t$  will also be negative if the total of  $p_s$  and  $p_d$  is negative.



## Pressure drop and flow losses

In a ventilation system, you want to get air moving! Clean air is to be supplied to the occupancy zone and polluted air must leave the room, process or machine. Energy is needed to move the air, which is added via the fan, which gets the air moving.

In order to flow through a duct system, air has to overcome two types of flow resistances or pressure drops:

- **friction loss** between the flowing air and the duct walls.
- **single loss** when the air changes direction or speed.

**Friction loss** (also known as the R value) is expressed in the

$$\text{unit Pa/m} \Delta p_f = \frac{\lambda}{d_h} \cdot \rho \frac{\bar{v}^2}{2}$$

where

$\Delta p_f$  = friction loss per metre (Pa/m)

$\lambda$  = friction factor related to duct material and surface roughness

$d_h$  = hydraulic diameter of the duct, the diameter of a circular duct which gives the same friction pressure drop at the same flow velocity as a rectangular duct

$$d_h = \frac{2 \cdot a \cdot b}{a + b}$$

where a and b are duct sides

For a circular duct,  $d_h = d$

$\rho$  = air density ( $\text{kg}/\text{m}^3$ )

$\bar{v}$  = average velocity of the air (m/s)

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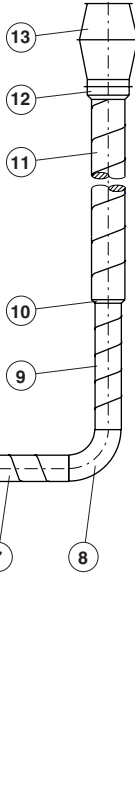
# Pressure

## Pressure drop calculation

### Fan pressure capacity required

Let us do a pressure drop calculation for a simple duct system!

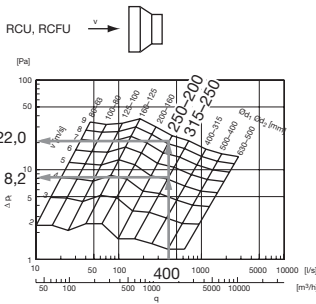
- Number the fittings, in the direction of air flow.
- Then put the dimension and data of each component in a table as in the example.
- Read the pressure drop from the graph for each component. You can follow this example from the reduced scale graphs below.



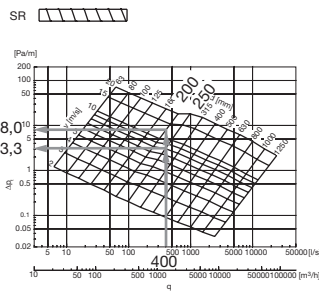
| No  | Flow l/s | Component Denom. | Dimension Ø mm | Length m | Pressure drop Pa/m | Pressure drop Pa |
|---|----------|------------------|----------------|----------|--------------------|------------------|
| ①   | 400      | RCU              | 315-250        | -        | -                  | 8,2              |
| ②   | "        | SR               | 250            | 2,0      | 3,3                | 6,6              |
| ③   | "        | BU 90°           | 250            | -        | -                  | 11,0             |
| ④   | "        | SR               | 250            | 1,6      | 3,3                | 5,3              |
| ⑤   | "        | SLCU 100         | 250/1200       | 1,2      | 5,0                | 6,0              |
| ⑥   | "        | RCFU             | 250-200        | -        | -                  | 22,0             |
| ⑦   | "        | SR               | 200            | 1,5      | 8,0                | 12,0             |
| ⑧   | "        | BU 90°           | 200            | -        | -                  | 24,0             |
| ⑨   | "        | SR               | 200            | 1,2      | 8,0                | 9,6              |
| ⑩   | "        | RCU              | 250-200        | -        | -                  | 15,0             |
| ⑪   | "        | SR               | 250            | 3,5      | 3,3                | 11,6             |
| ⑫   | "        | RCFU             | 400-250        | -        | -                  | 16,0             |
| ⑬   | "        | HF               | 400            | -        | -                  | 14,0             |
| <i>Total pressure drop (sum of rows 1 – 13) = 161,3</i> |          |                  |                |          |                    |                  |

Add up the pressure drops on the far right of the table. Then select a suitable fan which gives the required flow  $q = 400$  l/s and a total pressure rise of  $p_t = 161$  Pa.

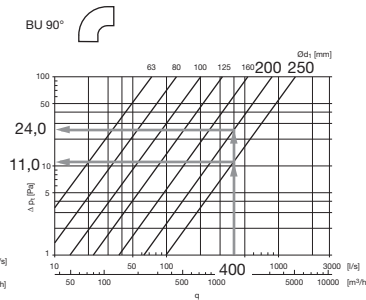
① ⑥



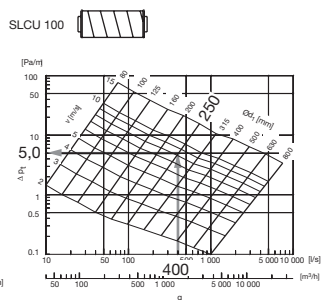
② ④ ⑦ ⑨ ⑪



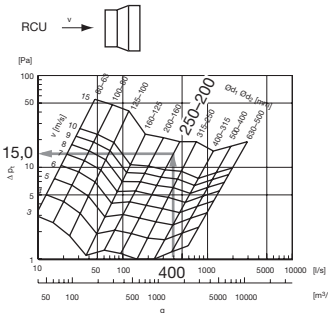
③ ⑧



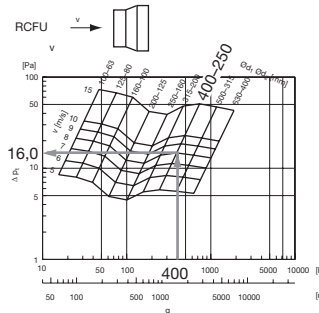
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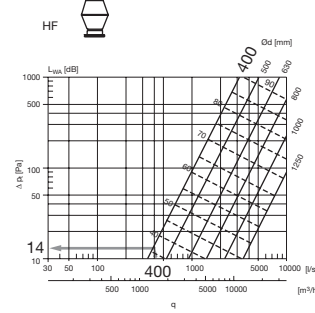
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⑫



⑬





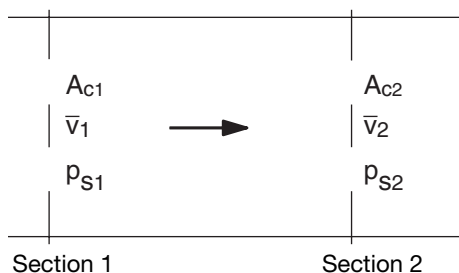
# Pressure

## Prerequisites

In order to correctly dimension a duct system you need information about the total pressure drops of the fittings.

The total pressure drop  $\Delta p_t$  (Pa) between two sections, 1 and 2, in a duct system is defined by

$$p_t = p_{t1} - p_{t2} = (p_{s1} + p_{d1}) - (p_{s2} + p_{d2})$$



where  $p_d = \frac{\rho \cdot \bar{v}^2}{2}$  and  $\bar{v} = \frac{q}{A_c}$

It is assumed in pressure drop calculation of ventilation ducts that:

- incompressible flow, i.e. air density does not change
- isothermal relationship, i.e. no exchange of heat between the duct and its surroundings occurs
- no changes in potential energy, i.e. height differences between the various sections of the duct system are neglected

## Designations used

|                 |   |                         |                   |
|-----------------|---|-------------------------|-------------------|
| l               | = | length                  | m (mm)            |
| a               | = | long side               | m (mm)            |
| b               | = | short side              | m (mm)            |
| r               | = | radius                  | m (mm)            |
| d               | = | diameter                | m (mm)            |
| d <sub>h</sub>  | = | hydraulic diameter      | m (mm)            |
| A <sub>c</sub>  | = | cross sectional area    | m <sup>2</sup>    |
| p <sub>A</sub>  | = | atmospheric pressure    | mbar              |
| p <sub>s</sub>  | = | static pressure         | Pa                |
| p <sub>d</sub>  | = | dynamic pressure        | Pa                |
| p <sub>t</sub>  | = | total pressure          | Pa                |
| Δp              | = | pressure drop           | Pa                |
| Δp <sub>t</sub> | = | total pressure drop     | Pa                |
| ϑ               | = | temperature             | °C                |
| $\bar{v}$       | = | air velocity (average)  | m/s               |
| q               | = | air flow                | m <sup>3</sup> /s |
| ρ               | = | density                 | kg/m <sup>3</sup> |
| α               | = | angle                   | °                 |
| φ               | = | relative humidity       | %                 |
| λ               | = | friction number         |                   |
| R               | = | coefficient of friction | Pa/m              |
| ζ               | = | resistance number       |                   |
| ν               | = | kinematic viscosity     | m <sup>2</sup> /s |

The total pressure drops for the most common fittings are shown in graphs, as a function of air flow (or velocity in some cases).

The basic data for the graphs comes from measurements and calculations done at our laboratories. Some graphs are taken from literature.

The graphs apply to air under standard conditions.

|                |   |   |
|----------------|---|---|
| ν              | = | 15,1 · 10 <sup>-6</sup> m <sup>2</sup> /s |
| ϑ              | = | 20 °C                                     |
| ρ              | = | 1,2 kg/m <sup>3</sup>                     |
| φ              | = | 65 %                                      |
| p <sub>A</sub> | = | 1013,2 mbar                               |

For air of other density (ρ<sub>other</sub>) the flow (q<sub>other\_density</sub>) is obtained from the formula

$$q_{\text{other\_density}} = q_{\text{graph}} \cdot \sqrt{\frac{1,2}{\rho_{\text{other}}}}$$

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# Sound

## Ventilation does not have to be noisy!

1

If you use your common sense, and construct your air treatment system with consideration and good components, you can often avoid problems and complaints.

2

Fans make noise, this is something you can not do a lot about. But you can prevent the noise from getting into the areas connected to the fan system - you can absorb and damp the noise on the way.

3

This description does not claim to teach you how to calculate and attenuate noise in a ventilation system - there are books available on this.

4

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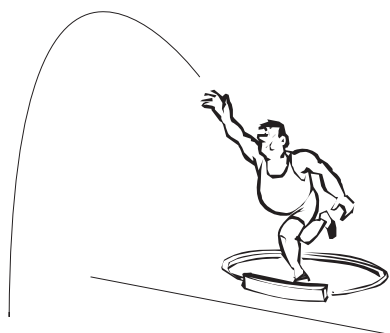
### Source

*Waves on water*

6

We throw a stone onto completely calm water.

7



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*Waves in air*

We fire a starter's gun.

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This description only aims at providing information about a few simple rules and hints, which together with common sense can be enough for simple installations.

You must have some basic knowledge about how and where noise is generated, transmitted and attenuated in the system, to be able to choose the correct principle and correct components. To take a simple analogy: noise transmission consists of waves in a medium, i.e. air, which we can not see. This is very similar to the way waves spread on water.

Let us examine the analogy, to make the comparison clearer:

### Distribution

*Waves on water*

Waves on water spread out in increasing concentric circles from the centre, where the stone hit the water.



*Waves in air*

Sound waves spread out in the air, in all directions, in an increasing ball from the centre, i.e. the gun.





# Sound

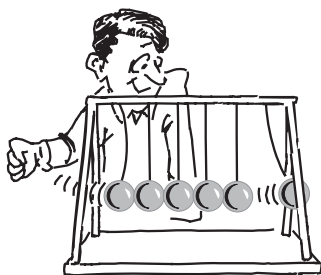
## Energy transport

### Waves on water

Kinetic energy is transmitted from molecule to molecule in the water. They bounce against each other. Molecules move back and forwards. Energy spreads from the source.

### Waves in air

Kinetic energy is transmitted from molecule to molecule in the air. They bounce against each other, and move back and forwards. Energy spreads from the source.



## Distance

### Waves on water

When waves depart from the centre, where the stone hit, the wave height becomes lower and lower, until they are invisible. The water is calm again.

### Waves in air

When sound waves depart from the source, the starter's gun, wave movement drops off and the sound becomes weaker and weaker until it can no longer be heard.



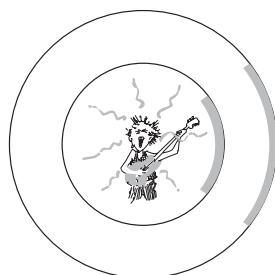
## Intensity

### Waves on water

The energy which started the wave propagation, or the power needed to keep it going, is distributed across an increasing area as the distance, the radius, increases.

### Waves in air

The energy which started the wave propagation, or the power needed to keep it going, is distributed across an increasing volume as the distance, the radius, increases.



## Obstruction in the way

### Waves on water

If waves in water encounter the side of a boat or jetty, they will be reflected at the same angle as they met the obstruction.

### Waves in air

If waves in air encounter a wall, they will be reflected at the same angle as they met the obstruction.

*In the same way as when you bounce a ball on the wall.*

## Energy loss

### Waves on water

The reflected wave height is lower than the incident wave. Some of the kinetic energy is absorbed in the collision with the jetty side (and is converted into heat).

### Waves in air

The reflected wave movement is lower than the incident wave. Some of the kinetic energy is absorbed in the collision with the wall (and is converted into heat)

*The ball moves more slowly when it bounces back than when it hits the wall.*

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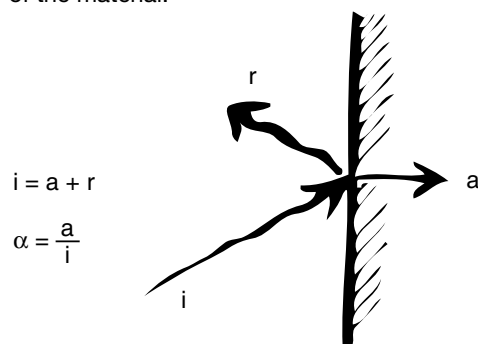
# Sound

## Sound can be absorbed

When sound waves meet a soft, porous wall (mineral wool etc.), the vibrating molecules penetrate the surface layer, and are then braked by friction against the material fibres.

The part of the energy which is thus absorbed is converted to heat in the material, and the rest is reflected back into the room. This type of damping, where the sound is braked by the soft surface layer, is referred to as porous absorption.

The sound absorption ability of different materials varies. This property is expressed as the sound absorption factor  $\alpha$  of the material.



If nothing is absorbed, everything is reflected, then  $a = 0$  which makes  $\alpha = 0$ :

$$i = 0 + r\alpha = \frac{0}{i} = 0$$

If nothing is reflected, everything is absorbed, then  $r = 0$  which makes  $\alpha = 1$ :

$$i = a + 0\alpha = \frac{a}{a} = 1$$

An open window can be said to have  $\alpha = 1$ , all sound from the room which arrives at the window disappears out!

In hard materials, such as concrete or marble surfaces, virtually no sound energy is absorbed, everything is reflected and the  $\alpha$  value is near to zero. In rooms with hard surfaces, the sound bounces for a long time before it dies out. The room has a long reverberation time and we get a strong, unpleasant echo. The sound level caused by normal sound sources becomes high.

In soft materials, such as thick mineral wool boards, the opposite happens. The  $\alpha$  value is close to 1. Sometimes, excessively damped, soft rooms are unsuitable "You can't hear what you say". Avoid extremes - the reverberation time in a room should be chosen to suit the activities there.

Sound, in a ventilation system, moves just as easily with or against the direction of flow.

Sound which moves through a duct system will be damped in several ways. Let us start off with bare metal duct walls.

### Metal walls also absorb - but not much

When the metal duct walls are hit by the sound wave, they will start to vibrate at the same frequency as the sound.

The movements are normally very small, and hardly visible to the naked eye (it is often easier to feel the vibration, with your fingertips on the sheet metal).

What happens is the same as when a window vibrates when a heavy truck passes by on the street.

The duct panels and the window will then function as **membrane dampers** - boards which are made to vibrate by the incident sound energy. But this movement is not without friction, since it is braked by both the bending strength of the sheet, and (mostly) by the connection around the edges of the sheet. As previously, with the porous damper, some of the energy is converted into heat - the sound which remains has become weaker and has been damped.

Given the same free duct area, a circular, spiral seamed duct is stiffer than a rectangular one and will thus provide less damping.

As shown in the illustration on the next page, damping in unlined ducts is relatively modest. For this reason, it is normally ignored when the noise in the installation is calculated, it is instead used as the margin of safety.

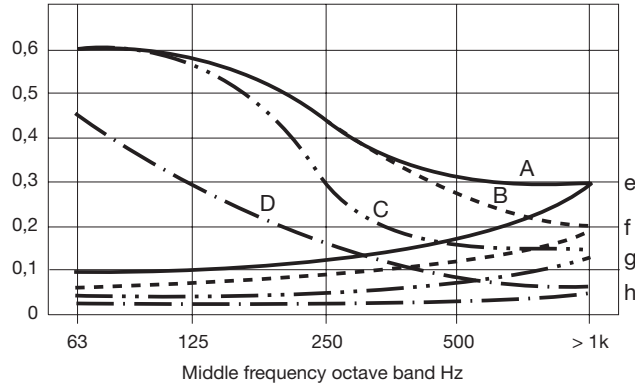
Attenuation in straight sheet metal ducts (1 mm sheet metal thickness)



# Sound

## Attenuation in straight sheet metal ducts (1 mm sheet metal thickness)

Attenuation  
dB per m

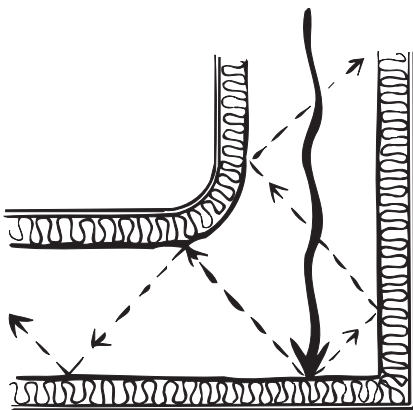


| Duct dimensions               |           |           |           |
|-------------------------------|-----------|-----------|-----------|
| Rectangular sheet metal ducts |           |           |           |
| □ 75-200                      | 200-400   | 400-800   | 800-1000  |
| A ———                         | B - - - - | C . . . . | D - . . . |
| Circular sheet metal ducts    |           |           |           |
| Ø75-200                       | 200-400   | 400-800   | 800-1600  |
| e ———                         | f - - - - | g . . . . | h - . . . |

### Absorption is more effective

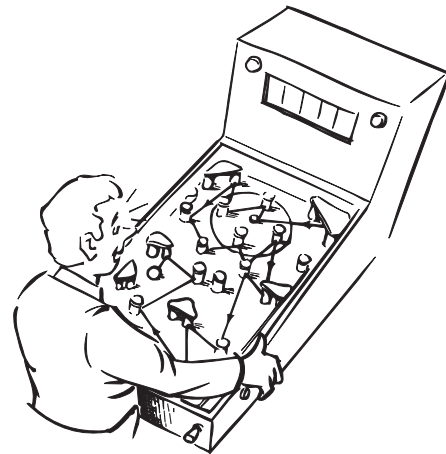
The damping becomes more effective if we put absorbent material into the duct system. The way that sound is damped was described above, part of the sound energy is absorbed by the absorption material which is hit by the sound.

If the sound waves bounce enough times against porous surfaces, the remaining sound energy, the kinetic energy which makes your eardrums vibrate, will be so low that it does not cause annoyance!

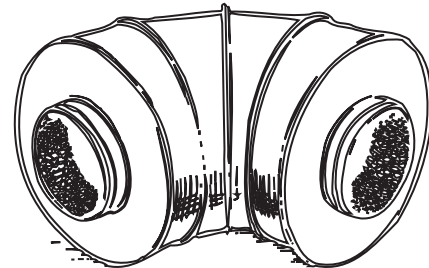


## Where should you put the absorption material in the ducts?

The answer is obvious - where the material comes into contact with the greatest number of sound waves. Noise which travels along a long, unlined, straight duct will be directed by reflection against the duct walls. Absorption material here is of less use than if it is put in a bend, a suction or pressure plenum chamber or in a straight duct just after a fan, or anywhere where we have "turbulent sound flow". The more times sound bounces against the soft sides, the more useful the material becomes.



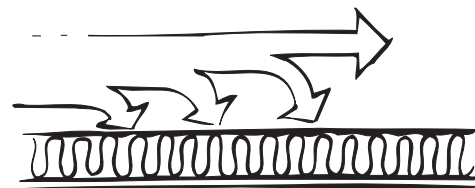
### Why the curved silencer BSLCU is so effective!



### Straight silencers concentrate the absorption material

There is a complement to the description of sound waves above. When the sound waves travel along a porous surface, they will be deflected towards the duct walls. This deflection is called, "diffraction".

This, and the way that sound propagation is disturbed by turbulence, gives that straight silencers can have high attenuation.

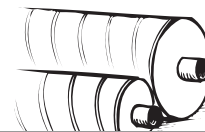


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# Sound

As we can see from the values for SLCU 50 and SLCU 100, damping varies with a few simple rules:



To attenuate low frequencies (< 500 Hz) thicker absorption material is needed. – SLCU 100 is more efficient than SLCU 50.

### SLCU 50

| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation in dB for centre frequency Hz |     |     |     |    |    |    |    |
|------------------------|---------|---|-----|-----|-----|----|----|----|----|
|                        |         | 63  | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                     | 300     | 5   | 5   | 8   | 15  | 28 | 29 | 23 | 16 |
| 80                     | 600     | 5   | 7   | 12  | 26  | 41 | 50 | 48 | 24 |
| 80                     | 900     | 5   | 9   | 17  | 37  | 50 | 50 | 50 | 32 |
| 80                     | 1200    | 6   | 11  | 21  | 49  | 50 | 50 | 50 | 40 |
| 100                    | 300     | 2   | 2   | 6   | 14  | 21 | 25 | 20 | 11 |

### SLCU 100

| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation in dB for centre frequency Hz |     |     |     |    |    |    |    |
|------------------------|---------|---|-----|-----|-----|----|----|----|----|
|                        |         | 63  | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                     | 300     | 10  | 8   | 10  | 16  | 21 | 27 | 24 | 16 |
| 80                     | 600     | 12  | 13  | 19  | 27  | 37 | 50 | 46 | 24 |
| 80                     | 900     | 14  | 18  | 28  | 38  | 50 | 50 | 50 | 33 |
| 80                     | 1200    | 16  | 23  | 37  | 49  | 50 | 50 | 50 | 42 |
| 100                    | 300     | 5   | 4   | 11  | 14  | 18 | 24 | 20 | 11 |

To attenuate high frequencies (> 500 Hz), thinner absorption material is sufficient. – SLCU 50 is just as effective as SLCU 100.

### SLCU 50

| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation in dB for centre frequency Hz |     |     |     |    |    |    |    |
|------------------------|---------|---|-----|-----|-----|----|----|----|----|
|                        |         | 63  | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                     | 300     | 5   | 5   | 8   | 15  | 28 | 29 | 23 | 16 |
| 80                     | 600     | 5   | 7   | 12  | 26  | 41 | 50 | 48 | 24 |
| 80                     | 900     | 5   | 9   | 17  | 37  | 50 | 50 | 50 | 32 |
| 80                     | 1200    | 6   | 11  | 21  | 49  | 50 | 50 | 50 | 40 |
| 100                    | 300     | 2   | 2   | 6   | 14  | 21 | 25 | 20 | 11 |

### SLCU 100

| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation in dB for centre frequency Hz |     |     |     |    |    |    |    |
|------------------------|---------|---|-----|-----|-----|----|----|----|----|
|                        |         | 63  | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                     | 300     | 10  | 8   | 10  | 16  | 21 | 27 | 24 | 16 |
| 80                     | 600     | 12  | 13  | 19  | 27  | 37 | 50 | 46 | 24 |
| 80                     | 900     | 14  | 18  | 28  | 38  | 50 | 50 | 50 | 33 |
| 80                     | 1200    | 16  | 23  | 37  | 49  | 50 | 50 | 50 | 42 |
| 100                    | 300     | 5   | 4   | 11  | 14  | 18 | 24 | 20 | 11 |

The longer way the sound has to pass over the absorption surface the higher the attenuation. Long silencers have higher attenuation than short ones. – SLCU with l = 600 attenuates more than SLCU with l = 300.

### SLCU 50

| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation in dB for centre frequency Hz |     |     |     |    |    |    |    |
|------------------------|---------|---|-----|-----|-----|----|----|----|----|
|                        |         | 63  | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                     | 300     | 5   | 5   | 8   | 15  | 28 | 29 | 23 | 16 |
| 80                     | 600     | 5   | 7   | 12  | 26  | 41 | 50 | 48 | 24 |
| 80                     | 900     | 5   | 9   | 17  | 37  | 50 | 50 | 50 | 32 |
| 80                     | 1200    | 6   | 11  | 21  | 49  | 50 | 50 | 50 | 40 |
| 100                    | 300     | 2   | 2   | 6   | 14  | 21 | 25 | 20 | 11 |

### NOTE!

The attenuation is not directly proportional to the length. The reason for this is that you get an extra attenuation at cross section area changes, and all silencers have two of them irrespective of their length.

The shorter distance between the absorbing surfaces the higher the attenuation. Silencers with small diameter attenuates more than big ones. – SLCU Ø 80 attenuates more than SLCU Ø 250.

### SLCU 50

| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation in dB for centre frequency Hz |     |     |     |    |    |    |    |
|------------------------|---------|---|-----|-----|-----|----|----|----|----|
|                        |         | 63  | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                     | 300     | 5   | 5   | 8   | 15  | 28 | 29 | 23 | 16 |
| 80                     | 600     | 5   | 7   | 12  | 26  | 41 | 50 | 48 | 24 |
| 80                     | 900     | 5   | 9   | 17  | 37  | 50 | 50 | 50 | 32 |
| 80                     | 1200    | 6   | 11  | 21  | 49  | 50 | 50 | 50 | 40 |
| 100                    | 300     | 2   | 2   | 6   | 14  | 21 | 25 | 20 | 11 |
| 250                    | 600     | 3   | 2   | 7   | 13  | 17 | 16 | 8  | 6  |
| 250                    | 900     | 3   | 4   | 8   | 20  | 26 | 23 | 10 | 8  |
| 250                    | 1200    | 4   | 5   | 9   | 26  | 35 | 30 | 12 | 10 |
| 315                    | 600     | 0   | 2   | 6   | 11  | 14 | 9  | 4  | 5  |

### SLCU 100

| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation in dB for centre frequency Hz |     |     |     |    |    |    |    |
|------------------------|---------|---|-----|-----|-----|----|----|----|----|
|                        |         | 63  | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                     | 300     | 10  | 8   | 10  | 16  | 21 | 27 | 24 | 16 |
| 80                     | 600     | 12  | 13  | 19  | 27  | 37 | 50 | 46 | 24 |
| 80                     | 900     | 14  | 18  | 28  | 38  | 50 | 50 | 50 | 33 |
| 80                     | 1200    | 16  | 23  | 37  | 49  | 50 | 50 | 50 | 42 |
| 100                    | 300     | 5   | 4   | 11  | 14  | 18 | 24 | 20 | 11 |
| 250                    | 900     | 7   | 7   | 15  | 18  | 25 | 23 | 10 | 9  |
| 250                    | 1200    | 7   | 9   | 20  | 25  | 34 | 30 | 13 | 11 |
| 315                    | 600     | 1   | 4   | 7   | 9   | 12 | 10 | 5  | 6  |
| 315                    | 900     | 2   | 6   | 12  | 14  | 19 | 15 | 7  | 8  |
| 315                    | 1200    | 2   | 8   | 16  | 18  | 26 | 21 | 9  | 10 |
| 400                    | 600     | 1   | 5   | 5   | 5   | 7  | 4  | 4  | 4  |

### SLCBU 100

| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation in dB for centre frequency Hz |     |     |     |    |    |    |    |
|------------------------|---------|---|-----|-----|-----|----|----|----|----|
|                        |         | 63  | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 315                    | 600     | 4   | 6   | 10  | 16  | 22 | 28 | 27 | 18 |
| 315                    | 900     | 5   | 7   | 16  | 23  | 30 | 38 | 32 | 22 |
| 315                    | 1200    | 7   | 9   | 23  | 30  | 38 | 47 | 37 | 25 |
| 400                    | 600     | 4   | 5   | 7   | 9   | 13 | 16 | 15 | 13 |

For the same reason, an extra baffle gives higher attenuation than a silencer of the same diameter, but without a baffle. – SLCBU 100 attenuates more than SLCU 100.



# Sound

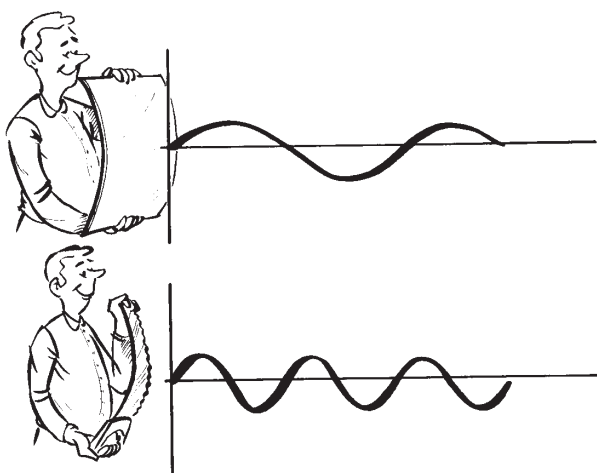
## Noise frequency influences the choice of silencer

As we see in the tables above, the damping ability varies with the frequency of sound. Before we look at the choice of silencers, it could be a good idea to describe the concept of frequency in greater detail.

A sound source influences the surrounding air, and makes it vibrate. The character of the sound depends on the variations in pressure which occur in the air.

Let us assume that the sound source is a vibrating plate - the changes in pressure, or the sound will then have the same frequency as the vibrations in the plate. The strength of the sound will depend on the amount that the plate vibrates, i.e. the amplitude of the movement. Let us start off with that:

If there is only one note, of a single frequency, the pressure will vary sinusoidally, so a pure note is referred to as a sine wave.



The characteristics of sound propagation are:

- frequency ( $f$ ), which is measured in hertz, **Hz**, ( $s^{-1}$ ), (and specifies the number of times a second that a new sound wave arrives).
- wave length ( $\lambda$ , "lambda"), which is measured in metres, **m**, (and specifies the distance between two similar points on the curve).

and

- speed of sound ( $c$ ) which is measured in **m/s**, (and specifies the speed of movement of the sound wave).

These three variables have the following relationship:

$$c = f \cdot \lambda$$

The speed of sound in air is also a function of pressure and temperature.

At normal air pressure and + 20 °C is  $c \approx 340$  m/s.

A young person with normal hearing can hear sounds at frequencies from 20-20 000 Hz, i.e. (in air) at wavelengths ranging from 17 m (at 20 Hz) to app. 17 mm (at 20 kHz).

We perceive changes in sound frequency on a logarithmic scale, i.e. it is the relative frequency and not the difference in Hz which determines how a change in note is perceived. A doubling of frequency is perceived as being the same, irrespective of whether it is a change from 100 to 200 Hz, 1000 to 2000 Hz or 10 to 20 kHz.

The logarithmic scale is usually sub-divided into octaves. i.e. in scales where the top note is twice the frequency of the bottom note. This has been customary in music for a long time.

1

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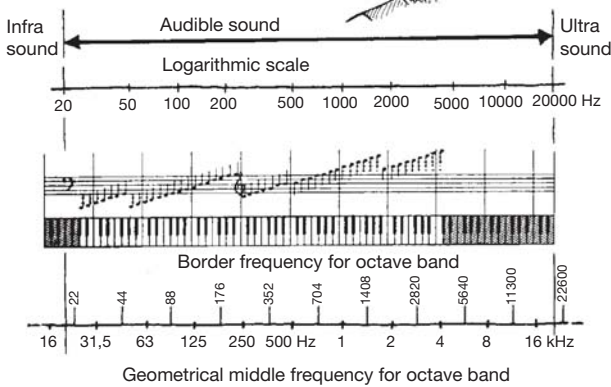
17

18



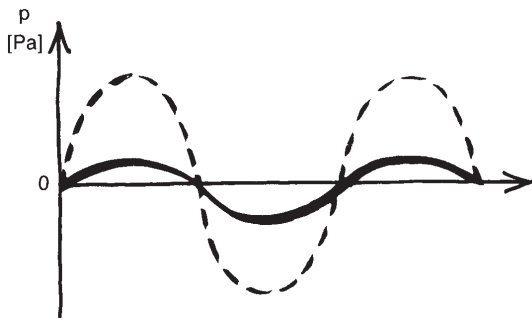
# Sound

And in engineering.



## The concept of decibel

The stronger the sound is, the harder the particles of air will bump into each other.



Sound pressure changes in the audible area can vary within very wide limits. Some sounds are so weak that we can not hear them. The so-called **audible limit** varies with frequency and is 20  $\mu$ Pa at about 1000 Hz .

Other sounds are so loud that we risk hearing damage. The **pain limit**, the sound pressure which causes pain in your ears also varies with frequency, but is about 20 Pa at 1000 Hz. This means that it is a million times louder than the weakest sound we can perceive.

We also perceive changes in sound pressure on a logarithmic scale. A **sound level concept** using the **decibel (dB)** as the unit, has been created to express comparable values.

The **dB** unit, which is used in many different applications, is generally defined as:  $10 \cdot \log (X/X_0)$ , where  $X$  is the unit measured, i.e. the sound pressure, and  $X_0$  is a reference level expressed in the same units. The relationship of  $X/X_0$  is thus dimensionless. The reference level from which the dB unit is

specified, is given instead. This means that you generally express the level in **dB (above  $X_0$ )**.

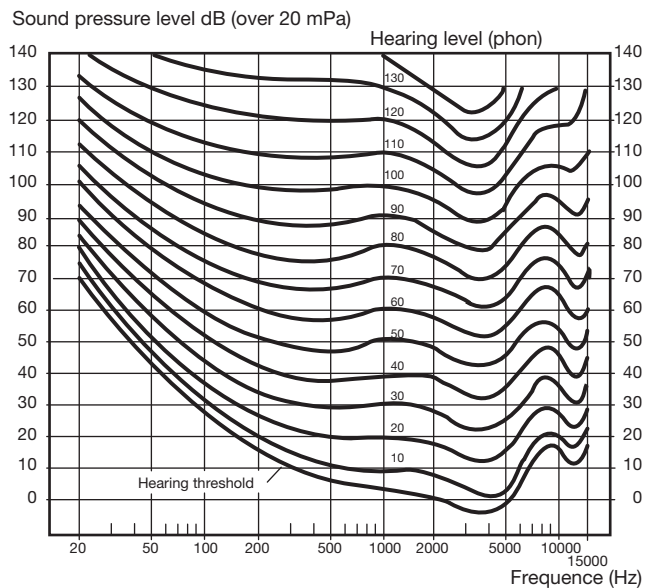
## Our perception of sound

We react differently to two sounds which have the same sound pressure level and different frequencies.



Curves which describe how people normally perceive sounds of varying strength and frequency have been constructed through experiments on large numbers of volunteers. These so-called **hearing level curves** are designated by the sound pressure level for each curve at a frequency of 1 kHz. The unit used for the curves is the **phon**.

## Hearing level curves



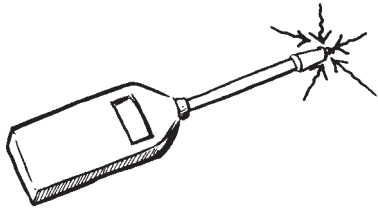
Example:

**The sound pressure level 70 dB at 50 Hz is normally perceived as being as loud as 50 dB at 1000 Hz.**

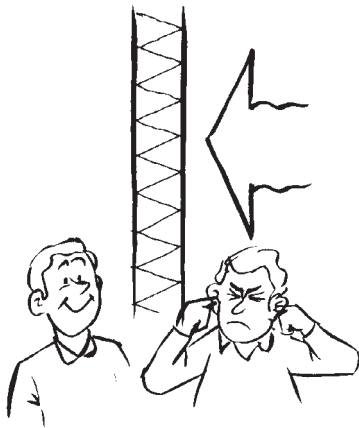


# Sound

## Sound levels



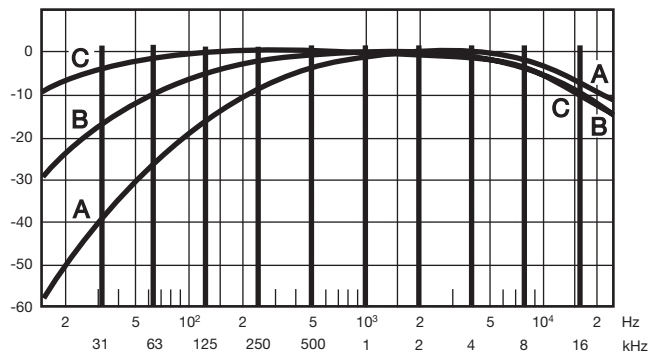
Several methods are used to compare the disturbance caused by two different sounds, and where the perception of the ear to noise has been modelled.



The simplest way is to compare their “weighted” sound levels. The incoming sound is filtered in an electronic filter to reduce the components, mostly the low-frequency components, where the ear is not so sensitive, and amplify the components between 1 and 4 kHz, where we are most sensitive.

Sound meters usually have three electronic filters, A-, B- and C-filter. The A-filter is mostly used these days, where the result, the “weighted” **sound level**, is expressed in **dB (A)**.

Attenuation dB (above 20 mPa)



## Choosing silencers

The fan is the primary sound source in a ventilation system, but intrusive noise can also be caused by an unsuitable choice of duct components and terminal units:

$$L_w = 40 + 10 \cdot \log q + 20 \cdot \log p_t \text{ dB (above 1 pW)}$$

$q$  = air flow (in m<sup>3</sup>/s) through the fan

$p_t$  = total pressure rise (in Pa) in the fan

40 = “specific noise power level” which considers the efficiency of the fan at its point of operation, and the SI units for  $q$  and  $p_t$ .

The noise generated in the fan must be attenuated in the duct system, at some point before the room terminal unit. Some of the attenuation is “natural”, examples are given above. This attenuation is often not enough, and additional silencers can be put in the duct system - in the main channel near the fan to damp the fan noise to all the duct branches or in the branch ducts only to damp particularly sensitive rooms.

Low air speeds should be selected in the ducts, to avoid disturbing noise in the rooms.

- At a given air speed, a doubling of that speed corresponds to a 12 dB increase in noise levels.

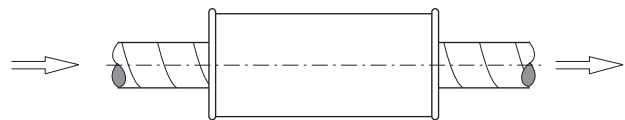
Low air speeds also cut operating costs.

- At a given air speed, the fan power required increases as the square of the air speed.

In this example, calculation has shows that the existing attenuation in the duct system is not enough. The table shows that more attenuation is needed. What to choose?

### Example

Duct Ø315



|            | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |    |
|------------|----|-----|-----|-----|----|----|----|----|----|
| Before     | X  | X   | X   | X   | X  | X  | X  | X  | dB |
| After      | X  | X   | X   | X   | X  | X  | X  | X  | dB |
| Difference | 1  | 4   | 8   | 13  | 20 | 16 | 7  | 7  | dB |

**Lindab** has a large range of silencers with varying characteristics and dimensions. Let us see what might fit!





# Sound

| SLCU 50 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
|---------|----|-----|-----|-----|----|----|----|----|
| 600     | 0  | 2   | 6   | 11  | 14 | 9  | 4  | 5  |
| 900     | 1  | 3   | 7   | 16  | 22 | 12 | 6  | 7  |
| 1200    | 1  | 3   | 8   | 22  | 30 | 16 | 7  | 9  |

This is the narrowest silencer, so the longest one, 1200 mm, should be selected to meet the requirements. The deviation in the 125 Hz band, 1 dB, is small and will not be noticeable. This is one of the possible alternatives!

| SLCU 100 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
|----------|----|-----|-----|-----|----|----|----|----|
| 600      | 1  | 4   | 7   | 9   | 12 | 10 | 5  | 6  |
| 900      | 2  | 6   | 12  | 14  | 19 | 15 | 7  | 8  |
| 1200     | 2  | 8   | 16  | 18  | 26 | 21 | 9  | 10 |

This silencer has a thicker layer of absorbing material (100 mm instead of 50 mm) and thus has better low frequency damping, but also has a larger external diameter than SLCU 50. To meet the requirements, you should choose the longer one, 900 mm. The deviations in the 500 and 1k Hz bands, 1 dB, are small and will not be noticeable. This is another of the possible alternatives.

| SLCUBU 100 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
|------------|----|-----|-----|-----|----|----|----|----|
| 600        | 4  | 6   | 10  | 16  | 22 | 28 | 27 | 18 |
| 900        | 5  | 7   | 16  | 23  | 30 | 38 | 32 | 22 |
| 1200       | 7  | 9   | 23  | 30  | 38 | 47 | 37 | 25 |

This silencer has the same thickness of absorbing material as SLCU 100 (100 mm) but also has a 100 mm thick baffle which increases damping (but also the pressure drop across the silencer). You only have to choose the shortest one, 600 mm, to meet the requirements by a wide margin. The silencer manages all the octave bands by a wide margin. This is still another possible alternative.

The final choice of alternatives is determined by other considerations:

- **SLCU 50 1200**  
if there is space lengthways, (but perhaps tight at the sides).
- **SLCU 100 900**  
shorter, but needs more room at the sides.
- **SLCUBU 100 600**  
If the lengthways space is limited and if the slight increase in total pressure drop is not important - e.g. in a branch duct where part of the available pressure has to be restricted anyway when the air flows are adjusted.

Decide how safe the values in the sound calculation are, and choose a silencer with the corresponding margin of safety. It is always more expensive and more difficult to add damping afterwards, if it was not installed from the beginning. If the users ever become dissatisfied with the noise, it is difficult to get them to change their views!

You can find the products under Silencers.



# Safe



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# Bends

## Overview bends – ordinary

| Ød <sub>1</sub> | Short radius<br>r <sub>m</sub> ≈ 0,6 • d <sub>1</sub> |                          | Normal radius<br>r <sub>m</sub> ≈ 1 • d <sub>1</sub> |   | Long radius<br>r <sub>m</sub> ≈ 1,5 • d <sub>1</sub> |                          |
|-----------------|---|--------------------------|--|---|--|--------------------------|
|                 | Pressed and seam welded                               | Segmented and lockseamed | Pressed and seam welded                              | Segmented and lockseamed                            | Pressed and seam welded                              | Segmented and lockseamed |
| 63              | BKU 90°   |                          | BU 90°<br>BU 60°<br>BU 45°<br>BU 30°<br>BU 15°       |   | BSU 90°<br>BSU 45°                                   |                          |
| 80              |   |                          |  |   |  |                          |
| 100             |   |                          |  |   |  |                          |
| 125             |   |                          |  |   |  |                          |
| 160             | BKFU 90°  |                          |  | BFU 90°<br>BFU 60°<br>BFU 45°<br>BFU 30°<br>BFU 15° |  | BSFU 90°<br>BSFU 45°     |
| 200             |   |                          |  |   |  |                          |
| 250             |   |                          |  |   |  |                          |
| 315             |   |                          |  |   |  |                          |
| 400             |   |                          |  |   |  |                          |
| 500             |   |                          |  |   |  |                          |
| 630             |   |                          |  |   |  |                          |
| 800             |   |                          |  |   |  |                          |
| 1000            |   |                          |  |   |  |                          |
| 1250            |   |                          |  |   |  |                          |



## Overview bends – others

| Ød <sub>1</sub> | Short radius<br>r <sub>m</sub> ≈ 0,6 • d <sub>1</sub> | Normal radius<br>r <sub>m</sub> ≈ 1 • d <sub>1</sub> |                         |                          |                          |                          |                            |                                  |
|-----------------|---|--|-------------------------|--------------------------|--------------------------|--------------------------|----------------------------|----------------------------------|
|                 | Pressed and seam welded                               | Segmented and lockseamed                             | Pressed and seam welded | Segmented and lockseamed | Segmented and lockseamed | Segmented and lockseamed | Pressed and seam welded    | Pressed and seam welded          |
| 63              | BKMU 90°  |  | BKCU 90°                |                          | BBKCU 90°                |                          | BU GJUT                    | BSIU GJUT                        |
| 80              |   |  |                         |                          |                          |                          |                            |                                  |
| 100             |   |  |                         |                          |                          |                          |                            |                                  |
| 125             |   |  |                         |                          |                          |                          |                            |                                  |
| 160             | BKFMU 90°   |  | BFCU 90°                |                          |                          | BFBKCU 90°               |                            |                                  |
| 200             |   |  |                         |                          |                          |                          |                            |                                  |
| 250             |   |  |                         |                          |                          |                          |                            |                                  |
| 315             |   |  |                         |                          |                          |                          |                            |                                  |
| 400             |   |  |                         |                          |                          |                          |                            |                                  |
| 500             |   |  |                         |                          |                          |                          |                            |                                  |
| 630             |   |  |                         |                          |                          |                          |                            |                                  |
|                 | Female end  |  | Cleaning stud at side   |                          | Cleaning stud at back    |                          | Female end and nail flange | Air valve socket and nail flange |





# T-pieces and saddle

## Overview T-pieces – ordinary

| Ød <sub>1</sub> | Short installation length | Normal installation length |                          |
|-----------------|---------------------------|----------------------------|--------------------------|
|                 | Pressed and seam welded   | Pressed and seam welded    | Segmented and lockseamed |
| 63              | TCPU KORT                 | TCPU                       | TCU<br>TU                |
| 80              |                           |                            |                          |
| 100             |                           |                            |                          |
| 125             |                           |                            |                          |
| 160             |                           |                            |                          |
| 200             |                           |                            |                          |
| 250             |                           |                            |                          |
| 315             |                           |                            |                          |
| 400             |                           |                            |                          |
| 500             |                           |                            |                          |
| 630             |                           |                            |                          |
| 800             |                           |                            |                          |
| 1000            |                           |                            |                          |
| 1250            |                           |                            |                          |



## Overview saddle and T-pieces

| Normal installation length |                          |
|----------------------------|--------------------------|
| Pressed and seam welded    | Segmented and lockseamed |
| PSU                        | TSTCU<br>TSTU            |



## Overview T-pieces – others

| Ød <sub>1</sub> | Short installation length | Normal installation length |                                  |
|-----------------|---------------------------|----------------------------|----------------------------------|
|                 | Pressed and seam welded   | Pressed and seam welded    | Pressed and seam welded          |
| 63              | TCPU GIPS                 | TCPU GJUT                  |                                  |
| 80              |                           |                            |                                  |
| 100             |                           |                            | TCSIU GJUT                       |
| 125             |                           |                            |                                  |
| 160             |                           |                            |                                  |
| 200             |                           |                            |                                  |
| 250             |                           |                            |                                  |
| 315             |                           |                            |                                  |
| 400             |                           |                            |                                  |
|                 | Female end                | Female end and nail flange | Air valve socket and nail flange |





# The Safe system

## The Safe-system

- Safe is a quickly assembled system for round ventilation ducts.
- Safe is type approved to class D by SITAC, no. 1358/88.
- The complete programme has dimensions according to Eurovent 2/3 and Swedish Standard SS-EN 1506.
- The system is based on a double-lipped, factory-installed seal made from EPDM rubber. The moulding, which can withstand rough handling, and is almost insensitive to temperature changes, gives a very air-tight seal.

## Advantages of the Safe-system

- Quick assembly.
- Factory fitted seal with no loose fittings.
- Can be twisted and adjusted with tightness unaffected.
- Installation without sealant or solvents.
- Can be used in all climates.
- Seal moulding remains tight from 5 000 Pa negative pressure to 3 000 Pa positive pressure. Duct resistance to collapse differs from these pressures, and is noted on page 51.
- Type approved to sealing class D.

## Click function

The Click function exists in principle on all Safe-products. The exceptions are stated under each product.

The Click function exists on the dimensions Ø 80–315.

The Click function means;

- that an end with male measure has an open turned-over end and
- that an end with female measure has a number of notches.

## Type approval

Approval no 1358/88 means that the Safe-system complies with the requirements for tightness class D without any demand for pressure testing after installation.

The approval is only valid on condition that all fittings are marked by us in accordance with the example and are installed in accordance with the accompanying installation instruction.

## Marking

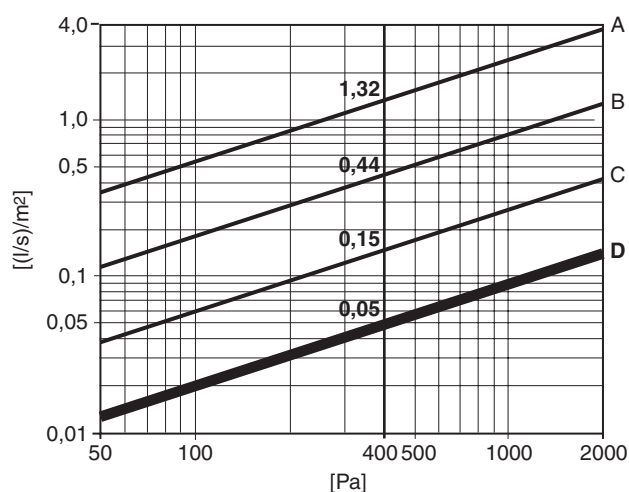
Each individual product is marked with a special label or stamped in the metal.



## Tightness

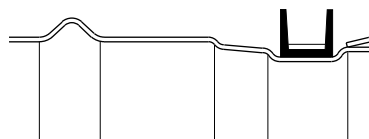
A duct system will never be “completely tight”. The system will normally have some leaks at joints between ducts and fittings. The leakage will also increase as the pressure difference between the in- and outside of the duct sides increases.

The leakage factor in (l/s)/m<sup>2</sup> is always specified in relation to the pressure difference in Pa. (The unit (l/s)/m<sup>2</sup> denotes the leakage flow in l/s in or out of the system in relation to its duct area in m<sup>2</sup>.) The graph below shows the leakage factor for the sealing classes A–D as a function of the pressure difference.



The graph shows that sealing class D is 3 times better than class C, which in turn is 3 times better than class B etc. Class D thus entails demands on not only the seal moulding but also the fittings and how well the system is installed.

This is one reason why we have given all fittings a turned-over edge and have given still more fittings a stop bead. This gives us stable products which are better suited to withstand handling on site at the same time as the risk of skewed assembly falls.



Turned-over edge design



# The Safe system

1

## Economy – Tightness

Present-day stringent demands for interior climate entail expensive air treatment. Leakage leads to uneconomical operation, adjustment difficulties and over-dimensioned equipment. For this reason, it is important that ventilation systems are very well sealed, to keep overall costs down. This is why official requirements for sealing vary with the size and use of systems.

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## Inspection/Testing

In order to make Safe comply with the requirements of sealing class D, we have constant inspection procedures where we do daily sampling. Inspection is done on goods received from sub-contractors and our own production of ducts and fittings.

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**Goods reception inspection** complies with Swedish Standard for testing methods and batch acceptance levels. The inspection points include:

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1. Inspection of seal moulding inner diameter. This is particularly important for ageing resistance of the rubber. The greater the load on the rubber, either stretching or pressure, the faster the rubber ages, causing brittleness and cracking.
2. The seal moulding profile is measured in a profile projector, where the dimensions of the seal moulding are checked against agreed tolerances.
3. The seal moulding material is tested by accelerated ageing in heat oven.

8

9

**Manufacturing inspection** is logged. The inspection includes a diameter check of ducts and fittings, a check of the groove where the seal moulding has been fixed, and a check of its fixing. Pressure testing is done in our air laboratory, to check the leakage flow from our products. This does not give the whole picture, however, so the best inspection of the Safe system is the pressure testing that The Swedish National and Testing Institute undertakes on randomly sampled products. In all these pressure tests, the Safe system has always exceeded the relevant sealing requirements.

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## Fittings

Products under the Safe insert and fittings with Safe seals under the Silencers, Dampers and measure units, and Isol inserts are included in the type approval for sealing class D. In addition, some fittings, under the Other circular products insert, are included.

14

15

A handful of fittings with the Safe seal can only manage up to tightness class C. This is marked on each of these products.

16

17

Fittings in this catalogue with a “U” in their designations have Safe seals, with only a few exceptions.

18

## Degreased

Fittings can be supplied degreased on the inside, to order.

## Dimensions

Almost all products in the Safe-programme can also be delivered in intermediate dimensions. For further information see page 15.

## Negative pressure

At big negative pressure there is a risk for a ventilation system to collapse. This risk is greater the bigger dimensions you have.

In order to increase the strength of *the ducts* you can e.g. increase their sheet metal thickness. This is a simple way but the effect is rather small. It exists other ways with higher result. For bigger dimensions then the ducts may be stronger than the fittings.

In order to increase the strength of *the fittings* other ways than thicker sheet metal thickness are more suitable.

Lindab has experience and knowledge about this and is willing to offer help at special cases. We can, as special, deliver duct systems that can withstand at least 5 000 Pa negative pressure.



# The Safe system

## Design

Our Safe seal system is based on a U-shaped profile of solid rubber. The seal moulding rests in a groove at the end of the fitting and is fixed with a steel strap.

**As standard** are Safe-fittings always supplied with an EPDM (ethylene-propylene rubber) seal moulding. The material has been chosen due to its long service life and the best possible resistance to ozone and UV radiation. It is also highly tolerant to temperature variations. Under normal conditions, the moulding can withstand:

- 30 °C to +100 °C continuous
- 50 °C to +120 °C intermittent

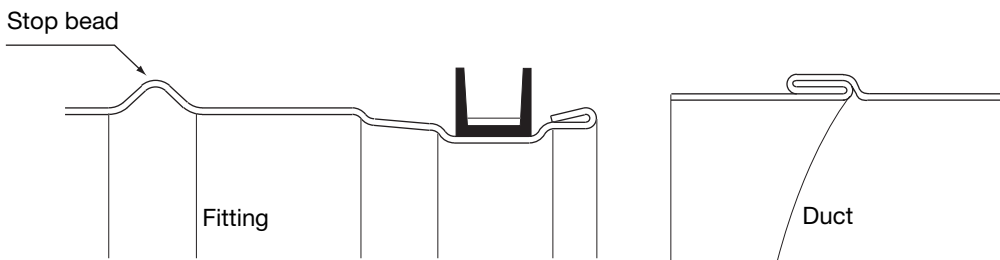
As special for installations which demand high temperature tolerance and somewhat higher oil resistance, Safe fittings can be supplied with a special silicone rubber moulding. This moulding is recognized by its blue colour. Mastic sealed fittings for higher temperatures are also produced with a more temperature resistant mastic. Temperature tolerance:

- 70 °C to +150 °C continuous
- 90 °C to +200 °C intermittent

When fittings are installed in ducts, the seal moulding lips will be bent backwards. This means that the seal will be better at withstanding negative pressure than positive pressure, since the negative pressure will tend to press the lips harder against the duct walls. The following pressure differences must not be exceeded, to cope with tightness class D.

Positive pressure in duct 3000 Pa  
 Negative pressure in duct 5000 Pa

Both Swedish and European standards allow a greater tolerance range between the duct and matching fittings as the diameter increases. In order to achieve maximum sealing for all dimensions, we have chosen to use successively bigger seal mouldings as duct dimensions increase.



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# The Safe system

## Resistance of seal mouldings to various substances

The table below gives a basic guide to how the rubber is affected by various substances.

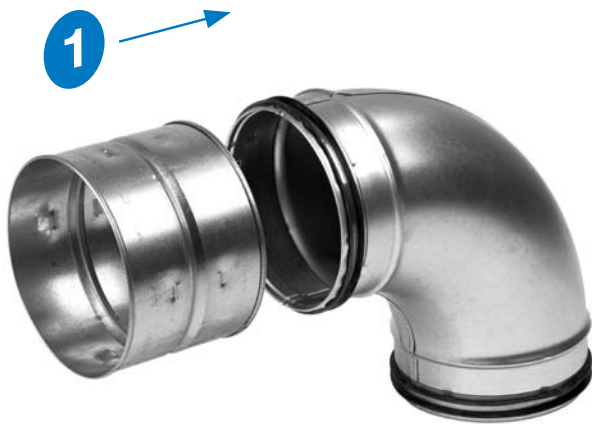
A figure for each type of rubber indicates its suitability.

- 4 Scarcely affected Recommended
- 3 Lightly affected Normally usable
- 2 Strongly affected Only usable in certain cases
- 1 Badly affected Unsuitable
- No information

|  | EPDM | Sili-<br>cone |  | EPDM     | Sili-<br>cone |  | EPDM     | Sili-<br>cone |
|--|------|---------------|--|----------|---------------|--|----------|---------------|
| <b>A</b>                                     |      |               | <b>Ethylene chloride</b>               | <b>1</b> | <b>-</b>      | <b>Oxalic acid</b>                     | <b>4</b> | <b>3</b>      |
| Acetaldehyde                                 | 4    | 4             | Ethyl glycol, cellosolve               | 3        | -             | Ozone                                  | 4        | 4             |
| Acetic acid dilute 30%                       | 4    | 3             | Ethyl chloride                         | 4        | 1             | Oxygen                                 | 4        | 4             |
| Acetic acid crystalline                      | 4    | 3             | Ethane, ethylene                       | 1        | -             |  |          |               |
| Acetic anhydride                             | 3    | 2             |  |          |               | <b>P</b>                               |          |               |
| Acetone                                      | 4    | 3             | <b>F</b>                               |          |               | Palmitinic acid                        | 3        | -             |
| Acetylene                                    | 3    | 3             | Fluoric silicate                       | 4        | 2             | Paraffin (kerosine)                    | 1        | 1             |
| Aluminium salts (non-oxidizing)              | 4    | 4             | Formic acid                            | 4        | 2             | Perchloroethylene                      | 1        | 3             |
| Alun   | 4    | 4             | Formaldehyde, formalin                 | 4        | -             | Perchloric acid                        | 3        | 1             |
| Ammonia, liquid                              | 4    | 1             | Freon, see CFC                         |          |               | Petrol (gasoline), 65 octane           | 1        | 1             |
| Ammonia gas, cold                            | 4    | 4             | Furan, furfuran                        | 2        | -             | Petrol (gasoline), 100 octane          | 1        | 1             |
| Ammonia gas, hot 65 °C                       | 3    | 3             | Furfural                               | 3        | -             | Petroleum ether                        | 1        | 1             |
| Ammonium hydroxide, dil. ammonia             | 3    | 3             |  |          |               | Petroleum oils high aromatic content   | 1        | 1             |
| Ammonium salts (non-oxidising)               | 4    | 3             | <b>G</b>                               |          |               | Petroleum oils low aromatic content    | 1        | 3             |
| Amyl acetate                                 | 4    | 1             | Glucose                                | 4        | 4             | Phenol                                 | 3        | 2             |
| Aniline                                      | 3    | -             | Glycerine, glycerol                    | 4        | 4             | Phosphoric acid 45%                    | 4        | 1             |
| Aniline dyes                                 | 4    | -             | Green liquor, white liquor             | 4        | 3             | Phosphoric acid 85%                    | 4        | 1             |
| Animal fats                                  | 2    | 3             |  |          |               | Plating solutions without chromium     | 4        | 3             |
| Arsenic acid                                 | 4    | 4             | <b>H</b>                               |          |               | Potassium hypochlorite,                |          |               |
| Asphalt                                      | 1    | 1             | Heating oil                            | 1        | 2             | pH 7 below 10 g/l                      | 4        | 1             |
|  |      |               | Hydraulic oil, mineral oil based       | 1        | 3             | over 10 g/l                            | 3        | 1             |
| <b>B</b>                                     |      |               | Hydraulic oil, phosphate ester based   | 4        | 4             | Potassium hydroxide, potash            | 4        | 3             |
| Barium salts (non-oxidizing)                 | 4    | 4             | Hydrogen                               | 4        | 4             | Potassium salts (non-oxidizing)        | 4        | 3             |
| Beer   | 4    | 4             | Hydrogen peroxide 3%                   | 4        | 4             | Propane, LPG                           | 1        | 1             |
| Benzene, bensol                              | 1    | 1             | 30% 20 °C                              | 4        | 4             | Propanol, Propyl alcohol               | 4        | 4             |
| Black liquor                                 | 1    | -             | 90% 20 °C                              | 2        | 4             |  |          |               |
| Black water, waste water                     | 4    | 3             | Hydrochloric acid dilute               | 4        | 1             |  |          |               |
| Bleaching liquor, see Potassium hypochlorite |      |               | conc 37% room temp                     | 4        | 1             | <b>R</b>                               |          |               |
| Borax  | 4    | 3             | conc 37% 70 °C                         | 2        | 1             | Radioactive radiation                  | 3        | 2             |
| Boric acid                                   | 4    | 4             | Hydrogen sulphide dry, room temp       | 4        | 4             | Rape seed oil (canola oil)             | 4        | 4             |
| Bromide, liquid                              | -    | 1             | damp, room temp                        | 4        | 2             | Rosin oil                              | 1        | 1             |
| Bromic acid                                  | 4    | 1             | damp, hot                              | 3        | 1             |  |          |               |
| Butane                                       | 1    | 4             | Hydrofluosilicic acid                  | 4        | 1             | <b>S</b>                               |          |               |
| Butanol, butyl alcohol                       | 4    | 3             | Hydrofluoric acid 50%                  | 4        | 1             | Salicylic acid                         | 4        | 4             |
| Butter oils                                  | 1    | 1             | Hydrofluoric acid, conc.               | 4        | 1             | Sodium salts (non-oxidizing)           | 4        | 4             |
| Butyl acetate                                | 4    | 1             |  |          |               | Sodium hydroxide, sodium hydrate       | 4        | 2             |
|  |      |               | <b>I</b>                               |          |               | Sodium hypochlorite max 10 g/l free Cl | 4        | -             |
| <b>C</b>                                     |      |               | Iodine                                 | -        | -             | over 10 g/l free Cl                    | 3        | -             |
| Caustic soda, sodium hydroxide               | 4    | 2             | Iron salts (non-oxidizing)             | 4        | 3             | Sugar solutions                        | 4        | 4             |
| Calcium salts (non-oxidizing)                | 4    | 3             |  |          |               | Styrene                                | 1        | 1             |
| Cellosolve, ethylene glycol                  | 3    | -             | <b>L</b>                               |          |               | Sulphur, melted                        | 4        | 4             |
| Cellosolve acetate                           | 3    | -             | Lactic acid                            | 4        | 4             | Sulphur dioxide, dry gas               | 4        | 3             |
| Chlorine gas dry                             | 2    | -             | Lead salts (non-oxidizing)             | 4        | 2             | Sulphur chloride                       | 1        | -             |
| damp   | 2    | -             | Linseed oil                            | 3        | 4             | Sulphuric acid 60% room temp.          | 4        | 1             |
| Chlorine solutions 0,1 g/l free chlorine     | 4    | -             | Liquid manure                          | 4        | 3             | 60% 50 °C                              | 4        | 1             |
| 0,1-1 g/l free chlorine                      | 4    | -             | LPG (Propane/butane)                   | 1        | 1             | 60-75% 50 °C                           | 3        | 1             |
| 1-10 g/l free chlorine                       | 3    | -             |  |          |               | 75-80% 50 °C                           | 2        | 1             |
| over 10 g/l free chlorine                    | 2    | -             | <b>M</b>                               |          |               | 85-96% 50 °C                           | 1        | 1             |
| Chlorine sulphonate acid                     | 1    | 1             | Magnesium salts (non-oxidizing)        | 4        | 4             | fuming, Oleum                          | 1        | 1             |
| Chromic acid                                 | 2    | 2             | Manganese salts (non-oxidizing)        | 4        | 4             | Sulphurous acid                        | 4        | 1             |
| CFC (e.g. Freon)                             | 11   | 11            | Mercury                                | 4        | 4             | Sulphur trioxide, dry gas              | 3        | 2             |
|  | 12   | 31            | Mercury salts (non-oxidizing)          | 4        | 4             |  |          |               |
|  | 13   | 4-            | Methanol, methyl alcohol, wood alcohol | 4        | 4             | <b>T</b>                               |          |               |
|  | 21   | 1-            | Methylene chloride                     | 1        | 1             | Tar                                    | 1        | 2             |
|  | 22   | 41            | Methyl chloride                        | 2        | 1             | Tannic acid                            | 4        | 1             |
|  | 31   | 4-            | Methyl ethyl ketone MEK                | 4        | -             | Terpentine, terpenes                   | 1        | 1             |
|  | 32   | 4-            | Methyl isobutyl ketone                 | 3        | 2             | Toluene, toluol                        | 1        | 1             |
|  | 112  | 1-            | Methyl isopropyl ketone                | 3        | 2             | Trichlorethane, "thinner"              | 1        | 2             |
|  | 113  | 11            | Milk                                   | 4        | 4             | Transformer oil mineral oil based      | 1        | 3             |
|  | 114  | 41            |  |          |               | chlorated hydrocarbon                  | 1        | 1             |
|  | 115  | 4             | <b>N</b>                               |          |               | <b>V</b>                               |          |               |
| Copper salts (non-oxidizing)                 | 44   | 4             | Natural gas                            | 1        | 4             | Vegetable oils                         | 4        | 4             |
| Citric acid                                  | 4    | 4             | Nickel salts (non-oxidizing)           | 4        | 4             |  |          |               |
|  |      |               | Nitrobenzene, Nitrobenzol              | 2        | 1             | <b>W</b>                               |          |               |
| <b>D</b>                                     |      |               | Nitric acid 20% room temp.             | 4        | -             | Water fresh                            | 4        | 4             |
| Detergent                                    | 4    | 4             | 20% 50 °C                              | 3        | 1             | distilled                              | 4        | 4             |
| Diesel oil                                   | 1    | 2             | 40% 50 °C                              | 3        | 1             | salt                                   | 4        | 4             |
| Dilutin (White spirit)                       | 1    | 1             | 50% 50 °C                              | 2        | 1             | fresh & dist. 100 °C                   | 4        | 2             |
| Developing solutions                         | 3    | -             | 60% room temp.                         | 2        | 1             | White spirit (Dilutin)                 | 1        | 1             |
|  |      |               | 70% room temp.                         | 1        | 1             | Wine                                   | 4        | 4             |
|  |      |               | red fuming                             | 1        | 1             |  |          |               |
| <b>E</b>                                     |      |               | Nitrogen                               | 4        | 4             | <b>X</b>                               |          |               |
| Ethanol, ethyl alcohol                       | 4    | 4             | Nitrous gases                          | 2        | 2             | Xylene, xylol                          | 1        | 1             |
| "Ether", diethyl ether, ethyl ether          | 2    | -             |  |          |               |  |          |               |
| Ethyl acetate                                | 3    | 2             | <b>O</b>                               |          |               | <b>Z</b>                               |          |               |
| Ethylene glycol                              | 4    | 3             | Olive oil                              | 3        | 3             | Zinc salts (non-oxidizing)             | 4        | 4             |
|  |      |               | Oleic acid                             | 4        | -             |  |          |               |



# Lindab Safe® Click Assemble easy and fast



2 "CLICK"



The new, innovative duct system from Lindab is based on a principle well known to you. A simple click is all it takes to assemble ducts and fittings. Save time and create a perfect ventilation solution.

The new system is installed quickly and improves working conditions especially where space is limited. Lindab Safe Click is based on our well-known, tested and documented Safe system. We just added simplicity. One click and the job is done.

## Advantages during installation

- Quick assembly
- Minimised use of screws or rivets
- Easy to install, especially where space is limited
- Better ergonomics
- Assembling and adjusting is made easier

## Advantages during use

- Fewer holes from screws or rivets in the duct system and thereby a tighter system
- Fewer sharp parts from screws or rivets in the duct
- The ducts are easier to clean and the risk of bacteria growth is reduced
- Based on our well-known, tested and well-documented Lindab Safe system
- Compatible with other systems



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# Assembly Instruction

## Lindab Safe and Lindab Safe Click

1

The Lindab Safe and the Lindab Safe Click duct system are type-approved, as per certificate no. 1358/88 issued by SITAC and are subject to continuous production checks.

2

This means that the requirements for air tightness class D are met if ducts and fittings of the systems are used and if assembly is performed as per these instructions.

3

The products covered by the type approval are either specified on the delivery note or are supplied with the following labelling. Labelling can comprise a sticker or an embossing on the sheet metal

4



6

NOTE! The assembly methods described herein only cope with the forces from the “Static pressure limits” defined in EN 12237. Forces from other sources, e.g. gravity or wind, have to be dealt with using other means, e.g. suspensions or supports.

7

NOTE! If the system shall be tested for air tightness, this shall be done before integration and insulation so that there is an opportunity for inspection and taking action. Any complaints regarding air tightness will only be dealt with provided the system is fully accessible for inspection.

8

### Joining systems (general characteristics)

9

| Lindab Safe                            | Lindab Safe Click  |
|--|--|
| Is joined with screws or blind rivets. | Is joined with snapping heels, below called notches. Is based on Lindab Safe.  |
| Spans all dimensions.                  | Spans only a restricted number of dimensions. See table 2. For the other dimensions use Lindab Safe.   |
|  | Lindab Safe Click can be complementary joined with screws or blind rivets.<br>This may be done in order to: <ul style="list-style-type: none"> <li>• achieve a stronger joint</li> <li>• prevent a joint from twisting</li> <li>• join a Click product with a non-Click product</li> <li>• join a Click product with a non-Click product to create an openable joint.</li> </ul> |

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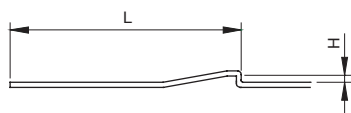


## Preparations for assembly

- Check that ducts and fittings to be used in the system are labelled as shown above.
- Store ducts and fittings in a well-ordered and weatherproof storage area to minimize the risk of damage. Do not use ducts or fittings that have been damaged in such a way that they jeopardise the air tightness or structural strength of the system.

| Lindab Safe   | Lindab Safe Click  |
|---|--|
| <ul style="list-style-type: none"> <li>• Cut ducts at right angles. Carefully remove any burrs from cut edges. Installation is easier and the risk of damaging the gasket is reduced if there are no burrs. Also cut away the two needles created from the fold.</li> </ul> | <ul style="list-style-type: none"> <li>• Cut ducts at right angles. This is an uncompromisable demand for Lindab Safe Click. Carefully remove any burrs from cut edges. Installation is easier and the risk of damaging the gasket is reduced if there are no burrs. Also cut away the two needles created from the fold.</li> </ul> |
|   | <ul style="list-style-type: none"> <li>• If a duct is cut – make notches around its circumference. See table 1 and 2.</li> </ul>   |
| <ul style="list-style-type: none"> <li>• Carefully seal any holes left by measurements, removed screws, blind rivets, etc.</li> </ul>   | <ul style="list-style-type: none"> <li>• Carefully seal any holes left by measurements etc.</li> </ul>   |

Table 1. Size and location of notches







| Ø [mm]  | Click Pliers   |   | L [mm]    |
|---------|--|---|-----------|
|         | 40.1   | 60.1  |           |
| 80–224  |  |  | 30,5–32,5 |
| 250–315 | –  | 2,5   | 50,5–52,5 |

Table 2. Number of fasteners and notches

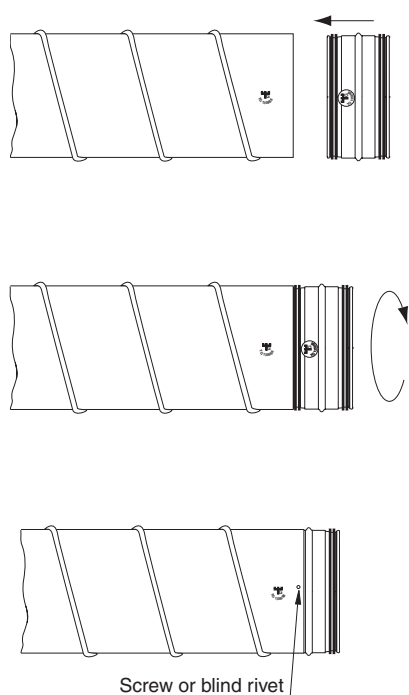
| Ø [mm]   | Lindab Safe  | Lindab Safe Click   |   |
|----------|--|---|---|
|          | Minimum number of fasteners required to achieve sufficient strength.   | Click Pliers  |   |
|          |  |   |  |
| 63       | 2  | –   | –   |
| 80–112   | 2  | 2   | –   |
| 125–160  | 3  | 4   | –   |
| 180–224  | 3  | 4   | –   |
| 250–315  | 4  | –   | 4   |
| 355–630  | 4  | –   | –   |
| 710–1250 | 6  | –   | –   |
|          | Depending on the means of suspension, a larger number of fasteners than this may be required to achieve sufficient structural strength of a duct system. | Depending on the means of suspension, a larger number of notches than this may be required to achieve sufficient structural strength of a duct system. A greater number of notches makes it harder to assemble the parts. |   |



## Assembly

|   | Lindab Safe  | Lindab Safe Click  |
|---|--|--|
|   | 1. Start by inserting the turned-over edge of the fitting into the duct.   | 1. Insert the fitting's turned-over edge into the duct.  |
| 1 | 2. Check that the first lip of the gasket is in contact with the edge of the duct all the way around and sticks straight out so that the lip is not twisted in one direction or the other. | 2. Check that the gasket's first lip is in contact with the duct's edge all the way around and points straight out so that the lip is not twisted in any direction.                      |
| 2 | 3. Push the end of the fitting into the duct. Twisting the fitting slightly aids insertion.  | 3. Push the first part of the fitting into the duct to just before the notches. Twisting the fitting slightly aids insertion.  |
| 3 | 4. Secure the fitting in the duct using self-tapping screws or airtight blind rivets. NOTE! Use only the types allowed by Lindab when going for tightness class C or D. See table 3.       | 4. Push the rest of the fitting into the duct and over the notches. Bend the fitting or duct back and forward slightly in order not to pass all notches at the same time aids insertion. |
| 4 | 5. Fasteners should be positioned 10–15 mm from the end of the duct to prevent damage to the gasket.   | 5. The fitting is secured to the duct when the fitting's end has snapped behind all the notches.   |
| 5 | 6. Always position fasteners at the present largest radial gap between fitting and duct. Be sure to achieve an even distribution around the circumference.                                 | 6. After assembly it's possible to rotate the fitting.   |

Lindab Safe



Lindab Safe Click

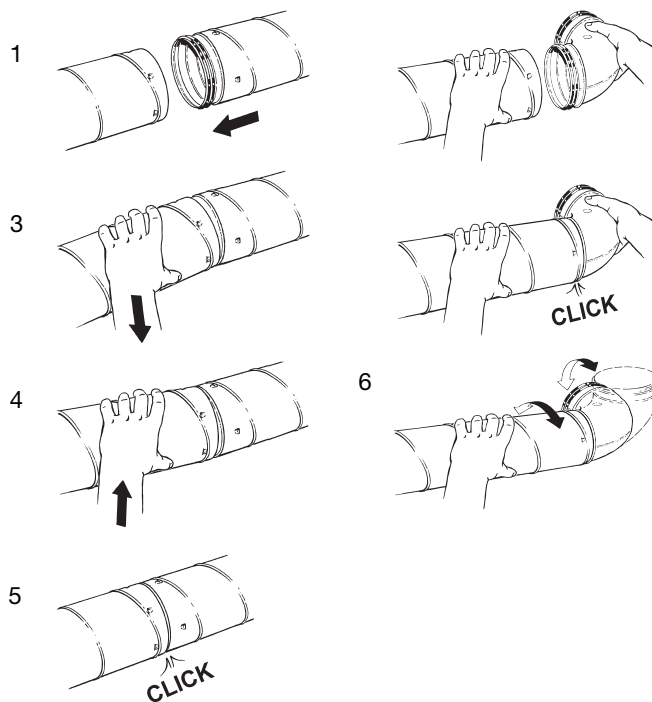




Table 3. Allowed and banned screws and blind rivets

|  |   |                                 |
|--|---|---------------------------------|
|  | <p><b>Screw with sharp tip</b></p> <ul style="list-style-type: none"> <li>• Very tight</li> <li>• Strong since it forms a collar in the thin sheet metal</li> </ul>                       | <p><b>Allowed by Lindab</b></p> |
|  | <p><b>Screw with reduced drill tip</b></p> <ul style="list-style-type: none"> <li>• Very tight</li> <li>• Strong since it only drills off a small part of the thin sheet metal</li> </ul> | <p><b>Allowed by Lindab</b></p> |
|  | <p><b>Screw with drill tip</b></p> <ul style="list-style-type: none"> <li>• Not tight</li> <li>• Weak since it drills off a big part of the thin sheet metal</li> </ul>                   | <p><b>Banned by Lindab</b></p>  |
|  | <p><b>Pressure-tight blind rivet</b></p> <ul style="list-style-type: none"> <li>• Very tight</li> <li>• Strong</li> <li>• Very laborious to install</li> </ul>                            | <p><b>Allowed by Lindab</b></p> |
|  | <p><b>Blind rivet</b></p> <ul style="list-style-type: none"> <li>• Not tight if the inner splint falls out</li> <li>• Strong</li> <li>• Laborious to install</li> </ul>                   | <p><b>Banned by Lindab</b></p>  |

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## Hints!

Turning and bending the fitting slightly as you insert it into the duct aids assembly and removal.

If ducts and fittings are round, assembly is much easier. Lindab has placed high demands on roundness during the design and production stages, but large heavy fittings in particular have a tendency to be slightly oval because of their weight. These often become round when suspended, which is why you should use the brackets to make the components round and in this way simplify assembly.

Carefully tapping the surface of the duct with your hand normally makes assembly a lot easier, as it reduces the friction between duct and fitting, and the fitting tries to move to the right side if there are burrs and irregularities.

When cutting, be sure to remove burrs properly. Also cut away the two needles created from the fold.

For larger dimensions, Lindab has moved the gasket away from the edge, which makes assembly much easier.

If you have to reinstall a product, take care to seal old holes from screws or blind rivets which can cause leaks and noise.

Products with special seals

Some fittings, such as the collar saddle PSU, T-pieces TSTCU, TSTU and take-offs ILRU, ILU, ILF, have one more connection than Lindab Safe or Lindab Safe Click. This connection must be sealed so that they definitely meet the requirements for air-tightness class C or D. Sealing material used must be durable and permanently elastic.

Products without Click

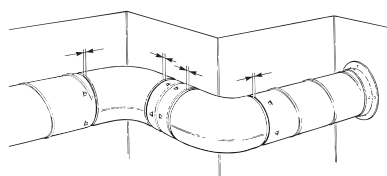
Some fittings, such as the slide-in female coupling SMFU, the end caps EPF and ESU and of course the cleaning covers EPFH, ESHU, KCU and KCIVU, do not have any Click function in order to make them easier to remove.

Use of products other than Lindab Safe or Lindab Safe Click

Products that do not formally fulfil the requirements for air tightness class C or D may only be used to a small extent. If such items are used, they must be carefully checked with regard to seal design and strength. They must be sealed so that they definitely meet the requirements for air-tightness class C or D. Sealing material used must be durable and permanently elastic.

### To join parts temporarily to check if length of duct or system run is all right.

| Lindab Safe   | Lindab Safe Click   |
|---|---|
| <p>Solution:</p> <ol style="list-style-type: none"> <li>1 Join together to check.</li> <li>2 Then take apart – and cut if necessary the duct length.</li> <li>3 Join together with screws or blind rivets.</li> </ol> | <p>Solution 1:</p> <ol style="list-style-type: none"> <li>1 Use a duct without notches in the end/ends.</li> <li>2 Join together to check.</li> <li>3 Then take apart – and cut if necessary the duct length.</li> <li>4 Make notches in the duct.</li> <li>5 Click-join together.</li> </ol> <p>Solution 2:</p> <ol style="list-style-type: none"> <li>1 Use a duct with notches in the end/ends.</li> <li>2 Join together to check – but don't join the parts completely so they click together.</li> <li>3 Then take apart – and cut if necessary the duct length and make new notches.</li> <li>4 Click-join together.</li> </ol> |

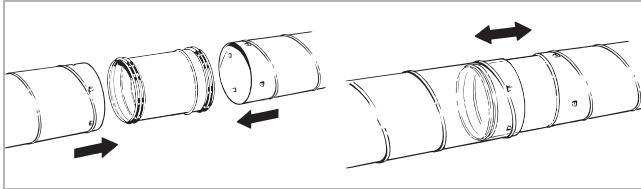




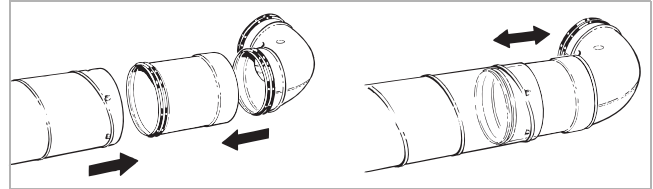
**To lengthwise adjust joined products instead of cutting the duct.**

| Lindab Safe  | Lindab Safe Click  |
|--|--|
| <p>Solution:</p> <ol style="list-style-type: none"> <li>1 Use products with sliding property. E.g. slide-in coupling SNPU or slide-in female coupling SMFU.</li> <li>2 Join together with screws or blind rivets.</li> </ol> | <p>Solution:</p> <ol style="list-style-type: none"> <li>1 Use products with sliding property. E.g. slide-in coupling SNPU or slide-in female coupling SMFU.</li> <li>2 Join together with screws or blind rivets.</li> </ol> |

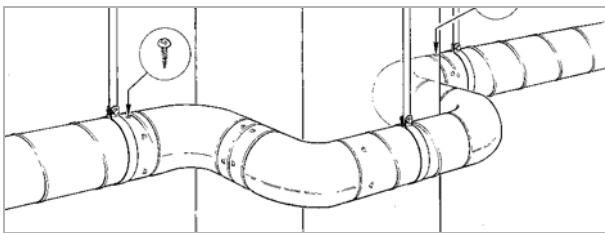
*Slide-in coupling*



*Slide-in female coupling*

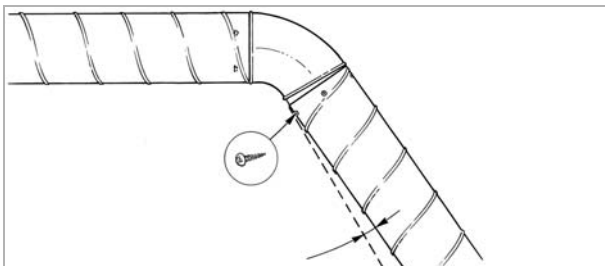


**The joint must be locked**



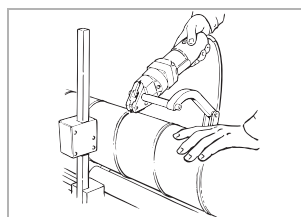
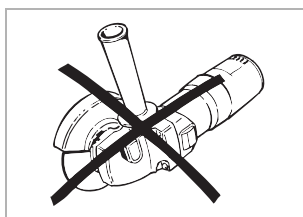
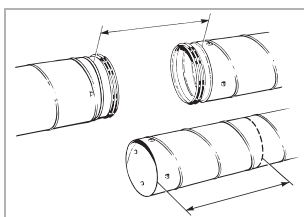
In situations where the mounting must be locked, e.g. when a bend is mounted to a duct and it twists downwards the floor. Mount the first hanger and mount the bend, then lock the joint with a screw or blind rivet.

**Corners out of angle and curved walls**

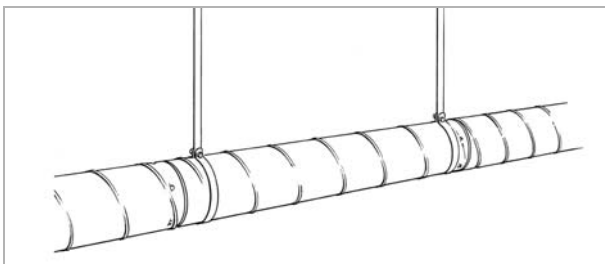


Mount the next piece of duct at an angle, but make sure that the rubber sealant is not visible. Put screws or blind rivets where the notches have not clicked in position.

**Cutting duct with the SR Cutter**



**Suspension**



Mount the hangers in a straight line and as close to every joint as possible. Fix with an extra screw when needed for extra stability.

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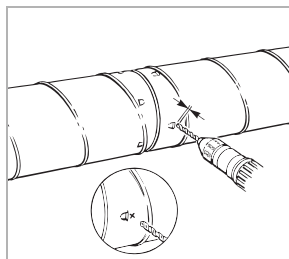
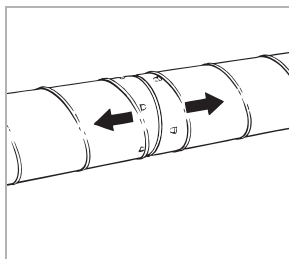
## Dismantling

### To separate joined products.

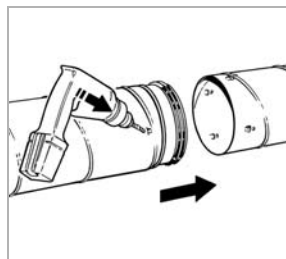
| Lindab Safe   | Lindab Safe Click   |
|---|---|
| <p>Solution:</p> <ol style="list-style-type: none"> <li>1 Unscrew the screws or drill away the blind rivets.</li> <li>2 Twist the product loose.</li> <li>3 The fitting will now have leaking holes but can be reused if these holes are carefully sealed off with mastic or tape.</li> </ol> | <p>Solution:</p> <ol style="list-style-type: none"> <li>1 Drill a 5 mm hole in the duct 4 mm behind the notch with the drill angled backward and</li> <li>2 turn in the same moment the drill back so the fitting and duct are separated somewhat from each other. With the right technique the fitting remains undamaged and can be reused.</li> <li>3 Repeat if necessary at more notches.</li> <li>4 Twist the product loose.</li> <li>5 Cut away the drilled through duct end.</li> </ol> |

### Lindab Safe Click

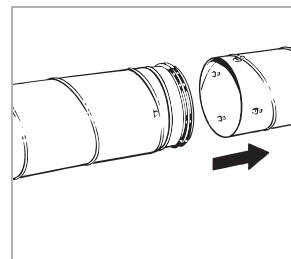
5 mm drill



Angle and press the drill backwards



Take apart



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# Circular duct

SR



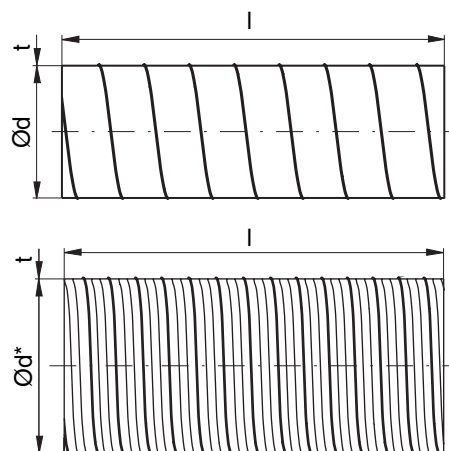
## Description

Circular duct.

Ducts are always produced locally and can therefore have different thicknesses and other specifications per country.

Has normally not any Click function – hasn't any notches.  
Can to order be delivered with Click function – i.e. with notches.

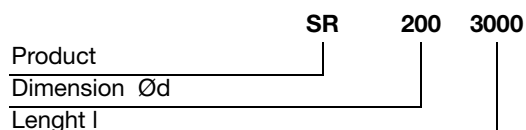
## Dimensions



| Ød<br>std<br>nom | O<br>$\pi d$<br>m | A<br>$\pi d^2/4$<br>m <sup>2</sup> | t<br>std<br>mm | l<br>std<br>mm | ml<br>std<br>kg/m |
|------------------|-------------------|------------------------------------|----------------|----------------|-------------------|
| 63               | 0,198             | 0,003                              | 0,5            | 3000           | 0,89              |
| 80               | 0,251             | 0,005                              | 0,45           | 3000           | 0,91              |
| 100              | 0,314             | 0,008                              | 0,45           | 3000           | 1,14              |
| 112              | 0,352             | 0,010                              | 0,5            | 3000           | 1,42              |
| 125              | 0,393             | 0,012                              | 0,45           | 3000           | 1,41              |
| 140              | 0,440             | 0,015                              | 0,5            | 3000           | 1,76              |
| 150              | 0,471             | 0,018                              | 0,5            | 3000           | 1,89              |
| 160              | 0,503             | 0,020                              | 0,5            | 3000           | 2,02              |
| 180              | 0,565             | 0,025                              | 0,5            | 3000           | 2,26              |
| 200              | 0,628             | 0,031                              | 0,5            | 3000           | 2,56              |
| 224              | 0,704             | 0,039                              | 0,6            | 3000           | 3,42              |
| 250 *            | 0,785             | 0,049                              | 0,5            | 3000           | 3,18              |
| 280              | 0,880             | 0,062                              | 0,55           | 3000           | 3,92              |
| 300 *            | 0,942             | 0,071                              | 0,55           | 3000           | 4,20              |
| 315 *            | 0,990             | 0,078                              | 0,55           | 3000           | 4,41              |
| 355 *            | 1,115             | 0,099                              | 0,55           | 3000           | 4,96              |
| 400 *            | 1,257             | 0,126                              | 0,55           | 3000           | 6,01              |
| 450 *            | 1,414             | 0,159                              | 0,7            | 3000           | 8,60              |
| 500 *            | 1,571             | 0,196                              | 0,7            | 3000           | 9,54              |
| 560 *            | 1,759             | 0,246                              | 0,8            | 3000           | 12,2              |
| 600 *            | 1,885             | 0,283                              | 0,7            | 3000           | 13,1              |
| 630 *            | 1,979             | 0,312                              | 0,7            | 3000           | 12,0              |
| 710 *            | 2,231             | 0,396                              | 0,8            | 3000           | 15,5              |
| 800 *            | 2,513             | 0,503                              | 0,8            | 3000           | 17,4              |
| 900 *            | 2,827             | 0,636                              | 0,9            | 3000           | 21,7              |
| 1000 *           | 3,142             | 0,785                              | 0,9            | 3000           | 24,1              |
| 1120 *           | 3,519             | 0,985                              | 0,9            | 3000           | 27,0              |
| 1250 *           | 3,927             | 1,227                              | 0,9            | 3000           | 30,2              |
| 1400 *           | 4,398             | 1,539                              | 1,25           | 2400           | 48,0              |
| 1500 *           | 4,712             | 1,767                              | 1,25           | 2400           | 51,4              |
| 1600 *           | 5,027             | 2,011                              | 1,25           | 2400           | 54,8              |

\* With outturned stiffening corrugation

## Ordering example

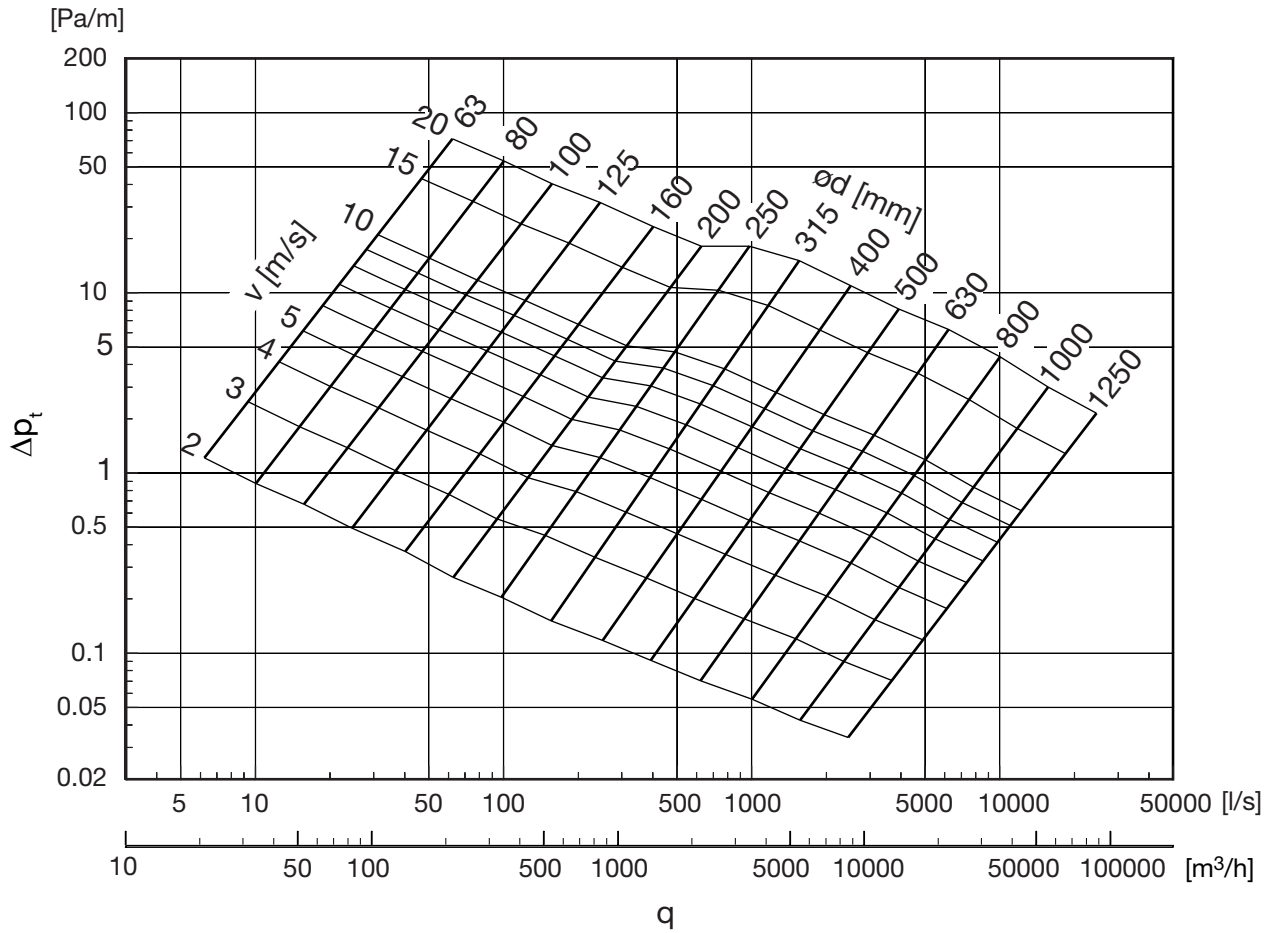




# Circular duct

SR

## Technical data



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# Circular duct

SR

## Technical data

### Special versions

We can supply ducts with the following special designs:

- In intermediate dimensions, see page 15.
- Extra tight, with nitrile rubber seal in the lock seam
- In other sheet metal thicknesses

### Extra tight, with seam seal

When extremely good sealing is required in the spiral seam, the ducts can also be supplied with a special rubber seal in the seam.

This seal is very effective at stopping leakage of vegetable oils and greases, and most petroleum products including white spirit.

### Other sheet metal thicknesses

If extra stability is needed in ducts, because of high negative pressure etc., they can be supplied with thicker sheet metal than standard. Remember that the thickness increase always reduces the inner diameter. Fittings for such special ducts must be specified separately and sometimes have to be made specially.

### Reinforcement corrugations

Ducts of Ø250 mm and above are normally given stiffening corrugations to increase radial stiffness.

## Strength

### Positive pressure

In case of high positive pressure, the seal moulding lips will first start to whistle. At considerably higher pressure, the joints between the ducts will be forced apart. If you manage to fix the connections very well, the ducts will burst at their seams at even higher pressure. The high pressures needed for this to happen are not relevant to ventilation installations.

### Negative pressure

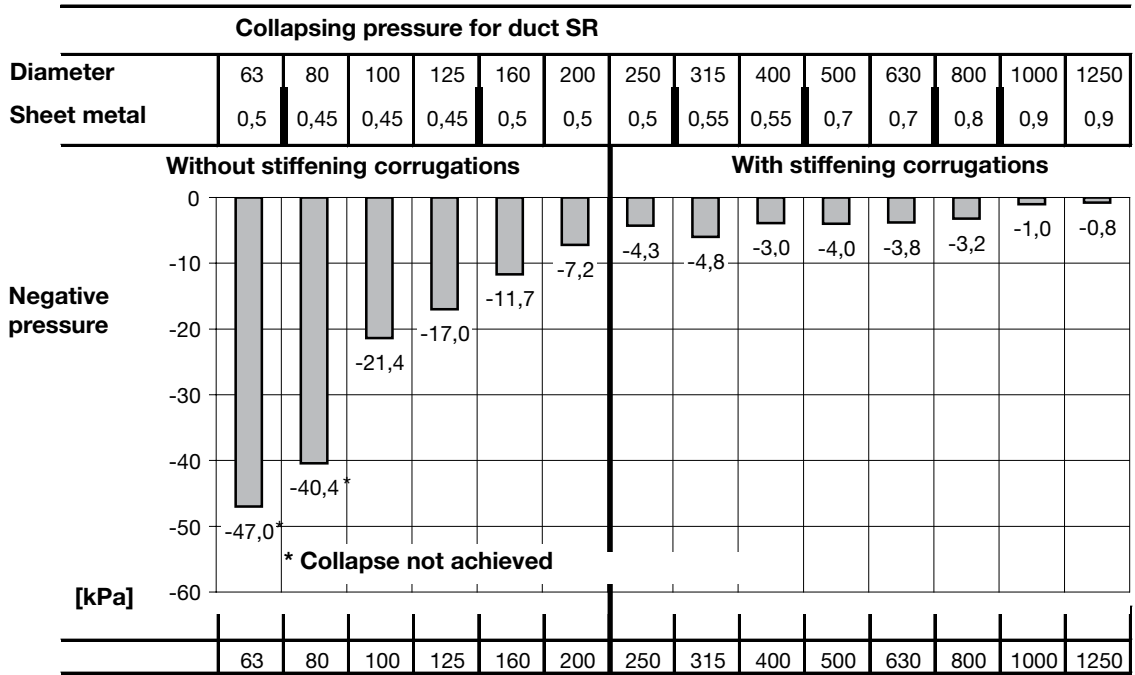
In installations with high negative pressure, there is a risk that the ducts could collapse.

This phenomenon is referred to as buckling, and can suddenly happen at the weakest point in the system. Buckling wanders along the duct, which can be completely flattened. The weakest point is frequently a "transport dent" on a duct. For this reason, only use undamaged ducts in systems which are close to the critical pressure!

### Sealing

The ability of the seal moulding to seal is different from these pressures, and is noted on page 39.

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# Capped circular duct

SRL



## Dimensions

| Ød<br>std<br>nom   | O<br>πd<br>m | A<br>πd <sup>2</sup> /4<br>m <sup>2</sup> | t<br>std<br>mm | l<br>std<br>mm | ml<br>std<br>kg/m |
|--------------------|--------------|---|----------------|----------------|-------------------|
| 63 <sup>1</sup>    | 0,198        | 0,003                                     | 0,5            | 3000           | 0,89              |
| 80 <sup>1</sup>    | 0,251        | 0,005                                     | 0,45           | 3000           | 0,91              |
| 100 <sup>1</sup>   | 0,314        | 0,008                                     | 0,45           | 3000           | 1,14              |
| 112                | 0,352        | 0,01                                      | 0,5            | 3000           | 1,42              |
| 125 <sup>1</sup>   | 0,393        | 0,012                                     | 0,45           | 3000           | 1,41              |
| 140                | 0,44         | 0,015                                     | 0,5            | 3000           | 1,76              |
| 150                | 0,471        | 0,018                                     | 0,5            | 3000           | 1,89              |
| 160 <sup>1</sup>   | 0,503        | 0,02                                      | 0,5            | 3000           | 2,02              |
| 180                | 0,565        | 0,025                                     | 0,5            | 3000           | 2,26              |
| 200 <sup>1</sup>   | 0,628        | 0,031                                     | 0,5            | 3000           | 2,56              |
| 224                | 0,704        | 0,039                                     | 0,6            | 3000           | 3,42              |
| 250 <sup>*1</sup>  | 0,785        | 0,049                                     | 0,5            | 3000           | 3,18              |
| 280                | 0,88         | 0,062                                     | 0,55           | 3000           | 3,92              |
| 300 <sup>*</sup>   | 0,942        | 0,071                                     | 0,55           | 3000           | 4,26              |
| 315 <sup>*1</sup>  | 0,99         | 0,078                                     | 0,55           | 3000           | 4,41              |
| 355 <sup>*</sup>   | 1,115        | 0,099                                     | 0,55           | 3000           | 4,96              |
| 400 <sup>*2</sup>  | 1,257        | 0,126                                     | 0,55           | 3000           | 6,01              |
| 450 <sup>*</sup>   | 1,414        | 0,159                                     | 0,7            | 3000           | 8,60              |
| 500 <sup>*2</sup>  | 1,571        | 0,196                                     | 0,7            | 3000           | 9,54              |
| 560 <sup>*</sup>   | 1,759        | 0,246                                     | 0,8            | 3000           | 12,2              |
| 600 <sup>*</sup>   | 1,885        | 0,283                                     | 0,7            | 3000           | 13,1              |
| 630 <sup>*2</sup>  | 1,979        | 0,312                                     | 0,7            | 3000           | 12,0              |
| 710 <sup>*</sup>   | 2,231        | 0,396                                     | 0,8            | 3000           | 15,5              |
| 800 <sup>*2</sup>  | 2,513        | 0,503                                     | 0,8            | 3000           | 17,4              |
| 900 <sup>*</sup>   | 2,827        | 0,636                                     | 0,9            | 3000           | 21,7              |
| 1000 <sup>*2</sup> | 3,142        | 0,785                                     | 0,9            | 3000           | 24,1              |
| 1120 <sup>*</sup>  | 3,519        | 0,985                                     | 0,9            | 3000           | 27,0              |
| 1250 <sup>*2</sup> | 3,927        | 1,227                                     | 0,9            | 3000           | 30,2              |

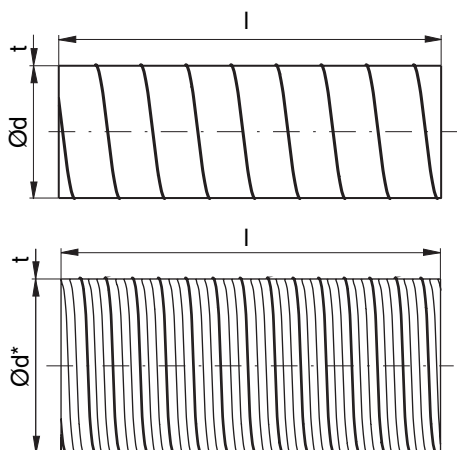
## Description

Capped circular duct.

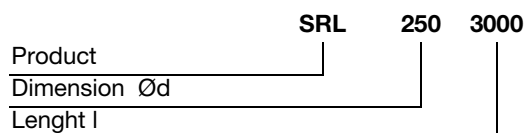
Ducts are always produced locally and can therefore have different thicknesses and other specifications per country.

Has normally not any Click function – hasn't any notches. Can to order be delivered with Click function – i.e. with notches.

## Dimensions



## Ordering example



\* With outturned stiffening corrugations.

<sup>1</sup> With blue plastic cap.

<sup>2</sup> With transparent plastic hood.



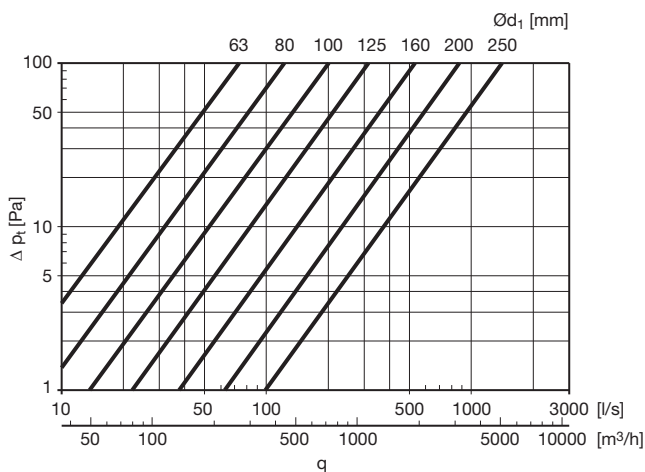
# Bend

# BU 90°

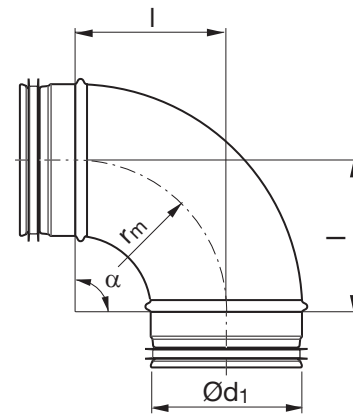


## Description

Pressed and seam welded bend.



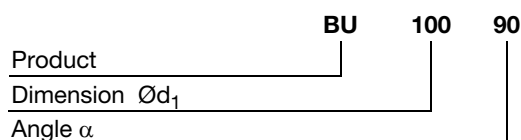
## Dimensions



$$r_m \approx 1 \cdot d_1$$

| Ød <sub>1</sub> nom | l mm | m kg |
|---------------------|------|------|
| 63                  | 110  | 0,20 |
| 80                  | 105  | 0,26 |
| 100                 | 100  | 0,31 |
| 112                 | 120  | 0,39 |
| 125                 | 125  | 0,48 |
| 140                 | 135  | 0,66 |
| 150                 | 150  | 0,66 |
| 160                 | 160  | 0,74 |
| 180                 | 180  | 1,02 |
| 200                 | 200  | 1,12 |
| 224                 | 225  | 1,33 |
| 250                 | 250  | 1,77 |

## Ordering example



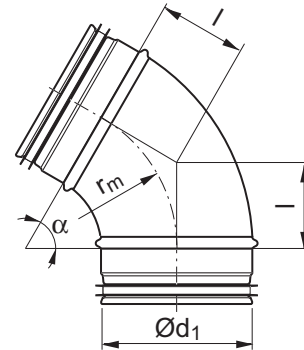


# Bend

# BU 60°



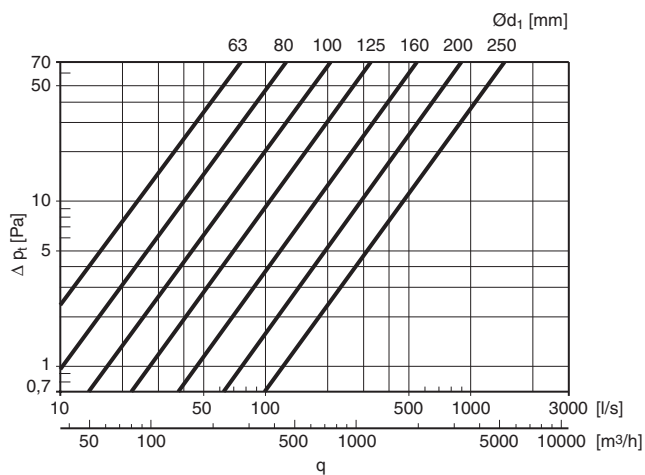
## Dimensions



$$r_m \approx 1 \cdot d_1$$

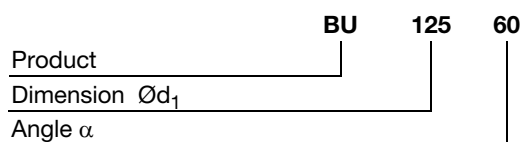
## Description

Pressed and seam welded bend.



| $\text{O} d_1$<br>nom | l<br>mm | m<br>kg |
|-----------------------|---------|---------|
| 63                    | 64      | 0,30    |
| 80                    | 58      | 0,32    |
| 100                   | 58      | 0,33    |
| 112                   | 69      | 0,37    |
| 125                   | 72      | 0,33    |
| 140                   | 78      | 0,51    |
| 150                   | 87      | 0,50    |
| 160                   | 92      | 0,56    |
| 180                   | 104     | 0,79    |
| 200                   | 115     | 0,82    |
| 224                   | 130     | 0,95    |
| 250                   | 144     | 1,12    |

## Ordering example





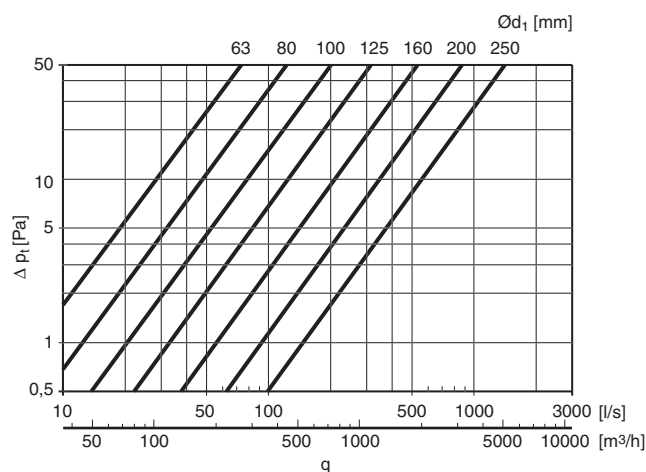
# Bend

# BU 45°

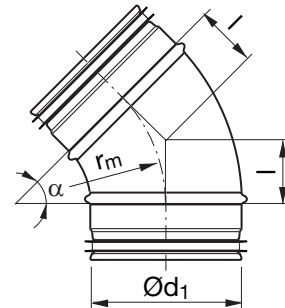


## Description

Pressed and seam welded bend.



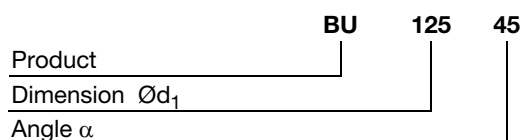
## Dimensions



$$r_m \approx 1 \cdot d_1$$

| Ød <sub>1</sub> nom | l mm | m kg |
|---------------------|------|------|
| 63                  | 46   | 0,16 |
| 80                  | 41   | 0,17 |
| 100                 | 41   | 0,21 |
| 112                 | 81   | 0,24 |
| 125                 | 52   | 0,29 |
| 140                 | 56   | 0,43 |
| 150                 | 62   | 0,42 |
| 160                 | 66   | 0,48 |
| 180                 | 76   | 0,65 |
| 200                 | 83   | 0,80 |
| 224                 | 93   | 0,82 |
| 250                 | 103  | 1,05 |

## Ordering example







# Bend

# BU 30°

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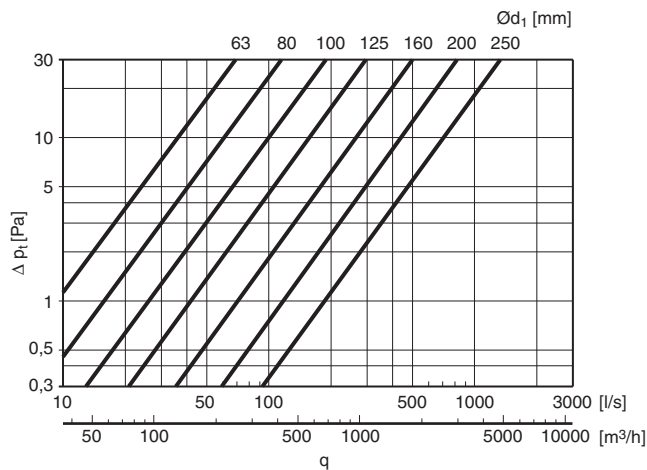


## Description

Pressed and seam welded bend.

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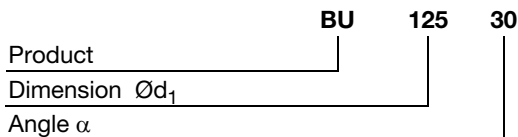
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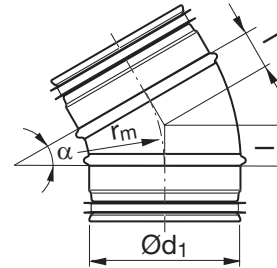
## Ordering example



17

18

## Dimensions



$$r_m \approx 1 \cdot d_1$$

| Ød <sub>1</sub> nom | l mm | m kg |
|---------------------|------|------|
| 63                  | 29   | 0,13 |
| 80                  | 27   | 0,15 |
| 100                 | 27   | 0,18 |
| 112                 | 30   | 0,21 |
| 125                 | 33   | 0,20 |
| 140                 | 36   | 0,36 |
| 150                 | 40   | 0,35 |
| 160                 | 43   | 0,32 |
| 180                 | 48   | 0,51 |
| 200                 | 54   | 0,62 |
| 224                 | 60   | 0,72 |
| 250                 | 67   | 0,91 |



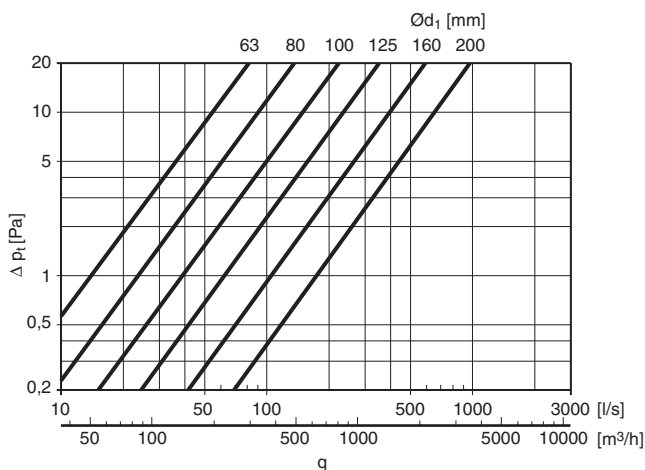
# Bend

# BU 15°

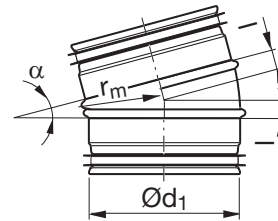


## Description

Pressed and seam welded bend.



## Dimensions

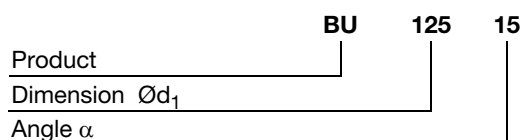


$$r_m \approx 1 \cdot d_1$$

| Ød <sub>1</sub> nom | l mm | m kg |
|---------------------|------|------|
| 63 *                | 14   | 0,09 |
| 80 *                | 13   | 0,11 |
| 100                 | 13   | 0,15 |
| 112 *               | 25   | 0,29 |
| 125                 | 16   | 0,18 |
| 140 *               | 18   | 0,29 |
| 150 *               | 20   | 0,27 |
| 160                 | 21   | 0,24 |
| 180 *               | 24   | 0,37 |
| 200                 | 26   | 0,47 |
| 224 *               | 30   | 0,56 |

\* Segmented and lockseamed

## Ordering example



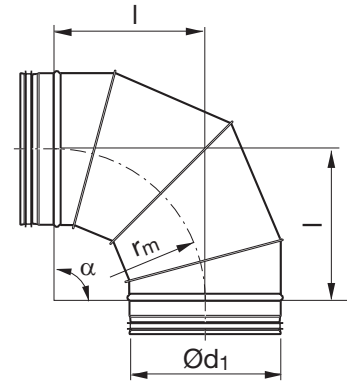


# Bend – lockseamed

# BFU 90°



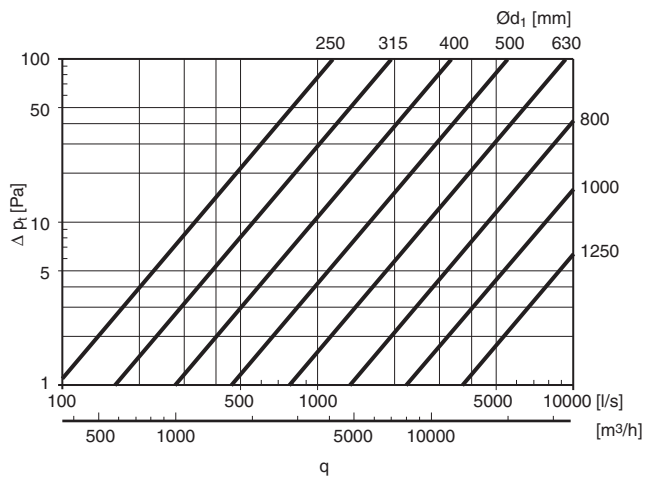
## Dimensions



$$r_m \approx 1 \cdot d_1$$

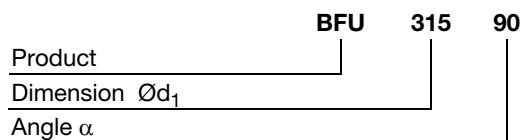
## Description

Segmented and lockseamed bend.



| $\text{Ø}d_1$<br>nom | l<br>mm | m<br>kg |
|----------------------|---------|---------|
| 250                  | 250     | 2,20    |
| 280                  | 280     | 2,50    |
| 300                  | 300     | 2,7     |
| 315                  | 315     | 3,00    |
| 355                  | 355     | 3,75    |
| 400                  | 400     | 5,64    |
| 450                  | 450     | 7,00    |
| 500                  | 500     | 8,20    |
| 560                  | 560     | 10,1    |
| 600                  | 600     | 11,7    |
| 630                  | 630     | 12,9    |
| 710                  | 710     | 19,8    |
| 800                  | 800     | 26,0    |
| 900                  | 900     | 33,6    |
| 1000                 | 1000    | 42,0    |
| 1120                 | 1120    | 52,6    |
| 1250                 | 1250    | 64,0    |

## Ordering example





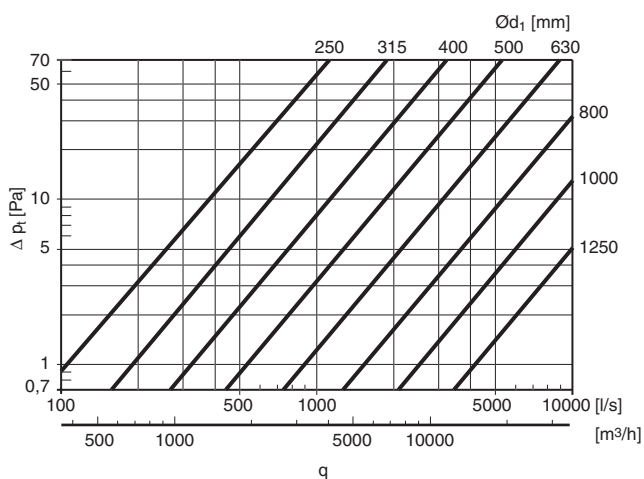
# Bend – lockseamed

# BFU 60°

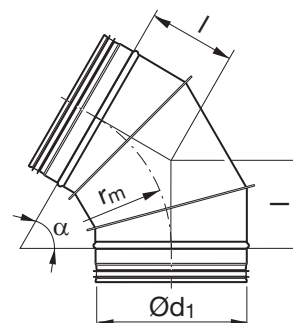


## Description

Segmented and lockseamed bend.



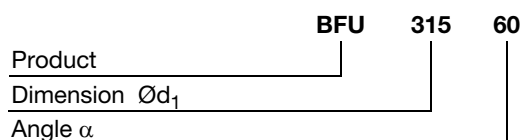
## Dimensions



$$r_m \approx 1 \cdot d_1$$

| $\text{Ø}d_1$<br>nom | $l$<br>mm | $m$<br>kg |
|----------------------|-----------|-----------|
| 250                  | 144       | 1,48      |
| 280                  | 162       | 1,80      |
| 300                  | 173       | 2,00      |
| 315                  | 182       | 2,20      |
| 355                  | 205       | 2,80      |
| 400                  | 231       | 3,47      |
| 450                  | 260       | 4,70      |
| 500                  | 289       | 6,00      |
| 560                  | 323       | 7,40      |
| 600                  | 346       | 8,60      |
| 630                  | 364       | 9,20      |
| 710                  | 410       | 11,3      |
| 800                  | 462       | 14,8      |
| 900                  | 520       | 19,3      |
| 1000                 | 577       | 24,2      |
| 1120                 | 647       | 30,1      |
| 1250                 | 722       | 36,6      |

## Ordering example



- 1
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# Bend – lockseamed

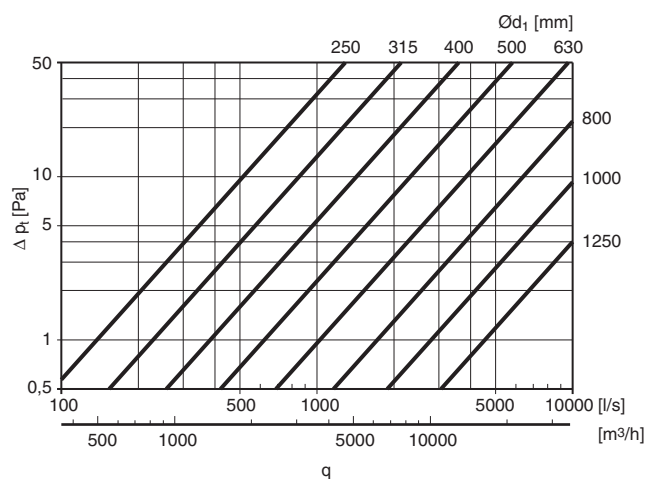
# BFU 45°

- 1
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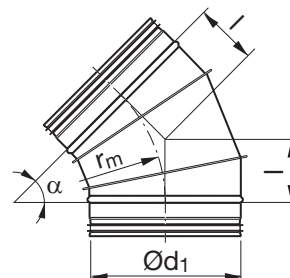


## Description

Segmented and lockseamed bend.



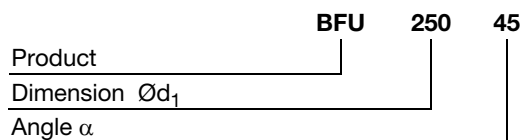
## Dimensions



$$r_m = 1 \cdot d_1$$

| Ød <sub>1</sub> nom | l mm | m kg |
|---------------------|------|------|
| 250                 | 104  | 1,26 |
| 280                 | 116  | 1,54 |
| 300                 | 124  | 1,77 |
| 315                 | 130  | 1,90 |
| 355                 | 147  | 2,26 |
| 400                 | 166  | 2,96 |
| 450                 | 186  | 4,00 |
| 500                 | 207  | 4,90 |
| 560                 | 232  | 6,10 |
| 600                 | 249  | 6,80 |
| 630                 | 261  | 7,49 |
| 710                 | 294  | 11,3 |
| 800                 | 331  | 15,0 |
| 900                 | 373  | 16,8 |
| 1000                | 414  | 19,5 |
| 1120                | 464  | 28,5 |
| 1250                | 518  | 38,0 |

## Ordering example





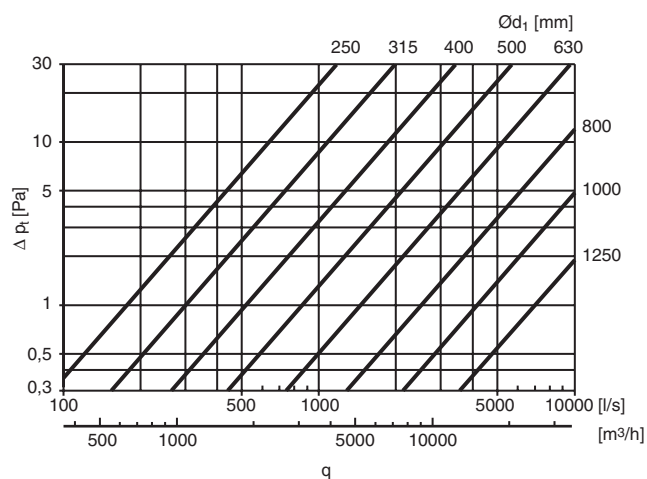
# Bend – lockseamed

# BFU 30°

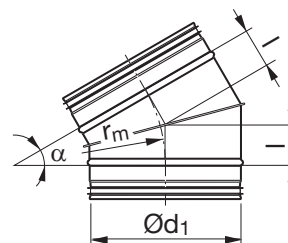


## Description

Segmented and lockseamed bend.



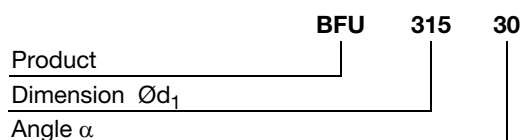
## Dimensions



$$r_m = 1 \cdot d_1$$

| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 250                    | 67      | 1,00    |
| 280                    | 75      | 1,10    |
| 300                    | 80      | 1,30    |
| 315                    | 84      | 1,42    |
| 355                    | 95      | 1,70    |
| 400                    | 107     | 2,27    |
| 450                    | 121     | 3,00    |
| 500                    | 134     | 3,70    |
| 560                    | 150     | 4,60    |
| 600                    | 161     | 5,10    |
| 630                    | 169     | 5,60    |
| 710                    | 190     | 8,60    |
| 800                    | 214     | 11,0    |
| 900                    | 241     | 10,9    |
| 1000                   | 268     | 13,4    |
| 1120                   | 300     | 16,1    |
| 1250                   | 335     | 19,0    |

## Ordering example



- 1
- 2
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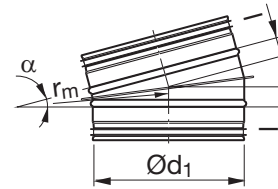


# Bend – lockseamed

# BFU 15°



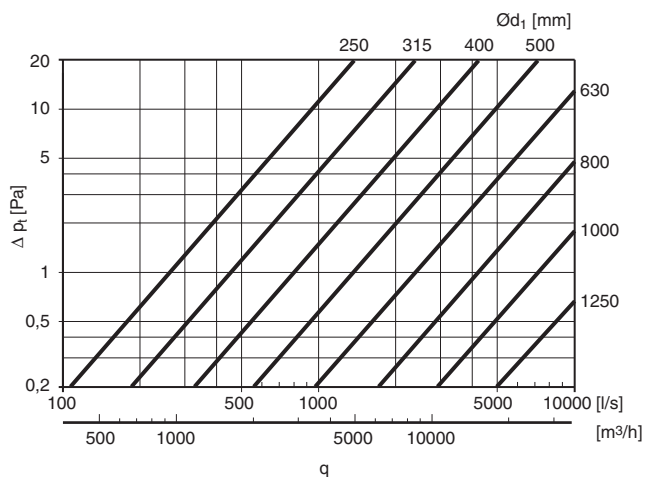
## Dimensions



$$r_m = 1 \cdot d_1$$

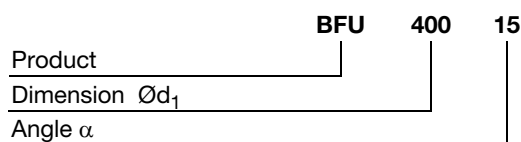
## Description

Segmented and lockseamed bend.



| $\text{Ø}d_1$<br>nom | l<br>mm | m<br>kg |
|----------------------|---------|---------|
| 250                  | 33      | 0,65    |
| 280                  | 37      | 0,77    |
| 300                  | 39      | 0,85    |
| 315                  | 41      | 0,91    |
| 355                  | 47      | 1,41    |
| 400                  | 53      | 1,70    |
| 450                  | 59      | 2,20    |
| 500                  | 66      | 2,65    |
| 560                  | 74      | 3,30    |
| 600                  | 79      | 3,70    |
| 630                  | 83      | 4,00    |
| 710                  | 93      | 5,80    |
| 800                  | 105     | 7,00    |
| 900                  | 118     | 8,50    |
| 1000                 | 132     | 10,4    |
| 1120                 | 147     | 12,5    |
| 1250                 | 165     | 14,5    |

## Ordering example





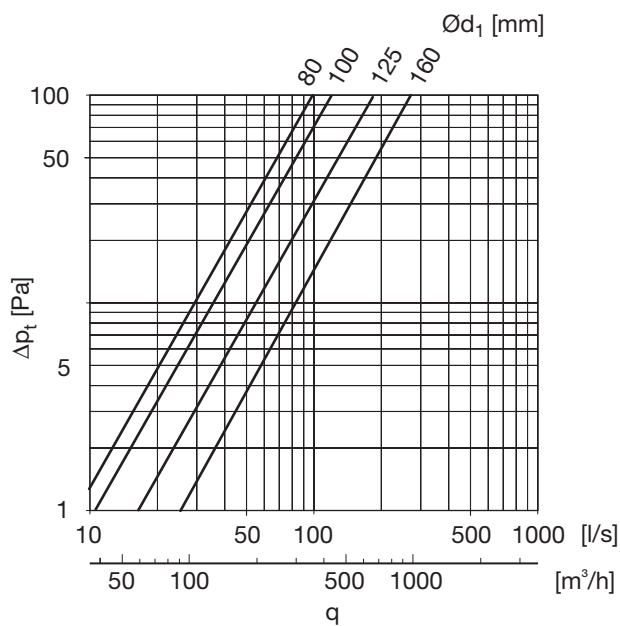
# Bend – short

# BKU90°

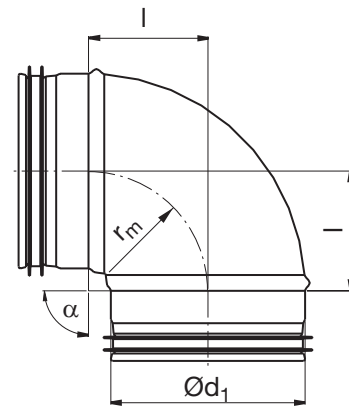


## Description

Pressed and seam welded bend with short installation length.



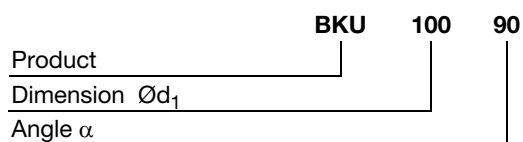
## Dimensions



$$r_m \approx 0,6 \cdot d_1$$

| $\text{Ø}d_1$<br>nom | $l$<br>mm | $m$<br>kg |
|----------------------|-----------|-----------|
| 80                   | 80        | 0,14      |
| 100                  | 62        | 0,22      |
| 125                  | 79        | 0,31      |
| 160                  | 94        | 0,50      |

## Ordering example



- 1
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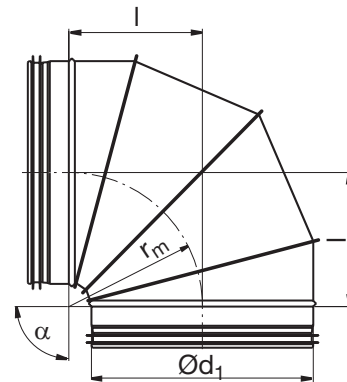


# Bend – short, lockseamed

# BKFU 90°



## Dimensions

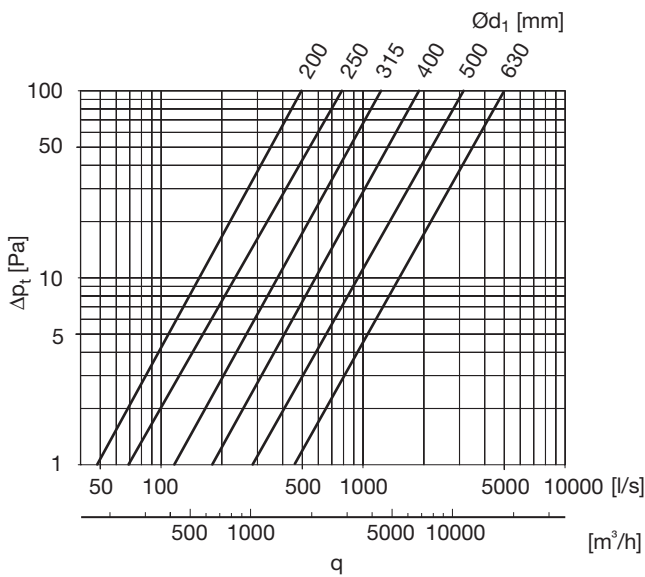


$$r_m \approx 0,6 \cdot d_1$$

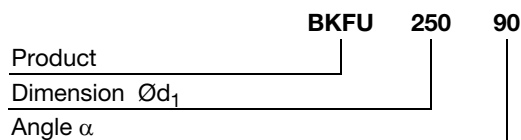
## Description

Segmented and lockseamed bend with short installation length.

| $\text{Ø}d_1$<br>nom | l<br>mm | m<br>kg |
|----------------------|---------|---------|
| 200                  | 158     | 1,18    |
| 250                  | 180     | 1,64    |
| 315                  | 220     | 2,49    |
| 400                  | 255     | 3,61    |
| 500                  | 315     | 6,30    |
| 630                  | 397     | 9,45    |



## Ordering example





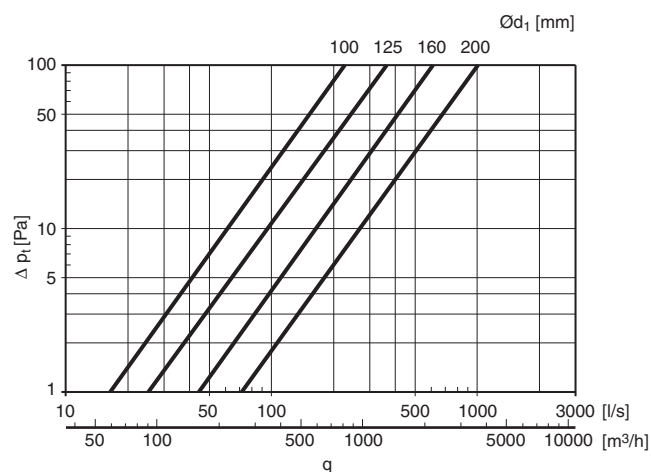
# Bend – long

# BSU 90°

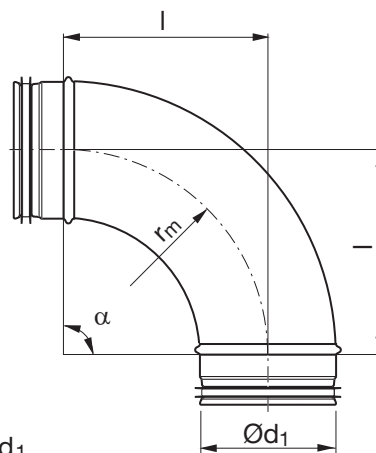


## Description

Pressed and seam welded bend.



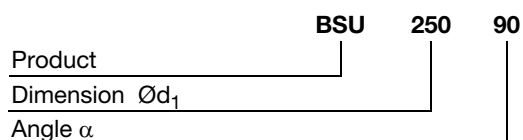
## Dimensions



$$r_m \approx 1,5 \cdot d_1$$

| $\text{Ø}d_1$<br>nom | $l$<br>mm | $m$<br>kg |
|----------------------|-----------|-----------|
| 100                  | 150       | 0,50      |
| 125                  | 190       | 0,79      |
| 150                  | 225       | 0,95      |
| 160                  | 240       | 1,14      |
| 180                  | 270       | 1,50      |
| 200                  | 300       | 1,55      |

## Ordering example



- 1
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# Bend – long

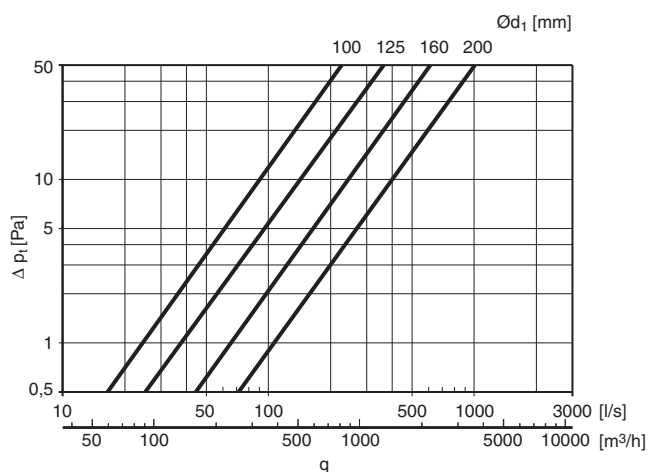
# BSU 45°

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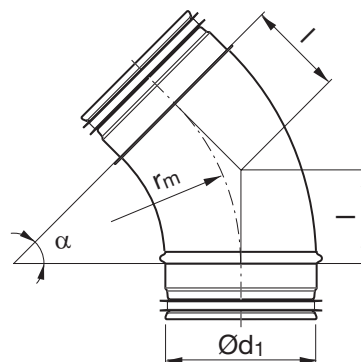


## Description

Pressed and seam welded bend.



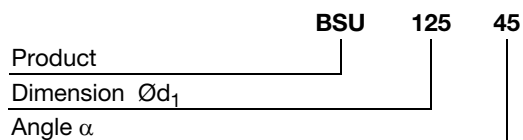
## Dimensions



$$r_m \approx 1,5 \cdot d_1$$

| $\text{Ø}d_1$<br>nom | l<br>mm | m<br>kg |
|----------------------|---------|---------|
| 100                  | 62      | 0,26    |
| 125                  | 79      | 0,41    |
| 150                  | 93      | 0,49    |
| 160                  | 100     | 0,59    |
| 180                  | 112     | 0,77    |
| 200                  | 124     | 0,82    |

## Ordering example





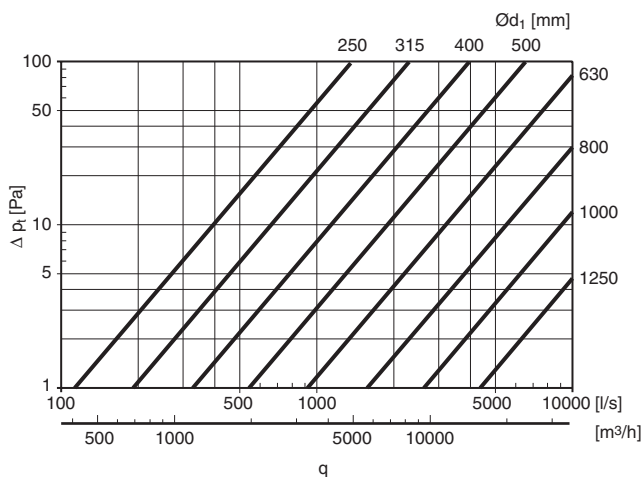
# Bend – long, lockseamed

# BSFU 90°

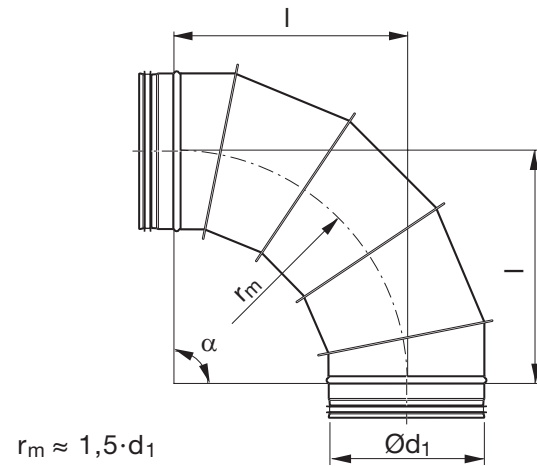


## Description

Segmented and lockseamed bend.

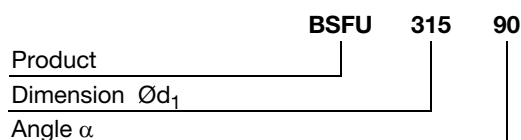


## Dimensions



| $\text{Ø}d_1$<br>nom | $l$<br>mm | $m$<br>kg |
|----------------------|-----------|-----------|
| 250                  | 375       | 2,70      |
| 280                  | 420       | 3,33      |
| 300                  | 450       | 3,60      |
| 315                  | 473       | 4,20      |
| 355                  | 533       | 4,60      |
| 400                  | 600       | 8,30      |
| 450                  | 675       | 10,2      |
| 500                  | 750       | 11,9      |
| 560                  | 840       | 15,2      |
| 600                  | 900       | 17,0      |
| 630                  | 945       | 18,8      |
| 710                  | 1065      | 22,7      |
| 800                  | 1200      | 26,9      |
| 900                  | 1350      | 39,3      |
| 1000                 | 1500      | 47,7      |
| 1120                 | 1680      | 63,0      |
| 1250                 | 1875      | 78,5      |

## Ordering example



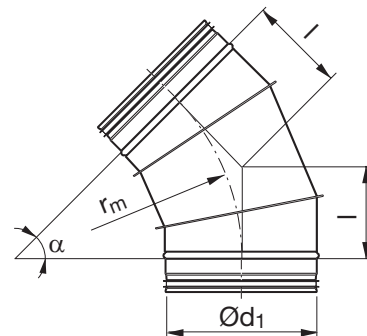


# Bend – long, lockseamed

# BSFU 45°



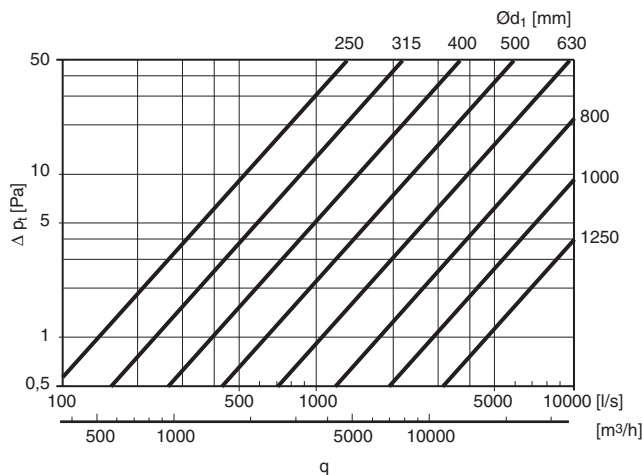
## Dimensions



$$r_m = 1,5 \cdot d_1$$

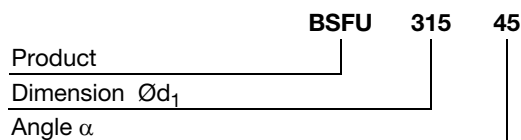
## Description

Segmented and lockseamed bend.



| $\text{Ø}d_1$<br>nom | l<br>mm | m<br>kg |
|----------------------|---------|---------|
| 250                  | 155     | 1,60    |
| 280                  | 174     | 1,81    |
| 300                  | 186     | 2,00    |
| 315                  | 196     | 2,26    |
| 355                  | 221     | 2,60    |
| 400                  | 249     | 4,50    |
| 450                  | 280     | 5,53    |
| 500                  | 311     | 6,60    |
| 560                  | 348     | 7,95    |
| 600                  | 373     | 8,80    |
| 630                  | 391     | 9,50    |
| 710                  | 441     | 11,1    |
| 800                  | 497     | 13,1    |
| 900                  | 559     | 18,9    |
| 1000                 | 621     | 23,9    |
| 1120                 | 696     | 29,6    |
| 1250                 | 777     | 36,1    |

## Ordering example





# Bend – Casting-in programme

# BKMU 90°



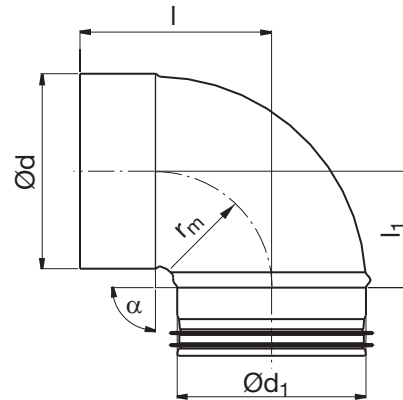
## Description

Pressed and seam welded bend with short installation length and female end.

Has Click function at the Safe end – has an open turned-over end.

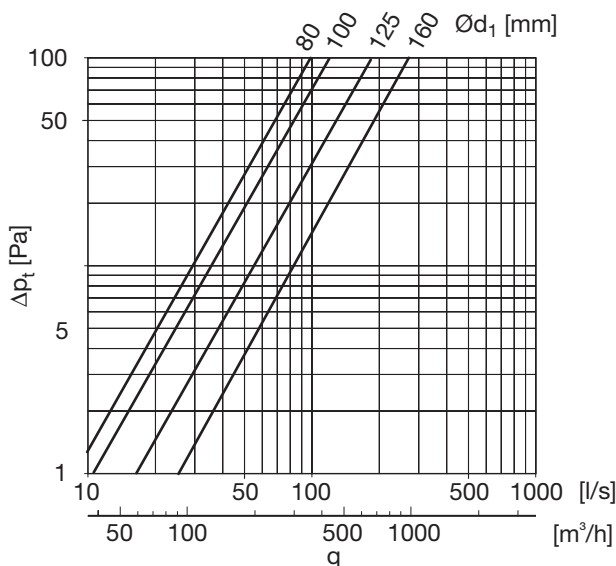
Has not any Click function at the female end – hasn't any notches.

## Dimensions

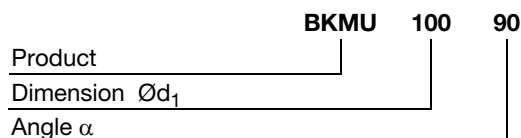


$$r_m = 0,6 \cdot d_1$$

| Ød <sub>1</sub> nom | Ød nom | l mm | l <sub>1</sub> mm | m kg |
|---------------------|--------|------|-------------------|------|
| 80                  | 80     | 123  | 80                | 0,13 |
| 100                 | 100    | 105  | 62                | 0,21 |
| 125                 | 125    | 120  | 79                | 0,31 |
| 160                 | 160    | 136  | 94                | 0,63 |



## Ordering example



- 1
- 2
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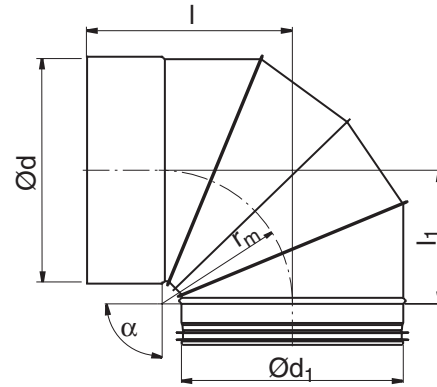


# Bend, short, segmented, female end

# BKFMU 90°



## Dimensions



$r_m \approx 0,6 \cdot d_1$

## Description

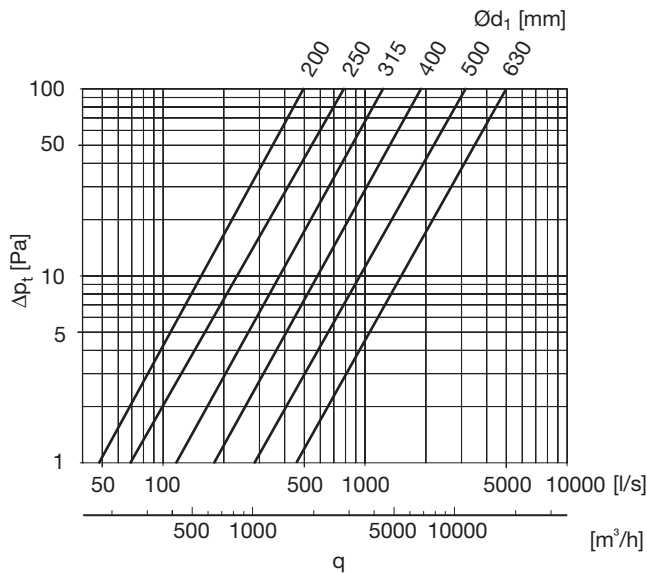
Segmented and lockseamed bend with short installation length and female end.

Has Click function at the Safe end – has an open turned-over end.

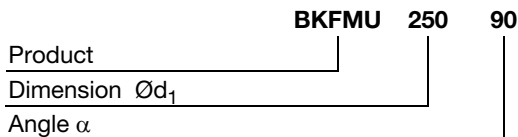
Has normally not any Click function at the female end – hasn't any notches.

Can to order be delivered with Click function at the female end as well – i.e. with notches.

| Ød <sub>1</sub> nom | Ød nom | l mm | l <sub>1</sub> mm | m kg |
|---------------------|--------|------|-------------------|------|
| 200                 | 200    | 199  | 158               | 1,17 |
| 250                 | 250    | 240  | 180               | 1,59 |
| 315                 | 315    | 280  | 220               | 2,26 |
| 400                 | 400    | 335  | 255               | 3,46 |
| 500                 | 500    | 395  | 315               | 6,33 |
| 630                 | 630    | 475  | 397               | 9,51 |
| 710                 | 710    | 525  | 425               | 16,0 |
| 800                 | 800    | 570  | 470               | 20,0 |
| 1000                | 1000   | 690  | 570               | 32,0 |
| 1120                | 1120   | 750  | 630               | 41,0 |
| 1250                | 1250   | 815  | 695               | 52,0 |



## Ordering example





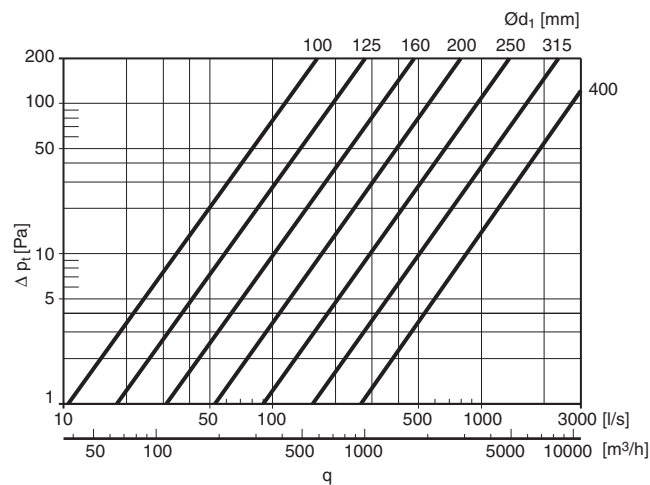
# Cleaning bends

## BKCU 90° BFKCU 90°



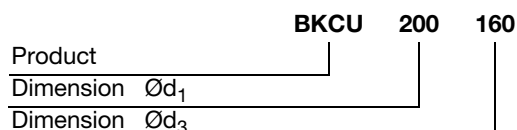
### Description

Pressed and seam welded bend with separate branch for cleaning. The stud is fitted with a Safe take-off and fits an inspection cap. The design gives a lower pressure drop than the equivalent design using a T-piece. The stud can also be used as the connection for an SR duct.

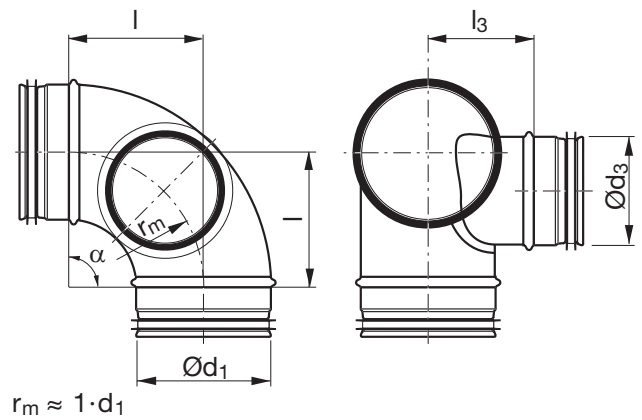


The graph applies to a cleaning bend with cleaning cap. Pressure drop is independent of take-off dimension ( $\text{Ø}d_3 \leq \text{Ø}d_1$ ).

### Ordering example



### Dimensions



| $\text{Ø}d_1$ nom | $\text{Ø}d_3$ nom | $l$ mm | $l_3$ mm | $m$ kg |
|-------------------|-------------------|--------|----------|--------|
| 100               | 100               | 100    | 75       | 0,41   |
| 112               | 100               | 120    | 85       | 0,50   |
| 125               | 100               | 125    | 90       | 0,59   |
| 125               | 125               | 125    | 90       | 0,66   |
| 140               | 125               | 135    | 100      | 0,75   |
| 150               | 125               | 150    | 105      | 0,78   |
| 160               | 125               | 160    | 110      | 0,97   |
| 160               | 160               | 160    | 110      | 0,97   |
| 180               | 160               | 180    | 120      | 1,18   |
| 200               | 160               | 200    | 130      | 1,24   |
| 200               | 200               | 200    | 130      | 1,28   |
| 224               | 200               | 225    | 140      | 1,57   |
| 250               | 200               | 250    | 155      | 1,93   |
| 250               | 250               | 250    | 150      | 2,01   |

\* Segmented and lockseamed. Designated BFKCU 90°

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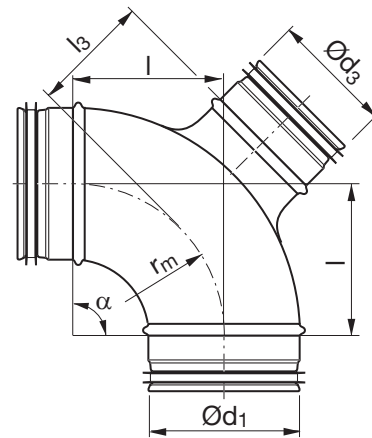


# Cleaning bends

## BBKCU90°, BFBKCU90°



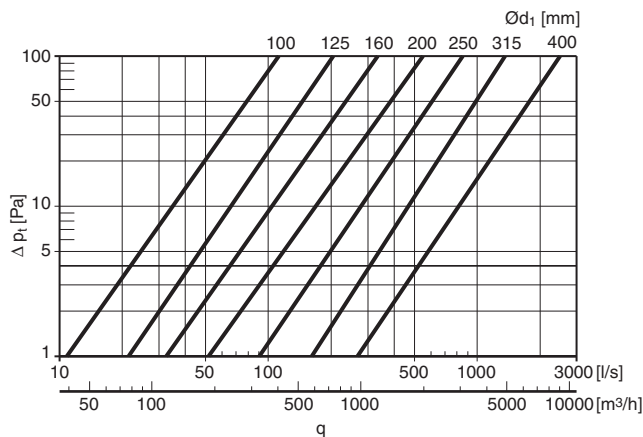
### Dimensions



$r_m \approx 1 \cdot d_1$

### Description

Pressed and seam welded bend with separate branch for cleaning. The stud is fitted with a Safe take-off and fits an inspection cap.



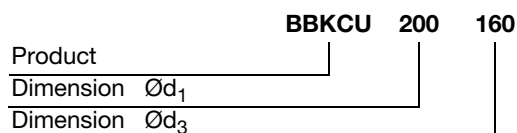
The graph applies to a cleaning bend with cleaning cap EPFH and with the same dimension of take-off and main duct ( $\text{Ø}d_3 = \text{Ø}d_1$ ).

The pressure drop is about 30% lower for cleaning cap KCU and  $\text{Ø}d_3 = \text{Ø}d_1$ .

The pressure drop is about 30% lower for cleaning cap EPFH and one step smaller take-off dimension ( $\text{Ø}d_3 < \text{Ø}d_1$ ).

The pressure drop is about 50% lower for cleaning cap KCU and one step smaller take-off dimension ( $\text{Ø}d_3 < \text{Ø}d_1$ ).

### Ordering example



| Ød <sub>1</sub> nom | Ød <sub>3</sub> nom | l mm | l <sub>3</sub> mm | m kg |
|---------------------|---------------------|------|-------------------|------|
| 100                 | 100                 | 100  | 75                | 0,42 |
| 112                 | 100                 | 120  | 78                | 0,51 |
| 125                 | 100                 | 125  | 78                | 0,58 |
| 125                 | 125                 | 125  | 83                | 0,58 |
| 140                 | 125                 | 135  | 90                | 0,75 |
| 150                 | 125                 | 150  | 90                | 0,77 |
| 160                 | 125                 | 160  | 100               | 0,97 |
| 160                 | 160                 | 160  | 105               | 0,96 |
| 180                 | 160                 | 180  | 108               | 1,20 |
| 200                 | 160                 | 200  | 125               | 1,24 |
| 200                 | 200                 | 200  | 125               | 1,29 |
| 224                 | 200                 | 225  | 128               | 1,67 |
| 250                 | 200                 | 250  | 150               | 2,02 |
| 250                 | 250                 | 250  | 150               | 2,12 |

\* Segmented and lockseamed. Designated BFBKCU 90°



# Bend – Casting-in programme

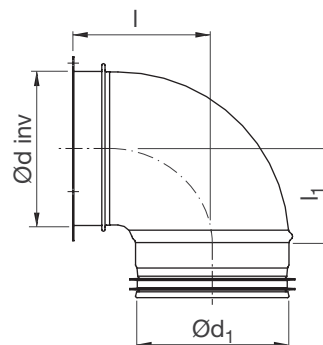
BU



## Description

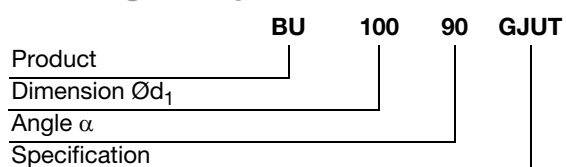
Short installation length with female end and nail flange with pre-punched holes.

## Dimensions



| Ød <sub>1</sub> nom | Ød nom | l mm | l <sub>1</sub> mm | m kg |
|---------------------|--------|------|-------------------|------|
| 80                  | 80     | 101  | 80                | 0,26 |
| 100                 | 100    | 93   | 62                | 0,24 |
| 125                 | 125    | 106  | 79                | 0,32 |
| 160                 | 160    | 130  | 94                | 0,43 |

## Ordering example



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# Bend – Casting-in programme

BSIU

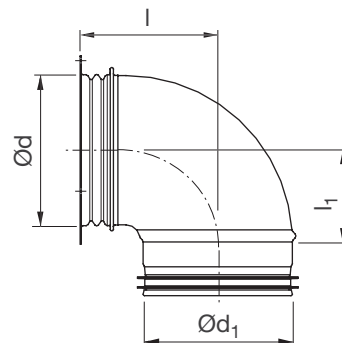
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## Description

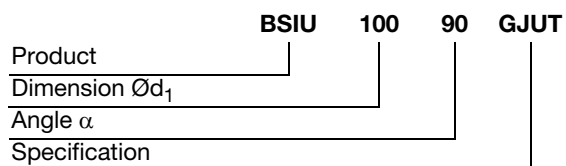
Short installation length with air valve socket and nail flange with pre-punched holes. Fits air valve KVB etc.

## Dimensions



| Ød <sub>1</sub> nom | Ød nom | l mm | l <sub>1</sub> mm | m kg |
|---------------------|--------|------|-------------------|------|
| 100                 | 92     | 93   | 62                | 0,23 |
| 125                 | 117    | 106  | 79                | 0,31 |
| 160                 | 152    | 131  | 94                | 0,39 |

## Ordering example





# Reducer

# RCU



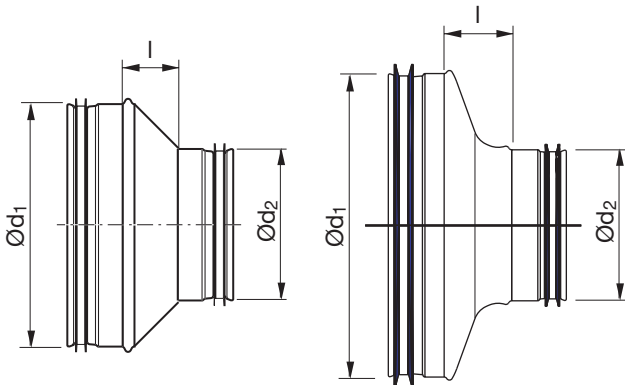
## Description

Pressed, concentric reducer to meet demands for short installation length with low pressure drop and low internal noise generation.

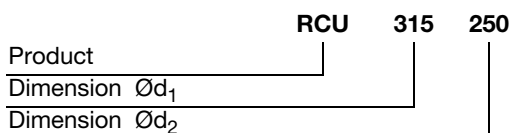
Pressure drop, see graphs on page 79.

Pressure drop, see graphs on page 79.

## Dimensions



## Ordering example



## Dimensions

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|
| 80                     | 63                     | 18      | 0,12    |
| 100                    | 63                     | 30      | 0,17    |
| 100 *                  | 80                     | 26      | 0,18    |
| 125 *                  | 80                     | 36      | 0,16    |
| 125 *                  | 100                    | 27      | 0,21    |
| 150                    | 100                    | 36      | 0,17    |
| 150 *                  | 125                    | 31      | 0,15    |
| 160                    | 80                     | 55      | 0,31    |
| 160 *                  | 100                    | 46      | 0,17    |
| 160 *                  | 125                    | 35      | 0,22    |
| 160                    | 150                    | 22      | 0,26    |
| 180                    | 100                    | 55      | 0,24    |
| 180                    | 125                    | 40      | 0,37    |
| 180                    | 150                    | 27      | 0,29    |
| 180                    | 160                    | 20      | 0,26    |
| 200 *                  | 100                    | 46      | 0,22    |
| 200 *                  | 125                    | 55      | 0,30    |
| 200                    | 150                    | 37      | 0,37    |
| 200 *                  | 160                    | 39      | 0,29    |
| 200                    | 180                    | 26      | 0,35    |
| 224                    | 150                    | 48      | 0,53    |
| 224                    | 160                    | 44      | 0,53    |
| 224                    | 180                    | 34      | 0,48    |
| 224                    | 200                    | 24      | 0,45    |
| 250                    | 125                    | 70      | 0,62    |
| 250                    | 150                    | 62      | 0,60    |
| 250 *                  | 160                    | 60      | 0,46    |
| 250                    | 180                    | 47      | 0,59    |
| 250 *                  | 200                    | 42      | 0,46    |
| 250                    | 224                    | 29      | 0,57    |
| 300 *                  | 200                    | 59      | 0,64    |
| 300                    | 250                    | 34      | 0,71    |
| 315                    | 160                    | 91      | 0,86    |
| 315 *                  | 200                    | 74      | 0,72    |
| 315 *                  | 250                    | 50      | 0,65    |
| 355                    | 250                    | 69      | 1,08    |
| 355                    | 315                    | 33      | 0,99    |
| 400                    | 200                    | 118     | 1,37    |
| 400                    | 250                    | 94      | 1,38    |
| 400                    | 315                    | 54      | 1,29    |
| 500 **                 | 250                    | 128     | 2,30    |
| 500                    | 315                    | 95      | 1,90    |
| 500                    | 400                    | 68      | 1,76    |
| 630 **                 | 315                    | 160     | 3,37    |
| 630 **                 | 400                    | 118     | 3,17    |
| 630 **                 | 500                    | 68      | 2,89    |

\* With stream-lined transition

\*\* Hand made





# Reducer

# RCFU



## Description

Pressed, concentric reducer with female coupling, with a 45° angle to meet demands for short installation length with low pressure drop and low internal noise generation. Ød fits outside another fitting.

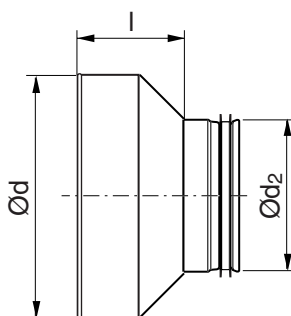
Pressure drop, see graphs on page 79.

Has Click function at the Safe end – has an open turned-over end.

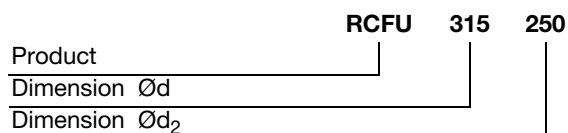
Has normally not any Click function at the female end – hasn't any notches.

Can to order be delivered with Click function at the female end as well – i.e. with notches.

## Dimensions



## Ordering example



## Dimensions

| Ød nom | Ød <sub>2</sub> nom | l mm | m kg |
|--------|---------------------|------|------|
| 80     | 63                  | 57   | 0,11 |
| 100    | 63                  | 70   | 0,14 |
| 100 *1 | 80                  | 61   | 0,16 |
| 125 *1 | 80                  | 73   | 0,16 |
| 125 *1 | 100                 | 64   | 0,14 |
| 150    | 100                 | 78   | 0,16 |
| 150 1  | 125                 | 66   | 0,17 |
| 160 *  | 80                  | 92   | 0,24 |
| 160 *1 | 100                 | 83   | 0,16 |
| 160 *1 | 125                 | 71   | 0,20 |
| 160    | 150                 | 59   | 0,25 |
| 180    | 100                 | 98   | 0,24 |
| 180    | 125                 | 85   | 0,31 |
| 180    | 150                 | 68   | 0,24 |
| 180    | 160                 | 66   | 0,27 |
| 200 *1 | 100                 | 84   | 0,23 |
| 200 *1 | 125                 | 90   | 0,27 |
| 200    | 150                 | 75   | 0,34 |
| 200 *1 | 160                 | 73   | 0,26 |
| 200    | 180                 | 63   | 0,32 |
| 224    | 150                 | 92   | 0,45 |
| 224    | 160                 | 87   | 0,49 |
| 224    | 180                 | 76   | 0,46 |
| 224    | 200                 | 66   | 0,45 |
| 250 *  | 125                 | 133  | 0,57 |
| 250    | 150                 | 122  | 0,56 |
| 250 *1 | 160                 | 117  | 0,40 |
| 250    | 180                 | 107  | 0,55 |
| 250 *1 | 200                 | 103  | 0,42 |
| 250    | 224                 | 89   | 0,53 |
| 300    | 200                 | 119  | 0,68 |
| 300    | 250                 | 94   | 0,66 |
| 315 *  | 160                 | 153  | 0,82 |
| 315 *  | 200                 | 134  | 0,77 |
| 315 *1 | 250                 | 108  | 0,65 |
| 355    | 250                 | 136  | 1,04 |
| 355    | 315                 | 97   | 0,89 |
| 400 *  | 200                 | 196  | 1,31 |
| 400 *  | 250                 | 174  | 1,37 |
| 400 *  | 315                 | 133  | 1,20 |
| 500 ** | 250                 | 208  | 2,12 |
| 500 ** | 315                 | 185  | 2,09 |
| 500 ** | 400                 | 150  | 1,95 |
| 630 ** | 315                 | 240  | 2,76 |
| 630 ** | 400                 | 198  | 2,72 |
| 630 ** | 500                 | 148  | 2,69 |

\* With turned-over edge

\*\* Hand made

1 With stream-lined transition

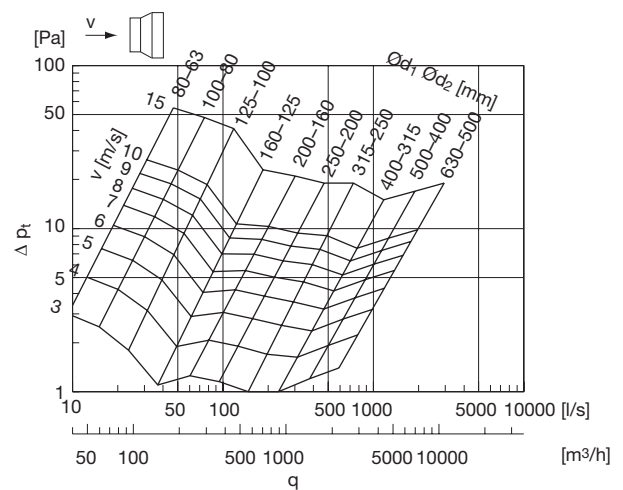
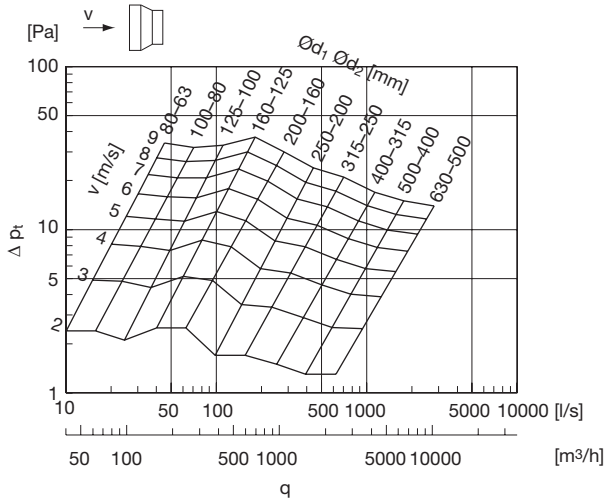


# Reducers

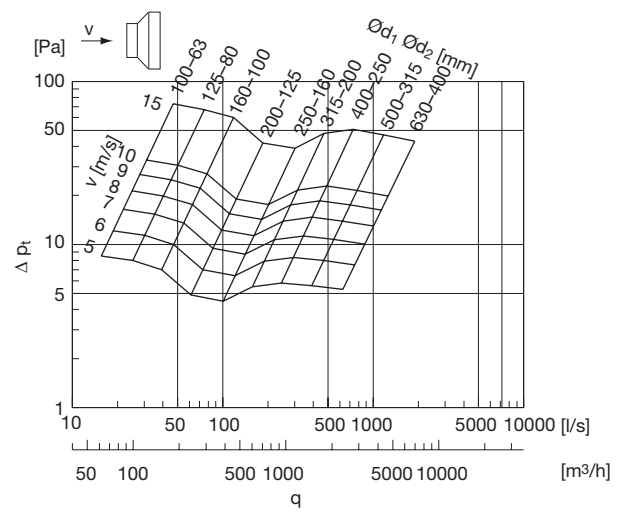
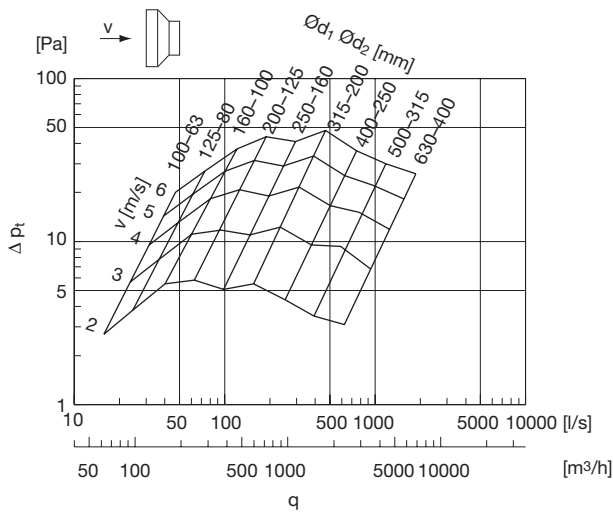
# RCU, RCFU

## Technical data

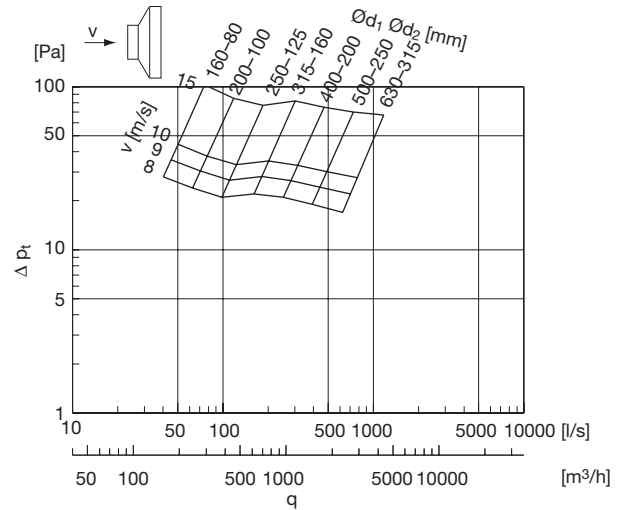
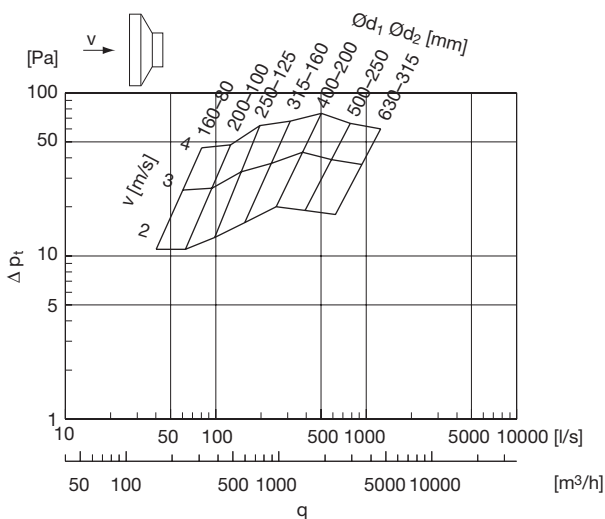
### 1 dimension step



### 2 dimension steps



### 3 dimension steps



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# Reducer

RU

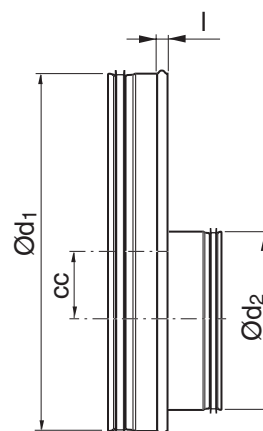
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## Description

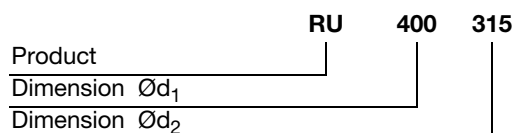
Short, eccentric reducer to achieve extremely short installation length.

## Dimensions



| Ød <sub>1</sub> nom | Ød <sub>2</sub> nom | cc mm | l mm | m kg |
|---------------------|---------------------|-------|------|------|
| 400                 | 200                 | 90    | 12   | 1,42 |
| 400                 | 224                 | 78    | 12   | 1,48 |
| 400                 | 250                 | 65    | 12   | 1,54 |
| 400                 | 280                 | 50    | 12   | 1,53 |
| 400                 | 300                 | 40    | 12   | 1,52 |
| 400                 | 315                 | 33    | 12   | 1,51 |
| 400                 | 355                 | 13    | 12   | 1,13 |
| 450                 | 250                 | 90    | 4    | 1,76 |
| 450                 | 280                 | 75    | 4    | 1,75 |
| 450                 | 300                 | 65    | 4    | 1,74 |
| 450                 | 315                 | 58    | 4    | 1,73 |
| 450                 | 355                 | 38    | 4    | 1,64 |
| 450                 | 400                 | 15    | 4    | 1,31 |
| 500                 | 250                 | 115   | 12   | 1,98 |
| 500                 | 280                 | 100   | 12   | 1,97 |
| 500                 | 300                 | 90    | 12   | 1,96 |
| 500                 | 315                 | 83    | 12   | 1,95 |
| 500                 | 355                 | 63    | 12   | 1,87 |
| 500                 | 400                 | 40    | 12   | 1,92 |
| 500                 | 450                 | 15    | 12   | 1,46 |
| 560                 | 315                 | 113   | 4    | 2,29 |
| 560                 | 355                 | 93    | 4    | 2,21 |
| 560                 | 400                 | 70    | 4    | 2,26 |
| 560                 | 450                 | 45    | 4    | 1,80 |
| 560                 | 500                 | 20    | 4    | 1,70 |
| 600                 | 315                 | 133   | 4    | 2,63 |
| 600                 | 355                 | 113   | 4    | 2,54 |
| 600                 | 400                 | 90    | 4    | 2,60 |
| 600                 | 450                 | 65    | 4    | 2,14 |
| 600                 | 500                 | 40    | 4    | 2,56 |
| 600                 | 560                 | 10    | 4    | 1,87 |
| 630                 | 315                 | 148   | 4    | 2,85 |
| 630                 | 355                 | 128   | 4    | 2,77 |

## Ordering example





# Reducer

# RU

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | cc<br>mm | l<br>mm | m<br>kg |
|------------------------|------------------------|----------|---------|---------|
| 630                    | 400                    | 105      | 4       | 2,82    |
| 630                    | 450                    | 80       | 4       | 2,36    |
| 630                    | 500                    | 55       | 4       | 2,78    |
| 630                    | 560                    | 25       | 4       | 2,09    |
| 630                    | 600                    | 5        | 4       | 1,90    |
| 710                    | 400                    | 145      | 4       | 3,43    |
| 710                    | 450                    | 120      | 4       | 2,97    |
| 710                    | 500                    | 95       | 4       | 3,39    |
| 710                    | 560                    | 65       | 4       | 2,70    |
| 710                    | 600                    | 45       | 4       | 2,51    |
| 710                    | 630                    | 30       | 4       | 2,48    |
| 800                    | 400                    | 190      | 4       | 4,06    |
| 800                    | 450                    | 165      | 4       | 3,60    |
| 800                    | 500                    | 140      | 4       | 4,02    |
| 800                    | 560                    | 110      | 4       | 3,33    |
| 800                    | 600                    | 90       | 4       | 3,14    |
| 800                    | 630                    | 75       | 4       | 3,75    |
| 800                    | 710                    | 35       | 4       | 3,06    |
| 900                    | 500                    | 190      | 4       | 5,30    |
| 900                    | 560                    | 160      | 4       | 4,58    |
| 900                    | 600                    | 140      | 4       | 4,36    |
| 900                    | 630                    | 125      | 4       | 4,95    |
| 900                    | 710                    | 85       | 4       | 4,20    |
| 900                    | 800                    | 40       | 4       | 4,01    |
| 1000                   | 500                    | 240      | 4       | 6,52    |
| 1000                   | 560                    | 210      | 4       | 5,80    |
| 1000                   | 600                    | 190      | 4       | 5,58    |
| 1000                   | 630                    | 175      | 4       | 6,17    |
| 1000                   | 710                    | 135      | 4       | 5,42    |
| 1000                   | 800                    | 90       | 4       | 5,23    |
| 1000                   | 900                    | 40       | 4       | 4,94    |
| 1120                   | 630                    | 235      | 4       | 7,59    |
| 1120                   | 710                    | 195      | 4       | 6,48    |
| 1120                   | 800                    | 150      | 4       | 6,64    |
| 1120                   | 900                    | 100      | 4       | 6,36    |
| 1120                   | 1000                   | 50       | 4       | 5,46    |
| 1250                   | 630                    | 300      | 4       | 9,69    |
| 1250                   | 710                    | 260      | 4       | 8,94    |
| 1250                   | 800                    | 215      | 4       | 8,74    |
| 1250                   | 900                    | 165      | 4       | 8,46    |
| 1250                   | 1000                   | 115      | 4       | 7,56    |
| 1250                   | 1120                   | 55       | 4       | 7,53    |

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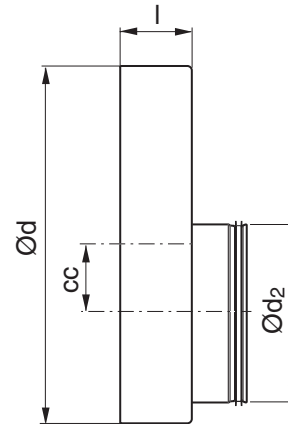


# Reducer

# RFU



## Dimensions



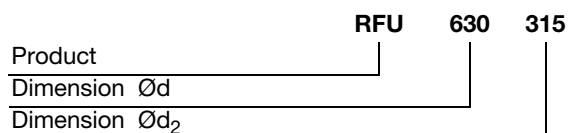
### Description

Short, eccentric reducer with female end to achieve extremely short installation length.

Ød fits outside another fitting.

| Ød nom | Ød <sub>2</sub> nom | cc mm | l mm | m kg |
|--------|---------------------|-------|------|------|
| 400 *  | 200                 | 90    | 80   | 1,33 |
| 400    | 224                 | 78    | 80   | 1,39 |
| 400 *  | 250                 | 65    | 80   | 1,44 |
| 400    | 280                 | 50    | 80   | 1,43 |
| 400    | 300                 | 40    | 80   | 1,43 |
| 400 *  | 315                 | 33    | 80   | 1,42 |
| 400    | 355                 | 13    | 80   | 0,99 |
| 450    | 250                 | 90    | 80   | 1,76 |
| 450    | 280                 | 75    | 80   | 1,75 |
| 450    | 300                 | 65    | 80   | 1,74 |
| 450    | 315                 | 58    | 80   | 1,73 |
| 450    | 355                 | 38    | 80   | 1,69 |
| 450    | 400                 | 15    | 80   | 1,31 |
| 500    | 250                 | 115   | 80   | 2,09 |
| 500    | 280                 | 100   | 80   | 2,08 |
| 500    | 300                 | 95    | 80   | 2,07 |
| 500    | 315                 | 83    | 80   | 2,06 |
| 500    | 355                 | 63    | 80   | 1,98 |
| 500    | 400                 | 40    | 80   | 2,03 |
| 500    | 450                 | 15    | 80   | 1,57 |
| 560    | 315                 | 113   | 80   | 2,39 |
| 560    | 355                 | 93    | 80   | 2,32 |
| 560    | 400                 | 70    | 80   | 2,36 |
| 560    | 450                 | 45    | 80   | 1,90 |
| 560    | 500                 | 20    | 80   | 1,80 |
| 600    | 315                 | 133   | 80   | 2,62 |
| 600    | 355                 | 113   | 80   | 2,54 |
| 600    | 400                 | 90    | 80   | 2,59 |
| 600    | 450                 | 65    | 80   | 2,53 |
| 600    | 500                 | 40    | 80   | 2,54 |
| 600    | 560                 | 10    | 80   | 1,86 |
| 630    | 315                 | 148   | 80   | 2,79 |
| 630    | 355                 | 128   | 80   | 2,71 |

### Ordering example





## Reducer

## RFU

| Ød<br>nom | Ød <sub>2</sub><br>nom | cc<br>mm | l<br>mm | m<br>kg |
|-----------|------------------------|----------|---------|---------|
| 630       | 400                    | 105      | 80      | 2,76    |
| 630       | 450                    | 80       | 80      | 2,30    |
| 630       | 500                    | 55       | 80      | 2,72    |
| 630       | 560                    | 25       | 80      | 2,03    |
| 630       | 600                    | 5        | 80      | 1,84    |
| 710       | 400                    | 145      | 100     | 3,72    |
| 710       | 450                    | 120      | 100     | 2,76    |
| 710       | 500                    | 95       | 100     | 3,18    |
| 710       | 560                    | 65       | 100     | 2,49    |
| 710       | 600                    | 45       | 100     | 2,30    |
| 710       | 630                    | 30       | 100     | 2,44    |
| 800       | 400                    | 190      | 100     | 3,76    |
| 800       | 450                    | 165      | 100     | 3,30    |
| 800       | 500                    | 140      | 100     | 3,72    |
| 800       | 560                    | 110      | 100     | 3,03    |
| 800       | 600                    | 90       | 100     | 2,84    |
| 800       | 630                    | 75       | 100     | 3,44    |
| 800       | 710                    | 35       | 100     | 2,76    |
| 900       | 500                    | 190      | 100     | 6,14    |
| 900       | 560                    | 160      | 100     | 5,42    |
| 900       | 600                    | 140      | 100     | 5,20    |
| 900       | 630                    | 125      | 100     | 5,74    |
| 900       | 710                    | 85       | 100     | 5,04    |
| 900       | 800                    | 40       | 100     | 4,84    |
| 1000      | 500                    | 240      | 100     | 7,34    |
| 1000      | 560                    | 210      | 100     | 6,42    |
| 1000      | 600                    | 190      | 100     | 6,40    |
| 1000      | 630                    | 175      | 100     | 6,99    |
| 1000      | 710                    | 135      | 100     | 6,24    |
| 1000      | 800                    | 90       | 100     | 6,04    |
| 1000      | 900                    | 40       | 100     | 5,76    |
| 1120      | 630                    | 235      | 120     | 9,09    |
| 1120      | 710                    | 195      | 120     | 8,34    |
| 1120      | 800                    | 150      | 120     | 8,14    |
| 1120      | 900                    | 100      | 120     | 7,86    |
| 1120      | 1000                   | 50       | 120     | 6,96    |
| 1250      | 630                    | 300      | 120     | 11,0    |
| 1250      | 710                    | 260      | 120     | 10,3    |
| 1250      | 800                    | 215      | 120     | 10,0    |
| 1250      | 900                    | 165      | 120     | 9,76    |
| 1250      | 1000                   | 115      | 120     | 8,86    |
| 1250      | 1120                   | 55       | 120     | 8,83    |

\* With turned-over edge

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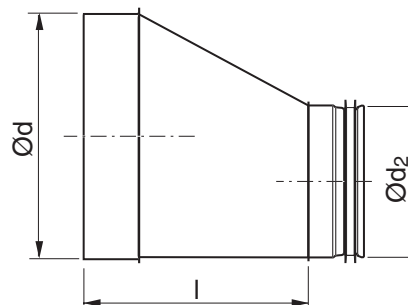


# Reducer

# RFLU



## Dimensions



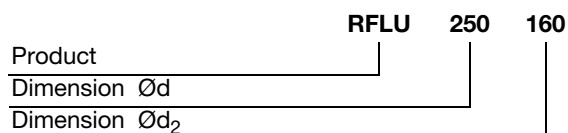
### Description

Long, tangential, hand made reducer with a female end and with approx. 35° angle.

Dimensions are otherwise adapted to DIN 24147 section 4.

| Ød nom | Ød <sub>2</sub> nom | l mm | m kg |
|--------|---------------------|------|------|
| 80     | 63                  | 98   | 0,14 |
| 100    | 63                  | 126  | 0,20 |
| 100    | 80                  | 103  | 0,18 |
| 112    | 63                  | 142  | 0,23 |
| 112    | 80                  | 119  | 0,22 |
| 112    | 100                 | 92   | 0,20 |
| 125    | 63                  | 159  | 0,28 |
| 125    | 80                  | 137  | 0,26 |
| 125    | 100                 | 109  | 0,24 |
| 125    | 112                 | 93   | 0,23 |
| 140    | 63                  | 181  | 0,33 |
| 140    | 80                  | 157  | 0,32 |
| 140    | 100                 | 130  | 0,30 |
| 140    | 112                 | 114  | 0,28 |
| 140    | 125                 | 96   | 0,27 |
| 150    | 63                  | 195  | 0,37 |
| 150    | 80                  | 171  | 0,36 |
| 150    | 100                 | 144  | 0,34 |
| 150    | 112                 | 127  | 0,32 |
| 150    | 125                 | 109  | 0,30 |
| 150    | 140                 | 99   | 0,28 |
| 160    | 63                  | 207  | 0,43 |
| 160    | 80                  | 185  | 0,42 |
| 160    | 100                 | 157  | 0,40 |
| 160    | 112                 | 141  | 0,38 |
| 160    | 125                 | 123  | 0,36 |
| 160    | 140                 | 102  | 0,34 |
| 160    | 150                 | 99   | 0,32 |
| 180    | 80                  | 212  | 0,51 |
| 180    | 100                 | 185  | 0,49 |
| 180    | 112                 | 168  | 0,47 |
| 180    | 125                 | 151  | 0,46 |
| 180    | 140                 | 130  | 0,43 |

### Ordering example





## Reducer

## RFLU

| Ød<br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|-----------|------------------------|---------|---------|
| 180       | 150                    | 116     | 0,41    |
| 180       | 160                    | 103     | 0,41    |
| 200       | 80                     | 240     | 0,61    |
| 200       | 100                    | 213     | 0,59    |
| 200       | 112                    | 196     | 0,57    |
| 200       | 125                    | 178     | 0,55    |
| 200       | 140                    | 157     | 0,53    |
| 200       | 150                    | 144     | 0,51    |
| 200       | 160                    | 130     | 0,50    |
| 200       | 180                    | 103     | 0,46    |
| 224       | 100                    | 215     | 0,72    |
| 224       | 112                    | 229     | 0,70    |
| 224       | 125                    | 211     | 0,68    |
| 224       | 140                    | 190     | 0,65    |
| 224       | 150                    | 177     | 0,64    |
| 224       | 160                    | 163     | 0,63    |
| 224       | 180                    | 135     | 0,58    |
| 224       | 200                    | 107     | 0,53    |
| 250       | 100                    | 301     | 0,94    |
| 250       | 112                    | 285     | 0,92    |
| 250       | 125                    | 267     | 0,90    |
| 250       | 140                    | 246     | 0,89    |
| 250       | 150                    | 232     | 0,87    |
| 250       | 160                    | 219     | 0,87    |
| 250       | 180                    | 191     | 0,80    |
| 250       | 200                    | 164     | 0,75    |
| 250       | 224                    | 131     | 0,67    |
| 280       | 125                    | 308     | 1,10    |
| 280       | 140                    | 287     | 1,08    |
| 280       | 150                    | 274     | 1,06    |
| 280       | 160                    | 260     | 1,05    |
| 280       | 180                    | 232     | 1,00    |
| 280       | 200                    | 205     | 0,95    |
| 280       | 224                    | 172     | 0,87    |
| 280       | 250                    | 136     | 0,84    |
| 300       | 125                    | 335     | 1,25    |
| 300       | 140                    | 315     | 1,22    |
| 300       | 150                    | 301     | 1,20    |
| 300       | 160                    | 287     | 1,20    |
| 300       | 180                    | 260     | 1,15    |
| 300       | 200                    | 262     | 1,09    |
| 300       | 224                    | 200     | 1,02    |
| 300       | 250                    | 164     | 0,98    |
| 300       | 280                    | 123     | 0,86    |
| 315       | 125                    | 356     | 1,36    |
| 315       | 140                    | 335     | 1,33    |
| 315       | 150                    | 322     | 1,32    |
| 315       | 160                    | 308     | 1,31    |

| Ød<br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|-----------|------------------------|---------|---------|
| 315       | 180                    | 281     | 1,26    |
| 315       | 200                    | 253     | 1,21    |
| 315       | 224                    | 220     | 1,13    |
| 315       | 250                    | 184     | 1,09    |
| 315       | 280                    | 143     | 0,97    |
| 315       | 300                    | 116     | 0,88    |
| 355       | 160                    | 363     | 1,84    |
| 355       | 180                    | 335     | 1,77    |
| 355       | 200                    | 308     | 1,71    |
| 355       | 224                    | 275     | 1,61    |
| 355       | 250                    | 239     | 1,56    |
| 355       | 280                    | 198     | 1,41    |
| 355       | 300                    | 171     | 1,30    |
| 355       | 315                    | 150     | 1,21    |
| 400       | 160                    | 450     | 2,44    |
| 400       | 180                    | 422     | 2,38    |
| 400       | 200                    | 395     | 2,31    |
| 400       | 224                    | 362     | 2,23    |
| 400       | 250                    | 326     | 2,20    |
| 400       | 280                    | 285     | 2,01    |
| 400       | 300                    | 257     | 1,90    |
| 400       | 315                    | 237     | 1,86    |
| 400       | 355                    | 182     | 1,55    |
| 450       | 200                    | 463     | 2,99    |
| 450       | 224                    | 431     | 2,90    |
| 450       | 250                    | 395     | 2,85    |
| 450       | 280                    | 354     | 2,70    |
| 450       | 300                    | 326     | 2,59    |
| 450       | 315                    | 306     | 2,50    |
| 450       | 355                    | 251     | 2,24    |
| 450       | 400                    | 194     | 2,64    |
| 500       | 200                    | 532     | 3,66    |
| 500       | 224                    | 499     | 3,56    |
| 500       | 250                    | 463     | 3,51    |
| 500       | 280                    | 422     | 3,36    |
| 500       | 300                    | 395     | 3,25    |
| 500       | 315                    | 374     | 3,16    |
| 500       | 355                    | 319     | 2,89    |
| 500       | 400                    | 262     | 2,69    |
| 500       | 450                    | 194     | 2,37    |
| 560       | 250                    | 546     | 4,47    |
| 560       | 280                    | 505     | 4,32    |
| 560       | 300                    | 477     | 4,21    |
| 560       | 315                    | 456     | 4,11    |
| 560       | 355                    | 402     | 3,85    |
| 560       | 400                    | 345     | 3,66    |
| 560       | 450                    | 276     | 2,70    |
| 560       | 500                    | 207     | 2,86    |

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## Reducer

## RFLU

| Ød<br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|-----------|------------------------|---------|---------|
| 600       | 250                    | 601     | 5,10    |
| 600       | 280                    | 560     | 4,96    |
| 600       | 300                    | 532     | 4,84    |
| 600       | 315                    | 512     | 4,76    |
| 600       | 355                    | 457     | 4,49    |
| 600       | 400                    | 400     | 4,29    |
| 600       | 450                    | 331     | 3,96    |
| 600       | 500                    | 262     | 3,49    |
| 600       | 560                    | 180     | 2,94    |
| 630       | 250                    | 642     | 5,60    |
| 630       | 280                    | 601     | 5,46    |
| 630       | 300                    | 573     | 5,34    |
| 630       | 315                    | 553     | 5,25    |
| 630       | 355                    | 498     | 4,99    |
| 630       | 400                    | 441     | 4,79    |
| 630       | 450                    | 372     | 4,46    |
| 630       | 500                    | 304     | 4,00    |
| 630       | 560                    | 221     | 3,43    |
| 630       | 600                    | 166     | 2,97    |
| 710       | 355                    | 633     | 7,11    |
| 710       | 400                    | 576     | 6,92    |
| 710       | 450                    | 507     | 6,60    |
| 710       | 500                    | 438     | 6,12    |
| 710       | 560                    | 356     | 5,57    |
| 710       | 600                    | 301     | 5,10    |
| 710       | 630                    | 260     | 4,72    |
| 800       | 400                    | 699     | 8,81    |
| 800       | 450                    | 631     | 8,49    |
| 800       | 500                    | 562     | 8,02    |
| 800       | 560                    | 480     | 7,46    |
| 800       | 600                    | 425     | 6,99    |
| 800       | 630                    | 384     | 6,62    |
| 800       | 710                    | 279     | 6,21    |
| 900       | 450                    | 768     | 10,8    |
| 900       | 500                    | 699     | 10,3    |
| 900       | 560                    | 617     | 9,78    |
| 900       | 600                    | 562     | 9,31    |
| 900       | 630                    | 521     | 8,94    |
| 900       | 710                    | 416     | 8,53    |
| 900       | 800                    | 292     | 7,18    |
| 1000      | 500                    | 857     | 13,1    |
| 1000      | 560                    | 774     | 12,5    |
| 1000      | 600                    | 719     | 12,0    |
| 1000      | 630                    | 678     | 11,7    |
| 1000      | 710                    | 573     | 11,2    |
| 1000      | 800                    | 450     | 9,91    |
| 1000      | 900                    | 312     | 8,17    |
| 1120      | 560                    | 939     | 16,4    |

| Ød<br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|-----------|------------------------|---------|---------|
| 1120      | 600                    | 884     | 15,9    |
| 1120      | 630                    | 843     | 15,5    |
| 1120      | 710                    | 738     | 15,1    |
| 1120      | 800                    | 615     | 13,8    |
| 1120      | 900                    | 477     | 12,1    |
| 1120      | 1000                   | 656     | 16,2    |
| 1250      | 600                    | 340     | 10,3    |
| 1250      | 630                    | 1063    | 20,1    |
| 1250      | 710                    | 1022    | 19,7    |
| 1250      | 800                    | 917     | 19,3    |
| 1250      | 900                    | 793     | 17,9    |
| 1250      | 1000                   | 518     | 14,4    |
| 1250      | 1120                   | 354     | 12,2    |



# Reducer

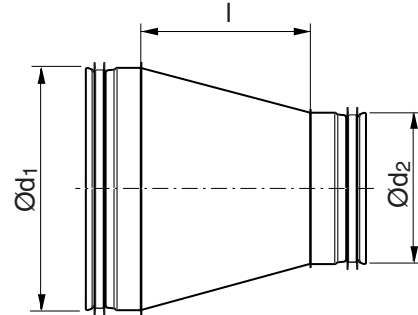
# RCLU



## Description

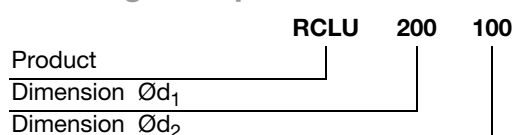
Long, concentric, hand made reducer with approx. 18° angle.

## Dimensions



| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|
| 112                    | 63                     | 97      | 0,23    |
| 112                    | 80                     | 74      | 0,22    |
| 112                    | 100                    | 47      | 0,20    |
| 125                    | 63                     | 115     | 0,28    |
| 125                    | 112                    | 48      | 0,23    |
| 140                    | 63                     | 136     | 0,33    |
| 140                    | 80                     | 112     | 0,32    |
| 140                    | 100                    | 85      | 0,30    |
| 140                    | 112                    | 69      | 0,28    |
| 140                    | 125                    | 51      | 0,27    |
| 150                    | 63                     | 150     | 0,37    |
| 150                    | 80                     | 126     | 0,36    |
| 150                    | 112                    | 82      | 0,32    |
| 150                    | 140                    | 44      | 0,28    |
| 160                    | 63                     | 163     | 0,43    |
| 160                    | 112                    | 96      | 0,38    |
| 160                    | 140                    | 57      | 0,34    |
| 180                    | 80                     | 167     | 0,51    |
| 180                    | 112                    | 123     | 0,47    |
| 180                    | 140                    | 85      | 0,43    |
| 200                    | 80                     | 195     | 0,61    |
| 200                    | 112                    | 151     | 0,57    |
| 200                    | 140                    | 112     | 0,53    |
| 224                    | 100                    | 200     | 0,72    |
| 224                    | 112                    | 184     | 0,70    |
| 224                    | 125                    | 166     | 0,68    |
| 224                    | 140                    | 145     | 0,65    |
| 250                    | 100                    | 236     | 0,94    |
| 250                    | 112                    | 220     | 0,92    |
| 250                    | 140                    | 181     | 0,89    |
| 280                    | 125                    | 243     | 1,10    |
| 280                    | 140                    | 222     | 1,08    |
| 280                    | 150                    | 209     | 1,06    |

## Ordering example





## Reducer

## RCLU

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|
| 280                    | 160                    | 195     | 1,05    |
| 280                    | 180                    | 167     | 1,00    |
| 280                    | 200                    | 140     | 0,95    |
| 280                    | 224                    | 107     | 0,87    |
| 280                    | 250                    | 71      | 0,84    |
| 300                    | 125                    | 270     | 1,25    |
| 300                    | 140                    | 250     | 1,22    |
| 300                    | 150                    | 236     | 1,20    |
| 300                    | 160                    | 222     | 1,20    |
| 300                    | 180                    | 195     | 1,15    |
| 300                    | 224                    | 135     | 1,02    |
| 300                    | 280                    | 58      | 0,86    |
| 315                    | 125                    | 291     | 1,36    |
| 315                    | 140                    | 270     | 1,33    |
| 315                    | 150                    | 257     | 1,32    |
| 315                    | 180                    | 216     | 1,26    |
| 315                    | 224                    | 155     | 1,13    |
| 315                    | 280                    | 78      | 0,97    |
| 315                    | 300                    | 51      | 0,88    |
| 355                    | 160                    | 298     | 1,84    |
| 355                    | 180                    | 270     | 1,77    |
| 355                    | 200                    | 243     | 1,71    |
| 355                    | 224                    | 210     | 1,61    |
| 355                    | 280                    | 133     | 1,41    |
| 355                    | 300                    | 106     | 1,30    |
| 400                    | 160                    | 365     | 2,44    |
| 400                    | 180                    | 337     | 2,38    |
| 400                    | 224                    | 277     | 2,23    |
| 400                    | 280                    | 200     | 2,01    |
| 400                    | 300                    | 172     | 1,90    |
| 400                    | 355                    | 97      | 1,55    |
| 450                    | 200                    | 378     | 2,99    |
| 450                    | 224                    | 346     | 2,90    |
| 450                    | 250                    | 310     | 2,85    |
| 450                    | 280                    | 269     | 2,70    |
| 450                    | 300                    | 241     | 2,59    |
| 450                    | 315                    | 221     | 2,50    |
| 450                    | 355                    | 166     | 2,24    |
| 450                    | 400                    | 109     | 2,64    |
| 500                    | 200                    | 447     | 3,66    |
| 500                    | 224                    | 414     | 3,56    |
| 500                    | 280                    | 337     | 3,36    |
| 500                    | 300                    | 310     | 3,25    |
| 500                    | 355                    | 234     | 2,89    |
| 500                    | 450                    | 109     | 2,37    |
| 560                    | 250                    | 461     | 4,47    |
| 560                    | 280                    | 420     | 4,32    |
| 560                    | 300                    | 392     | 4,21    |

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|
| 560                    | 315                    | 371     | 4,11    |
| 560                    | 355                    | 317     | 3,85    |
| 560                    | 400                    | 260     | 3,66    |
| 560                    | 450                    | 191     | 2,70    |
| 560                    | 500                    | 122     | 2,86    |
| 600                    | 250                    | 516     | 5,10    |
| 600                    | 280                    | 475     | 4,96    |
| 600                    | 300                    | 447     | 4,84    |
| 600                    | 315                    | 427     | 4,76    |
| 600                    | 355                    | 372     | 4,49    |
| 600                    | 400                    | 315     | 4,29    |
| 600                    | 450                    | 246     | 3,96    |
| 600                    | 500                    | 177     | 3,49    |
| 600                    | 560                    | 95      | 2,94    |
| 630                    | 250                    | 557     | 5,60    |
| 630                    | 280                    | 516     | 5,46    |
| 630                    | 300                    | 488     | 5,34    |
| 630                    | 355                    | 413     | 4,99    |
| 630                    | 450                    | 287     | 4,46    |
| 630                    | 560                    | 136     | 3,43    |
| 630                    | 600                    | 81      | 2,97    |
| 710                    | 355                    | 528     | 7,11    |
| 710                    | 400                    | 471     | 6,92    |
| 710                    | 450                    | 402     | 6,60    |
| 710                    | 500                    | 333     | 6,12    |
| 710                    | 560                    | 251     | 5,57    |
| 710                    | 600                    | 196     | 5,10    |
| 710                    | 630                    | 155     | 4,72    |
| 800                    | 400                    | 594     | 8,81    |
| 800                    | 450                    | 526     | 8,49    |
| 800                    | 500                    | 457     | 8,02    |
| 800                    | 560                    | 375     | 7,46    |
| 800                    | 600                    | 320     | 6,99    |
| 800                    | 630                    | 279     | 6,62    |
| 800                    | 710                    | 174     | 6,21    |
| 900                    | 450                    | 663     | 10,8    |
| 900                    | 500                    | 594     | 10,3    |
| 900                    | 560                    | 512     | 9,78    |
| 900                    | 600                    | 457     | 9,31    |
| 900                    | 630                    | 416     | 8,94    |
| 900                    | 710                    | 311     | 8,53    |
| 900                    | 800                    | 187     | 7,18    |
| 1000                   | 500                    | 732     | 13,1    |
| 1000                   | 560                    | 649     | 12,5    |
| 1000                   | 600                    | 594     | 12,0    |
| 1000                   | 630                    | 553     | 11,7    |
| 1000                   | 710                    | 448     | 11,2    |
| 1000                   | 800                    | 325     | 9,91    |



# Reducer

# RCLU

| $\text{\O}d_1$<br>nom | $\text{\O}d_2$<br>nom | l<br>mm | m<br>kg |
|-----------------------|-----------------------|---------|---------|
| 1000                  | 900                   | 187     | 8,17    |
| 1120                  | 560                   | 814     | 16,4    |
| 1120                  | 600                   | 759     | 15,9    |
| 1120                  | 630                   | 718     | 15,5    |
| 1120                  | 710                   | 613     | 15,1    |
| 1120                  | 800                   | 490     | 13,8    |
| 1120                  | 900                   | 352     | 12,1    |
| 1120                  | 1000                  | 215     | 10,3    |
| 1250                  | 600                   | 938     | 20,1    |
| 1250                  | 630                   | 897     | 19,7    |
| 1250                  | 710                   | 792     | 19,3    |
| 1250                  | 800                   | 668     | 17,9    |
| 1250                  | 900                   | 531     | 16,2    |
| 1250                  | 1000                  | 393     | 14,4    |
| 1250                  | 1120                  | 229     | 12,2    |

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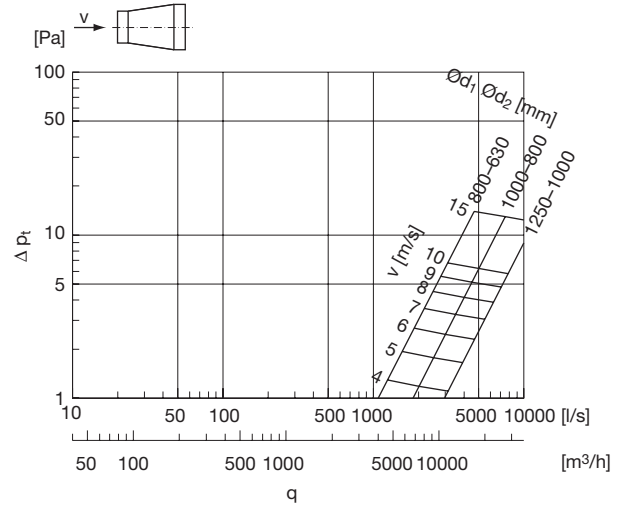
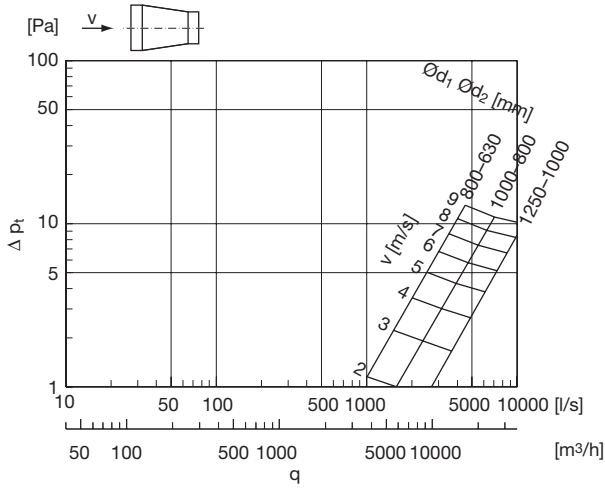


# Reducer

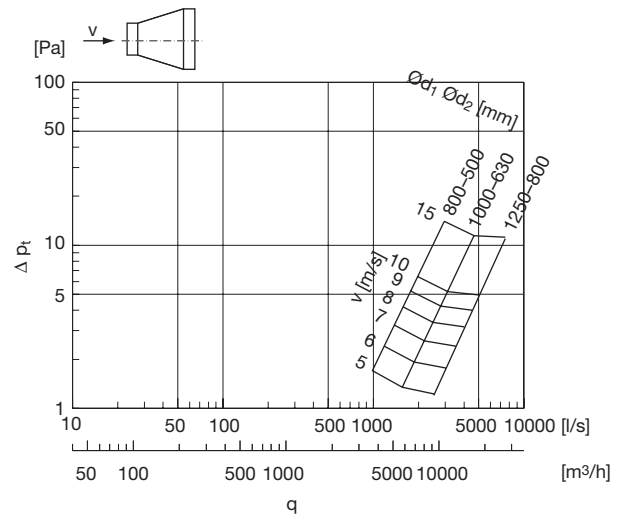
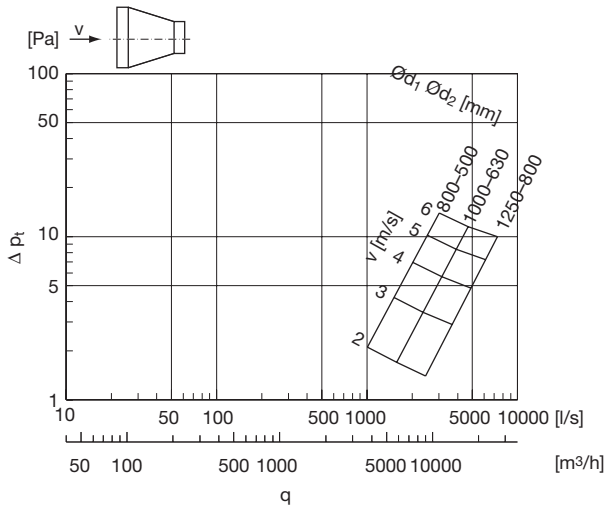
# RCLU

## Technical data

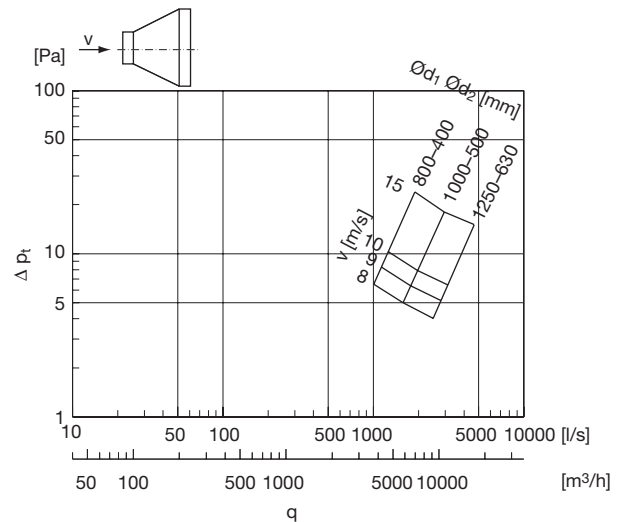
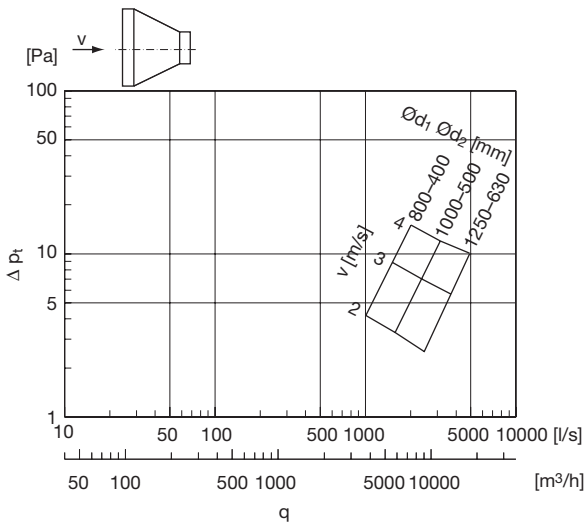
### 1 dimension step



### 2 dimension steps



### 3 dimension steps





# Reducer

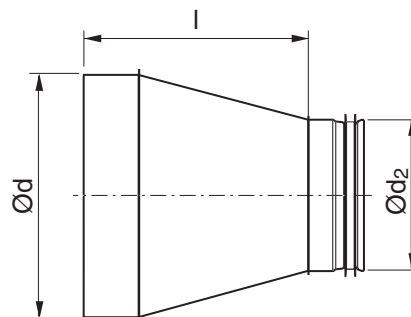
# RCFLU



## Description

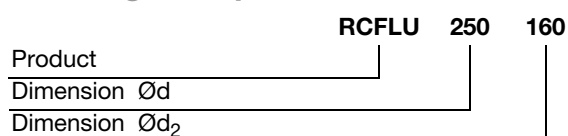
Long, concentric, hand made reducer with a female end and with approx. 18° angle.

## Dimensions



| Ød nom | Ød <sub>2</sub> nom | l mm | m kg |
|--------|---------------------|------|------|
| 80     | 63                  | 98   | 0,14 |
| 100    | 63                  | 126  | 0,20 |
| 100    | 80                  | 103  | 0,18 |
| 112    | 63                  | 142  | 0,23 |
| 112    | 80                  | 119  | 0,22 |
| 112    | 100                 | 92   | 0,20 |
| 125    | 63                  | 159  | 0,28 |
| 125    | 100                 | 109  | 0,24 |
| 125    | 112                 | 93   | 0,23 |
| 140    | 63                  | 137  | 0,26 |
| 140    | 80                  | 181  | 0,33 |
| 140    | 112                 | 130  | 0,30 |
| 140    | 125                 | 114  | 0,28 |
| 140    | 140                 | 96   | 0,27 |
| 150    | 63                  | 157  | 0,32 |
| 150    | 80                  | 195  | 0,37 |
| 150    | 100                 | 144  | 0,34 |
| 150    | 112                 | 127  | 0,32 |
| 150    | 125                 | 109  | 0,30 |
| 150    | 140                 | 99   | 0,28 |
| 160    | 63                  | 171  | 0,36 |
| 160    | 80                  | 207  | 0,43 |
| 160    | 100                 | 157  | 0,40 |
| 160    | 112                 | 141  | 0,38 |
| 160    | 125                 | 123  | 0,36 |
| 160    | 140                 | 102  | 0,34 |
| 160    | 150                 | 99   | 0,32 |
| 180    | 80                  | 185  | 0,42 |
| 180    | 100                 | 185  | 0,49 |
| 180    | 112                 | 168  | 0,47 |
| 180    | 125                 | 151  | 0,46 |
| 180    | 140                 | 130  | 0,43 |
| 180    | 150                 | 116  | 0,41 |

## Ordering example



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- 18



## Reducer

## RCFLU

| Ød<br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|-----------|------------------------|---------|---------|
| 180       | 160                    | 103     | 0,41    |
| 200       | 80                     | 212     | 0,51    |
| 200       | 100                    | 213     | 0,59    |
| 200       | 112                    | 196     | 0,57    |
| 200       | 125                    | 178     | 0,55    |
| 200       | 140                    | 157     | 0,53    |
| 200       | 150                    | 144     | 0,51    |
| 200       | 160                    | 130     | 0,50    |
| 200       | 180                    | 103     | 0,46    |
| 224       | 100                    | 215     | 0,72    |
| 224       | 112                    | 229     | 0,70    |
| 224       | 125                    | 211     | 0,68    |
| 224       | 140                    | 190     | 0,65    |
| 224       | 150                    | 177     | 0,64    |
| 224       | 160                    | 163     | 0,63    |
| 224       | 180                    | 135     | 0,58    |
| 224       | 200                    | 107     | 0,53    |
| 250       | 100                    | 301     | 0,94    |
| 250       | 112                    | 285     | 0,92    |
| 250       | 125                    | 267     | 0,90    |
| 250       | 140                    | 246     | 0,89    |
| 250       | 150                    | 232     | 0,87    |
| 250       | 160                    | 219     | 0,87    |
| 250       | 180                    | 191     | 0,80    |
| 250       | 200                    | 164     | 0,75    |
| 250       | 224                    | 131     | 0,67    |
| 280       | 125                    | 308     | 1,10    |
| 280       | 140                    | 287     | 1,08    |
| 280       | 150                    | 274     | 1,06    |
| 280       | 160                    | 260     | 1,05    |
| 280       | 180                    | 232     | 1,00    |
| 280       | 200                    | 205     | 0,95    |
| 280       | 224                    | 172     | 0,87    |
| 280       | 250                    | 136     | 0,84    |
| 300       | 125                    | 335     | 1,25    |
| 300       | 140                    | 315     | 1,22    |
| 300       | 150                    | 301     | 1,20    |
| 300       | 160                    | 287     | 1,20    |
| 300       | 180                    | 260     | 1,15    |
| 300       | 200                    | 262     | 1,09    |
| 300       | 224                    | 200     | 1,02    |
| 300       | 250                    | 164     | 0,98    |
| 300       | 280                    | 123     | 0,86    |
| 315       | 125                    | 356     | 1,36    |
| 315       | 140                    | 335     | 1,33    |
| 315       | 150                    | 322     | 1,32    |
| 315       | 160                    | 308     | 1,31    |
| 315       | 180                    | 281     | 1,26    |

| Ød<br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|-----------|------------------------|---------|---------|
| 315       | 200                    | 253     | 1,21    |
| 315       | 224                    | 220     | 1,13    |
| 315       | 250                    | 184     | 1,09    |
| 315       | 280                    | 143     | 0,97    |
| 315       | 300                    | 116     | 0,88    |
| 355       | 160                    | 363     | 1,84    |
| 355       | 180                    | 335     | 1,77    |
| 355       | 200                    | 308     | 1,71    |
| 355       | 224                    | 275     | 1,61    |
| 355       | 250                    | 239     | 1,56    |
| 355       | 280                    | 198     | 1,41    |
| 355       | 300                    | 171     | 1,30    |
| 355       | 315                    | 150     | 1,21    |
| 400       | 160                    | 450     | 2,44    |
| 400       | 180                    | 422     | 2,38    |
| 400       | 200                    | 395     | 2,31    |
| 400       | 224                    | 362     | 2,23    |
| 400       | 250                    | 326     | 2,20    |
| 400       | 280                    | 285     | 2,01    |
| 400       | 300                    | 257     | 1,90    |
| 400       | 315                    | 237     | 1,86    |
| 400       | 355                    | 182     | 1,55    |
| 450       | 200                    | 463     | 2,99    |
| 450       | 224                    | 431     | 2,90    |
| 450       | 250                    | 395     | 2,85    |
| 450       | 280                    | 354     | 2,70    |
| 450       | 300                    | 326     | 2,59    |
| 450       | 315                    | 306     | 2,50    |
| 450       | 355                    | 251     | 2,24    |
| 450       | 400                    | 194     | 2,64    |
| 500       | 200                    | 532     | 3,66    |
| 500       | 224                    | 499     | 3,56    |
| 500       | 250                    | 463     | 3,51    |
| 500       | 280                    | 422     | 3,36    |
| 500       | 300                    | 395     | 3,25    |
| 500       | 315                    | 374     | 3,16    |
| 500       | 355                    | 319     | 2,89    |
| 500       | 400                    | 262     | 2,69    |
| 500       | 450                    | 194     | 2,37    |
| 560       | 250                    | 546     | 4,47    |
| 560       | 280                    | 505     | 4,32    |
| 560       | 300                    | 477     | 4,21    |
| 560       | 315                    | 456     | 4,11    |
| 560       | 355                    | 402     | 3,85    |
| 560       | 400                    | 345     | 3,66    |
| 560       | 450                    | 276     | 2,70    |
| 560       | 500                    | 207     | 2,86    |
| 600       | 250                    | 601     | 5,10    |



## Reducer

## RCFLU

| Ød<br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|-----------|------------------------|---------|---------|
| 600       | 280                    | 560     | 4,96    |
| 600       | 300                    | 532     | 4,84    |
| 600       | 315                    | 512     | 4,76    |
| 600       | 355                    | 457     | 4,49    |
| 600       | 400                    | 400     | 4,29    |
| 600       | 450                    | 331     | 3,96    |
| 600       | 500                    | 262     | 3,49    |
| 600       | 560                    | 180     | 2,94    |
| 630       | 250                    | 642     | 5,60    |
| 630       | 280                    | 601     | 5,46    |
| 630       | 300                    | 573     | 5,34    |
| 630       | 315                    | 553     | 5,25    |
| 630       | 355                    | 498     | 4,99    |
| 630       | 400                    | 441     | 4,79    |
| 630       | 450                    | 372     | 4,46    |
| 630       | 500                    | 304     | 4,00    |
| 630       | 560                    | 221     | 3,43    |
| 630       | 600                    | 166     | 2,97    |
| 710       | 355                    | 633     | 7,11    |
| 710       | 400                    | 576     | 6,92    |
| 710       | 450                    | 507     | 6,60    |
| 710       | 500                    | 438     | 6,12    |
| 710       | 560                    | 356     | 5,57    |
| 710       | 600                    | 301     | 5,10    |
| 710       | 630                    | 260     | 4,72    |
| 800       | 400                    | 699     | 8,81    |
| 800       | 450                    | 631     | 8,49    |
| 800       | 500                    | 562     | 8,02    |
| 800       | 560                    | 480     | 7,46    |
| 800       | 600                    | 425     | 6,99    |
| 800       | 630                    | 384     | 6,62    |
| 800       | 710                    | 279     | 6,21    |
| 900       | 450                    | 768     | 10,8    |
| 900       | 500                    | 699     | 10,3    |
| 900       | 560                    | 617     | 9,78    |
| 900       | 600                    | 562     | 9,31    |
| 900       | 630                    | 521     | 8,94    |
| 900       | 710                    | 416     | 8,53    |
| 900       | 800                    | 292     | 7,18    |
| 1000      | 500                    | 857     | 13,1    |
| 1000      | 560                    | 774     | 12,5    |
| 1000      | 600                    | 719     | 12,0    |
| 1000      | 630                    | 678     | 11,7    |
| 1000      | 710                    | 573     | 11,2    |
| 1000      | 800                    | 450     | 9,91    |
| 1000      | 900                    | 312     | 8,17    |
| 1120      | 560                    | 939     | 16,4    |
| 1120      | 600                    | 884     | 15,9    |

| Ød<br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|-----------|------------------------|---------|---------|
| 1120      | 630                    | 843     | 15,5    |
| 1120      | 710                    | 738     | 15,1    |
| 1120      | 800                    | 615     | 13,8    |
| 1120      | 900                    | 477     | 12,1    |
| 1120      | 1000                   | 656     | 16,2    |
| 1250      | 600                    | 340     | 10,3    |
| 1250      | 630                    | 1063    | 20,1    |
| 1250      | 710                    | 1022    | 19,7    |
| 1250      | 800                    | 917     | 19,3    |
| 1250      | 900                    | 793     | 17,9    |
| 1250      | 1000                   | 518     | 14,4    |
| 1250      | 1120                   | 354     | 12,2    |

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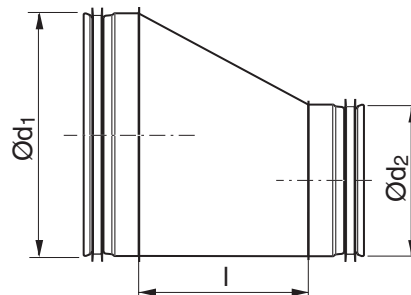


# Reducer

# RLU



## Dimensions



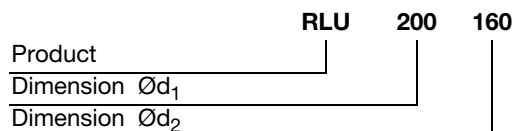
### Description

Long, tangential, hand made reducer with approx. 35° angle.

Dimensions are otherwise adapted to DIN 24147 section 4.

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|
| 80                     | 63                     | 53      | 0,14    |
| 100                    | 63                     | 81      | 0,20    |
| 100                    | 80                     | 58      | 0,18    |
| 112                    | 63                     | 97      | 0,23    |
| 112                    | 80                     | 74      | 0,22    |
| 112                    | 100                    | 47      | 0,20    |
| 125                    | 63                     | 115     | 0,28    |
| 125                    | 80                     | 92      | 0,26    |
| 125                    | 100                    | 64      | 0,24    |
| 125                    | 112                    | 48      | 0,23    |
| 140                    | 63                     | 136     | 0,33    |
| 140                    | 80                     | 112     | 0,32    |
| 140                    | 100                    | 85      | 0,30    |
| 140                    | 112                    | 69      | 0,28    |
| 140                    | 125                    | 51      | 0,27    |
| 150                    | 63                     | 150     | 0,37    |
| 150                    | 80                     | 126     | 0,36    |
| 150                    | 100                    | 99      | 0,34    |
| 150                    | 112                    | 82      | 0,32    |
| 150                    | 125                    | 64      | 0,30    |
| 150                    | 140                    | 44      | 0,28    |
| 160                    | 63                     | 163     | 0,43    |
| 160                    | 80                     | 140     | 0,42    |
| 160                    | 100                    | 112     | 0,40    |
| 160                    | 112                    | 96      | 0,38    |
| 160                    | 125                    | 78      | 0,36    |
| 160                    | 140                    | 57      | 0,34    |
| 160                    | 150                    | 44      | 0,32    |
| 180                    | 80                     | 167     | 0,51    |
| 180                    | 100                    | 140     | 0,49    |
| 180                    | 112                    | 123     | 0,47    |
| 180                    | 125                    | 106     | 0,46    |
| 180                    | 140                    | 85      | 0,43    |

### Ordering example





## Reducer

## RLU

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|
| 180                    | 150                    | 71      | 0,41    |
| 180                    | 160                    | 58      | 0,41    |
| 200                    | 80                     | 195     | 0,61    |
| 200                    | 100                    | 167     | 0,59    |
| 200                    | 112                    | 151     | 0,57    |
| 200                    | 125                    | 133     | 0,55    |
| 200                    | 140                    | 112     | 0,53    |
| 200                    | 150                    | 99      | 0,51    |
| 200                    | 160                    | 85      | 0,50    |
| 200                    | 180                    | 58      | 0,46    |
| 224                    | 100                    | 200     | 0,72    |
| 224                    | 112                    | 184     | 0,70    |
| 224                    | 125                    | 166     | 0,68    |
| 224                    | 140                    | 145     | 0,65    |
| 224                    | 150                    | 132     | 0,64    |
| 224                    | 160                    | 118     | 0,63    |
| 224                    | 180                    | 90      | 0,58    |
| 224                    | 200                    | 63      | 0,53    |
| 250                    | 100                    | 236     | 0,94    |
| 250                    | 112                    | 220     | 0,92    |
| 250                    | 125                    | 202     | 0,90    |
| 250                    | 140                    | 181     | 0,89    |
| 250                    | 150                    | 167     | 0,87    |
| 250                    | 160                    | 154     | 0,87    |
| 250                    | 180                    | 126     | 0,80    |
| 250                    | 200                    | 99      | 0,75    |
| 250                    | 224                    | 66      | 0,67    |
| 280                    | 125                    | 243     | 1,10    |
| 280                    | 140                    | 222     | 1,08    |
| 280                    | 150                    | 209     | 1,06    |
| 280                    | 160                    | 195     | 1,05    |
| 280                    | 180                    | 167     | 1,00    |
| 280                    | 200                    | 140     | 0,95    |
| 280                    | 224                    | 107     | 0,87    |
| 280                    | 250                    | 71      | 0,84    |
| 300                    | 125                    | 270     | 1,25    |
| 300                    | 140                    | 250     | 1,22    |
| 300                    | 150                    | 236     | 1,20    |
| 300                    | 160                    | 222     | 1,20    |
| 300                    | 180                    | 195     | 1,15    |
| 300                    | 200                    | 167     | 1,09    |
| 300                    | 224                    | 135     | 1,02    |
| 300                    | 250                    | 99      | 0,98    |
| 300                    | 280                    | 58      | 0,86    |
| 315                    | 125                    | 291     | 1,36    |
| 315                    | 140                    | 270     | 1,33    |
| 315                    | 150                    | 257     | 1,32    |
| 315                    | 160                    | 243     | 1,31    |

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|
| 315                    | 180                    | 216     | 1,26    |
| 315                    | 200                    | 188     | 1,21    |
| 315                    | 224                    | 155     | 1,13    |
| 315                    | 250                    | 119     | 1,09    |
| 315                    | 280                    | 78      | 0,97    |
| 315                    | 300                    | 51      | 0,88    |
| 355                    | 160                    | 298     | 1,84    |
| 355                    | 180                    | 270     | 1,77    |
| 355                    | 200                    | 243     | 1,71    |
| 355                    | 224                    | 210     | 1,61    |
| 355                    | 250                    | 174     | 1,56    |
| 355                    | 280                    | 133     | 1,41    |
| 355                    | 300                    | 106     | 1,30    |
| 355                    | 315                    | 85      | 1,21    |
| 400                    | 160                    | 365     | 2,44    |
| 400                    | 180                    | 337     | 2,38    |
| 400                    | 200                    | 310     | 2,31    |
| 400                    | 224                    | 277     | 2,23    |
| 400                    | 250                    | 241     | 2,20    |
| 400                    | 280                    | 200     | 2,01    |
| 400                    | 300                    | 172     | 1,90    |
| 400                    | 315                    | 152     | 1,86    |
| 400                    | 355                    | 97      | 1,55    |
| 450                    | 200                    | 378     | 2,99    |
| 450                    | 224                    | 346     | 2,90    |
| 450                    | 250                    | 310     | 2,85    |
| 450                    | 280                    | 269     | 2,70    |
| 450                    | 300                    | 241     | 2,59    |
| 450                    | 315                    | 221     | 2,50    |
| 450                    | 355                    | 166     | 2,24    |
| 450                    | 400                    | 109     | 2,64    |
| 500                    | 200                    | 447     | 3,66    |
| 500                    | 224                    | 414     | 3,56    |
| 500                    | 250                    | 378     | 3,51    |
| 500                    | 280                    | 337     | 3,36    |
| 500                    | 300                    | 310     | 3,25    |
| 500                    | 315                    | 289     | 3,16    |
| 500                    | 355                    | 234     | 2,89    |
| 500                    | 400                    | 177     | 2,69    |
| 500                    | 450                    | 109     | 2,37    |
| 560                    | 250                    | 461     | 4,47    |
| 560                    | 280                    | 420     | 4,32    |
| 560                    | 300                    | 392     | 4,21    |
| 560                    | 315                    | 371     | 4,11    |
| 560                    | 355                    | 317     | 3,85    |
| 560                    | 400                    | 260     | 3,66    |
| 560                    | 450                    | 191     | 2,70    |
| 560                    | 500                    | 122     | 2,86    |

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## Reducer

## RLU

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|
| 600                    | 250                    | 516     | 5,10    |
| 600                    | 280                    | 475     | 4,96    |
| 600                    | 300                    | 447     | 4,84    |
| 600                    | 315                    | 427     | 4,76    |
| 600                    | 355                    | 372     | 4,49    |
| 600                    | 400                    | 315     | 4,29    |
| 600                    | 450                    | 246     | 3,96    |
| 600                    | 500                    | 177     | 3,49    |
| 600                    | 560                    | 95      | 2,94    |
| 630                    | 250                    | 557     | 5,60    |
| 630                    | 280                    | 516     | 5,46    |
| 630                    | 300                    | 488     | 5,34    |
| 630                    | 315                    | 468     | 5,25    |
| 630                    | 355                    | 413     | 4,99    |
| 630                    | 400                    | 356     | 4,79    |
| 630                    | 450                    | 287     | 4,46    |
| 630                    | 500                    | 219     | 4,00    |
| 630                    | 560                    | 136     | 3,43    |
| 630                    | 600                    | 81      | 2,97    |
| 710                    | 355                    | 528     | 7,11    |
| 710                    | 400                    | 471     | 6,92    |
| 710                    | 450                    | 402     | 6,60    |
| 710                    | 500                    | 333     | 6,12    |
| 710                    | 560                    | 251     | 5,57    |
| 710                    | 600                    | 196     | 5,10    |
| 710                    | 630                    | 155     | 4,72    |
| 800                    | 400                    | 594     | 8,81    |
| 800                    | 450                    | 526     | 8,49    |
| 800                    | 500                    | 457     | 8,02    |
| 800                    | 560                    | 375     | 7,46    |
| 800                    | 600                    | 320     | 6,99    |
| 800                    | 630                    | 279     | 6,62    |
| 800                    | 710                    | 174     | 6,21    |
| 900                    | 450                    | 663     | 10,8    |
| 900                    | 500                    | 594     | 10,3    |
| 900                    | 560                    | 512     | 9,78    |
| 900                    | 600                    | 457     | 9,31    |
| 900                    | 630                    | 416     | 8,94    |
| 900                    | 710                    | 311     | 8,53    |
| 900                    | 800                    | 187     | 7,18    |
| 1000                   | 500                    | 732     | 13,1    |
| 1000                   | 560                    | 649     | 12,5    |
| 1000                   | 600                    | 594     | 12,0    |
| 1000                   | 630                    | 553     | 11,7    |
| 1000                   | 710                    | 448     | 11,2    |
| 1000                   | 800                    | 325     | 9,91    |
| 1000                   | 900                    | 187     | 8,17    |
| 1120                   | 560                    | 814     | 16,4    |

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|
| 1120                   | 600                    | 759     | 15,9    |
| 1120                   | 630                    | 718     | 15,5    |
| 1120                   | 710                    | 613     | 15,1    |
| 1120                   | 800                    | 490     | 13,8    |
| 1120                   | 900                    | 352     | 12,1    |
| 1120                   | 1000                   | 215     | 10,3    |
| 1250                   | 600                    | 938     | 20,1    |
| 1250                   | 630                    | 897     | 19,7    |
| 1250                   | 710                    | 792     | 19,3    |
| 1250                   | 800                    | 668     | 17,9    |
| 1250                   | 900                    | 531     | 16,2    |
| 1250                   | 1000                   | 393     | 14,4    |
| 1250                   | 1120                   | 229     | 12,2    |



# Saddle

# PSU



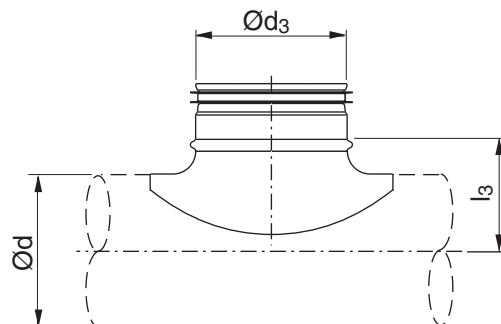
## Description

Pressed saddle with aerodynamic flow radius facing the branch.

Pressure drop, see graphs on page 85.

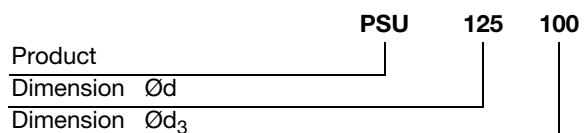
Some PSUs are pressed with one and the same tool, and fit several dimensions of main pipe.

## Dimensions



| Ød nom | Ød <sub>3</sub> nom | l <sub>3</sub> mm | m kg |
|--------|---------------------|-------------------|------|
| 63     | 63                  | 42                | 0,09 |
| 80     | 63                  | 50                | 0,09 |
| 80     | 80                  | 52                | 0,13 |
| 100    | 63                  | 60                | 0,09 |
| 100    | 80                  | 60                | 0,14 |
| 100    | 100                 | 65                | 0,18 |
| 112    | 63                  | 66                | 0,09 |
| 112    | 80                  | 68                | 0,13 |
| 112    | 100                 | 71                | 0,18 |
| 112 *  | 112                 | 81                | 0,21 |
| 125    | 63                  | 73                | 0,08 |
| 125    | 80                  | 75                | 0,13 |
| 125    | 100                 | 78                | 0,18 |
| 125 *  | 112                 | 88                | 0,21 |
| 125    | 125                 | 83                | 0,25 |
| 140    | 80                  | 82                | 0,13 |
| 140    | 100                 | 85                | 0,18 |
| 140 *  | 112                 | 95                | 0,21 |
| 140 *  | 125                 | 95                | 0,22 |
| 140    | 140                 | 90                | 0,25 |
| 150    | 80                  | 87                | 0,10 |
| 150    | 100                 | 90                | 0,18 |
| 150    | 125                 | 95                | 0,18 |
| 150    | 140                 | 95                | 0,25 |
| 150    | 150                 | 95                | 0,25 |
| 160    | 80                  | 92                | 0,10 |
| 160    | 100                 | 95                | 0,18 |
| 160    | 125                 | 100               | 0,18 |
| 160    | 140                 | 100               | 0,25 |
| 160    | 150                 | 100               | 0,32 |
| 160    | 160                 | 105               | 0,26 |
| 180    | 80                  | 102               | 0,09 |
| 180    | 100                 | 105               | 0,19 |

## Ordering example







## Saddle

## PSU

| Ød<br>nom | Ød <sub>3</sub><br>nom | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|----------------------|---------|
| 180       | 125                    | 110                  | 0,25    |
| 180       | 140                    | 110                  | 0,25    |
| 180       | 150                    | 110                  | 0,22    |
| 180       | 160                    | 115                  | 0,27    |
| 180       | 180                    | 115                  | 0,48    |
| 200       | 80                     | 112                  | 0,09    |
| 200       | 100                    | 115                  | 0,19    |
| 200       | 125                    | 115                  | 0,25    |
| 200       | 140                    | 120                  | 0,25    |
| 200       | 150                    | 120                  | 0,22    |
| 200       | 160                    | 125                  | 0,27    |
| 200       | 180                    | 125                  | 0,45    |
| 200       | 200                    | 125                  | 0,39    |
| 224       | 80                     | 124                  | 0,12    |
| 224       | 100                    | 127                  | 0,18    |
| 224       | 125                    | 132                  | 0,23    |
| 224       | 140                    | 132                  | 0,29    |
| 224       | 150                    | 132                  | 0,21    |
| 224       | 160                    | 137                  | 0,24    |
| 224       | 180                    | 137                  | 0,41    |
| 224       | 200                    | 137                  | 0,47    |
| 224       | 224                    | 137                  | 0,64    |
| 250       | 80                     | 137                  | 0,12    |
| 250       | 100                    | 140                  | 0,18    |
| 250       | 125                    | 145                  | 0,23    |
| 250       | 140                    | 145                  | 0,29    |
| 250       | 150                    | 145                  | 0,21    |
| 250       | 160                    | 150                  | 0,24    |
| 250       | 180                    | 150                  | 0,41    |
| 250       | 200                    | 150                  | 0,47    |
| 250       | 224                    | 150                  | 0,63    |
| 250       | 250                    | 150                  | 0,80    |
| 280       | 80                     | 155                  | 0,12    |
| 280       | 100                    | 155                  | 0,12    |
| 280       | 125                    | 160                  | 0,23    |
| 280       | 140                    | 160                  | 0,27    |
| 280       | 150                    | 160                  | 0,21    |
| 280       | 160                    | 165                  | 0,24    |
| 280       | 180                    | 165                  | 0,40    |
| 280       | 200                    | 165                  | 0,46    |
| 280       | 224                    | 165                  | 0,58    |
| 280 *     | 250                    | 165                  | 0,77    |
| 280 *     | 280                    | 165                  | 0,59    |
| 300       | 80                     | 162                  | 0,12    |
| 300       | 100                    | 165                  | 0,12    |
| 300       | 125                    | 170                  | 0,23    |
| 300       | 140                    | 170                  | 0,27    |
| 300       | 150                    | 170                  | 0,21    |

| Ød<br>nom | Ød <sub>3</sub><br>nom | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|----------------------|---------|
| 300       | 160                    | 175                  | 0,24    |
| 300       | 180                    | 175                  | 0,40    |
| 300       | 200                    | 175                  | 0,46    |
| 300       | 224                    | 175                  | 0,58    |
| 300       | 250                    | 175                  | 0,71    |
| 300 *     | 280                    | 175                  | 0,59    |
| 300       | 300                    | 175                  | 1,13    |
| 315       | 80                     | 170                  | 0,12    |
| 315       | 100                    | 173                  | 0,12    |
| 315       | 125                    | 178                  | 0,23    |
| 315       | 140                    | 178                  | 0,27    |
| 315       | 150                    | 178                  | 0,21    |
| 315       | 160                    | 182                  | 0,24    |
| 315       | 180                    | 182                  | 0,40    |
| 315       | 200                    | 182                  | 0,46    |
| 315       | 224                    | 182                  | 0,58    |
| 315       | 250                    | 182                  | 0,71    |
| 315 *     | 280                    | 182                  | 0,95    |
| 315       | 300                    | 182                  | 1,10    |
| 315       | 315                    | 182                  | 1,22    |
| 355       | 100                    | 193                  | 0,12    |
| 355       | 125                    | 198                  | 0,23    |
| 355       | 140                    | 198                  | 0,27    |
| 355       | 150                    | 198                  | 0,21    |
| 355       | 160                    | 203                  | 0,24    |
| 355       | 180                    | 203                  | 0,40    |
| 355       | 200                    | 203                  | 0,44    |
| 355       | 224                    | 203                  | 0,58    |
| 355       | 250                    | 203                  | 0,65    |
| 355 *     | 280                    | 203                  | 0,89    |
| 355       | 300                    | 203                  | 0,94    |
| 355 *     | 315                    | 203                  | 1,12    |
| 355 *     | 355                    | 203                  | 0,90    |
| 400       | 100                    | 215                  | 0,12    |
| 400       | 125                    | 220                  | 0,23    |
| 400       | 150                    | 220                  | 0,24    |
| 400       | 160                    | 225                  | 0,24    |
| 400       | 200                    | 225                  | 0,44    |
| 400       | 224                    | 225                  | 0,54    |
| 400       | 250                    | 225                  | 0,65    |
| 400 *     | 280                    | 225                  | 0,83    |
| 400       | 300                    | 250                  | 0,94    |
| 400       | 315                    | 225                  | 1,03    |
| 400 *     | 355                    | 225                  | 1,42    |
| 400       | 400                    | 225                  | 1,87    |
| 450       | 100                    | 240                  | 0,12    |
| 450       | 125                    | 245                  | 0,23    |
| 450       | 150                    | 245                  | 0,24    |



## Saddle

## PSU

| Ød<br>nom | Ød <sub>3</sub><br>nom | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|----------------------|---------|
| 450       | 160                    | 250                  | 0,25    |
| 450       | 200                    | 250                  | 0,42    |
| 450       | 224                    | 250                  | 0,54    |
| 450       | 250                    | 250                  | 0,67    |
| 450 *     | 280                    | 250                  | 0,77    |
| 450       | 300                    | 250                  | 0,83    |
| 450       | 315                    | 250                  | 0,94    |
| 450 *     | 355                    | 250                  | 1,01    |
| 450       | 400                    | 250                  | 1,81    |
| 450 *     | 450                    | 250                  | 1,58    |
| 500       | 100                    | 265                  | 0,12    |
| 500       | 125                    | 270                  | 0,23    |
| 500       | 150                    | 270                  | 0,24    |
| 500       | 160                    | 275                  | 0,25    |
| 500       | 200                    | 275                  | 0,42    |
| 500       | 224                    | 275                  | 0,54    |
| 500       | 250                    | 275                  | 0,67    |
| 500       | 300                    | 275                  | 0,83    |
| 500       | 315                    | 275                  | 0,93    |
| 500 *     | 355                    | 275                  | 1,01    |
| 500       | 400                    | 275                  | 1,75    |
| 500 *     | 450                    | 275                  | 1,45    |
| 500 *     | 500                    | 290                  | 1,87    |
| 560       | 100                    | 295                  | 0,12    |
| 560       | 125                    | 300                  | 0,23    |
| 560       | 160                    | 305                  | 0,25    |
| 560       | 200                    | 305                  | 0,42    |
| 560       | 224                    | 305                  | 0,54    |
| 560       | 250                    | 305                  | 0,67    |
| 560       | 300                    | 305                  | 0,83    |
| 560       | 315                    | 305                  | 0,93    |
| 560 *     | 355                    | 305                  | 1,06    |
| 560       | 400                    | 305                  | 1,75    |
| 560 *     | 450                    | 305                  | 1,37    |
| 560 *     | 500                    | 320                  | 1,75    |
| 560 *     | 560                    | 320                  | 2,24    |
| 600       | 100                    | 315                  | 0,12    |
| 600       | 125                    | 320                  | 0,23    |
| 600       | 160                    | 325                  | 0,31    |
| 600       | 200                    | 325                  | 0,40    |
| 600       | 224                    | 325                  | 0,54    |
| 600       | 250                    | 325                  | 0,65    |
| 600       | 300                    | 325                  | 0,83    |
| 600       | 315                    | 325                  | 0,93    |
| 600 *     | 355                    | 325                  | 0,94    |
| 600       | 400                    | 325                  | 1,49    |
| 600 *     | 450                    | 325                  | 1,34    |
| 600 *     | 500                    | 340                  | 1,60    |

| Ød<br>nom | Ød <sub>3</sub><br>nom | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|----------------------|---------|
| 600 *     | 560                    | 340                  | 2,09    |
| 600 *     | 600                    | 340                  | 2,47    |
| 630       | 100                    | 330                  | 0,12    |
| 630       | 125                    | 335                  | 0,23    |
| 630       | 160                    | 340                  | 0,31    |
| 630       | 200                    | 340                  | 0,40    |
| 630       | 224                    | 340                  | 0,54    |
| 630       | 250                    | 340                  | 0,83    |
| 630       | 300                    | 340                  | 0,55    |
| 630       | 315                    | 340                  | 0,93    |
| 630 *     | 355                    | 340                  | 0,80    |
| 630       | 400                    | 340                  | 1,49    |
| 630 *     | 450                    | 340                  | 1,82    |
| 630 *     | 500                    | 355                  | 1,53    |
| 630 *     | 560                    | 355                  | 2,09    |
| 630 *     | 600                    | 355                  | 2,35    |
| 630 *     | 630                    | 355                  | 2,53    |

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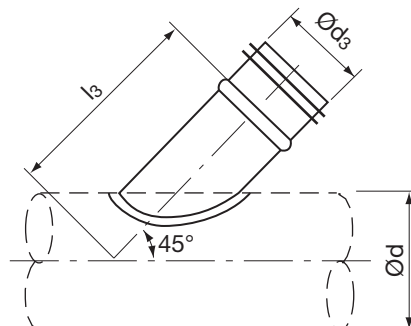
# Saddle

# PSVU45°

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## Dimensions

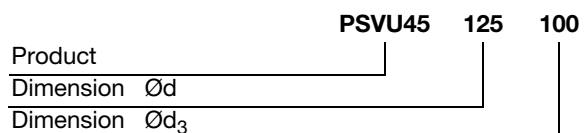


### Description

As standard the angle is 45°.  
Different angle available to order.

| Ød nom | Ød <sub>3</sub> nom | l <sub>3</sub> mm | m kg |
|--------|---------------------|-------------------|------|
| 80     | 80                  | 165               | 0,20 |
| 100    | 80                  | 180               | 0,20 |
| 100    | 100                 | 190               | 0,30 |
| 125    | 80                  | 200               | 0,20 |
| 125    | 100                 | 210               | 0,30 |
| 125    | 112                 | 215               | 0,30 |
| 125    | 125                 | 220               | 0,40 |
| 140    | 80                  | 210               | 0,20 |
| 140    | 100                 | 220               | 0,30 |
| 140    | 112                 | 225               | 0,30 |
| 140    | 125                 | 230               | 0,40 |
| 140    | 140                 | 250               | 0,50 |
| 150    | 80                  | 215               | 0,20 |
| 150    | 100                 | 225               | 0,30 |
| 150    | 112                 | 235               | 0,30 |
| 150    | 125                 | 240               | 0,40 |
| 150    | 140                 | 260               | 0,50 |
| 150    | 150                 | 265               | 0,50 |
| 160    | 80                  | 220               | 0,20 |
| 160    | 100                 | 230               | 0,30 |
| 160    | 112                 | 240               | 0,30 |
| 160    | 125                 | 245               | 0,40 |
| 160    | 140                 | 265               | 0,50 |
| 160    | 150                 | 270               | 0,50 |
| 160    | 160                 | 275               | 0,60 |
| 180    | 80                  | 235               | 0,20 |
| 180    | 100                 | 245               | 0,30 |
| 180    | 112                 | 250               | 0,30 |
| 180    | 125                 | 260               | 0,40 |
| 180    | 140                 | 280               | 0,50 |
| 180    | 150                 | 285               | 0,50 |
| 180    | 160                 | 290               | 0,60 |
| 180    | 180                 | 300               | 0,90 |

### Ordering example





## Saddle

## PSVU45°

| Ød<br>nom | Ød <sub>3</sub><br>nom | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|----------------------|---------|
| 200       | 80                     | 250                  | 0,20    |
| 200       | 100                    | 260                  | 0,30    |
| 200       | 112                    | 265                  | 0,30    |
| 200       | 125                    | 270                  | 0,40    |
| 200       | 140                    | 295                  | 0,50    |
| 200       | 150                    | 300                  | 0,50    |
| 200       | 160                    | 305                  | 0,60    |
| 200       | 180                    | 315                  | 0,90    |
| 200       | 200                    | 325                  | 1,00    |
| 224       | 100                    | 275                  | 0,30    |
| 224       | 112                    | 285                  | 0,30    |
| 224       | 125                    | 290                  | 0,40    |
| 224       | 140                    | 310                  | 0,50    |
| 224       | 150                    | 315                  | 0,50    |
| 224       | 160                    | 320                  | 0,60    |
| 224       | 180                    | 330                  | 0,90    |
| 224       | 200                    | 340                  | 1,00    |
| 224       | 224                    | 350                  | 1,20    |
| 250       | 80                     | 287                  | 0,20    |
| 250       | 100                    | 295                  | 0,30    |
| 250       | 112                    | 300                  | 0,30    |
| 250       | 125                    | 310                  | 0,40    |
| 250       | 140                    | 330                  | 0,50    |
| 250       | 150                    | 335                  | 0,50    |
| 250       | 160                    | 340                  | 0,60    |
| 250       | 180                    | 350                  | 0,90    |
| 250       | 200                    | 360                  | 1,00    |
| 250       | 224                    | 370                  | 1,20    |
| 250       | 250                    | 385                  | 1,60    |
| 280       | 112                    | 320                  | 0,30    |
| 280       | 125                    | 330                  | 0,40    |
| 280       | 140                    | 350                  | 0,50    |
| 280       | 150                    | 355                  | 0,50    |
| 280       | 160                    | 360                  | 0,60    |
| 280       | 180                    | 370                  | 0,90    |
| 280       | 200                    | 380                  | 1,00    |
| 280       | 224                    | 390                  | 1,20    |
| 280       | 250                    | 405                  | 1,60    |
| 280       | 280                    | 435                  | 1,80    |
| 300       | 125                    | 350                  | 0,40    |
| 300       | 140                    | 365                  | 0,50    |
| 300       | 150                    | 370                  | 0,50    |
| 300       | 160                    | 375                  | 0,60    |
| 300       | 180                    | 385                  | 0,90    |
| 300       | 200                    | 395                  | 1,00    |
| 300       | 224                    | 405                  | 1,20    |
| 300       | 250                    | 420                  | 1,60    |
| 300       | 280                    | 450                  | 2,00    |

| Ød<br>nom | Ød <sub>3</sub><br>nom | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|----------------------|---------|
| 300       | 300                    | 460                  | 2,20    |
| 315       | 80                     | 333                  | 0,20    |
| 315       | 100                    | 343                  | 0,30    |
| 315       | 125                    | 360                  | 0,40    |
| 315       | 140                    | 375                  | 0,50    |
| 315       | 150                    | 380                  | 0,50    |
| 315       | 160                    | 385                  | 0,60    |
| 315       | 180                    | 395                  | 0,90    |
| 315       | 200                    | 405                  | 1,00    |
| 315       | 224                    | 415                  | 1,20    |
| 315       | 250                    | 430                  | 1,60    |
| 315       | 280                    | 460                  | 1,90    |
| 315       | 300                    | 470                  | 2,20    |
| 315       | 315                    | 480                  | 2,40    |
| 355       | 80                     | 361                  | 0,20    |
| 355       | 100                    | 371                  | 0,30    |
| 355       | 125                    | 388                  | 0,40    |
| 355       | 150                    | 410                  | 0,50    |
| 355       | 160                    | 415                  | 0,60    |
| 355       | 180                    | 425                  | 0,90    |
| 355       | 200                    | 435                  | 1,00    |
| 355       | 224                    | 445                  | 1,20    |
| 355       | 250                    | 460                  | 1,60    |
| 355       | 280                    | 490                  | 2,00    |
| 355       | 300                    | 500                  | 2,20    |
| 355       | 315                    | 505                  | 2,30    |
| 355       | 355                    | 525                  | 2,80    |
| 400       | 80                     | 393                  | 0,20    |
| 400       | 100                    | 403                  | 0,30    |
| 400       | 125                    | 420                  | 0,40    |
| 400       | 160                    | 445                  | 0,60    |
| 400       | 180                    | 455                  | 0,90    |
| 400       | 200                    | 465                  | 1,00    |
| 400       | 224                    | 475                  | 1,20    |
| 400       | 250                    | 490                  | 1,60    |
| 400       | 280                    | 520                  | 1,90    |
| 400       | 300                    | 530                  | 2,20    |
| 400       | 315                    | 535                  | 2,30    |
| 400       | 355                    | 555                  | 2,80    |
| 400       | 400                    | 580                  | 4,30    |
| 450       | 180                    | 490                  | 0,90    |
| 450       | 200                    | 500                  | 1,00    |
| 450       | 224                    | 510                  | 1,20    |
| 450       | 250                    | 525                  | 1,60    |
| 450       | 280                    | 555                  | 1,90    |
| 450       | 300                    | 565                  | 2,20    |
| 450       | 315                    | 570                  | 2,30    |
| 450       | 355                    | 590                  | 2,80    |

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## Saddle

## PSVU45°

| Ød<br>nom | Ød <sub>3</sub><br>nom | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|----------------------|---------|
| 450       | 400                    | 615                  | 4,30    |
| 450       | 450                    | 640                  | 5,20    |
| 500       | 80                     | 464                  | 0,20    |
| 500       | 100                    | 474                  | 0,30    |
| 500       | 125                    | 491                  | 0,40    |
| 500       | 160                    | 518                  | 0,60    |
| 500       | 200                    | 535                  | 1,00    |
| 500       | 224                    | 550                  | 1,20    |
| 500       | 250                    | 560                  | 1,60    |
| 500       | 280                    | 590                  | 1,80    |
| 500       | 300                    | 600                  | 2,20    |
| 500       | 315                    | 610                  | 2,40    |
| 500       | 355                    | 630                  | 2,90    |
| 500       | 400                    | 650                  | 4,30    |
| 500       | 450                    | 675                  | 5,20    |
| 500       | 500                    | 700                  | 6,30    |
| 560       | 160                    | 560                  | 0,60    |
| 560       | 224                    | 590                  | 1,20    |
| 560       | 250                    | 605                  | 1,60    |
| 560       | 280                    | 630                  | 1,90    |
| 560       | 300                    | 640                  | 2,20    |
| 560       | 315                    | 650                  | 2,30    |
| 560       | 355                    | 670                  | 2,80    |
| 560       | 400                    | 690                  | 4,30    |
| 560       | 450                    | 715                  | 5,20    |
| 560       | 500                    | 740                  | 6,30    |
| 560       | 560                    | 800                  | 7,80    |
| 600       | 250                    | 630                  | 1,60    |
| 600       | 280                    | 655                  | 1,90    |
| 600       | 300                    | 665                  | 2,20    |
| 600       | 315                    | 675                  | 2,40    |
| 600       | 355                    | 695                  | 2,80    |
| 600       | 400                    | 715                  | 4,30    |
| 600       | 450                    | 740                  | 5,20    |
| 600       | 500                    | 765                  | 6,20    |
| 600       | 560                    | 825                  | 7,80    |
| 600       | 600                    | 850                  | 8,80    |
| 630       | 315                    | 700                  | 2,30    |
| 630       | 355                    | 720                  | 2,80    |
| 630       | 400                    | 740                  | 4,30    |
| 630       | 450                    | 765                  | 5,20    |
| 630       | 500                    | 790                  | 6,30    |
| 630       | 560                    | 850                  | 7,80    |
| 630       | 600                    | 870                  | 8,80    |
| 630       | 630                    | 885                  | 9,50    |
| 710       | 300                    | 745                  | 2,20    |
| 710       | 315                    | 755                  | 2,30    |
| 710       | 355                    | 775                  | 2,80    |

| Ød<br>nom | Ød <sub>3</sub><br>nom | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|----------------------|---------|
| 710       | 400                    | 800                  | 4,20    |
| 710       | 450                    | 825                  | 5,10    |
| 710       | 500                    | 850                  | 6,10    |
| 710       | 560                    | 905                  | 7,60    |
| 710       | 600                    | 925                  | 8,60    |
| 710       | 630                    | 940                  | 9,30    |
| 710       | 710                    | 980                  | 15,5    |
| 800       | 315                    | 820                  | 2,30    |
| 800       | 355                    | 840                  | 2,80    |
| 800       | 400                    | 860                  | 4,30    |
| 800       | 450                    | 885                  | 5,20    |
| 800       | 500                    | 910                  | 6,30    |
| 800       | 560                    | 970                  | 7,80    |
| 800       | 600                    | 990                  | 8,80    |
| 800       | 630                    | 1005                 | 9,50    |
| 800       | 710                    | 1045                 | 15,6    |
| 800       | 800                    | 1090                 | 19,0    |
| 900       | 355                    | 910                  | 2,80    |
| 900       | 400                    | 935                  | 4,30    |
| 900       | 450                    | 960                  | 5,20    |
| 900       | 500                    | 980                  | 6,30    |
| 900       | 560                    | 1040                 | 7,80    |
| 900       | 600                    | 1060                 | 8,80    |
| 900       | 630                    | 1075                 | 9,50    |
| 900       | 710                    | 1115                 | 15,6    |
| 900       | 800                    | 1160                 | 19,0    |
| 900       | 900                    | 1210                 | 23,3    |
| 1000      | 400                    | 1005                 | 4,30    |
| 1000      | 450                    | 1030                 | 5,20    |
| 1000      | 500                    | 1055                 | 6,40    |
| 1000      | 560                    | 1110                 | 7,80    |
| 1000      | 600                    | 1130                 | 8,80    |
| 1000      | 630                    | 1145                 | 9,50    |
| 1000      | 710                    | 1185                 | 15,5    |
| 1000      | 800                    | 1230                 | 19,0    |
| 1000      | 900                    | 1280                 | 23,0    |
| 1000      | 1000                   | 1330                 | 28,5    |
| 1120      | 500                    | 1140                 | 6,30    |
| 1120      | 560                    | 1195                 | 7,80    |
| 1120      | 600                    | 1215                 | 8,80    |
| 1120      | 630                    | 1230                 | 9,50    |
| 1120      | 710                    | 1270                 | 15,5    |
| 1120      | 800                    | 1315                 | 19,0    |
| 1120      | 900                    | 1365                 | 23,3    |
| 1120      | 1000                   | 1415                 | 28,5    |
| 1120      | 1120                   | 1505                 | 36,0    |
| 1250      | 500                    | 1230                 | 6,30    |
| 1250      | 560                    | 1290                 | 7,80    |



## Saddle

## PSVU45°

| Ød<br>nom | Ød <sub>3</sub><br>nom | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|----------------------|---------|
| 1250      | 600                    | 1310                 | 8,80    |
| 1250      | 630                    | 1325                 | 9,50    |
| 1250      | 710                    | 1365                 | 15,6    |
| 1250      | 800                    | 1410                 | 19,1    |
| 1250      | 900                    | 1460                 | 23,0    |
| 1250      | 1000                   | 1510                 | 28,6    |
| 1250      | 1120                   | 1595                 | 35,9    |
| 1250      | 1250                   | 1660                 | 43,4    |

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# T-piece

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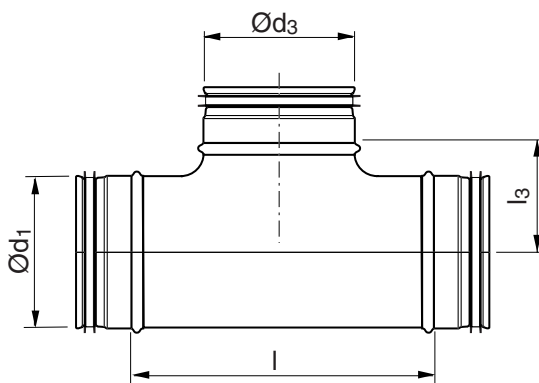
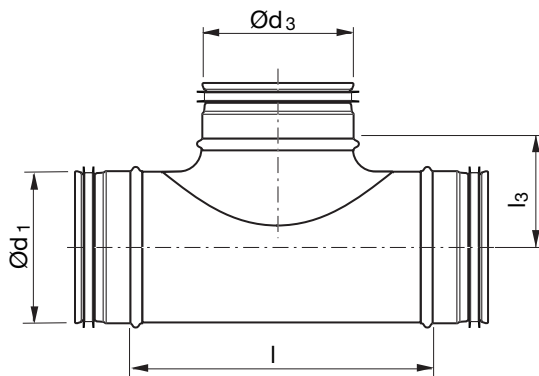
## Description

T-piece built with PSU saddle or a fully pressed top section.

Pressure drop, see graphs on page 85.

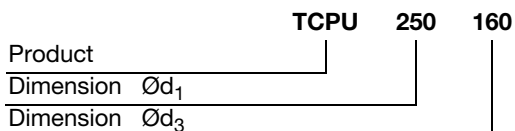
Pressure drop, see graphs on page 85.

## Dimensions



| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 63                     | 63                     | 125     | 42                   | 0,26    |
| 80                     | 63                     | 125     | 50                   | 0,31    |
| 80                     | 80                     | 140     | 52                   | 0,36    |
| 100                    | 63                     | 125     | 60                   | 0,35    |
| 100                    | 80                     | 103     | 65                   | 0,23    |
| 100                    | 100                    | 130     | 65                   | 0,32    |
| 112                    | 63                     | 125     | 66                   | 0,41    |
| 112                    | 80                     | 140     | 68                   | 0,47    |
| 112                    | 100                    | 175     | 71                   | 0,55    |
| 112                    | 112 *                  | 175     | 56                   | 0,57    |
| 125                    | 63                     | 125     | 73                   | 0,44    |
| 125                    | 80                     | 97      | 75                   | 0,34    |
| 125                    | 100                    | 130     | 78                   | 0,37    |
| 125                    | 112                    | 175     | 78                   | 0,61    |
| 125                    | 125                    | 165     | 83                   | 0,44    |
| 140                    | 80                     | 140     | 82                   | 0,56    |
| 140                    | 100                    | 175     | 85                   | 0,65    |
| 140                    | 112                    | 175     | 85                   | 0,67    |
| 140                    | 125 *                  | 215     | 70                   | 0,76    |
| 140                    | 140                    | 230     | 90                   | 0,78    |
| 150                    | 80                     | 140     | 87                   | 0,58    |

## Ordering example





## T-piece

## TCPU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 150                    | 100                    | 175     | 90                   | 0,69    |
| 150                    | 125                    | 215     | 95                   | 0,76    |
| 150                    | 140                    | 230     | 95                   | 0,82    |
| 150                    | 150                    | 260     | 95                   | 0,94    |
| 160                    | 80                     | 140     | 92                   | 0,59    |
| 160                    | 100                    | 130     | 95                   | 0,46    |
| 160                    | 125                    | 166     | 100                  | 0,53    |
| 160                    | 140                    | 230     | 100                  | 0,87    |
| 160                    | 150                    | 260     | 100                  | 0,99    |
| 160                    | 160                    | 209     | 105                  | 0,63    |
| 180                    | 80                     | 140     | 102                  | 0,92    |
| 180                    | 100                    | 175     | 105                  | 0,80    |
| 180                    | 125                    | 215     | 110                  | 0,91    |
| 180                    | 140                    | 230     | 110                  | 0,96    |
| 180                    | 150                    | 260     | 110                  | 1,08    |
| 180                    | 160                    | 260     | 115                  | 1,06    |
| 180                    | 180                    | 285     | 115                  | 1,44    |
| 200                    | 80                     | 140     | 112                  | 0,77    |
| 200                    | 100                    | 175     | 115                  | 0,88    |
| 200                    | 125                    | 215     | 115                  | 1,02    |
| 200                    | 140                    | 230     | 120                  | 1,07    |
| 200                    | 150                    | 260     | 120                  | 1,19    |
| 200                    | 160                    | 209     | 125                  | 0,67    |
| 200                    | 180                    | 285     | 125                  | 1,35    |
| 200                    | 200                    | 249     | 125                  | 1,21    |
| 224                    | 80                     | 140     | 124                  | 0,85    |
| 224                    | 100                    | 175     | 127                  | 1,01    |
| 224                    | 125                    | 215     | 132                  | 1,14    |
| 224                    | 140                    | 230     | 132                  | 1,20    |
| 224                    | 150                    | 260     | 132                  | 1,29    |
| 224                    | 160                    | 260     | 137                  | 1,28    |
| 224                    | 180                    | 285     | 137                  | 1,46    |
| 224                    | 200                    | 346     | 137                  | 1,69    |
| 250                    | 80                     | 156     | 137                  | 1,13    |
| 250                    | 100                    | 175     | 140                  | 1,22    |
| 250                    | 125                    | 220     | 145                  | 1,48    |
| 250                    | 140                    | 230     | 145                  | 1,48    |
| 250                    | 150                    | 255     | 145                  | 1,55    |
| 250                    | 160                    | 256     | 150                  | 1,58    |
| 250                    | 180                    | 306     | 150                  | 1,79    |
| 250                    | 200                    | 306     | 150                  | 1,78    |
| 250                    | 224                    | 350     | 150                  | 2,09    |
| 250                    | 250                    | 296     | 150                  | 1,65    |
| 280                    | 80                     | 156     | 155                  | 1,25    |
| 280                    | 100                    | 175     | 155                  | 1,37    |
| 280                    | 125                    | 220     | 160                  | 1,56    |
| 280                    | 140                    | 230     | 160                  | 1,63    |
| 280                    | 150                    | 255     | 160                  | 1,72    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 280                    | 160                    | 256     | 165                  | 1,75    |
| 280                    | 180                    | 306     | 165                  | 1,97    |
| 280                    | 200                    | 306     | 165                  | 2,01    |
| 280                    | 224                    | 350     | 165                  | 2,27    |
| 280                    | 250 *                  | 350     | 140                  | 2,44    |
| 280                    | 280 *                  | 390     | 140                  | 2,67    |
| 300                    | 80                     | 156     | 162                  | 1,36    |
| 300                    | 100                    | 175     | 165                  | 1,47    |
| 300                    | 125                    | 220     | 170                  | 1,68    |
| 300                    | 140                    | 230     | 170                  | 1,74    |
| 300                    | 150                    | 255     | 170                  | 1,86    |
| 300                    | 160                    | 256     | 175                  | 1,87    |
| 300                    | 180                    | 306     | 175                  | 2,12    |
| 300                    | 200                    | 306     | 175                  | 2,15    |
| 300                    | 224                    | 350     | 175                  | 2,41    |
| 300                    | 250                    | 350     | 175                  | 2,50    |
| 300                    | 280 *                  | 390     | 150                  | 2,53    |
| 300                    | 300                    | 430     | 175                  | 3,55    |
| 315                    | 80                     | 156     | 170                  | 1,43    |
| 315                    | 100                    | 175     | 173                  | 1,50    |
| 315                    | 125                    | 220     | 178                  | 1,76    |
| 315                    | 140                    | 230     | 178                  | 1,82    |
| 315                    | 150                    | 355     | 178                  | 2,38    |
| 315                    | 160                    | 256     | 182                  | 1,96    |
| 315                    | 180                    | 306     | 182                  | 2,21    |
| 315                    | 200                    | 306     | 182                  | 2,14    |
| 315                    | 224                    | 350     | 182                  | 2,51    |
| 315                    | 250                    | 350     | 182                  | 2,59    |
| 315                    | 280                    | 390     | 182                  | 3,00    |
| 315                    | 300                    | 430     | 182                  | 3,21    |
| 315                    | 315                    | 363     | 182                  | 2,20    |
| 355                    | 100                    | 175     | 193                  | 1,73    |
| 355                    | 125                    | 220     | 198                  | 1,96    |
| 355                    | 140                    | 230     | 198                  | 2,03    |
| 355                    | 150                    | 255     | 198                  | 2,46    |
| 355                    | 160                    | 256     | 203                  | 2,45    |
| 355                    | 180                    | 306     | 203                  | 2,81    |
| 355                    | 200                    | 306     | 203                  | 2,82    |
| 355                    | 224                    | 350     | 203                  | 3,13    |
| 355                    | 250                    | 350     | 203                  | 3,18    |
| 355                    | 280 *                  | 390     | 178                  | 3,63    |
| 355                    | 300                    | 430     | 203                  | 3,87    |
| 355                    | 315                    | 455     | 203                  | 4,06    |
| 355                    | 355 *                  | 470     | 203                  | 5,14    |
| 400                    | 100                    | 175     | 215                  | 2,27    |
| 400                    | 125                    | 225     | 220                  | 2,81    |
| 400                    | 160                    | 266     | 225                  | 3,02    |
| 400                    | 200                    | 300     | 225                  | 3,37    |

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## T-piece

## TCPUR

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 400                    | 224                    | 350     | 225                  | 3,74    |
| 400                    | 250                    | 350     | 225                  | 3,79    |
| 400                    | 280 *                  | 390     | 200                  | 4,23    |
| 400                    | 300                    | 430     | 225                  | 4,47    |
| 400                    | 315                    | 415     | 225                  | 4,42    |
| 400                    | 355 *                  | 470     | 225                  | 5,04    |
| 400                    | 400                    | 510     | 225                  | 6,20    |
| 450                    | 100                    | 175     | 240                  | 2,76    |
| 450                    | 125                    | 225     | 245                  | 3,15    |
| 450                    | 160                    | 266     | 250                  | 3,38    |
| 450                    | 200                    | 300     | 250                  | 3,75    |
| 450                    | 224                    | 350     | 250                  | 4,16    |
| 450                    | 250                    | 350     | 250                  | 4,23    |
| 450                    | 280 *                  | 390     | 225                  | 4,64    |
| 450                    | 300                    | 430     | 250                  | 4,89    |
| 450                    | 315                    | 415     | 250                  | 4,82    |
| 450                    | 355                    | 470     | 250                  | 5,16    |
| 450                    | 400                    | 510     | 250                  | 5,81    |
| 450                    | 450 *                  | 550     | 225                  | 6,99    |
| 500                    | 100                    | 175     | 265                  | 3,06    |
| 500                    | 125                    | 225     | 270                  | 3,35    |
| 500                    | 160                    | 266     | 275                  | 3,77    |
| 500                    | 200                    | 300     | 275                  | 4,14    |
| 500                    | 250                    | 350     | 275                  | 4,68    |
| 500                    | 300                    | 430     | 275                  | 5,36    |
| 500                    | 315                    | 415     | 275                  | 5,30    |
| 500                    | 355                    | 470     | 275                  | 5,70    |
| 500                    | 400                    | 510     | 275                  | 6,34    |
| 500                    | 450 *                  | 550     | 250                  | 6,56    |
| 500                    | 500 *                  | 552     | 290                  | 8,27    |
| 560                    | 100                    | 175     | 295                  | 3,59    |
| 560                    | 125                    | 225     | 300                  | 3,92    |
| 560                    | 160                    | 266     | 305                  | 4,41    |
| 560                    | 200                    | 300     | 305                  | 4,78    |
| 560                    | 250                    | 350     | 305                  | 5,38    |
| 560                    | 300                    | 430     | 280                  | 5,86    |
| 560                    | 315                    | 415     | 305                  | 6,06    |
| 560                    | 355                    | 470     | 305                  | 6,57    |
| 560                    | 400                    | 510     | 305                  | 7,08    |
| 560                    | 450 *                  | 550     | 280                  | 7,38    |
| 560                    | 500 *                  | 552     | 280                  | 7,57    |
| 560                    | 560 *                  | 610     | 280                  | 9,69    |
| 600                    | 100                    | 175     | 315                  | 3,83    |
| 600                    | 125                    | 225     | 320                  | 4,19    |
| 600                    | 160                    | 266     | 325                  | 4,73    |
| 600                    | 200                    | 300     | 325                  | 5,10    |
| 600                    | 250                    | 350     | 325                  | 5,73    |
| 600                    | 300 *                  | 430     | 300                  | 6,36    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 600                    | 315                    | 415     | 325                  | 6,46    |
| 600                    | 355 *                  | 470     | 300                  | 6,98    |
| 600                    | 400                    | 510     | 325                  | 7,43    |
| 600                    | 450 *                  | 550     | 300                  | 7,84    |
| 600                    | 500 *                  | 552     | 300                  | 7,91    |
| 600                    | 560 *                  | 610     | 300                  | 8,76    |
| 600                    | 600 *                  | 650     | 300                  | 10,8    |
| 630                    | 100                    | 175     | 330                  | 4,03    |
| 630                    | 125                    | 225     | 335                  | 4,41    |
| 630                    | 160                    | 266     | 340                  | 4,99    |
| 630                    | 200                    | 300     | 340                  | 5,35    |
| 630                    | 250                    | 350     | 340                  | 6,00    |
| 630                    | 300 *                  | 450     | 315                  | 7,23    |
| 630                    | 315                    | 415     | 340                  | 6,77    |
| 630                    | 355 *                  | 470     | 315                  | 7,18    |
| 630                    | 400                    | 510     | 340                  | 7,69    |
| 630                    | 450 *                  | 555     | 315                  | 8,24    |
| 630                    | 500 *                  | 552     | 340                  | 8,44    |
| 630                    | 560 *                  | 610     | 315                  | 9,11    |
| 630                    | 600 *                  | 650     | 315                  | 9,58    |
| 630                    | 630 *                  | 680     | 340                  | 11,3    |

\* Built with PSU saddle, without radius

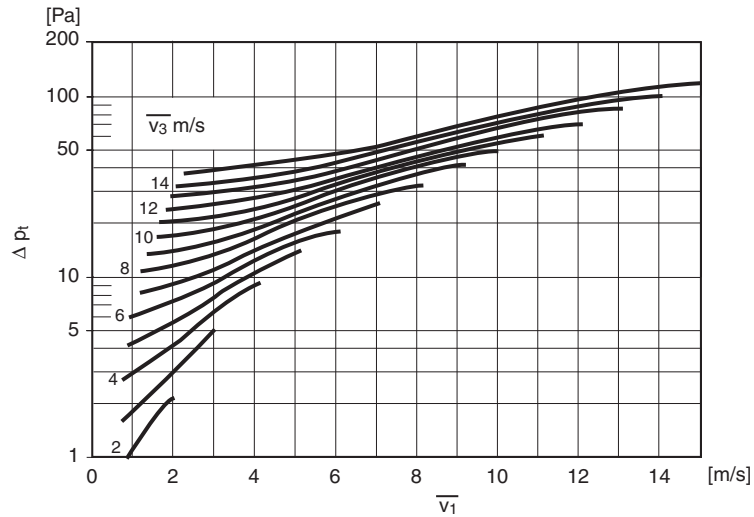
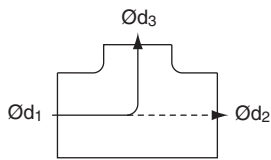


# T-piece and saddle

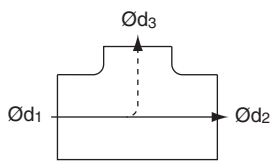
# TCPU, PSU

## Supply air

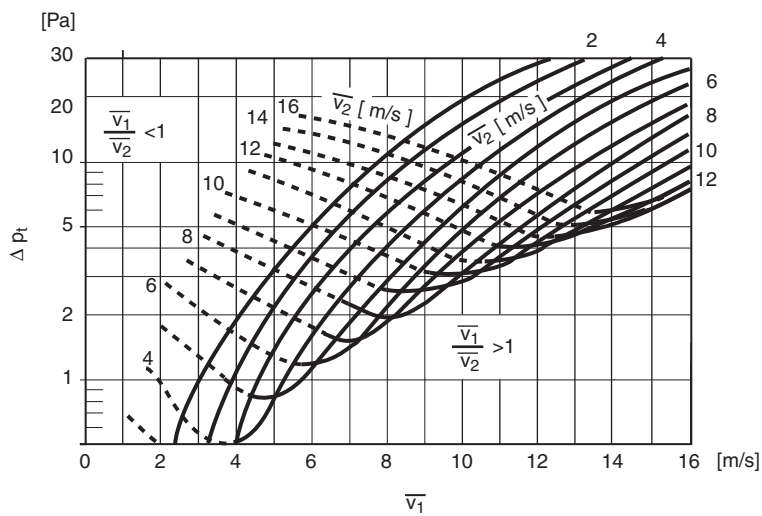
### Diverging flow



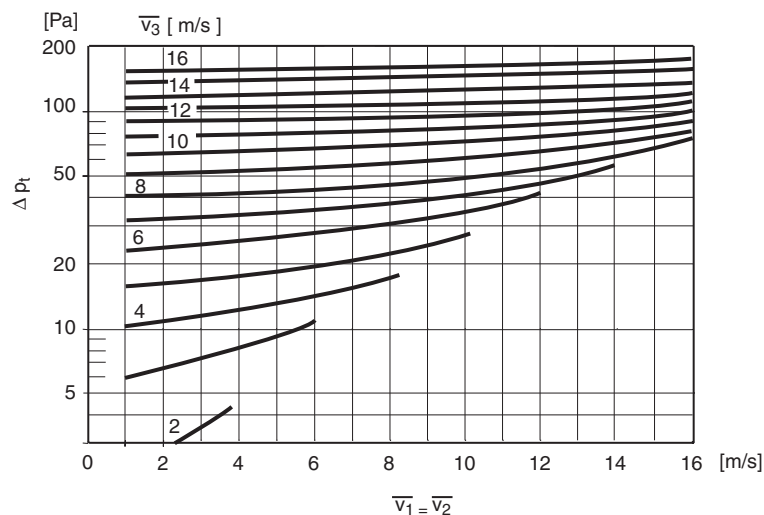
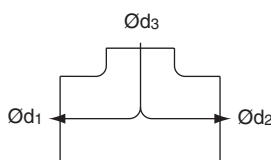
### Diverging flow



The diagram is also applicable to reduction in  $\text{Ød}_2$ .



### Diverging flow



- 1
- 2
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- 16
- 17
- 18



# T-piece and saddle

# TCPU, PSU

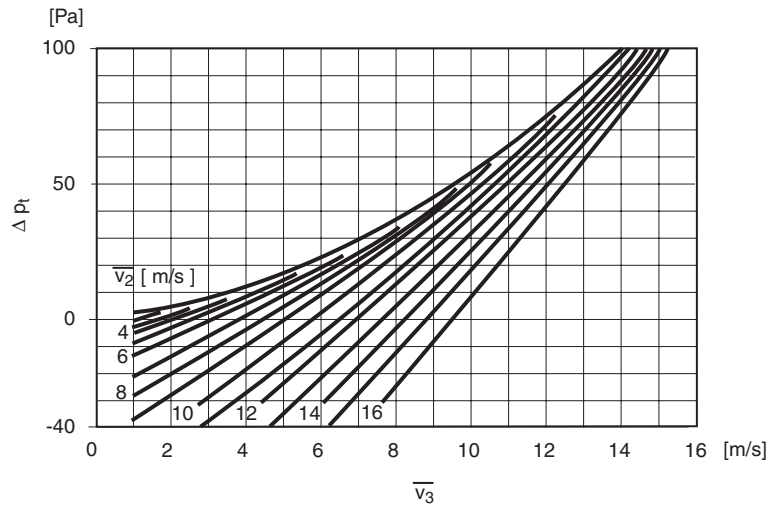
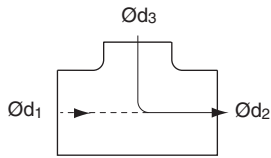
## Exhaust air

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3

### Converging flow



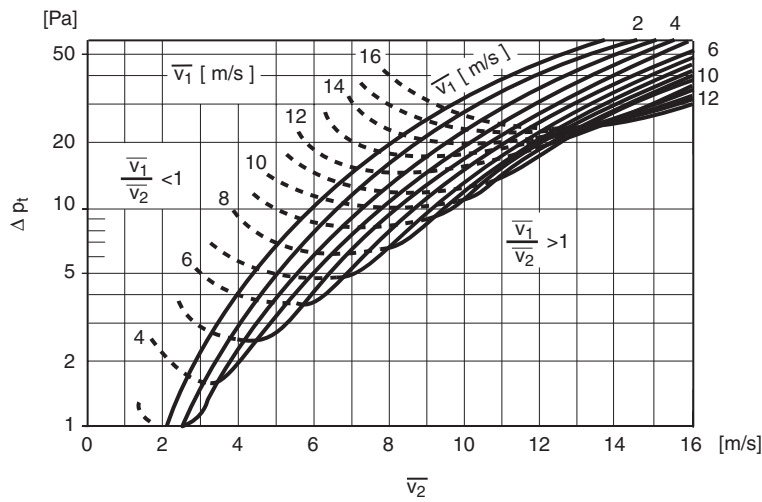
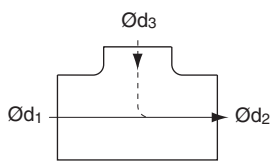
4

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### Converging flow



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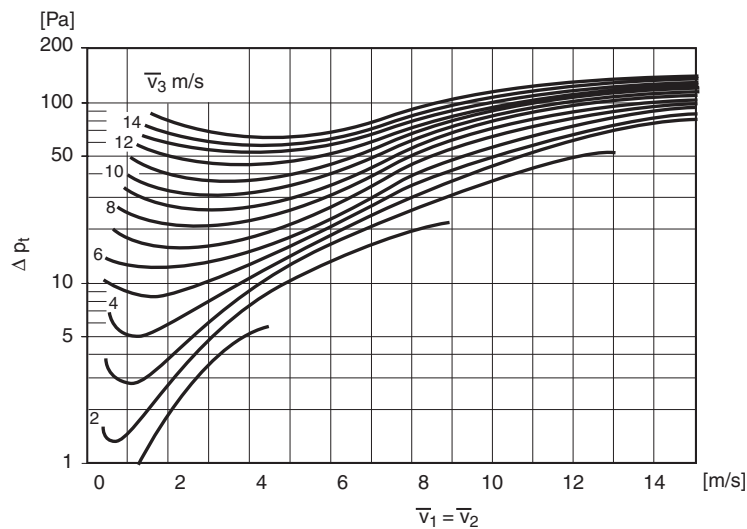
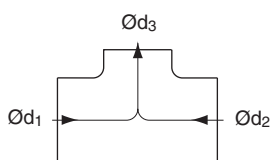
10

The diagram is also applicable to reduction in  $\text{Ød}_1$ .

11

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### Converging flow



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# T-piece – Casting-in programme

TCSIU

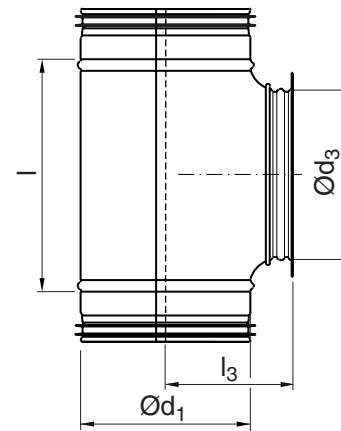


## Description

Short branch with air valve socket and nail flange with pre-punched holes.

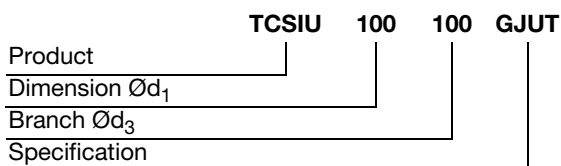
Fits air valve KVB etc.

## Dimensions



| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 100                    | 92                     | 130     | 93                   | 0,31    |
| 125                    | 92                     | 130     | 106                  | 0,52    |
| 125                    | 117                    | 165     | 106                  | 0,67    |
| 160                    | 152                    | 229     | 131                  | 1,02    |

## Ordering example



- 1
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- 14
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- 16
- 17
- 18



# T-piece – Casting-in programme

# TCPU

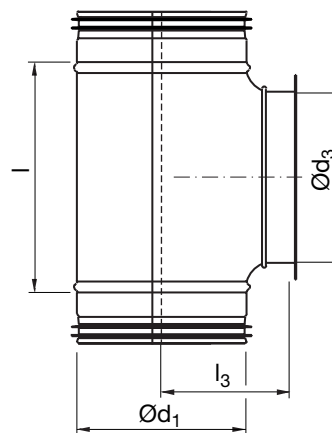
- 1
- 2
- 3
- 4
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- 12
- 13
- 14
- 15
- 16
- 17
- 18



### Description

Short branch with female end and nail flange with pre-punched holes.

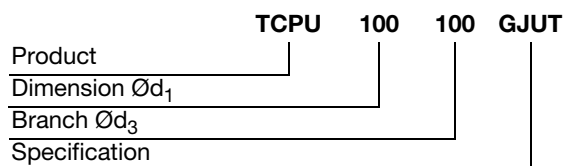
### Dimensions



| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 80 *                   | 80                     | 140     | 80                   | 0,38    |
| 100                    | 100                    | 130     | 93                   | 0,30    |
| 125                    | 100                    | 130     | 106                  | 0,50    |
| 125                    | 125                    | 165     | 102                  | 0,59    |
| 160                    | 160                    | 209     | 130                  | 0,88    |

\* Made with saddle PS

### Ordering example





# T-piece – Casting-in programme

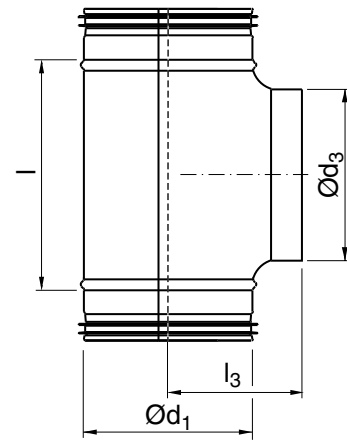
# TCPU



## Description

Short branch with female end.

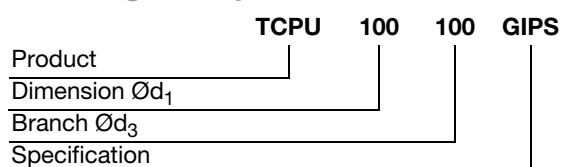
## Dimensions



| Ød <sub>1</sub> nom | Ød <sub>3</sub> nom | l mm | l <sub>3</sub> mm | m kg |
|---------------------|---------------------|------|-------------------|------|
| 80 *                | 80                  | 140  | 80                | 0,33 |
| 100                 | 100                 | 130  | 85                | 0,27 |
| 125                 | 100                 | 130  | 100               | 0,44 |
| 125                 | 125                 | 165  | 100               | 0,53 |
| 160                 | 160                 | 229  | 117               | 0,82 |

\* Made with saddle PS

## Ordering example



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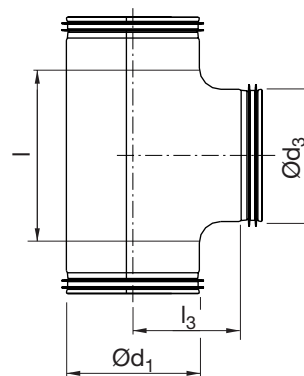


# T-piece – Casting-in programme

# TCPU



## Dimensions

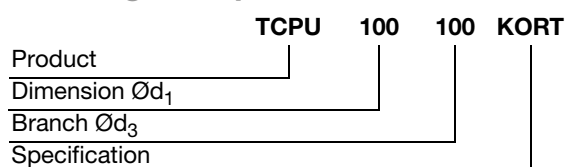


## Description

Short branch and short installation lengths.

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 100                    | 100                    | 130     | 65                   | 0,32    |
| 125                    | 125                    | 165     | 83                   | 0,44    |
| 160                    | 160                    | 210     | 105                  | 0,63    |

## Ordering example





# T-piece

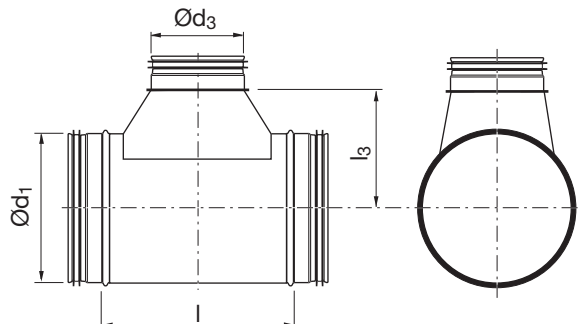
# TCU



## Description

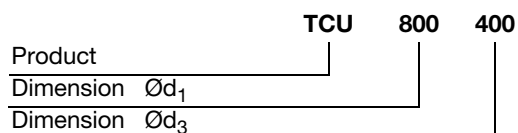
Centric T-piece with hand made T-piece TSTCU.

## Dimensions



| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 63                     | 80                     | 195     | 77                   | 0,33    |
| 63                     | 100                    | 215     | 77                   | 0,38    |
| 80                     | 112                    | 225     | 85                   | 0,48    |
| 80                     | 125                    | 240     | 85                   | 0,53    |
| 100                    | 112                    | 225     | 95                   | 0,52    |
| 100                    | 125                    | 240     | 95                   | 0,56    |
| 100                    | 140                    | 260     | 100                  | 0,63    |
| 100                    | 150                    | 270     | 100                  | 0,63    |
| 100                    | 160                    | 280     | 100                  | 0,68    |
| 112                    | 112                    | 225     | 100                  | 0,60    |
| 112                    | 140                    | 260     | 105                  | 0,71    |
| 112                    | 150                    | 270     | 105                  | 0,74    |
| 112                    | 160                    | 280     | 105                  | 0,77    |
| 112                    | 180                    | 300     | 105                  | 0,83    |
| 125                    | 140                    | 260     | 115                  | 0,72    |
| 125                    | 150                    | 270     | 115                  | 0,75    |
| 125                    | 160                    | 280     | 115                  | 0,77    |
| 125                    | 180                    | 300     | 115                  | 0,85    |
| 125                    | 200                    | 335     | 130                  | 1,01    |
| 140                    | 63                     | 178     | 115                  | 0,60    |
| 140                    | 125                    | 240     | 115                  | 0,75    |
| 140                    | 150                    | 270     | 120                  | 0,85    |
| 140                    | 160                    | 280     | 120                  | 0,88    |
| 140                    | 180                    | 300     | 120                  | 0,95    |
| 140                    | 200                    | 335     | 135                  | 1,09    |
| 140                    | 224                    | 360     | 135                  | 1,19    |
| 150                    | 63                     | 178     | 120                  | 0,59    |
| 150                    | 112                    | 225     | 120                  | 0,75    |
| 150                    | 180                    | 300     | 125                  | 0,99    |
| 150                    | 200                    | 335     | 140                  | 1,17    |
| 150                    | 224                    | 360     | 140                  | 1,24    |
| 150                    | 250                    | 385     | 140                  | 1,40    |
| 160                    | 63                     | 178     | 125                  | 0,58    |

## Ordering example







## T-piece

## TCU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 160                    | 200                    | 335     | 145                  | 1,21    |
| 160                    | 224                    | 360     | 145                  | 1,30    |
| 160                    | 250                    | 385     | 145                  | 1,52    |
| 180                    | 63                     | 178     | 135                  | 0,69    |
| 180                    | 112                    | 225     | 135                  | 0,87    |
| 180                    | 200                    | 335     | 155                  | 1,32    |
| 180                    | 224                    | 360     | 155                  | 1,41    |
| 180                    | 250                    | 385     | 155                  | 1,58    |
| 180                    | 280                    | 425     | 165                  | 1,98    |
| 200                    | 63                     | 178     | 145                  | 0,74    |
| 200                    | 112                    | 225     | 145                  | 0,92    |
| 200                    | 224                    | 360     | 165                  | 1,50    |
| 200                    | 250                    | 385     | 165                  | 1,68    |
| 200                    | 280                    | 425     | 175                  | 2,06    |
| 200                    | 300                    | 445     | 175                  | 2,19    |
| 200                    | 315                    | 460     | 175                  | 2,11    |
| 224                    | 63                     | 178     | 160                  | 0,83    |
| 224                    | 112                    | 225     | 160                  | 1,02    |
| 224                    | 250                    | 385     | 180                  | 1,94    |
| 224                    | 280                    | 425     | 190                  | 2,21    |
| 224                    | 300                    | 445     | 190                  | 2,33    |
| 224                    | 315                    | 460     | 190                  | 2,42    |
| 224                    | 355                    | 510     | 200                  | 2,80    |
| 250                    | 63                     | 178     | 170                  | 1,05    |
| 250                    | 112                    | 225     | 170                  | 1,12    |
| 250                    | 280                    | 425     | 200                  | 2,36    |
| 250                    | 300                    | 445     | 200                  | 2,49    |
| 250                    | 315                    | 460     | 200                  | 2,55    |
| 250                    | 355                    | 510     | 210                  | 2,97    |
| 250                    | 400                    | 555     | 210                  | 3,56    |
| 280                    | 112                    | 225     | 185                  | 1,24    |
| 280                    | 250                    | 385     | 205                  | 2,27    |
| 280                    | 280                    | 425     | 215                  | 2,51    |
| 280                    | 300                    | 445     | 215                  | 2,65    |
| 280                    | 315                    | 460     | 215                  | 2,75    |
| 280                    | 355                    | 510     | 225                  | 3,13    |
| 280                    | 400                    | 555     | 225                  | 3,74    |
| 280                    | 450                    | 605     | 225                  | 4,14    |
| 300                    | 112                    | 225     | 195                  | 1,34    |
| 300                    | 280                    | 425     | 225                  | 2,64    |
| 300                    | 315                    | 460     | 225                  | 2,87    |
| 300                    | 355                    | 510     | 235                  | 3,28    |
| 300                    | 400                    | 555     | 235                  | 3,81    |
| 300                    | 450                    | 605     | 235                  | 4,29    |
| 315                    | 112                    | 235     | 205                  | 1,38    |
| 315                    | 355                    | 520     | 245                  | 3,44    |
| 315                    | 400                    | 565     | 245                  | 3,99    |
| 315                    | 450                    | 615     | 245                  | 4,31    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 315                    | 500                    | 670     | 250                  | 4,68    |
| 355                    | 112                    | 235     | 225                  | 1,76    |
| 355                    | 280                    | 435     | 245                  | 3,78    |
| 355                    | 355                    | 520     | 265                  | 4,44    |
| 355                    | 400                    | 565     | 265                  | 5,07    |
| 355                    | 450                    | 615     | 265                  | 5,50    |
| 355                    | 500                    | 670     | 270                  | 5,99    |
| 355                    | 560                    | 730     | 270                  | 6,51    |
| 400                    | 112                    | 235     | 245                  | 1,97    |
| 400                    | 140                    | 270     | 250                  | 2,31    |
| 400                    | 150                    | 280     | 250                  | 2,40    |
| 400                    | 180                    | 310     | 250                  | 2,68    |
| 400                    | 280                    | 435     | 275                  | 4,16    |
| 400                    | 355                    | 520     | 285                  | 4,85    |
| 400                    | 450                    | 615     | 285                  | 5,99    |
| 400                    | 500                    | 670     | 290                  | 6,59    |
| 400                    | 560                    | 730     | 290                  | 7,11    |
| 400                    | 600                    | 770     | 290                  | 7,47    |
| 400                    | 630                    | 800     | 290                  | 7,73    |
| 450                    | 140                    | 270     | 275                  | 2,52    |
| 450                    | 150                    | 280     | 275                  | 2,62    |
| 450                    | 180                    | 310     | 275                  | 2,94    |
| 450                    | 280                    | 435     | 300                  | 4,72    |
| 450                    | 450                    | 615     | 310                  | 6,44    |
| 450                    | 500                    | 670     | 315                  | 7,16    |
| 450                    | 560                    | 730     | 315                  | 7,78    |
| 450                    | 600                    | 770     | 315                  | 8,19    |
| 450                    | 630                    | 800     | 315                  | 8,50    |
| 450                    | 710                    | 880     | 315                  | 9,85    |
| 500                    | 140                    | 270     | 300                  | 2,79    |
| 500                    | 150                    | 280     | 300                  | 2,90    |
| 500                    | 180                    | 310     | 300                  | 3,18    |
| 500                    | 224                    | 370     | 315                  | 3,87    |
| 500                    | 280                    | 435     | 325                  | 4,99    |
| 500                    | 450                    | 615     | 335                  | 7,15    |
| 500                    | 500                    | 670     | 340                  | 7,81    |
| 500                    | 560                    | 730     | 340                  | 8,60    |
| 500                    | 600                    | 770     | 340                  | 9,19    |
| 500                    | 630                    | 800     | 340                  | 9,41    |
| 500                    | 710                    | 880     | 340                  | 11,5    |
| 500                    | 800                    | 970     | 340                  | 11,8    |
| 560                    | 224                    | 370     | 345                  | 4,33    |
| 560                    | 280                    | 435     | 355                  | 5,56    |
| 560                    | 450                    | 615     | 365                  | 8,01    |
| 560                    | 500                    | 670     | 370                  | 8,56    |
| 560                    | 560                    | 730     | 370                  | 9,21    |
| 560                    | 600                    | 770     | 370                  | 9,80    |
| 560                    | 630                    | 800     | 370                  | 10,3    |



## T-piece

## TCU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 560                    | 710                    | 880     | 370                  | 12,1    |
| 560                    | 800                    | 970     | 370                  | 13,7    |
| 560                    | 900                    | 1090    | 370                  | 15,6    |
| 600                    | 224                    | 370     | 365                  | 4,62    |
| 600                    | 280                    | 435     | 375                  | 5,93    |
| 600                    | 300                    | 455     | 375                  | 6,15    |
| 600                    | 355                    | 520     | 385                  | 6,99    |
| 600                    | 450                    | 615     | 385                  | 8,55    |
| 600                    | 500                    | 670     | 390                  | 9,16    |
| 600                    | 560                    | 730     | 390                  | 9,63    |
| 600                    | 600                    | 770     | 390                  | 10,5    |
| 600                    | 630                    | 800     | 390                  | 10,7    |
| 600                    | 710                    | 880     | 390                  | 12,6    |
| 600                    | 800                    | 970     | 390                  | 14,1    |
| 600                    | 900                    | 1090    | 390                  | 16,1    |
| 630                    | 224                    | 380     | 380                  | 4,84    |
| 630                    | 280                    | 445     | 390                  | 6,21    |
| 630                    | 300                    | 465     | 390                  | 6,44    |
| 630                    | 355                    | 530     | 400                  | 7,23    |
| 630                    | 450                    | 625     | 400                  | 8,95    |
| 630                    | 500                    | 680     | 405                  | 9,72    |
| 630                    | 560                    | 740     | 405                  | 10,2    |
| 630                    | 600                    | 780     | 405                  | 10,4    |
| 630                    | 630                    | 810     | 405                  | 10,8    |
| 630                    | 710                    | 890     | 405                  | 12,9    |
| 630                    | 800                    | 980     | 405                  | 14,4    |
| 630                    | 900                    | 1100    | 405                  | 16,4    |
| 630                    | 1000                   | 1200    | 405                  | 18,3    |
| 710                    | 250                    | 455     | 420                  | 6,34    |
| 710                    | 280                    | 495     | 420                  | 7,00    |
| 710                    | 300                    | 515     | 430                  | 7,26    |
| 710                    | 315                    | 530     | 430                  | 7,46    |
| 710                    | 355                    | 580     | 440                  | 8,24    |
| 710                    | 400                    | 625     | 440                  | 9,49    |
| 710                    | 450                    | 675     | 440                  | 10,1    |
| 710                    | 500                    | 730     | 445                  | 10,9    |
| 710                    | 560                    | 790     | 445                  | 11,6    |
| 710                    | 600                    | 830     | 445                  | 12,1    |
| 710                    | 630                    | 860     | 445                  | 12,3    |
| 710                    | 710                    | 940     | 445                  | 14,1    |
| 710                    | 800                    | 1030    | 445                  | 15,7    |
| 710                    | 900                    | 1150    | 445                  | 17,8    |
| 710                    | 1000                   | 1250    | 445                  | 19,8    |
| 710                    | 1120                   | 1370    | 445                  | 23,2    |
| 800                    | 250                    | 455     | 465                  | 8,49    |
| 800                    | 280                    | 495     | 475                  | 9,46    |
| 800                    | 300                    | 515     | 475                  | 9,80    |
| 800                    | 315                    | 530     | 475                  | 9,99    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 800                    | 355                    | 580     | 485                  | 11,1    |
| 800                    | 400                    | 625     | 485                  | 12,6    |
| 800                    | 450                    | 675     | 485                  | 13,4    |
| 800                    | 500                    | 730     | 490                  | 14,6    |
| 800                    | 560                    | 790     | 490                  | 15,3    |
| 800                    | 600                    | 830     | 490                  | 15,8    |
| 800                    | 630                    | 860     | 490                  | 16,5    |
| 800                    | 710                    | 940     | 490                  | 18,0    |
| 800                    | 800                    | 1030    | 490                  | 19,5    |
| 800                    | 900                    | 1150    | 490                  | 21,5    |
| 800                    | 1000                   | 1250    | 490                  | 22,6    |
| 800                    | 1120                   | 1370    | 490                  | 27,6    |
| 800                    | 1250                   | 1500    | 490                  | 30,8    |
| 900                    | 315                    | 530     | 525                  | 11,5    |
| 900                    | 355                    | 580     | 535                  | 12,8    |
| 900                    | 400                    | 625     | 535                  | 15,0    |
| 900                    | 450                    | 675     | 535                  | 15,7    |
| 900                    | 500                    | 730     | 540                  | 16,9    |
| 900                    | 560                    | 790     | 540                  | 18,2    |
| 900                    | 600                    | 830     | 540                  | 19,0    |
| 900                    | 630                    | 860     | 540                  | 19,6    |
| 900                    | 710                    | 940     | 540                  | 22,2    |
| 900                    | 800                    | 1030    | 540                  | 23,8    |
| 900                    | 900                    | 1150    | 540                  | 26,1    |
| 900                    | 1000                   | 1250    | 540                  | 29,1    |
| 900                    | 1120                   | 1370    | 540                  | 34,1    |
| 900                    | 1250                   | 1500    | 540                  | 38,5    |
| 1000                   | 315                    | 530     | 575                  | 12,7    |
| 1000                   | 355                    | 580     | 585                  | 14,1    |
| 1000                   | 400                    | 625     | 585                  | 16,1    |
| 1000                   | 450                    | 675     | 585                  | 17,3    |
| 1000                   | 500                    | 730     | 590                  | 18,4    |
| 1000                   | 560                    | 790     | 590                  | 20,1    |
| 1000                   | 600                    | 830     | 590                  | 21,0    |
| 1000                   | 630                    | 860     | 590                  | 22,0    |
| 1000                   | 710                    | 940     | 590                  | 24,7    |
| 1000                   | 800                    | 1030    | 590                  | 26,8    |
| 1000                   | 900                    | 1150    | 590                  | 29,1    |
| 1000                   | 1000                   | 1250    | 590                  | 31,8    |
| 1000                   | 1120                   | 1370    | 590                  | 37,4    |
| 1000                   | 1250                   | 1500    | 590                  | 42,5    |
| 1120                   | 500                    | 730     | 650                  | 20,5    |
| 1120                   | 560                    | 790     | 650                  | 22,3    |
| 1120                   | 600                    | 830     | 650                  | 23,3    |
| 1120                   | 630                    | 860     | 650                  | 24,1    |
| 1120                   | 710                    | 940     | 650                  | 27,5    |
| 1120                   | 800                    | 1030    | 650                  | 29,9    |
| 1120                   | 900                    | 1150    | 650                  | 32,9    |

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## T-piece

TCU

| $\text{Ød}_1$<br>nom | $\text{Ød}_3$<br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|----------------------|----------------------|---------|----------------------|---------|
| 1120                 | 1000                 | 1250    | 650                  | 35,0    |
| 1120                 | 1120                 | 1370    | 650                  | 40,0    |
| 1120                 | 1250                 | 1500    | 650                  | 45,3    |
| 1250                 | 500                  | 730     | 715                  | 22,9    |
| 1250                 | 560                  | 790     | 715                  | 24,6    |
| 1250                 | 600                  | 830     | 715                  | 25,8    |
| 1250                 | 630                  | 860     | 715                  | 26,7    |
| 1250                 | 710                  | 940     | 715                  | 30,4    |
| 1250                 | 800                  | 1030    | 715                  | 33,1    |
| 1250                 | 900                  | 1150    | 715                  | 36,5    |
| 1250                 | 1000                 | 1250    | 715                  | 39,2    |
| 1250                 | 1120                 | 1370    | 715                  | 43,9    |
| 1250                 | 1250                 | 1500    | 715                  | 48,4    |



# T-piece

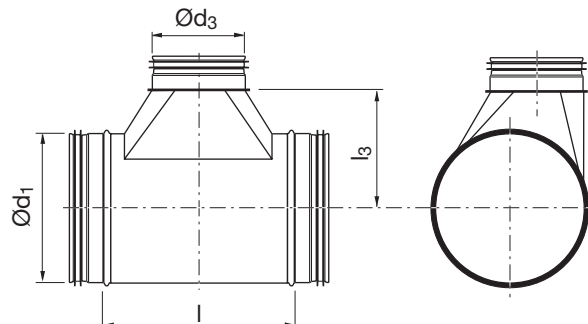
TU



## Description

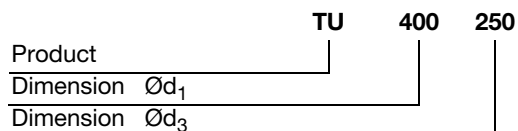
Tangential T-piece with hand made T-piece TSTU.

## Dimensions



| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 63                     | 63                     | 178     | 77                   | 0,28    |
| 63                     | 80                     | 195     | 77                   | 0,33    |
| 63                     | 100                    | 215     | 77                   | 0,38    |
| 80                     | 63                     | 178     | 85                   | 0,34    |
| 80                     | 80                     | 195     | 85                   | 0,38    |
| 80                     | 100                    | 215     | 85                   | 0,44    |
| 80                     | 112                    | 225     | 85                   | 0,48    |
| 80                     | 125                    | 240     | 85                   | 0,53    |
| 100                    | 63                     | 178     | 95                   | 0,41    |
| 100                    | 80                     | 195     | 95                   | 0,45    |
| 100                    | 100                    | 215     | 95                   | 0,49    |
| 100                    | 112                    | 225     | 95                   | 0,52    |
| 100                    | 125                    | 240     | 95                   | 0,56    |
| 100                    | 140                    | 260     | 100                  | 0,63    |
| 100                    | 150                    | 270     | 100                  | 0,63    |
| 100                    | 160                    | 280     | 100                  | 0,68    |
| 112                    | 63                     | 178     | 100                  | 0,50    |
| 112                    | 80                     | 195     | 100                  | 0,54    |
| 112                    | 100                    | 215     | 100                  | 0,59    |
| 112                    | 112                    | 225     | 100                  | 0,60    |
| 112                    | 125                    | 240     | 100                  | 0,65    |
| 112                    | 140                    | 260     | 105                  | 0,71    |
| 112                    | 150                    | 270     | 105                  | 0,74    |
| 112                    | 160                    | 280     | 105                  | 0,77    |
| 112                    | 180                    | 300     | 105                  | 0,83    |
| 125                    | 63                     | 178     | 110                  | 0,51    |
| 125                    | 80                     | 195     | 110                  | 0,55    |
| 125                    | 100                    | 215     | 110                  | 0,59    |
| 125                    | 112                    | 225     | 110                  | 0,61    |
| 125                    | 125                    | 240     | 110                  | 0,65    |
| 125                    | 140                    | 260     | 115                  | 0,72    |
| 125                    | 150                    | 270     | 115                  | 0,75    |
| 125                    | 160                    | 280     | 115                  | 0,77    |

## Ordering example





## T-piece

TU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 125                    | 180                    | 300     | 115                  | 0,85    |
| 125                    | 200                    | 335     | 130                  | 1,01    |
| 140                    | 63                     | 178     | 115                  | 0,60    |
| 140                    | 80                     | 195     | 115                  | 0,65    |
| 140                    | 100                    | 215     | 115                  | 0,69    |
| 140                    | 112                    | 225     | 115                  | 0,72    |
| 140                    | 125                    | 240     | 115                  | 0,75    |
| 140                    | 140                    | 260     | 120                  | 0,81    |
| 140                    | 150                    | 270     | 120                  | 0,85    |
| 140                    | 160                    | 280     | 120                  | 0,88    |
| 140                    | 180                    | 300     | 120                  | 0,95    |
| 140                    | 200                    | 335     | 135                  | 1,09    |
| 140                    | 224                    | 360     | 135                  | 1,19    |
| 150                    | 63                     | 178     | 120                  | 0,59    |
| 150                    | 80                     | 195     | 120                  | 0,65    |
| 150                    | 80                     | 195     | 120                  | 0,65    |
| 150                    | 100                    | 215     | 165                  | 0,70    |
| 150                    | 112                    | 225     | 120                  | 0,75    |
| 150                    | 125                    | 240     | 120                  | 0,80    |
| 150                    | 140                    | 260     | 125                  | 0,86    |
| 150                    | 150                    | 270     | 125                  | 0,89    |
| 150                    | 160                    | 280     | 125                  | 0,92    |
| 150                    | 180                    | 300     | 125                  | 0,99    |
| 150                    | 200                    | 335     | 140                  | 1,17    |
| 150                    | 224                    | 360     | 140                  | 1,24    |
| 150                    | 250                    | 385     | 140                  | 1,40    |
| 160                    | 63                     | 178     | 125                  | 0,58    |
| 160                    | 80                     | 195     | 125                  | 0,65    |
| 160                    | 100                    | 215     | 125                  | 0,72    |
| 160                    | 112                    | 225     | 125                  | 0,76    |
| 160                    | 125                    | 240     | 125                  | 0,82    |
| 160                    | 140                    | 260     | 130                  | 0,89    |
| 160                    | 150                    | 270     | 130                  | 0,91    |
| 160                    | 160                    | 280     | 130                  | 0,93    |
| 160                    | 180                    | 300     | 130                  | 1,04    |
| 160                    | 200                    | 335     | 145                  | 1,21    |
| 160                    | 224                    | 360     | 145                  | 1,30    |
| 160                    | 250                    | 385     | 145                  | 1,52    |
| 180                    | 63                     | 178     | 135                  | 0,69    |
| 180                    | 80                     | 195     | 135                  | 0,76    |
| 180                    | 100                    | 215     | 135                  | 0,82    |
| 180                    | 112                    | 225     | 135                  | 0,87    |
| 180                    | 125                    | 240     | 135                  | 0,90    |
| 180                    | 140                    | 260     | 140                  | 1,00    |
| 180                    | 150                    | 270     | 140                  | 1,03    |
| 180                    | 160                    | 280     | 140                  | 1,07    |
| 180                    | 180                    | 300     | 140                  | 1,12    |
| 180                    | 200                    | 335     | 155                  | 1,32    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 180                    | 224                    | 360     | 155                  | 1,41    |
| 180                    | 250                    | 385     | 155                  | 1,58    |
| 180                    | 280                    | 425     | 165                  | 1,98    |
| 200                    | 63                     | 178     | 145                  | 0,74    |
| 200                    | 80                     | 195     | 145                  | 0,95    |
| 200                    | 100                    | 215     | 145                  | 0,87    |
| 200                    | 112                    | 225     | 145                  | 0,92    |
| 200                    | 125                    | 240     | 145                  | 0,96    |
| 200                    | 140                    | 260     | 150                  | 1,07    |
| 200                    | 150                    | 270     | 150                  | 1,10    |
| 200                    | 160                    | 280     | 150                  | 1,12    |
| 200                    | 180                    | 300     | 150                  | 1,19    |
| 200                    | 200                    | 335     | 165                  | 1,42    |
| 200                    | 224                    | 360     | 165                  | 1,50    |
| 200                    | 250                    | 380     | 165                  | 1,68    |
| 200                    | 280                    | 425     | 175                  | 2,06    |
| 200                    | 300                    | 445     | 175                  | 2,19    |
| 200                    | 315                    | 460     | 175                  | 2,11    |
| 224                    | 63                     | 178     | 160                  | 0,83    |
| 224                    | 80                     | 195     | 160                  | 0,90    |
| 224                    | 100                    | 215     | 160                  | 0,98    |
| 224                    | 112                    | 225     | 160                  | 1,02    |
| 224                    | 125                    | 240     | 160                  | 1,08    |
| 224                    | 140                    | 260     | 165                  | 1,18    |
| 224                    | 150                    | 270     | 165                  | 1,22    |
| 224                    | 160                    | 280     | 165                  | 1,25    |
| 224                    | 180                    | 300     | 165                  | 1,33    |
| 224                    | 200                    | 335     | 180                  | 1,54    |
| 224                    | 224                    | 360     | 180                  | 1,61    |
| 224                    | 250                    | 385     | 180                  | 1,94    |
| 224                    | 280                    | 425     | 190                  | 2,21    |
| 224                    | 300                    | 445     | 190                  | 2,33    |
| 224                    | 315                    | 460     | 190                  | 2,42    |
| 224                    | 355                    | 510     | 200                  | 2,80    |
| 250                    | 63                     | 178     | 170                  | 1,05    |
| 250                    | 80                     | 195     | 170                  | 0,99    |
| 250                    | 100                    | 215     | 170                  | 1,20    |
| 250                    | 112                    | 225     | 170                  | 1,12    |
| 250                    | 125                    | 240     | 170                  | 1,30    |
| 250                    | 140                    | 260     | 175                  | 1,29    |
| 250                    | 150                    | 270     | 175                  | 1,34    |
| 250                    | 160                    | 280     | 175                  | 1,49    |
| 250                    | 180                    | 300     | 175                  | 1,46    |
| 250                    | 200                    | 335     | 190                  | 1,80    |
| 250                    | 224                    | 360     | 190                  | 1,76    |
| 250                    | 250                    | 385     | 190                  | 2,09    |
| 250                    | 280                    | 425     | 200                  | 2,36    |
| 250                    | 300                    | 445     | 200                  | 2,49    |



## T-piece

TU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 250                    | 315                    | 460     | 200                  | 2,55    |
| 250                    | 355                    | 510     | 210                  | 2,97    |
| 250                    | 400                    | 555     | 210                  | 3,56    |
| 280                    | 80                     | 195     | 185                  | 1,10    |
| 280                    | 100                    | 215     | 185                  | 1,20    |
| 280                    | 112                    | 225     | 185                  | 1,24    |
| 280                    | 125                    | 240     | 185                  | 1,32    |
| 280                    | 140                    | 260     | 190                  | 1,43    |
| 280                    | 150                    | 270     | 190                  | 1,48    |
| 280                    | 160                    | 280     | 190                  | 1,53    |
| 280                    | 180                    | 300     | 190                  | 1,62    |
| 280                    | 200                    | 335     | 205                  | 1,85    |
| 280                    | 224                    | 360     | 205                  | 1,96    |
| 280                    | 250                    | 385     | 205                  | 2,27    |
| 280                    | 280                    | 425     | 215                  | 2,51    |
| 280                    | 300                    | 445     | 215                  | 2,65    |
| 280                    | 315                    | 460     | 215                  | 2,75    |
| 280                    | 355                    | 510     | 225                  | 3,13    |
| 280                    | 400                    | 555     | 225                  | 3,74    |
| 280                    | 450                    | 605     | 225                  | 4,14    |
| 300                    | 80                     | 195     | 195                  | 1,18    |
| 300                    | 100                    | 215     | 195                  | 1,27    |
| 300                    | 112                    | 225     | 195                  | 1,34    |
| 300                    | 125                    | 240     | 195                  | 1,40    |
| 300                    | 140                    | 260     | 200                  | 1,52    |
| 300                    | 150                    | 270     | 200                  | 1,59    |
| 300                    | 160                    | 280     | 200                  | 1,64    |
| 300                    | 180                    | 300     | 200                  | 1,74    |
| 300                    | 200                    | 335     | 215                  | 2,01    |
| 300                    | 224                    | 360     | 215                  | 2,10    |
| 300                    | 250                    | 385     | 215                  | 2,44    |
| 300                    | 280                    | 425     | 225                  | 2,64    |
| 300                    | 300                    | 445     | 225                  | 2,77    |
| 300                    | 315                    | 460     | 225                  | 2,87    |
| 300                    | 355                    | 510     | 235                  | 3,28    |
| 300                    | 400                    | 555     | 235                  | 3,81    |
| 300                    | 450                    | 605     | 235                  | 4,29    |
| 315                    | 80                     | 205     | 205                  | 1,22    |
| 315                    | 100                    | 225     | 205                  | 1,33    |
| 315                    | 112                    | 235     | 205                  | 1,38    |
| 315                    | 125                    | 250     | 205                  | 1,46    |
| 315                    | 140                    | 270     | 210                  | 1,63    |
| 315                    | 150                    | 280     | 210                  | 1,69    |
| 315                    | 160                    | 290     | 210                  | 1,72    |
| 315                    | 180                    | 310     | 210                  | 1,87    |
| 315                    | 200                    | 345     | 225                  | 2,09    |
| 315                    | 224                    | 370     | 225                  | 2,28    |
| 315                    | 250                    | 395     | 225                  | 2,60    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 315                    | 280                    | 435     | 235                  | 2,85    |
| 315                    | 300                    | 455     | 235                  | 2,90    |
| 315                    | 315                    | 470     | 235                  | 3,08    |
| 315                    | 355                    | 520     | 245                  | 3,44    |
| 315                    | 400                    | 565     | 245                  | 3,99    |
| 315                    | 450                    | 615     | 245                  | 4,31    |
| 315                    | 500                    | 670     | 250                  | 4,68    |
| 355                    | 100                    | 225     | 225                  | 1,67    |
| 355                    | 112                    | 235     | 225                  | 1,76    |
| 355                    | 125                    | 250     | 225                  | 1,89    |
| 355                    | 140                    | 270     | 230                  | 2,09    |
| 355                    | 150                    | 280     | 230                  | 2,18    |
| 355                    | 160                    | 290     | 230                  | 2,26    |
| 355                    | 180                    | 310     | 230                  | 2,42    |
| 355                    | 200                    | 345     | 245                  | 2,79    |
| 355                    | 224                    | 370     | 245                  | 2,97    |
| 355                    | 250                    | 395     | 245                  | 3,45    |
| 355                    | 280                    | 435     | 245                  | 3,78    |
| 355                    | 300                    | 455     | 255                  | 3,89    |
| 355                    | 315                    | 470     | 255                  | 3,96    |
| 355                    | 355                    | 520     | 265                  | 4,44    |
| 355                    | 400                    | 565     | 265                  | 5,07    |
| 355                    | 450                    | 615     | 265                  | 5,50    |
| 355                    | 500                    | 670     | 270                  | 5,99    |
| 355                    | 560                    | 730     | 270                  | 6,51    |
| 400                    | 100                    | 225     | 245                  | 1,90    |
| 400                    | 112                    | 235     | 245                  | 1,97    |
| 400                    | 125                    | 250     | 245                  | 2,11    |
| 400                    | 140                    | 270     | 250                  | 2,31    |
| 400                    | 150                    | 280     | 250                  | 2,40    |
| 400                    | 160                    | 290     | 250                  | 2,50    |
| 400                    | 180                    | 310     | 250                  | 2,68    |
| 400                    | 200                    | 345     | 265                  | 3,04    |
| 400                    | 224                    | 370     | 265                  | 3,30    |
| 400                    | 250                    | 395     | 265                  | 3,84    |
| 400                    | 280                    | 435     | 275                  | 4,16    |
| 400                    | 300                    | 455     | 275                  | 4,38    |
| 400                    | 315                    | 470     | 275                  | 4,43    |
| 400                    | 355                    | 520     | 285                  | 4,85    |
| 400                    | 400                    | 565     | 285                  | 5,54    |
| 400                    | 450                    | 615     | 285                  | 5,99    |
| 400                    | 500                    | 670     | 290                  | 6,59    |
| 400                    | 560                    | 730     | 290                  | 7,11    |
| 400                    | 600                    | 770     | 290                  | 7,47    |
| 400                    | 630                    | 800     | 290                  | 7,73    |
| 450                    | 125                    | 250     | 270                  | 2,26    |
| 450                    | 140                    | 270     | 275                  | 2,52    |
| 450                    | 150                    | 280     | 275                  | 2,62    |

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## T-piece

TU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 450                    | 160                    | 290     | 275                  | 2,73    |
| 450                    | 180                    | 310     | 275                  | 2,94    |
| 450                    | 200                    | 345     | 290                  | 3,41    |
| 450                    | 224                    | 370     | 290                  | 3,66    |
| 450                    | 250                    | 395     | 290                  | 4,26    |
| 450                    | 280                    | 435     | 300                  | 4,72    |
| 450                    | 300                    | 455     | 300                  | 4,89    |
| 450                    | 315                    | 470     | 300                  | 5,02    |
| 450                    | 355                    | 520     | 310                  | 5,50    |
| 450                    | 400                    | 565     | 310                  | 6,19    |
| 450                    | 450                    | 615     | 310                  | 6,44    |
| 450                    | 500                    | 670     | 315                  | 7,16    |
| 450                    | 560                    | 730     | 315                  | 7,78    |
| 450                    | 600                    | 770     | 315                  | 8,19    |
| 450                    | 630                    | 800     | 315                  | 8,50    |
| 450                    | 710                    | 880     | 315                  | 9,85    |
| 500                    | 125                    | 250     | 295                  | 2,56    |
| 500                    | 140                    | 270     | 300                  | 2,79    |
| 500                    | 150                    | 280     | 300                  | 2,90    |
| 500                    | 160                    | 290     | 300                  | 3,70    |
| 500                    | 180                    | 310     | 300                  | 3,18    |
| 500                    | 200                    | 345     | 315                  | 3,73    |
| 500                    | 224                    | 370     | 315                  | 3,87    |
| 500                    | 250                    | 395     | 315                  | 4,57    |
| 500                    | 280                    | 435     | 325                  | 4,99    |
| 500                    | 300                    | 455     | 325                  | 5,18    |
| 500                    | 315                    | 470     | 325                  | 5,32    |
| 500                    | 355                    | 520     | 335                  | 5,89    |
| 500                    | 400                    | 565     | 335                  | 6,75    |
| 500                    | 450                    | 615     | 335                  | 7,15    |
| 500                    | 500                    | 670     | 340                  | 7,81    |
| 500                    | 560                    | 730     | 340                  | 8,60    |
| 500                    | 600                    | 770     | 340                  | 9,19    |
| 500                    | 630                    | 800     | 340                  | 9,41    |
| 500                    | 710                    | 880     | 340                  | 11,5    |
| 500                    | 800                    | 970     | 340                  | 11,8    |
| 560                    | 200                    | 345     | 345                  | 4,07    |
| 560                    | 224                    | 370     | 345                  | 4,33    |
| 560                    | 250                    | 395     | 345                  | 5,03    |
| 560                    | 280                    | 435     | 355                  | 5,56    |
| 560                    | 300                    | 455     | 355                  | 5,77    |
| 560                    | 315                    | 470     | 355                  | 5,93    |
| 560                    | 355                    | 520     | 365                  | 6,56    |
| 560                    | 400                    | 565     | 365                  | 7,52    |
| 560                    | 450                    | 615     | 365                  | 8,01    |
| 560                    | 500                    | 670     | 370                  | 8,56    |
| 560                    | 560                    | 730     | 370                  | 9,21    |
| 560                    | 600                    | 770     | 370                  | 9,80    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 560                    | 630                    | 800     | 370                  | 10,3    |
| 560                    | 710                    | 880     | 370                  | 12,1    |
| 560                    | 800                    | 970     | 370                  | 13,7    |
| 560                    | 900                    | 1090    | 370                  | 15,6    |
| 600                    | 200                    | 345     | 365                  | 4,34    |
| 600                    | 224                    | 370     | 365                  | 4,62    |
| 600                    | 250                    | 395     | 365                  | 5,37    |
| 600                    | 280                    | 435     | 375                  | 5,93    |
| 600                    | 300                    | 455     | 375                  | 6,15    |
| 600                    | 315                    | 470     | 375                  | 6,32    |
| 600                    | 355                    | 520     | 385                  | 6,99    |
| 600                    | 400                    | 565     | 385                  | 8,01    |
| 600                    | 450                    | 615     | 385                  | 8,55    |
| 600                    | 500                    | 670     | 390                  | 9,16    |
| 600                    | 560                    | 730     | 390                  | 9,63    |
| 600                    | 600                    | 770     | 390                  | 10,5    |
| 600                    | 630                    | 800     | 390                  | 10,7    |
| 600                    | 710                    | 880     | 390                  | 12,6    |
| 600                    | 800                    | 970     | 390                  | 14,1    |
| 600                    | 900                    | 1090    | 390                  | 16,1    |
| 630                    | 200                    | 355     | 380                  | 4,56    |
| 630                    | 224                    | 380     | 380                  | 4,84    |
| 630                    | 250                    | 405     | 380                  | 5,62    |
| 630                    | 280                    | 445     | 390                  | 6,21    |
| 630                    | 300                    | 465     | 390                  | 6,44    |
| 630                    | 315                    | 480     | 390                  | 6,62    |
| 630                    | 355                    | 530     | 400                  | 7,23    |
| 630                    | 400                    | 575     | 400                  | 8,48    |
| 630                    | 450                    | 625     | 400                  | 8,95    |
| 630                    | 500                    | 680     | 405                  | 9,72    |
| 630                    | 560                    | 740     | 405                  | 10,2    |
| 630                    | 600                    | 780     | 405                  | 10,4    |
| 630                    | 630                    | 810     | 405                  | 10,8    |
| 630                    | 710                    | 890     | 405                  | 12,9    |
| 630                    | 800                    | 980     | 405                  | 14,4    |
| 630                    | 900                    | 1100    | 405                  | 16,4    |
| 630                    | 1000                   | 1200    | 405                  | 18,3    |
| 710                    | 250                    | 455     | 420                  | 6,34    |
| 710                    | 280                    | 495     | 420                  | 7,00    |
| 710                    | 300                    | 515     | 430                  | 7,26    |
| 710                    | 315                    | 530     | 430                  | 7,46    |
| 710                    | 355                    | 580     | 440                  | 8,24    |
| 710                    | 400                    | 625     | 440                  | 9,49    |
| 710                    | 450                    | 675     | 440                  | 10,1    |
| 710                    | 500                    | 730     | 445                  | 10,9    |
| 710                    | 560                    | 790     | 445                  | 11,6    |
| 710                    | 600                    | 830     | 445                  | 12,1    |
| 710                    | 630                    | 860     | 445                  | 12,3    |



## T-piece

TU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 710                    | 710                    | 940     | 445                  | 14,1    |
| 710                    | 800                    | 1030    | 445                  | 15,7    |
| 710                    | 900                    | 1150    | 445                  | 17,8    |
| 710                    | 1000                   | 1250    | 445                  | 19,8    |
| 710                    | 1120                   | 1370    | 445                  | 23,2    |
| 800                    | 250                    | 455     | 465                  | 8,49    |
| 800                    | 280                    | 495     | 475                  | 9,46    |
| 800                    | 300                    | 515     | 475                  | 9,80    |
| 800                    | 315                    | 530     | 475                  | 9,99    |
| 800                    | 355                    | 580     | 485                  | 11,1    |
| 800                    | 400                    | 625     | 485                  | 12,6    |
| 800                    | 450                    | 675     | 485                  | 13,4    |
| 800                    | 500                    | 730     | 490                  | 14,6    |
| 800                    | 560                    | 790     | 490                  | 15,3    |
| 800                    | 600                    | 830     | 490                  | 15,8    |
| 800                    | 630                    | 860     | 490                  | 16,5    |
| 800                    | 710                    | 940     | 490                  | 18,0    |
| 800                    | 800                    | 1030    | 490                  | 19,5    |
| 800                    | 900                    | 1150    | 490                  | 21,5    |
| 800                    | 1000                   | 1250    | 490                  | 22,6    |
| 800                    | 1120                   | 1370    | 490                  | 27,6    |
| 800                    | 1250                   | 1500    | 490                  | 30,8    |
| 900                    | 315                    | 530     | 525                  | 11,5    |
| 900                    | 355                    | 580     | 535                  | 12,8    |
| 900                    | 400                    | 625     | 535                  | 15,0    |
| 900                    | 450                    | 675     | 535                  | 15,7    |
| 900                    | 500                    | 730     | 540                  | 16,9    |
| 900                    | 560                    | 790     | 540                  | 18,2    |
| 900                    | 600                    | 830     | 540                  | 19,0    |
| 900                    | 630                    | 860     | 540                  | 19,6    |
| 900                    | 710                    | 940     | 540                  | 22,2    |
| 900                    | 800                    | 1030    | 540                  | 23,8    |
| 900                    | 900                    | 1150    | 540                  | 26,1    |
| 900                    | 1000                   | 1250    | 540                  | 29,1    |
| 900                    | 1120                   | 1370    | 540                  | 34,1    |
| 900                    | 1250                   | 1500    | 540                  | 38,5    |
| 1000                   | 315                    | 530     | 575                  | 12,7    |
| 1000                   | 355                    | 580     | 585                  | 14,1    |
| 1000                   | 400                    | 625     | 585                  | 16,1    |
| 1000                   | 450                    | 675     | 585                  | 17,3    |
| 1000                   | 500                    | 730     | 590                  | 18,4    |
| 1000                   | 560                    | 790     | 590                  | 20,1    |
| 1000                   | 600                    | 830     | 590                  | 21,0    |
| 1000                   | 630                    | 860     | 590                  | 22,0    |
| 1000                   | 710                    | 940     | 590                  | 24,7    |
| 1000                   | 800                    | 1030    | 590                  | 26,8    |
| 1000                   | 900                    | 1150    | 590                  | 29,1    |
| 1000                   | 1000                   | 1250    | 590                  | 31,8    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 1000                   | 1120                   | 1370    | 590                  | 37,4    |
| 1000                   | 1250                   | 1500    | 590                  | 42,5    |
| 1120                   | 500                    | 730     | 650                  | 20,5    |
| 1120                   | 560                    | 790     | 650                  | 22,3    |
| 1120                   | 600                    | 830     | 650                  | 23,3    |
| 1120                   | 630                    | 860     | 650                  | 24,1    |
| 1120                   | 710                    | 940     | 650                  | 27,5    |
| 1120                   | 800                    | 1030    | 650                  | 29,9    |
| 1120                   | 900                    | 1150    | 650                  | 32,9    |
| 1120                   | 1000                   | 1250    | 650                  | 35,0    |
| 1120                   | 1120                   | 1370    | 650                  | 40,0    |
| 1120                   | 1250                   | 1500    | 650                  | 45,3    |
| 1250                   | 500                    | 730     | 715                  | 22,9    |
| 1250                   | 560                    | 790     | 715                  | 24,6    |
| 1250                   | 600                    | 830     | 715                  | 25,8    |
| 1250                   | 630                    | 860     | 715                  | 26,7    |
| 1250                   | 710                    | 940     | 715                  | 30,4    |
| 1250                   | 800                    | 1030    | 715                  | 33,1    |
| 1250                   | 900                    | 1150    | 715                  | 36,5    |
| 1250                   | 1000                   | 1250    | 715                  | 39,2    |
| 1250                   | 1120                   | 1370    | 715                  | 43,9    |
| 1250                   | 1250                   | 1500    | 715                  | 48,4    |

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# T-piece

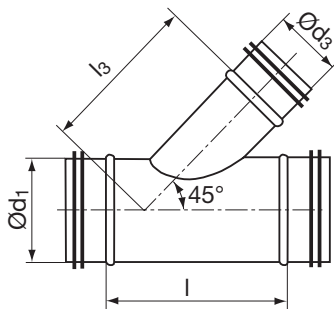
# TVU45°



## Description

As standard the angle is 45°.  
Different angle available to order.

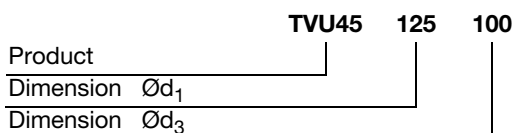
## Dimensions



## Dimensions

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 80                     | 80                     | 250     | 165                  | 0,70    |
| 100                    | 80                     | 250     | 180                  | 0,80    |
| 100                    | 100                    | 280     | 190                  | 1,10    |
| 125                    | 80                     | 250     | 200                  | 0,90    |
| 125                    | 100                    | 280     | 210                  | 1,10    |
| 125                    | 112                    | 300     | 215                  | 1,20    |
| 125                    | 125                    | 315     | 220                  | 1,30    |
| 140                    | 80                     | 280     | 210                  | 1,00    |
| 140                    | 100                    | 305     | 220                  | 1,20    |
| 140                    | 112                    | 320     | 225                  | 1,30    |
| 140                    | 125                    | 340     | 230                  | 1,40    |
| 140                    | 140                    | 365     | 250                  | 1,60    |
| 150                    | 80                     | 280     | 215                  | 1,10    |
| 150                    | 100                    | 305     | 225                  | 1,30    |
| 150                    | 112                    | 320     | 235                  | 1,40    |
| 150                    | 125                    | 340     | 240                  | 1,50    |
| 150                    | 140                    | 365     | 260                  | 1,70    |
| 150                    | 150                    | 380     | 265                  | 1,80    |
| 160                    | 80                     | 280     | 220                  | 1,10    |
| 160                    | 100                    | 305     | 230                  | 1,30    |
| 160                    | 112                    | 320     | 240                  | 1,40    |
| 160                    | 125                    | 340     | 245                  | 1,50    |
| 160                    | 140                    | 365     | 265                  | 1,70    |
| 160                    | 150                    | 380     | 270                  | 1,80    |
| 160                    | 160                    | 390     | 275                  | 1,90    |
| 180                    | 80                     | 280     | 235                  | 1,20    |
| 180                    | 100                    | 305     | 245                  | 1,40    |
| 180                    | 112                    | 320     | 250                  | 1,50    |
| 180                    | 125                    | 340     | 260                  | 1,60    |
| 180                    | 140                    | 365     | 280                  | 1,90    |
| 180                    | 150                    | 380     | 285                  | 2,00    |
| 180                    | 160                    | 390     | 290                  | 2,10    |
| 180                    | 180                    | 420     | 300                  | 2,30    |
| 200                    | 80                     | 280     | 250                  | 1,30    |
| 200                    | 100                    | 305     | 260                  | 1,50    |
| 200                    | 112                    | 320     | 265                  | 1,60    |
| 200                    | 125                    | 340     | 270                  | 1,80    |
| 200                    | 140                    | 365     | 295                  | 2,00    |
| 200                    | 150                    | 380     | 300                  | 2,10    |
| 200                    | 160                    | 390     | 305                  | 2,20    |
| 200                    | 180                    | 420     | 315                  | 2,50    |
| 200                    | 200                    | 450     | 325                  | 2,80    |
| 224                    | 100                    | 305     | 275                  | 1,70    |
| 224                    | 112                    | 320     | 285                  | 1,80    |
| 224                    | 125                    | 340     | 290                  | 1,90    |
| 224                    | 140                    | 365     | 310                  | 2,20    |
| 224                    | 150                    | 380     | 315                  | 2,30    |
| 224                    | 160                    | 390     | 320                  | 2,40    |

## Ordering example





## T-piece

## TVU45°

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 224                    | 180                    | 420     | 330                  | 2,70    |
| 224                    | 200                    | 450     | 340                  | 3,00    |
| 224                    | 224                    | 480     | 350                  | 3,20    |
| 250                    | 100                    | 305     | 295                  | 2,10    |
| 250                    | 112                    | 320     | 300                  | 2,20    |
| 250                    | 125                    | 340     | 310                  | 2,30    |
| 250                    | 140                    | 365     | 330                  | 2,60    |
| 250                    | 150                    | 380     | 335                  | 2,80    |
| 250                    | 160                    | 390     | 340                  | 2,80    |
| 250                    | 180                    | 420     | 350                  | 3,00    |
| 250                    | 200                    | 450     | 360                  | 3,40    |
| 250                    | 224                    | 480     | 370                  | 3,60    |
| 250                    | 250                    | 520     | 385                  | 4,10    |
| 280                    | 112                    | 320     | 320                  | 2,50    |
| 280                    | 125                    | 340     | 330                  | 2,70    |
| 280                    | 140                    | 365     | 350                  | 2,90    |
| 280                    | 150                    | 380     | 355                  | 3,00    |
| 280                    | 160                    | 390     | 360                  | 3,10    |
| 280                    | 180                    | 445     | 370                  | 3,40    |
| 280                    | 200                    | 475     | 380                  | 3,80    |
| 280                    | 224                    | 510     | 390                  | 4,00    |
| 280                    | 250                    | 545     | 405                  | 4,50    |
| 280                    | 280                    | 590     | 435                  | 5,10    |
| 300                    | 125                    | 340     | 350                  | 3,10    |
| 300                    | 140                    | 365     | 365                  | 3,40    |
| 300                    | 150                    | 380     | 370                  | 3,60    |
| 300                    | 160                    | 390     | 375                  | 3,70    |
| 300                    | 180                    | 445     | 385                  | 4,00    |
| 300                    | 200                    | 475     | 395                  | 4,40    |
| 300                    | 224                    | 510     | 405                  | 4,70    |
| 300                    | 250                    | 545     | 420                  | 5,20    |
| 300                    | 280                    | 590     | 450                  | 5,90    |
| 300                    | 300                    | 615     | 460                  | 6,70    |
| 315                    | 100                    | 280     | 343                  | 3,50    |
| 315                    | 125                    | 340     | 360                  | 3,60    |
| 315                    | 140                    | 365     | 375                  | 3,80    |
| 315                    | 150                    | 380     | 380                  | 4,00    |
| 315                    | 160                    | 395     | 385                  | 4,10    |
| 315                    | 180                    | 445     | 395                  | 4,40    |
| 315                    | 200                    | 475     | 405                  | 4,90    |
| 315                    | 224                    | 510     | 415                  | 5,20    |
| 315                    | 250                    | 545     | 430                  | 5,80    |
| 315                    | 280                    | 590     | 460                  | 6,50    |
| 315                    | 300                    | 615     | 470                  | 7,00    |
| 315                    | 315                    | 640     | 480                  | 7,30    |
| 355                    | 100                    | 280     | 371                  | 4,00    |
| 355                    | 125                    | 340     | 388                  | 5,90    |
| 355                    | 150                    | 380     | 410                  | 4,40    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 355                    | 160                    | 395     | 415                  | 4,50    |
| 355                    | 180                    | 445     | 425                  | 4,80    |
| 355                    | 200                    | 475     | 435                  | 5,40    |
| 355                    | 224                    | 510     | 445                  | 5,60    |
| 355                    | 250                    | 545     | 460                  | 6,30    |
| 355                    | 280                    | 590     | 490                  | 7,10    |
| 355                    | 300                    | 615     | 500                  | 7,50    |
| 355                    | 315                    | 640     | 505                  | 7,80    |
| 355                    | 355                    | 695     | 525                  | 8,80    |
| 400                    | 100                    | 280     | 403                  | 5,90    |
| 400                    | 125                    | 340     | 420                  | 6,10    |
| 400                    | 160                    | 395     | 445                  | 5,30    |
| 400                    | 180                    | 445     | 455                  | 5,60    |
| 400                    | 200                    | 475     | 465                  | 6,20    |
| 400                    | 224                    | 510     | 475                  | 6,50    |
| 400                    | 250                    | 545     | 490                  | 7,10    |
| 400                    | 280                    | 590     | 520                  | 8,00    |
| 400                    | 300                    | 615     | 530                  | 8,50    |
| 400                    | 315                    | 640     | 535                  | 8,80    |
| 400                    | 355                    | 695     | 555                  | 9,80    |
| 400                    | 400                    | 760     | 580                  | 11,2    |
| 450                    | 180                    | 445     | 490                  | 6,30    |
| 450                    | 200                    | 475     | 500                  | 6,90    |
| 450                    | 224                    | 510     | 510                  | 7,20    |
| 450                    | 250                    | 545     | 525                  | 7,90    |
| 450                    | 280                    | 590     | 555                  | 8,70    |
| 450                    | 300                    | 615     | 565                  | 9,20    |
| 450                    | 315                    | 640     | 570                  | 9,60    |
| 450                    | 355                    | 695     | 590                  | 10,6    |
| 450                    | 400                    | 760     | 615                  | 12,1    |
| 450                    | 450                    | 830     | 640                  | 13,5    |
| 500                    | 200                    | 475     | 535                  | 7,50    |
| 500                    | 224                    | 510     | 550                  | 7,80    |
| 500                    | 250                    | 545     | 560                  | 8,60    |
| 500                    | 280                    | 590     | 560                  | 9,50    |
| 500                    | 300                    | 615     | 600                  | 10,0    |
| 500                    | 315                    | 640     | 610                  | 10,4    |
| 500                    | 355                    | 695     | 630                  | 11,5    |
| 500                    | 400                    | 760     | 650                  | 13,0    |
| 500                    | 450                    | 830     | 675                  | 14,5    |
| 500                    | 500                    | 900     | 700                  | 16,1    |
| 560                    | 224                    | 510     | 590                  | 9,20    |
| 560                    | 250                    | 600     | 605                  | 10,0    |
| 560                    | 280                    | 640     | 630                  | 10,8    |
| 560                    | 300                    | 665     | 640                  | 11,4    |
| 560                    | 315                    | 690     | 650                  | 11,8    |
| 560                    | 355                    | 750     | 670                  | 13,0    |
| 560                    | 400                    | 810     | 690                  | 14,5    |

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## T-piece

TVU45°

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 560                    | 450                    | 880     | 715                  | 16,1    |
| 560                    | 500                    | 950     | 740                  | 17,8    |
| 560                    | 560                    | 1040    | 800                  | 20,4    |
| 600                    | 250                    | 600     | 630                  | 11,5    |
| 600                    | 280                    | 640     | 655                  | 12,5    |
| 600                    | 300                    | 665     | 665                  | 13,1    |
| 600                    | 315                    | 690     | 675                  | 13,6    |
| 600                    | 355                    | 750     | 695                  | 15,1    |
| 600                    | 400                    | 810     | 715                  | 16,7    |
| 600                    | 450                    | 880     | 740                  | 18,4    |
| 600                    | 500                    | 950     | 765                  | 20,5    |
| 600                    | 560                    | 1040    | 825                  | 23,4    |
| 600                    | 600                    | 1090    | 850                  | 25,8    |
| 630                    | 280                    | 640     | 680                  | 14,0    |
| 630                    | 300                    | 665     | 690                  | 14,6    |
| 630                    | 315                    | 690     | 700                  | 15,1    |
| 630                    | 355                    | 750     | 720                  | 16,8    |
| 630                    | 400                    | 810     | 740                  | 18,7    |
| 630                    | 450                    | 880     | 765                  | 20,6    |
| 630                    | 500                    | 950     | 790                  | 22,7    |
| 630                    | 560                    | 1040    | 850                  | 25,8    |
| 630                    | 600                    | 1090    | 870                  | 27,8    |
| 630                    | 630                    | 1140    | 885                  | 29,2    |
| 710                    | 300                    | 665     | 745                  | 16,9    |
| 710                    | 315                    | 690     | 755                  | 17,4    |
| 710                    | 355                    | 750     | 775                  | 19,1    |
| 710                    | 400                    | 810     | 800                  | 21,0    |
| 710                    | 450                    | 880     | 825                  | 23,2    |
| 710                    | 500                    | 950     | 850                  | 25,4    |
| 710                    | 560                    | 1040    | 905                  | 28,6    |
| 710                    | 600                    | 1090    | 925                  | 30,6    |
| 710                    | 630                    | 1140    | 940                  | 32,2    |
| 710                    | 710                    | 1250    | 980                  | 36,7    |
| 800                    | 315                    | 690     | 820                  | 19,2    |
| 800                    | 355                    | 750     | 840                  | 21,0    |
| 800                    | 400                    | 810     | 860                  | 23,1    |
| 800                    | 450                    | 880     | 885                  | 25,4    |
| 800                    | 500                    | 950     | 910                  | 27,7    |
| 800                    | 560                    | 1040    | 970                  | 31,2    |
| 800                    | 600                    | 1090    | 990                  | 33,9    |
| 800                    | 630                    | 1140    | 1005                 | 34,9    |
| 800                    | 710                    | 1250    | 1045                 | 39,6    |
| 800                    | 800                    | 1380    | 1090                 | 45,0    |
| 900                    | 355                    | 750     | 910                  | 26,2    |
| 900                    | 400                    | 810     | 935                  | 28,8    |
| 900                    | 450                    | 880     | 960                  | 31,5    |
| 900                    | 500                    | 950     | 985                  | 34,4    |
| 900                    | 560                    | 1040    | 1040                 | 38,6    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 900                    | 600                    | 1090    | 1060                 | 41,1    |
| 900                    | 630                    | 1140    | 1075                 | 43,1    |
| 900                    | 710                    | 1250    | 1115                 | 48,7    |
| 900                    | 800                    | 1380    | 1160                 | 55,2    |
| 900                    | 900                    | 1520    | 1210                 | 62,7    |
| 1000                   | 400                    | 810     | 1005                 | 31,5    |
| 1000                   | 450                    | 880     | 1030                 | 34,4    |
| 1000                   | 500                    | 950     | 1055                 | 37,5    |
| 1000                   | 560                    | 1040    | 1110                 | 41,8    |
| 1000                   | 600                    | 1090    | 1130                 | 44,5    |
| 1000                   | 630                    | 1140    | 1145                 | 46,5    |
| 1000                   | 710                    | 1250    | 1185                 | 52,5    |
| 1000                   | 800                    | 1380    | 1230                 | 59,3    |
| 1000                   | 900                    | 1520    | 1280                 | 67,2    |
| 1000                   | 1000                   | 1660    | 1330                 | 75,5    |
| 1120                   | 500                    | 1005    | 1140                 | 49,0    |
| 1120                   | 560                    | 1090    | 1195                 | 54,3    |
| 1120                   | 600                    | 1140    | 1215                 | 57,4    |
| 1120                   | 630                    | 1190    | 1230                 | 60,0    |
| 1120                   | 710                    | 1305    | 1270                 | 67,1    |
| 1120                   | 800                    | 1430    | 1315                 | 75,2    |
| 1120                   | 900                    | 1570    | 1365                 | 84,6    |
| 1120                   | 1000                   | 1710    | 1415                 | 94,7    |
| 1120                   | 1120                   | 1880    | 1505                 | 109     |
| 1250                   | 500                    | 1005    | 1230                 | 53,6    |
| 1250                   | 560                    | 1090    | 1290                 | 59,3    |
| 1250                   | 600                    | 1140    | 1310                 | 62,8    |
| 1250                   | 630                    | 1190    | 1325                 | 65,4    |
| 1250                   | 710                    | 1305    | 1365                 | 73,0    |
| 1250                   | 800                    | 1430    | 1410                 | 81,5    |
| 1250                   | 900                    | 1570    | 1460                 | 91,5    |
| 1250                   | 1000                   | 1710    | 1510                 | 101     |
| 1250                   | 1120                   | 1880    | 1595                 | 117     |
| 1250                   | 1250                   | 2065    | 1660                 | 132     |



# X-piece

# XCU

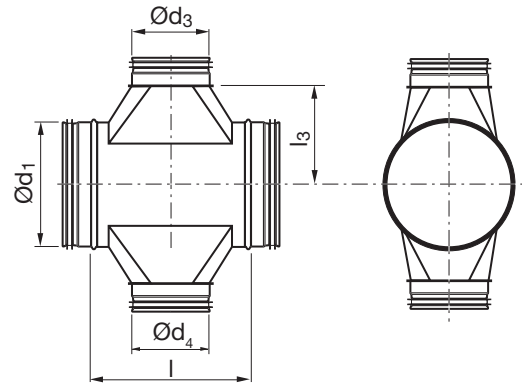


## Description

Centric –

- fully pressed or
- with saddle PSU or
- with hand made T-piece TSTCU

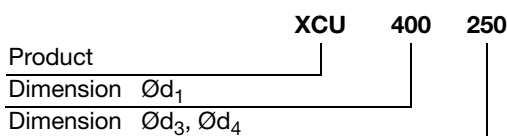
## Dimensions



Centric – fully pressed

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 63 *                   | 63                                      | 125     | 42                   | 0,38    |
| 80 *                   | 63                                      | 125     | 50                   | 0,31    |
| 80 *                   | 80                                      | 140     | 52                   | 0,36    |
| 100 *                  | 63                                      | 125     | 60                   | 0,35    |
| 100 *                  | 80                                      | 126     | 65                   | 0,43    |
| 100                    | 100                                     | 130     | 65                   | 0,37    |
| 112                    | 63                                      | 125     | 66                   | 0,68    |
| 112                    | 80                                      | 140     | 68                   | 0,73    |
| 112                    | 100                                     | 175     | 71                   | 0,77    |
| 112                    | 112                                     | 225     | 100                  | 0,80    |
| 125 *                  | 63                                      | 125     | 73                   | 0,44    |
| 125 *                  | 80                                      | 146     | 75                   | 0,51    |
| 125 *                  | 100                                     | 175     | 78                   | 0,45    |
| 125                    | 112                                     | 225     | 110                  | 0,77    |
| 125                    | 125                                     | 165     | 83                   | 0,57    |
| 140                    | 63                                      | 178     | 115                  | 0,79    |
| 140                    | 80                                      | 140     | 82                   | 0,79    |
| 140                    | 100                                     | 175     | 85                   | 0,86    |
| 140                    | 112                                     | 225     | 115                  | 0,88    |
| 140                    | 125                                     | 240     | 115                  | 0,92    |
| 140                    | 140                                     | 230     | 90                   | 0,99    |
| 150                    | 63                                      | 178     | 120                  | 0,67    |
| 150                    | 80                                      | 140     | 87                   | 0,77    |
| 150                    | 100                                     | 175     | 90                   | 0,86    |
| 150                    | 112                                     | 225     | 120                  | 0,90    |
| 150                    | 125                                     | 215     | 95                   | 0,96    |
| 150                    | 140                                     | 230     | 95                   | 1,03    |
| 150                    | 150                                     | 260     | 95                   | 1,08    |
| 160 *                  | 63                                      | 178     | 125                  | 0,62    |
| 160 *                  | 80                                      | 140     | 92                   | 0,59    |
| 160 *                  | 100                                     | 175     | 95                   | 0,91    |
| 160                    | 112                                     | 225     | 125                  | 0,89    |
| 160 *                  | 125                                     | 215     | 100                  | 0,91    |

## Ordering example





## X-piece

XCU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 160                    | 140                                     | 230     | 100                  | 1,05    |
| 160                    | 150                                     | 260     | 100                  | 1,08    |
| 160                    | 160                                     | 209     | 105                  | 0,67    |
| 180                    | 63                                      | 178     | 135                  | 0,79    |
| 180                    | 80                                      | 140     | 102                  | 0,88    |
| 180                    | 100                                     | 175     | 105                  | 0,97    |
| 180                    | 112                                     | 225     | 135                  | 1,01    |
| 180                    | 125                                     | 215     | 110                  | 1,08    |
| 180                    | 140                                     | 230     | 110                  | 1,18    |
| 180                    | 150                                     | 260     | 110                  | 1,21    |
| 180                    | 160                                     | 260     | 115                  | 1,26    |
| 180                    | 180                                     | 285     | 115                  | 1,33    |
| 200 **                 | 63                                      | 178     | 145                  | 0,83    |
| 200 *                  | 80                                      | 140     | 112                  | 0,77    |
| 200 *                  | 100                                     | 175     | 115                  | 0,88    |
| 200                    | 112                                     | 200     | 145                  | 1,05    |
| 200 *                  | 125                                     | 215     | 115                  | 1,02    |
| 200                    | 140                                     | 230     | 120                  | 1,22    |
| 200                    | 150                                     | 260     | 120                  | 1,26    |
| 200 *                  | 160                                     | 260     | 125                  | 0,77    |
| 200                    | 180                                     | 285     | 125                  | 1,36    |
| 200                    | 200                                     | 249     | 125                  | 1,70    |
| 224                    | 63                                      | 178     | 160                  | 0,91    |
| 224                    | 80                                      | 140     | 124                  | 0,99    |
| 224                    | 100                                     | 175     | 127                  | 1,09    |
| 224                    | 112                                     | 200     | 160                  | 1,14    |
| 224                    | 125                                     | 215     | 132                  | 1,22    |
| 224                    | 140                                     | 230     | 132                  | 1,33    |
| 224                    | 150                                     | 260     | 132                  | 1,38    |
| 224                    | 160                                     | 260     | 137                  | 1,42    |
| 224                    | 180                                     | 285     | 137                  | 1,50    |
| 224                    | 200                                     | 346     | 137                  | 1,81    |
| 224                    | 224                                     | 346     | 137                  | 1,83    |
| 250 **                 | 63                                      | 178     | 170                  | 0,99    |
| 250 *                  | 80                                      | 156     | 137                  | 1,13    |
| 250 *                  | 100                                     | 175     | 140                  | 1,22    |
| 250                    | 112                                     | 200     | 170                  | 1,24    |
| 250 *                  | 125                                     | 220     | 145                  | 1,48    |
| 250                    | 140                                     | 230     | 145                  | 1,45    |
| 250                    | 150                                     | 255     | 145                  | 1,50    |
| 250 *                  | 160                                     | 256     | 150                  | 1,58    |
| 250                    | 180                                     | 306     | 150                  | 1,65    |
| 250 *                  | 200                                     | 306     | 150                  | 1,78    |
| 250                    | 224                                     | 350     | 150                  | 1,98    |
| 250                    | 250                                     | 296     | 150                  | 1,78    |
| 280                    | 80                                      | 156     | 152                  | 1,20    |
| 280                    | 100                                     | 175     | 155                  | 1,31    |
| 280                    | 112                                     | 200     | 185                  | 1,37    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 280                    | 125                                     | 220     | 160                  | 1,46    |
| 280                    | 140                                     | 230     | 160                  | 1,59    |
| 280                    | 150                                     | 255     | 160                  | 1,65    |
| 280                    | 160                                     | 256     | 165                  | 1,71    |
| 280                    | 180                                     | 306     | 165                  | 1,81    |
| 280                    | 200                                     | 306     | 165                  | 2,08    |
| 280                    | 224                                     | 350     | 165                  | 2,19    |
| 280                    | 250                                     | 385     | 205                  | 2,57    |
| 280                    | 280                                     | 425     | 215                  | 2,86    |
| 300                    | 80                                      | 156     | 162                  | 1,29    |
| 300                    | 100                                     | 175     | 165                  | 1,38    |
| 300                    | 112                                     | 200     | 195                  | 1,47    |
| 300                    | 125                                     | 220     | 170                  | 1,53    |
| 300                    | 140                                     | 230     | 170                  | 1,66    |
| 300                    | 150                                     | 255     | 170                  | 1,76    |
| 300                    | 160                                     | 256     | 175                  | 1,82    |
| 300                    | 180                                     | 306     | 175                  | 1,93    |
| 300                    | 200                                     | 306     | 175                  | 2,27    |
| 300                    | 224                                     | 350     | 175                  | 2,34    |
| 300                    | 250                                     | 350     | 175                  | 2,75    |
| 300                    | 280                                     | 425     | 225                  | 2,95    |
| 300                    | 300                                     | 445     | 225                  | 3,12    |
| 315 *                  | 80                                      | 156     | 170                  | 1,43    |
| 315 *                  | 100                                     | 175     | 173                  | 1,50    |
| 315                    | 112                                     | 200     | 205                  | 1,49    |
| 315 *                  | 125                                     | 220     | 178                  | 1,76    |
| 315                    | 140                                     | 230     | 178                  | 1,81    |
| 315                    | 150                                     | 255     | 178                  | 1,90    |
| 315 *                  | 160                                     | 256     | 182                  | 1,96    |
| 315                    | 180                                     | 306     | 182                  | 2,13    |
| 315 *                  | 200                                     | 306     | 182                  | 2,14    |
| 315                    | 224                                     | 350     | 182                  | 2,61    |
| 315 *                  | 250                                     | 350     | 182                  | 2,59    |
| 315                    | 280                                     | 435     | 235                  | 3,26    |
| 315                    | 300                                     | 430     | 182                  | 3,26    |
| 315                    | 315                                     | 363     | 182                  | 3,73    |
| 355                    | 100                                     | 175     | 193                  | 1,74    |
| 355                    | 112                                     | 200     | 225                  | 1,85    |
| 355                    | 125                                     | 220     | 198                  | 2,03    |
| 355                    | 140                                     | 230     | 198                  | 2,29    |
| 355                    | 150                                     | 255     | 198                  | 2,40    |
| 355                    | 160                                     | 256     | 203                  | 2,50    |
| 355                    | 180                                     | 306     | 203                  | 2,71    |
| 355                    | 200                                     | 306     | 203                  | 3,15    |
| 355                    | 224                                     | 350     | 203                  | 3,37    |
| 355                    | 250                                     | 350     | 203                  | 3,96    |
| 355                    | 280                                     | 435     | 245                  | 4,33    |
| 355                    | 300                                     | 430     | 203                  | 4,43    |



## X-piece

## XCU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 355                    | 315                                     | 470     | 255                  | 4,48    |
| 355                    | 355                                     | 520     | 265                  | 5,09    |
| 400 *                  | 100                                     | 175     | 215                  | 2,27    |
| 400                    | 112                                     | 200     | 245                  | 2,05    |
| 400 *                  | 125                                     | 225     | 220                  | 2,81    |
| 400                    | 140                                     | 270     | 250                  | 2,47    |
| 400                    | 150                                     | 255     | 220                  | 2,60    |
| 400 *                  | 160                                     | 266     | 225                  | 3,02    |
| 400                    | 180                                     | 310     | 250                  | 2,95    |
| 400 *                  | 200                                     | 300     | 225                  | 3,37    |
| 400                    | 224                                     | 350     | 225                  | 3,71    |
| 400 *                  | 250                                     | 350     | 225                  | 3,79    |
| 400                    | 280                                     | 435     | 275                  | 4,68    |
| 400                    | 300                                     | 430     | 225                  | 4,97    |
| 400 *                  | 315                                     | 415     | 225                  | 4,42    |
| 400                    | 355                                     | 470     | 225                  | 5,42    |
| 400 *                  | 400                                     | 510     | 225                  | 6,20    |
| 450                    | 125                                     | 225     | 245                  | 2,30    |
| 450                    | 140                                     | 270     | 275                  | 2,62    |
| 450                    | 150                                     | 255     | 245                  | 2,76    |
| 450                    | 160                                     | 266     | 250                  | 2,90    |
| 450                    | 180                                     | 310     | 275                  | 3,17    |
| 450                    | 200                                     | 300     | 250                  | 3,75    |
| 450                    | 224                                     | 350     | 250                  | 4,06    |
| 450                    | 250                                     | 350     | 250                  | 4,79    |
| 450                    | 280                                     | 435     | 300                  | 5,33    |
| 450                    | 300                                     | 430     | 250                  | 5,54    |
| 450                    | 315                                     | 415     | 250                  | 5,68    |
| 450                    | 355                                     | 525     | 310                  | 6,19    |
| 450                    | 400                                     | 510     | 250                  | 6,96    |
| 450                    | 450                                     | 615     | 310                  | 7,08    |
| 500 *                  | 125                                     | 225     | 270                  | 3,35    |
| 500                    | 140                                     | 270     | 300                  | 2,91    |
| 500                    | 150                                     | 255     | 270                  | 3,04    |
| 500 *                  | 160                                     | 266     | 275                  | 3,77    |
| 500                    | 180                                     | 310     | 300                  | 3,35    |
| 500 *                  | 200                                     | 300     | 275                  | 4,14    |
| 500                    | 224                                     | 350     | 275                  | 4,12    |
| 500 *                  | 250                                     | 350     | 275                  | 4,68    |
| 500                    | 280                                     | 435     | 325                  | 5,42    |
| 500                    | 300                                     | 430     | 275                  | 5,64    |
| 500 *                  | 315                                     | 415     | 275                  | 5,30    |
| 500                    | 355                                     | 470     | 275                  | 6,45    |
| 500 *                  | 400                                     | 510     | 275                  | 6,34    |
| 500                    | 450                                     | 615     | 335                  | 7,86    |
| 500 **                 | 500                                     | 670     | 340                  | 8,69    |
| 560                    | 200                                     | 300     | 305                  | 4,30    |
| 560                    | 224                                     | 350     | 305                  | 4,59    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 560                    | 250                                     | 350     | 305                  | 5,41    |
| 560                    | 280                                     | 435     | 355                  | 6,01    |
| 560                    | 300                                     | 430     | 305                  | 6,25    |
| 560                    | 315                                     | 415     | 305                  | 6,43    |
| 560                    | 355                                     | 520     | 365                  | 7,15    |
| 560                    | 400                                     | 510     | 305                  | 8,28    |
| 560                    | 450                                     | 615     | 365                  | 8,82    |
| 560                    | 500                                     | 670     | 370                  | 9,35    |
| 560                    | 560                                     | 730     | 370                  | 10,1    |
| 600                    | 200                                     | 300     | 325                  | 4,59    |
| 600                    | 224                                     | 350     | 325                  | 4,98    |
| 600                    | 250                                     | 350     | 325                  | 5,75    |
| 600                    | 280                                     | 430     | 325                  | 6,38    |
| 600                    | 300                                     | 430     | 325                  | 6,64    |
| 600                    | 315                                     | 415     | 325                  | 6,83    |
| 600                    | 355                                     | 510     | 325                  | 7,59    |
| 600                    | 400                                     | 510     | 325                  | 8,78    |
| 600                    | 450                                     | 615     | 385                  | 9,38    |
| 600                    | 500                                     | 670     | 390                  | 10,0    |
| 600                    | 560                                     | 730     | 390                  | 10,4    |
| 600                    | 600                                     | 770     | 390                  | 11,7    |
| 630 *                  | 200                                     | 300     | 340                  | 5,35    |
| 630                    | 224                                     | 350     | 340                  | 5,12    |
| 630 *                  | 250                                     | 350     | 340                  | 6,00    |
| 630                    | 280                                     | 445     | 390                  | 6,67    |
| 630                    | 300                                     | 430     | 340                  | 6,93    |
| 630 *                  | 315                                     | 415     | 340                  | 6,77    |
| 630                    | 355                                     | 530     | 400                  | 7,74    |
| 630 *                  | 400                                     | 510     | 340                  | 7,69    |
| 630                    | 450                                     | 625     | 400                  | 9,78    |
| 630 **                 | 500                                     | 680     | 405                  | 10,7    |
| 630                    | 560                                     | 740     | 405                  | 11,0    |
| 630                    | 600                                     | 780     | 405                  | 11,1    |
| 630 **                 | 630                                     | 810     | 405                  | 11,6    |
| 710                    | 250                                     | 455     | 420                  | 6,78    |
| 710                    | 280                                     | 495     | 420                  | 7,52    |
| 710                    | 300                                     | 515     | 430                  | 7,82    |
| 710                    | 315                                     | 530     | 430                  | 8,05    |
| 710                    | 355                                     | 580     | 440                  | 8,91    |
| 710                    | 400                                     | 625     | 440                  | 10,4    |
| 710                    | 450                                     | 675     | 440                  | 11,1    |
| 710                    | 500                                     | 730     | 445                  | 12,0    |
| 710                    | 560                                     | 790     | 445                  | 12,7    |
| 710                    | 600                                     | 830     | 445                  | 13,2    |
| 710                    | 630                                     | 860     | 445                  | 13,4    |
| 710                    | 710                                     | 940     | 445                  | 15,5    |
| 800 **                 | 250                                     | 455     | 465                  | 7,08    |
| 800                    | 280                                     | 495     | 475                  | 8,10    |

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## X-piece

## XCU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 800                    | 300                                     | 515     | 475                  | 8,42    |
| 800 **                 | 315                                     | 530     | 475                  | 8,54    |
| 800                    | 355                                     | 580     | 485                  | 9,60    |
| 800 **                 | 400                                     | 625     | 485                  | 11,1    |
| 800                    | 450                                     | 675     | 485                  | 11,9    |
| 800 **                 | 500                                     | 730     | 490                  | 13,3    |
| 800                    | 560                                     | 790     | 490                  | 13,7    |
| 800                    | 600                                     | 830     | 490                  | 14,2    |
| 800 **                 | 630                                     | 860     | 490                  | 15,2    |
| 800                    | 710                                     | 940     | 490                  | 16,3    |
| 800 **                 | 800                                     | 1030    | 490                  | 17,9    |
| 900                    | 315                                     | 530     | 525                  | 11,9    |
| 900                    | 355                                     | 580     | 535                  | 13,2    |
| 900                    | 400                                     | 625     | 535                  | 16,0    |
| 900                    | 450                                     | 675     | 535                  | 16,5    |
| 900                    | 500                                     | 730     | 540                  | 17,9    |
| 900                    | 560                                     | 790     | 540                  | 19,2    |
| 900                    | 600                                     | 830     | 540                  | 20,1    |
| 900                    | 630                                     | 860     | 540                  | 20,7    |
| 900                    | 710                                     | 940     | 540                  | 23,7    |
| 900                    | 800                                     | 1030    | 540                  | 25,1    |
| 900                    | 900                                     | 1150    | 540                  | 27,8    |
| 1000 **                | 315                                     | 530     | 575                  | 13,0    |
| 1000                   | 355                                     | 580     | 585                  | 14,3    |
| 1000 **                | 400                                     | 625     | 585                  | 16,6    |
| 1000                   | 450                                     | 675     | 585                  | 17,9    |
| 1000 **                | 500                                     | 730     | 590                  | 19,0    |
| 1000                   | 560                                     | 790     | 590                  | 21,0    |
| 1000                   | 600                                     | 830     | 590                  | 22,1    |
| 1000 **                | 630                                     | 860     | 590                  | 23,4    |
| 1000                   | 710                                     | 940     | 590                  | 26,4    |
| 1000 **                | 800                                     | 1030    | 590                  | 28,5    |
| 1000                   | 900                                     | 1150    | 590                  | 31,0    |
| 1000 **                | 1000                                    | 1250    | 590                  | 34,3    |
| 1120                   | 500                                     | 730     | 650                  | 21,4    |
| 1120                   | 560                                     | 790     | 650                  | 23,1    |
| 1120                   | 600                                     | 830     | 650                  | 24,3    |
| 1120                   | 630                                     | 860     | 650                  | 25,2    |
| 1120                   | 710                                     | 940     | 650                  | 29,1    |
| 1120                   | 800                                     | 1030    | 650                  | 31,7    |
| 1120                   | 900                                     | 1150    | 650                  | 35,4    |
| 1120                   | 1000                                    | 1250    | 650                  | 37,3    |
| 1120                   | 1120                                    | 1370    | 650                  | 43,5    |
| 1250 **                | 500                                     | 730     | 715                  | 23,4    |
| 1250                   | 560                                     | 790     | 715                  | 25,3    |
| 1250                   | 600                                     | 830     | 715                  | 26,6    |
| 1250 **                | 630                                     | 860     | 715                  | 27,6    |
| 1250                   | 710                                     | 940     | 715                  | 31,9    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 1250 **                | 800                                     | 1030    | 715                  | 34,9    |
| 1250                   | 900                                     | 1150    | 715                  | 39,1    |
| 1250 **                | 1000                                    | 1250    | 715                  | 41,9    |
| 1250                   | 1120                                    | 1370    | 715                  | 47,1    |
| 1250 **                | 1250                                    | 1500    | 715                  | 52,6    |



# X-piece

XU

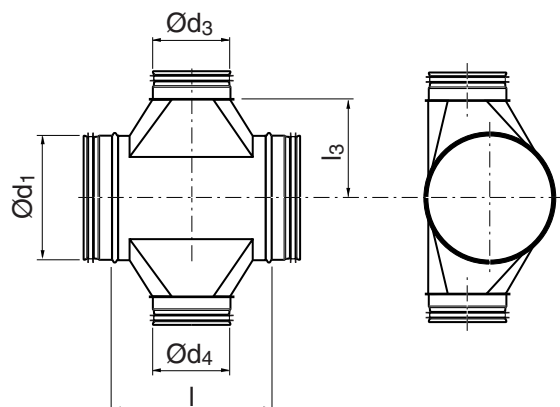


## Description

Tangential –

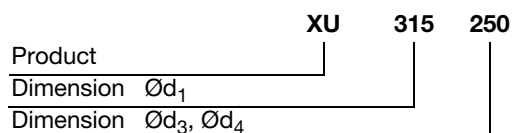
- with hand made T-piece TSTU

## Dimensions



| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 80                     | 63                                      | 178     | 85                   | 0,46    |
| 100                    | 63                                      | 178     | 95                   | 0,54    |
| 100                    | 80                                      | 195     | 95                   | 0,58    |
| 112                    | 63                                      | 178     | 100                  | 0,68    |
| 112                    | 80                                      | 195     | 100                  | 0,73    |
| 112                    | 100                                     | 215     | 100                  | 0,77    |
| 125                    | 63                                      | 178     | 110                  | 0,65    |
| 125                    | 80                                      | 195     | 110                  | 0,70    |
| 125                    | 100                                     | 215     | 110                  | 0,75    |
| 125                    | 112                                     | 225     | 110                  | 0,77    |
| 140                    | 63                                      | 178     | 115                  | 0,79    |
| 140                    | 80                                      | 195     | 115                  | 0,79    |
| 140                    | 100                                     | 215     | 115                  | 0,86    |
| 140                    | 112                                     | 225     | 115                  | 0,88    |
| 140                    | 125                                     | 240     | 115                  | 0,92    |
| 150                    | 63                                      | 178     | 120                  | 0,67    |
| 150                    | 80                                      | 195     | 120                  | 0,77    |
| 150                    | 100                                     | 215     | 120                  | 0,86    |
| 150                    | 112                                     | 225     | 120                  | 0,90    |
| 150                    | 125                                     | 240     | 120                  | 0,96    |
| 150                    | 140                                     | 260     | 125                  | 1,03    |
| 160                    | 63                                      | 178     | 125                  | 0,62    |
| 160                    | 80                                      | 195     | 125                  | 0,72    |
| 160                    | 100                                     | 215     | 125                  | 0,82    |
| 160                    | 112                                     | 225     | 125                  | 0,89    |
| 160                    | 125                                     | 240     | 125                  | 0,97    |
| 160                    | 140                                     | 260     | 130                  | 1,05    |
| 160                    | 150                                     | 270     | 130                  | 1,08    |
| 180                    | 63                                      | 178     | 135                  | 0,79    |
| 180                    | 80                                      | 195     | 135                  | 0,88    |
| 180                    | 100                                     | 215     | 135                  | 0,97    |
| 180                    | 112                                     | 225     | 135                  | 1,01    |
| 180                    | 125                                     | 240     | 135                  | 1,08    |

## Ordering example







## X-piece

XU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 180                    | 140                                     | 260     | 140                  | 1,18    |
| 180                    | 150                                     | 270     | 140                  | 1,21    |
| 180                    | 160                                     | 280     | 140                  | 1,26    |
| 200                    | 63                                      | 178     | 145                  | 0,83    |
| 200                    | 80                                      | 195     | 145                  | 0,91    |
| 200                    | 100                                     | 215     | 145                  | 1,00    |
| 200                    | 112                                     | 225     | 145                  | 1,05    |
| 200                    | 125                                     | 240     | 145                  | 1,11    |
| 200                    | 140                                     | 260     | 150                  | 1,22    |
| 200                    | 150                                     | 270     | 150                  | 1,26    |
| 200                    | 160                                     | 280     | 150                  | 1,30    |
| 200                    | 180                                     | 300     | 150                  | 1,36    |
| 224                    | 63                                      | 178     | 160                  | 0,91    |
| 224                    | 80                                      | 195     | 160                  | 0,99    |
| 224                    | 100                                     | 215     | 160                  | 1,09    |
| 224                    | 112                                     | 225     | 160                  | 1,14    |
| 224                    | 125                                     | 240     | 160                  | 1,22    |
| 224                    | 140                                     | 260     | 165                  | 1,33    |
| 224                    | 150                                     | 270     | 165                  | 1,38    |
| 224                    | 160                                     | 280     | 165                  | 1,42    |
| 224                    | 180                                     | 300     | 165                  | 1,50    |
| 224                    | 200                                     | 335     | 180                  | 1,81    |
| 250                    | 63                                      | 178     | 170                  | 0,99    |
| 250                    | 80                                      | 195     | 170                  | 1,08    |
| 250                    | 100                                     | 215     | 170                  | 1,19    |
| 250                    | 112                                     | 225     | 170                  | 1,24    |
| 250                    | 125                                     | 240     | 170                  | 1,31    |
| 250                    | 140                                     | 260     | 175                  | 1,45    |
| 250                    | 150                                     | 270     | 175                  | 1,50    |
| 250                    | 160                                     | 280     | 175                  | 1,55    |
| 250                    | 180                                     | 300     | 175                  | 1,65    |
| 250                    | 200                                     | 335     | 190                  | 1,95    |
| 250                    | 224                                     | 360     | 190                  | 1,98    |
| 280                    | 80                                      | 195     | 185                  | 1,20    |
| 280                    | 100                                     | 215     | 185                  | 1,31    |
| 280                    | 112                                     | 225     | 185                  | 1,37    |
| 280                    | 125                                     | 240     | 185                  | 1,46    |
| 280                    | 140                                     | 260     | 190                  | 1,59    |
| 280                    | 150                                     | 270     | 190                  | 1,65    |
| 280                    | 160                                     | 280     | 190                  | 1,71    |
| 280                    | 180                                     | 300     | 190                  | 1,81    |
| 280                    | 200                                     | 335     | 205                  | 2,08    |
| 280                    | 224                                     | 360     | 205                  | 2,19    |
| 280                    | 250                                     | 385     | 205                  | 2,57    |
| 300                    | 80                                      | 195     | 195                  | 1,29    |
| 300                    | 100                                     | 215     | 195                  | 1,38    |
| 300                    | 112                                     | 225     | 195                  | 1,47    |
| 300                    | 125                                     | 240     | 195                  | 1,53    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 300                    | 140                                     | 260     | 200                  | 1,66    |
| 300                    | 150                                     | 270     | 200                  | 1,76    |
| 300                    | 160                                     | 280     | 200                  | 1,82    |
| 300                    | 180                                     | 300     | 200                  | 1,93    |
| 300                    | 200                                     | 335     | 215                  | 2,27    |
| 300                    | 224                                     | 360     | 215                  | 2,34    |
| 300                    | 250                                     | 385     | 215                  | 2,75    |
| 300                    | 280                                     | 425     | 225                  | 2,95    |
| 315                    | 80                                      | 205     | 205                  | 1,31    |
| 315                    | 100                                     | 225     | 205                  | 1,44    |
| 315                    | 112                                     | 235     | 205                  | 1,49    |
| 315                    | 125                                     | 250     | 205                  | 1,59    |
| 315                    | 140                                     | 270     | 210                  | 1,81    |
| 315                    | 150                                     | 280     | 210                  | 1,90    |
| 315                    | 160                                     | 290     | 210                  | 1,91    |
| 315                    | 180                                     | 310     | 210                  | 2,13    |
| 315                    | 200                                     | 345     | 225                  | 2,35    |
| 315                    | 224                                     | 370     | 225                  | 2,61    |
| 315                    | 250                                     | 395     | 225                  | 2,97    |
| 315                    | 280                                     | 435     | 235                  | 3,26    |
| 315                    | 300                                     | 455     | 235                  | 3,26    |
| 355                    | 100                                     | 225     | 250                  | 1,74    |
| 355                    | 112                                     | 235     | 250                  | 1,85    |
| 355                    | 125                                     | 250     | 250                  | 2,03    |
| 355                    | 140                                     | 270     | 230                  | 2,29    |
| 355                    | 150                                     | 280     | 230                  | 2,40    |
| 355                    | 160                                     | 290     | 230                  | 2,50    |
| 355                    | 180                                     | 310     | 230                  | 2,71    |
| 355                    | 200                                     | 345     | 245                  | 3,15    |
| 355                    | 224                                     | 370     | 245                  | 3,37    |
| 355                    | 250                                     | 395     | 245                  | 3,96    |
| 355                    | 280                                     | 435     | 245                  | 4,33    |
| 355                    | 300                                     | 455     | 255                  | 4,43    |
| 355                    | 315                                     | 470     | 255                  | 4,48    |
| 400                    | 100                                     | 225     | 245                  | 1,99    |
| 400                    | 112                                     | 235     | 245                  | 2,05    |
| 400                    | 125                                     | 250     | 245                  | 2,24    |
| 400                    | 140                                     | 270     | 250                  | 2,47    |
| 400                    | 150                                     | 280     | 250                  | 2,60    |
| 400                    | 160                                     | 290     | 250                  | 2,72    |
| 400                    | 180                                     | 310     | 250                  | 2,95    |
| 400                    | 200                                     | 345     | 265                  | 3,35    |
| 400                    | 224                                     | 370     | 265                  | 3,71    |
| 400                    | 250                                     | 395     | 265                  | 4,37    |
| 400                    | 280                                     | 435     | 275                  | 4,68    |
| 400                    | 300                                     | 455     | 275                  | 4,97    |
| 400                    | 315                                     | 470     | 275                  | 4,99    |
| 400                    | 355                                     | 520     | 285                  | 5,42    |



## X-piece

XU

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 450                    | 125                                     | 250     | 270                  | 2,30    |
| 450                    | 140                                     | 270     | 275                  | 2,62    |
| 450                    | 150                                     | 280     | 275                  | 2,76    |
| 450                    | 160                                     | 290     | 275                  | 2,90    |
| 450                    | 180                                     | 310     | 275                  | 3,17    |
| 450                    | 200                                     | 345     | 290                  | 3,75    |
| 450                    | 224                                     | 370     | 290                  | 4,06    |
| 450                    | 250                                     | 395     | 290                  | 4,79    |
| 450                    | 280                                     | 435     | 300                  | 5,33    |
| 450                    | 300                                     | 455     | 300                  | 5,54    |
| 450                    | 315                                     | 470     | 300                  | 5,68    |
| 450                    | 355                                     | 520     | 310                  | 6,19    |
| 450                    | 400                                     | 565     | 310                  | 6,96    |
| 500                    | 125                                     | 250     | 295                  | 2,65    |
| 500                    | 140                                     | 270     | 300                  | 2,91    |
| 500                    | 150                                     | 280     | 300                  | 3,04    |
| 500                    | 160                                     | 290     | 300                  | 3,14    |
| 500                    | 180                                     | 310     | 300                  | 3,35    |
| 500                    | 200                                     | 345     | 315                  | 4,05    |
| 500                    | 224                                     | 370     | 315                  | 4,12    |
| 500                    | 250                                     | 395     | 315                  | 4,99    |
| 500                    | 280                                     | 435     | 325                  | 5,42    |
| 500                    | 300                                     | 455     | 325                  | 5,64    |
| 500                    | 315                                     | 470     | 325                  | 5,80    |
| 500                    | 355                                     | 520     | 335                  | 6,45    |
| 500                    | 400                                     | 565     | 335                  | 6,81    |
| 500                    | 450                                     | 615     | 335                  | 7,86    |
| 560                    | 200                                     | 345     | 345                  | 4,30    |
| 560                    | 224                                     | 370     | 345                  | 4,59    |
| 560                    | 250                                     | 395     | 345                  | 5,41    |
| 560                    | 280                                     | 435     | 355                  | 6,01    |
| 560                    | 300                                     | 455     | 355                  | 6,25    |
| 560                    | 315                                     | 470     | 355                  | 6,43    |
| 560                    | 355                                     | 520     | 365                  | 7,15    |
| 560                    | 400                                     | 565     | 365                  | 8,28    |
| 560                    | 450                                     | 615     | 365                  | 8,82    |
| 560                    | 500                                     | 670     | 370                  | 9,35    |
| 600                    | 200                                     | 345     | 365                  | 4,59    |
| 600                    | 224                                     | 370     | 365                  | 4,89    |
| 600                    | 250                                     | 395     | 365                  | 5,75    |
| 600                    | 280                                     | 435     | 375                  | 6,38    |
| 600                    | 300                                     | 455     | 375                  | 6,64    |
| 600                    | 315                                     | 470     | 375                  | 6,83    |
| 600                    | 355                                     | 520     | 385                  | 7,59    |
| 600                    | 400                                     | 565     | 385                  | 8,78    |
| 600                    | 450                                     | 615     | 385                  | 9,38    |
| 600                    | 500                                     | 670     | 390                  | 10,0    |
| 600                    | 560                                     | 730     | 390                  | 10,4    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|---|---------|----------------------|---------|
| 630                    | 200                                     | 355     | 380                  | 4,81    |
| 630                    | 224                                     | 380     | 380                  | 5,12    |
| 630                    | 250                                     | 405     | 380                  | 6,01    |
| 630                    | 280                                     | 445     | 390                  | 6,67    |
| 630                    | 300                                     | 465     | 390                  | 6,93    |
| 630                    | 315                                     | 480     | 390                  | 7,13    |
| 630                    | 355                                     | 530     | 400                  | 7,74    |
| 630                    | 400                                     | 575     | 400                  | 9,36    |
| 630                    | 450                                     | 625     | 400                  | 9,78    |
| 630                    | 500                                     | 680     | 405                  | 10,7    |
| 630                    | 560                                     | 740     | 405                  | 11,0    |
| 630                    | 600                                     | 780     | 405                  | 11,1    |
| 710                    | 250                                     | 455     | 420                  | 6,78    |
| 710                    | 280                                     | 495     | 420                  | 7,52    |
| 710                    | 300                                     | 515     | 430                  | 7,82    |
| 710                    | 315                                     | 530     | 430                  | 8,05    |
| 710                    | 355                                     | 580     | 440                  | 8,91    |
| 710                    | 400                                     | 625     | 440                  | 10,4    |
| 710                    | 450                                     | 675     | 440                  | 11,1    |
| 710                    | 500                                     | 730     | 445                  | 12,0    |
| 710                    | 560                                     | 790     | 445                  | 12,7    |
| 710                    | 600                                     | 830     | 445                  | 13,2    |
| 710                    | 630                                     | 860     | 445                  | 13,4    |
| 800                    | 250                                     | 455     | 465                  | 7,08    |
| 800                    | 280                                     | 495     | 475                  | 8,10    |
| 800                    | 300                                     | 515     | 475                  | 8,42    |
| 800                    | 315                                     | 530     | 475                  | 8,54    |
| 800                    | 355                                     | 580     | 485                  | 9,60    |
| 800                    | 400                                     | 625     | 485                  | 11,1    |
| 800                    | 450                                     | 675     | 485                  | 11,9    |
| 800                    | 500                                     | 730     | 490                  | 13,3    |
| 800                    | 560                                     | 790     | 490                  | 13,7    |
| 800                    | 600                                     | 830     | 490                  | 14,2    |
| 800                    | 630                                     | 860     | 490                  | 15,2    |
| 800                    | 710                                     | 940     | 490                  | 16,3    |
| 900                    | 315                                     | 530     | 525                  | 11,9    |
| 900                    | 355                                     | 580     | 535                  | 13,2    |
| 900                    | 400                                     | 625     | 535                  | 16,0    |
| 900                    | 450                                     | 675     | 535                  | 16,5    |
| 900                    | 500                                     | 730     | 540                  | 17,9    |
| 900                    | 560                                     | 790     | 540                  | 19,2    |
| 900                    | 600                                     | 830     | 540                  | 20,1    |
| 900                    | 630                                     | 860     | 540                  | 20,7    |
| 900                    | 710                                     | 940     | 540                  | 23,7    |
| 900                    | 800                                     | 1030    | 540                  | 25,1    |
| 1000                   | 315                                     | 530     | 575                  | 13,0    |
| 1000                   | 355                                     | 580     | 585                  | 14,3    |
| 1000                   | 400                                     | 625     | 585                  | 16,6    |

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## X-piece

XU

| $\varnothing d_1$<br>nom | $\varnothing d_3/\varnothing d_4$<br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|--------------------------|--|---------|----------------------|---------|
| 1000                     | 450                                      | 675     | 585                  | 17,9    |
| 1000                     | 500                                      | 730     | 590                  | 19,0    |
| 1000                     | 560                                      | 790     | 590                  | 21,0    |
| 1000                     | 600                                      | 830     | 590                  | 22,1    |
| 1000                     | 630                                      | 860     | 590                  | 23,4    |
| 1000                     | 710                                      | 940     | 590                  | 26,4    |
| 1000                     | 800                                      | 1030    | 590                  | 28,5    |
| 1000                     | 900                                      | 1150    | 590                  | 31,0    |
| 1120                     | 500                                      | 730     | 650                  | 21,4    |
| 1120                     | 560                                      | 790     | 650                  | 23,1    |
| 1120                     | 600                                      | 830     | 650                  | 24,3    |
| 1120                     | 630                                      | 860     | 650                  | 25,2    |
| 1120                     | 710                                      | 940     | 650                  | 29,1    |
| 1120                     | 800                                      | 1030    | 650                  | 31,7    |
| 1120                     | 900                                      | 1150    | 650                  | 35,4    |
| 1120                     | 1000                                     | 1250    | 650                  | 37,3    |
| 1250                     | 500                                      | 730     | 715                  | 23,4    |
| 1250                     | 560                                      | 790     | 715                  | 25,3    |
| 1250                     | 600                                      | 830     | 715                  | 26,6    |
| 1250                     | 630                                      | 860     | 715                  | 27,6    |
| 1250                     | 710                                      | 940     | 715                  | 31,9    |
| 1250                     | 800                                      | 1030    | 715                  | 34,9    |
| 1250                     | 900                                      | 1150    | 715                  | 39,1    |
| 1250                     | 1000                                     | 1250    | 715                  | 41,9    |
| 1250                     | 1120                                     | 1370    | 715                  | 47,1    |



# X-piece

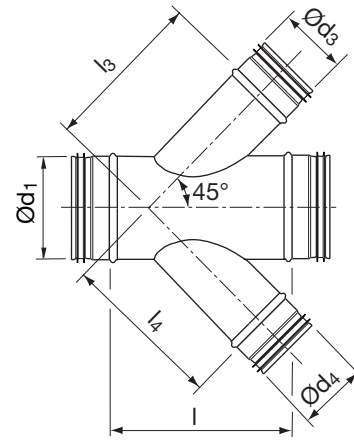
# XVU45°



### Description

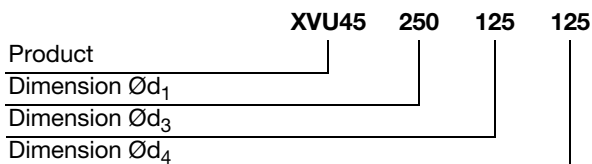
As standard is  $\text{Ød}_3 = \text{Ød}_4$  and the angle  $45^\circ$ .  
Different dimensions and angle available to order.

### Dimensions



| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub> /l <sub>4</sub><br>mm | m<br>kg |
|------------------------|---|---------|--------------------------------------|---------|
| 80                     | 80                                      | 250     | 165                                  | 0,80    |
| 100                    | 80                                      | 250     | 180                                  | 0,90    |
| 100                    | 100                                     | 280     | 190                                  | 1,10    |
| 125                    | 80                                      | 250     | 200                                  | 1,00    |
| 125                    | 100                                     | 280     | 210                                  | 1,30    |
| 125                    | 112                                     | 295     | 215                                  | 1,40    |
| 125                    | 125                                     | 315     | 220                                  | 1,50    |
| 140                    | 80                                      | 280     | 210                                  | 1,10    |
| 140                    | 100                                     | 305     | 220                                  | 1,40    |
| 140                    | 112                                     | 320     | 225                                  | 1,50    |
| 140                    | 125                                     | 340     | 230                                  | 1,60    |
| 140                    | 140                                     | 365     | 250                                  | 1,90    |
| 150                    | 80                                      | 280     | 215                                  | 1,20    |
| 150                    | 100                                     | 305     | 225                                  | 1,50    |
| 150                    | 112                                     | 320     | 235                                  | 1,60    |
| 150                    | 125                                     | 340     | 240                                  | 1,70    |
| 150                    | 140                                     | 365     | 260                                  | 2,00    |
| 150                    | 150                                     | 380     | 265                                  | 2,10    |
| 160                    | 80                                      | 280     | 220                                  | 1,20    |
| 160                    | 100                                     | 305     | 230                                  | 1,50    |
| 160                    | 112                                     | 320     | 240                                  | 1,60    |
| 160                    | 125                                     | 340     | 245                                  | 1,70    |
| 160                    | 140                                     | 365     | 265                                  | 2,00    |
| 160                    | 150                                     | 380     | 270                                  | 2,10    |
| 160                    | 160                                     | 390     | 275                                  | 2,20    |
| 180                    | 80                                      | 280     | 235                                  | 1,30    |
| 180                    | 100                                     | 305     | 245                                  | 1,60    |
| 180                    | 112                                     | 320     | 250                                  | 1,70    |
| 180                    | 125                                     | 340     | 260                                  | 1,80    |
| 180                    | 140                                     | 365     | 280                                  | 2,20    |
| 180                    | 150                                     | 380     | 285                                  | 2,30    |
| 180                    | 160                                     | 390     | 290                                  | 2,40    |
| 180                    | 180                                     | 420     | 300                                  | 2,70    |

### Ordering example





## X-piece

## XVU45°

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub> /l <sub>4</sub><br>mm | m<br>kg |
|------------------------|---|---------|--------------------------------------|---------|
| 200                    | 80                                      | 280     | 250                                  | 1,40    |
| 200                    | 100                                     | 305     | 260                                  | 1,70    |
| 200                    | 112                                     | 320     | 265                                  | 1,80    |
| 200                    | 125                                     | 340     | 270                                  | 2,00    |
| 200                    | 140                                     | 365     | 295                                  | 2,30    |
| 200                    | 150                                     | 380     | 300                                  | 2,40    |
| 200                    | 160                                     | 390     | 305                                  | 2,50    |
| 200                    | 180                                     | 420     | 315                                  | 2,90    |
| 200                    | 200                                     | 450     | 325                                  | 3,30    |
| 224                    | 100                                     | 305     | 275                                  | 1,90    |
| 224                    | 112                                     | 320     | 285                                  | 2,00    |
| 224                    | 125                                     | 340     | 290                                  | 2,10    |
| 224                    | 140                                     | 365     | 310                                  | 2,50    |
| 224                    | 150                                     | 380     | 315                                  | 2,60    |
| 224                    | 160                                     | 390     | 320                                  | 2,70    |
| 224                    | 180                                     | 420     | 330                                  | 3,10    |
| 224                    | 200                                     | 450     | 340                                  | 3,50    |
| 224                    | 224                                     | 480     | 350                                  | 3,80    |
| 250                    | 100                                     | 305     | 295                                  | 2,30    |
| 250                    | 112                                     | 320     | 300                                  | 2,40    |
| 250                    | 125                                     | 340     | 310                                  | 2,50    |
| 250                    | 140                                     | 365     | 330                                  | 2,90    |
| 250                    | 150                                     | 380     | 335                                  | 3,10    |
| 250                    | 160                                     | 390     | 340                                  | 3,20    |
| 250                    | 180                                     | 420     | 350                                  | 3,40    |
| 250                    | 200                                     | 450     | 360                                  | 3,90    |
| 250                    | 224                                     | 480     | 370                                  | 4,20    |
| 250                    | 250                                     | 520     | 385                                  | 4,80    |
| 280                    | 112                                     | 320     | 320                                  | 2,70    |
| 280                    | 125                                     | 340     | 330                                  | 2,90    |
| 280                    | 140                                     | 365     | 350                                  | 3,20    |
| 280                    | 150                                     | 380     | 355                                  | 3,30    |
| 280                    | 160                                     | 390     | 360                                  | 3,40    |
| 280                    | 180                                     | 445     | 370                                  | 3,80    |
| 280                    | 200                                     | 475     | 380                                  | 4,30    |
| 280                    | 224                                     | 510     | 390                                  | 4,60    |
| 280                    | 250                                     | 545     | 405                                  | 5,20    |
| 280                    | 280                                     | 590     | 435                                  | 5,90    |
| 300                    | 125                                     | 340     | 350                                  | 3,30    |
| 300                    | 140                                     | 365     | 365                                  | 3,70    |
| 300                    | 150                                     | 380     | 370                                  | 3,90    |
| 300                    | 160                                     | 390     | 375                                  | 4,00    |
| 300                    | 180                                     | 445     | 385                                  | 4,40    |
| 300                    | 200                                     | 475     | 395                                  | 4,90    |
| 300                    | 224                                     | 510     | 405                                  | 5,30    |
| 300                    | 250                                     | 545     | 420                                  | 5,90    |
| 300                    | 280                                     | 590     | 450                                  | 6,70    |
| 300                    | 300                                     | 615     | 460                                  | 7,60    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub> /l <sub>4</sub><br>mm | m<br>kg |
|------------------------|---|---------|--------------------------------------|---------|
| 315                    | 140                                     | 365     | 375                                  | 4,10    |
| 315                    | 150                                     | 380     | 380                                  | 4,30    |
| 315                    | 160                                     | 395     | 385                                  | 4,40    |
| 315                    | 180                                     | 445     | 395                                  | 4,80    |
| 315                    | 200                                     | 475     | 405                                  | 5,40    |
| 315                    | 224                                     | 510     | 415                                  | 5,80    |
| 315                    | 250                                     | 545     | 430                                  | 6,50    |
| 315                    | 280                                     | 590     | 460                                  | 7,30    |
| 315                    | 300                                     | 615     | 470                                  | 7,90    |
| 315                    | 315                                     | 640     | 480                                  | 8,30    |
| 355                    | 150                                     | 380     | 410                                  | 4,70    |
| 355                    | 160                                     | 395     | 415                                  | 4,80    |
| 355                    | 180                                     | 445     | 425                                  | 5,20    |
| 355                    | 200                                     | 475     | 435                                  | 5,90    |
| 355                    | 224                                     | 510     | 445                                  | 6,20    |
| 355                    | 250                                     | 545     | 460                                  | 7,00    |
| 355                    | 280                                     | 590     | 490                                  | 7,90    |
| 355                    | 300                                     | 615     | 500                                  | 8,40    |
| 355                    | 315                                     | 640     | 505                                  | 8,80    |
| 355                    | 355                                     | 695     | 525                                  | 10,0    |
| 400                    | 160                                     | 395     | 445                                  | 5,60    |
| 400                    | 180                                     | 445     | 455                                  | 6,00    |
| 400                    | 200                                     | 475     | 465                                  | 6,70    |
| 400                    | 224                                     | 510     | 475                                  | 7,10    |
| 400                    | 250                                     | 545     | 490                                  | 7,80    |
| 400                    | 280                                     | 590     | 520                                  | 8,80    |
| 400                    | 300                                     | 615     | 530                                  | 9,40    |
| 400                    | 315                                     | 640     | 535                                  | 9,80    |
| 400                    | 355                                     | 695     | 555                                  | 11,0    |
| 400                    | 400                                     | 760     | 580                                  | 12,7    |
| 450                    | 180                                     | 445     | 490                                  | 6,70    |
| 450                    | 200                                     | 475     | 500                                  | 7,40    |
| 450                    | 224                                     | 510     | 510                                  | 7,80    |
| 450                    | 250                                     | 545     | 525                                  | 8,60    |
| 450                    | 280                                     | 590     | 555                                  | 9,50    |
| 450                    | 300                                     | 615     | 565                                  | 10,1    |
| 450                    | 315                                     | 640     | 570                                  | 10,6    |
| 450                    | 355                                     | 695     | 590                                  | 11,8    |
| 450                    | 400                                     | 760     | 615                                  | 13,6    |
| 450                    | 450                                     | 830     | 640                                  | 15,5    |
| 500                    | 200                                     | 475     | 535                                  | 8,00    |
| 500                    | 224                                     | 510     | 550                                  | 8,40    |
| 500                    | 250                                     | 545     | 560                                  | 9,30    |
| 500                    | 280                                     | 590     | 590                                  | 10,3    |
| 500                    | 300                                     | 615     | 600                                  | 10,9    |
| 500                    | 315                                     | 640     | 610                                  | 11,4    |
| 500                    | 355                                     | 695     | 630                                  | 12,7    |
| 500                    | 400                                     | 760     | 650                                  | 14,5    |



## X-piece

## XVU45°

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub> /l <sub>4</sub><br>mm | m<br>kg |
|------------------------|---|---------|--------------------------------------|---------|
| 500                    | 450                                     | 830     | 675                                  | 16,5    |
| 500                    | 500                                     | 900     | 700                                  | 18,6    |
| 560                    | 224                                     | 510     | 590                                  | 9,80    |
| 560                    | 250                                     | 600     | 605                                  | 10,7    |
| 560                    | 280                                     | 640     | 630                                  | 11,6    |
| 560                    | 300                                     | 665     | 640                                  | 12,3    |
| 560                    | 315                                     | 690     | 650                                  | 12,6    |
| 560                    | 355                                     | 750     | 670                                  | 14,2    |
| 560                    | 400                                     | 810     | 690                                  | 16,0    |
| 560                    | 450                                     | 880     | 715                                  | 18,1    |
| 560                    | 500                                     | 950     | 740                                  | 20,3    |
| 560                    | 560                                     | 1040    | 800                                  | 23,4    |
| 600                    | 250                                     | 600     | 630                                  | 12,2    |
| 600                    | 280                                     | 640     | 655                                  | 13,3    |
| 600                    | 300                                     | 665     | 665                                  | 14,0    |
| 600                    | 315                                     | 690     | 675                                  | 14,6    |
| 600                    | 355                                     | 750     | 695                                  | 16,3    |
| 600                    | 400                                     | 810     | 715                                  | 18,2    |
| 600                    | 450                                     | 880     | 740                                  | 20,4    |
| 600                    | 500                                     | 950     | 765                                  | 23,0    |
| 600                    | 560                                     | 1040    | 825                                  | 26,4    |
| 600                    | 600                                     | 1090    | 850                                  | 29,3    |
| 630                    | 280                                     | 640     | 680                                  | 14,8    |
| 630                    | 300                                     | 665     | 690                                  | 15,6    |
| 630                    | 315                                     | 690     | 700                                  | 16,1    |
| 630                    | 355                                     | 750     | 720                                  | 18,0    |
| 630                    | 400                                     | 810     | 740                                  | 20,2    |
| 630                    | 450                                     | 880     | 765                                  | 22,6    |
| 630                    | 500                                     | 950     | 790                                  | 25,2    |
| 630                    | 560                                     | 1040    | 850                                  | 28,8    |
| 630                    | 600                                     | 1090    | 870                                  | 31,3    |
| 630                    | 630                                     | 1140    | 885                                  | 33,4    |
| 710                    | 300                                     | 665     | 745                                  | 17,8    |
| 710                    | 315                                     | 690     | 755                                  | 18,4    |
| 710                    | 355                                     | 750     | 775                                  | 20,3    |
| 710                    | 400                                     | 810     | 800                                  | 22,5    |
| 710                    | 450                                     | 880     | 825                                  | 25,2    |
| 710                    | 500                                     | 950     | 850                                  | 27,9    |
| 710                    | 560                                     | 1040    | 905                                  | 31,6    |
| 710                    | 600                                     | 1090    | 925                                  | 34,1    |
| 710                    | 630                                     | 1140    | 940                                  | 36,4    |
| 710                    | 710                                     | 1250    | 980                                  | 41,7    |
| 800                    | 315                                     | 690     | 820                                  | 20,2    |
| 800                    | 355                                     | 750     | 840                                  | 22,2    |
| 800                    | 400                                     | 810     | 860                                  | 24,6    |
| 800                    | 450                                     | 880     | 885                                  | 27,4    |
| 800                    | 500                                     | 950     | 910                                  | 30,2    |
| 800                    | 560                                     | 1040    | 970                                  | 34,2    |

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub> /Ød <sub>4</sub><br>nom | l<br>mm | l <sub>3</sub> /l <sub>4</sub><br>mm | m<br>kg |
|------------------------|---|---------|--------------------------------------|---------|
| 800                    | 600                                     | 1090    | 990                                  | 37,4    |
| 800                    | 630                                     | 1140    | 1005                                 | 39,1    |
| 800                    | 710                                     | 1250    | 1045                                 | 44,6    |
| 800                    | 800                                     | 1380    | 1090                                 | 51,0    |
| 900                    | 355                                     | 750     | 910                                  | 27,4    |
| 900                    | 400                                     | 810     | 935                                  | 30,3    |
| 900                    | 450                                     | 880     | 960                                  | 33,5    |
| 900                    | 500                                     | 950     | 985                                  | 36,9    |
| 900                    | 560                                     | 1040    | 1040                                 | 41,6    |
| 900                    | 600                                     | 1090    | 1060                                 | 44,6    |
| 900                    | 630                                     | 1140    | 1075                                 | 47,3    |
| 900                    | 710                                     | 1250    | 1115                                 | 53,7    |
| 900                    | 800                                     | 1380    | 1160                                 | 51,2    |
| 900                    | 900                                     | 1520    | 1210                                 | 69,7    |
| 1000                   | 400                                     | 810     | 1005                                 | 33,0    |
| 1000                   | 450                                     | 880     | 1030                                 | 36,4    |
| 1000                   | 500                                     | 950     | 1055                                 | 40,0    |
| 1000                   | 560                                     | 1040    | 1110                                 | 44,8    |
| 1000                   | 600                                     | 1090    | 1130                                 | 48,0    |
| 1000                   | 630                                     | 1140    | 1145                                 | 50,7    |
| 1000                   | 710                                     | 1250    | 1185                                 | 57,5    |
| 1000                   | 800                                     | 1380    | 1230                                 | 65,3    |
| 1000                   | 900                                     | 1520    | 1280                                 | 74,2    |
| 1000                   | 1000                                    | 1660    | 1330                                 | 83,5    |
| 1120                   | 500                                     | 1005    | 1140                                 | 51,0    |
| 1120                   | 560                                     | 1090    | 1195                                 | 57,3    |
| 1120                   | 600                                     | 1140    | 1215                                 | 60,9    |
| 1120                   | 630                                     | 1190    | 1230                                 | 64,2    |
| 1120                   | 710                                     | 1305    | 1270                                 | 72,1    |
| 1120                   | 800                                     | 1430    | 1315                                 | 81,2    |
| 1120                   | 900                                     | 1570    | 1365                                 | 91,6    |
| 1120                   | 1000                                    | 1710    | 1415                                 | 102     |
| 1120                   | 1120                                    | 1880    | 1505                                 | 118     |
| 1250                   | 500                                     | 1005    | 1230                                 | 56,1    |
| 1250                   | 560                                     | 1090    | 1290                                 | 62,3    |
| 1250                   | 600                                     | 1140    | 1310                                 | 66,3    |
| 1250                   | 630                                     | 1190    | 1325                                 | 69,6    |
| 1250                   | 710                                     | 1305    | 1365                                 | 78,0    |
| 1250                   | 800                                     | 1430    | 1410                                 | 87,5    |
| 1250                   | 900                                     | 1570    | 1460                                 | 98,5    |
| 1250                   | 1000                                    | 1710    | 1510                                 | 110     |
| 1250                   | 1120                                    | 1880    | 1595                                 | 126     |
| 1250                   | 1250                                    | 2065    | 1660                                 | 142     |

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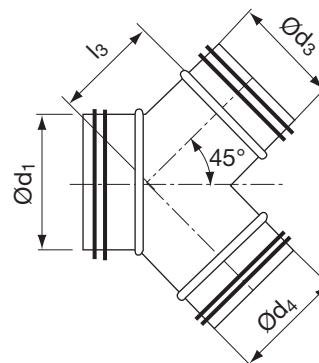


# Y-piece

# YVU45°



## Dimensions

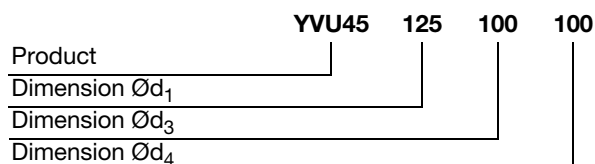


### Description

As standard is  $\text{Ød}_3 = \text{Ød}_4$  and the angle  $45^\circ$ .  
Different dimensions and angle available to order.

| Ød <sub>1</sub> nom | Ød <sub>3</sub> nom | Ød <sub>4</sub> nom | l <sub>3</sub> mm | m kg |
|---------------------|---------------------|---------------------|-------------------|------|
| 80                  | 80                  | 80                  | 120               | 0,90 |
| 100                 | 80                  | 80                  | 140               | 1,00 |
| 100                 | 100                 | 100                 | 140               | 1,00 |
| 112                 | 80                  | 80                  | 160               | 1,00 |
| 125                 | 100                 | 100                 | 170               | 1,30 |
| 125                 | 125                 | 125                 | 170               | 1,30 |
| 140                 | 100                 | 100                 | 185               | 1,40 |
| 150                 | 100                 | 100                 | 190               | 1,50 |
| 150                 | 150                 | 150                 | 190               | 1,50 |
| 160                 | 112                 | 112                 | 205               | 1,60 |
| 160                 | 160                 | 160                 | 205               | 1,80 |
| 180                 | 125                 | 125                 | 215               | 1,80 |
| 180                 | 180                 | 180                 | 215               | 1,80 |
| 200                 | 140                 | 140                 | 230               | 2,10 |
| 200                 | 200                 | 200                 | 230               | 2,10 |
| 224                 | 160                 | 160                 | 250               | 3,50 |
| 224                 | 224                 | 224                 | 250               | 2,70 |
| 250                 | 180                 | 180                 | 280               | 3,50 |
| 250                 | 200                 | 200                 | 280               | 3,50 |
| 250                 | 250                 | 250                 | 280               | 3,50 |
| 280                 | 200                 | 200                 | 310               | 3,60 |
| 280                 | 280                 | 280                 | 310               | 3,50 |
| 300                 | 200                 | 200                 | 320               | 4,20 |
| 300                 | 300                 | 300                 | 320               | 4,20 |
| 315                 | 224                 | 224                 | 335               | 4,40 |
| 315                 | 315                 | 315                 | 335               | 4,80 |
| 355                 | 250                 | 250                 | 365               | 5,00 |
| 355                 | 355                 | 355                 | 365               | 6,40 |
| 400                 | 280                 | 280                 | 410               | 6,80 |
| 400                 | 300                 | 300                 | 410               | 7,00 |
| 400                 | 400                 | 400                 | 410               | 9,10 |
| 450                 | 300                 | 300                 | 440               | 8,50 |
| 450                 | 315                 | 315                 | 440               | 8,50 |

### Ordering example





## Y-piece

## YVU45°

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | Ød <sub>4</sub><br>nom | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|------------------------|----------------------|---------|
| 500                    | 355                    | 355                    | 490                  | 9,80    |
| 560                    | 400                    | 400                    | 550                  | 12,1    |
| 600                    | 400                    | 400                    | 580                  | 13,2    |
| 630                    | 450                    | 450                    | 610                  | 15,6    |
| 630                    | 630                    | 630                    | 610                  | 20,6    |
| 710                    | 500                    | 500                    | 670                  | 18,7    |
| 710                    | 710                    | 710                    | 670                  | 24,4    |
| 800                    | 560                    | 560                    | 740                  | 22,7    |
| 800                    | 800                    | 800                    | 740                  | 28,9    |
| 900                    | 630                    | 630                    | 825                  | 24,8    |
| 1000                   | 710                    | 710                    | 920                  | 30,5    |
| 1120                   | 800                    | 800                    | 1030                 | 38,0    |
| 1250                   | 900                    | 900                    | 1150                 | 50,0    |

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# T-piece

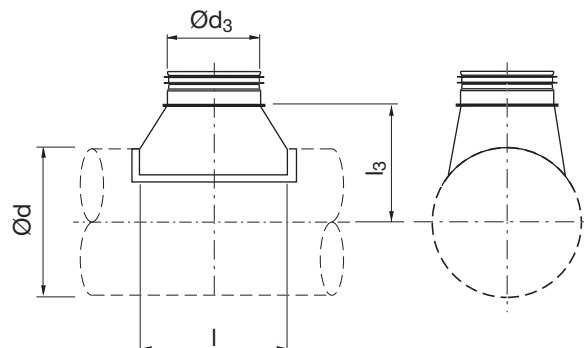
# TSTCU



## Description

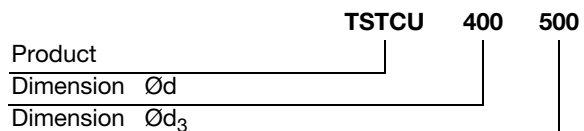
Hand made centric T-piece.

## Dimensions



| Ød nom | Ød <sub>3</sub> nom | l mm | l <sub>3</sub> mm | m kg |
|--------|---------------------|------|-------------------|------|
| 63     | 80                  | 145  | 77                | 0,15 |
| 63     | 100                 | 165  | 77                | 0,20 |
| 80     | 100                 | 165  | 85                | 0,21 |
| 80     | 112                 | 175  | 85                | 0,24 |
| 80     | 125                 | 190  | 85                | 0,29 |
| 100    | 112                 | 175  | 95                | 0,22 |
| 100    | 125                 | 190  | 95                | 0,25 |
| 100    | 140                 | 210  | 100               | 0,30 |
| 100    | 150                 | 220  | 100               | 0,30 |
| 100    | 160                 | 230  | 100               | 0,36 |
| 112    | 112                 | 175  | 100               | 0,27 |
| 112    | 125                 | 190  | 100               | 0,30 |
| 112    | 140                 | 210  | 105               | 0,34 |
| 112    | 150                 | 220  | 105               | 0,37 |
| 112    | 160                 | 230  | 105               | 0,39 |
| 112    | 180                 | 250  | 105               | 0,43 |
| 125    | 112                 | 175  | 110               | 0,23 |
| 125    | 140                 | 210  | 115               | 0,31 |
| 125    | 150                 | 220  | 115               | 0,33 |
| 125    | 160                 | 230  | 115               | 0,35 |
| 125    | 180                 | 250  | 115               | 0,41 |
| 125    | 200                 | 285  | 130               | 0,50 |
| 140    | 80                  | 145  | 115               | 0,22 |
| 140    | 112                 | 175  | 115               | 0,28 |
| 140    | 150                 | 220  | 120               | 0,38 |
| 140    | 160                 | 230  | 120               | 0,40 |
| 140    | 180                 | 250  | 120               | 0,45 |
| 140    | 200                 | 285  | 135               | 0,53 |
| 140    | 224                 | 310  | 135               | 0,59 |
| 150    | 80                  | 145  | 120               | 0,19 |
| 150    | 112                 | 175  | 120               | 0,27 |
| 150    | 160                 | 230  | 125               | 0,43 |
| 150    | 180                 | 250  | 125               | 0,47 |

## Ordering example





## T-piece

## TSTCU

| Ød nom | Ød <sub>3</sub> nom | l mm | l <sub>3</sub> mm | m kg |
|--------|---------------------|------|-------------------|------|
| 150    | 200                 | 285  | 140               | 0,57 |
| 150    | 224                 | 310  | 140               | 0,64 |
| 150    | 250                 | 335  | 140               | 0,77 |
| 160    | 63                  | 128  | 125               | 0,10 |
| 160    | 112                 | 175  | 125               | 0,25 |
| 160    | 180                 | 250  | 130               | 0,47 |
| 160    | 200                 | 285  | 145               | 0,57 |
| 160    | 224                 | 310  | 145               | 0,65 |
| 160    | 250                 | 335  | 145               | 0,85 |
| 180    | 63                  | 128  | 135               | 0,16 |
| 180    | 80                  | 145  | 135               | 0,20 |
| 180    | 112                 | 175  | 135               | 0,27 |
| 180    | 125                 | 190  | 135               | 0,31 |
| 180    | 140                 | 210  | 140               | 0,36 |
| 180    | 150                 | 220  | 140               | 0,39 |
| 180    | 160                 | 230  | 140               | 0,43 |
| 180    | 200                 | 285  | 155               | 0,62 |
| 180    | 224                 | 310  | 155               | 0,69 |
| 180    | 250                 | 335  | 155               | 0,82 |
| 180    | 280                 | 375  | 165               | 1,02 |
| 200    | 63                  | 128  | 145               | 0,14 |
| 200    | 112                 | 175  | 145               | 0,25 |
| 200    | 224                 | 310  | 165               | 0,66 |
| 200    | 250                 | 335  | 165               | 0,79 |
| 200    | 280                 | 375  | 175               | 1,00 |
| 200    | 300                 | 395  | 175               | 1,09 |
| 200    | 315                 | 410  | 175               | 1,13 |
| 224    | 63                  | 128  | 160               | 0,15 |
| 224    | 112                 | 175  | 160               | 0,25 |
| 224    | 250                 | 335  | 180               | 0,84 |
| 224    | 280                 | 375  | 190               | 1,01 |
| 224    | 300                 | 395  | 190               | 1,11 |
| 224    | 315                 | 410  | 190               | 1,18 |
| 224    | 355                 | 460  | 200               | 1,44 |
| 250    | 63                  | 128  | 170               | 0,15 |
| 250    | 112                 | 175  | 170               | 0,26 |
| 250    | 280                 | 375  | 200               | 1,03 |
| 250    | 300                 | 395  | 200               | 1,12 |
| 250    | 315                 | 410  | 200               | 1,13 |
| 250    | 355                 | 460  | 210               | 1,46 |
| 250    | 400                 | 505  | 210               | 1,83 |
| 280    | 112                 | 175  | 185               | 0,27 |
| 280    | 250                 | 335  | 205               | 0,86 |
| 280    | 280                 | 375  | 215               | 1,03 |
| 280    | 300                 | 395  | 215               | 1,12 |
| 280    | 315                 | 410  | 215               | 1,19 |
| 280    | 355                 | 460  | 225               | 1,44 |
| 280    | 400                 | 505  | 225               | 1,80 |

| Ød nom | Ød <sub>3</sub> nom | l mm | l <sub>3</sub> mm | m kg |
|--------|---------------------|------|-------------------|------|
| 280    | 450                 | 555  | 225               | 2,11 |
| 300    | 112                 | 175  | 195               | 0,28 |
| 300    | 280                 | 375  | 225               | 1,03 |
| 300    | 315                 | 410  | 225               | 1,20 |
| 300    | 355                 | 460  | 235               | 1,45 |
| 300    | 400                 | 505  | 235               | 1,73 |
| 300    | 450                 | 555  | 235               | 2,10 |
| 315    | 112                 | 175  | 205               | 0,26 |
| 315    | 280                 | 375  | 235               | 1,11 |
| 315    | 355                 | 460  | 245               | 1,53 |
| 315    | 400                 | 505  | 245               | 1,80 |
| 315    | 450                 | 555  | 245               | 2,01 |
| 315    | 500                 | 610  | 250               | 2,24 |
| 355    | 112                 | 175  | 225               | 0,28 |
| 355    | 280                 | 375  | 245               | 1,36 |
| 355    | 315                 | 410  | 255               | 1,55 |
| 355    | 355                 | 460  | 265               | 1,91 |
| 355    | 400                 | 505  | 265               | 2,18 |
| 355    | 450                 | 555  | 265               | 2,46 |
| 355    | 500                 | 610  | 270               | 2,77 |
| 355    | 560                 | 670  | 270               | 3,11 |
| 400    | 112                 | 175  | 245               | 0,28 |
| 400    | 140                 | 210  | 250               | 0,44 |
| 400    | 180                 | 250  | 250               | 0,66 |
| 400    | 280                 | 375  | 275               | 1,34 |
| 400    | 355                 | 460  | 285               | 1,89 |
| 400    | 450                 | 555  | 285               | 2,58 |
| 400    | 500                 | 610  | 290               | 2,96 |
| 400    | 560                 | 670  | 290               | 3,29 |
| 400    | 600                 | 710  | 290               | 3,51 |
| 400    | 630                 | 740  | 290               | 3,68 |
| 450    | 140                 | 210  | 275               | 0,40 |
| 450    | 180                 | 250  | 275               | 0,64 |
| 450    | 280                 | 375  | 300               | 1,46 |
| 450    | 355                 | 460  | 310               | 1,98 |
| 450    | 450                 | 555  | 310               | 2,60 |
| 450    | 500                 | 610  | 315               | 3,08 |
| 450    | 560                 | 670  | 315               | 3,48 |
| 450    | 600                 | 710  | 315               | 3,74 |
| 450    | 630                 | 740  | 315               | 3,94 |
| 450    | 710                 | 820  | 315               | 4,70 |
| 500    | 140                 | 210  | 300               | 0,43 |
| 500    | 180                 | 250  | 300               | 0,60 |
| 500    | 280                 | 375  | 325               | 1,29 |
| 500    | 355                 | 460  | 335               | 1,85 |
| 500    | 450                 | 555  | 335               | 2,74 |
| 500    | 500                 | 610  | 340               | 3,28 |
| 500    | 560                 | 670  | 340               | 3,83 |

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## T-piece

## TSTCU

| Ød<br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|---------|----------------------|---------|
| 500       | 600                    | 710     | 340                  | 4,25    |
| 500       | 630                    | 740     | 340                  | 4,35    |
| 500       | 710                    | 820     | 340                  | 5,74    |
| 500       | 800                    | 910     | 340                  | 6,91    |
| 560       | 280                    | 375     | 355                  | 1,34    |
| 560       | 355                    | 460     | 365                  | 1,98    |
| 560       | 450                    | 555     | 365                  | 2,78    |
| 560       | 500                    | 610     | 370                  | 3,27    |
| 560       | 560                    | 670     | 370                  | 3,85    |
| 560       | 600                    | 710     | 370                  | 4,26    |
| 560       | 630                    | 740     | 370                  | 4,58    |
| 560       | 710                    | 820     | 370                  | 5,71    |
| 560       | 800                    | 910     | 370                  | 6,34    |
| 560       | 900                    | 1030    | 370                  | 8,45    |
| 600       | 280                    | 375     | 375                  | 1,37    |
| 600       | 355                    | 460     | 385                  | 1,93    |
| 600       | 450                    | 555     | 385                  | 2,81    |
| 600       | 500                    | 610     | 390                  | 3,29    |
| 600       | 560                    | 670     | 390                  | 3,86    |
| 600       | 600                    | 710     | 390                  | 4,54    |
| 600       | 630                    | 740     | 390                  | 4,58    |
| 600       | 710                    | 820     | 390                  | 5,69    |
| 600       | 800                    | 910     | 390                  | 6,79    |
| 600       | 900                    | 1030    | 390                  | 8,36    |
| 630       | 280                    | 375     | 390                  | 1,39    |
| 630       | 355                    | 460     | 400                  | 1,86    |
| 630       | 450                    | 555     | 400                  | 2,83    |
| 630       | 500                    | 610     | 405                  | 3,42    |
| 630       | 560                    | 670     | 405                  | 3,87    |
| 630       | 600                    | 710     | 405                  | 4,27    |
| 630       | 630                    | 740     | 405                  | 4,45    |
| 630       | 710                    | 820     | 405                  | 5,68    |
| 630       | 800                    | 910     | 405                  | 6,76    |
| 630       | 900                    | 1030    | 405                  | 8,30    |
| 630       | 1000                   | 1130    | 405                  | 9,71    |
| 710       | 250                    | 335     | 420                  | 1,26    |
| 710       | 280                    | 375     | 420                  | 1,50    |
| 710       | 300                    | 395     | 430                  | 1,64    |
| 710       | 315                    | 410     | 430                  | 1,74    |
| 710       | 355                    | 460     | 440                  | 2,08    |
| 710       | 400                    | 505     | 440                  | 2,61    |
| 710       | 450                    | 555     | 440                  | 3,01    |
| 710       | 500                    | 610     | 445                  | 3,52    |
| 710       | 560                    | 670     | 445                  | 4,11    |
| 710       | 600                    | 710     | 445                  | 4,52    |
| 710       | 630                    | 740     | 445                  | 4,81    |
| 710       | 710                    | 820     | 445                  | 6,00    |
| 710       | 800                    | 910     | 445                  | 7,10    |

| Ød<br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|---------|----------------------|---------|
| 710       | 900                    | 1030    | 445                  | 8,69    |
| 710       | 1000                   | 1130    | 445                  | 10,2    |
| 710       | 1120                   | 1250    | 445                  | 12,4    |
| 800       | 250                    | 335     | 465                  | 1,08    |
| 800       | 280                    | 375     | 475                  | 1,44    |
| 800       | 300                    | 395     | 475                  | 1,57    |
| 800       | 315                    | 410     | 475                  | 1,61    |
| 800       | 355                    | 460     | 485                  | 2,00    |
| 800       | 400                    | 505     | 485                  | 2,50    |
| 800       | 450                    | 555     | 485                  | 2,88    |
| 800       | 500                    | 610     | 490                  | 3,59    |
| 800       | 560                    | 670     | 490                  | 3,93    |
| 800       | 600                    | 710     | 490                  | 4,32    |
| 800       | 630                    | 740     | 490                  | 4,94    |
| 800       | 710                    | 820     | 490                  | 5,73    |
| 800       | 800                    | 910     | 490                  | 6,99    |
| 800       | 900                    | 1030    | 490                  | 8,32    |
| 800       | 1000                   | 1130    | 490                  | 8,61    |
| 800       | 1120                   | 1250    | 490                  | 11,9    |
| 800       | 1250                   | 1380    | 490                  | 14,0    |
| 900       | 315                    | 410     | 525                  | 2,00    |
| 900       | 355                    | 460     | 535                  | 2,43    |
| 900       | 400                    | 505     | 535                  | 3,41    |
| 900       | 450                    | 555     | 535                  | 3,59    |
| 900       | 500                    | 610     | 540                  | 4,24    |
| 900       | 560                    | 670     | 540                  | 5,01    |
| 900       | 600                    | 710     | 540                  | 5,56    |
| 900       | 630                    | 740     | 540                  | 5,99    |
| 900       | 710                    | 820     | 540                  | 7,50    |
| 900       | 800                    | 910     | 540                  | 9,03    |
| 900       | 900                    | 1030    | 540                  | 11,2    |
| 900       | 1000                   | 1130    | 540                  | 13,3    |
| 900       | 1120                   | 1250    | 540                  | 16,4    |
| 900       | 1250                   | 1380    | 540                  | 19,7    |
| 1000      | 315                    | 410     | 575                  | 1,95    |
| 1000      | 355                    | 460     | 585                  | 2,36    |
| 1000      | 400                    | 505     | 585                  | 2,97    |
| 1000      | 450                    | 555     | 585                  | 3,54    |
| 1000      | 500                    | 610     | 590                  | 3,99    |
| 1000      | 560                    | 670     | 590                  | 5,02    |
| 1000      | 600                    | 710     | 590                  | 5,66    |
| 1000      | 630                    | 740     | 590                  | 6,34    |
| 1000      | 710                    | 820     | 590                  | 7,67    |
| 1000      | 800                    | 910     | 590                  | 9,31    |
| 1000      | 900                    | 1030    | 590                  | 11,8    |
| 1000      | 1000                   | 1130    | 590                  | 14,2    |
| 1000      | 1120                   | 1250    | 590                  | 17,7    |
| 1000      | 1250                   | 1380    | 590                  | 21,5    |



## T-piece

## TSTCU

| Ød<br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|---------|----------------------|---------|
| 1120      | 500                    | 610     | 650                  | 4,25    |
| 1120      | 560                    | 670     | 650                  | 5,07    |
| 1120      | 600                    | 710     | 650                  | 5,66    |
| 1120      | 630                    | 740     | 650                  | 6,12    |
| 1120      | 710                    | 820     | 650                  | 7,75    |
| 1120      | 800                    | 910     | 650                  | 9,45    |
| 1120      | 900                    | 1030    | 650                  | 12,2    |
| 1120      | 1000                   | 1130    | 650                  | 14,3    |
| 1120      | 1120                   | 1250    | 650                  | 17,9    |
| 1120      | 1250                   | 1380    | 650                  | 21,7    |
| 1250      | 500                    | 610     | 715                  | 4,28    |
| 1250      | 560                    | 670     | 715                  | 5,11    |
| 1250      | 600                    | 710     | 715                  | 5,71    |
| 1250      | 630                    | 740     | 715                  | 6,18    |
| 1250      | 710                    | 820     | 715                  | 7,83    |
| 1250      | 800                    | 910     | 715                  | 9,55    |
| 1250      | 900                    | 1030    | 715                  | 12,5    |
| 1250      | 1000                   | 1130    | 715                  | 14,5    |
| 1250      | 1120                   | 1250    | 715                  | 18,2    |
| 1250      | 1250                   | 1380    | 715                  | 22,0    |

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# T-piece

# TSTU

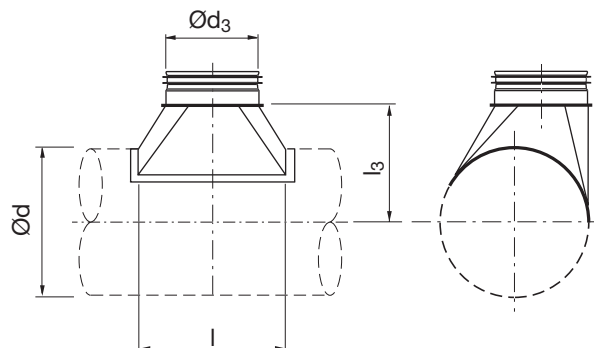
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## Description

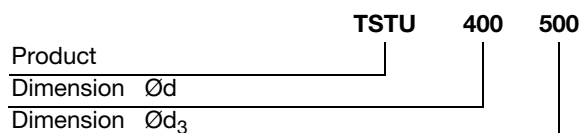
Hand made tangential T-piece.

## Dimensions



| Ød nom | Ød <sub>3</sub> nom | l mm | l <sub>3</sub> mm | m kg |
|--------|---------------------|------|-------------------|------|
| 63     | 63                  | 128  | 77                | 0,12 |
| 63     | 80                  | 145  | 77                | 0,15 |
| 63     | 100                 | 165  | 77                | 0,20 |
| 80     | 63                  | 128  | 85                | 0,12 |
| 80     | 80                  | 145  | 85                | 0,16 |
| 80     | 100                 | 165  | 85                | 0,21 |
| 80     | 112                 | 175  | 85                | 0,24 |
| 80     | 125                 | 190  | 85                | 0,29 |
| 100    | 63                  | 128  | 95                | 0,13 |
| 100    | 80                  | 145  | 95                | 0,16 |
| 100    | 100                 | 165  | 95                | 0,20 |
| 100    | 112                 | 175  | 95                | 0,22 |
| 100    | 125                 | 190  | 95                | 0,25 |
| 100    | 140                 | 210  | 100               | 0,30 |
| 100    | 150                 | 220  | 100               | 0,30 |
| 100    | 160                 | 230  | 100               | 0,36 |
| 112    | 63                  | 128  | 100               | 0,18 |
| 112    | 80                  | 145  | 100               | 0,21 |
| 112    | 100                 | 165  | 100               | 0,25 |
| 112    | 112                 | 175  | 100               | 0,27 |
| 112    | 125                 | 190  | 100               | 0,30 |
| 112    | 140                 | 210  | 105               | 0,34 |
| 112    | 150                 | 220  | 105               | 0,37 |
| 112    | 160                 | 230  | 105               | 0,39 |
| 112    | 180                 | 250  | 105               | 0,43 |
| 125    | 63                  | 128  | 110               | 0,14 |
| 125    | 80                  | 145  | 110               | 0,17 |
| 125    | 100                 | 165  | 110               | 0,21 |
| 125    | 112                 | 175  | 110               | 0,23 |
| 125    | 125                 | 190  | 110               | 0,27 |
| 125    | 140                 | 210  | 115               | 0,31 |
| 125    | 150                 | 220  | 115               | 0,33 |
| 125    | 160                 | 230  | 115               | 0,35 |

## Ordering example





## T-piece

## TSTU

| Ød nom | Ød <sub>3</sub> nom | l mm | l <sub>3</sub> mm | m kg |
|--------|---------------------|------|-------------------|------|
| 125    | 180                 | 250  | 115               | 0,41 |
| 125    | 200                 | 285  | 130               | 0,50 |
| 140    | 63                  | 128  | 115               | 0,18 |
| 140    | 80                  | 145  | 115               | 0,22 |
| 140    | 100                 | 165  | 115               | 0,26 |
| 140    | 112                 | 175  | 115               | 0,28 |
| 140    | 125                 | 190  | 115               | 0,31 |
| 140    | 140                 | 210  | 120               | 0,36 |
| 140    | 150                 | 220  | 120               | 0,38 |
| 140    | 160                 | 230  | 120               | 0,40 |
| 140    | 180                 | 250  | 120               | 0,45 |
| 140    | 200                 | 285  | 135               | 0,53 |
| 140    | 224                 | 310  | 135               | 0,59 |
| 150    | 63                  | 128  | 120               | 0,14 |
| 150    | 80                  | 145  | 120               | 0,19 |
| 150    | 100                 | 165  | 120               | 0,24 |
| 150    | 112                 | 175  | 120               | 0,27 |
| 150    | 125                 | 190  | 120               | 0,31 |
| 150    | 140                 | 210  | 125               | 0,37 |
| 150    | 150                 | 220  | 125               | 0,39 |
| 150    | 160                 | 230  | 125               | 0,43 |
| 150    | 180                 | 250  | 125               | 0,47 |
| 150    | 200                 | 285  | 140               | 0,57 |
| 150    | 224                 | 310  | 140               | 0,64 |
| 150    | 250                 | 335  | 140               | 0,77 |
| 160    | 63                  | 128  | 125               | 0,10 |
| 160    | 80                  | 145  | 125               | 0,15 |
| 160    | 100                 | 165  | 125               | 0,22 |
| 160    | 112                 | 175  | 125               | 0,25 |
| 160    | 125                 | 190  | 125               | 0,29 |
| 160    | 140                 | 210  | 130               | 0,35 |
| 160    | 150                 | 220  | 130               | 0,38 |
| 160    | 160                 | 230  | 130               | 0,41 |
| 160    | 180                 | 250  | 130               | 0,47 |
| 160    | 200                 | 285  | 145               | 0,57 |
| 160    | 224                 | 310  | 145               | 0,65 |
| 160    | 250                 | 335  | 145               | 0,85 |
| 180    | 63                  | 128  | 135               | 0,16 |
| 180    | 80                  | 145  | 135               | 0,20 |
| 180    | 100                 | 165  | 135               | 0,25 |
| 180    | 112                 | 175  | 135               | 0,27 |
| 180    | 125                 | 190  | 135               | 0,31 |
| 180    | 140                 | 210  | 140               | 0,36 |
| 180    | 150                 | 220  | 140               | 0,39 |
| 180    | 160                 | 230  | 140               | 0,43 |
| 180    | 180                 | 250  | 140               | 0,49 |
| 180    | 200                 | 285  | 155               | 0,62 |
| 180    | 224                 | 310  | 155               | 0,69 |

| Ød nom | Ød <sub>3</sub> nom | l mm | l <sub>3</sub> mm | m kg |
|--------|---------------------|------|-------------------|------|
| 180    | 250                 | 335  | 155               | 0,82 |
| 180    | 280                 | 375  | 165               | 1,02 |
| 200    | 63                  | 128  | 145               | 0,14 |
| 200    | 80                  | 145  | 145               | 0,18 |
| 200    | 100                 | 165  | 145               | 0,23 |
| 200    | 112                 | 175  | 145               | 0,25 |
| 200    | 125                 | 190  | 145               | 0,29 |
| 200    | 140                 | 210  | 150               | 0,34 |
| 200    | 150                 | 220  | 150               | 0,37 |
| 200    | 160                 | 230  | 150               | 0,40 |
| 200    | 180                 | 250  | 150               | 0,46 |
| 200    | 200                 | 285  | 165               | 0,64 |
| 200    | 224                 | 310  | 165               | 0,66 |
| 200    | 250                 | 335  | 165               | 0,79 |
| 200    | 280                 | 375  | 175               | 1,00 |
| 200    | 300                 | 395  | 175               | 1,09 |
| 200    | 315                 | 410  | 175               | 1,13 |
| 224    | 63                  | 128  | 160               | 0,15 |
| 224    | 80                  | 145  | 160               | 0,18 |
| 224    | 100                 | 165  | 160               | 0,23 |
| 224    | 112                 | 175  | 160               | 0,25 |
| 224    | 125                 | 190  | 160               | 0,29 |
| 224    | 140                 | 210  | 165               | 0,35 |
| 224    | 150                 | 220  | 165               | 0,37 |
| 224    | 160                 | 230  | 165               | 0,40 |
| 224    | 180                 | 250  | 165               | 0,47 |
| 224    | 200                 | 285  | 180               | 0,63 |
| 224    | 224                 | 310  | 180               | 0,67 |
| 224    | 250                 | 335  | 180               | 0,84 |
| 224    | 280                 | 375  | 190               | 1,01 |
| 224    | 300                 | 395  | 190               | 1,11 |
| 224    | 315                 | 410  | 190               | 1,18 |
| 224    | 355                 | 460  | 200               | 1,44 |
| 250    | 63                  | 128  | 170               | 0,15 |
| 250    | 80                  | 145  | 170               | 0,18 |
| 250    | 100                 | 165  | 170               | 0,23 |
| 250    | 112                 | 175  | 170               | 0,26 |
| 250    | 125                 | 190  | 170               | 0,29 |
| 250    | 140                 | 210  | 175               | 0,35 |
| 250    | 150                 | 220  | 175               | 0,38 |
| 250    | 160                 | 230  | 175               | 0,41 |
| 250    | 180                 | 250  | 175               | 0,47 |
| 250    | 200                 | 285  | 190               | 0,62 |
| 250    | 224                 | 310  | 190               | 0,68 |
| 250    | 250                 | 335  | 190               | 0,89 |
| 250    | 280                 | 375  | 200               | 1,03 |
| 250    | 300                 | 395  | 200               | 1,12 |
| 250    | 315                 | 410  | 200               | 1,13 |

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## T-piece

## TSTU

| Ød<br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|---------|----------------------|---------|
| 250       | 355                    | 460     | 210                  | 1,46    |
| 250       | 400                    | 505     | 210                  | 1,83    |
| 280       | 80                     | 145     | 185                  | 0,20    |
| 280       | 100                    | 165     | 185                  | 0,24    |
| 280       | 112                    | 175     | 185                  | 0,27    |
| 280       | 125                    | 190     | 185                  | 0,31    |
| 280       | 140                    | 210     | 190                  | 0,36    |
| 280       | 150                    | 220     | 190                  | 0,39    |
| 280       | 160                    | 230     | 190                  | 0,42    |
| 280       | 180                    | 250     | 190                  | 0,49    |
| 280       | 200                    | 285     | 205                  | 0,60    |
| 280       | 224                    | 310     | 205                  | 0,69    |
| 280       | 250                    | 335     | 205                  | 0,86    |
| 280       | 280                    | 375     | 215                  | 1,03    |
| 280       | 300                    | 395     | 215                  | 1,12    |
| 280       | 315                    | 410     | 215                  | 1,19    |
| 280       | 355                    | 460     | 225                  | 1,44    |
| 280       | 400                    | 505     | 225                  | 1,80    |
| 280       | 450                    | 555     | 225                  | 2,11    |
| 300       | 80                     | 145     | 195                  | 0,20    |
| 300       | 100                    | 165     | 195                  | 0,24    |
| 300       | 112                    | 175     | 195                  | 0,28    |
| 300       | 125                    | 190     | 195                  | 0,30    |
| 300       | 140                    | 210     | 200                  | 0,35    |
| 300       | 150                    | 220     | 200                  | 0,40    |
| 300       | 160                    | 230     | 200                  | 0,43    |
| 300       | 180                    | 250     | 200                  | 0,49    |
| 300       | 200                    | 285     | 215                  | 0,63    |
| 300       | 224                    | 310     | 215                  | 0,70    |
| 300       | 250                    | 335     | 215                  | 0,86    |
| 300       | 280                    | 375     | 225                  | 1,03    |
| 300       | 300                    | 395     | 225                  | 1,13    |
| 300       | 315                    | 410     | 225                  | 1,20    |
| 300       | 355                    | 460     | 235                  | 1,45    |
| 300       | 400                    | 505     | 235                  | 1,73    |
| 300       | 450                    | 555     | 235                  | 2,10    |
| 315       | 80                     | 145     | 205                  | 0,19    |
| 315       | 100                    | 165     | 205                  | 0,24    |
| 315       | 112                    | 175     | 205                  | 0,26    |
| 315       | 125                    | 190     | 205                  | 0,31    |
| 315       | 140                    | 210     | 210                  | 0,40    |
| 315       | 150                    | 220     | 210                  | 0,44    |
| 315       | 160                    | 230     | 210                  | 0,45    |
| 315       | 180                    | 250     | 210                  | 0,56    |
| 315       | 200                    | 285     | 225                  | 0,63    |
| 315       | 224                    | 310     | 225                  | 0,79    |
| 315       | 250                    | 335     | 225                  | 0,92    |
| 315       | 280                    | 375     | 235                  | 1,11    |

| Ød<br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|---------|----------------------|---------|
| 315       | 300                    | 395     | 235                  | 1,19    |
| 315       | 315                    | 410     | 235                  | 1,32    |
| 315       | 355                    | 460     | 245                  | 1,53    |
| 315       | 400                    | 505     | 245                  | 1,80    |
| 315       | 450                    | 555     | 245                  | 2,01    |
| 315       | 500                    | 610     | 250                  | 2,24    |
| 355       | 100                    | 165     | 225                  | 0,23    |
| 355       | 112                    | 175     | 225                  | 0,28    |
| 355       | 125                    | 195     | 225                  | 0,36    |
| 355       | 140                    | 210     | 230                  | 0,45    |
| 355       | 150                    | 220     | 230                  | 0,50    |
| 355       | 160                    | 230     | 230                  | 0,55    |
| 355       | 180                    | 250     | 230                  | 0,65    |
| 355       | 200                    | 285     | 245                  | 0,82    |
| 355       | 224                    | 310     | 245                  | 0,95    |
| 355       | 250                    | 335     | 245                  | 1,16    |
| 355       | 280                    | 375     | 245                  | 1,36    |
| 355       | 300                    | 395     | 255                  | 1,47    |
| 355       | 315                    | 410     | 255                  | 1,55    |
| 355       | 355                    | 460     | 265                  | 1,91    |
| 355       | 400                    | 505     | 265                  | 2,18    |
| 355       | 450                    | 555     | 265                  | 2,46    |
| 355       | 500                    | 610     | 270                  | 2,77    |
| 355       | 560                    | 670     | 270                  | 3,11    |
| 400       | 100                    | 165     | 245                  | 0,26    |
| 400       | 112                    | 175     | 245                  | 0,28    |
| 400       | 125                    | 195     | 245                  | 0,36    |
| 400       | 140                    | 210     | 250                  | 0,44    |
| 400       | 150                    | 220     | 250                  | 0,50    |
| 400       | 160                    | 230     | 250                  | 0,55    |
| 400       | 180                    | 250     | 250                  | 0,66    |
| 400       | 200                    | 285     | 265                  | 0,78    |
| 400       | 224                    | 310     | 265                  | 0,97    |
| 400       | 250                    | 335     | 265                  | 1,19    |
| 400       | 280                    | 375     | 275                  | 1,34    |
| 400       | 300                    | 395     | 275                  | 1,52    |
| 400       | 315                    | 410     | 275                  | 1,56    |
| 400       | 355                    | 460     | 285                  | 1,89    |
| 400       | 400                    | 505     | 285                  | 2,29    |
| 400       | 450                    | 555     | 285                  | 2,58    |
| 400       | 500                    | 610     | 290                  | 2,96    |
| 400       | 560                    | 670     | 290                  | 3,29    |
| 400       | 600                    | 710     | 290                  | 3,51    |
| 400       | 630                    | 740     | 290                  | 3,68    |
| 450       | 125                    | 190     | 270                  | 0,28    |
| 450       | 140                    | 210     | 275                  | 0,40    |
| 450       | 150                    | 220     | 275                  | 0,46    |
| 450       | 160                    | 230     | 275                  | 0,52    |



## T-piece

## TSTU

| Ød<br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|---------|----------------------|---------|
| 450       | 180                    | 250     | 275                  | 0,64    |
| 450       | 200                    | 285     | 290                  | 0,84    |
| 450       | 224                    | 310     | 290                  | 0,98    |
| 450       | 250                    | 335     | 290                  | 1,22    |
| 450       | 280                    | 375     | 300                  | 1,46    |
| 450       | 300                    | 395     | 300                  | 1,58    |
| 450       | 315                    | 410     | 300                  | 1,68    |
| 450       | 355                    | 460     | 310                  | 1,98    |
| 450       | 400                    | 505     | 310                  | 2,39    |
| 450       | 450                    | 555     | 310                  | 2,60    |
| 450       | 500                    | 610     | 315                  | 3,08    |
| 450       | 560                    | 670     | 315                  | 3,48    |
| 450       | 600                    | 710     | 315                  | 3,74    |
| 450       | 630                    | 740     | 315                  | 3,94    |
| 450       | 710                    | 820     | 315                  | 4,70    |
| 500       | 125                    | 190     | 295                  | 0,35    |
| 500       | 140                    | 210     | 300                  | 0,43    |
| 500       | 150                    | 220     | 300                  | 0,48    |
| 500       | 160                    | 230     | 300                  | 0,52    |
| 500       | 180                    | 250     | 300                  | 0,60    |
| 500       | 200                    | 285     | 315                  | 0,84    |
| 500       | 224                    | 310     | 315                  | 0,86    |
| 500       | 250                    | 335     | 315                  | 1,13    |
| 500       | 280                    | 375     | 325                  | 1,29    |
| 500       | 300                    | 395     | 325                  | 1,42    |
| 500       | 315                    | 410     | 325                  | 1,52    |
| 500       | 355                    | 460     | 335                  | 1,85    |
| 500       | 400                    | 505     | 335                  | 2,26    |
| 500       | 450                    | 555     | 335                  | 2,74    |
| 500       | 500                    | 610     | 340                  | 3,28    |
| 500       | 560                    | 670     | 340                  | 3,83    |
| 500       | 600                    | 710     | 340                  | 4,25    |
| 500       | 630                    | 740     | 340                  | 4,35    |
| 500       | 710                    | 820     | 340                  | 5,74    |
| 500       | 800                    | 910     | 340                  | 6,91    |
| 560       | 200                    | 285     | 345                  | 0,78    |
| 560       | 224                    | 310     | 345                  | 0,90    |
| 560       | 250                    | 335     | 345                  | 1,12    |
| 560       | 280                    | 375     | 355                  | 1,34    |
| 560       | 300                    | 395     | 355                  | 1,47    |
| 560       | 315                    | 410     | 355                  | 1,57    |
| 560       | 355                    | 460     | 365                  | 1,98    |
| 560       | 400                    | 505     | 365                  | 2,38    |
| 560       | 450                    | 555     | 365                  | 2,78    |
| 560       | 500                    | 610     | 370                  | 3,27    |
| 560       | 560                    | 670     | 370                  | 3,85    |
| 560       | 600                    | 710     | 370                  | 4,26    |
| 560       | 630                    | 740     | 370                  | 4,58    |

| Ød<br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|---------|----------------------|---------|
| 560       | 710                    | 820     | 370                  | 5,71    |
| 560       | 800                    | 910     | 370                  | 6,34    |
| 560       | 900                    | 1030    | 370                  | 8,45    |
| 600       | 200                    | 285     | 365                  | 0,81    |
| 600       | 224                    | 310     | 365                  | 0,93    |
| 600       | 250                    | 335     | 365                  | 1,14    |
| 600       | 280                    | 375     | 375                  | 1,37    |
| 600       | 300                    | 395     | 375                  | 1,50    |
| 600       | 315                    | 410     | 375                  | 1,59    |
| 600       | 355                    | 460     | 385                  | 1,93    |
| 600       | 400                    | 505     | 385                  | 2,39    |
| 600       | 450                    | 555     | 385                  | 2,81    |
| 600       | 500                    | 610     | 390                  | 3,29    |
| 600       | 560                    | 670     | 390                  | 3,86    |
| 600       | 600                    | 710     | 390                  | 4,54    |
| 600       | 630                    | 740     | 390                  | 4,58    |
| 600       | 710                    | 820     | 390                  | 5,69    |
| 600       | 800                    | 910     | 390                  | 6,79    |
| 600       | 900                    | 1030    | 390                  | 8,36    |
| 630       | 200                    | 285     | 380                  | 0,83    |
| 630       | 224                    | 310     | 380                  | 0,95    |
| 630       | 250                    | 335     | 380                  | 1,16    |
| 630       | 280                    | 375     | 390                  | 1,39    |
| 630       | 300                    | 395     | 390                  | 1,52    |
| 630       | 315                    | 410     | 390                  | 1,62    |
| 630       | 355                    | 460     | 400                  | 1,86    |
| 630       | 400                    | 505     | 400                  | 2,51    |
| 630       | 450                    | 555     | 400                  | 2,83    |
| 630       | 500                    | 610     | 405                  | 3,42    |
| 630       | 560                    | 670     | 405                  | 3,87    |
| 630       | 600                    | 710     | 405                  | 4,27    |
| 630       | 630                    | 740     | 405                  | 4,45    |
| 630       | 710                    | 820     | 405                  | 5,68    |
| 630       | 800                    | 910     | 405                  | 6,76    |
| 630       | 900                    | 1030    | 405                  | 8,30    |
| 630       | 1000                   | 1130    | 405                  | 9,71    |
| 710       | 250                    | 335     | 420                  | 1,26    |
| 710       | 280                    | 375     | 420                  | 1,50    |
| 710       | 300                    | 395     | 430                  | 1,64    |
| 710       | 315                    | 410     | 430                  | 1,74    |
| 710       | 355                    | 460     | 440                  | 2,08    |
| 710       | 400                    | 505     | 440                  | 2,61    |
| 710       | 450                    | 555     | 440                  | 3,01    |
| 710       | 500                    | 610     | 445                  | 3,52    |
| 710       | 560                    | 670     | 445                  | 4,11    |
| 710       | 600                    | 710     | 445                  | 4,52    |
| 710       | 630                    | 740     | 445                  | 4,81    |
| 710       | 710                    | 820     | 445                  | 6,00    |

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## T-piece

## TSTU

| Ød<br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|---------|----------------------|---------|
| 710       | 800                    | 910     | 445                  | 7,10    |
| 710       | 900                    | 1030    | 445                  | 8,69    |
| 710       | 1000                   | 1130    | 445                  | 10,2    |
| 710       | 1120                   | 1250    | 445                  | 12,4    |
| 800       | 250                    | 335     | 465                  | 1,08    |
| 800       | 280                    | 375     | 475                  | 1,44    |
| 800       | 300                    | 395     | 475                  | 1,57    |
| 800       | 315                    | 410     | 475                  | 1,61    |
| 800       | 355                    | 460     | 485                  | 2,00    |
| 800       | 400                    | 505     | 485                  | 2,50    |
| 800       | 450                    | 555     | 485                  | 2,88    |
| 800       | 500                    | 610     | 490                  | 3,59    |
| 800       | 560                    | 670     | 490                  | 3,93    |
| 800       | 600                    | 710     | 490                  | 4,32    |
| 800       | 630                    | 740     | 490                  | 4,94    |
| 800       | 710                    | 820     | 490                  | 5,73    |
| 800       | 800                    | 910     | 490                  | 6,99    |
| 800       | 900                    | 1030    | 490                  | 8,32    |
| 800       | 1000                   | 1130    | 490                  | 8,61    |
| 800       | 1120                   | 1250    | 490                  | 11,9    |
| 800       | 1250                   | 1380    | 490                  | 14,0    |
| 900       | 315                    | 410     | 525                  | 2,00    |
| 900       | 355                    | 460     | 535                  | 2,43    |
| 900       | 400                    | 505     | 535                  | 3,41    |
| 900       | 450                    | 555     | 535                  | 3,59    |
| 900       | 500                    | 610     | 540                  | 4,24    |
| 900       | 560                    | 670     | 540                  | 5,01    |
| 900       | 600                    | 710     | 540                  | 5,56    |
| 900       | 630                    | 740     | 540                  | 5,99    |
| 900       | 710                    | 820     | 540                  | 7,50    |
| 900       | 800                    | 910     | 540                  | 9,03    |
| 900       | 900                    | 1030    | 540                  | 11,2    |
| 900       | 1000                   | 1130    | 540                  | 13,3    |
| 900       | 1120                   | 1250    | 540                  | 16,4    |
| 900       | 1250                   | 1380    | 540                  | 19,7    |
| 1000      | 315                    | 410     | 575                  | 1,95    |
| 1000      | 355                    | 460     | 585                  | 2,36    |
| 1000      | 400                    | 505     | 585                  | 2,97    |
| 1000      | 450                    | 555     | 585                  | 3,54    |
| 1000      | 500                    | 610     | 590                  | 3,99    |
| 1000      | 560                    | 670     | 590                  | 5,02    |
| 1000      | 600                    | 710     | 590                  | 5,66    |
| 1000      | 630                    | 740     | 590                  | 6,34    |
| 1000      | 710                    | 820     | 590                  | 7,67    |
| 1000      | 800                    | 910     | 590                  | 9,31    |
| 1000      | 900                    | 1030    | 590                  | 11,8    |
| 1000      | 1000                   | 1130    | 590                  | 14,2    |
| 1000      | 1120                   | 1250    | 590                  | 17,7    |

| Ød<br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|------------------------|---------|----------------------|---------|
| 1000      | 1250                   | 1380    | 590                  | 21,5    |
| 1120      | 500                    | 610     | 650                  | 4,25    |
| 1120      | 560                    | 670     | 650                  | 5,07    |
| 1120      | 600                    | 710     | 650                  | 5,66    |
| 1120      | 630                    | 740     | 650                  | 6,12    |
| 1120      | 710                    | 820     | 650                  | 7,75    |
| 1120      | 800                    | 910     | 650                  | 9,45    |
| 1120      | 900                    | 1030    | 650                  | 12,2    |
| 1120      | 1000                   | 1130    | 650                  | 14,3    |
| 1120      | 1120                   | 1250    | 650                  | 17,9    |
| 1120      | 1250                   | 1380    | 650                  | 21,7    |
| 1250      | 500                    | 610     | 715                  | 4,28    |
| 1250      | 560                    | 670     | 715                  | 5,11    |
| 1250      | 600                    | 710     | 715                  | 5,71    |
| 1250      | 630                    | 740     | 715                  | 6,18    |
| 1250      | 710                    | 820     | 715                  | 7,83    |
| 1250      | 800                    | 910     | 715                  | 9,55    |
| 1250      | 900                    | 1030    | 715                  | 12,5    |
| 1250      | 1000                   | 1130    | 715                  | 14,5    |
| 1250      | 1120                   | 1250    | 715                  | 18,2    |
| 1250      | 1250                   | 1380    | 715                  | 22,0    |



# Take-off

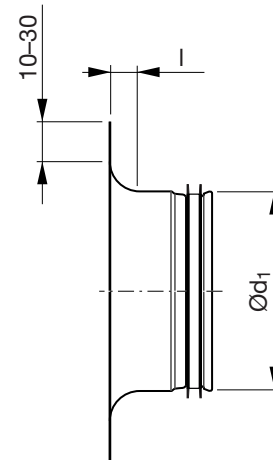
# ILRU



## Description

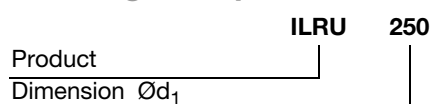
Take-off with radius.

## Dimensions



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 63                     | 10      | 0,07    |
| 80                     | 12      | 0,10    |
| 100                    | 15      | 0,11    |
| 125                    | 20      | 0,14    |
| 140                    | 20      | 0,22    |
| 150                    | 20      | 0,24    |
| 160                    | 25      | 0,19    |
| 180                    | 25      | 0,30    |
| 200                    | 25      | 0,26    |
| 224                    | 25      | 0,46    |
| 250                    | 25      | 0,57    |
| 300                    | 25      | 0,68    |
| 315                    | 25      | 0,72    |
| 355                    | 25      | 0,53    |
| 400                    | 25      | 0,97    |
| 500                    | 25      | 1,35    |
| 630                    | 25      | 1,77    |

## Ordering example



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# Take-off

ILU

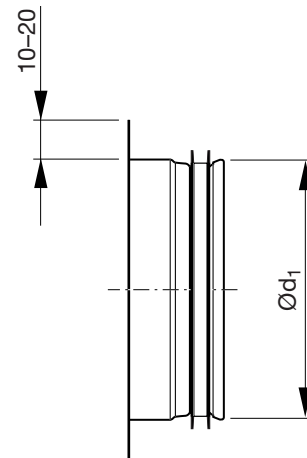
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## Description

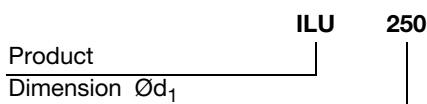
Take-off without radius.

## Dimensions



| Ød <sub>1</sub><br>nom | m<br>kg |
|------------------------|---------|
| 63                     | 0,07    |
| 80                     | 0,07    |
| 100                    | 0,08    |
| 112                    | 0,09    |
| 125                    | 0,11    |
| 140                    | 0,12    |
| 150                    | 0,12    |
| 160                    | 0,16    |
| 180                    | 0,20    |
| 200                    | 0,17    |
| 224                    | 0,23    |
| 250                    | 0,33    |
| 280                    | 0,37    |
| 300                    | 0,40    |
| 315                    | 0,42    |
| 355                    | 0,48    |
| 400                    | 0,65    |
| 450                    | 0,74    |
| 500                    | 0,82    |
| 560                    | 1,13    |
| 600                    | 1,21    |
| 630                    | 1,27    |
| 710                    | 2,12    |
| 800                    | 2,39    |
| 900                    | 2,69    |
| 1000                   | 3,57    |
| 1120                   | 3,99    |
| 1250                   | 4,46    |

## Ordering example





# Take-off

# ILF

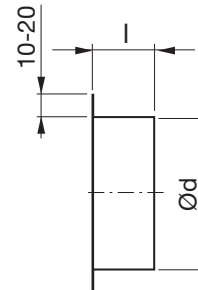


## Description

Take-off without radius. With female end – fits outside a Safe fitting.

Hasn't any Click function – hasn't any notches.

## Dimensions



| Ød<br>nom | l<br>mm | m<br>kg |
|-----------|---------|---------|
| 63        | 45      | 0,06    |
| 80        | 45      | 0,08    |
| 100       | 45      | 0,06    |
| 112       | 45      | 0,10    |
| 125       | 45      | 0,08    |
| 140       | 45      | 0,15    |
| 150       | 45      | 0,15    |
| 160       | 45      | 0,16    |
| 180       | 45      | 0,19    |
| 200       | 45      | 0,21    |
| 224       | 45      | 0,26    |
| 250       | 65      | 0,31    |
| 280       | 65      | 0,30    |
| 300       | 65      | 0,41    |
| 315       | 65      | 0,46    |
| 355       | 65      | 0,41    |
| 400       | 90      | 0,58    |
| 450       | 90      | 0,71    |
| 500       | 90      | 0,83    |
| 560       | 90      | 0,96    |
| 600       | 90      | 0,99    |
| 630       | 90      | 1,13    |

## Ordering example

|              |     |     |
|--------------|-----|-----|
| Product      | ILF | 200 |
| Dimension Ød |     |     |

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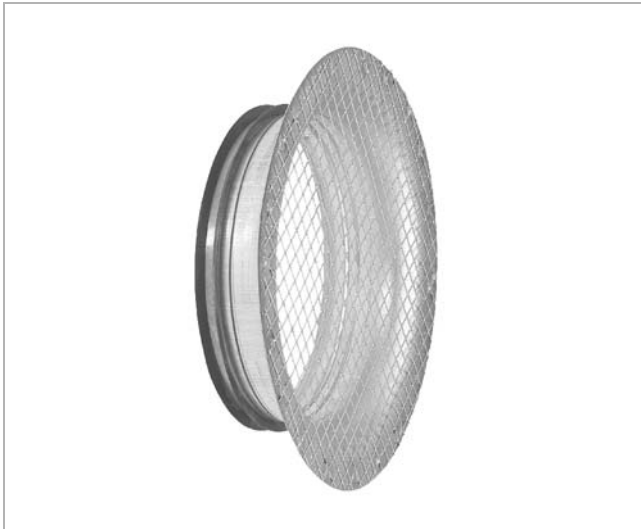
18



# Take-off with mesh

# ILRNU

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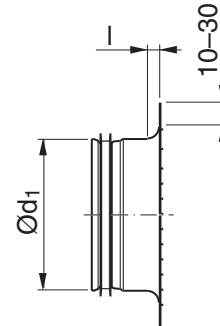
## Description

To terminate an inlet duct.

With radius.

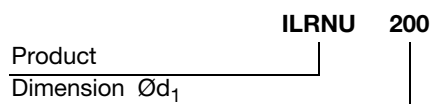
Mesh size 10 × 10 mm

## Dimensions



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 63                     | 10      | 0,07    |
| 80                     | 12      | 0,11    |
| 100                    | 15      | 0,16    |
| 125                    | 20      | 0,21    |
| 140                    | 20      | 0,24    |
| 150                    | 20      | 0,27    |
| 160                    | 25      | 0,22    |
| 180                    | 25      | 0,34    |
| 200                    | 25      | 0,39    |
| 224                    | 25      | 0,51    |
| 250                    | 25      | 0,64    |
| 300                    | 25      | 0,77    |
| 315                    | 25      | 0,83    |
| 355                    | 25      | 0,89    |
| 400                    | 25      | 1,14    |
| 500                    | 25      | 1,61    |
| 630                    | 25      | 2,19    |

## Ordering example





# Take-off with mesh

# ESNU

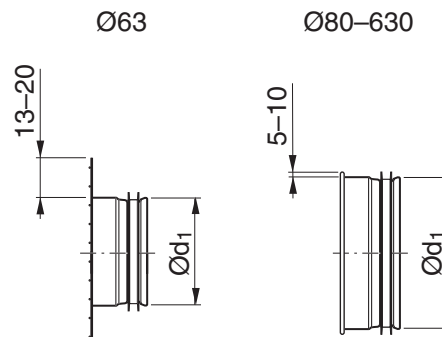


## Description

To terminate an inlet duct.

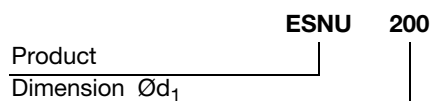
Mesh size 10 × 10 mm.

## Dimensions



| Ød <sub>1</sub><br>nom | m<br>kg |
|------------------------|---------|
| 63                     | 0,06    |
| 80                     | 0,08    |
| 100                    | 0,10    |
| 112                    | 0,11    |
| 125                    | 0,13    |
| 140                    | 0,15    |
| 150                    | 0,16    |
| 160                    | 0,17    |
| 180                    | 0,21    |
| 200                    | 0,25    |
| 224                    | 0,31    |
| 250                    | 0,38    |
| 280                    | 0,44    |
| 300                    | 0,51    |
| 315                    | 0,57    |
| 355                    | 0,66    |
| 400                    | 0,75    |
| 450                    | 0,92    |
| 500                    | 1,09    |
| 560                    | 1,32    |
| 600                    | 1,48    |
| 630                    | 1,55    |
| 710                    | 1,82    |
| 800                    | 2,11    |
| 900                    | 2,57    |
| 1000                   | 3,23    |
| 1120                   | 3,59    |
| 1250                   | 4,00    |

## Ordering example



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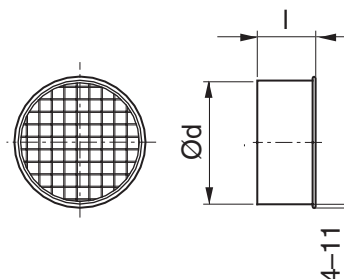
# Take-off with mesh

# EPNF

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## Dimensions



### Description

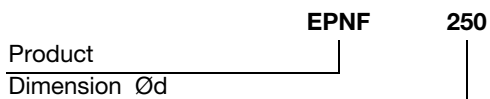
To terminate an inlet duct. With female end – fits outside a Safe fitting.

Mesh size 10 × 10 mm.

No Click function – no notches.

| Ød nom | l mm | m kg |
|--------|------|------|
| 80     | 48   | 0,07 |
| 100    | 48   | 0,09 |
| 112    | 48   | 0,10 |
| 125    | 48   | 0,11 |
| 140    | 48   | 0,13 |
| 150    | 48   | 0,14 |
| 160    | 48   | 0,15 |
| 180    | 48   | 0,17 |
| 200    | 48   | 0,21 |
| 224    | 48   | 0,25 |
| 250    | 68   | 0,32 |
| 280    | 68   | 0,38 |
| 300    | 68   | 0,42 |
| 315    | 68   | 0,45 |
| 355    | 68   | 0,54 |
| 400    | 93   | 0,69 |
| 450    | 93   | 0,81 |
| 500    | 93   | 0,92 |
| 560    | 93   | 1,12 |
| 600    | 93   | 1,23 |
| 630    | 93   | 1,29 |
| 710    | 113  | 1,47 |
| 800    | 113  | 1,65 |
| 900    | 138  | 1,97 |
| 1000   | 138  | 2,50 |
| 1120   | 138  | 2,79 |
| 1250   | 138  | 3,08 |

### Ordering example



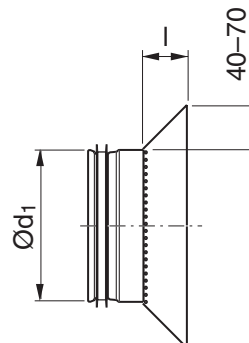


# Take-off with mesh and cone

# ILKNU 50



## Dimensions



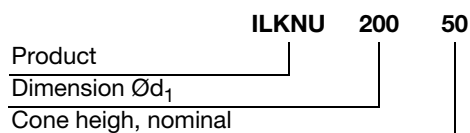
### Description

To terminate an inlet duct.

Mesh size 10 × 10 mm.

| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 100                    | 50      | 0,15    |
| 125                    | 50      | 0,22    |
| 160                    | 50      | 0,25    |
| 200                    | 50      | 0,32    |
| 250                    | 53      | 0,65    |
| 315                    | 68      | 0,89    |
| 400                    | 50      | 1,00    |
| 500                    | 50      | 1,24    |
| 630                    | 40      | 1,43    |
| 800                    | 50      | 1,79    |

### Ordering example



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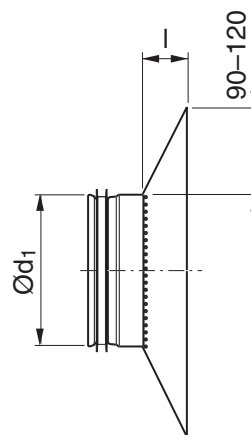
# Take-off with mesh and cone

# ILKNU 100

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## Dimensions



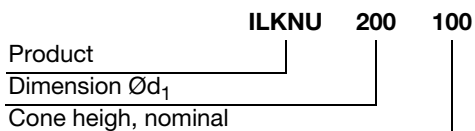
## Description

To terminate an inlet duct.

Mesh size 10 × 10 mm.

| $\varnothing d_1$<br>nom | l<br>mm | m<br>kg |
|--------------------------|---------|---------|
| 100                      | 100     | 0,48    |
| 125                      | 95      | 0,54    |
| 160                      | 98      | 0,68    |
| 200                      | 100     | 0,99    |
| 250                      | 100     | 1,23    |
| 315                      | 93      | 1,43    |
| 400                      | 100     | 1,73    |
| 500                      | 105     | 2,14    |
| 630                      | 115     | 2,87    |
| 800                      | 100     | 4,21    |

## Ordering example



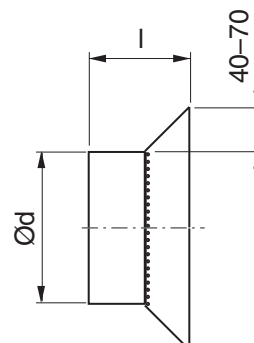


# Take-off with mesh and cone

## ILKNF 50



### Dimensions



### Description

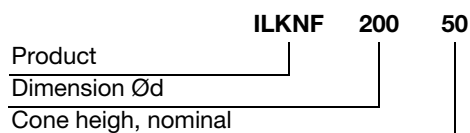
To terminate an inlet duct. With female end – fits outside a Safe fitting.

Mesh size 10 × 10 mm.

No Click function – no notches.

| Ød nom | l mm | m kg |
|--------|------|------|
| 100    | 92   | 0,15 |
| 125    | 92   | 0,22 |
| 160    | 92   | 0,25 |
| 200    | 92   | 0,32 |
| 250    | 115  | 0,65 |
| 315    | 130  | 0,89 |
| 400    | 132  | 1,00 |
| 500    | 132  | 1,24 |
| 630    | 122  | 1,43 |
| 800    | 152  | 1,79 |

### Ordering example



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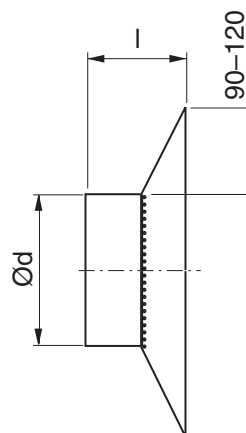
# Take-off with mesh and cone

# ILKNF 100

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## Dimensions



### Description

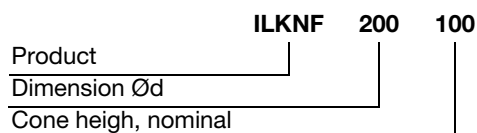
To terminate an inlet duct. With female end – fits outside a Safe fitting.

Mesh size 10 × 10 mm.

No Click function – no notches.

| Ød<br>nom | l<br>mm | m<br>kg |
|-----------|---------|---------|
| 100       | 142     | 0,48    |
| 125       | 137     | 0,54    |
| 160       | 140     | 0,68    |
| 200       | 142     | 0,99    |
| 250       | 162     | 1,23    |
| 315       | 155     | 1,43    |
| 400       | 182     | 1,73    |
| 500       | 187     | 2,14    |
| 630       | 197     | 2,87    |
| 800       | 202     | 4,21    |

### Ordering example





# Take-off

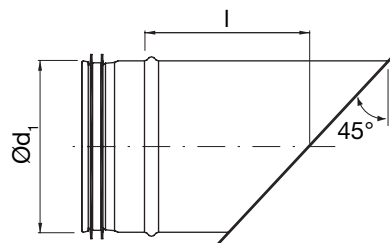
# ILVU45°



## Description

As standard the angle is 45°.  
Different angle available to order.

## Dimensions



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 80                     | 80      | 0,11    |
| 100                    | 90      | 0,15    |
| 112                    | 96      | 0,18    |
| 125                    | 103     | 0,21    |
| 140                    | 110     | 0,25    |
| 150                    | 115     | 0,27    |
| 160                    | 120     | 0,30    |
| 180                    | 130     | 0,36    |
| 200                    | 140     | 0,43    |
| 224                    | 152     | 0,62    |
| 250                    | 185     | 0,87    |
| 280                    | 200     | 1,00    |
| 300                    | 210     | 1,20    |
| 315                    | 218     | 1,20    |
| 355                    | 238     | 1,50    |
| 400                    | 280     | 2,40    |
| 450                    | 305     | 2,90    |
| 500                    | 330     | 3,50    |
| 560                    | 360     | 4,20    |
| 600                    | 380     | 4,60    |
| 630                    | 395     | 5,00    |
| 710                    | 455     | 8,40    |
| 800                    | 500     | 10,0    |
| 900                    | 550     | 12,0    |
| 1000                   | 620     | 16,0    |
| 1120                   | 680     | 19,0    |
| 1250                   | 745     | 23,0    |

## Ordering example

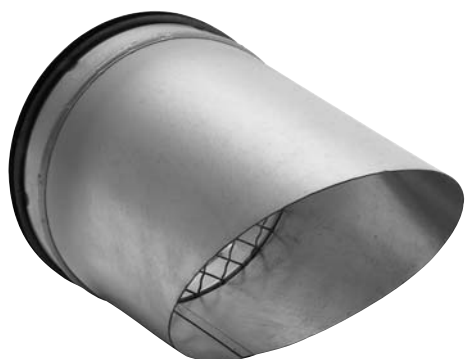
|                           |        |     |
|---------------------------|--------|-----|
| Product                   | ILVU45 | 125 |
| Dimension Ød <sub>1</sub> |        |     |

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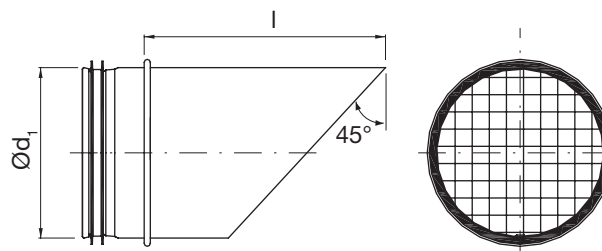


# Take-off

AVU



## Dimensions

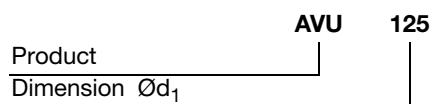


### Description

As standard the angle is 45°.  
Different angle available to order.

| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 63                     | 160     | 0,12    |
| 80                     | 180     | 0,17    |
| 100                    | 200     | 0,22    |
| 112                    | 210     | 0,25    |
| 125                    | 225     | 0,29    |
| 140                    | 240     | 0,34    |
| 150                    | 250     | 0,37    |
| 160                    | 260     | 0,41    |
| 180                    | 280     | 0,48    |
| 200                    | 300     | 0,56    |
| 224                    | 325     | 0,80    |
| 250                    | 350     | 1,00    |
| 280                    | 380     | 1,20    |
| 300                    | 400     | 1,30    |
| 315                    | 415     | 1,40    |
| 355                    | 455     | 1,70    |
| 400                    | 500     | 2,50    |
| 450                    | 550     | 3,00    |
| 500                    | 600     | 3,60    |
| 560                    | 660     | 4,30    |
| 600                    | 700     | 4,80    |
| 630                    | 730     | 5,20    |
| 710                    | 810     | 8,40    |
| 800                    | 900     | 10,0    |
| 900                    | 1000    | 12,0    |
| 1000                   | 1100    | 15,0    |
| 1120                   | 1220    | 19,0    |
| 1250                   | 1350    | 23,0    |

### Ordering example





# Coupling

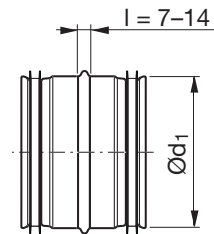
# NPU



## Description

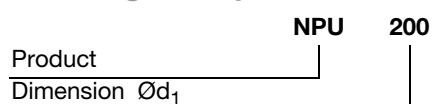
Coupling connector for joining circular ducts.

## Dimensions



| Ød <sub>1</sub><br>nom | m<br>kg |
|------------------------|---------|
| 63                     | 0,07    |
| 80                     | 0,09    |
| 100                    | 0,12    |
| 112                    | 0,14    |
| 125                    | 0,15    |
| 140                    | 0,16    |
| 150                    | 0,18    |
| 160                    | 0,19    |
| 180                    | 0,25    |
| 200                    | 0,30    |
| 224                    | 0,30    |
| 250                    | 0,52    |
| 280                    | 0,56    |
| 300                    | 0,64    |
| 315                    | 0,66    |
| 355                    | 0,76    |
| 400                    | 1,10    |
| 450                    | 1,34    |
| 500                    | 1,52    |
| 560                    | 1,90    |
| 600                    | 2,10    |
| 630                    | 2,24    |
| 710                    | 2,65    |
| 800                    | 3,10    |
| 900                    | 4,52    |
| 1000                   | 5,30    |
| 1120                   | 7,03    |
| 1250                   | 7,70    |

## Ordering example



- 1
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# Expanding coupling

NPEU

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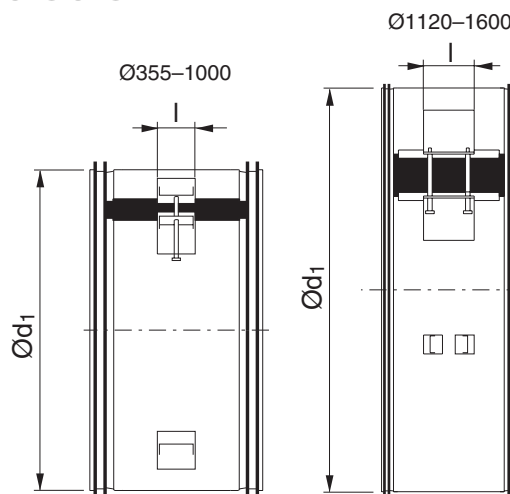


## Description

Expanding coupling, intended for installation of ventilation ducts and components of larger dimensions. The coupling makes installation easier and can also be used between circular ducts and fittings without a rubber seal.

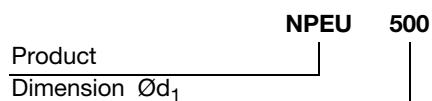
The coupling is expanded by means of a threaded bolt, socket no. 13. Can achieve maximum tightness class C.

## Dimensions



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 355                    | 45      | 1,24    |
| 400                    | 45      | 1,64    |
| 450                    | 45      | 1,83    |
| 500                    | 45      | 2,50    |
| 560                    | 45      | 2,95    |
| 600                    | 45      | 3,15    |
| 630                    | 45      | 3,30    |
| 710                    | 45      | 4,30    |
| 800                    | 45      | 4,81    |
| 900                    | 45      | 5,40    |
| 1000                   | 45      | 8,48    |
| 1120                   | 120     | 15,3    |
| 1250                   | 120     | 17,3    |
| 1400                   | 120     | 15,2    |
| 1500                   | 120     | 16,4    |
| 1600                   | 120     | 17,5    |

## Ordering example





# Female coupling

MF

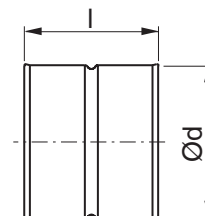


## Description

Female coupling for joining fittings.

Has normally not any Click function – hasn't any notches.  
Can to order be delivered with Click function – i.e. with notches.

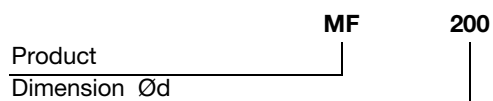
## Dimensions



| Ød nom | l mm | m kg |
|--------|------|------|
| 63 *   | 95   | 0,06 |
| 80 *   | 95   | 0,08 |
| 100 *  | 95   | 0,10 |
| 112    | 90   | 0,11 |
| 125 *  | 95   | 0,13 |
| 140    | 90   | 0,17 |
| 150 *  | 95   | 0,18 |
| 160 *  | 95   | 0,20 |
| 180    | 90   | 0,22 |
| 200 *  | 95   | 0,25 |
| 224    | 90   | 0,27 |
| 250 *  | 140  | 0,42 |
| 280    | 125  | 0,50 |
| 300    | 125  | 0,51 |
| 315 *  | 140  | 0,54 |
| 355    | 125  | 0,62 |
| 400 *  | 180  | 0,96 |
| 450    | 170  | 1,17 |
| 500 *  | 180  | 1,46 |
| 560    | 170  | 1,57 |
| 600    | 170  | 1,65 |
| 630    | 170  | 1,74 |
| 710    | 219  | 1,96 |
| 800    | 219  | 2,24 |
| 900    | 219  | 4,00 |
| 1000   | 255  | 5,09 |
| 1120   | 255  | 8,71 |
| 1250   | 255  | 10,2 |

\* With turned-over edge

## Ordering example



- 1
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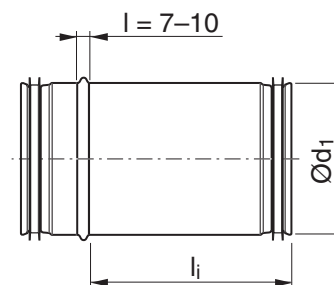


# Slide-in coupling

SNPU



## Dimensions



## Description

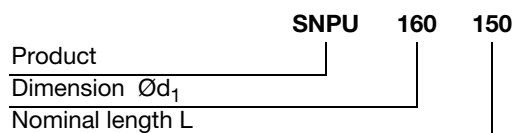
### Areas of use:

- To eliminate the accurate length cutting of ducts which the ordinary NPU connector sometimes requires when joining SR ducts. In this case the slide-in coupling shall be secured with screws or pop rivets.
- To make it possible to use a duct that is cut to a too short length – instead of having to cut a new duct to the correct length. In this case the slide-in coupling shall be secured with screws or pop rivets.
- To assist when joining two ducts which run towards each other. E.g. when building a system from two opposing directions. In this case the slide-in coupling shall be secured with screws or pop rivets.
- To assist when inserting or adding an other product into an existing system. E.g. the addition of a new piece of duct to replace a damaged part. In this case the slide-in coupling shall be secured with screws or pop rivets.
- To facilitate access when inspecting and/or cleaning a system – by simply sliding the coupling. The coupling acts as an access cap.

No Click function – has closed turned-over ends (at both ends).

| Ød <sub>1</sub> nom | L nom | l <sub>i</sub> mm | m kg |
|---------------------|-------|-------------------|------|
| 80                  | 150   | 133               | 0,18 |
| 80                  | 300   | 284               | 0,32 |
| 80                  | 500   | 548               | 0,69 |
| 100                 | 150   | 133               | 0,22 |
| 100                 | 300   | 284               | 0,40 |
| 100                 | 500   | 548               | 0,84 |
| 112                 | 150   | 133               | 0,24 |
| 112                 | 300   | 284               | 0,43 |
| 112                 | 500   | 548               | 0,92 |
| 125                 | 150   | 133               | 0,28 |
| 125                 | 300   | 284               | 0,50 |
| 125                 | 500   | 548               | 1,07 |
| 140                 | 150   | 133               | 0,31 |
| 140                 | 300   | 284               | 0,56 |
| 140                 | 500   | 548               | 1,19 |
| 150                 | 150   | 133               | 0,33 |
| 150                 | 300   | 284               | 0,59 |
| 150                 | 500   | 548               | 1,26 |
| 160                 | 150   | 133               | 0,36 |
| 160                 | 300   | 284               | 0,65 |
| 160                 | 500   | 548               | 1,38 |
| 180                 | 150   | 133               | 0,40 |
| 180                 | 300   | 284               | 0,72 |
| 180                 | 500   | 548               | 1,53 |
| 200                 | 150   | 133               | 0,56 |
| 200                 | 300   | 293               | 1,02 |
| 200                 | 500   | 548               | 1,76 |
| 224                 | 150   | 133               | 0,62 |
| 224                 | 300   | 293               | 1,13 |
| 224                 | 500   | 548               | 1,95 |
| 250                 | 150   | 177               | 0,91 |
| 250                 | 300   | 297               | 1,35 |
| 250                 | 500   | 527               | 2,17 |

## Ordering example





# Slide-in coupling

# SNPU

| $\varnothing d_1$<br>nom | L<br>nom | $l_i$<br>mm | m<br>kg |
|--------------------------|----------|-------------|---------|
| 280                      | 150      | 177         | 1,02    |
| 280                      | 300      | 297         | 1,50    |
| 280                      | 500      | 527         | 2,41    |
| 300                      | 150      | 177         | 1,12    |
| 300                      | 300      | 297         | 1,63    |
| 300                      | 500      | 527         | 2,61    |
| 315                      | 150      | 177         | 1,18    |
| 315                      | 300      | 297         | 1,72    |
| 315                      | 500      | 527         | 2,76    |
| 355                      | 150      | 177         | 1,32    |
| 355                      | 300      | 297         | 1,94    |
| 355                      | 500      | 527         | 2,93    |
| 400                      | 150      | 175         | 2,11    |
| 400                      | 300      | 297         | 2,80    |
| 400                      | 500      | 510         | 3,10    |
| 450                      | 150      | 175         | 2,37    |
| 450                      | 300      | 297         | 3,10    |
| 450                      | 500      | 510         | 3,80    |
| 500                      | 150      | 175         | 2,65    |
| 500                      | 300      | 297         | 3,70    |
| 500                      | 500      | 515         | 4,50    |
| 630                      | 150      | 175         | 3,40    |
| 630                      | 300      | 297         | 4,70    |
| 630                      | 500      | 515         | 6,00    |

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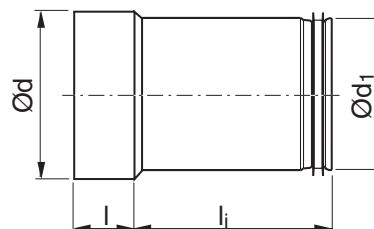


# Slide-in female coupling

# SMFU



## Dimensions



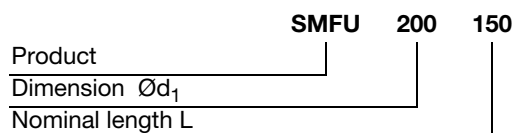
## Description

### Areas of use:

- To avoid the necessity of an exact length cutting of a duct when it is difficult to take a proper measure. E.g. the connection of a duct to a stub on an air supply terminal. In this case the slide-in coupling shall be secured with screws or pop rivets.
- To make it possible to use a duct that is cut to a too short length – instead of having to cut a new duct to the correct length. In this case the slide-in coupling shall be secured with screws or pop rivets.
- To eliminate or minimize the number of ordinary duct cuttings at building site – together with pre-cut ducts of shorter lengths. In this case the slide-in coupling shall be secured with screws or pop rivets.
- To assist when inserting or adding an other product into an existing system. E.g. the cutting-in of an extra silencer. In this case the slide-in coupling shall be secured with screws or pop rivets.
- To assist when removing an other product when cleaning a system. E.g. the removal of a damper with a obstructionable blade.
- To facilitate access when inspecting and/or cleaning a system – by simply sliding the coupling. The coupling acts as an access cap.
- To extend the distance between a T-piece and an access cap, e.g. EPFH or KCU, to get the cap outside any insulation. In this case the slide-in coupling shall be secured with screws or pop rivets only at its female end.

No Click function – has a closed turned-over end and hasn't any notches.

## Ordering example



| Ød <sub>1</sub> nom | L nom | l mm | l <sub>i</sub> mm | m kg |
|---------------------|-------|------|-------------------|------|
| 80                  | 150   | 40   | 127               | 0,16 |
| 80                  | 300   | 40   | 288               | 0,30 |
| 80                  | 500   | 40   | 552               | 0,65 |
| 100                 | 150   | 40   | 127               | 0,20 |
| 100                 | 300   | 40   | 288               | 0,38 |
| 100                 | 500   | 40   | 552               | 0,81 |
| 112                 | 150   | 40   | 127               | 0,23 |
| 112                 | 300   | 40   | 288               | 0,43 |
| 112                 | 500   | 40   | 552               | 0,93 |
| 125                 | 150   | 40   | 127               | 0,25 |
| 125                 | 300   | 40   | 288               | 0,47 |
| 125                 | 500   | 40   | 552               | 1,01 |
| 140                 | 150   | 40   | 127               | 0,28 |
| 140                 | 300   | 40   | 288               | 0,53 |
| 140                 | 500   | 40   | 552               | 1,13 |
| 150                 | 150   | 40   | 127               | 0,29 |
| 150                 | 300   | 40   | 288               | 0,57 |
| 150                 | 500   | 40   | 552               | 1,21 |
| 160                 | 150   | 40   | 127               | 0,31 |
| 160                 | 300   | 40   | 288               | 0,60 |
| 160                 | 500   | 40   | 552               | 1,29 |
| 180                 | 150   | 40   | 127               | 0,35 |
| 180                 | 300   | 40   | 288               | 0,68 |
| 180                 | 500   | 40   | 552               | 1,45 |
| 200                 | 150   | 40   | 127               | 0,49 |
| 200                 | 300   | 40   | 297               | 0,96 |
| 200                 | 500   | 40   | 552               | 1,67 |
| 224                 | 150   | 40   | 127               | 0,55 |
| 224                 | 300   | 40   | 297               | 1,08 |
| 224                 | 500   | 40   | 552               | 1,87 |
| 250                 | 150   | 60   | 192               | 0,90 |
| 250                 | 300   | 60   | 302               | 1,28 |
| 250                 | 500   | 60   | 537               | 2,10 |



## Slide-in female coupling

## SMFU

| $\varnothing d_1$<br>nom | L<br>nom | l<br>mm | $l_j$<br>mm | m<br>kg |
|--------------------------|----------|---------|-------------|---------|
| 280                      | 150      | 60      | 192         | 1,02    |
| 280                      | 300      | 60      | 302         | 1,44    |
| 280                      | 500      | 60      | 537         | 2,36    |
| 300                      | 150      | 60      | 192         | 1,10    |
| 300                      | 300      | 60      | 302         | 1,55    |
| 300                      | 500      | 60      | 537         | 2,53    |
| 315 *                    | 150      | 60      | 182         | 1,11    |
| 315 *                    | 300      | 60      | 297         | 1,62    |
| 315 *                    | 500      | 60      | 537         | 2,64    |
| 355 *                    | 150      | 60      | 182         | 1,26    |
| 355 *                    | 300      | 60      | 297         | 1,83    |
| 355 *                    | 500      | 60      | 537         | 5,00    |
| 400 **                   | 300      | 80      | 242         | 2,65    |
| 400 **                   | 500      | 80      | 500         | 6,05    |
| 450 **                   | 300      | 80      | 242         | 3,04    |
| 450 **                   | 500      | 80      | 500         | 7,20    |
| 500 **                   | 300      | 80      | 242         | 3,37    |
| 500 **                   | 500      | 80      | 500         | 7,69    |
| 630 **                   | 300      | 80      | 242         | 5,90    |
| 630 **                   | 500      | 80      | 500         | 8,00    |

\* With stiffening bead

\*\* Design with lockseam

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17

18



# End cap

# EPF

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18

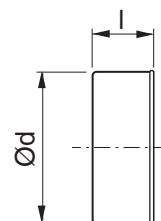


## Description

End cap, which fits outside a Safe fitting.

No Click function – no notches.

## Dimensions



| Ød<br>nom | l<br>mm | m<br>kg |
|-----------|---------|---------|
| 63        | 40      | 0,04    |
| 80 *      | 48      | 0,07    |
| 100 *     | 48      | 0,11    |
| 112       | 48      | 0,10    |
| 125 *     | 48      | 0,14    |
| 140       | 48      | 0,16    |
| 150       | 48      | 0,14    |
| 160 *     | 48      | 0,17    |
| 180       | 48      | 0,24    |
| 200 *     | 46      | 0,21    |
| 224       | 46      | 0,35    |
| 250 *     | 68      | 0,50    |
| 280       | 60      | 0,61    |
| 300       | 60      | 0,63    |
| 315 *     | 60      | 0,67    |
| 355       | 60      | 0,84    |
| 400 *     | 91      | 1,17    |
| 450       | 80      | 1,48    |
| 500 **    | 80      | 1,81    |
| 560       | 80      | 2,14    |
| 600       | 80      | 2,37    |
| 630 **    | 80      | 2,54    |
| 710       | 100     | 3,00    |
| 800 **    | 100     | 3,54    |
| 900       | 100     | 6,10    |
| 1000 **   | 100     | 7,30    |
| 1120      | 120     | 9,40    |
| 1250 **   | 120     | 11,3    |

\* With turned-over edge

\*\* Hand made

## Ordering example

Product **EPF**      **250**  
 Dimension Ød



# End cap

ESU

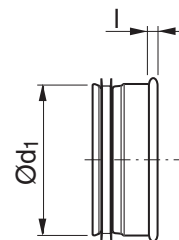


## Description

End cap, which fits inside SR duct.

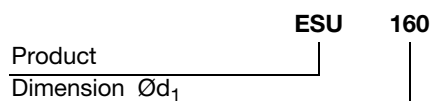
No Click function – has a closed turned-over end.

## Dimensions



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 63                     | 4       | 0,08    |
| 80                     | 10      | 0,08    |
| 100                    | 10      | 0,12    |
| 112                    | 4       | 0,13    |
| 125                    | 10      | 0,14    |
| 140                    | 10      | 0,19    |
| 150                    | 10      | 0,17    |
| 160                    | 10      | 0,24    |
| 180                    | 10      | 0,28    |
| 200                    | 10      | 0,32    |
| 224                    | 10      | 0,40    |
| 250                    | 10      | 0,37    |
| 280                    | 4       | 0,62    |
| 300                    | 10      | 0,70    |
| 315                    | 10      | 0,80    |
| 355                    | 12      | 0,91    |
| 400                    | 12      | 1,26    |
| 450                    | 4       | 1,48    |
| 500                    | 12      | 2,00    |
| 560                    | 4       | 2,04    |
| 600                    | 4       | 2,38    |
| 630                    | 4       | 2,90    |
| 710                    | 4       | 3,21    |
| 800                    | 4       | 5,00    |
| 900                    | 4       | 5,26    |
| 1000                   | 4       | 9,25    |
| 1120                   | 4       | 7,92    |
| 1250                   | 4       | 10,0    |

## Ordering example



- 1
- 2
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- 12
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# Silencers



|                                    |          |
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| <b>Silencers</b>                   | <b>4</b> |
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| Fire dampers & Smoke evacuation    | 6        |
| Air valves                         | 7        |
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## Circular straight



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## Circular straight low-built



|            |     |
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## Circular curved



|                |     |
|----------------|-----|
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## Exhaust air terminal device



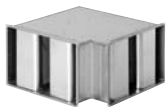
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## Rectangular straight silencers



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## Rectangular curved silencer



|           |     |
|-----------|-----|
| BDLD..... | 216 |
|-----------|-----|

## Rectangular straight low-built silencer



|           |     |
|-----------|-----|
| LRLB..... | 225 |
|-----------|-----|





Overview silencers – circular connection

| Ød <sub>1</sub> | Straight                    |                             |          |                                | Curved                      |                     | Straight                    |                       |
|-----------------|-----------------------------|-----------------------------|----------|--------------------------------|-----------------------------|---------------------|-----------------------------|-----------------------|
|                 | Circular outer sheet casing |                             |          | Rectangular outer sheet casing | Circular outer sheet casing |                     | Circular outer sheet casing |                       |
|                 |                             |                             | Baffle   |                                | Baffle                      |                     |                             |                       |
| 63              |                             |                             |          |                                |                             |                     |                             |                       |
| 80              | SLCU 50                     | SLU<br>SLCU 100<br>SLGU 100 | SLGU 150 | LRCA                           | LRBCB                       | BSLU 50<br>BSLCU 50 | BSLU 100<br>BSLCU 100       | SLKNU 50<br>SLKNU 100 |
| 100             |                             |                             |          |                                |                             |                     |                             |                       |
| 125             |                             |                             |          |                                |                             |                     |                             |                       |
| 160             |                             |                             |          |                                |                             |                     |                             |                       |
| 200             |                             |                             |          |                                |                             |                     |                             |                       |
| 250             |                             |                             |          |                                |                             |                     |                             |                       |
| 315             |                             |                             |          |                                |                             |                     |                             |                       |
| 400             |                             |                             |          |                                |                             |                     |                             |                       |
| 500             |                             |                             |          |                                |                             |                     |                             |                       |
| 630             |                             |                             |          |                                |                             |                     |                             |                       |
| 800             |                             |                             |          |                                |                             |                     |                             |                       |
| 1000            |                             |                             |          |                                |                             |                     |                             |                       |
| 1250            |                             |                             |          |                                |                             |                     |                             |                       |
|                 |                             |                             |          |                                | Low built                   |                     |                             | Cone and net          |
|                 |                             |                             |          |                                |                             |                     |                             |                       |

Overview silencers – rectangular connection

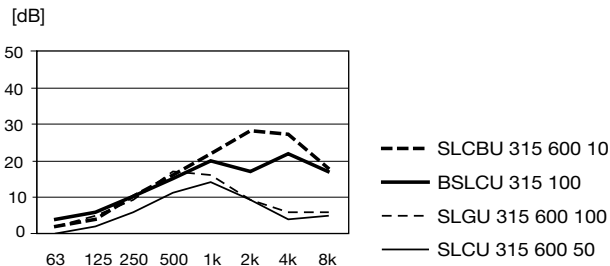
| a x b | Straight |      |     |      |      |           | Curved |
|-------|----------|------|-----|------|------|-----------|--------|
|       | Baffle   |      |     |      |      |           |        |
|       | SLRS     | SLRA | DLD | DLDY | DLDR | LRLB      | BDLD   |
|       |          |      |     |      |      | Low built |        |
|       |          |      |     |      |      |           |        |





### General

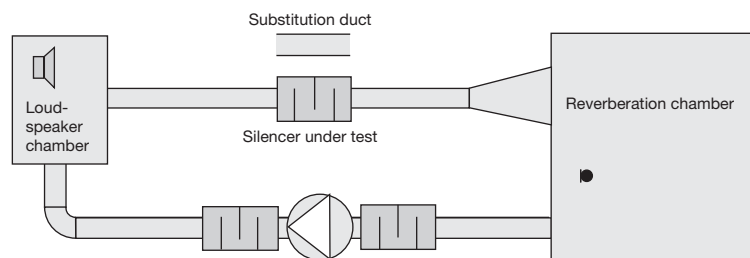
The silencers are of the absorption silencer type. The damping ability of absorption silencers is affected by the geometric design of the silencer and the type of damping material chosen. Silencer comprises a total of 17 such variants, with different properties. The graph below summarises the attenuation of some types of silencer.



More information about damping in duct systems, and dimensioning and calculation examples can be found on page 30.

### Method of measurement

The silencers are tested in accordance with ISO 7235 "Acoustics - Measurement procedures for ducted silencers - Insertion loss, flow noise and total pressure loss".



### Design

The straight types consist of an outer and inner sheet casing. The space between them is filled with mineral wool of varying type and density.

The outer sheet casing of the circular curved silencers are built as a segmented bend, BFU.

Baffles, one or more, for better noise attenuation, exist in SLCBU, SLBGU, LRBCB.

The tear of fibre is prevented since all exposed surfaces are lined. The connections of the circular types are supplied with a Safe-gasket.

| A Swedish fire classification <b>does not exist</b> for these silencers | A Swedish fire classification <b>exists</b> for these silencers |
|---|---|
| SLU   | SLCU 50   |
|   | SLCU 100  |
| SLBU  | SLCBU 100   |
| BSLU 50   | BSLCU 50  |
| BSLU 100  | BSLCU 100   |

### Cleaning of duct systems

Silencers with baffles have parts which block the duct system to a greater or lesser extent, and thus obstruct or prevent cleaning of the duct system. Please refer to page 601.

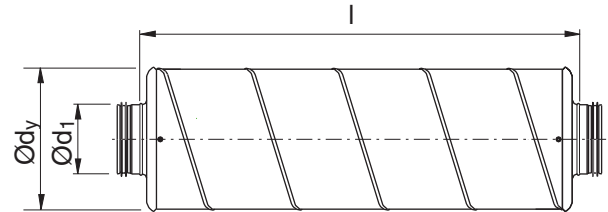


# Circular straight silencer

# SLU



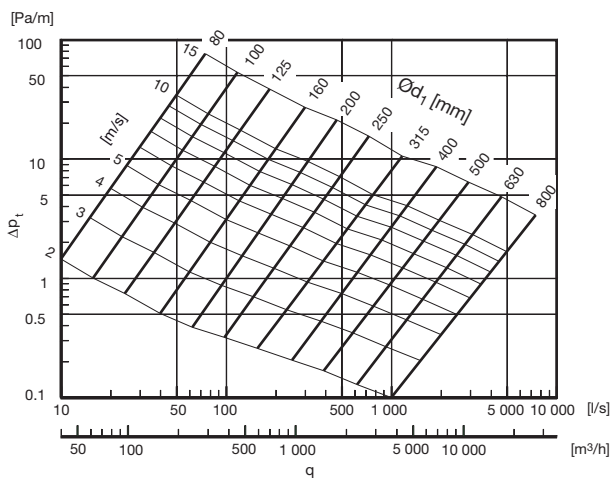
## Dimensions



## Description

Insulation thickness 50 mm (Ø 80–250).  
 Insulation thickness 100 mm (Ø 315–800).

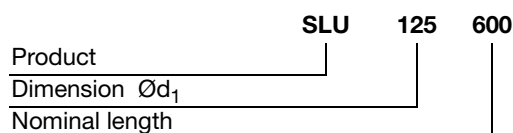
## Technical data



| Ød <sub>1</sub><br>nom | Length<br>nom | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub><br>mm | l<br>mm | m<br>kg |
|------------------------|---------------|--|-----|-----|-----|----|----|----|----|-----------------------|---------|---------|
|                        |               | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                       |         |         |
| 80                     | 300           | 1                                      | 5   | 8   | 15  | 25 | 25 | 21 | 15 | 180                   | 300     | 2,00    |
| 80                     | 600           | 2                                      | 8   | 14  | 28  | 49 | 50 | 47 | 24 | 180                   | 600     | 3,00    |
| 80                     | 900           | 3                                      | 10  | 21  | 40  | 50 | 50 | 50 | 34 | 180                   | 900     | 5,00    |
| 80                     | 1200          | 4                                      | 13  | 27  | 50  | 50 | 50 | 50 | 43 | 180                   | 1200    | 7,00    |
| 100                    | 300           | 1                                      | 5   | 7   | 15  | 25 | 25 | 21 | 13 | 200                   | 360     | 2,00    |
| 100                    | 600           | 1                                      | 7   | 12  | 25  | 43 | 48 | 35 | 20 | 200                   | 660     | 3,00    |
| 100                    | 900           | 2                                      | 10  | 17  | 34  | 50 | 50 | 49 | 28 | 200                   | 960     | 5,00    |
| 100                    | 1200          | 3                                      | 12  | 22  | 44  | 50 | 50 | 50 | 35 | 200                   | 1260    | 7,00    |
| 125                    | 300           | 0                                      | 4   | 5   | 13  | 23 | 20 | 16 | 11 | 224                   | 365     | 3,00    |
| 125                    | 600           | 1                                      | 5   | 10  | 22  | 39 | 37 | 26 | 16 | 224                   | 665     | 4,00    |
| 125                    | 900           | 1                                      | 7   | 14  | 30  | 50 | 50 | 37 | 21 | 224                   | 965     | 7,00    |
| 125                    | 1200          | 2                                      | 9   | 18  | 39  | 50 | 50 | 47 | 26 | 224                   | 1265    | 9,00    |
| 160                    | 300           | 0                                      | 3   | 5   | 11  | 22 | 16 | 11 | 7  | 260                   | 375     | 3,00    |
| 160                    | 600           | 1                                      | 4   | 8   | 19  | 37 | 28 | 17 | 11 | 260                   | 675     | 6,00    |
| 160                    | 900           | 1                                      | 5   | 12  | 27  | 50 | 39 | 24 | 14 | 260                   | 975     | 8,00    |
| 160                    | 1200          | 2                                      | 6   | 15  | 35  | 50 | 50 | 30 | 17 | 260                   | 1275    | 10,0    |
| 200                    | 300           | 0                                      | 2   | 4   | 9   | 19 | 11 | 7  | 5  | 300                   | 385     | 4,00    |
| 200                    | 600           | 1                                      | 3   | 8   | 15  | 28 | 19 | 12 | 8  | 300                   | 685     | 7,00    |
| 200                    | 900           | 2                                      | 4   | 11  | 21  | 37 | 28 | 16 | 10 | 300                   | 985     | 10,0    |
| 200                    | 1200          | 2                                      | 5   | 14  | 27  | 46 | 36 | 21 | 13 | 300                   | 1285    | 12,0    |
| 250                    | 600           | 1                                      | 2   | 6   | 14  | 26 | 14 | 8  | 7  | 355                   | 600     | 9,00    |
| 250                    | 900           | 1                                      | 3   | 9   | 19  | 38 | 19 | 11 | 9  | 355                   | 900     | 12,0    |
| 250                    | 1200          | 2                                      | 4   | 11  | 24  | 50 | 24 | 13 | 11 | 355                   | 1200    | 15,0    |
| 315                    | 600           | 2                                      | 5   | 9   | 14  | 12 | 6  | 4  | 5  | 500                   | 600     | 12,0    |
| 315                    | 900           | 3                                      | 6   | 13  | 20  | 19 | 10 | 6  | 7  | 500                   | 900     | 18,0    |
| 315                    | 1200          | 4                                      | 8   | 16  | 27  | 25 | 15 | 9  | 10 | 500                   | 1200    | 24,0    |
| 400 *                  | 600           | 4                                      | 5   | 8   | 10  | 7  | 4  | 4  | 6  | 600                   | 600     | 16,0    |
| 400 *                  | 900           | 4                                      | 5   | 10  | 17  | 13 | 6  | 6  | 8  | 600                   | 900     | 22,0    |
| 400 *                  | 1200          | 5                                      | 6   | 13  | 24  | 18 | 8  | 7  | 10 | 600                   | 1200    | 32,0    |
| 500 *                  | 900           | 4                                      | 4   | 10  | 14  | 8  | 4  | 6  | 6  | 710                   | 900     | 26,0    |
| 500 *                  | 1200          | 3                                      | 5   | 11  | 21  | 12 | 6  | 7  | 9  | 710                   | 1200    | 39,0    |
| 630 *                  | 900           | 2                                      | 3   | 7   | 12  | 5  | 4  | 4  | 5  | 800                   | 900     | 44,0    |
| 630 *                  | 1200          | 2                                      | 4   | 8   | 17  | 7  | 4  | 5  | 7  | 800                   | 1200    | 56,0    |
| 800 *                  | 1200          | 2                                      | 3   | 8   | 11  | 5  | 4  | 5  | 6  | 1000                  | 1200    | 69,0    |
| 800 *                  | 1500          | 2                                      | 3   | 10  | 16  | 6  | 5  | 6  | 7  | 1000                  | 1500    | 86,0    |

\* Supplied with two loose couplings

## Ordering example



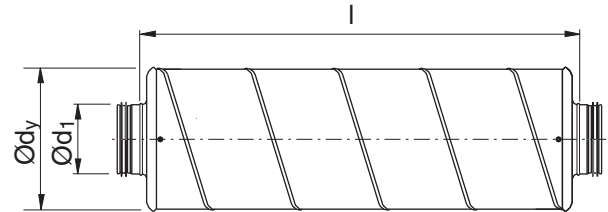


# Circular straight silencer

# SLCU 50



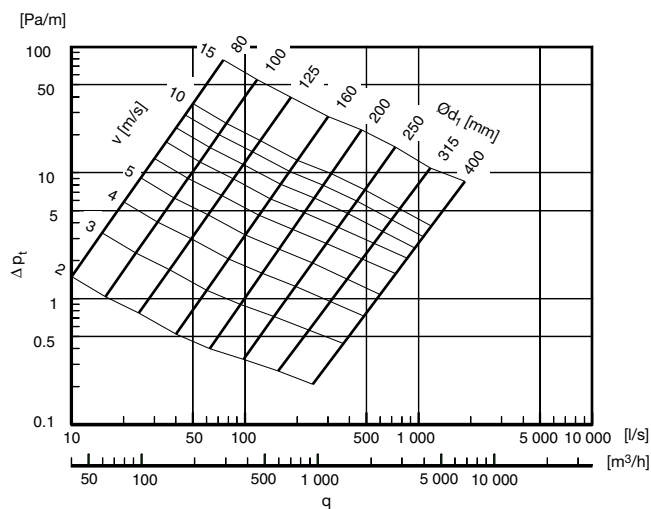
## Dimensions



## Description

Insulation thickness 50 mm.

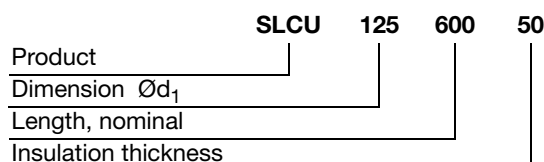
## Technical data



| Ød <sub>1</sub><br>nom | Length<br>nom | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub><br>mm | l<br>mm | m<br>kg |
|------------------------|---------------|--|-----|-----|-----|----|----|----|----|-----------------------|---------|---------|
|                        |               | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                       |         |         |
| 80                     | 300           | 5                                      | 5   | 8   | 15  | 28 | 29 | 23 | 16 | 190                   | 300     | 1,92    |
| 80                     | 600           | 5                                      | 7   | 12  | 26  | 41 | 50 | 48 | 24 | 190                   | 600     | 3,14    |
| 80                     | 900           | 5                                      | 9   | 17  | 37  | 50 | 50 | 50 | 32 | 190                   | 900     | 4,61    |
| 80                     | 1200          | 6                                      | 11  | 21  | 49  | 50 | 50 | 50 | 40 | 190                   | 1200    | 5,73    |
| 100                    | 300           | 2                                      | 2   | 6   | 14  | 21 | 25 | 20 | 11 | 210                   | 360     | 2,28    |
| 100                    | 600           | 4                                      | 3   | 11  | 24  | 36 | 49 | 34 | 17 | 210                   | 660     | 4,09    |
| 100                    | 900           | 5                                      | 4   | 15  | 34  | 50 | 50 | 48 | 23 | 210                   | 960     | 5,18    |
| 100                    | 1200          | 6                                      | 5   | 19  | 45  | 50 | 50 | 50 | 29 | 210                   | 1260    | 6,46    |
| 125                    | 300           | 2                                      | 2   | 6   | 13  | 16 | 20 | 15 | 10 | 235                   | 365     | 2,66    |
| 125                    | 600           | 3                                      | 3   | 9   | 23  | 30 | 40 | 22 | 14 | 235                   | 665     | 4,39    |
| 125                    | 900           | 4                                      | 4   | 12  | 33  | 45 | 50 | 30 | 17 | 235                   | 965     | 6,20    |
| 125                    | 1200          | 5                                      | 5   | 15  | 43  | 50 | 50 | 38 | 21 | 235                   | 1265    | 7,47    |
| 160                    | 300           | 1                                      | 2   | 4   | 10  | 12 | 15 | 8  | 8  | 270                   | 375     | 2,98    |
| 160                    | 600           | 2                                      | 3   | 7   | 19  | 27 | 29 | 14 | 11 | 270                   | 675     | 5,37    |
| 160                    | 900           | 2                                      | 4   | 10  | 28  | 42 | 43 | 20 | 15 | 270                   | 975     | 7,48    |
| 160                    | 1200          | 2                                      | 5   | 13  | 37  | 50 | 50 | 26 | 19 | 270                   | 1275    | 9,23    |
| 200                    | 300           | 1                                      | 2   | 5   | 8   | 10 | 11 | 5  | 5  | 325                   | 385     | 4,11    |
| 200                    | 600           | 2                                      | 3   | 7   | 16  | 21 | 23 | 9  | 8  | 325                   | 685     | 6,90    |
| 200                    | 900           | 2                                      | 4   | 8   | 24  | 32 | 34 | 13 | 10 | 325                   | 985     | 9,74    |
| 200                    | 1200          | 3                                      | 5   | 10  | 31  | 43 | 45 | 18 | 13 | 325                   | 1285    | 12,0    |
| 250                    | 600           | 3                                      | 2   | 7   | 13  | 17 | 16 | 8  | 6  | 365                   | 600     | 8,55    |
| 250                    | 900           | 3                                      | 4   | 8   | 20  | 26 | 23 | 10 | 8  | 365                   | 900     | 11,7    |
| 250                    | 1200          | 4                                      | 5   | 9   | 26  | 35 | 30 | 12 | 10 | 365                   | 1200    | 15,0    |
| 315                    | 600           | 0                                      | 2   | 6   | 11  | 14 | 9  | 4  | 5  | 427                   | 600     | 11,3    |
| 315                    | 900           | 1                                      | 3   | 7   | 16  | 22 | 12 | 6  | 7  | 427                   | 900     | 15,6    |
| 315                    | 1200          | 1                                      | 3   | 8   | 22  | 30 | 16 | 7  | 9  | 427                   | 1200    | 20,3    |
| 400 *                  | 600           | 0                                      | 3   | 4   | 6   | 8  | 4  | 4  | 4  | 508                   | 600     | 20,5    |
| 400 *                  | 900           | 1                                      | 3   | 5   | 10  | 13 | 7  | 5  | 6  | 508                   | 900     | 26,8    |
| 400 *                  | 1200          | 1                                      | 4   | 7   | 14  | 19 | 10 | 7  | 8  | 508                   | 1200    | 30,0    |

\* Supplied with two loose couplings

## Ordering example



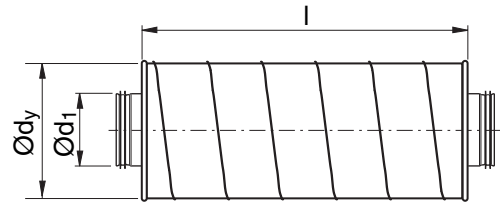


# Circular straight silencer

# SLCU 100



## Dimensions

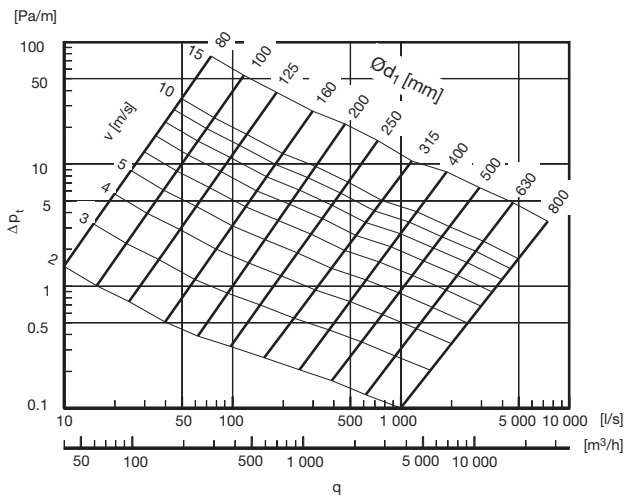


## Description

Insulation thickness 100 mm.

Good attenuation in 125 and 250 Hz bands.

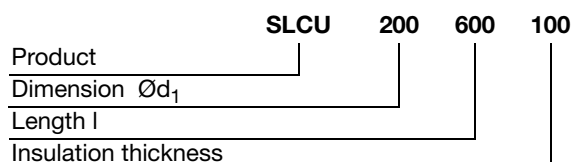
## Technical data



| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub><br>mm | m<br>kg |
|------------------------|---------|--|-----|-----|-----|----|----|----|----|-----------------------|---------|
|                        |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                       |         |
| 80                     | 300     | 10                                     | 8   | 10  | 16  | 21 | 27 | 24 | 16 | 295                   | 4,28    |
| 80                     | 600     | 12                                     | 13  | 19  | 27  | 37 | 50 | 46 | 24 | 295                   | 7,05    |
| 80                     | 900     | 14                                     | 18  | 28  | 38  | 50 | 50 | 50 | 33 | 295                   | 8,93    |
| 80                     | 1200    | 16                                     | 23  | 37  | 49  | 50 | 50 | 50 | 42 | 295                   | 11,6    |
| 100                    | 300     | 5                                      | 4   | 11  | 14  | 18 | 24 | 20 | 11 | 325                   | 4,53    |
| 100                    | 600     | 8                                      | 8   | 18  | 25  | 34 | 46 | 38 | 19 | 325                   | 7,26    |
| 100                    | 900     | 11                                     | 11  | 25  | 36  | 50 | 50 | 50 | 26 | 325                   | 11,2    |
| 100                    | 1200    | 14                                     | 14  | 32  | 47  | 50 | 50 | 50 | 33 | 325                   | 13,4    |
| 125                    | 300     | 5                                      | 4   | 9   | 11  | 16 | 19 | 15 | 10 | 325                   | 5,17    |
| 125                    | 600     | 7                                      | 7   | 16  | 20  | 28 | 37 | 24 | 14 | 325                   | 7,54    |
| 125                    | 900     | 9                                      | 10  | 22  | 29  | 41 | 50 | 33 | 18 | 325                   | 10,8    |
| 125                    | 1200    | 12                                     | 13  | 29  | 38  | 50 | 50 | 42 | 22 | 325                   | 14,6    |
| 160                    | 300     | 4                                      | 3   | 6   | 8   | 11 | 14 | 9  | 8  | 365                   | 5,69    |
| 160                    | 600     | 5                                      | 6   | 13  | 16  | 23 | 28 | 15 | 12 | 365                   | 9,48    |
| 160                    | 900     | 6                                      | 9   | 20  | 24  | 34 | 42 | 21 | 16 | 365                   | 13,0    |
| 160                    | 1200    | 8                                      | 12  | 27  | 32  | 46 | 50 | 28 | 20 | 365                   | 17,4    |
| 200                    | 300     | 4                                      | 4   | 6   | 6   | 9  | 11 | 6  | 6  | 410                   | 7,69    |
| 200                    | 600     | 5                                      | 6   | 11  | 14  | 19 | 22 | 10 | 8  | 410                   | 10,6    |
| 200                    | 900     | 6                                      | 9   | 17  | 21  | 29 | 33 | 14 | 11 | 410                   | 15,3    |
| 200                    | 1200    | 7                                      | 11  | 22  | 29  | 38 | 45 | 18 | 13 | 410                   | 19,4    |
| 250                    | 600     | 6                                      | 5   | 10  | 11  | 16 | 16 | 8  | 7  | 465                   | 10,7    |
| 250                    | 900     | 7                                      | 7   | 15  | 18  | 25 | 23 | 10 | 9  | 465                   | 18,0    |
| 250                    | 1200    | 7                                      | 9   | 20  | 25  | 34 | 30 | 13 | 11 | 465                   | 22,9    |
| 315                    | 600     | 1                                      | 4   | 7   | 9   | 12 | 10 | 5  | 6  | 510                   | 16,3    |
| 315                    | 900     | 2                                      | 6   | 12  | 14  | 19 | 15 | 7  | 8  | 510                   | 22,3    |
| 315                    | 1200    | 2                                      | 8   | 16  | 18  | 26 | 21 | 9  | 10 | 510                   | 29,1    |
| 400*                   | 600     | 1                                      | 5   | 5   | 5   | 7  | 4  | 4  | 4  | 625                   | 20,6    |
| 400*                   | 900     | 3                                      | 7   | 8   | 9   | 13 | 7  | 5  | 6  | 625                   | 30,0    |
| 400*                   | 1200    | 4                                      | 8   | 12  | 13  | 19 | 10 | 6  | 7  | 625                   | 38,1    |
| 500*                   | 900     | 2                                      | 4   | 7   | 8   | 10 | 5  | 3  | 5  | 735                   | 34,6    |
| 500*                   | 1200    | 3                                      | 7   | 10  | 12  | 14 | 7  | 4  | 6  | 735                   | 44,7    |
| 630*                   | 900     | 2                                      | 4   | 5   | 7   | 6  | 4  | 3  | 4  | 880                   | 44,3    |
| 630*                   | 1200    | 2                                      | 6   | 8   | 10  | 9  | 4  | 4  | 5  | 880                   | 54,5    |
| 800*                   | 1200    | 2                                      | 3   | 6   | 7   | 4  | 3  | 4  | 4  | 1030                  | 76,2    |
| 800*                   | 1500    | 2                                      | 5   | 8   | 10  | 6  | 4  | 4  | 5  | 1030                  | 93,2    |

\* Supplied with two loose couplings

## Ordering example



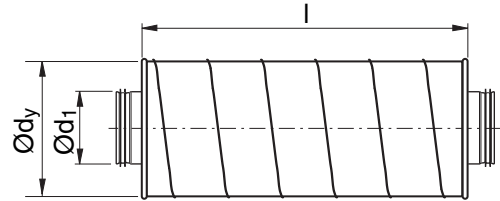


# Circular straight silencer

# SLGU 100



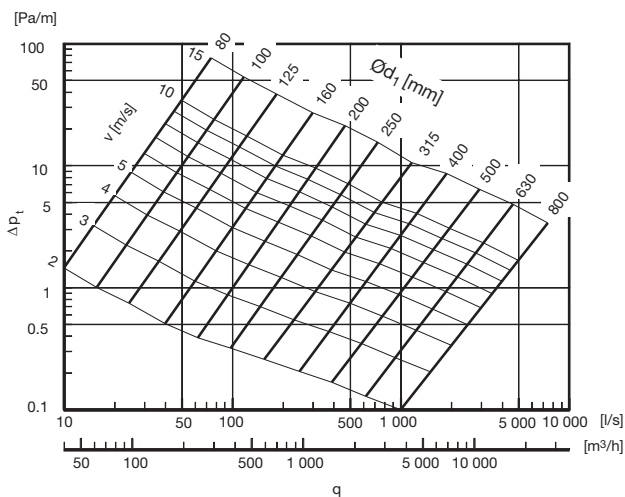
## Dimensions



## Description

Insulation thickness 100 mm.

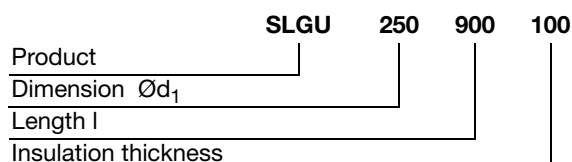
## Technical data



| $\text{Ø}d_1$<br>nom | l<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | $\text{Ø}d_y$<br>mm | m<br>kg |
|----------------------|---------|--|-----|-----|-----|----|----|----|----|---------------------|---------|
|                      |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                     |         |
| 80                   | 300     | 4                                      | 8   | 11  | 17  | 25 | 30 | 28 | 15 | 295                 | 3,00    |
| 80                   | 600     | 6                                      | 15  | 23  | 34  | 50 | 50 | 50 | 25 | 295                 | 5,30    |
| 80                   | 900     | 9                                      | 22  | 35  | 50  | 50 | 50 | 50 | 36 | 295                 | 7,60    |
| 100                  | 300     | 2                                      | 7   | 10  | 15  | 20 | 25 | 21 | 13 | 310                 | 3,40    |
| 100                  | 600     | 4                                      | 13  | 20  | 28  | 40 | 49 | 36 | 20 | 310                 | 6,10    |
| 100                  | 900     | 7                                      | 20  | 30  | 41  | 50 | 50 | 50 | 27 | 310                 | 8,80    |
| 125                  | 300     | 1                                      | 7   | 9   | 16  | 19 | 19 | 15 | 10 | 325                 | 3,20    |
| 125                  | 600     | 3                                      | 11  | 17  | 26  | 38 | 38 | 25 | 15 | 325                 | 5,90    |
| 125                  | 900     | 4                                      | 15  | 25  | 36  | 50 | 50 | 35 | 20 | 325                 | 8,50    |
| 125                  | 1200    | 6                                      | 19  | 33  | 46  | 50 | 50 | 45 | 25 | 325                 | 11,2    |
| 160                  | 300     | 1                                      | 6   | 9   | 14  | 16 | 14 | 10 | 7  | 365                 | 4,20    |
| 160                  | 600     | 3                                      | 8   | 15  | 23  | 29 | 29 | 17 | 11 | 365                 | 7,50    |
| 160                  | 900     | 4                                      | 11  | 21  | 32  | 43 | 44 | 25 | 14 | 365                 | 10,7    |
| 160                  | 1200    | 5                                      | 14  | 27  | 41  | 50 | 50 | 32 | 18 | 365                 | 14,0    |
| 200                  | 600     | 3                                      | 7   | 14  | 21  | 24 | 21 | 12 | 9  | 410                 | 10,6    |
| 200                  | 900     | 5                                      | 10  | 20  | 33  | 38 | 30 | 16 | 11 | 410                 | 15,3    |
| 200                  | 1200    | 6                                      | 12  | 26  | 45  | 50 | 40 | 20 | 13 | 410                 | 20,0    |
| 250                  | 600     | 3                                      | 5   | 11  | 17  | 19 | 15 | 8  | 7  | 465                 | 12,2    |
| 250                  | 900     | 4                                      | 8   | 17  | 27  | 30 | 21 | 11 | 9  | 465                 | 17,7    |
| 250                  | 1200    | 5                                      | 10  | 23  | 37  | 41 | 26 | 14 | 11 | 465                 | 23,2    |
| 315                  | 600     | 2                                      | 5   | 9   | 17  | 16 | 9  | 6  | 6  | 510                 | 15,7    |
| 315                  | 900     | 3                                      | 6   | 14  | 23  | 24 | 13 | 8  | 8  | 510                 | 23,0    |
| 315                  | 1200    | 4                                      | 8   | 18  | 29  | 32 | 17 | 10 | 11 | 510                 | 30,1    |
| 400*                 | 900     | 4                                      | 5   | 10  | 11  | 14 | 7  | 6  | 8  | 615                 | 27,4    |
| 400*                 | 1200    | 5                                      | 6   | 13  | 16  | 17 | 9  | 7  | 9  | 615                 | 35,9    |
| 400*                 | 1500    | 5                                      | 8   | 15  | 20  | 20 | 11 | 8  | 11 | 615                 | 44,3    |
| 500*                 | 900     | 3                                      | 5   | 10  | 11  | 9  | 5  | 6  | 7  | 735                 | 31,4    |
| 500*                 | 1200    | 3                                      | 6   | 14  | 16  | 13 | 7  | 7  | 9  | 735                 | 41,0    |
| 500*                 | 1500    | 4                                      | 7   | 17  | 21  | 17 | 9  | 7  | 11 | 735                 | 50,6    |
| 630*                 | 900     | 3                                      | 4   | 7   | 8   | 5  | 4  | 4  | 5  | 880                 | 39,9    |
| 630*                 | 1200    | 3                                      | 5   | 11  | 12  | 8  | 5  | 5  | 7  | 880                 | 51,9    |
| 630*                 | 1500    | 3                                      | 6   | 14  | 16  | 11 | 6  | 6  | 9  | 880                 | 64,0    |
| 800*                 | 1200    | 2                                      | 3   | 9   | 8   | 5  | 4  | 5  | 5  | 1030                | 68,7    |
| 800*                 | 1500    | 2                                      | 4   | 11  | 12  | 6  | 5  | 6  | 6  | 1030                | 84,7    |

\* Supplied with two loose couplings

## Ordering example



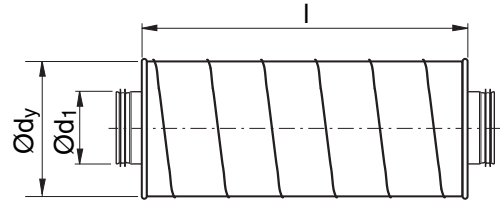


# Circular straight silencer

# SLGU 150



## Dimensions

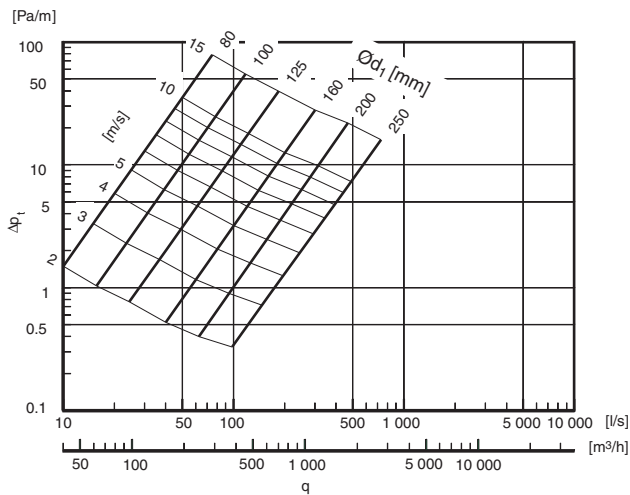


## Description

Insulation thickness 150 mm.

Used when you need particularly good attenuation at low frequencies (125 and 250 Hz). Otherwise equivalent to SLGU 100.

## Technical data



| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub><br>mm | m<br>kg |
|------------------------|---------|--|-----|-----|-----|----|----|----|----|-----------------------|---------|
|                        |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                       |         |
| 80                     | 900     | 15                                     | 30  | 41  | 50  | 50 | 50 | 50 | 34 | 410                   | 13,6    |
| 100                    | 900     | 10                                     | 26  | 36  | 48  | 50 | 50 | 48 | 26 | 410                   | 14,1    |
| 125                    | 900     | 8                                      | 20  | 31  | 45  | 49 | 49 | 36 | 19 | 465                   | 15,9    |
| 125                    | 1200    | 13                                     | 30  | 38  | 48  | 50 | 50 | 45 | 24 | 465                   | 20,9    |
| 160                    | 900     | 6                                      | 15  | 25  | 38  | 48 | 45 | 23 | 14 | 465                   | 16,7    |
| 160                    | 1200    | 11                                     | 21  | 31  | 47  | 50 | 50 | 30 | 16 | 465                   | 22,1    |
| 200                    | 900     | 8                                      | 15  | 23  | 33  | 38 | 30 | 16 | 11 | 510                   | 19,7    |
| 200                    | 1200    | 10                                     | 19  | 28  | 43  | 49 | 39 | 21 | 13 | 510                   | 25,9    |
| 250                    | 900     | 8                                      | 12  | 19  | 27  | 31 | 21 | 11 | 10 | 580                   | 22,6    |
| 250                    | 1200    | 9                                      | 15  | 26  | 36  | 41 | 26 | 14 | 11 | 580                   | 29,8    |

## Ordering example

|                           |             |            |            |            |
|---------------------------|-------------|------------|------------|------------|
|                           | <b>SLGU</b> | <b>160</b> | <b>900</b> | <b>150</b> |
| Product                   |             |            |            |            |
| Dimension Ød <sub>1</sub> |             |            |            |            |
| Length l                  |             |            |            |            |
| Insulation thickness      |             |            |            |            |

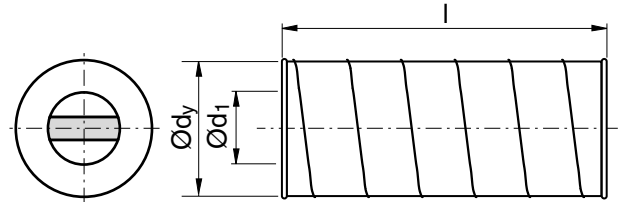


# Circular straight silencer with baffle

# SLBU



## Dimensions



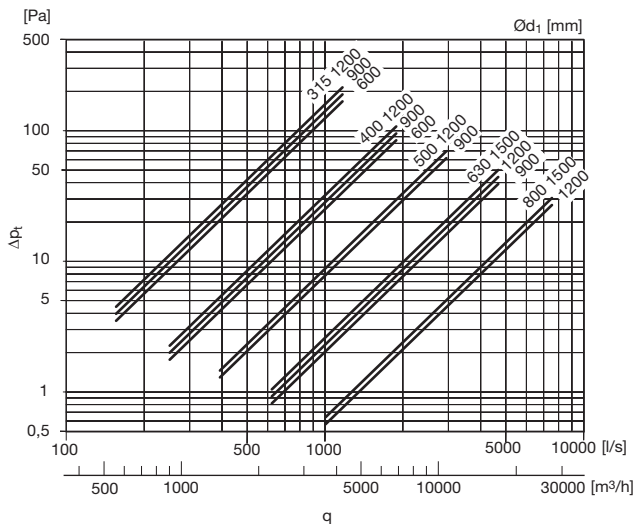
## Description

Insulation thickness 100 mm.

Provided with a 100 mm thick baffle. This gives very good attenuation across the entire range.

Used where very good attenuation is needed and SLU 100 is not enough. Specially suitable for large dimensions.

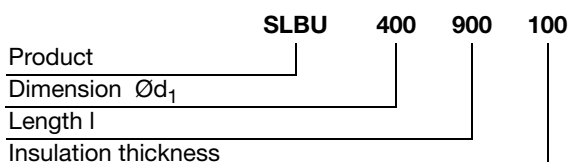
## Technical data



| Ød <sub>1</sub><br>nom | l<br>nom | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub><br>mm | m<br>kg |
|------------------------|----------|--|-----|-----|-----|----|----|----|----|-----------------------|---------|
|                        |          | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                       |         |
| 315                    | 600      | 3                                      | 6   | 12  | 20  | 25 | 22 | 17 | 14 | 500                   | 15,0    |
| 315                    | 900      | 4                                      | 8   | 17  | 26  | 39 | 37 | 24 | 19 | 500                   | 22,0    |
| 315                    | 1200     | 5                                      | 10  | 21  | 33  | 50 | 50 | 32 | 23 | 500                   | 29,0    |
| 400 *                  | 600      | 4                                      | 5   | 10  | 15  | 18 | 14 | 11 | 12 | 600                   | 20,0    |
| 400 *                  | 900      | 5                                      | 7   | 13  | 22  | 30 | 22 | 16 | 15 | 600                   | 30,0    |
| 400 *                  | 1200     | 6                                      | 8   | 16  | 30  | 42 | 31 | 21 | 18 | 600                   | 40,0    |
| 500 *                  | 900      | 4                                      | 5   | 12  | 20  | 23 | 15 | 11 | 12 | 710                   | 40,0    |
| 500 *                  | 1200     | 4                                      | 6   | 14  | 27  | 34 | 21 | 14 | 15 | 710                   | 53,0    |
| 630 *                  | 1200     | 3                                      | 4   | 11  | 23  | 24 | 14 | 11 | 12 | 800                   | 62,0    |
| 630 *                  | 1500     | 3                                      | 6   | 15  | 29  | 30 | 17 | 12 | 14 | 800                   | 78,0    |
| 800 *                  | 1200     | 2                                      | 3   | 10  | 20  | 16 | 10 | 9  | 9  | 1000                  | 80,0    |
| 800 *                  | 1500     | 2                                      | 4   | 13  | 26  | 20 | 12 | 10 | 10 | 1000                  | 99,0    |

\* Supplied with two loose couplings

## Ordering example





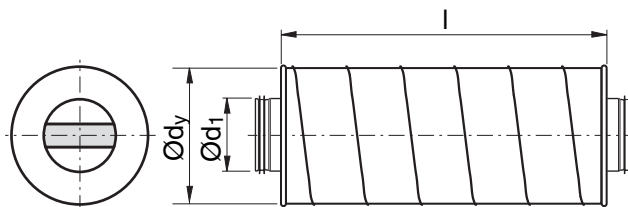


# Circular straight silencer with baffle

# SLCBU 100



## Dimensions



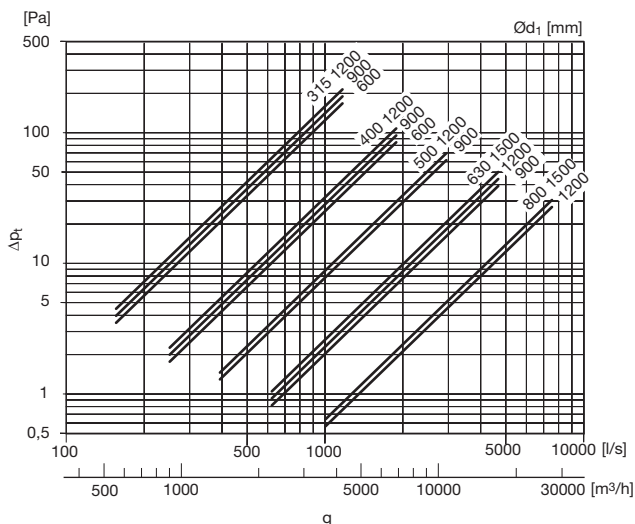
## Description

Insulation thickness 100 mm.

Provided with a 100 mm thick baffle. This gives very good attenuation across the entire range.

Used where very good attenuation is needed and SLU 100 is not enough. Specially suitable for large dimensions.

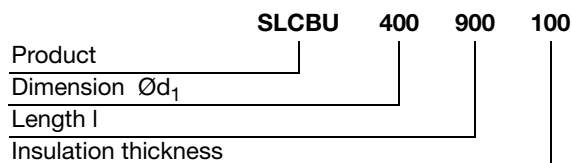
## Technical data



| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub><br>mm | m<br>kg |
|------------------------|---------|--|-----|-----|-----|----|----|----|----|-----------------------|---------|
|                        |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                       |         |
| 315                    | 600     | 4                                      | 6   | 10  | 16  | 22 | 28 | 27 | 18 | 510                   | 18,3    |
| 315                    | 900     | 5                                      | 7   | 16  | 23  | 30 | 38 | 32 | 22 | 510                   | 25,1    |
| 315                    | 1200    | 7                                      | 9   | 23  | 30  | 38 | 47 | 37 | 25 | 510                   | 32,6    |
| 400 *                  | 600     | 4                                      | 5   | 7   | 9   | 13 | 16 | 15 | 13 | 625                   | 22,5    |
| 400 *                  | 900     | 5                                      | 7   | 12  | 16  | 22 | 26 | 20 | 16 | 625                   | 32,7    |
| 400 *                  | 1200    | 6                                      | 10  | 18  | 23  | 31 | 36 | 25 | 19 | 625                   | 41,7    |
| 500 *                  | 900     | 4                                      | 6   | 9   | 12  | 17 | 20 | 15 | 13 | 735                   | 37,8    |
| 500 *                  | 1200    | 4                                      | 8   | 13  | 18  | 24 | 28 | 17 | 16 | 735                   | 48,8    |
| 630 *                  | 900     | 3                                      | 6   | 6   | 9   | 13 | 13 | 11 | 10 | 880                   | 48,0    |
| 630 *                  | 1200    | 3                                      | 8   | 10  | 13  | 18 | 18 | 12 | 12 | 880                   | 59,3    |
| 630 *                  | 1500    | 4                                      | 10  | 13  | 17  | 23 | 22 | 13 | 13 | 880                   | 70,4    |
| 800 *                  | 1200    | 2                                      | 4   | 8   | 10  | 13 | 12 | 9  | 8  | 1030                  | 81,8    |
| 800 *                  | 1500    | 2                                      | 5   | 11  | 12  | 17 | 15 | 10 | 10 | 1030                  | 100     |

\* Supplied with two loose couplings

## Ordering example



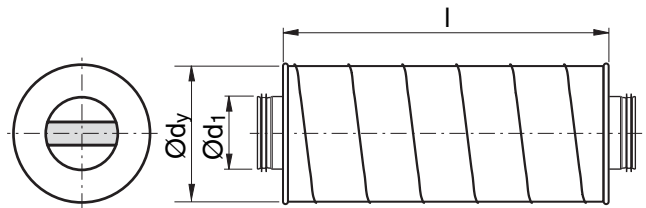


# Circular straight silencer with baffle

# SLBGU 100



## Dimensions



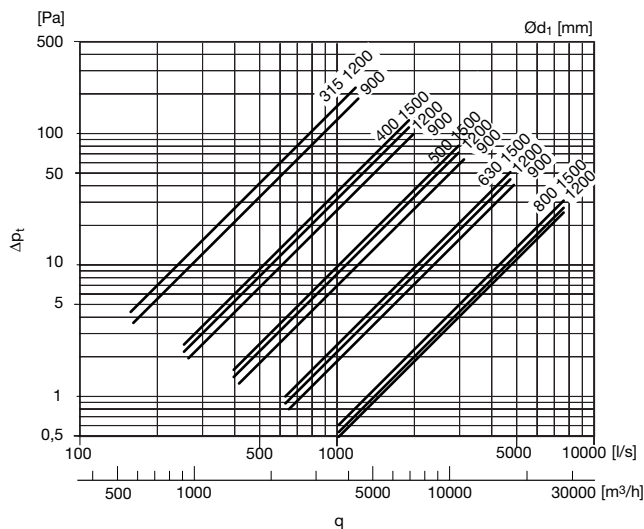
## Description

Insulation thickness 100 mm.

Provided with a 100 mm thick baffle. This gives very good attenuation across the entire range.

Used where very good attenuation is needed and SLGU 100 is not enough. Specially suitable for large dimensions.

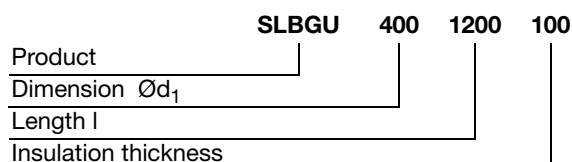
## Technical data



| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub><br>mm | m<br>kg |
|------------------------|---------|--|-----|-----|-----|----|----|----|----|-----------------------|---------|
|                        |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                       |         |
| 315                    | 900     | 6                                      | 9   | 20  | 34  | 39 | 44 | 34 | 22 | 510                   | 25,5    |
| 315                    | 1200    | 7                                      | 12  | 27  | 39  | 50 | 50 | 45 | 27 | 510                   | 33,6    |
| 400*                   | 900     | 4                                      | 6   | 13  | 22  | 24 | 26 | 20 | 17 | 625                   | 29,9    |
| 400*                   | 1200    | 6                                      | 9   | 19  | 29  | 33 | 35 | 24 | 19 | 625                   | 39,5    |
| 400*                   | 1500    | 7                                      | 12  | 25  | 38  | 42 | 44 | 29 | 22 | 625                   | 48,7    |
| 500*                   | 900     | 4                                      | 6   | 13  | 17  | 19 | 19 | 12 | 12 | 735                   | 34,3    |
| 500*                   | 1200    | 4                                      | 8   | 19  | 24  | 26 | 26 | 17 | 15 | 735                   | 45,1    |
| 500*                   | 1500    | 4                                      | 9   | 25  | 31  | 33 | 33 | 20 | 18 | 735                   | 55,7    |
| 630*                   | 900     | 3                                      | 4   | 10  | 12  | 14 | 12 | 10 | 10 | 880                   | 43,2    |
| 630*                   | 1200    | 3                                      | 7   | 14  | 17  | 18 | 17 | 12 | 12 | 880                   | 56,7    |
| 630*                   | 1500    | 4                                      | 8   | 19  | 23  | 23 | 20 | 14 | 14 | 880                   | 69,9    |
| 800*                   | 1200    | 2                                      | 4   | 11  | 12  | 13 | 11 | 9  | 8  | 1030                  | 74,3    |
| 800*                   | 1500    | 2                                      | 5   | 15  | 17  | 16 | 14 | 10 | 9  | 1030                  | 91,6    |

\* Supplied with two loose couplings

## Ordering example





# Circular straight low-built silencer

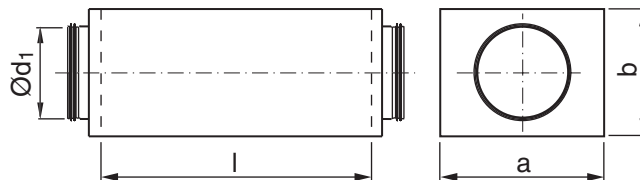
# LRCA



## Description

Silencer with low installation height. LRCA has a bowl-shaped mineral wool insulation with a fibre cloth in order to prevent tear off mineral wool. Can achieve maximum tightness class C.

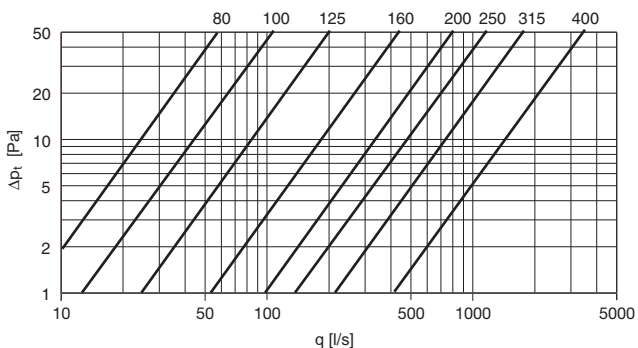
## Dimensions



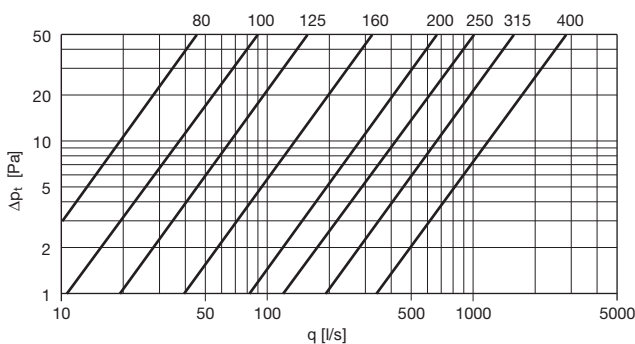
| Ød <sub>1</sub><br>nom | l<br>mm | a<br>mm | b<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | m<br>kg |
|------------------------|---------|---------|---------|--|-----|-----|-----|----|----|----|----|---------|
|                        |         |         |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |         |
| 100                    | 500     | 210     | 158     | 8                                      | 12  | 12  | 23  | 44 | 45 | 30 | 18 | 3,17    |
| 100                    | 1000    | 210     | 158     | 17                                     | 18  | 25  | 41  | 50 | 50 | 50 | 32 | 5,55    |
| 125                    | 500     | 239     | 181     | 8                                      | 9   | 11  | 21  | 36 | 36 | 23 | 14 | 3,85    |
| 125                    | 1000    | 239     | 181     | 17                                     | 14  | 21  | 38  | 50 | 50 | 45 | 23 | 6,89    |
| 160                    | 500     | 275     | 218     | 6                                      | 7   | 10  | 18  | 28 | 24 | 13 | 10 | 4,40    |
| 160                    | 1000    | 275     | 218     | 9                                      | 10  | 19  | 36  | 50 | 49 | 24 | 17 | 7,90    |
| 200                    | 500     | 328     | 254     | 5                                      | 6   | 9   | 16  | 22 | 17 | 7  | 7  | 5,74    |
| 200                    | 1000    | 328     | 254     | 11                                     | 13  | 15  | 30  | 46 | 36 | 14 | 12 | 10,1    |
| 250                    | 500     | 390     | 308     | 5                                      | 4   | 8   | 16  | 19 | 13 | 6  | 6  | 7,24    |
| 250                    | 1000    | 390     | 308     | 11                                     | 7   | 14  | 31  | 41 | 26 | 12 | 9  | 13,0    |
| 315                    | 500     | 453     | 372     | 3                                      | 4   | 7   | 13  | 15 | 8  | 4  | 5  | 9,15    |
| 315                    | 1000    | 453     | 372     | 8                                      | 8   | 13  | 26  | 33 | 18 | 9  | 9  | 16,4    |
| 400                    | 500     | 546     | 460     | 2                                      | 3   | 6   | 10  | 10 | 5  | 5  | 5  | 12,7    |
| 400                    | 1000    | 546     | 460     | 6                                      | 6   | 12  | 20  | 24 | 11 | 7  | 8  | 21,6    |

## Technical data

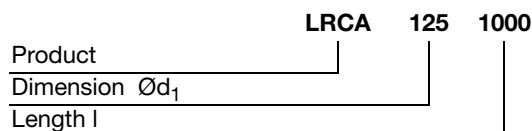
500 mm



1000 mm



## Ordering example



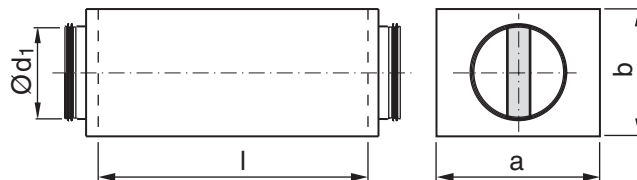


# Circular straight low-built silencer with baffle

## LRBCB



### Dimensions



### Description

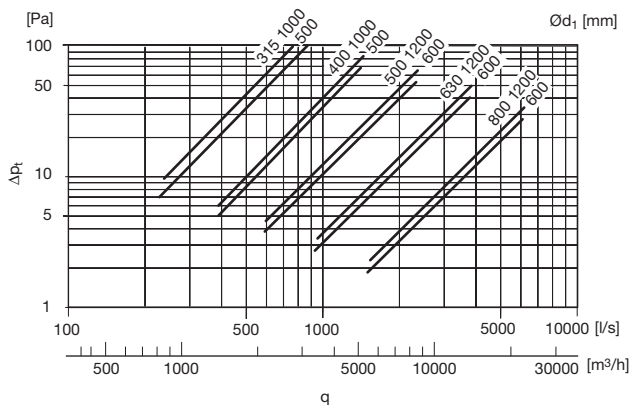
Baffle silencer with low installation height.

Inner pipe of perforated sheet metal. A fibre cloth prevents tear off mineral wool. Can achieve maximum tightness class C.

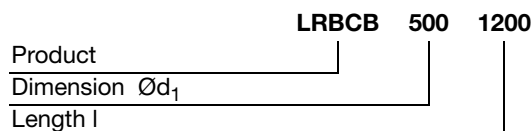
The baffle has an approved surface lining that can withstand cleaning with rotating plastic brush.

### Technical data

| Ød <sub>1</sub><br>nom | l<br>mm | a<br>mm | b<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | m<br>kg |
|------------------------|---------|---------|---------|--|-----|-----|-----|----|----|----|----|---------|
|                        |         |         |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |         |
| 315                    | 500     | 453     | 372     | 5                                      | 5   | 7   | 15  | 28 | 19 | 14 | 14 | 10,6    |
| 315                    | 1000    | 453     | 372     | 9                                      | 6   | 13  | 27  | 45 | 36 | 23 | 21 | 19,4    |
| 400                    | 500     | 546     | 460     | 5                                      | 4   | 6   | 13  | 21 | 13 | 11 | 10 | 14,0    |
| 400                    | 1000    | 546     | 460     | 6                                      | 5   | 10  | 22  | 39 | 25 | 17 | 15 | 24,3    |
| 500                    | 600     | 700     | 600     | 5                                      | 4   | 9   | 17  | 17 | 12 | 10 | 9  | 24,1    |
| 500                    | 1200    | 700     | 600     | 6                                      | 6   | 15  | 28  | 32 | 21 | 15 | 13 | 41,4    |
| 630                    | 600     | 810     | 710     | 3                                      | 3   | 7   | 16  | 11 | 9  | 7  | 7  | 29,5    |
| 630                    | 1200    | 810     | 710     | 5                                      | 5   | 13  | 26  | 24 | 15 | 11 | 10 | 50,4    |
| 800                    | 600     | 980     | 880     | 2                                      | 2   | 6   | 12  | 9  | 7  | 5  | 5  | 38,4    |
| 800                    | 1200    | 980     | 880     | 3                                      | 4   | 11  | 14  | 11 | 9  | 7  | 6  | 63,7    |



### Ordering example



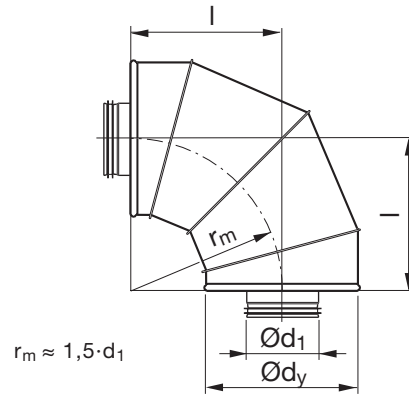


# Circular curved silencer

# BSLU 50



## Dimensions



## Description

Lack of space is a frequent problem in air treatment installations. This means that it is often difficult to find enough straight lengths to install a straight silencer.

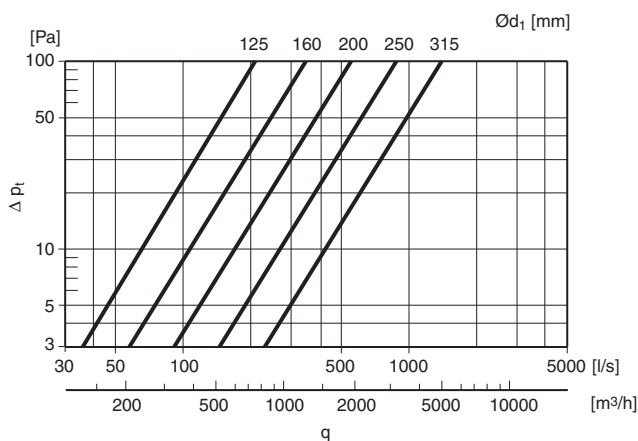
This problem can be eliminated by installing a curved silencer.

For the same length, it mostly has better attenuation than the equivalent straight silencer. In particular, you get better attenuation at high frequencies (4 and 8 kHz).

Insulation thickness 50 mm.

| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub><br>mm | m<br>kg |
|------------------------|---------|--|-----|-----|-----|----|----|----|----|-----------------------|---------|
|                        |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                       |         |
| 125                    | 260     | 3                                      | 2   | 6   | 14  | 22 | 33 | 26 | 22 | 235                   | 3,34    |
| 160                    | 285     | 1                                      | 2   | 6   | 14  | 23 | 29 | 25 | 21 | 270                   | 4,22    |
| 200                    | 355     | 0                                      | 2   | 5   | 15  | 29 | 24 | 24 | 20 | 310                   | 6,31    |
| 250                    | 370     | 1                                      | 2   | 6   | 17  | 31 | 22 | 27 | 20 | 365                   | 10,7    |
| 315                    | 370     | 1                                      | 2   | 7   | 19  | 20 | 17 | 20 | 16 | 427                   | 11,4    |

## Technical data



## Ordering example



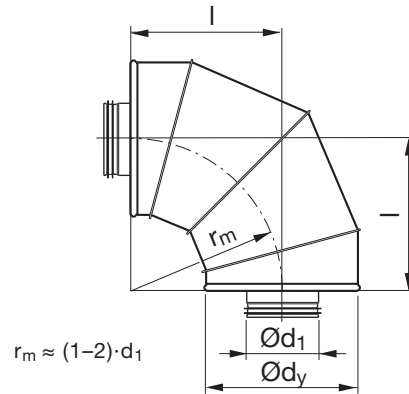


# Circular curved silencer

# BSLU 100



## Dimensions



## Description

Lack of space is a frequent problem in air treatment installations. This means that it is often difficult to find enough straight lengths to install a straight silencer.

This problem can be eliminated by installing a curved silencer.

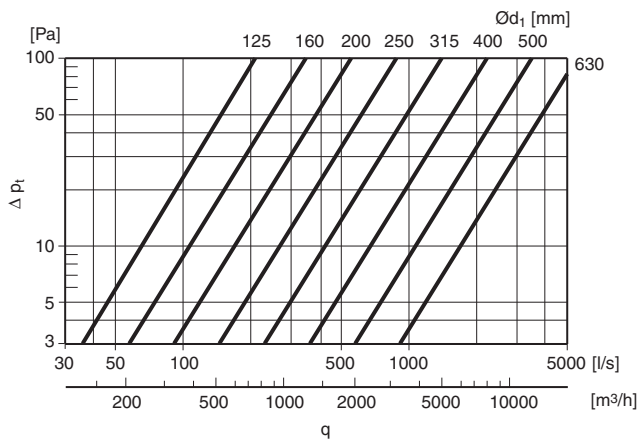
For the same length, it mostly has better attenuation than the equivalent straight silencer. In particular, you get better attenuation at high frequencies (4 and 8 kHz).

Insulation thickness 100 mm.

| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub><br>mm | m<br>kg |
|------------------------|---------|--|-----|-----|-----|----|----|----|----|-----------------------|---------|
|                        |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                       |         |
| 125                    | 260     | 7                                      | 6   | 17  | 22  | 28 | 38 | 33 | 26 | 325                   | 7,70    |
| 160                    | 280     | 4                                      | 6   | 13  | 17  | 25 | 33 | 26 | 25 | 365                   | 8,90    |
| 200                    | 325     | 2                                      | 5   | 14  | 19  | 29 | 24 | 25 | 22 | 410                   | 11,8    |
| 250                    | 370     | 3                                      | 5   | 11  | 15  | 28 | 22 | 26 | 21 | 465                   | 16,0    |
| 315                    | 375     | 2                                      | 4   | 10  | 15  | 20 | 17 | 22 | 17 | 510                   | 19,6    |
| 400 *                  | 420     | 2                                      | 4   | 8   | 13  | 13 | 13 | 14 | 13 | 615                   | 29,9    |
| 500 *                  | 510     | 1                                      | 4   | 9   | 13  | 10 | 13 | 13 | 12 | 735                   | 45,0    |
| 630 *                  | 610     | 2                                      | 6   | 13  | 12  | 11 | 12 | 13 | 12 | 880                   | 64,1    |

\* Supplied with two loose couplings

## Technical data



## Ordering example



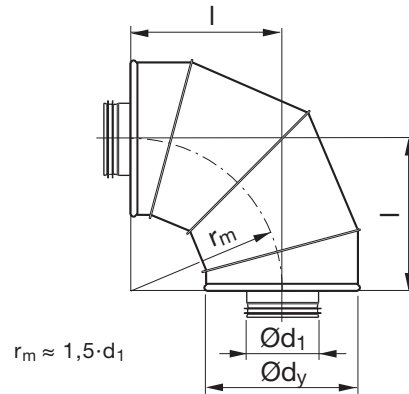


# Circular curved silencer

# BSLCU 50



## Dimensions



## Description

Lack of space is a frequent problem in air treatment installations. This means that it is often difficult to find enough straight lengths to install a straight silencer.

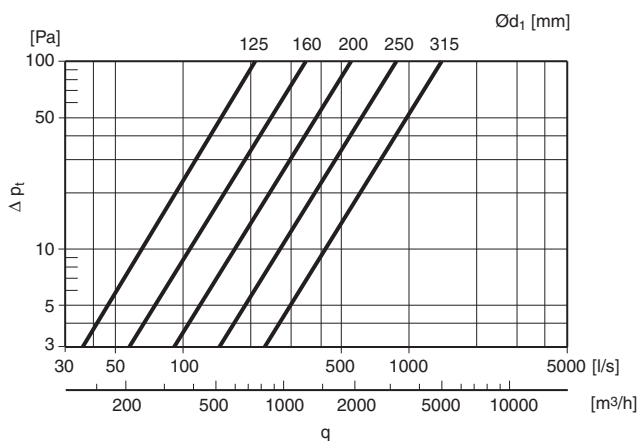
This problem can be eliminated by installing a curved silencer.

For the same length, it mostly has better attenuation than the equivalent straight silencer. In particular, you get better attenuation at high frequencies (4 and 8 kHz).

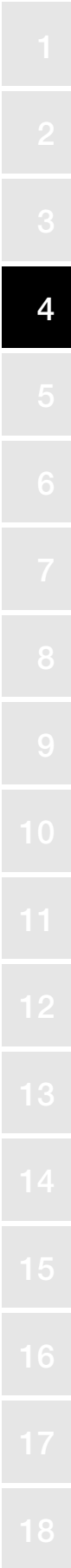
Insulation thickness 50 mm.

| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub><br>mm | m<br>kg |
|------------------------|---------|--|-----|-----|-----|----|----|----|----|-----------------------|---------|
|                        |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                       |         |
| 125                    | 260     | 3                                      | 2   | 6   | 14  | 22 | 33 | 26 | 22 | 235                   | 3,34    |
| 160                    | 285     | 1                                      | 2   | 6   | 14  | 23 | 29 | 25 | 21 | 270                   | 4,22    |
| 200                    | 355     | 0                                      | 2   | 5   | 15  | 29 | 24 | 24 | 20 | 310                   | 6,31    |
| 250                    | 370     | 1                                      | 2   | 6   | 17  | 31 | 22 | 27 | 20 | 365                   | 9,74    |
| 315                    | 370     | 1                                      | 2   | 7   | 19  | 20 | 17 | 20 | 16 | 427                   | 13,6    |

## Technical data



## Ordering example



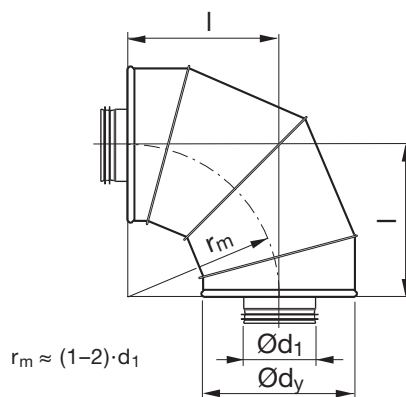


# Circular curved silencer

# BSLCU 100



## Dimensions



## Description

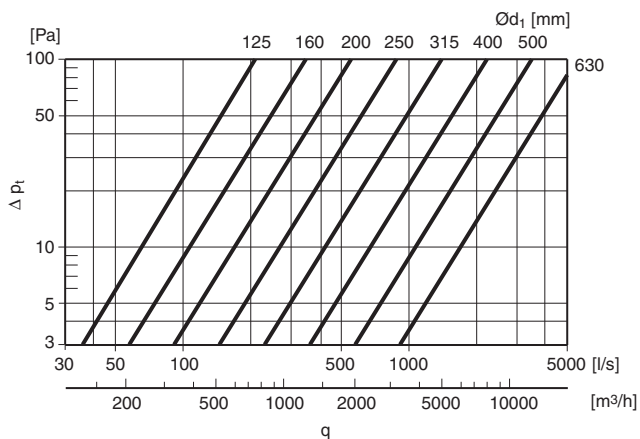
Lack of space is a frequent problem in air treatment installations. This means that it is often difficult to find enough straight lengths to install a straight silencer.

This problem can be eliminated by installing a curved silencer.

For the same length, it mostly has better attenuation than the equivalent straight silencer. In particular, you get better attenuation at high frequencies (4 and 8 kHz).

Insulation thickness 100 mm.

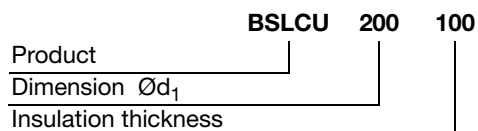
## Technical data



| Ød <sub>1</sub><br>nom | l<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub><br>mm | m<br>kg |
|------------------------|---------|--|-----|-----|-----|----|----|----|----|-----------------------|---------|
|                        |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                       |         |
| 125                    | 260     | 7                                      | 6   | 17  | 22  | 28 | 38 | 33 | 26 | 325                   | 6,93    |
| 160                    | 280     | 4                                      | 6   | 13  | 17  | 25 | 33 | 26 | 25 | 365                   | 8,01    |
| 200                    | 325     | 2                                      | 5   | 14  | 19  | 29 | 24 | 25 | 22 | 410                   | 10,6    |
| 250                    | 370     | 3                                      | 5   | 11  | 15  | 28 | 22 | 26 | 21 | 465                   | 14,4    |
| 315                    | 375     | 2                                      | 4   | 10  | 15  | 20 | 17 | 22 | 17 | 510                   | 17,6    |
| 400*                   | 420     | 2                                      | 4   | 8   | 13  | 13 | 13 | 14 | 13 | 615                   | 26,9    |
| 500*                   | 510     | 1                                      | 4   | 9   | 13  | 10 | 13 | 13 | 12 | 735                   | 38,5    |
| 630*                   | 610     | 2                                      | 6   | 13  | 12  | 11 | 12 | 13 | 12 | 880                   | 57,7    |

\* Supplied with two loose couplings

## Ordering example







# Exhaust air terminal device

# SLKNU 50



## Description

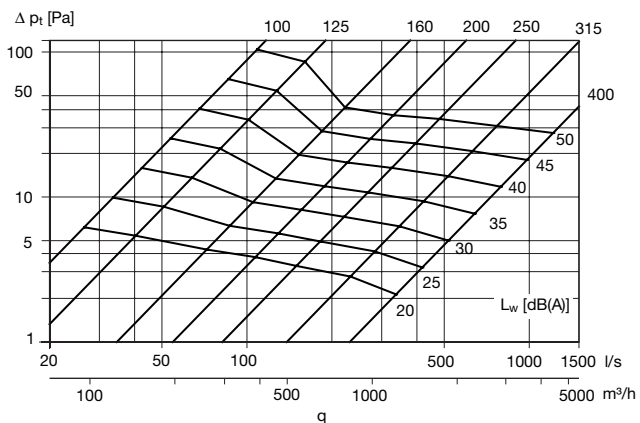
SLKNU is an exhaust air terminal device consisting of a silencer with 50 mm insulation and conical inlet with net.

## Material and surface treatment

SLKNU is manufactured from galvanized sheet metal and is as standard delivered non-painted. The device can also be painted to order.

## Capacity

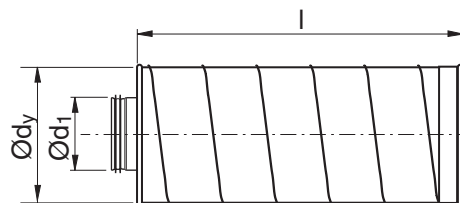
Air flow  $q$  [l/s] and [m<sup>3</sup>/h], total pressure  $\Delta p_t$  [Pa] and sound pressure level  $L_w$  [dB(A)] is read in the graph.



## Ordering example

|                             |              |            |            |           |
|-----------------------------|--------------|------------|------------|-----------|
|                             | <b>SLKNU</b> | <b>125</b> | <b>600</b> | <b>50</b> |
| Product                     |              |            |            |           |
| Dimension $\varnothing d_1$ |              |            |            |           |
| Length, nominal             |              |            |            |           |
| Insulation thickness        |              |            |            |           |

## Dimensions



## Self attenuation $\Delta L$

The device's self attenuation from duct to room inclusive end reflexion.

| $\varnothing d_1$<br>nom | Length<br>nom | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | $\varnothing d_y$<br>mm | l<br>mm | m<br>kg |
|--------------------------|---------------|--|-----|-----|-----|----|----|----|----|-------------------------|---------|---------|
|                          |               | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |         |         |
| 100                      | 300           | 2                                      | 2   | 6   | 14  | 21 | 25 | 20 | 11 | 210                     | 382     | 2,32    |
| 100                      | 600           | 4                                      | 3   | 11  | 24  | 36 | 49 | 34 | 17 | 210                     | 682     | 4,27    |
| 100                      | 900           | 5                                      | 4   | 15  | 34  | 50 | 50 | 48 | 23 | 210                     | 982     | 5,51    |
| 100                      | 1200          | 6                                      | 5   | 19  | 45  | 50 | 50 | 50 | 29 | 210                     | 1282    | 6,94    |
| 125                      | 300           | 2                                      | 2   | 6   | 13  | 16 | 20 | 15 | 10 | 235                     | 382     | 2,69    |
| 125                      | 600           | 3                                      | 3   | 9   | 23  | 30 | 40 | 22 | 14 | 235                     | 682     | 4,59    |
| 125                      | 900           | 4                                      | 4   | 12  | 33  | 45 | 50 | 30 | 17 | 235                     | 982     | 6,56    |
| 125                      | 1200          | 5                                      | 5   | 15  | 43  | 50 | 50 | 38 | 21 | 235                     | 1282    | 8,00    |
| 160                      | 300           | 1                                      | 2   | 4   | 10  | 12 | 15 | 8  | 8  | 270                     | 382     | 2,99    |
| 160                      | 600           | 2                                      | 3   | 7   | 19  | 27 | 29 | 14 | 11 | 270                     | 682     | 5,57    |
| 160                      | 900           | 2                                      | 4   | 10  | 28  | 42 | 43 | 20 | 15 | 270                     | 982     | 7,87    |
| 160                      | 1200          | 2                                      | 5   | 13  | 37  | 50 | 50 | 26 | 19 | 270                     | 1282    | 9,82    |
| 200                      | 300           | 1                                      | 2   | 5   | 8   | 10 | 11 | 5  | 5  | 325                     | 410     | 4,03    |
| 200                      | 600           | 2                                      | 3   | 7   | 16  | 21 | 23 | 9  | 8  | 325                     | 710     | 6,82    |
| 200                      | 900           | 2                                      | 4   | 8   | 24  | 32 | 34 | 13 | 10 | 325                     | 1010    | 9,66    |
| 200                      | 1200          | 3                                      | 5   | 10  | 31  | 43 | 45 | 18 | 13 | 325                     | 1310    | 11,9    |
| 250                      | 600           | 3                                      | 2   | 7   | 13  | 17 | 16 | 8  | 6  | 365                     | 693     | 8,43    |
| 250                      | 900           | 3                                      | 4   | 8   | 20  | 26 | 23 | 10 | 8  | 365                     | 993     | 11,6    |
| 250                      | 1200          | 4                                      | 5   | 9   | 26  | 35 | 30 | 12 | 10 | 365                     | 1293    | 14,9    |
| 315                      | 600           | 0                                      | 2   | 6   | 11  | 14 | 9  | 4  | 5  | 427                     | 701     | 10,9    |
| 315                      | 900           | 1                                      | 3   | 7   | 16  | 22 | 12 | 6  | 7  | 427                     | 1001    | 15,3    |
| 315                      | 1200          | 1                                      | 3   | 8   | 22  | 30 | 16 | 7  | 9  | 427                     | 1301    | 20,2    |
| 400*                     | 600           | 0                                      | 3   | 4   | 6   | 8  | 4  | 4  | 4  | 508                     | 655     | 18,9    |
| 400*                     | 900           | 1                                      | 3   | 5   | 10  | 13 | 7  | 5  | 6  | 508                     | 955     | 24,3    |
| 400*                     | 1200          | 1                                      | 4   | 7   | 14  | 19 | 10 | 7  | 8  | 508                     | 1255    | 26,7    |

\* Supplied with one loose coupling

Sound power level  $L_{Wok} = L_w + k_{ok}$

| $\varnothing d_1$<br>mm | Correction, $k_{ok}$ , in dB at middle frequency Hz |     |     |     |     |    |     |     |
|-------------------------|---|-----|-----|-----|-----|----|-----|-----|
|                         | 63  | 125 | 250 | 500 | 1k  | 2k | 4k  | 8k  |
| 100                     | 5   | -11 | -17 | -15 | -9  | -2 | -15 | -22 |
| 125                     | 9   | -9  | -14 | -12 | -8  | -3 | -13 | -21 |
| 160                     | 3   | -14 | -18 | -14 | -9  | -2 | -13 | -20 |
| 200                     | 12  | -9  | -12 | -9  | -5  | -4 | -16 | -21 |
| 250                     | 7   | -8  | -13 | -10 | -4  | -5 | -16 | -22 |
| 315                     | 20  | -8  | -14 | -12 | -7  | -4 | -17 | -27 |
| 400                     | 11  | -3  | -8  | -10 | -10 | -2 | -19 | -28 |

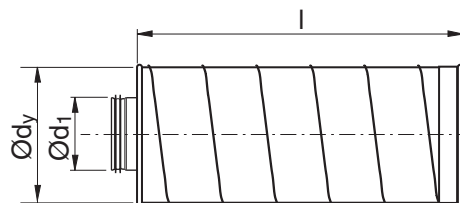


# Exhaust air terminal device

# SLKNU 100



## Dimensions



## Self attenuation ΔL

The device's self attenuation from duct to room inclusive end reflexion.

## Description

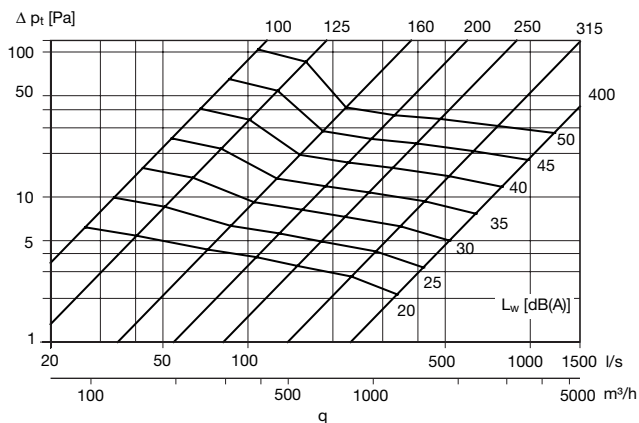
SLKNU is an exhaust air terminal device consisting of a silencer with 100 mm insulation and conical inlet with net.

## Material and surface treatment

SLKNU is manufactured from galvanized sheet metal and is as standard delivered non-painted. The device can also be painted to order.

## Capacity

Air flow  $q$  [l/s] and [m<sup>3</sup>/h], total pressure  $\Delta p_t$  [Pa] and sound pressure level  $L_w$  [dB(A)] is read in the graph.



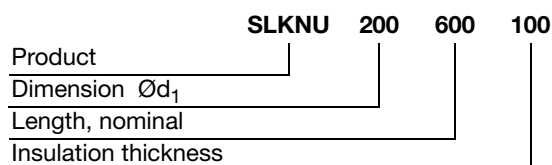
| Ød <sub>1</sub> nom | Length nom | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ød <sub>y</sub> mm | l mm | m kg |
|---------------------|------------|--|-----|-----|-----|----|----|----|----|--------------------|------|------|
|                     |            | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                    |      |      |
| 100                 | 300        | 5                                      | 4   | 11  | 14  | 18 | 24 | 20 | 11 | 325                | 432  | 4,31 |
| 100                 | 600        | 8                                      | 8   | 18  | 25  | 34 | 46 | 38 | 19 | 325                | 732  | 7,04 |
| 100                 | 900        | 11                                     | 11  | 25  | 36  | 50 | 50 | 50 | 26 | 325                | 1032 | 11,0 |
| 100                 | 1200       | 14                                     | 14  | 32  | 47  | 50 | 50 | 50 | 33 | 325                | 1332 | 13,2 |
| 125                 | 300        | 5                                      | 4   | 9   | 11  | 16 | 19 | 15 | 10 | 325                | 427  | 4,94 |
| 125                 | 600        | 7                                      | 7   | 16  | 20  | 28 | 37 | 24 | 14 | 325                | 727  | 7,31 |
| 125                 | 900        | 9                                      | 10  | 22  | 29  | 41 | 50 | 33 | 18 | 325                | 1027 | 11,6 |
| 125                 | 1200       | 12                                     | 13  | 29  | 38  | 50 | 50 | 42 | 22 | 325                | 1327 | 14,4 |
| 160                 | 300        | 4                                      | 3   | 6   | 8   | 11 | 14 | 9  | 8  | 325                | 439  | 5,40 |
| 160                 | 600        | 5                                      | 6   | 13  | 16  | 23 | 28 | 15 | 12 | 325                | 739  | 9,19 |
| 160                 | 900        | 6                                      | 9   | 20  | 24  | 34 | 42 | 21 | 16 | 325                | 1039 | 12,7 |
| 160                 | 1200       | 8                                      | 12  | 27  | 32  | 46 | 50 | 28 | 20 | 325                | 1339 | 17,1 |
| 200                 | 300        | 4                                      | 4   | 6   | 6   | 9  | 11 | 6  | 6  | 410                | 434  | 7,37 |
| 200                 | 600        | 5                                      | 6   | 11  | 14  | 19 | 22 | 10 | 8  | 410                | 734  | 10,3 |
| 200                 | 900        | 6                                      | 9   | 17  | 21  | 29 | 33 | 14 | 11 | 410                | 1034 | 14,9 |
| 200                 | 1200       | 7                                      | 11  | 22  | 29  | 38 | 45 | 18 | 13 | 410                | 1334 | 19,0 |
| 250                 | 600        | 6                                      | 5   | 10  | 11  | 16 | 16 | 8  | 7  | 465                | 749  | 10,3 |
| 250                 | 900        | 7                                      | 7   | 15  | 18  | 25 | 23 | 10 | 9  | 465                | 1049 | 17,6 |
| 250                 | 1200       | 7                                      | 9   | 20  | 25  | 34 | 30 | 13 | 11 | 465                | 1349 | 22,5 |
| 315                 | 600        | 1                                      | 4   | 7   | 9   | 12 | 10 | 5  | 6  | 510                | 735  | 14,3 |
| 315                 | 900        | 2                                      | 6   | 12  | 14  | 19 | 15 | 7  | 8  | 510                | 1035 | 19,4 |
| 315                 | 1200       | 2                                      | 8   | 16  | 18  | 26 | 21 | 9  | 10 | 510                | 1335 | 25,4 |
| 400*                | 600        | 1                                      | 5   | 5   | 5   | 7  | 4  | 4  | 4  | 625                | 702  | 20,2 |
| 400*                | 900        | 3                                      | 7   | 8   | 9   | 13 | 7  | 5  | 6  | 625                | 1002 | 29,6 |
| 400*                | 1200       | 4                                      | 8   | 12  | 13  | 19 | 10 | 6  | 7  | 625                | 1302 | 37,7 |

\* Supplied with one loose coupling

Sound power level  $L_{Wok} = L_w + k_{ok}$

| Ød <sub>1</sub> mm | Correction, $k_{ok}$ , in dB at middle frequency Hz |     |     |     |     |    |     |     |
|--------------------|---|-----|-----|-----|-----|----|-----|-----|
|                    | 63  | 125 | 250 | 500 | 1k  | 2k | 4k  | 8k  |
| 100                | 5   | -11 | -17 | -15 | -9  | -2 | -15 | -22 |
| 125                | 9   | -9  | -14 | -12 | -8  | -3 | -13 | -21 |
| 160                | 3   | -14 | -18 | -14 | -9  | -2 | -13 | -20 |
| 200                | 12  | -9  | -12 | -9  | -5  | -4 | -16 | -21 |
| 250                | 7   | -8  | -13 | -10 | -4  | -5 | -16 | -22 |
| 315                | 20  | -8  | -14 | -12 | -7  | -4 | -17 | -27 |
| 400                | 11  | -3  | -8  | -10 | -10 | -2 | -19 | -28 |

## Ordering example





# Silencer

# SLRS

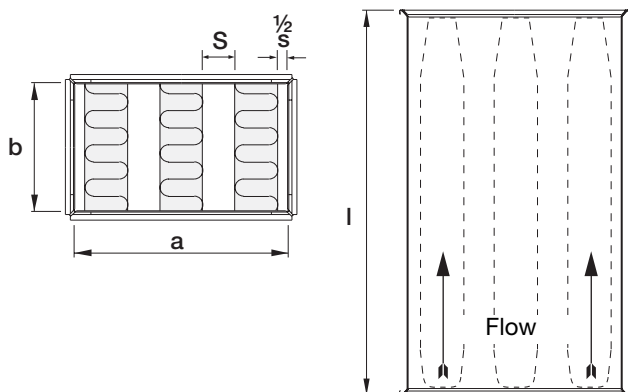


## Description

Rectangular straight silencer from the Aerodim™ series. SLRS is built with the Aerodim™ silencer splitter SLRA. The silencer SLRA is manufactured with a frame of galvanized sheet and absorption material type Lindtec™. The Lindtec™ surface is easy to clean and prevents removal of fibres.

Due to the aerodynamic design, the SLRS has a low pressure loss and a low generation of flow noise. The splitter is available in a width of 200 mm. The SLRS is also available in other lengths and with other splitter distances than shown in the tables. To calculate the silencer, you can use our IT-program DIMsilencer, where splitter distance, length and height can be optimized for the best performance.

## Dimensions



## Ordering example

|                          |             |            |            |             |            |             |           |
|--------------------------|-------------|------------|------------|-------------|------------|-------------|-----------|
|                          | <b>SLRS</b> | <b>200</b> | <b>100</b> | <b>1200</b> | <b>900</b> | <b>1000</b> | <b>LS</b> |
| Product                  |             |            |            |             |            |             |           |
| Splitter width in mm     |             |            |            |             |            |             |           |
| Splitter distance in mm. |             |            |            |             |            |             |           |
| a in mm                  |             |            |            |             |            |             |           |
| b in mm                  |             |            |            |             |            |             |           |
| l in mm                  |             |            |            |             |            |             |           |
| Connection type, e.g. LS |             |            |            |             |            |             |           |

## Technical data

### Splitter distance S = 60 mm

| Length<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Pressure<br>value $\xi$ |
|--------------|--|-----|-----|-----|----|----|----|----|-------------------------|
|              | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| 1000         | 5                                      | 11  | 23  | 34  | 48 | 43 | 28 | 20 | 10,2                    |
| 1500         | 7                                      | 16  | 34  | 50  | 50 | 50 | 39 | 27 | 12,9                    |
| 2000         | 9                                      | 22  | 45  | 50  | 50 | 50 | 49 | 33 | 15,6                    |
| 2500         | 11                                     | 27  | 50  | 50  | 50 | 50 | 50 | 38 | 18,2                    |

### Splitter distance S = 80 mm

| Length<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Pressure<br>value $\xi$ |
|--------------|--|-----|-----|-----|----|----|----|----|-------------------------|
|              | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| 1000         | 4                                      | 9   | 20  | 30  | 42 | 36 | 23 | 17 | 5,5                     |
| 1500         | 5                                      | 14  | 29  | 44  | 50 | 50 | 32 | 22 | 6,9                     |
| 2000         | 7                                      | 18  | 39  | 50  | 50 | 50 | 40 | 27 | 8,2                     |
| 2500         | 8                                      | 22  | 48  | 50  | 50 | 50 | 48 | 31 | 9,5                     |

### Splitter distance S = 100 mm

| Length<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Pressure<br>value $\xi$ |
|--------------|--|-----|-----|-----|----|----|----|----|-------------------------|
|              | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| 1000         | 3                                      | 8   | 18  | 27  | 37 | 29 | 19 | 14 | 3,2                     |
| 1500         | 5                                      | 12  | 26  | 40  | 50 | 44 | 27 | 18 | 4,0                     |
| 2000         | 6                                      | 16  | 34  | 50  | 50 | 50 | 33 | 22 | 4,8                     |
| 2500         | 7                                      | 19  | 42  | 50  | 50 | 50 | 40 | 26 | 5,6                     |

### Splitter distance S = 120 mm

| Length<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Pressure<br>value $\xi$ |
|--------------|--|-----|-----|-----|----|----|----|----|-------------------------|
|              | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| 1000         | 3                                      | 7   | 16  | 25  | 32 | 24 | 16 | 11 | 2,0                     |
| 1500         | 4                                      | 11  | 23  | 36  | 50 | 36 | 22 | 15 | 2,5                     |
| 2000         | 5                                      | 14  | 31  | 48  | 50 | 47 | 28 | 18 | 3,0                     |
| 2500         | 6                                      | 17  | 38  | 50  | 50 | 50 | 33 | 21 | 3,5                     |

### Splitter distance S = 140 mm

| Length<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Pressure<br>value $\xi$ |
|--------------|--|-----|-----|-----|----|----|----|----|-------------------------|
|              | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| 1000         | 3                                      | 7   | 15  | 23  | 28 | 20 | 13 | 9  | 1,3                     |
| 1500         | 4                                      | 10  | 22  | 34  | 44 | 30 | 18 | 12 | 1,7                     |
| 2000         | 4                                      | 13  | 28  | 45  | 50 | 39 | 23 | 15 | 2,0                     |
| 2500         | 5                                      | 16  | 35  | 50  | 50 | 48 | 27 | 18 | 2,4                     |

NB. Max. attenuation specified is 50 dB. The pressure loss  $\Delta p$  in Pa can be calculated from the pressure value  $\xi$ :  $\Delta p = 0,6 \times v^2 \times \xi$  where (v) is the velocity on the face area of the silencer.

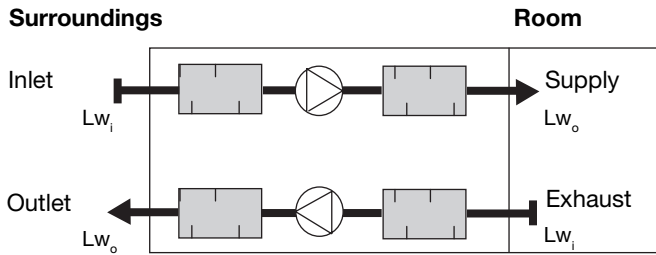
The lengths shown above are only examples, other lengths between are also available. Min. length is 500 mm. Maximum length is 2500 mm. Lengths over 2500 mm. will be divided up into two or more silencers.



# Silencer

# SLRS

## Technical data



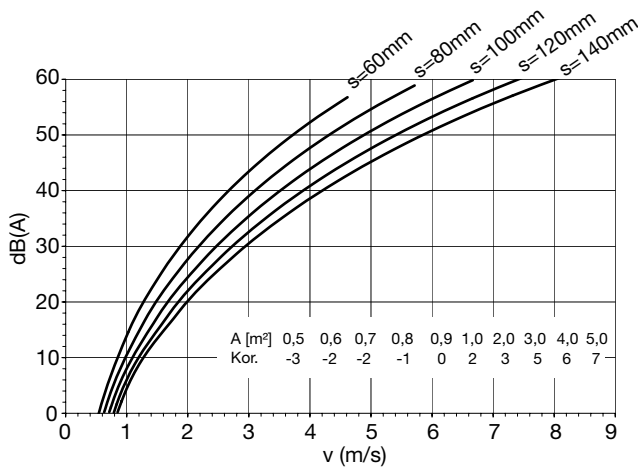
The flow noise and pressure loss is dependent on the velocity ( $v$ ) on the face area ( $A$ ) of the silencer.

However, the noise generated at the inlet of the silencer  $Lw_i$  is higher than the noise generated at the outlet of the silencer  $Lw_o$ . It is therefore crucial to use the correct value depend on the placement of the silencer in the duct system, cf. drawing.

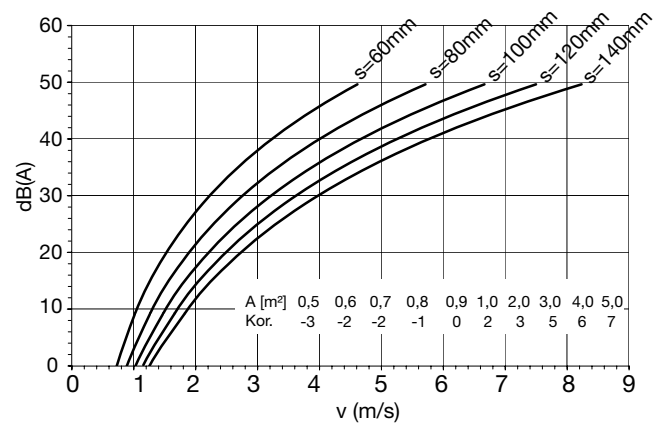
When calculating the silencer for:

- supply and outlet - use outlet noise  $Lw_o$
- inlet and exhaust - use inlet noise  $Lw_i$

Sound power level, inlet:  $Lw_i$



Sound power level, outlet:  $Lw_o$

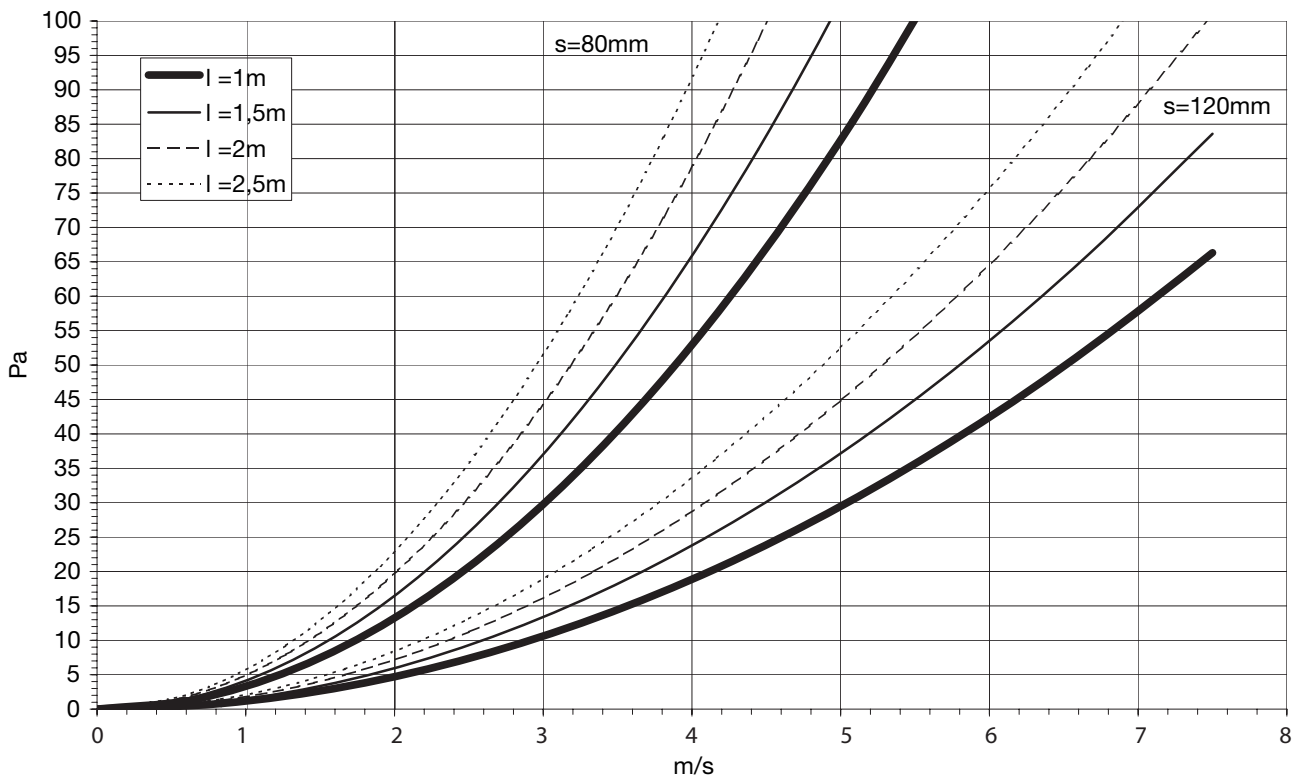
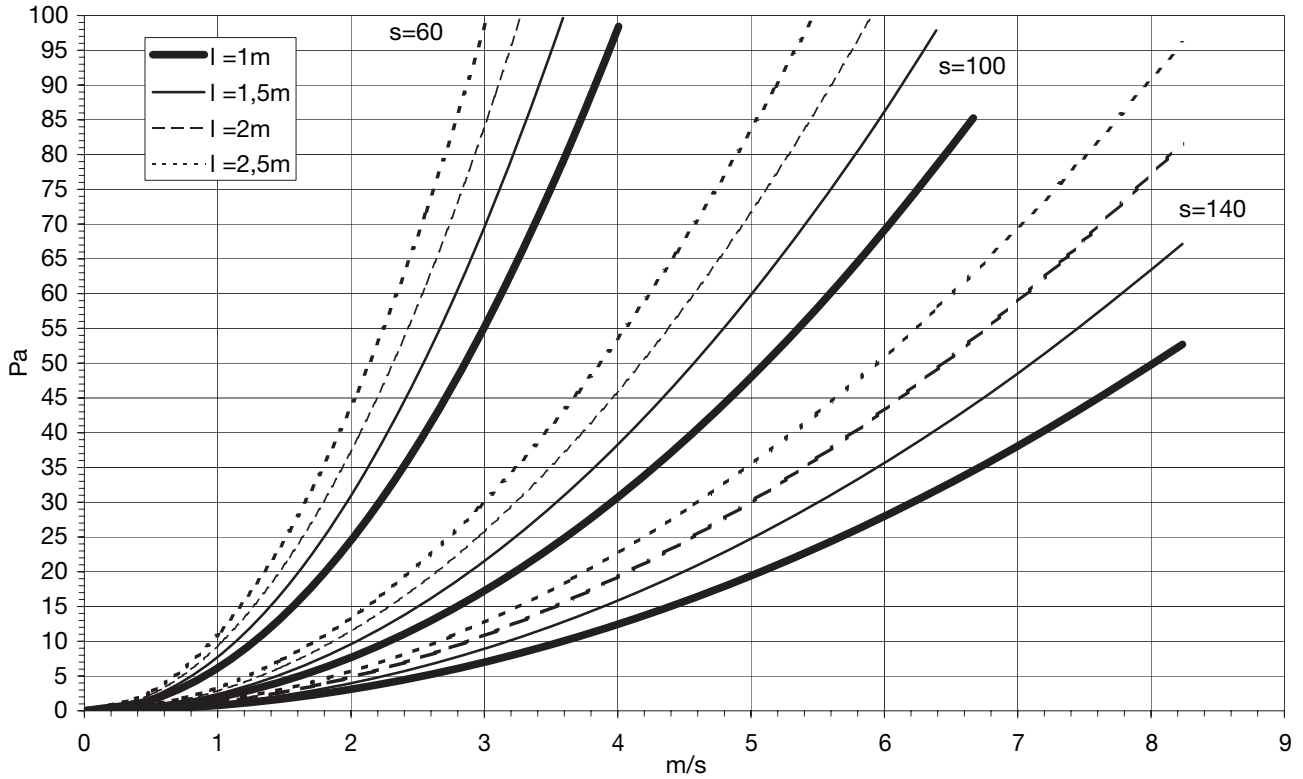




# Silencer

# SLRS

## Pressure drop



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



# Silencer

# SLRS

## Calculation example

Pressure loss and flow noise depend on the velocity on the face area of the silencer A.

This is illustrated in the following example:  
 SLRS 900x600 mm, Length 1.5 metre  
 3 splitters, distance 100 mm.

Flow = 7776 m<sup>3</sup>/h = 2.16 m<sup>3</sup>/s.  
 Area A = 0.9 m × 0.6 m = 0.54 m<sup>2</sup>

$$\text{Face velocity} = \frac{2,16 \text{ m}^3/\text{s}}{0,54 \text{ m}^2} = 4 \text{ m/s}$$

### Pressure loss:

Pressure loss = 39 Pa.

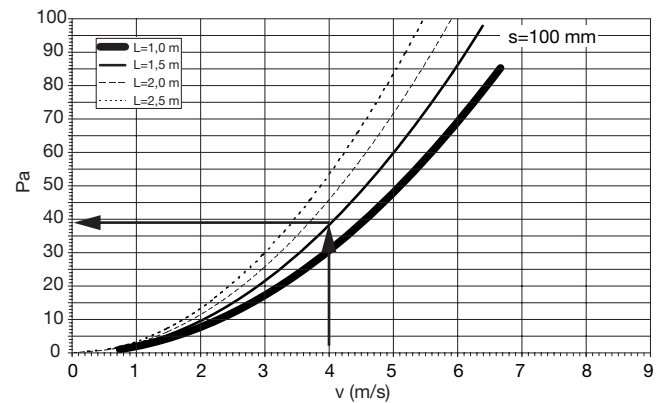
### Flow noise from inlet:

Lw<sub>i</sub> = 44 dB(A) -3 = 41 dB(A)  
 (-3 from area korrektion)

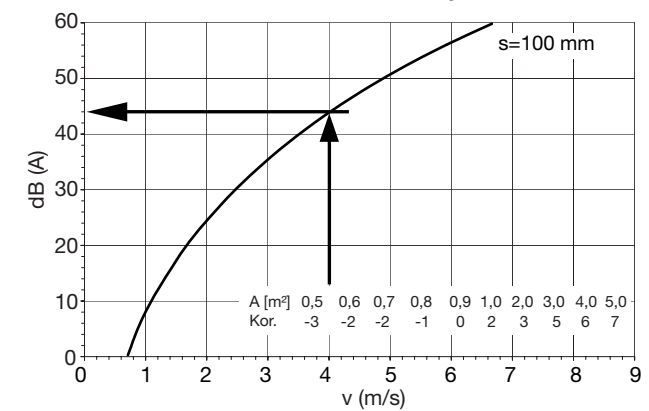
### Flow noise from outlet:

From graph:  
 Lw<sub>o</sub> = 36 dB(A) -3 = 33 dB(A)  
 (-3 from area korrektion)

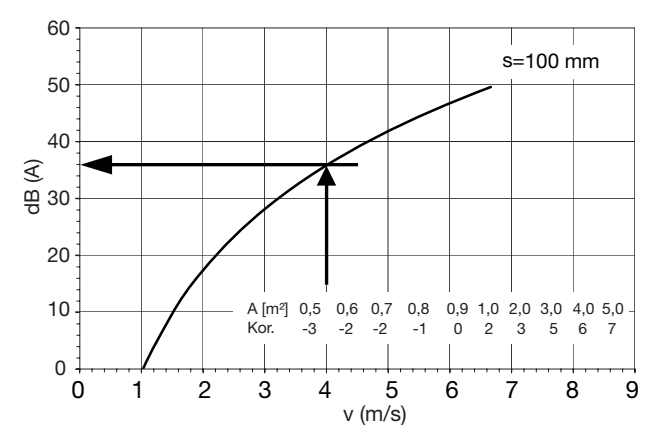
## Pressure loss



## Sound power level, inlet: Lw<sub>i</sub>



## Sound power level, outlet: Lw<sub>o</sub>





# Silencer splitter

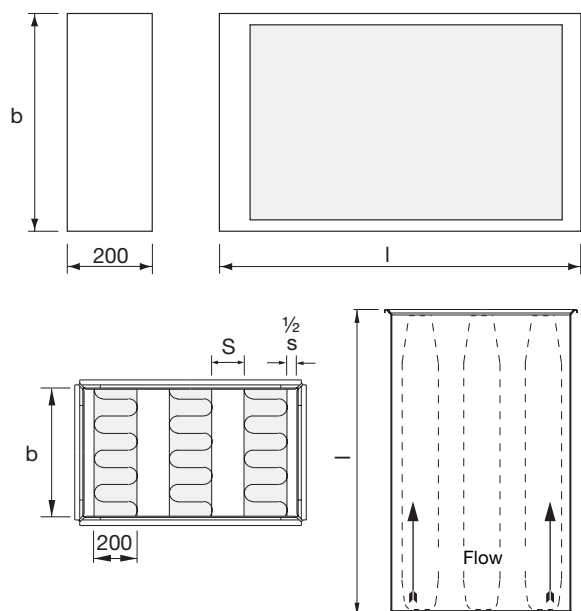
# SLRA



## Description

SLRA is the basic element in the Aerodim™ silencer series. The SLRA is manufactured with a frame of galvanized sheet and absorption material type Lindtec™. The Lindtec™ surface is easy to clean and prevents removal of fibres. Due to the aerodynamic design, the SLRA has a low pressure loss and a low generation of flow noise. The SLRA is available in a width of 200 mm. The SLRA is also available in other lengths and with other splitter distances than shown in the tables. To calculate the silencer, you can use our IT-program DIMsilencer, where splitter distance, length and height can be optimized for the best performance.

## Dimensions



## Ordering example

|                      |      |     |     |      |
|----------------------|------|-----|-----|------|
|                      | SLRA | 200 | 600 | 1000 |
| Product              |      |     |     |      |
| Splitter width in mm |      |     |     |      |
| b in mm              |      |     |     |      |
| l nom. in mm.        |      |     |     |      |

## Technical data

### Splitter distance S = 60 mm

| Length<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Pressure<br>value $\xi$ |
|--------------|--|-----|-----|-----|----|----|----|----|-------------------------|
|              | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| 1000         | 5                                      | 11  | 23  | 34  | 48 | 43 | 28 | 20 | 10,2                    |
| 1500         | 7                                      | 16  | 34  | 50  | 50 | 50 | 39 | 27 | 12,9                    |
| 2000         | 9                                      | 22  | 45  | 50  | 50 | 50 | 49 | 33 | 15,6                    |
| 2500         | 11                                     | 27  | 50  | 50  | 50 | 50 | 50 | 38 | 18,2                    |

### Splitter distance S = 80 mm

| Length<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Pressure<br>value $\xi$ |
|--------------|--|-----|-----|-----|----|----|----|----|-------------------------|
|              | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| 1000         | 4                                      | 9   | 20  | 30  | 42 | 36 | 23 | 17 | 5,5                     |
| 1500         | 5                                      | 14  | 29  | 44  | 50 | 50 | 32 | 22 | 6,9                     |
| 2000         | 7                                      | 18  | 39  | 50  | 50 | 50 | 40 | 27 | 8,2                     |
| 2500         | 8                                      | 22  | 48  | 50  | 50 | 50 | 48 | 31 | 9,5                     |

### Splitter distance S = 100 mm

| Length<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Pressure<br>value $\xi$ |
|--------------|--|-----|-----|-----|----|----|----|----|-------------------------|
|              | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| 1000         | 3                                      | 8   | 18  | 27  | 37 | 29 | 19 | 14 | 3,2                     |
| 1500         | 5                                      | 12  | 26  | 40  | 50 | 44 | 27 | 18 | 4,0                     |
| 2000         | 6                                      | 16  | 34  | 50  | 50 | 50 | 33 | 22 | 4,8                     |
| 2500         | 7                                      | 19  | 42  | 50  | 50 | 50 | 40 | 26 | 5,6                     |

### Splitter distance S = 120 mm

| Length<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Pressure<br>value $\xi$ |
|--------------|--|-----|-----|-----|----|----|----|----|-------------------------|
|              | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| 1000         | 3                                      | 7   | 16  | 25  | 32 | 24 | 16 | 11 | 2,0                     |
| 1500         | 4                                      | 11  | 23  | 36  | 50 | 36 | 22 | 15 | 2,5                     |
| 2000         | 5                                      | 14  | 31  | 48  | 50 | 47 | 28 | 18 | 3,0                     |
| 2500         | 6                                      | 17  | 38  | 50  | 50 | 50 | 33 | 21 | 3,5                     |

### Splitter distance S = 140 mm

| Length<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Pressure<br>value $\xi$ |
|--------------|--|-----|-----|-----|----|----|----|----|-------------------------|
|              | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| 1000         | 3                                      | 7   | 15  | 23  | 28 | 20 | 13 | 9  | 1,3                     |
| 1500         | 4                                      | 10  | 22  | 34  | 44 | 30 | 18 | 12 | 1,7                     |
| 2000         | 4                                      | 13  | 28  | 45  | 50 | 39 | 23 | 15 | 2,0                     |
| 2500         | 5                                      | 16  | 35  | 50  | 50 | 48 | 27 | 18 | 2,4                     |

NB. Max. attenuation specified is 50 dB.

The pressure loss  $\Delta p$  in pa can be calculated from the pressure value  $\xi$ :  $\Delta p = 0,6 \times v^2 \times \xi$  where (v) is the velocity on the face area of the silencer.

The lengths shown above are only examples, other lengths between are also available. Min. length is 500 mm. Maximum length is 2500 mm.

Be aware that, **l nom** means, that the length in the Order examples normally are ment as the length of the duct, the splitter will be a bit shorter to prevent mounting problems.



# Rectangular straight silencer

DLD

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



## Description

DLD has a conventional design with dimensions that not exceed the corresponding connection dimensions. The silencer can be manufactured in all standard duct sizes.

### Design

DLD has an outer sheet casing of trapezoidal corrugated sheet metal for stability and reduced risk of natural oscillation.

DLD is designed for low air resistance with baffle combinations that attenuate particularly low-frequency noise well. The type of insulation material has been developed to provide good noise properties, low weight and to be cleanable.

DLD meets the requirements of air tightness class C and pressure class 2 according to EN 1507:2006.

DLD is equipped with joining profile type RJFP.

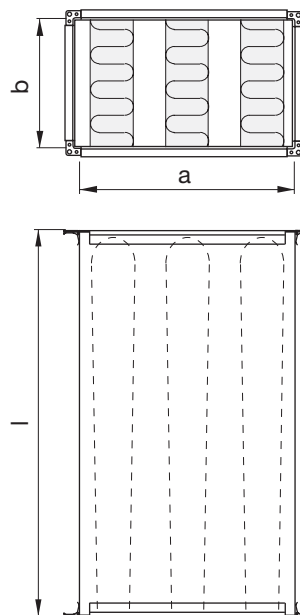
### Tools for dimensioning and planning

The software CADvent and DIMsilencer offer features for dimensioning and selection of products in an environment with 3D modelling. Computerised planning can be conducted with automatic presentation of noise levels, pressure drop etc.

## Ordering example

|                    |            |                  |            |             |            |
|--------------------|------------|------------------|------------|-------------|------------|
|                    | <b>DLD</b> | <b>800 × 600</b> | <b>650</b> | <b>1015</b> | <b>TRA</b> |
| Product            |            |                  |            |             |            |
| Width height a × b |            |                  |            |             |            |
| Length l           |            |                  |            |             |            |
| Code               |            |                  |            |             |            |
| Accessories        |            |                  |            |             |            |

## Dimensions



If alternative material is required, this shall be stated when ordering, e.g. aluminium zinc (AZ185), stainless (2333) and acid-proof steel (2343).

The silencer is also available with the following accessories/options.

- TRA = Non-insulated inspection hatch.
- TRB = Hatch intended for external insulation.\*
- TRC = Hatch intended for external insulation.\*
- AIA = 50 mm fire protection insulation. Note! a and b dimensions increase by 100 mm.
- AIB = 100 mm fire protection insulation. Note! a and b dimensions increase by 200 mm.
- AIA+TRB = 50 mm fire protection insulation and the appropriate cleaning cover. Note! a and b dimensions increase by 100 mm.
- AIB+TRC = 100 mm fire protection insulation and the appropriate cleaning cover. Note! a and b dimensions increase by 200 mm.

The dimension of the hatches is adapted for cleaning and inspection of all baffle spacings.

\* Specify insulation thickness when ordering.





# Rectangular straight silencer

# DLDR



## Description

DLDR has a conventional design with dimensions that not exceed the corresponding connection dimensions. The silencer can be manufactured in all standard duct sizes.

The silencer is provided with cleaning hatch and removable baffles.

### Design

DLDR has an outer sheet casing of trapezoidal corrugated sheet metal for stability and reduced risk of natural oscillation.

DLDR is designed for low air resistance with baffle combinations that attenuate particularly low-frequency noise well. The type of insulation material has been developed to provide good noise properties, low weight and to be cleanable.

DLDR meets the requirements of air tightness class C and pressure class 2 according to EN 1507:2006.

DLDR is equipped with joining profile type RJFP.

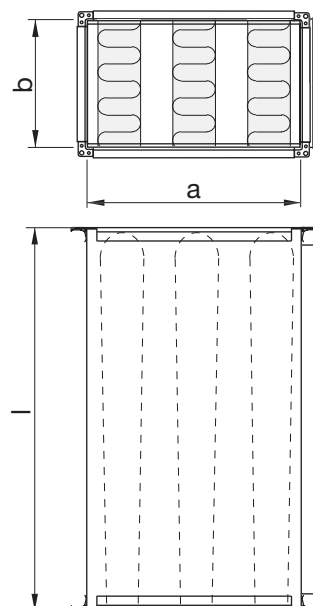
### Tools for dimensioning and planning

The software CADvent and DIMsilencer offer features for dimensioning and selection of products in an environment with 3D modelling. Computerised planning can be conducted with automatic presentation of noise levels, pressure drop etc.

## Ordering example

|   |             |                  |            |             |          |            |
|---|-------------|------------------|------------|-------------|----------|------------|
|   | <b>DLDR</b> | <b>800 x 600</b> | <b>750</b> | <b>1015</b> | <b>1</b> | <b>TRB</b> |
| Product   |             |                  |            |             |          |            |
| Width height a x b  |             |                  |            |             |          |            |
| Length l  |             |                  |            |             |          |            |
| Code  |             |                  |            |             |          |            |
| Alternative for placing of hatch<br>(Alt 1 on top, alt 2 on side, alt 3 on bottom.) |             |                  |            |             |          |            |
| Accessories   |             |                  |            |             |          |            |

## Dimensions



If alternative material is required, this shall be stated when ordering, e.g. aluminium zinc (AZ185), stainless (2333) and acid-proof steel (2343).

The silencer is also available with the following accessories/options.

- TRB = Hatch intended for external insulation.\*
- TRC = Hatch intended for external insulation.\*
- AIA = 50 mm fire protection insulation. Note! a and b dimensions increase by 100 mm.
- AIB = 100 mm fire protection insulation. Note! a and b dimensions increase by 200 mm.

The dimension of the hatches is adapted for cleaning and inspection of all baffle spacings.

\* Specify insulation thickness when ordering.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



# Rectangular straight silencer DLD/DLDR

## Manual designing for DLD and DLDR

A number of silencers can be designed manually, for more combinations of silencers and faster calculations use DIMsilencer. Manual method of calculation is shown below:

**A** Specify connection dimensions and flow-type location of the silencer.

|          |             |    |
|----------|-------------|----|
| Width    | 800         | mm |
| Height   | 1000        | mm |
| Length   | 1250        | mm |
| Location | Exhaust air |    |

DLD-800-1000-1250-1016

**B** Specify the sound power level before the silencer.  
Read the insertion attenuation from the tables on page 201 – 204.  
Calculate the sound power level after the silencer irrespective of the air flow (self generated noise).

### Insertion attenuation

|   | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz | Resistance number | Self generated noise number inlet |
|---|-------|--------|-------|-------|--------|--------|--------|--------|-------------------|-----------------------------------|
| Sound power level before silencer                             | 72    | 73     | 73    | 64    | 62     | 59     | 52     | 44     |                   |                                   |
| Attenuation from table page 201 – 204                         | 3     | 9      | 16    | 23    | 23     | 17     | 12     | 9      | 2,8               | 2,7                               |
| Sound power level after silencer without self generated noise | 69    | 64     | 57    | 41    | 39     | 42     | 40     | 35     |                   |                                   |

**C** Determine the pressure drop with help of the graph on page 198 and table on page 199.  
In this case we have straight ducts before and after the silencer.

### Pressure drop

|   | Area         | 0,8 m <sup>2</sup> | Air flow                       | 400 l/s |
|---|--------------|--------------------|--------------------------------|---------|
| Graph on page 198, use resistance number, area and air velocity | Air velocity | 5 m/s              | Pressure drop                  | 42 Pa   |
| Correction at disturbance according table on page 199           | Factor       | 1                  | Pressure drop after correction | 42 Pa   |

**D** Determine the self generated noise from the silencer at present air flow.  
Calculate the sound power level after the silencer inclusive the self generated noise.

### Self generated noise

|  | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz |  |
|--|-------|--------|-------|-------|--------|--------|--------|--------|--|
| Graph on page 200, use resistance number and air velocity  | 59    | 55     | 54    | 51    | 48     | 45     | 41     | 35     |  |
| Correction for gross cross section area  | -1    | -1     | -1    | -1    | -1     | -1     | -1     | -1     |  |
| Self generated noise   | 58    | 54     | 53    | 50    | 47     | 44     | 40     | 34     |  |
| Sound power level after the silencer   | 69    | 64     | 58    | 51    | 48     | 46     | 43     | 38     |  |
| (Logarithmical addition of self generated noise and sound power level after the silencer without self generated noise) |       |        |       |       |        |        |        |        |  |



# Rectangular straight silencer DLD/DLDR

The following table can be used for own manual calculations in accordance with the example on the previous page.

## Designing table for DLD and DLDR

|          |                      |    |
|----------|----------------------|----|
| With     | <input type="text"/> | mm |
| Height   | <input type="text"/> | mm |
| Length   | <input type="text"/> | mm |
| Location | <input type="text"/> |    |

### Insertion attenuation

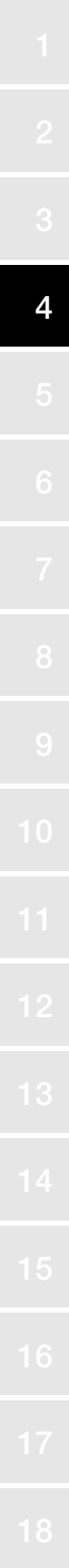
|   | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz | Resis-<br>tance num-<br>ber | Self gene-<br>rated noise<br>number inlet |
|---|-------|--------|-------|-------|--------|--------|--------|--------|-----------------------------|---|
| Sound power level before silencer                             |       |        |       |       |        |        |        |        |                             |   |
| Attenuation from table page 201 – 204                         |       |        |       |       |        |        |        |        |                             |   |
| Sound power level after silencer without self generated noise |       |        |       |       |        |        |        |        |                             |   |

### Pressure drop

|   | Area         | m <sup>2</sup> | Air flow                       | l/s |
|---|--------------|----------------|--------------------------------|-----|
| Graph on page 198, use resistance number, area and air velocity | Air velocity | m/s            | Pressure drop                  | Pa  |
| Correction at disturbance according table on page 199           | Factor       |                | Pressure drop after correction | Pa  |

### Self generated noise

|  | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz |
|--|-------|--------|-------|-------|--------|--------|--------|--------|
| Graph on page 200, use resistance number and air velocity  |       |        |       |       |        |        |        |        |
| Correction for gross cross section area  |       |        |       |       |        |        |        |        |
| Self generated noise   |       |        |       |       |        |        |        |        |
| Sound power level after the silencer   |       |        |       |       |        |        |        |        |
| (Logarithmical addition of self generated noise and sound power level after the silencer without self generated noise) |       |        |       |       |        |        |        |        |





# Rectangular straight silencer DLD/DLDR

1

## Pressure drop

Follow the directions below and the adjoining graph.

- 1 Calculate the gross cross section area  $a \times b$  in  $m^2$ .
- 2 Go horizontal in the graph to the present air flow, l/s.
- 3 Go up to the resistance number achieved from the tables on page 201 – 204.
- 4 Read the pressure drop over the silencer, at straight duct connection before and after the silencer, (factor 1,0). For other modes of connection see the table for correction on page 199.
- 5 Air flow velocity, which is used at the calculation of the self generated noise, can be read here.

2

3

4

5

6

7

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11

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13

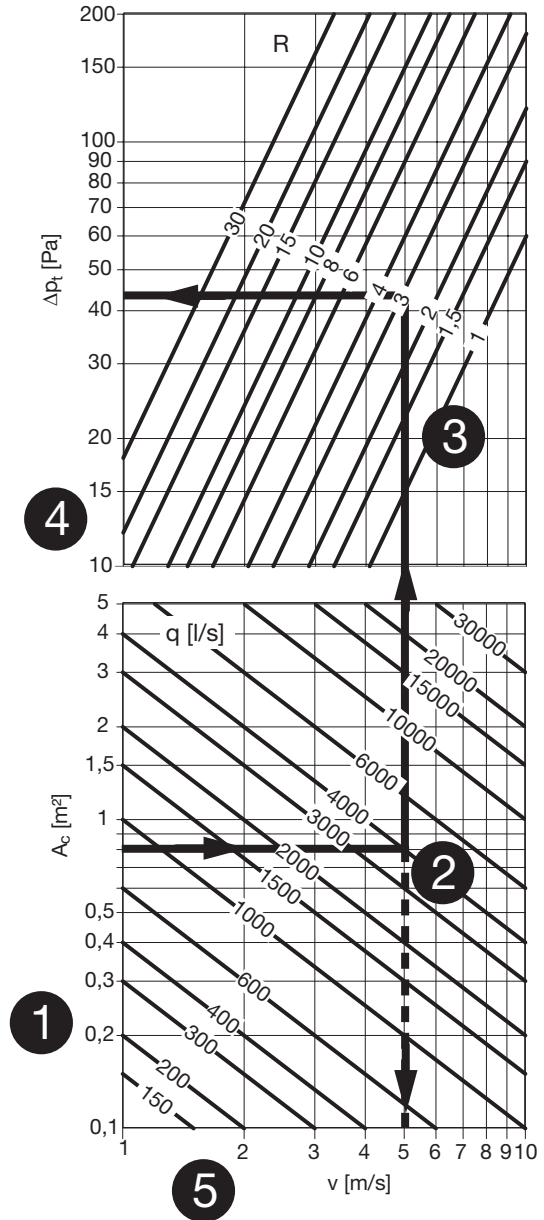
14

15

16

17

18





# Rectangular straight silencer DLD/DLDR

## Pressure drop

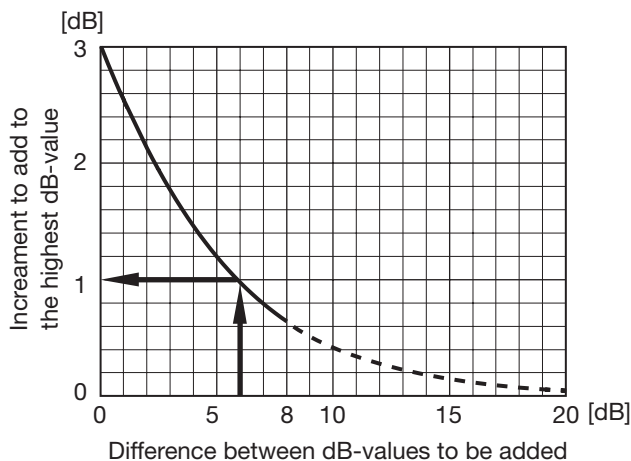
Present pressure drop = Read pressure drop × below factor

D = The largest connection side (a or b) of the silencer.

The table contains of a selection of the most common disturbance cases.

| Before the silencer          |      |      |      | Silencer | After the silencer          |      |     |     | Factor |
|------------------------------|------|------|------|----------|-----------------------------|------|-----|-----|--------|
| Distance before the silencer |      |      |      |          | Distance after the silencer |      |     |     |        |
| 3×D                          | 2×D  | 1×D  | 0×D  |          | 0×D                         | 1×D  | 2×D | 3×D |        |
| Duct                         |      |      |      | Silencer | Duct                        |      |     |     | 1,0    |
| Bend                         |      |      |      | Silencer | Duct                        |      |     |     | 1,1    |
|                              | Bend |      |      | Silencer | Duct                        |      |     |     | 1,2    |
|                              |      | Bend |      | Silencer | Duct                        |      |     |     | 1,4    |
|                              |      |      | Bend | Silencer | Duct                        |      |     |     | 1,5    |
| Duct                         |      |      |      | Silencer |                             | Bend |     |     | 1,2    |
| Duct                         |      |      |      | Silencer | Bend                        |      |     |     | 1,3    |
| Bend                         |      |      |      | Silencer |                             | Bend |     |     | 1,3    |
| Bend                         |      |      |      | Silencer | Bend                        | Bend |     |     | 1,4    |
|                              | Bend |      |      | Silencer | Bend                        | Bend |     |     | 1,5    |
|                              | Bend |      |      | Silencer | Bend                        | Bend |     |     | 1,6    |
|                              |      | Bend |      | Silencer | Bend                        | Bend |     |     | 1,7    |
|                              |      | Bend |      | Silencer | Bend                        | Bend |     |     | 1,8    |
|                              |      |      | Bend | Silencer | Bend                        | Bend |     |     | 1,9    |
|                              |      |      | Bend | Silencer | Bend                        | Bend |     |     | 2,0    |
| Chamber                      |      |      |      | Silencer | Duct branch                 |      |     |     | 2,0    |
| Duct                         |      |      |      | Silencer | Chamber                     |      |     |     | 3,0    |
| Chamber                      |      |      |      | Silencer | Chamber                     |      |     |     | 3,5    |

## Logarithmic addition



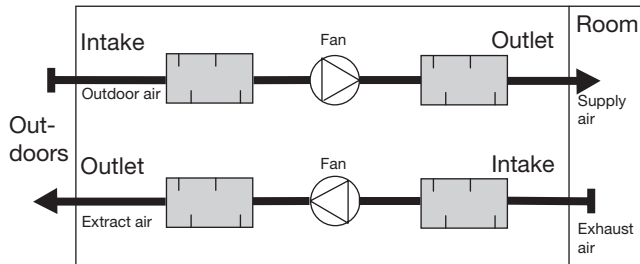
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



# Rectangular straight silencer DLD/DLDR

## Self generated noise per frequency band

- 6 Decide from the location of the silencer whether it is the supply or exhaust graph that shall be used. (Rule of memory - the side that leads away from the fan, i.e. at supply air the outlet graph is used and at exhaust air the in-take graph.)



- 7 Go horizontally into the present graph, at present air velocity, to the self generated noise number.
- 8 Then go vertically up to the crossing of the different frequency band lines.
- 9 Read the self generated noise, at gross cross section area 1 m<sup>2</sup>, for each frequency band straight out to the left. In the example only the 8000 Hz-reading is shown.
- 10 Add or subtract the correction for the present gross cross section area.

## Sound power level after the silencer

The sound power level after the silencer can be calculated for all frequencies by a logarithmical addition of:

"The self generated noise" and "The sound power level before the silencer".

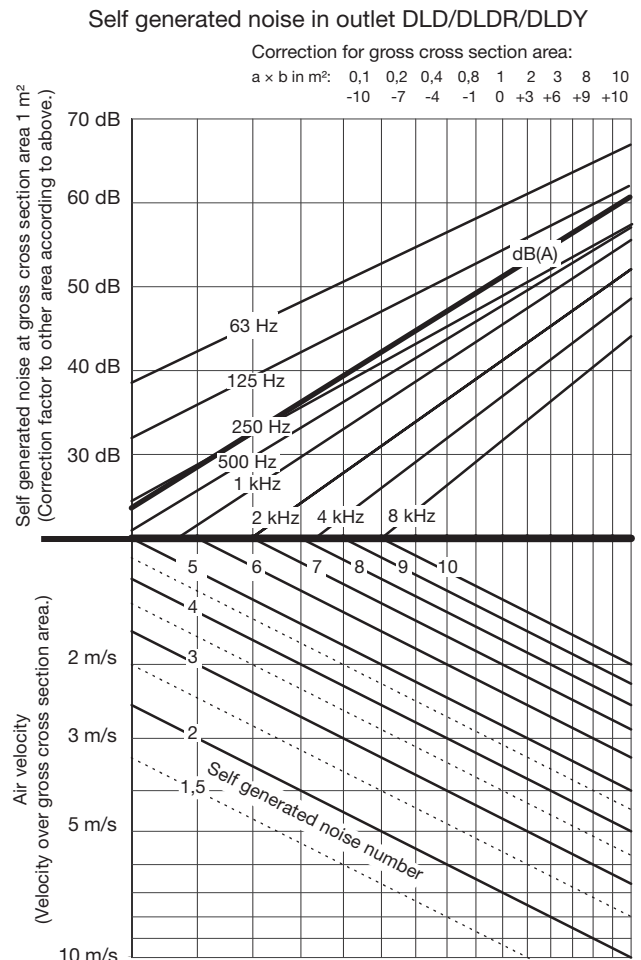
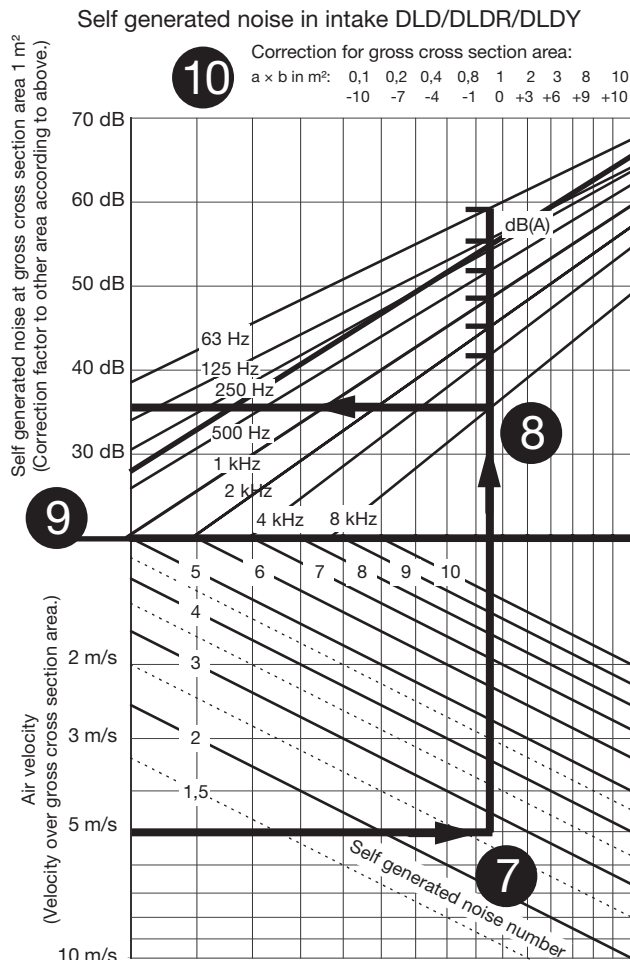
The shown example gives at 8000 Hz:

$$\text{Self generated noise} = 35 \text{ dB} - 1 \text{ dB} = 34 \text{ dB}$$

$$\text{Sound power level before the silencer - the attenuation: } 44 \text{ dB} - 9 \text{ dB} = 35 \text{ dB}$$

$$\text{Logarithmic addition of 34 and 35} = 36 \text{ dB}$$

(See graph for logarithmical addition on page 199.)





# Rectangular straight silencer DLD/DLDR

| Width a mm | Code | Length l mm |      | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      |      | Resistance number | Self generated noise number Intake | Self generated noise number Outlet |
|------------|------|-------------|------|---|-----|-----|-----|------|------|------|------|-------------------|------------------------------------|------------------------------------|
|            |      | DLD         | DLDR | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                   |                                    |                                    |
| 400        | 1009 | 650         | 750  | 2   | 4   | 7   | 11  | 10   | 9    | 7    | 5    | 1,0               | 2,0                                | 1,6                                |
| 400        | 1010 | 650         | 750  | 2   | 6   | 9   | 14  | 13   | 11   | 8    | 6    | 2,5               | 2,7                                | 2,0                                |
| 400        | 1011 | 650         | 750  | 3   | 8   | 12  | 19  | 19   | 14   | 11   | 9    | 6,9               | 4,0                                | 2,7                                |
| 400        | 1009 | 1250        | 1350 | 2   | 7   | 12  | 18  | 18   | 13   | 10   | 7    | 1,2               | 2,0                                | 1,6                                |
| 400        | 1010 | 1250        | 1350 | 3   | 9   | 16  | 23  | 23   | 17   | 12   | 9    | 2,8               | 2,7                                | 2,0                                |
| 400        | 1011 | 1250        | 1350 | 5   | 13  | 22  | 31  | 32   | 24   | 17   | 13   | 8,0               | 4,0                                | 2,7                                |
| 400        | 1009 | 1850        | 1950 | 2   | 10  | 18  | 25  | 26   | 18   | 13   | 9    | 1,3               | 2,0                                | 1,6                                |
| 400        | 1010 | 1850        | 1950 | 4   | 13  | 23  | 32  | 33   | 24   | 16   | 12   | 3,2               | 2,7                                | 2,0                                |
| 400        | 1011 | 1850        | 1950 | 6   | 18  | 32  | 43  | 46   | 34   | 23   | 17   | 9,1               | 4,0                                | 2,7                                |
| 500        | 1013 | 650         | 750  | 2   | 6   | 8   | 12  | 10   | 9    | 7    | 5    | 2,2               | 2,5                                | 2,0                                |
| 500        | 1014 | 650         | 750  | 3   | 7   | 10  | 15  | 13   | 11   | 8    | 6    | 4,7               | 3,3                                | 2,5                                |
| 500        | 1013 | 1250        | 1350 | 3   | 10  | 15  | 20  | 18   | 13   | 10   | 7    | 2,4               | 2,5                                | 2,0                                |
| 500        | 1014 | 1250        | 1350 | 5   | 12  | 19  | 25  | 23   | 17   | 12   | 9    | 5,3               | 3,3                                | 2,5                                |
| 500        | 1013 | 1850        | 1950 | 4   | 13  | 22  | 28  | 26   | 18   | 13   | 9    | 2,6               | 2,5                                | 2,0                                |
| 500        | 1014 | 1850        | 1950 | 6   | 17  | 28  | 35  | 33   | 24   | 16   | 12   | 5,9               | 3,3                                | 2,5                                |
| 600        | 1012 | 650         | 750  | 2   | 6   | 9   | 17  | 19   | 14   | 11   | 9    | 3,1               | 3,0                                | 2,0                                |
| 600        | 1014 | 650         | 750  | 4   | 9   | 14  | 23  | 29   | 23   | 18   | 14   | 15,3              | 6,0                                | 3,0                                |
| 600        | 1017 | 650         | 750  | 3   | 7   | 10  | 13  | 10   | 9    | 7    | 5    | 3,8               | 3,0                                | 2,4                                |
| 600        | 1012 | 1250        | 1350 | 3   | 9   | 17  | 28  | 32   | 24   | 17   | 13   | 3,8               | 3,0                                | 2,0                                |
| 600        | 1014 | 1250        | 1350 | 5   | 15  | 27  | 38  | 50   | 40   | 29   | 22   | 19,1              | 6,0                                | 3,0                                |
| 600        | 1017 | 1250        | 1350 | 5   | 12  | 18  | 21  | 18   | 13   | 10   | 7    | 4,1               | 3,0                                | 2,4                                |
| 600        | 1012 | 1850        | 1950 | 3   | 13  | 25  | 39  | 46   | 34   | 23   | 17   | 4,4               | 3,0                                | 2,0                                |
| 600        | 1014 | 1850        | 1950 | 7   | 21  | 39  | 53  | 60   | 57   | 39   | 29   | 22,9              | 6,0                                | 3,0                                |
| 600        | 1017 | 1850        | 1950 | 6   | 17  | 26  | 30  | 26   | 18   | 13   | 9    | 4,5               | 3,0                                | 2,4                                |
| 700        | 1012 | 650         | 750  | 2   | 5   | 8   | 13  | 13   | 11   | 8    | 6    | 1,6               | 2,3                                | 1,8                                |
| 700        | 1013 | 650         | 750  | 3   | 7   | 11  | 18  | 19   | 14   | 11   | 9    | 4,8               | 3,5                                | 2,3                                |
| 700        | 1012 | 1250        | 1350 | 2   | 8   | 14  | 22  | 23   | 17   | 12   | 9    | 1,9               | 2,3                                | 1,8                                |
| 700        | 1013 | 1250        | 1350 | 4   | 11  | 20  | 30  | 32   | 24   | 17   | 13   | 5,7               | 3,5                                | 2,3                                |
| 700        | 1012 | 1850        | 1950 | 3   | 11  | 21  | 30  | 33   | 24   | 16   | 12   | 2,2               | 2,3                                | 1,8                                |
| 700        | 1013 | 1850        | 1950 | 5   | 16  | 29  | 42  | 46   | 34   | 23   | 17   | 6,5               | 3,5                                | 2,3                                |
| 800        | 1014 | 650         | 750  | 2   | 4   | 7   | 11  | 10   | 9    | 7    | 5    | 1,0               | 2,0                                | 1,6                                |
| 800        | 1015 | 650         | 750  | 2   | 7   | 11  | 21  | 25   | 19   | 15   | 12   | 6,1               | 4,0                                | 2,3                                |
| 800        | 1016 | 650         | 750  | 2   | 6   | 9   | 14  | 13   | 11   | 8    | 6    | 2,5               | 2,7                                | 2,0                                |
| 800        | 1017 | 650         | 750  | 3   | 8   | 12  | 19  | 19   | 14   | 11   | 9    | 6,9               | 4,0                                | 2,7                                |
| 800        | 1014 | 1250        | 1350 | 2   | 7   | 12  | 18  | 18   | 13   | 10   | 7    | 1,2               | 2,0                                | 1,6                                |
| 800        | 1015 | 1250        | 1350 | 3   | 11  | 21  | 36  | 44   | 33   | 24   | 18   | 7,6               | 4,0                                | 2,3                                |
| 800        | 1016 | 1250        | 1350 | 3   | 9   | 16  | 23  | 23   | 17   | 12   | 9    | 2,8               | 2,7                                | 2,0                                |
| 800        | 1017 | 1250        | 1350 | 5   | 13  | 22  | 31  | 32   | 24   | 17   | 13   | 8,0               | 4,0                                | 2,7                                |
| 800        | 1014 | 1850        | 1950 | 2   | 10  | 18  | 25  | 26   | 18   | 13   | 9    | 1,3               | 2,0                                | 1,6                                |
| 800        | 1015 | 1850        | 1950 | 4   | 15  | 31  | 50  | 60   | 46   | 32   | 24   | 9,1               | 4,0                                | 2,3                                |
| 800        | 1016 | 1850        | 1950 | 4   | 13  | 23  | 32  | 33   | 24   | 16   | 12   | 3,2               | 2,7                                | 2,0                                |
| 800        | 1017 | 1850        | 1950 | 6   | 18  | 32  | 43  | 46   | 34   | 23   | 17   | 9,1               | 4,0                                | 2,7                                |
| 800        | 1014 | 2450        | 2550 | 3   | 12  | 23  | 32  | 33   | 23   | 15   | 11   | 1,5               | 2,0                                | 1,6                                |
| 800        | 1016 | 2450        | 2550 | 5   | 17  | 31  | 41  | 43   | 30   | 20   | 15   | 3,5               | 2,7                                | 2,0                                |
| 800        | 1017 | 2450        | 2550 | 8   | 23  | 42  | 56  | 60   | 43   | 29   | 22   | 10,3              | 4,0                                | 2,7                                |
| 900        | 1017 | 650         | 750  | 2   | 5   | 7   | 11  | 10   | 9    | 7    | 5    | 1,5               | 2,3                                | 1,8                                |
| 900        | 1018 | 650         | 750  | 4   | 9   | 14  | 23  | 29   | 23   | 18   | 14   | 15,3              | 6,0                                | 3,0                                |
| 900        | 1019 | 650         | 750  | 3   | 7   | 10  | 14  | 13   | 11   | 8    | 6    | 3,5               | 3,0                                | 2,3                                |
| 900        | 1020 | 650         | 750  | 4   | 9   | 13  | 19  | 19   | 14   | 11   | 9    | 9,4               | 4,5                                | 3,0                                |
| 900        | 1017 | 1250        | 1350 | 3   | 8   | 14  | 19  | 18   | 13   | 10   | 7    | 1,7               | 2,3                                | 1,8                                |
| 900        | 1018 | 1250        | 1350 | 5   | 15  | 27  | 38  | 50   | 40   | 29   | 22   | 19,1              | 6,0                                | 3,0                                |
| 900        | 1019 | 1250        | 1350 | 4   | 11  | 18  | 24  | 23   | 17   | 12   | 9    | 4,0               | 3,0                                | 2,3                                |
| 900        | 1020 | 1250        | 1350 | 6   | 15  | 24  | 32  | 32   | 24   | 17   | 13   | 10,8              | 4,5                                | 3,0                                |
| 900        | 1017 | 1850        | 1950 | 3   | 12  | 20  | 27  | 26   | 18   | 13   | 9    | 1,9               | 2,3                                | 1,8                                |
| 900        | 1018 | 1850        | 1950 | 7   | 21  | 39  | 53  | 60   | 57   | 39   | 29   | 22,9              | 6,0                                | 3,0                                |
| 900        | 1019 | 1850        | 1950 | 5   | 15  | 26  | 34  | 33   | 24   | 16   | 12   | 4,4               | 3,0                                | 2,3                                |
| 900        | 1020 | 1850        | 1950 | 8   | 20  | 35  | 45  | 46   | 34   | 23   | 17   | 12,2              | 4,5                                | 3,0                                |
| 900        | 1017 | 2450        | 2550 | 4   | 15  | 27  | 34  | 33   | 23   | 15   | 11   | 2,1               | 2,3                                | 1,8                                |
| 900        | 1018 | 2450        | 2550 | 9   | 26  | 51  | 60  | 60   | 60   | 50   | 37   | 26,7              | 6,0                                | 3,0                                |
| 900        | 1019 | 2450        | 2550 | 6   | 20  | 34  | 43  | 43   | 30   | 20   | 15   | 4,9               | 3,0                                | 2,3                                |
| 900        | 1020 | 2450        | 2550 | 10  | 26  | 45  | 58  | 60   | 43   | 29   | 22   | 13,6              | 4,5                                | 3,0                                |
| 1000       | 1019 | 650         | 750  | 3   | 7   | 12  | 20  | 21   | 16   | 13   | 10   | 6,5               | 4,0                                | 2,5                                |





# Rectangular straight silencer DLD/DLDR

| Width a mm | Code | Length l mm |      | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      |      | Resistance number | Self generated noise number Intake | Self generated noise number Outlet |
|------------|------|-------------|------|---|-----|-----|-----|------|------|------|------|-------------------|------------------------------------|------------------------------------|
|            |      | DLD         | DLDR | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                   |                                    |                                    |
| 1000       | 1020 | 650         | 750  | 2   | 6   | 8   | 12  | 10   | 9    | 7    | 5    | 2,2               | 2,5                                | 2,0                                |
| 1000       | 1021 | 650         | 750  | 3   | 7   | 10  | 15  | 13   | 11   | 8    | 6    | 4,7               | 3,3                                | 2,5                                |
| 1000       | 1022 | 650         | 750  | 5   | 10  | 14  | 20  | 19   | 14   | 11   | 9    | 12,2              | 5,0                                | 3,3                                |
| 1000       | 1019 | 1250        | 1350 | 4   | 12  | 21  | 33  | 37   | 28   | 20   | 15   | 7,8               | 4,0                                | 2,5                                |
| 1000       | 1020 | 1250        | 1350 | 3   | 10  | 15  | 20  | 18   | 13   | 10   | 7    | 2,4               | 2,5                                | 2,0                                |
| 1000       | 1021 | 1250        | 1350 | 5   | 12  | 19  | 25  | 23   | 17   | 12   | 9    | 5,3               | 3,3                                | 2,5                                |
| 1000       | 1022 | 1250        | 1350 | 7   | 16  | 25  | 33  | 32   | 24   | 17   | 13   | 13,9              | 5,0                                | 3,3                                |
| 1000       | 1019 | 1850        | 1950 | 5   | 17  | 31  | 46  | 53   | 39   | 27   | 20   | 9,1               | 4,0                                | 2,5                                |
| 1000       | 1020 | 1850        | 1950 | 4   | 13  | 22  | 28  | 26   | 18   | 13   | 9    | 2,6               | 2,5                                | 2,0                                |
| 1000       | 1021 | 1850        | 1950 | 6   | 17  | 28  | 35  | 33   | 24   | 16   | 12   | 5,9               | 3,3                                | 2,5                                |
| 1000       | 1022 | 1850        | 1950 | 9   | 23  | 37  | 46  | 46   | 34   | 23   | 17   | 15,7              | 5,0                                | 3,3                                |
| 1000       | 1019 | 2450        | 2550 | 7   | 22  | 41  | 59  | 60   | 50   | 34   | 25   | 10,4              | 4,0                                | 2,5                                |
| 1000       | 1020 | 2450        | 2550 | 5   | 17  | 29  | 36  | 33   | 23   | 15   | 11   | 2,9               | 2,5                                | 2,0                                |
| 1000       | 1021 | 2450        | 2550 | 8   | 22  | 37  | 45  | 43   | 30   | 20   | 15   | 6,4               | 3,3                                | 2,5                                |
| 1000       | 1022 | 2450        | 2550 | 12  | 29  | 49  | 60  | 60   | 43   | 29   | 22   | 17,4              | 5,0                                | 3,3                                |
| 1100       | 1017 | 650         | 750  | 2   | 5   | 7   | 12  | 12   | 10   | 8    | 6    | 1,4               | 2,2                                | 1,7                                |
| 1100       | 1018 | 650         | 750  | 2   | 6   | 11  | 20  | 23   | 18   | 14   | 11   | 5,0               | 3,7                                | 2,2                                |
| 1100       | 1022 | 650         | 750  | 4   | 9   | 14  | 24  | 25   | 19   | 15   | 12   | 13,6              | 5,5                                | 3,1                                |
| 1100       | 1023 | 650         | 750  | 3   | 6   | 9   | 12  | 10   | 9    | 7    | 5    | 2,9               | 2,8                                | 2,2                                |
| 1100       | 1024 | 650         | 750  | 4   | 8   | 11  | 15  | 13   | 11   | 8    | 6    | 6,2               | 3,7                                | 2,8                                |
| 1100       | 1017 | 1250        | 1350 | 2   | 8   | 13  | 20  | 21   | 16   | 11   | 8    | 1,6               | 2,2                                | 1,7                                |
| 1100       | 1018 | 1250        | 1350 | 3   | 11  | 20  | 33  | 41   | 30   | 22   | 16   | 6,2               | 3,7                                | 2,2                                |
| 1100       | 1022 | 1250        | 1350 | 6   | 15  | 26  | 39  | 44   | 33   | 24   | 18   | 16,3              | 5,5                                | 3,1                                |
| 1100       | 1023 | 1250        | 1350 | 4   | 11  | 17  | 21  | 18   | 13   | 10   | 7    | 3,2               | 2,8                                | 2,2                                |
| 1100       | 1024 | 1250        | 1350 | 6   | 14  | 21  | 26  | 23   | 17   | 12   | 9    | 6,8               | 3,7                                | 2,8                                |
| 1100       | 1017 | 1850        | 1950 | 2   | 11  | 20  | 28  | 30   | 21   | 15   | 11   | 1,8               | 2,2                                | 1,7                                |
| 1100       | 1018 | 1850        | 1950 | 4   | 15  | 29  | 47  | 58   | 42   | 29   | 22   | 7,4               | 3,7                                | 2,2                                |
| 1100       | 1022 | 1850        | 1950 | 8   | 21  | 38  | 55  | 60   | 46   | 32   | 24   | 19,1              | 5,5                                | 3,1                                |
| 1100       | 1023 | 1850        | 1950 | 5   | 15  | 24  | 29  | 26   | 18   | 13   | 9    | 3,5               | 2,8                                | 2,2                                |
| 1100       | 1024 | 1850        | 1950 | 7   | 19  | 30  | 36  | 33   | 24   | 16   | 12   | 7,5               | 3,7                                | 2,8                                |
| 1100       | 1017 | 2450        | 2550 | 3   | 14  | 26  | 37  | 39   | 27   | 18   | 13   | 2,0               | 2,2                                | 1,7                                |
| 1100       | 1018 | 2450        | 2550 | 5   | 19  | 38  | 60  | 60   | 55   | 37   | 27   | 8,5               | 3,7                                | 2,2                                |
| 1100       | 1022 | 2450        | 2550 | 10  | 27  | 50  | 60  | 60   | 60   | 40   | 30   | 21,9              | 5,5                                | 3,1                                |
| 1100       | 1023 | 2450        | 2550 | 6   | 19  | 32  | 37  | 33   | 23   | 15   | 11   | 3,8               | 2,8                                | 2,2                                |
| 1100       | 1024 | 2450        | 2550 | 9   | 24  | 40  | 46  | 43   | 30   | 20   | 15   | 8,2               | 3,7                                | 2,8                                |
| 1200       | 1019 | 650         | 750  | 2   | 4   | 7   | 11  | 10   | 9    | 7    | 5    | 1,0               | 2,0                                | 1,6                                |
| 1200       | 1020 | 650         | 750  | 2   | 6   | 9   | 17  | 19   | 14   | 11   | 9    | 3,1               | 3,0                                | 2,0                                |
| 1200       | 1024 | 650         | 750  | 3   | 8   | 12  | 19  | 19   | 14   | 11   | 9    | 6,9               | 4,0                                | 2,7                                |
| 1200       | 1026 | 650         | 750  | 5   | 11  | 17  | 25  | 29   | 23   | 18   | 14   | 29,7              | 8,0                                | 4,0                                |
| 1200       | 1027 | 650         | 750  | 3   | 7   | 10  | 13  | 10   | 9    | 7    | 5    | 3,8               | 3,0                                | 2,4                                |
| 1200       | 1019 | 1250        | 1350 | 2   | 7   | 12  | 18  | 18   | 13   | 10   | 7    | 1,2               | 2,0                                | 1,6                                |
| 1200       | 1020 | 1250        | 1350 | 3   | 9   | 17  | 28  | 32   | 24   | 17   | 13   | 3,8               | 3,0                                | 2,0                                |
| 1200       | 1024 | 1250        | 1350 | 5   | 13  | 22  | 31  | 32   | 24   | 17   | 13   | 8,0               | 4,0                                | 2,7                                |
| 1200       | 1026 | 1250        | 1350 | 8   | 19  | 32  | 41  | 50   | 40   | 29   | 22   | 36,5              | 8,0                                | 4,0                                |
| 1200       | 1027 | 1250        | 1350 | 5   | 12  | 18  | 21  | 18   | 13   | 10   | 7    | 4,1               | 3,0                                | 2,4                                |
| 1200       | 1019 | 1850        | 1950 | 2   | 10  | 18  | 25  | 26   | 18   | 13   | 9    | 1,3               | 2,0                                | 1,6                                |
| 1200       | 1020 | 1850        | 1950 | 3   | 13  | 25  | 39  | 46   | 34   | 23   | 17   | 4,4               | 3,0                                | 2,0                                |
| 1200       | 1024 | 1850        | 1950 | 6   | 18  | 32  | 43  | 46   | 34   | 23   | 17   | 9,1               | 4,0                                | 2,7                                |
| 1200       | 1026 | 1850        | 1950 | 11  | 27  | 47  | 58  | 60   | 57   | 39   | 29   | 43,2              | 8,0                                | 4,0                                |
| 1200       | 1027 | 1850        | 1950 | 6   | 17  | 26  | 30  | 26   | 18   | 13   | 9    | 4,5               | 3,0                                | 2,4                                |
| 1200       | 1019 | 2450        | 2550 | 3   | 12  | 23  | 32  | 33   | 23   | 15   | 11   | 1,5               | 2,0                                | 1,6                                |
| 1200       | 1020 | 2450        | 2550 | 4   | 17  | 33  | 51  | 60   | 43   | 29   | 22   | 5,0               | 3,0                                | 2,0                                |
| 1200       | 1024 | 2450        | 2550 | 8   | 23  | 42  | 56  | 60   | 43   | 29   | 22   | 10,3              | 4,0                                | 2,7                                |
| 1200       | 1027 | 2450        | 2550 | 8   | 21  | 34  | 38  | 33   | 23   | 15   | 11   | 4,8               | 3,0                                | 2,4                                |
| 1300       | 1019 | 650         |      | 2   | 5   | 8   | 15  | 15   | 12   | 10   | 7    | 2,2               | 2,6                                | 1,9                                |
| 1300       | 1020 | 650         |      | 3   | 7   | 12  | 22  | 27   | 20   | 16   | 12   | 7,3               | 4,3                                | 2,4                                |
| 1300       | 1023 | 650         |      | 3   | 7   | 10  | 16  | 15   | 12   | 9    | 7    | 4,3               | 3,3                                | 2,4                                |
| 1300       | 1025 | 650         |      | 4   | 9   | 14  | 21  | 21   | 16   | 13   | 10   | 12,7              | 5,2                                | 3,3                                |
| 1300       | 1019 | 1250        |      | 2   | 9   | 16  | 24  | 27   | 20   | 14   | 11   | 2,6               | 2,6                                | 1,9                                |
| 1300       | 1020 | 1250        |      | 4   | 12  | 22  | 36  | 48   | 35   | 25   | 19   | 9,1               | 4,3                                | 2,4                                |
| 1300       | 1023 | 1250        |      | 4   | 11  | 19  | 26  | 26   | 19   | 14   | 10   | 4,9               | 3,3                                | 2,4                                |
| 1300       | 1025 | 1250        |      | 7   | 16  | 26  | 36  | 37   | 28   | 20   | 15   | 14,8              | 5,2                                | 3,3                                |





# Rectangular straight silencer DLD/DLDR

| Width a mm | Code | Length l mm |      | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      |      | Resistance number | Self generated noise number Intake | Self generated noise number Outlet |
|------------|------|-------------|------|---|-----|-----|-----|------|------|------|------|-------------------|------------------------------------|------------------------------------|
|            |      | DLD         | DLDR | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                   |                                    |                                    |
| 1300       | 1019 | 1850        |      | 3   | 12  | 23  | 34  | 39   | 28   | 19   | 14   | 3,0               | 2,6                                | 1,9                                |
| 1300       | 1020 | 1850        |      | 5   | 16  | 32  | 50  | 60   | 50   | 34   | 26   | 11,0              | 4,3                                | 2,4                                |
| 1300       | 1023 | 1850        |      | 5   | 16  | 28  | 36  | 37   | 26   | 18   | 13   | 5,4               | 3,3                                | 2,4                                |
| 1300       | 1025 | 1850        |      | 9   | 22  | 38  | 50  | 53   | 39   | 27   | 20   | 17,0              | 5,2                                | 3,3                                |
| 1300       | 1019 | 2450        |      | 4   | 15  | 30  | 44  | 50   | 36   | 24   | 18   | 3,4               | 2,6                                | 1,9                                |
| 1300       | 1020 | 2450        |      | 6   | 21  | 42  | 60  | 60   | 60   | 44   | 32   | 12,8              | 4,3                                | 2,4                                |
| 1300       | 1023 | 2450        |      | 7   | 21  | 36  | 47  | 48   | 34   | 23   | 17   | 6,0               | 3,3                                | 2,4                                |
| 1300       | 1025 | 2450        |      | 11  | 28  | 50  | 60  | 60   | 50   | 34   | 25   | 19,2              | 5,2                                | 3,3                                |
| 1400       | 1022 | 650         |      | 2   | 5   | 8   | 13  | 13   | 11   | 8    | 6    | 1,6               | 2,3                                | 1,8                                |
| 1400       | 1025 | 650         |      | 3   | 7   | 11  | 18  | 19   | 14   | 11   | 9    | 4,8               | 3,5                                | 2,3                                |
| 1400       | 1026 | 650         |      | 3   | 6   | 9   | 13  | 12   | 10   | 8    | 6    | 2,9               | 2,8                                | 2,2                                |
| 1400       | 1028 | 650         |      | 4   | 8   | 12  | 18  | 16   | 13   | 10   | 8    | 7,2               | 4,0                                | 2,8                                |
| 1400       | 1030 | 650         |      | 6   | 11  | 16  | 25  | 25   | 19   | 15   | 12   | 24,0              | 7,0                                | 4,0                                |
| 1400       | 1022 | 1250        |      | 2   | 8   | 14  | 22  | 23   | 17   | 12   | 9    | 1,9               | 2,3                                | 1,8                                |
| 1400       | 1025 | 1250        |      | 4   | 11  | 20  | 30  | 32   | 24   | 17   | 13   | 5,7               | 3,5                                | 2,3                                |
| 1400       | 1026 | 1250        |      | 4   | 10  | 17  | 22  | 21   | 16   | 11   | 8    | 3,3               | 2,8                                | 2,2                                |
| 1400       | 1028 | 1250        |      | 5   | 14  | 22  | 29  | 29   | 21   | 15   | 11   | 8,2               | 4,0                                | 2,8                                |
| 1400       | 1030 | 1250        |      | 9   | 19  | 31  | 42  | 44   | 33   | 24   | 18   | 28,5              | 7,0                                | 4,0                                |
| 1400       | 1022 | 1850        |      | 3   | 11  | 21  | 30  | 33   | 24   | 16   | 12   | 2,2               | 2,3                                | 1,8                                |
| 1400       | 1025 | 1850        |      | 5   | 16  | 29  | 42  | 46   | 34   | 23   | 17   | 6,5               | 3,5                                | 2,3                                |
| 1400       | 1026 | 1850        |      | 5   | 15  | 25  | 31  | 30   | 21   | 15   | 11   | 3,7               | 2,8                                | 2,2                                |
| 1400       | 1028 | 1850        |      | 7   | 19  | 32  | 41  | 41   | 30   | 20   | 15   | 9,2               | 4,0                                | 2,8                                |
| 1400       | 1030 | 1850        |      | 12  | 27  | 45  | 59  | 60   | 46   | 32   | 24   | 33,0              | 7,0                                | 4,0                                |
| 1400       | 1022 | 2450        |      | 3   | 14  | 27  | 39  | 43   | 30   | 20   | 15   | 2,4               | 2,3                                | 1,8                                |
| 1400       | 1025 | 2450        |      | 6   | 20  | 38  | 53  | 60   | 43   | 29   | 22   | 7,4               | 3,5                                | 2,3                                |
| 1400       | 1026 | 2450        |      | 6   | 19  | 32  | 40  | 39   | 27   | 18   | 13   | 4,0               | 2,8                                | 2,2                                |
| 1400       | 1028 | 2450        |      | 9   | 25  | 42  | 53  | 53   | 38   | 26   | 19   | 10,2              | 4,0                                | 2,8                                |
| 1500       | 1021 | 650         |      | 2   | 4   | 7   | 12  | 12   | 9    | 7    | 6    | 1,3               | 2,1                                | 1,7                                |
| 1500       | 1022 | 650         |      | 2   | 6   | 9   | 17  | 19   | 14   | 11   | 9    | 3,1               | 3,0                                | 2,0                                |
| 1500       | 1027 | 650         |      | 2   | 6   | 8   | 12  | 10   | 9    | 7    | 5    | 2,2               | 2,5                                | 2,0                                |
| 1500       | 1029 | 650         |      | 3   | 7   | 10  | 15  | 13   | 11   | 8    | 6    | 4,7               | 3,3                                | 2,5                                |
| 1500       | 1030 | 650         |      | 5   | 10  | 14  | 20  | 19   | 14   | 11   | 9    | 12,2              | 5,0                                | 3,3                                |
| 1500       | 1022 | 1250        |      | 3   | 9   | 17  | 28  | 32   | 24   | 17   | 13   | 3,8               | 3,0                                | 2,0                                |
| 1500       | 1027 | 1250        |      | 3   | 10  | 15  | 20  | 18   | 13   | 10   | 7    | 2,4               | 2,5                                | 2,0                                |
| 1500       | 1029 | 1250        |      | 5   | 12  | 19  | 25  | 23   | 17   | 12   | 9    | 5,3               | 3,3                                | 2,5                                |
| 1500       | 1030 | 1250        |      | 7   | 16  | 25  | 33  | 32   | 24   | 17   | 13   | 13,9              | 5,0                                | 3,3                                |
| 1500       | 1021 | 1850        |      | 2   | 10  | 19  | 28  | 29   | 21   | 14   | 10   | 1,7               | 2,1                                | 1,7                                |
| 1500       | 1022 | 1850        |      | 3   | 13  | 25  | 39  | 46   | 34   | 23   | 17   | 4,4               | 3,0                                | 2,0                                |
| 1500       | 1027 | 1850        |      | 4   | 13  | 22  | 28  | 26   | 18   | 13   | 9    | 2,6               | 2,5                                | 2,0                                |
| 1500       | 1029 | 1850        |      | 6   | 17  | 28  | 35  | 33   | 24   | 16   | 12   | 5,9               | 3,3                                | 2,5                                |
| 1500       | 1030 | 1850        |      | 9   | 23  | 37  | 46  | 46   | 34   | 23   | 17   | 15,7              | 5,0                                | 3,3                                |
| 1500       | 1021 | 2450        |      | 3   | 13  | 25  | 35  | 38   | 26   | 18   | 13   | 1,9               | 2,1                                | 1,7                                |
| 1500       | 1022 | 2450        |      | 4   | 17  | 33  | 51  | 60   | 43   | 29   | 22   | 5,0               | 3,0                                | 2,0                                |
| 1500       | 1027 | 2450        |      | 5   | 17  | 29  | 36  | 33   | 23   | 15   | 11   | 2,9               | 2,5                                | 2,0                                |
| 1500       | 1029 | 2450        |      | 8   | 22  | 37  | 45  | 43   | 30   | 20   | 15   | 6,4               | 3,3                                | 2,5                                |
| 1500       | 1030 | 2450        |      | 12  | 29  | 49  | 60  | 60   | 43   | 29   | 22   | 17,4              | 5,0                                | 3,3                                |
| 1600       | 1023 | 650         |      | 2   | 4   | 7   | 11  | 10   | 9    | 7    | 5    | 1,0               | 2,0                                | 1,6                                |
| 1600       | 1024 | 650         |      | 2   | 5   | 9   | 15  | 16   | 13   | 10   | 8    | 2,3               | 2,7                                | 1,9                                |
| 1600       | 1025 | 650         |      | 2   | 7   | 11  | 21  | 25   | 19   | 15   | 12   | 6,1               | 4,0                                | 2,3                                |
| 1600       | 1032 | 650         |      | 4   | 9   | 12  | 17  | 15   | 12   | 9    | 7    | 7,5               | 4,0                                | 2,9                                |
| 1600       | 1023 | 1250        |      | 2   | 7   | 12  | 18  | 18   | 13   | 10   | 7    | 1,2               | 2,0                                | 1,6                                |
| 1600       | 1024 | 1250        |      | 3   | 9   | 16  | 25  | 28   | 21   | 15   | 11   | 2,8               | 2,7                                | 1,9                                |
| 1600       | 1025 | 1250        |      | 3   | 11  | 21  | 36  | 44   | 33   | 24   | 18   | 7,6               | 4,0                                | 2,3                                |
| 1600       | 1032 | 1250        |      | 6   | 14  | 22  | 28  | 26   | 19   | 14   | 10   | 8,4               | 4,0                                | 2,9                                |
| 1600       | 1023 | 1850        |      | 2   | 10  | 18  | 25  | 26   | 18   | 13   | 9    | 1,3               | 2,0                                | 1,6                                |
| 1600       | 1024 | 1850        |      | 3   | 12  | 23  | 35  | 40   | 29   | 20   | 15   | 3,2               | 2,7                                | 1,9                                |
| 1600       | 1025 | 1850        |      | 4   | 15  | 31  | 50  | 60   | 46   | 32   | 24   | 9,1               | 4,0                                | 2,3                                |
| 1600       | 1032 | 1850        |      | 8   | 20  | 32  | 39  | 37   | 26   | 18   | 13   | 9,3               | 4,0                                | 2,9                                |
| 1600       | 1023 | 2450        |      | 3   | 12  | 23  | 32  | 33   | 23   | 15   | 11   | 1,5               | 2,0                                | 1,6                                |
| 1600       | 1024 | 2450        |      | 4   | 16  | 31  | 45  | 52   | 37   | 25   | 18   | 3,6               | 2,7                                | 1,9                                |
| 1600       | 1025 | 2450        |      | 5   | 20  | 40  | 60  | 60   | 60   | 40   | 30   | 10,6              | 4,0                                | 2,3                                |
| 1600       | 1032 | 2450        |      | 10  | 26  | 42  | 50  | 48   | 34   | 23   | 17   | 10,2              | 4,0                                | 2,9                                |





# Rectangular straight silencer DLD/DLDR

| Width a mm | Code | Length l mm |      | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      |      | Resistance number | Self generated noise number Intake | Self generated noise number Outlet |
|------------|------|-------------|------|---|-----|-----|-----|------|------|------|------|-------------------|------------------------------------|------------------------------------|
|            |      | DLD         | DLDR | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                   |                                    |                                    |
| 1800       | 1026 | 650         |      | 2   | 5   | 7   | 13  | 13   | 10   | 8    | 6    | 1,5               | 2,3                                | 1,7                                |
| 1800       | 1033 | 650         |      | 4   | 10  | 15  | 24  | 27   | 20   | 16   | 12   | 16,2              | 6,0                                | 3,3                                |
| 1800       | 1035 | 650         |      | 4   | 9   | 13  | 19  | 19   | 14   | 11   | 9    | 9,4               | 4,5                                | 3,0                                |
| 1800       | 1036 | 650         |      | 3   | 7   | 10  | 13  | 10   | 9    | 7    | 5    | 3,8               | 3,0                                | 2,4                                |
| 1800       | 1026 | 1250        |      | 2   | 8   | 14  | 21  | 22   | 16   | 12   | 9    | 1,7               | 2,3                                | 1,7                                |
| 1800       | 1033 | 1250        |      | 6   | 16  | 27  | 40  | 48   | 35   | 25   | 19   | 19,7              | 6,0                                | 3,3                                |
| 1800       | 1035 | 1250        |      | 6   | 15  | 24  | 32  | 32   | 24   | 17   | 13   | 10,8              | 4,5                                | 3,0                                |
| 1800       | 1036 | 1250        |      | 5   | 12  | 18  | 21  | 18   | 13   | 10   | 7    | 4,1               | 3,0                                | 2,4                                |
| 1800       | 1026 | 1850        |      | 3   | 11  | 20  | 29  | 31   | 22   | 15   | 11   | 1,9               | 2,3                                | 1,7                                |
| 1800       | 1033 | 1850        |      | 8   | 22  | 40  | 56  | 60   | 50   | 34   | 26   | 23,2              | 6,0                                | 3,3                                |
| 1800       | 1035 | 1850        |      | 8   | 20  | 35  | 45  | 46   | 34   | 23   | 17   | 12,2              | 4,5                                | 3,0                                |
| 1800       | 1036 | 1850        |      | 6   | 17  | 26  | 30  | 26   | 18   | 13   | 9    | 4,5               | 3,0                                | 2,4                                |
| 1800       | 1026 | 2450        |      | 3   | 14  | 26  | 38  | 41   | 28   | 19   | 14   | 2,2               | 2,3                                | 1,7                                |
| 1800       | 1033 | 2450        |      | 11  | 29  | 53  | 60  | 60   | 60   | 44   | 32   | 26,6              | 6,0                                | 3,3                                |
| 1800       | 1035 | 2450        |      | 10  | 26  | 45  | 58  | 60   | 43   | 29   | 22   | 13,6              | 4,5                                | 3,0                                |
| 1800       | 1036 | 2450        |      | 8   | 21  | 34  | 38  | 33   | 23   | 15   | 11   | 4,8               | 3,0                                | 2,4                                |
| 2000       | 1027 | 650         |      | 2   | 4   | 7   | 11  | 10   | 9    | 7    | 5    | 1,0               | 2,0                                | 1,6                                |
| 2000       | 1029 | 650         |      | 2   | 6   | 10  | 18  | 21   | 16   | 13   | 10   | 4,0               | 3,3                                | 2,1                                |
| 2000       | 1032 | 650         |      | 2   | 6   | 9   | 14  | 13   | 11   | 8    | 6    | 2,5               | 2,7                                | 2,0                                |
| 2000       | 1033 | 650         |      | 3   | 7   | 12  | 20  | 21   | 16   | 13   | 10   | 6,5               | 4,0                                | 2,5                                |
| 2000       | 1039 | 650         |      | 5   | 10  | 14  | 20  | 19   | 14   | 11   | 9    | 12,2              | 5,0                                | 3,3                                |
| 2000       | 1027 | 1250        |      | 2   | 7   | 12  | 18  | 18   | 13   | 10   | 7    | 1,2               | 2,0                                | 1,6                                |
| 2000       | 1029 | 1250        |      | 3   | 10  | 19  | 31  | 37   | 27   | 20   | 15   | 4,9               | 3,3                                | 2,1                                |
| 2000       | 1032 | 1250        |      | 3   | 9   | 16  | 23  | 23   | 17   | 12   | 9    | 2,8               | 2,7                                | 2,0                                |
| 2000       | 1033 | 1250        |      | 4   | 12  | 21  | 33  | 37   | 28   | 20   | 15   | 7,8               | 4,0                                | 2,5                                |
| 2000       | 1039 | 1250        |      | 7   | 16  | 25  | 33  | 32   | 24   | 17   | 13   | 13,9              | 5,0                                | 3,3                                |
| 2000       | 1027 | 1850        |      | 2   | 10  | 18  | 25  | 26   | 18   | 13   | 9    | 1,3               | 2,0                                | 1,6                                |
| 2000       | 1029 | 1850        |      | 4   | 14  | 27  | 43  | 52   | 38   | 26   | 20   | 5,8               | 3,3                                | 2,1                                |
| 2000       | 1032 | 1850        |      | 4   | 13  | 23  | 32  | 33   | 24   | 16   | 12   | 3,2               | 2,7                                | 2,0                                |
| 2000       | 1033 | 1850        |      | 5   | 17  | 31  | 46  | 53   | 39   | 27   | 20   | 9,1               | 4,0                                | 2,5                                |
| 2000       | 1039 | 1850        |      | 9   | 23  | 37  | 46  | 46   | 34   | 23   | 17   | 15,7              | 5,0                                | 3,3                                |
| 2000       | 1027 | 2450        |      | 3   | 12  | 23  | 32  | 33   | 23   | 15   | 11   | 1,5               | 2,0                                | 1,6                                |
| 2000       | 1029 | 2450        |      | 5   | 18  | 36  | 55  | 60   | 49   | 33   | 24   | 6,7               | 3,3                                | 2,1                                |
| 2000       | 1032 | 2450        |      | 5   | 17  | 31  | 41  | 43   | 30   | 20   | 15   | 3,5               | 2,7                                | 2,0                                |
| 2000       | 1033 | 2450        |      | 7   | 22  | 41  | 59  | 60   | 50   | 34   | 25   | 10,4              | 4,0                                | 2,5                                |
| 2000       | 1039 | 2450        |      | 12  | 29  | 49  | 60  | 60   | 43   | 29   | 22   | 17,4              | 5,0                                | 3,3                                |
| 2200       | 1031 | 650         |      | 2   | 5   | 7   | 12  | 12   | 10   | 8    | 6    | 1,4               | 2,2                                | 1,7                                |
| 2200       | 1033 | 650         |      | 2   | 6   | 11  | 20  | 23   | 18   | 14   | 11   | 5,0               | 3,7                                | 2,2                                |
| 2200       | 1036 | 650         |      | 3   | 8   | 13  | 23  | 26   | 19   | 16   | 12   | 10,1              | 4,9                                | 2,8                                |
| 2200       | 1038 | 650         |      | 3   | 7   | 10  | 15  | 14   | 11   | 9    | 7    | 3,9               | 3,1                                | 2,3                                |
| 2200       | 1040 | 650         |      | 3   | 6   | 9   | 12  | 10   | 9    | 7    | 5    | 2,9               | 2,8                                | 2,2                                |
| 2200       | 1042 | 650         |      | 4   | 8   | 11  | 15  | 13   | 11   | 8    | 6    | 6,2               | 3,7                                | 2,8                                |
| 2200       | 1031 | 1250        |      | 2   | 8   | 13  | 20  | 21   | 16   | 11   | 8    | 1,6               | 2,2                                | 1,7                                |
| 2200       | 1033 | 1250        |      | 3   | 11  | 20  | 33  | 41   | 30   | 22   | 16   | 6,2               | 3,7                                | 2,2                                |
| 2200       | 1036 | 1250        |      | 5   | 13  | 24  | 38  | 45   | 34   | 24   | 18   | 12,3              | 4,9                                | 2,8                                |
| 2200       | 1038 | 1250        |      | 4   | 11  | 18  | 25  | 25   | 18   | 13   | 10   | 4,5               | 3,1                                | 2,3                                |
| 2200       | 1040 | 1250        |      | 4   | 11  | 17  | 21  | 18   | 13   | 10   | 7    | 3,2               | 2,8                                | 2,2                                |
| 2200       | 1042 | 1250        |      | 6   | 14  | 21  | 26  | 23   | 17   | 12   | 9    | 6,8               | 3,7                                | 2,8                                |
| 2200       | 1031 | 1850        |      | 2   | 11  | 20  | 28  | 30   | 21   | 15   | 11   | 1,8               | 2,2                                | 1,7                                |
| 2200       | 1033 | 1850        |      | 4   | 15  | 29  | 47  | 58   | 42   | 29   | 22   | 7,4               | 3,7                                | 2,2                                |
| 2200       | 1036 | 1850        |      | 6   | 19  | 35  | 53  | 60   | 48   | 33   | 24   | 14,5              | 4,9                                | 2,8                                |
| 2200       | 1038 | 1850        |      | 5   | 16  | 27  | 35  | 35   | 25   | 17   | 13   | 5,0               | 3,1                                | 2,3                                |
| 2200       | 1040 | 1850        |      | 5   | 15  | 24  | 29  | 26   | 18   | 13   | 9    | 3,5               | 2,8                                | 2,2                                |
| 2200       | 1042 | 1850        |      | 7   | 19  | 30  | 36  | 33   | 24   | 16   | 12   | 7,5               | 3,7                                | 2,8                                |
| 2200       | 1031 | 2450        |      | 3   | 14  | 26  | 37  | 39   | 27   | 18   | 13   | 2,0               | 2,2                                | 1,7                                |
| 2200       | 1033 | 2450        |      | 5   | 19  | 38  | 60  | 60   | 55   | 37   | 27   | 8,5               | 3,7                                | 2,2                                |
| 2200       | 1036 | 2450        |      | 8   | 24  | 46  | 60  | 60   | 60   | 41   | 31   | 16,8              | 4,9                                | 2,8                                |
| 2200       | 1038 | 2450        |      | 6   | 20  | 35  | 45  | 46   | 32   | 22   | 16   | 5,5               | 3,1                                | 2,3                                |
| 2200       | 1040 | 2450        |      | 6   | 19  | 32  | 37  | 33   | 23   | 15   | 11   | 3,8               | 2,8                                | 2,2                                |
| 2200       | 1042 | 2450        |      | 9   | 24  | 40  | 46  | 43   | 30   | 20   | 15   | 8,2               | 3,7                                | 2,8                                |



# Rectangular straight silencer

# DLDY



## Description

DLDY is fitted with built-in side baffles located outside the fitting dimensions. The products can be manufactured in all standard duct sizes.

## Design

DLDY has an external shell of trapezoidal corrugated sheet for stability and reduced risk of natural oscillation. DLDY is designed for low air resistance with baffle combinations that dampen particularly low-frequency noise well. The type of insulation material is Lindtec which has been developed to provide good noise properties, low weight and to be cleanable.

DLDY meets the requirements of air tightness class C and pressure class 2 according to EN 1507:2006.

DLDY is equipped with joining profile type RJFP.

## Tools for dimensioning and planning

The software DIMsilencer is recommended for fast choice of silencer or a complete and fast sound calculation of the duct system.

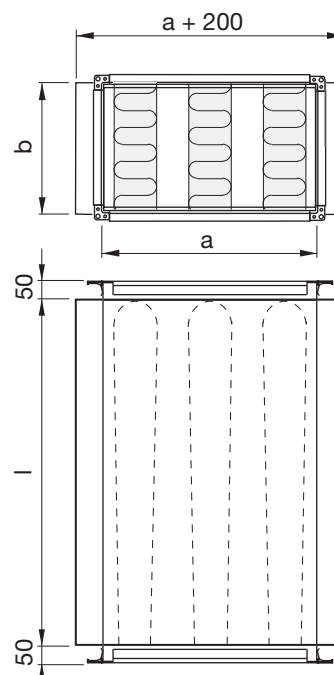
The software CADvent offers dimensioning in an environment with 3D-modelling.

Computerised planning can be conducted with automatic presentation of noise levels, pressure drop etc.

## Ordering example

|                    |             |                  |            |             |            |
|--------------------|-------------|------------------|------------|-------------|------------|
|                    | <b>DLDY</b> | <b>800 × 600</b> | <b>650</b> | <b>2015</b> | <b>TRA</b> |
| Product            |             |                  |            |             |            |
| Width height a × b |             |                  |            |             |            |
| Length l           |             |                  |            |             |            |
| Code               |             |                  |            |             |            |
| Accessories        |             |                  |            |             |            |

## Dimensions



If alternative material is required, this shall be stated when ordering, e.g. aluminium zinc (AZ185), stainless (2333) and acid-proof steel (2343).

The silencer is also available with the following accessories/options.

- TRA = Non-insulated inspection hatch.
- TRB = Hatch intended for external insulation.\*
- TRC = Hatch intended for external insulation.\*
- AIA = 50 mm fire protection insulation. Note! a and b dimensions increase by 100 mm.
- AIB = 100 mm fire protection insulation. Note! a and b dimensions increase by 200 mm.
- AIA+TRB = 50 mm fire protection insulation and the appropriate cleaning cover. Note! a and b dimensions increase by 100 mm.
- AIB+TRC = 100 mm fire protection insulation and the appropriate cleaning cover. Note! a and b dimensions increase by 200 mm.

The dimension of the hatches is adapted for cleaning and inspection of all baffle spacings.

\* Specify insulation thickness when ordering.





# Rectangular straight silencer

DLDY

## Manual designing for DLDY

A number of silencers can be designed manually, for more combinations of silencers and faster calculations use DIMsilencer. Manual method of calculation is shown below:

**A** Specify connection dimensions and flow-type location of the silencer.

|          |             |    |
|----------|-------------|----|
| Width    | 800         | mm |
| Height   | 1000        | mm |
| Length   | 1350        | mm |
| Location | Exhaust air |    |

DLDY-800-1000-1350-2016

**B** Specify the sound power level before the silencer.  
 Read the insertion attenuation from the tables on page 211 – 215.  
 Calculate the sound power level after the silencer irrespective of the air flow (self generated noise).

### Insertion attenuation

|   | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz | Resistance number | Self generated noise number inlet |
|---|-------|--------|-------|-------|--------|--------|--------|--------|-------------------|-----------------------------------|
| Sound power level before silencer                             | 72    | 73     | 73    | 64    | 62     | 59     | 52     | 44     |                   |                                   |
| Attenuation from table page 211 – 215                         | 3     | 11     | 19    | 31    | 35     | 26     | 19     | 14     | 2,8               | 2,7                               |
| Sound power level after silencer without self generated noise | 69    | 62     | 54    | 33    | 27     | 33     | 33     | 30     |                   |                                   |

**C** Determine the pressure drop with help of the graph on page 208 and table on page 209. In this case we have straight ducts before and after the silencer.

### Pressure drop

|   | Area         | 0,8 m <sup>2</sup> | Air flow                       | 400 l/s |
|---|--------------|--------------------|--------------------------------|---------|
| Graph on page 208, use resistance number, area and air velocity | Air velocity | 5 m/s              | Pressure drop                  | 42 Pa   |
| Correction at disturbance according table on page 209           | Factor       | 1                  | Pressure drop after correction | 42 Pa   |

**D** Determine the self generated noise from the silencer at present air flow.  
 Calculate the sound power level after the silencer inclusive the self generated noise.

### Self generated noise

|  | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz |  |
|--|-------|--------|-------|-------|--------|--------|--------|--------|--|
| Graph on page 210, use resistance number and air velocity  | 59    | 55     | 54    | 51    | 48     | 45     | 41     | 35     |  |
| Correction for gross cross section area  | -1    | -1     | -1    | -1    | -1     | -1     | -1     | -1     |  |
| Self generated noise   | 58    | 54     | 53    | 50    | 47     | 44     | 40     | 34     |  |
| Sound power level after the silencer   | 59    | 63     | 57    | 50    | 47     | 44     | 41     | 35     |  |
| (Logarithmical addition of self generated noise and sound power level after the silencer without self generated noise) |       |        |       |       |        |        |        |        |  |



# Rectangular straight silencer

DLDY

The following table can be used for own manual calculations in accordance with the example on the previous page.

## Designing table for DLDY

|          |                      |    |
|----------|----------------------|----|
| With     | <input type="text"/> | mm |
| Height   | <input type="text"/> | mm |
| Length   | <input type="text"/> | mm |
| Location | <input type="text"/> |    |

## Insertion attenuation

|   | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz | Resistance number | Self generated noise number inlet |
|---|-------|--------|-------|-------|--------|--------|--------|--------|-------------------|-----------------------------------|
| Sound power level before silencer                             |       |        |       |       |        |        |        |        |                   |                                   |
| Attenuation from table page 211 – 215                         |       |        |       |       |        |        |        |        |                   |                                   |
| Sound power level after silencer without self generated noise |       |        |       |       |        |        |        |        |                   |                                   |

## Pressure drop

|   | Area         | m <sup>2</sup> | Air flow                       | l/s |
|---|--------------|----------------|--------------------------------|-----|
| Graph on page 208, use resistance number, area and air velocity | Air velocity | m/s            | Pressure drop                  | Pa  |
| Correction at disturbance according table on page 209           | Factor       |                | Pressure drop after correction | Pa  |

## Self generated noise

|  | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz |
|--|-------|--------|-------|-------|--------|--------|--------|--------|
| Graph on page 210, use resistance number and air velocity  |       |        |       |       |        |        |        |        |
| Correction for gross cross section area  |       |        |       |       |        |        |        |        |
| Self generated noise   |       |        |       |       |        |        |        |        |
| Sound power level after the silencer<br>(Logarithmical addition of self generated noise and sound power level after the silencer without self generated noise) |       |        |       |       |        |        |        |        |

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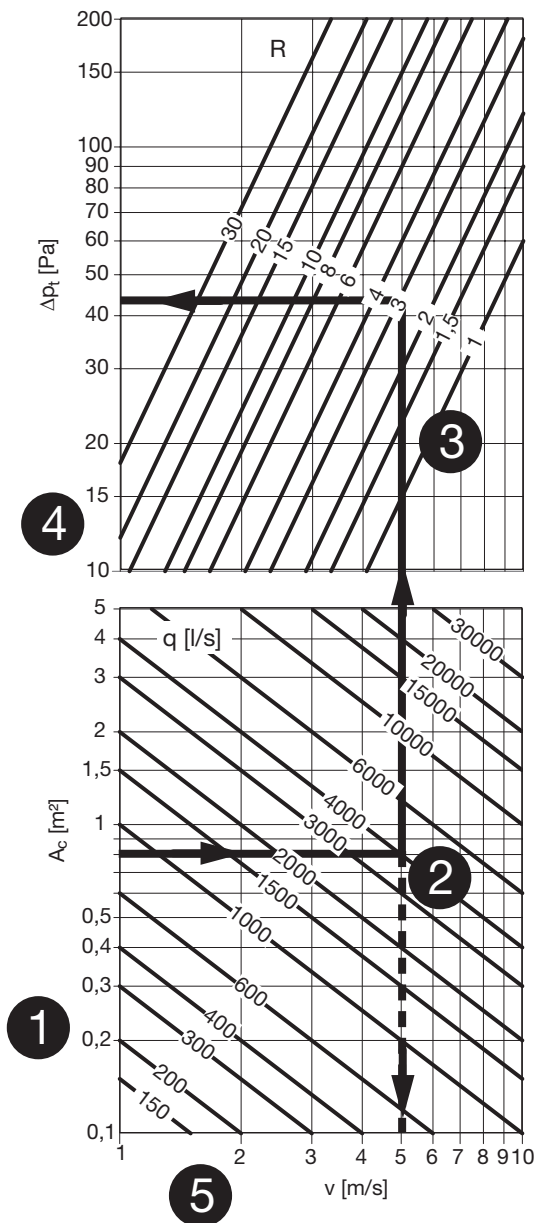
# Rectangular straight silencer

DLDY

## Pressure drop

Follow the directions below and the adjoining graph.

- 1 Calculate the gross cross section area  $a \times b$  in  $m^2$ .
- 2 Go horizontal in the graph to the present air flow,  $l/s$ .
- 3 Go up to the resistance number achieved from the tables on page 211 –215.
- 4 Read the pressure drop over the silencer, at straight duct connection before and after the silencer, (factor 1,0). For other modes of connection see the table for correction on page 209.
- 5 Air flow velocity, which is used at the calculation of the self generated noise, can be read here.



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# Rectangular straight silencer

DLDY

## Tryckfall

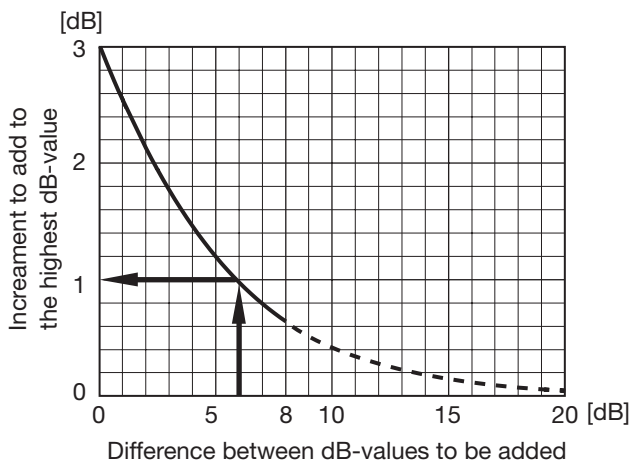
Aktuellt tryckfall = Avläst tryckfall × nedanstående faktor.

D = Ljuddämparens största anslutningssida (a eller b).

Tabellen omfattar ett urval av de vanligaste förekommande störningsfallen.

| Before the silencer          |      |         |      | Silencer | After the silencer          |      |     |     | Factor |
|------------------------------|------|---------|------|----------|-----------------------------|------|-----|-----|--------|
| Distance before the silencer |      |         |      |          | Distance after the silencer |      |     |     |        |
| 3xD                          | 2xD  | 1xD     | 0xD  |          | 0xD                         | 1xD  | 2xD | 3xD |        |
| Duct                         |      |         |      | Silencer | Duct                        |      |     |     | 1,0    |
| Bend                         |      |         |      | Silencer | Duct                        |      |     |     | 1,1    |
|                              | Bend |         |      | Silencer | Duct                        |      |     |     | 1,2    |
|                              |      | Bend    |      | Silencer | Duct                        |      |     |     | 1,4    |
|                              |      |         | Bend | Silencer | Duct                        |      |     |     | 1,5    |
| Duct                         |      |         |      | Silencer |                             | Bend |     |     | 1,2    |
| Duct                         |      |         |      | Silencer | Bend                        |      |     |     | 1,3    |
| Bend                         |      |         |      | Silencer |                             | Bend |     |     | 1,3    |
| Bend                         |      |         |      | Silencer | Bend                        |      |     |     | 1,4    |
|                              | Bend |         |      | Silencer |                             | Bend |     |     | 1,5    |
|                              | Bend |         |      | Silencer | Bend                        |      |     |     | 1,6    |
|                              |      | Bend    |      | Silencer |                             | Bend |     |     | 1,7    |
|                              |      | Bend    |      | Silencer | Bend                        |      |     |     | 1,8    |
|                              |      |         | Bend | Silencer |                             | Bend |     |     | 1,9    |
|                              |      |         | Bend | Silencer | Bend                        |      |     |     | 2,0    |
|                              |      | Chamber |      | Silencer | Duct branch                 |      |     |     | 2,0    |
| Duct                         |      |         |      | Silencer | Chamber                     |      |     |     | 3,0    |
|                              |      | Chamber |      | Silencer | Chamber                     |      |     |     | 3,5    |

## Logaritmsk addition



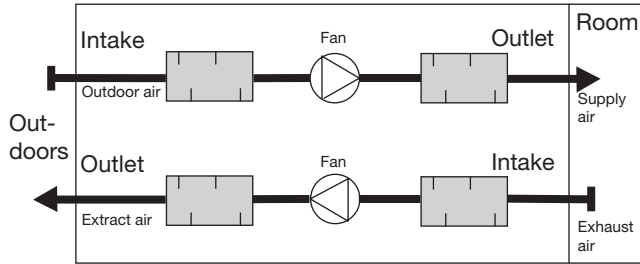


# Rectangular straight silencer

DLDY

## Self generated noise per frequency band

- Decide from the location of the silencer whether it is the supply or exhaust graph that shall be used. (Rule of memory - the side that leads away from the fan, i.e. at supply air the outlet graph is used and at exhaust air the in-take graph.)



- Go horizontally into the present graph, at present air velocity, to the self generated noise number.
- Then go vertically up to the crossing of the different frequency band lines.
- Read the self generated noise, at gross cross section area 1 m<sup>2</sup>, for each frequency band straight out to the left. In the example only the 8000 Hz-reading is shown.
- Add or subtract the correction for the present gross cross section area.

## Sound power level after the silencer

The sound power level after the silencer can be calculated for all frequencies by a logarithmical addition of:

"The self generated noise" and "The sound power level before the silencer".

The shown example gives at 8000 Hz:

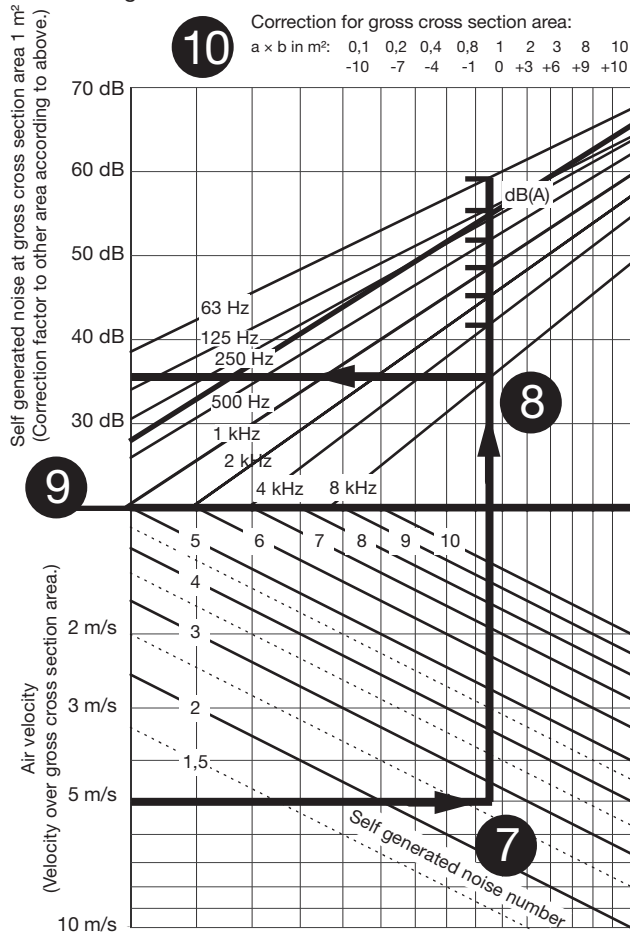
$$\text{Self generated noise} = 35 \text{ dB} - 1 \text{ dB} = 34 \text{ dB}$$

$$\text{Sound power level before the silencer} - \text{the attenuation: } 44 \text{ dB} - 14 \text{ dB} = 30 \text{ dB}$$

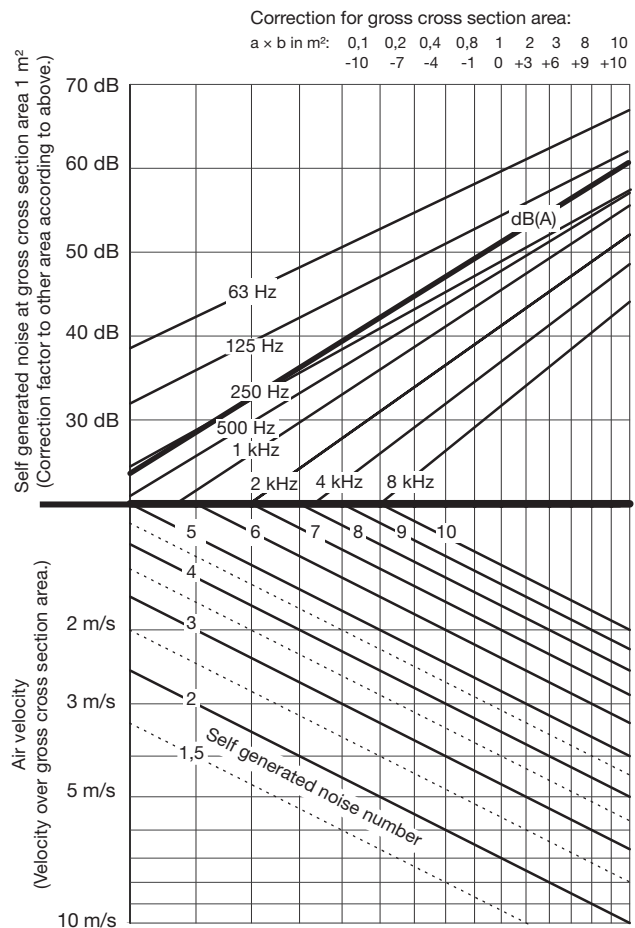
$$\text{Logarithmic addition of } 34 \text{ and } 30 = 35 \text{ dB}$$

(See graph for logarithmical addition on page 209.)

Self generated noise in intake DLD/DLDR/DLDY



Self generated noise in outlet DLD/DLDR/DLDY







# Rectangular straight silencer

DLDY

| Width a mm | Code | Length l mm | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      |      | Resistance number | Self generated noise number Intake | Self generated noise number Outlet |
|------------|------|-------------|---|-----|-----|-----|------|------|------|------|-------------------|------------------------------------|------------------------------------|
|            |      |             | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                   |                                    |                                    |
| 400        | 2009 | 650         | 2   | 5   | 9   | 18  | 21   | 16   | 13   | 10   | 1,0               | 2,0                                | 1,6                                |
| 400        | 2010 | 650         | 3   | 7   | 11  | 23  | 26   | 20   | 16   | 12   | 2,5               | 2,7                                | 2,0                                |
| 400        | 2009 | 1250        | 2   | 9   | 16  | 30  | 36   | 27   | 19   | 14   | 1,2               | 2,0                                | 1,6                                |
| 400        | 2010 | 1250        | 4   | 12  | 21  | 38  | 46   | 34   | 25   | 19   | 2,8               | 2,7                                | 2,0                                |
| 400        | 2009 | 1850        | 3   | 12  | 24  | 43  | 51   | 38   | 26   | 19   | 1,3               | 2,0                                | 1,6                                |
| 400        | 2010 | 1850        | 5   | 16  | 31  | 53  | 60   | 49   | 33   | 25   | 3,2               | 2,7                                | 2,0                                |
| 500        | 2012 | 650         | 2   | 5   | 9   | 17  | 17   | 13   | 10   | 8    | 1,1               | 2,0                                | 1,7                                |
| 500        | 2013 | 650         | 3   | 7   | 11  | 20  | 21   | 16   | 13   | 10   | 2,2               | 2,5                                | 2,0                                |
| 500        | 2014 | 650         | 4   | 9   | 14  | 25  | 26   | 20   | 16   | 12   | 4,7               | 3,3                                | 2,5                                |
| 500        | 2012 | 1250        | 3   | 9   | 16  | 28  | 29   | 22   | 16   | 12   | 1,2               | 2,0                                | 1,7                                |
| 500        | 2013 | 1250        | 4   | 12  | 20  | 34  | 36   | 27   | 19   | 14   | 2,4               | 2,5                                | 2,0                                |
| 500        | 2014 | 1250        | 6   | 15  | 26  | 41  | 46   | 34   | 25   | 19   | 5,3               | 3,3                                | 2,5                                |
| 500        | 2012 | 1850        | 4   | 13  | 24  | 39  | 42   | 31   | 21   | 16   | 1,3               | 2,0                                | 1,7                                |
| 500        | 2013 | 1850        | 5   | 16  | 30  | 47  | 51   | 38   | 26   | 19   | 2,6               | 2,5                                | 2,0                                |
| 500        | 2014 | 1850        | 8   | 21  | 38  | 58  | 60   | 49   | 33   | 25   | 5,9               | 3,3                                | 2,5                                |
| 600        | 2012 | 650         | 2   | 6   | 11  | 22  | 28   | 21   | 17   | 13   | 3,1               | 3,0                                | 2,0                                |
| 600        | 2013 | 650         | 2   | 5   | 7   | 13  | 12   | 10   | 8    | 6    | 0,6               | 1,7                                | 1,5                                |
| 600        | 2015 | 650         | 2   | 6   | 9   | 15  | 14   | 11   | 9    | 7    | 1,1               | 2,0                                | 1,7                                |
| 600        | 2016 | 650         | 3   | 7   | 11  | 18  | 17   | 13   | 10   | 8    | 2,0               | 2,4                                | 2,0                                |
| 600        | 2017 | 650         | 4   | 9   | 13  | 22  | 21   | 16   | 13   | 10   | 3,8               | 3,0                                | 2,4                                |
| 600        | 2012 | 1250        | 3   | 11  | 20  | 36  | 49   | 36   | 26   | 19   | 3,8               | 3,0                                | 2,0                                |
| 600        | 2013 | 1250        | 2   | 8   | 14  | 22  | 22   | 16   | 12   | 9    | 0,7               | 1,7                                | 1,5                                |
| 600        | 2015 | 1250        | 3   | 10  | 16  | 25  | 25   | 18   | 13   | 10   | 1,2               | 2,0                                | 1,7                                |
| 600        | 2016 | 1250        | 4   | 12  | 20  | 30  | 29   | 22   | 16   | 12   | 2,2               | 2,4                                | 2,0                                |
| 600        | 2017 | 1250        | 6   | 15  | 24  | 36  | 36   | 27   | 19   | 14   | 4,1               | 3,0                                | 2,4                                |
| 600        | 2012 | 1850        | 4   | 15  | 30  | 50  | 60   | 51   | 35   | 26   | 4,4               | 3,0                                | 2,0                                |
| 600        | 2013 | 1850        | 3   | 11  | 20  | 30  | 31   | 22   | 15   | 11   | 0,7               | 1,7                                | 1,5                                |
| 600        | 2015 | 1850        | 4   | 14  | 24  | 36  | 36   | 26   | 18   | 13   | 1,3               | 2,0                                | 1,7                                |
| 600        | 2016 | 1850        | 6   | 17  | 29  | 42  | 42   | 31   | 21   | 16   | 2,4               | 2,4                                | 2,0                                |
| 600        | 2017 | 1850        | 8   | 21  | 35  | 50  | 51   | 38   | 26   | 19   | 4,5               | 3,0                                | 2,4                                |
| 700        | 2012 | 650         | 2   | 5   | 9   | 18  | 20   | 15   | 12   | 9    | 1,6               | 2,3                                | 1,8                                |
| 700        | 2013 | 650         | 3   | 8   | 12  | 23  | 28   | 21   | 17   | 13   | 4,8               | 3,5                                | 2,3                                |
| 700        | 2016 | 650         | 3   | 6   | 9   | 14  | 12   | 10   | 8    | 6    | 1,1               | 2,0                                | 1,8                                |
| 700        | 2017 | 650         | 3   | 7   | 10  | 16  | 14   | 11   | 9    | 7    | 1,9               | 2,3                                | 2,0                                |
| 700        | 2012 | 1250        | 3   | 9   | 17  | 30  | 35   | 26   | 19   | 14   | 1,9               | 2,3                                | 1,8                                |
| 700        | 2013 | 1250        | 4   | 13  | 23  | 38  | 49   | 36   | 26   | 19   | 5,7               | 3,5                                | 2,3                                |
| 700        | 2016 | 1250        | 4   | 10  | 16  | 24  | 22   | 16   | 12   | 9    | 1,2               | 2,0                                | 1,8                                |
| 700        | 2017 | 1250        | 5   | 12  | 19  | 27  | 25   | 18   | 13   | 10   | 2,0               | 2,3                                | 2,0                                |
| 700        | 2012 | 1850        | 3   | 12  | 24  | 41  | 50   | 36   | 25   | 19   | 2,2               | 2,3                                | 1,8                                |
| 700        | 2013 | 1850        | 6   | 18  | 34  | 53  | 60   | 51   | 35   | 26   | 6,5               | 3,5                                | 2,3                                |
| 700        | 2016 | 1850        | 5   | 14  | 24  | 33  | 31   | 22   | 15   | 11   | 1,3               | 2,0                                | 1,8                                |
| 700        | 2017 | 1850        | 6   | 17  | 28  | 38  | 36   | 26   | 18   | 13   | 2,2               | 2,3                                | 2,0                                |
| 800        | 2016 | 650         | 2   | 6   | 10  | 19  | 20   | 15   | 12   | 9    | 2,5               | 2,7                                | 2,0                                |
| 800        | 2017 | 650         | 4   | 9   | 14  | 24  | 28   | 21   | 17   | 13   | 6,9               | 4,0                                | 2,7                                |
| 800        | 2019 | 650         | 3   | 6   | 9   | 13  | 11   | 9    | 7    | 5    | 1,2               | 2,0                                | 1,8                                |
| 800        | 2016 | 1250        | 3   | 11  | 19  | 31  | 35   | 26   | 19   | 14   | 2,8               | 2,7                                | 2,0                                |
| 800        | 2017 | 1250        | 6   | 15  | 26  | 40  | 49   | 36   | 26   | 19   | 8,0               | 4,0                                | 2,7                                |
| 800        | 2019 | 1250        | 4   | 11  | 16  | 22  | 19   | 14   | 10   | 8    | 1,2               | 2,0                                | 1,8                                |
| 800        | 2016 | 1850        | 4   | 15  | 28  | 44  | 50   | 36   | 25   | 19   | 3,2               | 2,7                                | 2,0                                |
| 800        | 2017 | 1850        | 7   | 20  | 37  | 56  | 60   | 51   | 35   | 26   | 9,1               | 4,0                                | 2,7                                |
| 800        | 2019 | 1850        | 5   | 15  | 24  | 31  | 27   | 19   | 13   | 10   | 1,3               | 2,0                                | 1,8                                |
| 800        | 2016 | 2450        | 5   | 19  | 36  | 56  | 60   | 47   | 31   | 23   | 3,5               | 2,7                                | 2,0                                |
| 800        | 2017 | 2450        | 9   | 26  | 49  | 60  | 60   | 60   | 44   | 33   | 10,3              | 4,0                                | 2,7                                |
| 800        | 2019 | 2450        | 6   | 19  | 31  | 40  | 35   | 24   | 16   | 12   | 1,4               | 2,0                                | 1,8                                |
| 900        | 2015 | 650         | 2   | 4   | 7   | 13  | 13   | 10   | 8    | 6    | 0,7               | 1,8                                | 1,5                                |
| 900        | 2017 | 650         | 2   | 6   | 9   | 15  | 15   | 12   | 10   | 7    | 1,5               | 2,3                                | 1,8                                |
| 900        | 2019 | 650         | 3   | 7   | 11  | 20  | 20   | 15   | 12   | 9    | 3,5               | 3,0                                | 2,3                                |
| 900        | 2020 | 650         | 4   | 10  | 15  | 25  | 28   | 21   | 17   | 13   | 9,4               | 4,5                                | 3,0                                |
| 900        | 2015 | 1250        | 2   | 7   | 13  | 21  | 22   | 16   | 12   | 9    | 0,8               | 1,8                                | 1,5                                |
| 900        | 2017 | 1250        | 3   | 9   | 16  | 26  | 27   | 20   | 14   | 11   | 1,7               | 2,3                                | 1,8                                |

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# Rectangular straight silencer

DLDY

|    | Width a mm | Code | Length l mm | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      | Resistance number | Self generated noise number Intake | Self generated noise number Outlet |      |
|----|------------|------|-------------|---|-----|-----|-----|------|------|------|-------------------|------------------------------------|------------------------------------|------|
|    |            |      |             | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 |                   |                                    |                                    | 8000 |
| 1  | 900        | 2019 | 1250        | 4   | 12  | 21  | 33  | 35   | 26   | 19   | 14                | 4,0                                | 3,0                                | 2,3  |
| 2  | 900        | 2020 | 1250        | 7   | 16  | 28  | 41  | 49   | 36   | 26   | 19                | 10,8                               | 4,5                                | 3,0  |
| 3  | 900        | 2015 | 1850        | 2   | 10  | 19  | 29  | 32   | 23   | 16   | 12                | 0,9                                | 1,8                                | 1,5  |
| 4  | 900        | 2017 | 1850        | 4   | 13  | 24  | 36  | 39   | 28   | 19   | 14                | 1,9                                | 2,3                                | 1,8  |
| 5  | 900        | 2019 | 1850        | 6   | 17  | 30  | 46  | 50   | 36   | 25   | 19                | 4,4                                | 3,0                                | 2,3  |
| 6  | 900        | 2020 | 1850        | 9   | 23  | 41  | 58  | 60   | 51   | 35   | 26                | 12,2                               | 4,5                                | 3,0  |
| 7  | 900        | 2015 | 2450        | 3   | 13  | 24  | 38  | 41   | 29   | 19   | 14                | 1,0                                | 1,8                                | 1,5  |
| 8  | 900        | 2017 | 2450        | 4   | 17  | 31  | 46  | 50   | 36   | 24   | 18                | 2,1                                | 2,3                                | 1,8  |
| 9  | 900        | 2019 | 2450        | 7   | 22  | 40  | 59  | 60   | 47   | 31   | 23                | 4,9                                | 3,0                                | 2,3  |
| 10 | 900        | 2020 | 2450        | 11  | 30  | 53  | 60  | 60   | 60   | 44   | 33                | 13,6                               | 4,5                                | 3,0  |
| 11 | 1000       | 2015 | 650         | 1   | 4   | 6   | 11  | 11   | 9    | 7    | 5                 | 0,5                                | 1,7                                | 1,4  |
| 12 | 1000       | 2018 | 650         | 2   | 5   | 8   | 13  | 13   | 10   | 8    | 6                 | 1,1                                | 2,0                                | 1,7  |
| 13 | 1000       | 2020 | 650         | 3   | 6   | 10  | 16  | 15   | 12   | 10   | 7                 | 2,2                                | 2,5                                | 2,0  |
| 14 | 1000       | 2021 | 650         | 4   | 8   | 12  | 20  | 20   | 15   | 12   | 9                 | 4,7                                | 3,3                                | 2,5  |
| 15 | 1000       | 2022 | 650         | 5   | 11  | 16  | 25  | 28   | 21   | 17   | 13                | 12,2                               | 5,0                                | 3,3  |
| 16 | 1000       | 2015 | 1250        | 2   | 6   | 11  | 18  | 19   | 14   | 10   | 7                 | 0,6                                | 1,7                                | 1,4  |
| 17 | 1000       | 2018 | 1250        | 3   | 8   | 14  | 22  | 22   | 16   | 12   | 9                 | 1,2                                | 2,0                                | 1,7  |
| 18 | 1000       | 2020 | 1250        | 4   | 11  | 18  | 27  | 27   | 20   | 14   | 11                | 2,4                                | 2,5                                | 2,0  |
| 19 | 1000       | 2021 | 1250        | 5   | 14  | 23  | 34  | 35   | 26   | 19   | 14                | 5,3                                | 3,3                                | 2,5  |
| 20 | 1000       | 2022 | 1250        | 8   | 18  | 30  | 42  | 49   | 36   | 26   | 19                | 13,9                               | 5,0                                | 3,3  |
| 21 | 1000       | 2015 | 1850        | 2   | 9   | 17  | 26  | 27   | 19   | 13   | 10                | 0,7                                | 1,7                                | 1,4  |
| 22 | 1000       | 2018 | 1850        | 3   | 12  | 21  | 31  | 32   | 23   | 16   | 12                | 1,3                                | 2,0                                | 1,7  |
| 23 | 1000       | 2020 | 1850        | 5   | 15  | 26  | 38  | 39   | 28   | 19   | 14                | 2,6                                | 2,5                                | 2,0  |
| 24 | 1000       | 2021 | 1850        | 7   | 19  | 33  | 47  | 50   | 36   | 25   | 19                | 5,9                                | 3,3                                | 2,5  |
| 25 | 1000       | 2022 | 1850        | 11  | 25  | 44  | 59  | 60   | 51   | 35   | 26                | 15,7                               | 5,0                                | 3,3  |
| 26 | 1000       | 2015 | 2450        | 2   | 12  | 22  | 33  | 35   | 24   | 16   | 12                | 0,7                                | 1,7                                | 1,4  |
| 27 | 1000       | 2018 | 2450        | 4   | 15  | 28  | 40  | 41   | 29   | 19   | 14                | 1,4                                | 2,0                                | 1,7  |
| 28 | 1000       | 2020 | 2450        | 6   | 19  | 34  | 49  | 50   | 36   | 24   | 18                | 2,9                                | 2,5                                | 2,0  |
| 29 | 1000       | 2021 | 2450        | 9   | 25  | 44  | 60  | 60   | 47   | 31   | 23                | 6,4                                | 3,3                                | 2,5  |
| 30 | 1000       | 2022 | 2450        | 14  | 33  | 57  | 60  | 60   | 60   | 44   | 33                | 17,4                               | 5,0                                | 3,3  |
| 31 | 1100       | 2018 | 650         | 2   | 7   | 12  | 22  | 29   | 22   | 17   | 13                | 5,0                                | 3,7                                | 2,2  |
| 32 | 1100       | 2019 | 650         | 2   | 5   | 7   | 12  | 11   | 9    | 7    | 5                 | 0,8                                | 1,8                                | 1,6  |
| 33 | 1100       | 2021 | 650         | 2   | 6   | 9   | 14  | 13   | 10   | 8    | 6                 | 1,5                                | 2,2                                | 1,8  |
| 34 | 1100       | 2023 | 650         | 3   | 7   | 10  | 17  | 15   | 12   | 10   | 7                 | 2,9                                | 2,8                                | 2,2  |
| 35 | 1100       | 2024 | 650         | 4   | 9   | 13  | 21  | 20   | 15   | 12   | 9                 | 6,2                                | 3,7                                | 2,8  |
| 36 | 1100       | 2018 | 1250        | 3   | 11  | 22  | 36  | 50   | 38   | 27   | 20                | 6,2                                | 3,7                                | 2,2  |
| 37 | 1100       | 2019 | 1250        | 2   | 8   | 13  | 20  | 19   | 14   | 10   | 7                 | 0,9                                | 1,8                                | 1,6  |
| 38 | 1100       | 2021 | 1250        | 3   | 10  | 16  | 23  | 22   | 16   | 12   | 9                 | 1,6                                | 2,2                                | 1,8  |
| 39 | 1100       | 2023 | 1250        | 5   | 12  | 19  | 28  | 27   | 20   | 14   | 11                | 3,2                                | 2,8                                | 2,2  |
| 40 | 1100       | 2024 | 1250        | 6   | 15  | 24  | 35  | 35   | 26   | 19   | 14                | 6,8                                | 3,7                                | 2,8  |
| 41 | 1100       | 2018 | 1850        | 4   | 16  | 32  | 50  | 60   | 53   | 37   | 27                | 7,4                                | 3,7                                | 2,2  |
| 42 | 1100       | 2019 | 1850        | 3   | 11  | 19  | 27  | 27   | 19   | 13   | 10                | 1,0                                | 1,8                                | 1,6  |
| 43 | 1100       | 2021 | 1850        | 4   | 13  | 23  | 32  | 32   | 23   | 16   | 12                | 1,8                                | 2,2                                | 1,8  |
| 44 | 1100       | 2023 | 1850        | 6   | 17  | 28  | 39  | 39   | 28   | 19   | 14                | 3,5                                | 2,8                                | 2,2  |
| 45 | 1100       | 2024 | 1850        | 9   | 21  | 36  | 49  | 50   | 36   | 25   | 19                | 7,5                                | 3,7                                | 2,8  |
| 46 | 1100       | 2018 | 2450        | 5   | 20  | 42  | 60  | 60   | 60   | 46   | 34                | 8,5                                | 3,7                                | 2,2  |
| 47 | 1100       | 2019 | 2450        | 3   | 14  | 25  | 35  | 35   | 24   | 16   | 12                | 1,0                                | 1,8                                | 1,6  |
| 48 | 1100       | 2021 | 2450        | 5   | 17  | 31  | 42  | 41   | 29   | 19   | 14                | 1,9                                | 2,2                                | 1,8  |
| 49 | 1100       | 2023 | 2450        | 7   | 22  | 37  | 50  | 50   | 36   | 24   | 18                | 3,8                                | 2,8                                | 2,2  |
| 50 | 1100       | 2024 | 2450        | 11  | 27  | 47  | 60  | 60   | 47   | 31   | 23                | 8,2                                | 3,7                                | 2,8  |
| 51 | 1200       | 2023 | 650         | 2   | 5   | 8   | 12  | 11   | 9    | 7    | 5                 | 1,1                                | 2,0                                | 1,7  |
| 52 | 1200       | 2024 | 650         | 4   | 8   | 13  | 23  | 25   | 19   | 15   | 11                | 6,9                                | 4,0                                | 2,7  |
| 53 | 1200       | 2025 | 650         | 3   | 7   | 9   | 14  | 13   | 10   | 8    | 6                 | 2,0                                | 2,4                                | 2,0  |
| 54 | 1200       | 2027 | 650         | 4   | 8   | 11  | 17  | 15   | 12   | 10   | 7                 | 3,8                                | 3,0                                | 2,4  |
| 55 | 1200       | 2023 | 1250        | 3   | 9   | 14  | 20  | 19   | 14   | 10   | 7                 | 1,2                                | 2,0                                | 1,7  |
| 56 | 1200       | 2024 | 1250        | 5   | 14  | 24  | 39  | 43   | 32   | 23   | 17                | 8,0                                | 4,0                                | 2,7  |
| 57 | 1200       | 2025 | 1250        | 4   | 11  | 17  | 24  | 22   | 16   | 12   | 9                 | 2,2                                | 2,4                                | 2,0  |
| 58 | 1200       | 2027 | 1250        | 5   | 13  | 21  | 29  | 27   | 20   | 14   | 11                | 4,1                                | 3,0                                | 2,4  |
| 59 | 1200       | 2023 | 1850        | 4   | 12  | 21  | 29  | 27   | 19   | 13   | 10                | 1,3                                | 2,0                                | 1,7  |
| 60 | 1200       | 2024 | 1850        | 7   | 20  | 36  | 54  | 60   | 45   | 31   | 23                | 9,1                                | 4,0                                | 2,7  |
| 61 | 1200       | 2025 | 1850        | 5   | 15  | 25  | 34  | 32   | 23   | 16   | 12                | 2,4                                | 2,4                                | 2,0  |



# Rectangular straight silencer

DLDY

| Width a mm | Code | Length l mm | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      |      | Resistance number | Self generated noise number Intake | Self generated noise number Outlet |
|------------|------|-------------|---|-----|-----|-----|------|------|------|------|-------------------|------------------------------------|------------------------------------|
|            |      |             | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                   |                                    |                                    |
| 1200       | 2027 | 1850        | 7   | 19  | 31  | 40  | 39   | 28   | 19   | 14   | 4,5               | 3,0                                | 2,4                                |
| 1200       | 2023 | 2450        | 4   | 16  | 28  | 37  | 35   | 24   | 16   | 12   | 1,4               | 2,0                                | 1,7                                |
| 1200       | 2024 | 2450        | 9   | 25  | 47  | 60  | 60   | 59   | 39   | 29   | 10,3              | 4,0                                | 2,7                                |
| 1200       | 2025 | 2450        | 6   | 20  | 33  | 43  | 41   | 29   | 19   | 14   | 2,5               | 2,4                                | 2,0                                |
| 1200       | 2027 | 2450        | 9   | 24  | 40  | 52  | 50   | 36   | 24   | 18   | 4,8               | 3,0                                | 2,4                                |
| 1300       | 2018 | 650         | 2   | 4   | 7   | 12  | 12   | 10   | 8    | 6    | 0,8               | 1,9                                | 1,5                                |
| 1300       | 2021 | 650         | 2   | 6   | 9   | 15  | 15   | 12   | 9    | 7    | 1,8               | 2,4                                | 1,9                                |
| 1300       | 2022 | 650         | 3   | 8   | 13  | 23  | 29   | 22   | 17   | 13   | 7,8               | 4,3                                | 2,6                                |
| 1300       | 2023 | 650         | 3   | 7   | 11  | 19  | 19   | 15   | 12   | 9    | 4,3               | 3,3                                | 2,4                                |
| 1300       | 2026 | 650         | 3   | 7   | 10  | 15  | 13   | 10   | 8    | 6    | 2,6               | 2,6                                | 2,2                                |
| 1300       | 2018 | 1250        | 2   | 7   | 13  | 20  | 21   | 15   | 11   | 8    | 0,9               | 1,9                                | 1,5                                |
| 1300       | 2021 | 1250        | 3   | 9   | 16  | 25  | 26   | 19   | 14   | 10   | 2,0               | 2,4                                | 1,9                                |
| 1300       | 2022 | 1250        | 5   | 13  | 24  | 38  | 50   | 38   | 27   | 20   | 9,4               | 4,3                                | 2,6                                |
| 1300       | 2023 | 1250        | 5   | 12  | 21  | 32  | 34   | 25   | 18   | 14   | 4,9               | 3,3                                | 2,4                                |
| 1300       | 2026 | 1250        | 5   | 12  | 19  | 25  | 22   | 16   | 12   | 9    | 2,8               | 2,6                                | 2,2                                |
| 1300       | 2018 | 1850        | 2   | 10  | 18  | 28  | 30   | 21   | 15   | 11   | 1,0               | 1,9                                | 1,5                                |
| 1300       | 2021 | 1850        | 4   | 13  | 24  | 35  | 37   | 27   | 18   | 14   | 2,2               | 2,4                                | 1,9                                |
| 1300       | 2022 | 1850        | 6   | 19  | 36  | 53  | 60   | 53   | 37   | 27   | 11,0              | 4,3                                | 2,6                                |
| 1300       | 2023 | 1850        | 6   | 17  | 31  | 45  | 49   | 36   | 24   | 18   | 5,4               | 3,3                                | 2,4                                |
| 1300       | 2026 | 1850        | 6   | 17  | 27  | 35  | 32   | 23   | 16   | 12   | 3,0               | 2,6                                | 2,2                                |
| 1300       | 2018 | 2450        | 3   | 13  | 24  | 36  | 39   | 27   | 18   | 13   | 1,1               | 1,9                                | 1,5                                |
| 1300       | 2021 | 2450        | 4   | 17  | 31  | 45  | 48   | 34   | 23   | 17   | 2,5               | 2,4                                | 1,9                                |
| 1300       | 2022 | 2450        | 8   | 24  | 47  | 60  | 60   | 60   | 46   | 34   | 12,6              | 4,3                                | 2,6                                |
| 1300       | 2023 | 2450        | 7   | 22  | 41  | 58  | 60   | 46   | 31   | 23   | 6,0               | 3,3                                | 2,4                                |
| 1300       | 2026 | 2450        | 8   | 22  | 36  | 45  | 41   | 29   | 19   | 14   | 3,2               | 2,6                                | 2,2                                |
| 1400       | 2021 | 650         | 1   | 4   | 6   | 11  | 11   | 9    | 7    | 5    | 0,6               | 1,8                                | 1,5                                |
| 1400       | 2022 | 650         | 2   | 5   | 8   | 15  | 17   | 13   | 10   | 8    | 1,6               | 2,3                                | 1,8                                |
| 1400       | 2026 | 650         | 3   | 7   | 10  | 17  | 16   | 13   | 10   | 8    | 2,9               | 2,8                                | 2,2                                |
| 1400       | 2028 | 650         | 4   | 9   | 13  | 22  | 22   | 17   | 13   | 10   | 7,2               | 4,0                                | 2,8                                |
| 1400       | 2029 | 650         | 3   | 7   | 9   | 13  | 11   | 9    | 7    | 5    | 1,9               | 2,3                                | 2,0                                |
| 1400       | 2021 | 1250        | 2   | 7   | 12  | 18  | 19   | 14   | 10   | 7    | 0,7               | 1,8                                | 1,5                                |
| 1400       | 2022 | 1250        | 2   | 8   | 15  | 26  | 29   | 21   | 15   | 12   | 1,9               | 2,3                                | 1,8                                |
| 1400       | 2026 | 1250        | 4   | 11  | 19  | 28  | 28   | 21   | 15   | 11   | 3,3               | 2,8                                | 2,2                                |
| 1400       | 2028 | 1250        | 6   | 15  | 25  | 36  | 38   | 28   | 20   | 15   | 8,2               | 4,0                                | 2,8                                |
| 1400       | 2029 | 1250        | 4   | 11  | 17  | 22  | 19   | 14   | 10   | 7    | 2,0               | 2,3                                | 2,0                                |
| 1400       | 2021 | 1850        | 2   | 9   | 17  | 26  | 26   | 19   | 13   | 10   | 0,8               | 1,8                                | 1,5                                |
| 1400       | 2022 | 1850        | 3   | 12  | 23  | 36  | 41   | 30   | 21   | 15   | 2,2               | 2,3                                | 1,8                                |
| 1400       | 2026 | 1850        | 5   | 16  | 27  | 39  | 40   | 29   | 20   | 15   | 3,7               | 2,8                                | 2,2                                |
| 1400       | 2028 | 1850        | 8   | 21  | 36  | 51  | 54   | 40   | 27   | 20   | 9,2               | 4,0                                | 2,8                                |
| 1400       | 2029 | 1850        | 5   | 15  | 25  | 30  | 27   | 19   | 13   | 10   | 2,2               | 2,3                                | 2,0                                |
| 1400       | 2021 | 2450        | 2   | 12  | 22  | 33  | 34   | 24   | 16   | 12   | 0,9               | 1,8                                | 1,5                                |
| 1400       | 2022 | 2450        | 3   | 15  | 30  | 46  | 54   | 38   | 26   | 19   | 2,4               | 2,3                                | 1,8                                |
| 1400       | 2026 | 2450        | 6   | 20  | 36  | 50  | 52   | 37   | 25   | 18   | 4,0               | 2,8                                | 2,2                                |
| 1400       | 2028 | 2450        | 10  | 27  | 47  | 60  | 60   | 52   | 35   | 26   | 10,2              | 4,0                                | 2,8                                |
| 1400       | 2029 | 2450        | 7   | 20  | 32  | 39  | 35   | 24   | 16   | 12   | 2,3               | 2,3                                | 2,0                                |
| 1500       | 2021 | 650         | 2   | 5   | 8   | 14  | 14   | 11   | 9    | 7    | 1,3               | 2,1                                | 1,7                                |
| 1500       | 2022 | 650         | 2   | 6   | 10  | 19  | 22   | 17   | 13   | 10   | 3,1               | 3,0                                | 2,0                                |
| 1500       | 2027 | 650         | 3   | 6   | 9   | 15  | 14   | 11   | 9    | 7    | 2,2               | 2,5                                | 2,0                                |
| 1500       | 2029 | 650         | 3   | 8   | 12  | 19  | 18   | 14   | 11   | 8    | 4,7               | 3,3                                | 2,5                                |
| 1500       | 2030 | 650         | 5   | 11  | 15  | 25  | 25   | 19   | 15   | 11   | 12,2              | 5,0                                | 3,3                                |
| 1500       | 2021 | 1250        | 2   | 8   | 14  | 23  | 25   | 19   | 14   | 10   | 1,5               | 2,1                                | 1,7                                |
| 1500       | 2022 | 1250        | 3   | 10  | 19  | 32  | 39   | 29   | 21   | 16   | 3,8               | 3,0                                | 2,0                                |
| 1500       | 2027 | 1250        | 4   | 10  | 17  | 25  | 24   | 18   | 13   | 10   | 2,4               | 2,5                                | 2,0                                |
| 1500       | 2029 | 1250        | 5   | 13  | 22  | 31  | 31   | 23   | 16   | 12   | 5,3               | 3,3                                | 2,5                                |
| 1500       | 2030 | 1250        | 8   | 18  | 28  | 41  | 43   | 32   | 23   | 17   | 13,9              | 5,0                                | 3,3                                |
| 1500       | 2021 | 1850        | 3   | 11  | 21  | 33  | 36   | 26   | 18   | 13   | 1,7               | 2,1                                | 1,7                                |
| 1500       | 2022 | 1850        | 4   | 14  | 27  | 45  | 56   | 41   | 28   | 21   | 4,4               | 3,0                                | 2,0                                |
| 1500       | 2027 | 1850        | 5   | 14  | 25  | 34  | 34   | 25   | 17   | 13   | 2,6               | 2,5                                | 2,0                                |
| 1500       | 2029 | 1850        | 7   | 19  | 32  | 43  | 44   | 32   | 22   | 16   | 5,9               | 3,3                                | 2,5                                |
| 1500       | 2030 | 1850        | 10  | 25  | 41  | 58  | 60   | 45   | 31   | 23   | 15,7              | 5,0                                | 3,3                                |
| 1500       | 2021 | 2450        | 3   | 14  | 27  | 42  | 47   | 33   | 22   | 16   | 1,9               | 2,1                                | 1,7                                |

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# Rectangular straight silencer

DLDY

|    | Width a mm | Code | Length l mm | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      | Resistance number | Self generated noise number Intake | Self generated noise number Outlet |      |
|----|------------|------|-------------|---|-----|-----|-----|------|------|------|-------------------|------------------------------------|------------------------------------|------|
|    |            |      |             | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 |                   |                                    |                                    | 8000 |
| 1  | 1500       | 2022 | 2450        | 5   | 18  | 36  | 58  | 60   | 53   | 35   | 26                | 5,0                                | 3,0                                | 2,0  |
| 2  | 1500       | 2027 | 2450        | 6   | 19  | 33  | 44  | 45   | 31   | 21   | 16                | 2,9                                | 2,5                                | 2,0  |
|    | 1500       | 2029 | 2450        | 8   | 24  | 42  | 56  | 57   | 41   | 28   | 20                | 6,4                                | 3,3                                | 2,5  |
|    | 1500       | 2030 | 2450        | 13  | 32  | 55  | 60  | 60   | 59   | 39   | 29                | 17,4                               | 5,0                                | 3,3  |
| 3  | 1600       | 2023 | 650         | 2   | 4   | 7   | 13  | 13   | 10   | 8    | 6                 | 1,0                                | 2,0                                | 1,6  |
|    | 1600       | 2024 | 650         | 2   | 5   | 9   | 17  | 19   | 15   | 12   | 9                 | 2,3                                | 2,7                                | 1,9  |
|    | 1600       | 2025 | 650         | 3   | 7   | 12  | 22  | 29   | 22   | 18   | 13                | 6,1                                | 4,0                                | 2,3  |
|    | 1600       | 2028 | 650         | 2   | 6   | 8   | 13  | 12   | 10   | 8    | 6                 | 1,7                                | 2,3                                | 1,9  |
| 4  | 1600       | 2030 | 650         | 3   | 7   | 10  | 16  | 15   | 12   | 9    | 7                 | 3,4                                | 2,9                                | 2,3  |
|    | 1600       | 2032 | 650         | 4   | 9   | 13  | 21  | 19   | 15   | 12   | 9                 | 7,5                                | 4,0                                | 2,9  |
|    | 1600       | 2023 | 1250        | 2   | 7   | 13  | 21  | 23   | 17   | 12   | 9                 | 1,2                                | 2,0                                | 1,6  |
|    | 1600       | 2024 | 1250        | 3   | 9   | 17  | 29  | 34   | 25   | 18   | 13                | 2,8                                | 2,7                                | 1,9  |
| 5  | 1600       | 2025 | 1250        | 4   | 12  | 22  | 36  | 50   | 38   | 27   | 21                | 7,6                                | 4,0                                | 2,3  |
|    | 1600       | 2028 | 1250        | 3   | 10  | 16  | 22  | 21   | 15   | 11   | 8                 | 1,9                                | 2,3                                | 1,9  |
|    | 1600       | 2030 | 1250        | 5   | 12  | 19  | 27  | 26   | 19   | 14   | 10                | 3,7                                | 2,9                                | 2,3  |
|    | 1600       | 2032 | 1250        | 7   | 15  | 25  | 34  | 34   | 25   | 18   | 14                | 8,4                                | 4,0                                | 2,9  |
|    | 1600       | 2023 | 1850        | 2   | 10  | 19  | 30  | 32   | 23   | 16   | 12                | 1,3                                | 2,0                                | 1,6  |
| 6  | 1600       | 2024 | 1850        | 3   | 13  | 25  | 40  | 48   | 35   | 24   | 18                | 3,2                                | 2,7                                | 1,9  |
|    | 1600       | 2025 | 1850        | 5   | 16  | 32  | 50  | 60   | 54   | 37   | 28                | 9,1                                | 4,0                                | 2,3  |
|    | 1600       | 2028 | 1850        | 4   | 13  | 23  | 31  | 30   | 21   | 15   | 11                | 2,0                                | 2,3                                | 1,9  |
|    | 1600       | 2030 | 1850        | 6   | 17  | 28  | 38  | 37   | 27   | 18   | 14                | 4,1                                | 2,9                                | 2,3  |
|    | 1600       | 2032 | 1850        | 9   | 22  | 36  | 48  | 49   | 36   | 24   | 18                | 9,3                                | 4,0                                | 2,9  |
|    | 1600       | 2023 | 2450        | 3   | 13  | 26  | 38  | 42   | 29   | 20   | 14                | 1,5                                | 2,0                                | 1,6  |
|    | 1600       | 2024 | 2450        | 4   | 16  | 33  | 52  | 60   | 45   | 30   | 22                | 3,6                                | 2,7                                | 1,9  |
|    | 1600       | 2025 | 2450        | 6   | 21  | 43  | 60  | 60   | 60   | 47   | 35                | 10,6                               | 4,0                                | 2,3  |
|    | 1600       | 2028 | 2450        | 5   | 17  | 30  | 40  | 39   | 27   | 18   | 13                | 2,2                                | 2,3                                | 1,9  |
|    | 1600       | 2030 | 2450        | 7   | 22  | 37  | 49  | 48   | 34   | 23   | 17                | 4,4                                | 2,9                                | 2,3  |
|    | 1600       | 2032 | 2450        | 11  | 28  | 47  | 60  | 60   | 46   | 31   | 23                | 10,2                               | 4,0                                | 2,9  |
|    | 1800       | 2026 | 650         | 2   | 5   | 8   | 14  | 15   | 12   | 9    | 7                 | 1,5                                | 2,3                                | 1,7  |
|    | 1800       | 2027 | 650         | 2   | 6   | 10  | 19  | 22   | 16   | 13   | 10                | 3,1                                | 3,0                                | 2,0  |
| 10 | 1800       | 2032 | 650         | 3   | 7   | 10  | 17  | 17   | 13   | 10   | 8                 | 3,5                                | 3,0                                | 2,3  |
|    | 1800       | 2034 | 650         | 3   | 6   | 9   | 13  | 11   | 9    | 7    | 6                 | 2,0                                | 2,4                                | 2,0  |
|    | 1800       | 2035 | 650         | 4   | 9   | 14  | 23  | 23   | 18   | 14   | 11                | 9,4                                | 4,5                                | 3,0  |
|    | 1800       | 2036 | 650         | 3   | 8   | 11  | 16  | 14   | 11   | 9    | 7                 | 3,8                                | 3,0                                | 2,4  |
|    | 1800       | 2026 | 1250        | 2   | 8   | 15  | 24  | 26   | 19   | 14   | 11                | 1,7                                | 2,3                                | 1,7  |
|    | 1800       | 2027 | 1250        | 3   | 10  | 18  | 32  | 38   | 28   | 20   | 15                | 3,8                                | 3,0                                | 2,0  |
|    | 1800       | 2032 | 1250        | 4   | 12  | 19  | 28  | 29   | 21   | 15   | 12                | 4,0                                | 3,0                                | 2,3  |
| 12 | 1800       | 2034 | 1250        | 4   | 10  | 16  | 22  | 20   | 15   | 10   | 8                 | 2,2                                | 2,4                                | 2,0  |
|    | 1800       | 2035 | 1250        | 6   | 16  | 26  | 38  | 41   | 30   | 22   | 16                | 10,8                               | 4,5                                | 3,0  |
|    | 1800       | 2036 | 1250        | 5   | 13  | 20  | 26  | 24   | 18   | 13   | 10                | 4,1                                | 3,0                                | 2,4  |
| 13 | 1800       | 2026 | 1850        | 3   | 11  | 21  | 34  | 38   | 27   | 19   | 14                | 1,9                                | 2,3                                | 1,7  |
|    | 1800       | 2027 | 1850        | 4   | 14  | 27  | 44  | 54   | 40   | 27   | 20                | 4,4                                | 3,0                                | 2,0  |
|    | 1800       | 2032 | 1850        | 5   | 16  | 28  | 40  | 41   | 30   | 21   | 15                | 4,4                                | 3,0                                | 2,3  |
|    | 1800       | 2034 | 1850        | 5   | 15  | 24  | 31  | 28   | 20   | 14   | 10                | 2,4                                | 2,4                                | 2,0  |
|    | 1800       | 2035 | 1850        | 9   | 22  | 38  | 53  | 58   | 42   | 29   | 22                | 12,2                               | 4,5                                | 3,0  |
| 14 | 1800       | 2036 | 1850        | 7   | 18  | 29  | 37  | 34   | 25   | 17   | 13                | 4,5                                | 3,0                                | 2,4  |
|    | 1800       | 2026 | 2450        | 3   | 14  | 28  | 43  | 49   | 35   | 23   | 17                | 2,2                                | 2,3                                | 1,7  |
|    | 1800       | 2027 | 2450        | 4   | 18  | 35  | 57  | 60   | 51   | 34   | 25                | 5,0                                | 3,0                                | 2,0  |
| 15 | 1800       | 2032 | 2450        | 7   | 21  | 37  | 51  | 54   | 38   | 26   | 19                | 4,9                                | 3,0                                | 2,3  |
|    | 1800       | 2034 | 2450        | 6   | 19  | 32  | 39  | 36   | 25   | 17   | 12                | 2,5                                | 2,4                                | 2,0  |
|    | 1800       | 2035 | 2450        | 11  | 28  | 50  | 60  | 60   | 55   | 37   | 27                | 13,6                               | 4,5                                | 3,0  |
| 16 | 1800       | 2036 | 2450        | 8   | 23  | 38  | 47  | 45   | 31   | 21   | 16                | 4,8                                | 3,0                                | 2,4  |
|    | 2000       | 2027 | 650         | 2   | 4   | 7   | 12  | 12   | 10   | 8    | 6                 | 1,0                                | 2,0                                | 1,6  |
|    | 2000       | 2028 | 650         | 2   | 5   | 9   | 16  | 17   | 13   | 11   | 8                 | 2,0                                | 2,5                                | 1,8  |
|    | 2000       | 2029 | 650         | 2   | 6   | 11  | 20  | 24   | 18   | 14   | 11                | 4,0                                | 3,3                                | 2,1  |
|    | 2000       | 2035 | 650         | 3   | 8   | 13  | 21  | 22   | 17   | 13   | 10                | 6,9                                | 4,0                                | 2,7  |
| 17 | 2000       | 2038 | 650         | 3   | 7   | 9   | 13  | 11   | 9    | 7    | 5                 | 2,3                                | 2,5                                | 2,1  |
|    | 2000       | 2039 | 650         | 5   | 10  | 15  | 24  | 23   | 18   | 14   | 11                | 12,2                               | 5,0                                | 3,3  |
|    | 2000       | 2027 | 1250        | 2   | 7   | 13  | 21  | 22   | 16   | 12   | 9                 | 1,2                                | 2,0                                | 1,6  |
|    | 2000       | 2028 | 1250        | 2   | 9   | 16  | 26  | 30   | 22   | 16   | 12                | 2,3                                | 2,5                                | 1,8  |
| 18 | 2000       | 2029 | 1250        | 3   | 10  | 20  | 34  | 42   | 31   | 22   | 17                | 4,9                                | 3,3                                | 2,1  |



# Rectangular straight silencer

DLDY

| Width a<br>mm | Code | Length l<br>mm | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      |      | Resis-<br>tance<br>number | Self gen-<br>erated<br>noise<br>number<br>Intake | Self gen-<br>erated<br>noise<br>number<br>Outlet |
|---------------|------|----------------|---|-----|-----|-----|------|------|------|------|---------------------------|--|--|
|               |      |                | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                           |  |  |
| 2000          | 2035 | 1250           | 5   | 14  | 23  | 36  | 39   | 29   | 21   | 16   | 8,0                       | 4,0  | 2,7  |
| 2000          | 2038 | 1250           | 4   | 11  | 17  | 22  | 19   | 14   | 10   | 7    | 2,5                       | 2,5  | 2,1  |
| 2000          | 2039 | 1250           | 8   | 17  | 28  | 39  | 41   | 30   | 22   | 16   | 13,9                      | 5,0  | 3,3  |
| 2000          | 2027 | 1850           | 2   | 10  | 19  | 29  | 31   | 22   | 15   | 11   | 1,3                       | 2,0  | 1,6  |
| 2000          | 2028 | 1850           | 3   | 12  | 23  | 37  | 43   | 31   | 21   | 16   | 2,6                       | 2,5  | 1,8  |
| 2000          | 2029 | 1850           | 4   | 15  | 29  | 48  | 60   | 44   | 30   | 22   | 5,8                       | 3,3  | 2,1  |
| 2000          | 2035 | 1850           | 7   | 19  | 34  | 50  | 56   | 41   | 28   | 21   | 9,1                       | 4,0  | 2,7  |
| 2000          | 2038 | 1850           | 6   | 16  | 25  | 30  | 26   | 19   | 13   | 10   | 2,7                       | 2,5  | 2,1  |
| 2000          | 2039 | 1850           | 10  | 24  | 40  | 55  | 58   | 42   | 29   | 22   | 15,7                      | 5,0  | 3,3  |
| 2000          | 2027 | 2450           | 3   | 13  | 25  | 37  | 40   | 28   | 19   | 14   | 1,5                       | 2,0  | 1,6  |
| 2000          | 2028 | 2450           | 4   | 16  | 31  | 47  | 55   | 40   | 27   | 20   | 3,0                       | 2,5  | 1,8  |
| 2000          | 2029 | 2450           | 5   | 19  | 38  | 60  | 60   | 57   | 38   | 28   | 6,7                       | 3,3  | 2,1  |
| 2000          | 2035 | 2450           | 8   | 25  | 45  | 60  | 60   | 53   | 35   | 26   | 10,3                      | 4,0  | 2,7  |
| 2000          | 2038 | 2450           | 7   | 20  | 33  | 39  | 34   | 24   | 16   | 12   | 2,9                       | 2,5  | 2,1  |
| 2000          | 2039 | 2450           | 13  | 31  | 53  | 60  | 60   | 55   | 37   | 27   | 17,4                      | 5,0  | 3,3  |
| 2200          | 2030 | 650            | 1   | 4   | 6   | 11  | 10   | 9    | 7    | 5    | 0,8                       | 1,8  | 1,5  |
| 2200          | 2031 | 650            | 2   | 5   | 8   | 14  | 14   | 11   | 9    | 7    | 1,4                       | 2,2  | 1,7  |
| 2200          | 2032 | 650            | 2   | 6   | 9   | 17  | 19   | 15   | 12   | 9    | 2,5                       | 2,8  | 1,9  |
| 2200          | 2038 | 650            | 3   | 7   | 11  | 17  | 17   | 13   | 10   | 8    | 3,9                       | 3,1  | 2,3  |
| 2200          | 2041 | 650            | 4   | 10  | 14  | 24  | 24   | 18   | 15   | 11   | 11,2                      | 4,9  | 3,1  |
| 2200          | 2042 | 650            | 4   | 9   | 12  | 18  | 17   | 13   | 10   | 8    | 6,2                       | 3,7  | 2,8  |
| 2200          | 2030 | 1250           | 2   | 7   | 12  | 18  | 18   | 14   | 10   | 7    | 0,9                       | 1,8  | 1,5  |
| 2200          | 2031 | 1250           | 2   | 8   | 14  | 23  | 25   | 18   | 13   | 10   | 1,6                       | 2,2  | 1,7  |
| 2200          | 2032 | 1250           | 3   | 9   | 17  | 29  | 33   | 25   | 18   | 13   | 3,0                       | 2,8  | 1,9  |
| 2200          | 2038 | 1250           | 4   | 12  | 20  | 29  | 29   | 22   | 16   | 12   | 4,5                       | 3,1  | 2,3  |
| 2200          | 2041 | 1250           | 7   | 16  | 27  | 39  | 42   | 31   | 23   | 17   | 13,0                      | 4,9  | 3,1  |
| 2200          | 2042 | 1250           | 6   | 14  | 23  | 30  | 29   | 21   | 15   | 12   | 6,8                       | 3,7  | 2,8  |
| 2200          | 2030 | 1850           | 2   | 9   | 17  | 26  | 26   | 18   | 13   | 9    | 1,0                       | 1,8  | 1,5  |
| 2200          | 2031 | 1850           | 3   | 11  | 21  | 32  | 35   | 25   | 17   | 13   | 1,8                       | 2,2  | 1,7  |
| 2200          | 2032 | 1850           | 3   | 13  | 25  | 40  | 47   | 35   | 24   | 18   | 3,5                       | 2,8  | 1,9  |
| 2200          | 2038 | 1850           | 5   | 16  | 29  | 40  | 42   | 31   | 21   | 16   | 5,0                       | 3,1  | 2,3  |
| 2200          | 2041 | 1850           | 9   | 22  | 39  | 55  | 60   | 44   | 30   | 23   | 14,8                      | 4,9  | 3,1  |
| 2200          | 2042 | 1850           | 8   | 20  | 33  | 43  | 41   | 30   | 21   | 15   | 7,5                       | 3,7  | 2,8  |
| 2200          | 2030 | 2450           | 2   | 12  | 23  | 33  | 34   | 23   | 16   | 11   | 1,1                       | 1,8  | 1,5  |
| 2200          | 2031 | 2450           | 3   | 14  | 27  | 41  | 46   | 32   | 22   | 16   | 2,0                       | 2,2  | 1,7  |
| 2200          | 2032 | 2450           | 4   | 17  | 33  | 52  | 60   | 45   | 30   | 22   | 4,0                       | 2,8  | 1,9  |
| 2200          | 2038 | 2450           | 7   | 21  | 38  | 52  | 55   | 39   | 26   | 19   | 5,5                       | 3,1  | 2,3  |
| 2200          | 2041 | 2450           | 11  | 29  | 51  | 60  | 60   | 57   | 38   | 29   | 16,6                      | 4,9  | 3,1  |
| 2200          | 2042 | 2450           | 10  | 26  | 43  | 55  | 54   | 38   | 26   | 19   | 8,2                       | 3,7  | 2,8  |

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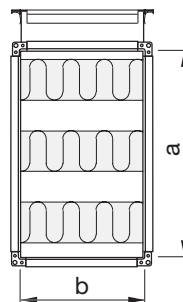
# Rectangular curved silencer

# BDLD

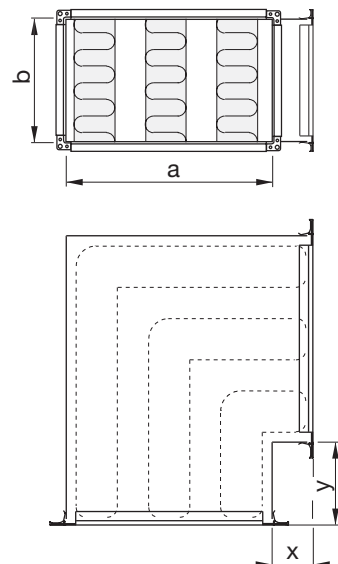


## Dimensions

Vertical mounting



Horizontal mounting



## Description

BDLD is a curved rectangular silencer with conventional design with width and height dimensions that doesn't exceed the present connection dimensions. The silencer can be produced in all normally existing duct dimensions.

## Design

BDLD has an external shell of trapezoidal corrugated sheet metal for stability and reduced risk of oscillation.

BDLD is designed for low pressure drop with baffle combinations that attenuate especially low frequencies well.

The type of insulation material is developed to provide good sound properties, low weight and to be cleanable.

BDLD meets the requirements of air tightness class C and pressure class 2 according to EN 1507:2006.

DLDY is equipped with joining profile type RJFP.

Tools for dimensioning and planning

The software DIMsilencer is recommended for fast choice of silencer or a complete and fast sound calculation of the duct system.

The software CADvent offers dimensioning in an environment with 3D-modelling.

Computerised planning can be conducted with automatic presentation of noise levels, pressure drop etc.

If alternative material is required, this shall be stated when ordering, e.g. aluminium zinc (AZ185), stainless (2333) and acid-proof steel (2343).

The silencer is also available with the following accessories/options.

- TRA = Non-insulated inspection hatch.
- TRB = Hatch intended for external insulation.\*
- TRC = Hatch intended for external insulation.\*
- AIA = 50 mm fire protection insulation. Note! a and b dimensions increase by 100 mm.
- AIB = 100 mm fire protection insulation. Note! a and b dimensions increase by 200 mm.
- AIA+TRB = 50 mm fire protection insulation and the appropriate cleaning cover. Note! a and b dimensions increase by 100 mm.
- AIB+TRC = 100 mm fire protection insulation and the appropriate cleaning cover. Note! a and b dimensions increase by 200 mm..

\* Specify insulation thickness when ordering.

## Ordering example

**BDLD 800 x 600 150-150 3015 TRA**

|                    |  |
|--------------------|--|
| Product            |  |
| Width height a x b |  |
| Leg length x, y    |  |
| Code               |  |
| Accessories        |  |



# Rectangular curved silencer

# BDLD

## Manual designing for BDLD

A number of silencers can be designed manually, for more combinations of silencers and faster calculations use DIMsilencer. Manual method of calculation is shown below:

**A** Specify connection dimensions and flow-type location of the silencer.

|            |             |    |
|------------|-------------|----|
| Width      | 800         | mm |
| Height     | 1000        | mm |
| Leg length | 150         | mm |
| Location   | Exhaust air |    |

BDLD-800-1000-150-3008

**B** Specify the sound power level before the silencer.  
 Read the insertion attenuation from the tables on page 222–224.  
 Calculate the sound power level after the silencer irrespective of the air flow (self generated noise).

### Insertion attenuation

|   | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz | Resistance number | Self generated noise number inlet |
|---|-------|--------|-------|-------|--------|--------|--------|--------|-------------------|-----------------------------------|
| Sound power level before silencer                             | 72    | 73     | 73    | 64    | 62     | 59     | 52     | 44     |                   |                                   |
| Attenuation from table page 222–224                           | 3     | 10     | 17    | 17    | 16     | 16     | 17     | 17     | 1,8               | 1,6                               |
| Sound power level after silencer without self generated noise | 69    | 63     | 56    | 47    | 46     | 43     | 35     | 27     |                   |                                   |

**C** Determine the pressure drop with help of the graph on page 219 and table on page 220.  
 In this case we have straight ducts before and after the silencer.

### Pressure drop

|   | Area         | 0,8 m <sup>2</sup> | Air flow                       | 400 l/s |
|---|--------------|--------------------|--------------------------------|---------|
| Graph on page 219, use resistance number, area and air velocity | Air velocity | 5 m/s              | Pressure drop                  | 28 Pa   |
| Correction at disturbance according table on page 220           | Factor       | 1                  | Pressure drop after correction | 28 Pa   |

**D** Determine the self generated noise from the silencer at present air flow.  
 Calculate the sound power level after the silencer inclusive the self generated noise.

### Self generated noise

|   | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz |
|---|-------|--------|-------|-------|--------|--------|--------|--------|
| Graph on page 221, use resistance number and air velocity | 59    | 56     | 49    | 46    | 44     | 40     | 36     | 28     |
| Correction for gross cross section area                   | -1    | -1     | -1    | -1    | -1     | -1     | -1     | -1     |
| Self generated noise                                      | 58    | 55     | 48    | 45    | 43     | 39     | 35     | 27     |
| Sound power level after the silencer                      | 69    | 64     | 57    | 49    | 48     | 44     | 38     | 30     |

(Logarithmical addition of self generated noise and sound power level after the silencer without self generated noise)





# Rectangular curved silencer

BDLD

The following table can be used for own manual calculations in accordance with the example on the previous page.

## Designing table for DLDY

|            |                      |    |
|------------|----------------------|----|
| With       | <input type="text"/> | mm |
| Height     | <input type="text"/> | mm |
| Leg length | <input type="text"/> | mm |
| Location   | <input type="text"/> |    |

## Insertion attenuation

|   | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz | Resis-<br>tance<br>number | Self gene-<br>rated noise<br>number inlet |
|---|-------|--------|-------|-------|--------|--------|--------|--------|---------------------------|---|
| Sound power level before silencer                             |       |        |       |       |        |        |        |        |                           |   |
| Attenuation from table page 222-224                           |       |        |       |       |        |        |        |        |                           |   |
| Sound power level after silencer without self generated noise |       |        |       |       |        |        |        |        |                           |   |

## Pressure drop

|   | Area         | m <sup>2</sup> | Air flow                       | l/s |
|---|--------------|----------------|--------------------------------|-----|
| Graph on page 219, use resistance number, area and air velocity | Air velocity | m/s            | Pressure drop                  | Pa  |
| Correction at disturbance according table on page 220           | Factor       |                | Pressure drop after correction | Pa  |

## Self generated noise

|  | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz |
|--|-------|--------|-------|-------|--------|--------|--------|--------|
| Graph on page 221, use resistance number and air velocity  |       |        |       |       |        |        |        |        |
| Correction for gross cross section area  |       |        |       |       |        |        |        |        |
| Self generated noise   |       |        |       |       |        |        |        |        |
| Sound power level after the silencer<br>(Logarithmical addition of self generated noise and sound power level after the silencer without self generated noise) |       |        |       |       |        |        |        |        |





# Rectangular curved silencer

BDLD

## Pressure drop

Follow the directions below and the adjoining graph.

- 1 Calculate the gross cross section area  $a \times b$  in  $m^2$ .
- 2 Go horizontal in the graph to the present air flow, l/s.
- 3 Go up to the resistance number achieved from the tables on page 222–224.
- 4 Read the pressure drop over the silencer, at straight duct connection before and after the silencer, (factor 1,0). For other modes of connection see the table for correction on page 220.
- 5 Air flow velocity, which is used at the calculation of the self generated noise, can be read here.

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# Rectangular curved silencer

BDLD

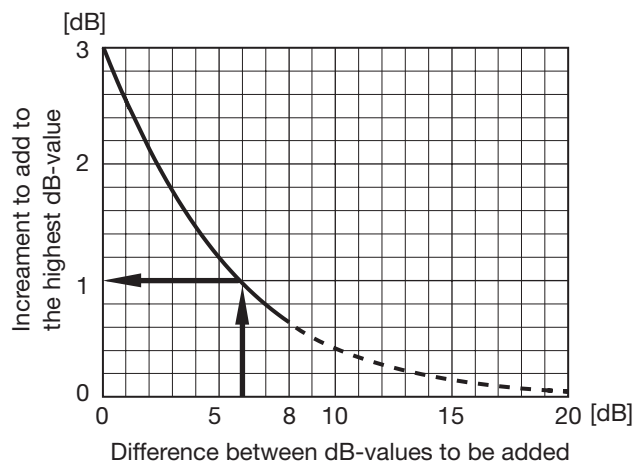
## Pressure drop

Present pressure drop = Read pressure drop × below factor  
 D = The largest connection side (a or b) of the silencer.

The table contains of a selection of the most common disturbance cases.

| Before the silencer          |      |         |      | Silencer | After the silencer          |      |     |     | Factor |
|------------------------------|------|---------|------|----------|-----------------------------|------|-----|-----|--------|
| Distance before the silencer |      |         |      |          | Distance after the silencer |      |     |     |        |
| 3xD                          | 2xD  | 1xD     | 0xD  |          | 0xD                         | 1xD  | 2xD | 3xD |        |
| Duct                         |      |         |      | Silencer | Duct                        |      |     |     | 1,0    |
| Bend                         |      |         |      | Silencer | Duct                        |      |     |     | 1,1    |
|                              | Bend |         |      | Silencer | Duct                        |      |     |     | 1,2    |
|                              |      | Bend    |      | Silencer | Duct                        |      |     |     | 1,4    |
|                              |      |         | Bend | Silencer | Duct                        |      |     |     | 1,5    |
| Duct                         |      |         |      | Silencer |                             | Bend |     |     | 1,2    |
| Duct                         |      |         |      | Silencer | Bend                        |      |     |     | 1,3    |
| Bend                         |      |         |      | Silencer |                             | Bend |     |     | 1,3    |
| Bend                         |      |         |      | Silencer | Bend                        |      |     |     | 1,4    |
|                              | Bend |         |      | Silencer | Bend                        |      |     |     | 1,5    |
|                              |      | Bend    |      | Silencer | Bend                        |      |     |     | 1,6    |
|                              |      |         | Bend | Silencer | Bend                        |      |     |     | 1,7    |
|                              |      |         | Bend | Silencer | Bend                        |      |     |     | 1,8    |
|                              |      |         | Bend | Silencer | Bend                        |      |     |     | 1,9    |
|                              |      |         | Bend | Silencer | Bend                        |      |     |     | 2,0    |
|                              |      | Chamber |      | Silencer | Duct branch                 |      |     |     | 2,0    |
| Duct                         |      |         |      | Silencer | Chamber                     |      |     |     | 3,0    |
|                              |      | Chamber |      | Silencer | Chamber                     |      |     |     | 3,5    |

## Logarithmic addition



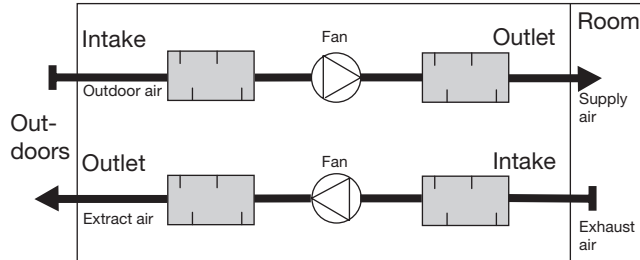


# Rectangular curved silencer

# BDLD

## Self generated noise per frequency band

- 6 Decide from the location of the silencer whether it is the supply or exhaust graph that shall be used. (Rule of memory - the side that leads away from the fan, i.e. at supply air the outlet graph is used and at exhaust air the in-take graph.)



- 7 Go horizontally into the present graph, at present air velocity, to the self generated noise number.
- 8 Then go vertically up to the crossing of the different frequency band lines.
- 9 Read the self generated noise, at gross cross section area 1 m<sup>2</sup>, for each frequency band straight out to the left. In the example only the 8000 Hz-reading is shown.
- 10 Add or subtract the correction for the present gross cross section area.

## Sound power level after the silencer

The sound power level after the silencer can be calculated for all frequencies by a logarithmical addition of:

"The self generated noise" and "The sound power level before the silencer".

The shown example gives at 8000 Hz

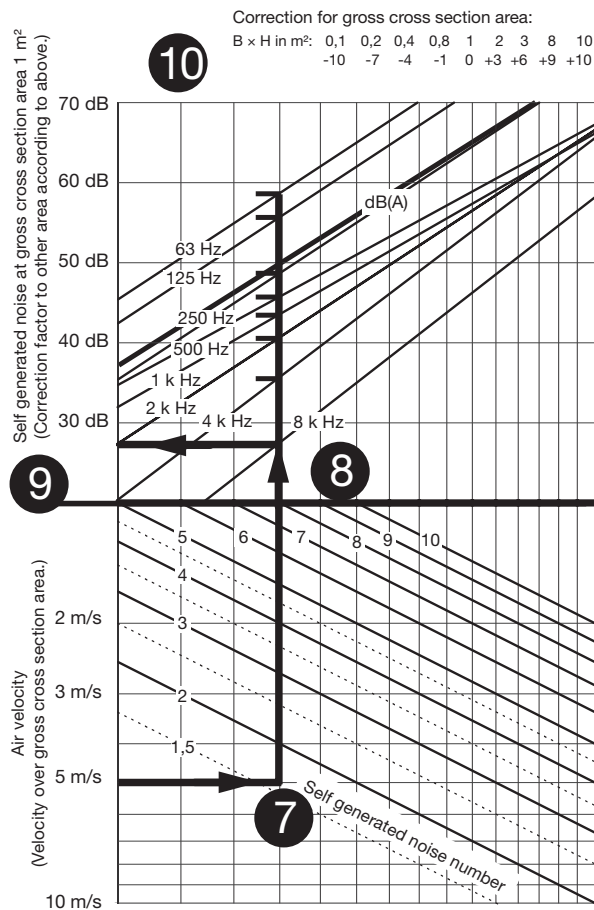
$$\text{Self generated noise} = 28 \text{ dB} - 1 \text{ dB} = 27 \text{ dB}$$

$$\text{Sound power level before the silencer - the attenuation: } 44 \text{ dB} - 17 \text{ dB} = 27 \text{ dB}$$

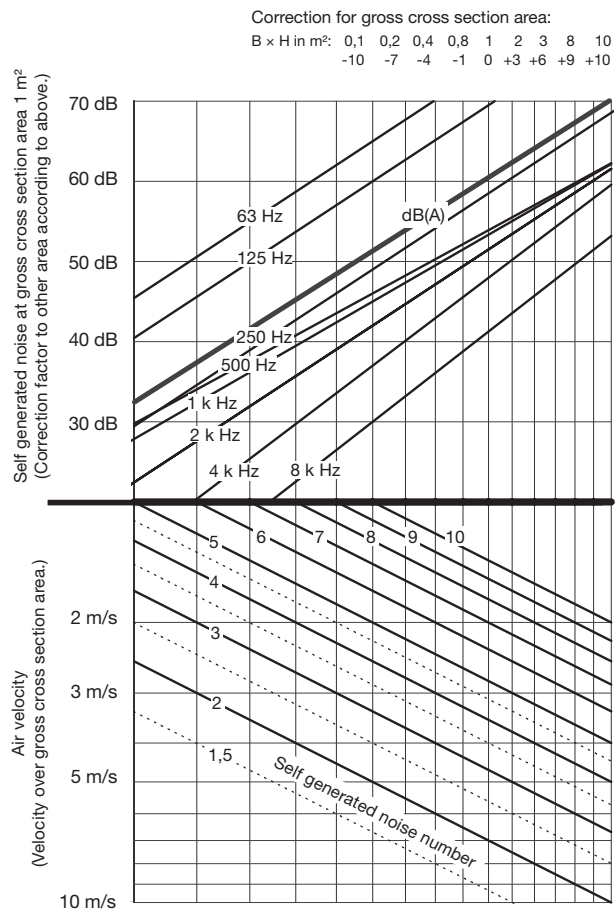
$$\text{Logarithmic addition of } 27 \text{ and } 27 = 30 \text{ dB}$$

(See graph for logarithmical addition on page 220.)

Self generated noise in intake BDLD



Self generated noise in outlet BDLD





# Rectangular curved silencer

BDLD

| Width a<br>mm | Code | Leg<br>length<br>(x+y)/2<br>mm | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      |      | Resis-<br>tance<br>number | Self gener-<br>ated noise<br>number/Out-<br>lett |
|---------------|------|--------------------------------|---|-----|-----|-----|------|------|------|------|---------------------------|--|
|               |      |                                | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                           |  |
| 400           | 3006 | 150                            | 1   | 6   | 16  | 17  | 17   | 14   | 13   | 15   | 3,3                       | 2,0  |
| 400           | 3009 | 150                            | 1   | 7   | 12  | 12  | 13   | 12   | 11   | 12   | 3,3                       | 2,0  |
| 400           | 3010 | 150                            | 1   | 8   | 14  | 14  | 14   | 13   | 12   | 13   | 7,1                       | 2,7  |
| 400           | 3006 | 300                            | 1   | 8   | 20  | 23  | 25   | 20   | 17   | 17   | 3,6                       | 2,0  |
| 400           | 3009 | 300                            | 1   | 8   | 15  | 16  | 17   | 14   | 13   | 13   | 3,4                       | 2,0  |
| 400           | 3010 | 300                            | 2   | 10  | 18  | 19  | 20   | 16   | 14   | 15   | 7,4                       | 2,7  |
| 400           | 3006 | 450                            | 1   | 9   | 23  | 29  | 34   | 26   | 21   | 20   | 3,8                       | 2,0  |
| 400           | 3009 | 450                            | 2   | 10  | 19  | 20  | 22   | 17   | 14   | 14   | 3,5                       | 2,0  |
| 400           | 3010 | 450                            | 2   | 12  | 22  | 24  | 26   | 20   | 17   | 16   | 7,6                       | 2,7  |
| 500           | 3006 | 150                            | 1   | 7   | 15  | 15  | 15   | 14   | 13   | 14   | 2,0                       | 1,7  |
| 500           | 3007 | 150                            | 2   | 8   | 21  | 22  | 20   | 17   | 17   | 19   | 6,0                       | 2,5  |
| 500           | 3014 | 150                            | 2   | 11  | 15  | 15  | 15   | 14   | 13   | 14   | 12,4                      | 3,3  |
| 500           | 3006 | 300                            | 1   | 8   | 18  | 19  | 21   | 18   | 16   | 16   | 2,1                       | 1,7  |
| 500           | 3007 | 300                            | 2   | 10  | 25  | 29  | 31   | 27   | 23   | 23   | 6,7                       | 2,5  |
| 500           | 3014 | 300                            | 3   | 13  | 20  | 21  | 21   | 18   | 16   | 16   | 12,8                      | 3,3  |
| 500           | 3006 | 450                            | 2   | 9   | 20  | 24  | 27   | 22   | 18   | 18   | 2,2                       | 1,7  |
| 500           | 3007 | 450                            | 3   | 12  | 29  | 35  | 42   | 36   | 29   | 27   | 7,5                       | 2,5  |
| 500           | 3014 | 450                            | 4   | 16  | 25  | 26  | 27   | 22   | 18   | 18   | 13,2                      | 3,3  |
| 600           | 3006 | 150                            | 2   | 7   | 14  | 14  | 14   | 14   | 14   | 14   | 1,5                       | 1,5  |
| 600           | 3007 | 150                            | 2   | 9   | 19  | 19  | 18   | 16   | 17   | 18   | 3,3                       | 2,0  |
| 600           | 3008 | 150                            | 3   | 11  | 26  | 27  | 24   | 20   | 20   | 22   | 9,6                       | 3,0  |
| 600           | 3006 | 300                            | 2   | 8   | 17  | 17  | 18   | 16   | 15   | 16   | 1,5                       | 1,5  |
| 600           | 3007 | 300                            | 2   | 10  | 23  | 25  | 27   | 23   | 20   | 21   | 3,6                       | 2,0  |
| 600           | 3008 | 300                            | 4   | 13  | 30  | 34  | 34   | 29   | 26   | 27   | 11,1                      | 3,0  |
| 600           | 3006 | 450                            | 2   | 9   | 19  | 21  | 23   | 19   | 17   | 17   | 1,6                       | 1,5  |
| 600           | 3007 | 450                            | 3   | 12  | 26  | 31  | 36   | 29   | 24   | 23   | 3,8                       | 2,0  |
| 600           | 3008 | 450                            | 4   | 15  | 34  | 40  | 45   | 39   | 33   | 31   | 12,7                      | 3,0  |
| 700           | 3008 | 150                            | 3   | 9   | 18  | 18  | 17   | 16   | 16   | 18   | 2,3                       | 1,8  |
| 700           | 3011 | 150                            | 4   | 12  | 22  | 22  | 20   | 18   | 19   | 20   | 8,0                       | 2,8  |
| 700           | 3012 | 150                            | 3   | 11  | 17  | 17  | 16   | 16   | 16   | 17   | 5,0                       | 2,3  |
| 700           | 3008 | 300                            | 3   | 11  | 21  | 22  | 23   | 21   | 19   | 20   | 2,4                       | 1,8  |
| 700           | 3011 | 300                            | 4   | 14  | 27  | 29  | 31   | 26   | 23   | 24   | 8,7                       | 2,8  |
| 700           | 3012 | 300                            | 4   | 13  | 21  | 22  | 22   | 20   | 18   | 19   | 5,2                       | 2,3  |
| 700           | 3008 | 450                            | 3   | 12  | 24  | 27  | 30   | 25   | 22   | 22   | 2,5                       | 1,8  |
| 700           | 3011 | 450                            | 5   | 16  | 31  | 36  | 41   | 34   | 28   | 27   | 9,4                       | 2,8  |
| 700           | 3012 | 450                            | 4   | 15  | 25  | 27  | 28   | 24   | 21   | 20   | 5,4                       | 2,3  |
| 800           | 3008 | 150                            | 3   | 10  | 17  | 17  | 16   | 16   | 17   | 17   | 1,8                       | 1,6  |
| 800           | 3009 | 150                            | 4   | 11  | 22  | 21  | 19   | 19   | 19   | 21   | 3,3                       | 2,0  |
| 800           | 3012 | 150                            | 4   | 12  | 20  | 20  | 18   | 18   | 18   | 20   | 4,7                       | 2,3  |
| 800           | 3015 | 150                            | 6   | 16  | 26  | 26  | 23   | 21   | 22   | 23   | 19,2                      | 4,0  |
| 800           | 3008 | 300                            | 3   | 11  | 20  | 21  | 21   | 20   | 19   | 19   | 1,8                       | 1,6  |
| 800           | 3009 | 300                            | 4   | 13  | 25  | 27  | 28   | 25   | 23   | 23   | 3,6                       | 2,0  |
| 800           | 3012 | 300                            | 4   | 14  | 24  | 26  | 26   | 23   | 22   | 22   | 5,0                       | 2,3  |
| 800           | 3015 | 300                            | 7   | 19  | 31  | 34  | 33   | 30   | 27   | 28   | 21,1                      | 4,0  |
| 800           | 3008 | 450                            | 3   | 12  | 23  | 25  | 27   | 23   | 21   | 20   | 1,9                       | 1,6  |
| 800           | 3009 | 450                            | 4   | 14  | 28  | 33  | 37   | 31   | 27   | 26   | 3,8                       | 2,0  |
| 800           | 3012 | 450                            | 5   | 16  | 28  | 31  | 33   | 28   | 25   | 24   | 5,3                       | 2,3  |
| 800           | 3015 | 450                            | 8   | 21  | 37  | 41  | 44   | 40   | 33   | 32   | 22,9                      | 4,0  |
| 900           | 3008 | 150                            | 3   | 10  | 17  | 16  | 15   | 16   | 17   | 17   | 1,5                       | 1,5  |
| 900           | 3010 | 150                            | 5   | 13  | 25  | 25  | 22   | 21   | 22   | 23   | 4,5                       | 2,3  |
| 900           | 3011 | 150                            | 7   | 15  | 30  | 31  | 26   | 23   | 25   | 27   | 9,6                       | 3,0  |
| 900           | 3013 | 150                            | 5   | 13  | 19  | 18  | 17   | 17   | 18   | 19   | 3,3                       | 2,0  |
| 900           | 3008 | 300                            | 3   | 11  | 19  | 19  | 20   | 19   | 18   | 19   | 1,5                       | 1,5  |
| 900           | 3010 | 300                            | 5   | 15  | 29  | 31  | 32   | 29   | 27   | 27   | 5,0                       | 2,3  |
| 900           | 3011 | 300                            | 7   | 17  | 34  | 38  | 37   | 33   | 31   | 32   | 11,1                      | 3,0  |
| 900           | 3013 | 300                            | 5   | 14  | 22  | 23  | 23   | 21   | 21   | 21   | 3,5                       | 2,0  |
| 900           | 3008 | 450                            | 3   | 12  | 22  | 23  | 24   | 22   | 20   | 20   | 1,6                       | 1,5  |
| 900           | 3010 | 450                            | 6   | 16  | 33  | 38  | 43   | 37   | 31   | 31   | 5,5                       | 2,3  |
| 900           | 3011 | 450                            | 7   | 19  | 38  | 44  | 47   | 42   | 37   | 36   | 12,7                      | 3,0  |



# Rectangular curved silencer

BDLD

| Width a<br>mm | Code | Leg<br>length<br>(x+y)/2<br>mm | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      |      | Resis-<br>tance<br>number | Self gener-<br>ated noise<br>number<br>Intake/Out-<br>lett |
|---------------|------|--------------------------------|---|-----|-----|-----|------|------|------|------|---------------------------|--|
|               |      |                                | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                           |  |
| 900           | 3013 | 450                            | 5   | 16  | 26  | 28  | 29   | 25   | 23   | 23   | 3,6                       | 2,0  |
| 1000          | 3009 | 150                            | 5   | 12  | 20  | 19  | 18   | 18   | 19   | 20   | 2,0                       | 1,7  |
| 1000          | 3010 | 150                            | 6   | 13  | 24  | 23  | 20   | 20   | 21   | 23   | 3,3                       | 2,0  |
| 1000          | 3011 | 150                            | 7   | 15  | 28  | 28  | 24   | 23   | 24   | 26   | 6,0                       | 2,5  |
| 1000          | 3014 | 150                            | 9   | 18  | 32  | 32  | 27   | 24   | 26   | 29   | 19,2                      | 4,0  |
| 1000          | 3009 | 300                            | 5   | 13  | 23  | 23  | 23   | 22   | 22   | 22   | 2,1                       | 1,7  |
| 1000          | 3010 | 300                            | 6   | 15  | 27  | 29  | 29   | 27   | 25   | 26   | 3,6                       | 2,0  |
| 1000          | 3011 | 300                            | 7   | 16  | 32  | 35  | 35   | 32   | 30   | 30   | 6,7                       | 2,5  |
| 1000          | 3014 | 300                            | 10  | 21  | 37  | 39  | 37   | 34   | 32   | 33   | 22,0                      | 4,0  |
| 1000          | 3009 | 450                            | 5   | 14  | 25  | 27  | 29   | 26   | 24   | 24   | 2,2                       | 1,7  |
| 1000          | 3010 | 450                            | 6   | 16  | 31  | 35  | 38   | 33   | 29   | 28   | 3,8                       | 2,0  |
| 1000          | 3011 | 450                            | 7   | 18  | 36  | 41  | 45   | 42   | 36   | 35   | 7,5                       | 2,5  |
| 1000          | 3014 | 450                            | 10  | 24  | 42  | 46  | 48   | 43   | 39   | 38   | 24,8                      | 4,0  |
| 1200          | 3010 | 150                            | 6   | 13  | 19  | 17  | 17   | 18   | 19   | 20   | 1,5                       | 1,5  |
| 1200          | 3011 | 150                            | 7   | 14  | 22  | 21  | 19   | 20   | 21   | 22   | 2,1                       | 1,7  |
| 1200          | 3012 | 150                            | 8   | 15  | 26  | 24  | 21   | 22   | 24   | 25   | 3,3                       | 2,0  |
| 1200          | 3014 | 150                            | 11  | 18  | 34  | 34  | 28   | 26   | 29   | 31   | 9,6                       | 3,0  |
| 1200          | 3018 | 150                            | 12  | 21  | 34  | 34  | 28   | 26   | 29   | 31   | 19,2                      | 4,0  |
| 1200          | 3010 | 300                            | 6   | 14  | 21  | 21  | 21   | 21   | 21   | 21   | 1,5                       | 1,5  |
| 1200          | 3011 | 300                            | 7   | 15  | 25  | 25  | 25   | 24   | 24   | 24   | 2,3                       | 1,7  |
| 1200          | 3012 | 300                            | 8   | 17  | 29  | 30  | 30   | 28   | 27   | 28   | 3,6                       | 2,0  |
| 1200          | 3014 | 300                            | 11  | 20  | 38  | 41  | 38   | 36   | 35   | 36   | 11,1                      | 3,0  |
| 1200          | 3018 | 300                            | 13  | 24  | 39  | 41  | 38   | 36   | 35   | 36   | 22,0                      | 4,0  |
| 1200          | 3010 | 450                            | 6   | 15  | 24  | 24  | 25   | 24   | 23   | 22   | 1,6                       | 1,5  |
| 1200          | 3011 | 450                            | 7   | 16  | 28  | 30  | 31   | 29   | 27   | 26   | 2,4                       | 1,7  |
| 1200          | 3012 | 450                            | 8   | 18  | 32  | 36  | 39   | 34   | 31   | 31   | 3,8                       | 2,0  |
| 1200          | 3014 | 450                            | 11  | 22  | 42  | 47  | 49   | 45   | 41   | 40   | 12,7                      | 3,0  |
| 1200          | 3018 | 450                            | 14  | 27  | 44  | 48  | 49   | 45   | 41   | 40   | 24,8                      | 4,0  |
| 1400          | 3012 | 150                            | 8   | 15  | 21  | 19  | 18   | 20   | 22   | 22   | 1,6                       | 1,6  |
| 1400          | 3013 | 150                            | 9   | 16  | 24  | 22  | 20   | 22   | 23   | 25   | 2,3                       | 1,8  |
| 1400          | 3014 | 150                            | 10  | 17  | 27  | 26  | 22   | 23   | 26   | 27   | 3,3                       | 2,0  |
| 1400          | 3015 | 150                            | 12  | 19  | 31  | 30  | 25   | 25   | 28   | 30   | 5,0                       | 2,3  |
| 1400          | 3016 | 150                            | 13  | 20  | 35  | 34  | 28   | 27   | 30   | 33   | 8,0                       | 2,8  |
| 1400          | 3020 | 150                            | 16  | 24  | 36  | 36  | 29   | 28   | 31   | 34   | 19,2                      | 4,0  |
| 1400          | 3022 | 150                            | 11  | 20  | 23  | 21  | 19   | 21   | 23   | 24   | 5,0                       | 2,3  |
| 1400          | 3012 | 300                            | 8   | 16  | 24  | 23  | 23   | 23   | 23   | 24   | 1,7                       | 1,6  |
| 1400          | 3013 | 300                            | 9   | 17  | 27  | 27  | 26   | 26   | 26   | 27   | 2,4                       | 1,8  |
| 1400          | 3014 | 300                            | 10  | 19  | 31  | 32  | 31   | 30   | 29   | 30   | 3,6                       | 2,0  |
| 1400          | 3015 | 300                            | 12  | 20  | 35  | 36  | 35   | 34   | 33   | 33   | 5,5                       | 2,3  |
| 1400          | 3016 | 300                            | 14  | 22  | 39  | 41  | 38   | 37   | 36   | 37   | 9,2                       | 2,8  |
| 1400          | 3020 | 300                            | 17  | 27  | 41  | 43  | 39   | 38   | 37   | 38   | 22,0                      | 4,0  |
| 1400          | 3022 | 300                            | 11  | 22  | 27  | 26  | 25   | 25   | 25   | 25   | 5,2                       | 2,3  |
| 1400          | 3012 | 450                            | 8   | 17  | 26  | 27  | 27   | 26   | 25   | 25   | 1,8                       | 1,6  |
| 1400          | 3013 | 450                            | 9   | 19  | 30  | 32  | 33   | 31   | 29   | 29   | 2,5                       | 1,8  |
| 1400          | 3014 | 450                            | 10  | 20  | 34  | 38  | 39   | 36   | 33   | 32   | 3,8                       | 2,0  |
| 1400          | 3015 | 450                            | 12  | 22  | 39  | 42  | 46   | 42   | 38   | 37   | 6,1                       | 2,3  |
| 1400          | 3016 | 450                            | 14  | 24  | 43  | 47  | 49   | 46   | 42   | 41   | 10,4                      | 2,8  |
| 1400          | 3020 | 450                            | 17  | 29  | 46  | 50  | 50   | 47   | 44   | 43   | 24,8                      | 4,0  |
| 1400          | 3022 | 450                            | 11  | 24  | 31  | 31  | 31   | 29   | 28   | 27   | 5,4                       | 2,3  |
| 1600          | 3013 | 150                            | 9   | 16  | 23  | 20  | 19   | 21   | 23   | 24   | 1,8                       | 1,6  |
| 1600          | 3015 | 150                            | 11  | 18  | 28  | 26  | 22   | 24   | 26   | 28   | 3,3                       | 2,0  |
| 1600          | 3016 | 150                            | 13  | 20  | 31  | 30  | 25   | 26   | 28   | 30   | 4,7                       | 2,3  |
| 1600          | 3017 | 150                            | 14  | 21  | 35  | 34  | 27   | 28   | 31   | 33   | 7,1                       | 2,7  |
| 1600          | 3023 | 150                            | 10  | 20  | 21  | 19  | 17   | 20   | 22   | 22   | 3,3                       | 2,0  |
| 1600          | 3025 | 150                            | 17  | 26  | 33  | 32  | 26   | 27   | 30   | 32   | 19,2                      | 4,0  |
| 1600          | 3013 | 300                            | 9   | 17  | 25  | 24  | 24   | 24   | 25   | 25   | 1,8                       | 1,6  |
| 1600          | 3015 | 300                            | 12  | 20  | 31  | 32  | 31   | 30   | 30   | 31   | 3,6                       | 2,0  |
| 1600          | 3016 | 300                            | 13  | 21  | 35  | 36  | 35   | 34   | 33   | 34   | 5,2                       | 2,3  |
| 1600          | 3017 | 300                            | 15  | 23  | 39  | 40  | 38   | 37   | 36   | 37   | 8,0                       | 2,7  |

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# Rectangular curved silencer

BDDL

|    | Width a mm | Code | Leg length (x+y)/2 mm | Static insertion attenuation / octave band [dB] |     |     |     |      |      |      |      | Resistance number | Self generated noise number Intake/Outlet |
|----|------------|------|-----------------------|---|-----|-----|-----|------|------|------|------|-------------------|---|
|    |            |      |                       | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |                   |   |
| 1  | 1600       | 3023 | 300                   | 11  | 21  | 24  | 23  | 22   | 23   | 23   | 23   | 3,4               | 2,0                                       |
| 2  | 1600       | 3025 | 300                   | 18  | 29  | 39  | 40  | 37   | 36   | 36   | 36   | 21,1              | 4,0                                       |
|    | 1600       | 3013 | 450                   | 9   | 18  | 28  | 28  | 29   | 28   | 27   | 27   | 1,9               | 1,6                                       |
|    | 1600       | 3015 | 450                   | 12  | 21  | 35  | 38  | 40   | 36   | 34   | 33   | 3,8               | 2,0                                       |
| 3  | 1600       | 3016 | 450                   | 13  | 23  | 39  | 43  | 46   | 42   | 38   | 38   | 5,7               | 2,3                                       |
|    | 1600       | 3017 | 450                   | 15  | 25  | 43  | 47  | 49   | 46   | 42   | 42   | 9,0               | 2,7                                       |
|    | 1600       | 3023 | 450                   | 11  | 23  | 27  | 27  | 26   | 26   | 25   | 25   | 3,5               | 2,0                                       |
|    | 1600       | 3025 | 450                   | 19  | 32  | 45  | 47  | 48   | 46   | 41   | 40   | 22,9              | 4,0                                       |
| 4  | 1800       | 3014 | 150                   | 9   | 16  | 23  | 21  | 19   | 21   | 23   | 24   | 1,9               | 1,6                                       |
|    | 1800       | 3016 | 150                   | 11  | 18  | 28  | 26  | 22   | 24   | 26   | 28   | 3,3               | 2,0                                       |
|    | 1800       | 3019 | 150                   | 16  | 22  | 37  | 37  | 29   | 29   | 32   | 35   | 9,6               | 3,0                                       |
|    | 1800       | 3026 | 150                   | 12  | 21  | 23  | 21  | 19   | 21   | 23   | 24   | 4,5               | 2,3                                       |
| 5  | 1800       | 3027 | 150                   | 14  | 23  | 28  | 26  | 22   | 24   | 26   | 28   | 9,6               | 3,0                                       |
|    | 1800       | 3030 | 150                   | 15  | 25  | 27  | 25  | 22   | 23   | 26   | 27   | 11,8              | 3,3                                       |
|    | 1800       | 3014 | 300                   | 9   | 17  | 26  | 25  | 25   | 25   | 25   | 26   | 2,0               | 1,6                                       |
| 6  | 1800       | 3016 | 300                   | 12  | 20  | 31  | 32  | 31   | 30   | 30   | 31   | 3,6               | 2,0                                       |
|    | 1800       | 3019 | 300                   | 16  | 24  | 41  | 43  | 40   | 38   | 38   | 39   | 11,1              | 3,0                                       |
|    | 1800       | 3026 | 300                   | 12  | 23  | 27  | 26  | 24   | 25   | 25   | 26   | 4,7               | 2,3                                       |
|    | 1800       | 3027 | 300                   | 15  | 26  | 33  | 33  | 31   | 30   | 30   | 31   | 10,1              | 3,0                                       |
| 7  | 1800       | 3030 | 300                   | 16  | 27  | 32  | 32  | 30   | 29   | 29   | 30   | 12,5              | 3,3                                       |
|    | 1800       | 3014 | 450                   | 9   | 19  | 28  | 29  | 30   | 29   | 28   | 27   | 2,1               | 1,6                                       |
|    | 1800       | 3016 | 450                   | 12  | 21  | 35  | 38  | 40   | 36   | 34   | 33   | 3,8               | 2,0                                       |
| 8  | 1800       | 3019 | 450                   | 16  | 26  | 46  | 50  | 50   | 48   | 45   | 44   | 12,7              | 3,0                                       |
|    | 1800       | 3026 | 450                   | 12  | 24  | 30  | 30  | 30   | 28   | 28   | 27   | 4,9               | 2,3                                       |
|    | 1800       | 3027 | 450                   | 16  | 28  | 38  | 40  | 40   | 36   | 34   | 33   | 10,7              | 3,0                                       |
|    | 1800       | 3030 | 450                   | 16  | 30  | 37  | 38  | 37   | 35   | 33   | 32   | 13,1              | 3,3                                       |
|    | 2000       | 3016 | 150                   | 9   | 17  | 24  | 22  | 19   | 22   | 24   | 24   | 2,0               | 1,7                                       |
|    | 2000       | 3018 | 150                   | 11  | 18  | 28  | 26  | 22   | 24   | 26   | 28   | 3,3               | 2,0                                       |
|    | 2000       | 3019 | 150                   | 13  | 19  | 30  | 29  | 24   | 25   | 28   | 30   | 4,4               | 2,2                                       |
| 10 | 2000       | 3020 | 150                   | 14  | 20  | 33  | 32  | 26   | 27   | 30   | 32   | 6,0               | 2,5                                       |
|    | 2000       | 3021 | 150                   | 15  | 22  | 36  | 36  | 28   | 28   | 32   | 34   | 8,4               | 2,9                                       |
|    | 2000       | 3026 | 150                   | 18  | 25  | 37  | 37  | 29   | 29   | 32   | 35   | 19,2              | 4,0                                       |
|    | 2000       | 3029 | 150                   | 16  | 24  | 30  | 28  | 24   | 25   | 28   | 29   | 12,4              | 3,3                                       |
| 11 | 2000       | 3016 | 300                   | 9   | 18  | 26  | 26  | 25   | 25   | 26   | 26   | 2,1               | 1,7                                       |
|    | 2000       | 3018 | 300                   | 12  | 20  | 31  | 32  | 31   | 30   | 30   | 31   | 3,6               | 2,0                                       |
|    | 2000       | 3019 | 300                   | 13  | 21  | 34  | 35  | 35   | 33   | 33   | 33   | 4,8               | 2,2                                       |
| 12 | 2000       | 3020 | 300                   | 14  | 22  | 37  | 39  | 37   | 36   | 36   | 36   | 6,7               | 2,5                                       |
|    | 2000       | 3021 | 300                   | 15  | 24  | 40  | 42  | 39   | 38   | 38   | 38   | 9,7               | 2,9                                       |
|    | 2000       | 3026 | 300                   | 19  | 28  | 42  | 44  | 40   | 38   | 38   | 39   | 22,0              | 4,0                                       |
|    | 2000       | 3029 | 300                   | 16  | 27  | 35  | 36  | 34   | 32   | 32   | 33   | 13,3              | 3,3                                       |
| 13 | 2000       | 3016 | 450                   | 10  | 19  | 29  | 30  | 31   | 29   | 28   | 28   | 2,2               | 1,7                                       |
|    | 2000       | 3018 | 450                   | 12  | 21  | 35  | 38  | 40   | 36   | 34   | 33   | 3,8               | 2,0                                       |
|    | 2000       | 3019 | 450                   | 13  | 23  | 38  | 42  | 46   | 41   | 37   | 37   | 5,3               | 2,2                                       |
| 14 | 2000       | 3020 | 450                   | 14  | 24  | 41  | 45  | 48   | 46   | 41   | 40   | 7,5               | 2,5                                       |
|    | 2000       | 3021 | 450                   | 16  | 25  | 44  | 49  | 50   | 47   | 44   | 43   | 11,0              | 2,9                                       |
|    | 2000       | 3026 | 450                   | 19  | 31  | 47  | 51  | 50   | 48   | 45   | 44   | 24,8              | 4,0                                       |
| 15 | 2000       | 3029 | 450                   | 17  | 29  | 41  | 43  | 44   | 40   | 37   | 36   | 14,2              | 3,3                                       |

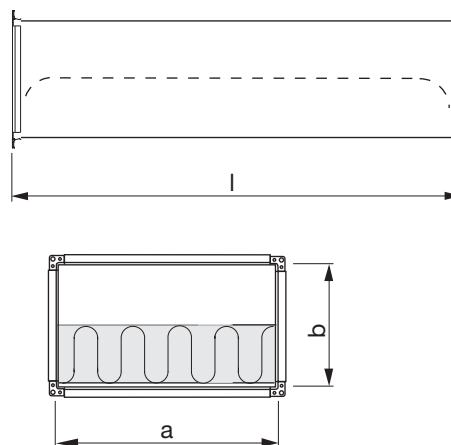


# Rectangular straight low-built silencer

# LRLB



## Dimensions



## Description

Rectangular silencer with low installation height.

Insulation with surface cover which can be cleaned with a rotating brush.

LRLB meets the requirements of tightness class C and pressure class 2 according to EN 1507:2006.

LRLB is equipped with joining profile type RJFP.

Note that the choice of interior fire insulation to reduce the free area of the silencer, leading to higher pressure drop.

| a<br>mm  | b<br>mm | l<br>mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Self generated noise number Intake/Outlet |
|----------|---------|---------|--|-----|-----|-----|----|----|----|----|---|
|          |         |         | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |   |
| 200-1000 | 200     | 650     | 4                                      | 6   | 11  | 13  | 15 | 14 | 12 | 12 | 2,5                                       |
| 200-1000 | 200     | 950     | 5                                      | 9   | 16  | 21  | 23 | 20 | 15 | 14 | 2,5                                       |
| 200-1000 | 200     | 1250    | 6                                      | 11  | 20  | 28  | 31 | 26 | 17 | 15 | 2,5                                       |
| 250-1000 | 250     | 650     | 5                                      | 8   | 10  | 13  | 12 | 11 | 10 | 9  | 2,5                                       |
| 250-1000 | 250     | 950     | 6                                      | 10  | 15  | 19  | 18 | 15 | 12 | 11 | 2,5                                       |
| 250-1000 | 250     | 1250    | 6                                      | 12  | 19  | 25  | 22 | 18 | 14 | 12 | 2,5                                       |
| 300-1000 | 300     | 650     | 4                                      | 8   | 11  | 15  | 12 | 13 | 11 | 10 | 3   |
| 300-1000 | 300     | 950     | 5                                      | 10  | 15  | 19  | 17 | 19 | 15 | 13 | 3   |
| 300-1000 | 300     | 1250    | 6                                      | 13  | 18  | 23  | 21 | 22 | 17 | 15 | 3   |
| 350-1000 | 150     | 650     | 3                                      | 7   | 15  | 19  | 20 | 17 | 16 | 14 | 3   |
| 350-1000 | 150     | 950     | 3                                      | 9   | 21  | 28  | 30 | 28 | 23 | 19 | 3   |
| 350-1000 | 150     | 1250    | 4                                      | 12  | 26  | 35  | 40 | 37 | 29 | 22 | 3   |
| 350-1000 | 350     | 650     | 4                                      | 7   | 7   | 11  | 10 | 9  | 8  | 7  | 2,3                                       |
| 350-1000 | 350     | 950     | 5                                      | 9   | 10  | 14  | 13 | 11 | 9  | 8  | 2,3                                       |
| 350-1000 | 350     | 1250    | 5                                      | 11  | 13  | 18  | 17 | 14 | 10 | 9  | 2,3                                       |
| 400-1000 | 400     | 650     | 3                                      | 6   | 6   | 10  | 12 | 14 | 12 | 11 | 1,9                                       |
| 400-1000 | 400     | 950     | 4                                      | 8   | 9   | 15  | 19 | 20 | 15 | 12 | 1,9                                       |
| 400-1000 | 400     | 1250    | 6                                      | 10  | 12  | 20  | 25 | 24 | 17 | 14 | 1,9                                       |

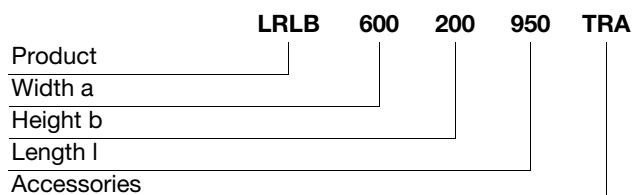
If alternative material is required, this shall be stated when ordering, e.g. aluminium zinc (AZ185), stainless (2333) and acid-proof steel (2343).

The silencer is also available with the following accessories/options.

- TRA = Non-insulated inspection hatch.
- TRB = Hatch intended for external insulation.\*
- AIC = **Internal** 50 mm fire protection insulation. All insulation is covered with perforated steel.
- AIB+TRB = **Internal** 50 mm fire protection insulation as above and cleaning outlet for internal insulation.

\* Specify insulation thickness when ordering.

## Ordering example





# Rectangular straight low-built silencer

LRLB

## Manual designing for LRLB

A number of silencers can be designed manually, for more combinations of silencers and faster calculations use DIMsilencer. Manual method of calculation is shown below:

**A** Specify connection dimensions and flow-type location of the silencer.

|            |             |    |
|------------|-------------|----|
| Width      | 800         | mm |
| Height     | 200         | mm |
| Leg length | 950         | mm |
| Location   | Exhaust air |    |

LRLB-800-200-950

**B** Specify the sound power level before the silencer. Read the insertion attenuation from the table on pages 225. Calculate the sound power level after the silencer irrespective of the air flow (self generated noise).

### Insertion attenuation

|   | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz | Self generated noise number inlet |
|---|-------|--------|-------|-------|--------|--------|--------|--------|-----------------------------------|
| Sound power level before silencer                             | 72    | 73     | 73    | 64    | 62     | 59     | 52     | 44     |                                   |
| Attenuation from table pages 225                              | 5     | 9      | 16    | 21    | 23     | 20     | 15     | 14     | 1,6                               |
| Sound power level after silencer without self generated noise | 67    | 64     | 57    | 43    | 39     | 39     | 37     | 30     |                                   |

**C** Determine the pressure drop with help of the graph on page 228–229 and table on page 230. In this case we have straight ducts before and after the silencer.

### Pressure drop

|   | Area         | 0,16 m <sup>2</sup> | Air flow                       | 600 l/s |
|---|--------------|---------------------|--------------------------------|---------|
| Graph on page 228–229, use resistance number, area and air velocity | Air velocity | 3,8 m/s             | Pressure drop                  | 35 Pa   |
| Correction at disturbance according table on page 230               | Factor       | 1                   | Pressure drop after correction | 35 Pa   |

**D** Determine the self generated noise from the silencer at present air flow. Calculate the sound power level after the silencer inclusive the self generated noise.

### Self generated noise

|  | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz |
|--|-------|--------|-------|-------|--------|--------|--------|--------|
| Graph on page 231, use resistance number and air velocity  | 52    | 47     | 45    | 42    | 38     | 34     | 30     | 22     |
| Correction for gross cross section area  | -9    | -9     | -9    | -9    | -9     | -9     | -9     | -9     |
| Self generated noise   | 43    | 38     | 36    | 33    | 29     | 25     | 21     | 13     |
| Sound power level after the silencer<br>(Logarithmical addition of self generated noise and sound power level after the silencer without self generated noise) | 67    | 64     | 57    | 43    | 39     | 39     | 37     | 30     |





# Rectangular straight low-built silencer

LRLB

The following table can be used for own manual calculations in accordance with the example on the previous page.

## Designing table for LRLB

|            |                      |    |
|------------|----------------------|----|
| With       | <input type="text"/> | mm |
| Height     | <input type="text"/> | mm |
| Leg length | <input type="text"/> | mm |
| Location   | <input type="text"/> |    |

## Insertion attenuation

|   | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz | Self generated noise number inlet |
|---|-------|--------|-------|-------|--------|--------|--------|--------|-----------------------------------|
| Sound power level before silencer                             |       |        |       |       |        |        |        |        |                                   |
| Attenuation from table pages 225                              |       |        |       |       |        |        |        |        |                                   |
| Sound power level after silencer without self generated noise |       |        |       |       |        |        |        |        |                                   |

## Pressure drop

|   | Area         | m <sup>2</sup> | Air flow                       | l/s |
|---|--------------|----------------|--------------------------------|-----|
| Graph on page 228–229, use resistance number, area and air velocity | Air velocity | m/s            | Pressure drop                  | Pa  |
| Correction at disturbance according table on page 230               | Factor       |                | Pressure drop after correction | Pa  |

## Self generated noise

|  | 63 Hz | 125 Hz | 250Hz | 500Hz | 1000Hz | 2000Hz | 4000Hz | 8000Hz |
|--|-------|--------|-------|-------|--------|--------|--------|--------|
| Graph on page 231, use resistance number and air velocity  |       |        |       |       |        |        |        |        |
| Correction for gross cross section area  |       |        |       |       |        |        |        |        |
| Self generated noise   |       |        |       |       |        |        |        |        |
| Sound power level after the silencer<br>(Logarithmical addition of self generated noise and sound power level after the silencer without self generated noise) |       |        |       |       |        |        |        |        |

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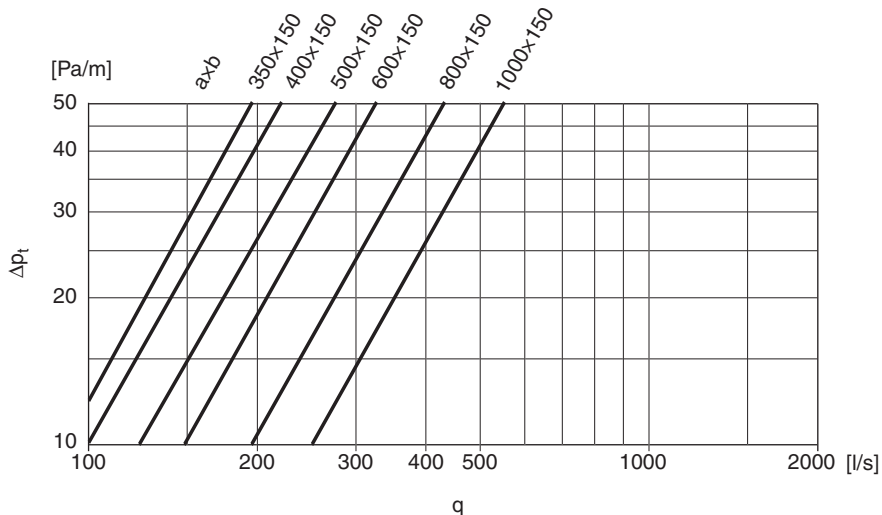
# Rectangular straight low-built silencer

LRLB

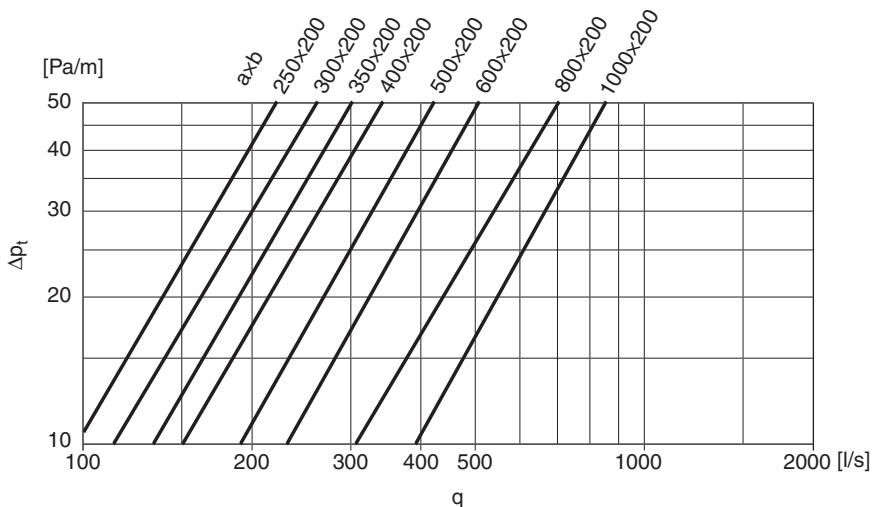
## Technical data

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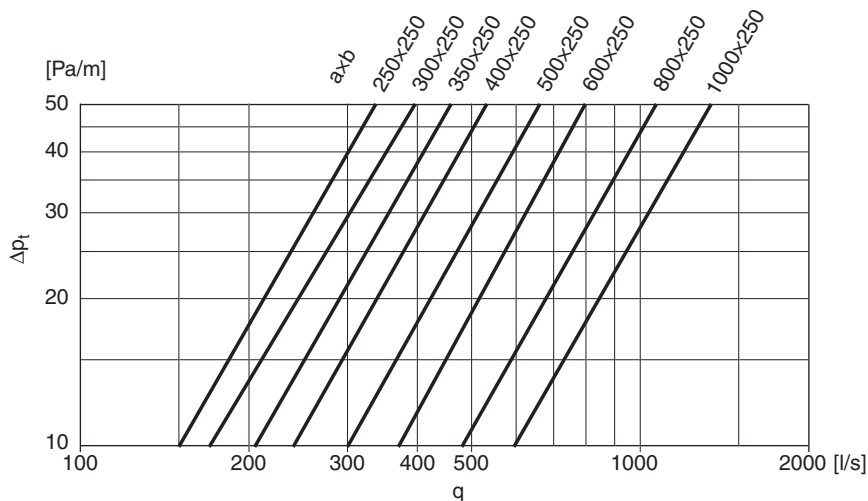
### Height 150 mm



### Height 200 mm



### Height 250 mm



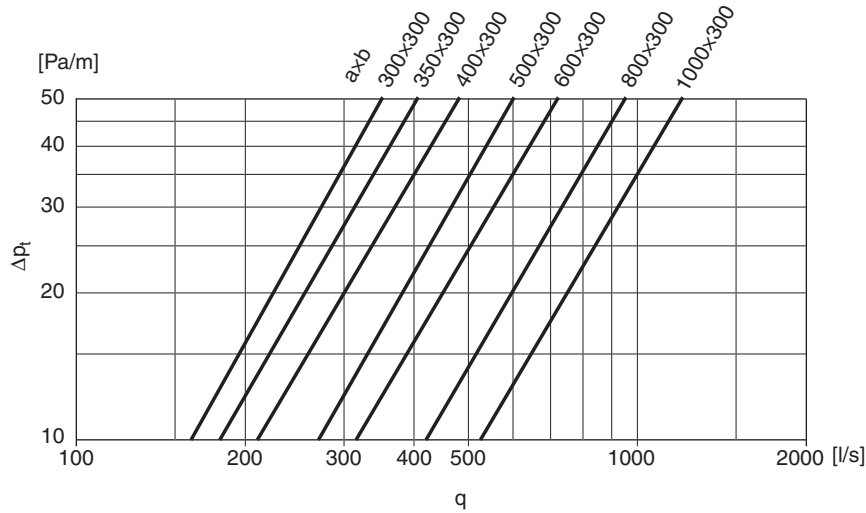


# Rectangular straight low-built silencer

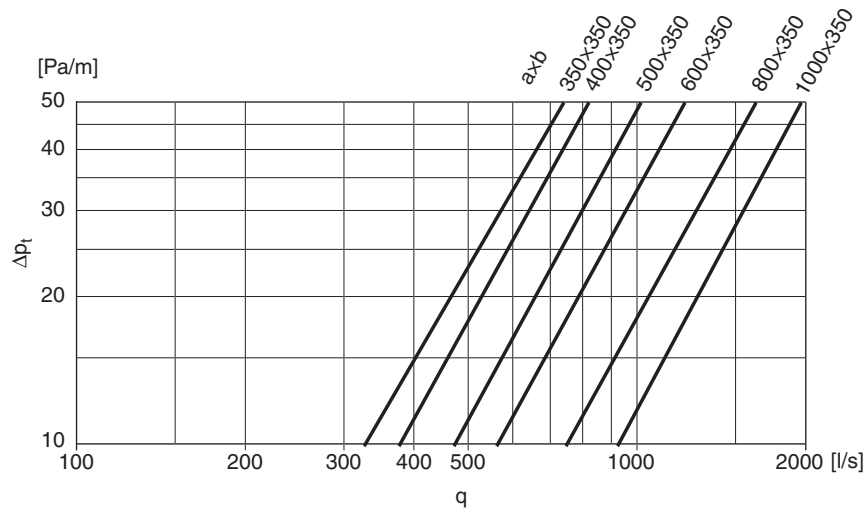
LRLB

## Technical data

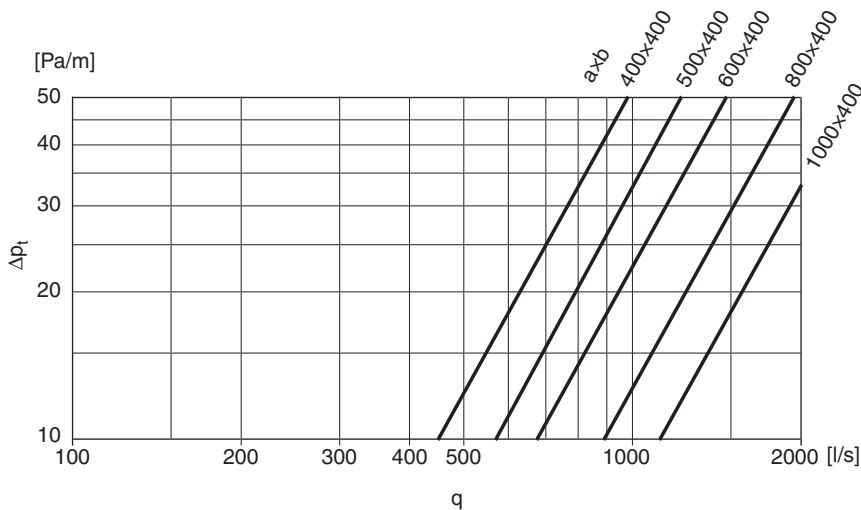
### Height 300 mm



### Height 350 mm



### Height 400 mm



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# Rectangular straight low-built silencer

LRLB

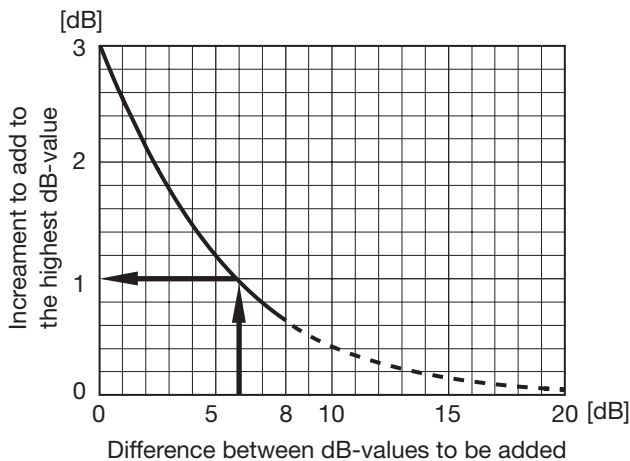
## Pressure drop

Present pressure drop = Read pressure drop × below factor  
 D = The largest connection side (a or b) of the silencer.

The table contains of a selection of the most common disturbance cases.

| Before the silencer          |      |      |      | Silencer | After the silencer          |             |     |     | Factor |     |
|------------------------------|------|------|------|----------|-----------------------------|-------------|-----|-----|--------|-----|
| Distance before the silencer |      |      |      |          | Distance after the silencer |             |     |     |        |     |
| 3xD                          | 2xD  | 1xD  | 0xD  |          | 0xD                         | 1xD         | 2xD | 3xD |        |     |
| Duct                         |      |      |      | Silencer | Duct                        |             |     |     | 1,0    |     |
| Bend                         |      |      |      | Silencer | Duct                        |             |     |     | 1,1    |     |
|                              | Bend |      |      | Silencer | Duct                        |             |     |     | 1,2    |     |
|                              |      | Bend |      | Silencer | Duct                        |             |     |     | 1,4    |     |
|                              |      |      | Bend | Silencer | Duct                        |             |     |     | 1,5    |     |
| Duct                         |      |      |      | Silencer |                             | Bend        |     |     | 1,2    |     |
| Duct                         |      |      |      | Silencer | Bend                        |             |     |     | 1,3    |     |
| Bend                         |      |      |      | Silencer |                             | Bend        |     |     | 1,3    |     |
| Bend                         |      |      |      | Silencer | Bend                        |             |     |     | 1,4    |     |
|                              | Bend |      |      | Silencer | Bend                        | Bend        |     |     | 1,5    |     |
|                              | Bend |      |      | Silencer | Bend                        | Bend        |     |     | 1,6    |     |
|                              |      | Bend |      | Silencer | Bend                        | Bend        |     |     | 1,7    |     |
|                              |      | Bend |      | Silencer | Bend                        | Bend        |     |     | 1,8    |     |
|                              |      |      | Bend | Silencer | Bend                        | Bend        |     |     | 1,9    |     |
|                              |      |      | Bend | Silencer | Bend                        | Bend        |     |     | 2,0    |     |
|                              |      |      |      | Chamber  | Silencer                    | Duct branch |     |     | 2,0    |     |
| Duct                         |      |      |      | Silencer | Chamber                     |             |     |     | 3,0    |     |
|                              |      |      |      | Chamber  | Silencer                    | Chamber     |     |     |        | 3,5 |

## Logarithmic addition



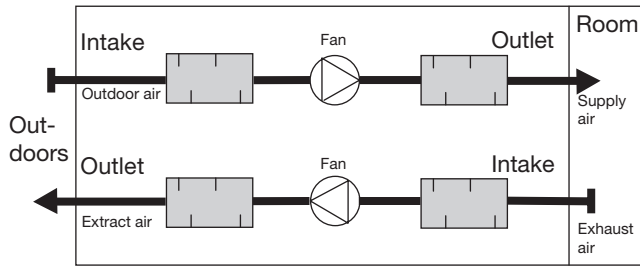


# Rectangular straight low-built silencer

# LRLB

## Self generated noise per frequency band

- 6 Decide from the location of the silencer whether it is the supply or exhaust graph that shall be used. (Rule of memory - the side that leads away from the fan, i.e. at supply air the outlet graph is used and at exhaust air the in-take graph.)



- 7 Go horizontally into the present graph, at present air velocity, to the self generated noise number.
- 8 Then go vertically up to the crossing of the different frequency band lines.
- 9 Read the self generated noise, at gross cross section area 1 m<sup>2</sup>, for each frequency band straight out to the left. In the example only the 8000 Hz-reading is shown.
- 10 Add or subtract the correction for the present gross cross section area.

## Sound power level after the silencer

The sound power level after the silencer can be calculated for all frequencies by a logarithmical addition of:

”The self generated noise” and ”The sound power level before the silencer”.

The shown example gives at 8000 Hz

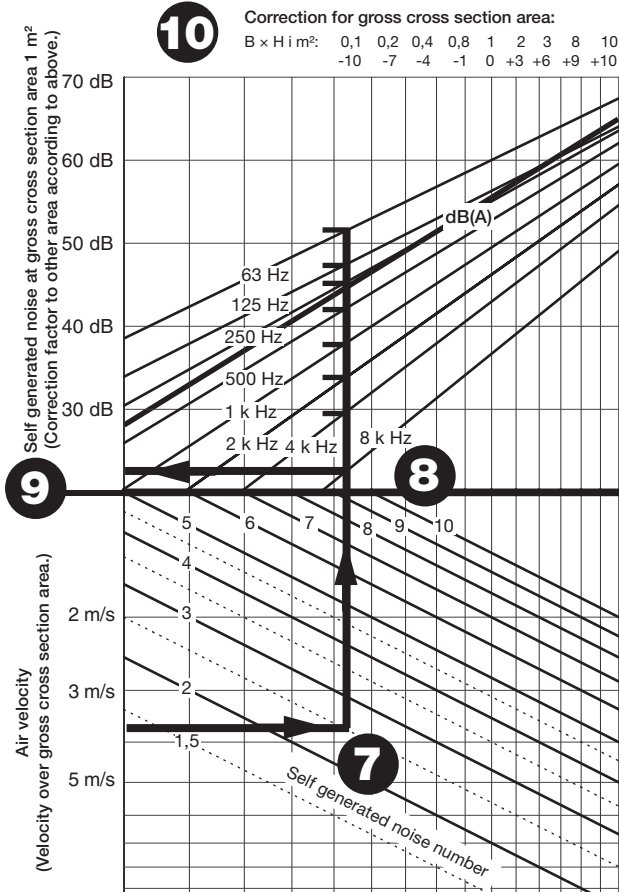
$$\text{Self generated noise} = 28 \text{ dB} - 1 \text{ dB} = 27\text{dB}$$

$$\text{Sound power level before the silencer - the attenuation: } 44 \text{ dB} - 17 \text{ dB} = 27\text{dB}$$

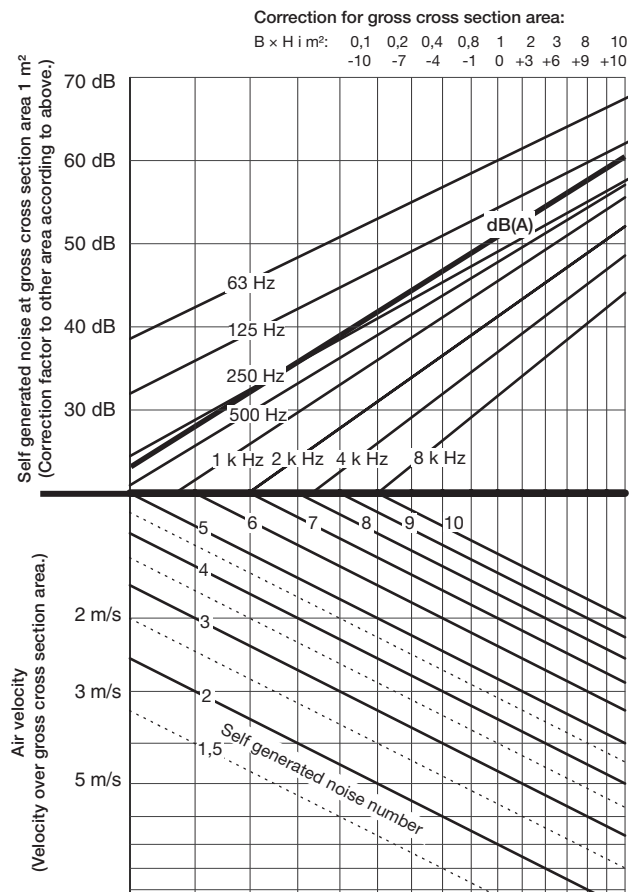
$$\text{Logarithmic addition of } 27 \text{ and } 27 = 30 \text{ dB}$$

(See graph for logarithmical addition on page 230).

Self generated noise in intake LRLB



Self generated noise in outlet LRLB



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# Dampers & Measure units












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| Lindab                             | 1        |
| General information and theory     | 2        |
| Safe                               | 3        |
| Silencers                          | 4        |
| <b>Dampers &amp; Measure units</b> | <b>5</b> |
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|  |                            | To regulate   | To shut-off   |
|--|----------------------------|---|---|
| <b>Standard dampers</b>                                      | manual                     | <br>DRU ..... 238<br>DIRU ..... 244    | DSU ..... 250<br>DTU ..... 256<br>DTMU/DTWU ..... 264                                     |
|  | for motor                  | electric or pneumatic<br>              | DTHU ..... 262  |
|  | with motor                 | electric<br>                           | DIRBU ..... 269<br>DIRVU ..... 271<br>DTBU ..... 273<br>DTBCU ..... 277<br>DTFU ..... 282 |
|  |                            | pneumatic<br>                          | DTPU ..... 283  |
| <b>Cleaning dampers</b>                                      | manual                     | <br>PSDRU ..... 284<br>TDRU ..... 285 | TDSU ..... 286  |
|  | <b>Alternating dampers</b> | manual  |        |
| with motor   |                            | electric<br>                         | TATBU ..... 289   |
| <b>Constant- and variable flow units (automatic dampers)</b> | manual                     |                                      | DAU ..... 298   |
|  | with motor                 | electric<br>                         | DA2EU ..... 299<br>DAVU ..... 300   |



**Regulating damper**



LKSR..... 301

**Regulating damper**



DRUI..... 302

**Sliding dampers**



SKMTR..... 303  
SKPTR ..... 304

**Flow meters**



FMDRU ..... 305



FMDU ..... 310



FMU ..... 315

**Measuring bends**



MBU..... 318



MBFU..... 319

**Insulation cup**



IK ..... 321

**Handle**



DRHTG ..... 321



HANDLE ..... 321

**Assembly kits**



MSATS 31  
MSATS 41 ..... 321  
MSATS 42

**Extension spindles**



VREDF 8 35 ..... 321  
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**Mounting shelves**



KOMHY ..... 321



LÖMOK..... 321

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# Content – Dampers

## Tightness and pressure classes

|                |   | Tightness class   |                           |   |  |   |               |   |               |   |  |  |
|----------------|---|---|---------------------------|---|--|---|---------------|---|---------------|---|--|--|
|                |   | 0   |                           | 1 |  | 2 |               | 3 |               | 4 |  |  |
|                |   | To regulate   |                           |   |  |   | To shut-off   |   |               |   |  |  |
| Pressure class | A | DRU<br>DIRU<br>DIRBU<br>DIRVU<br>DSU Ø63–315<br>PSDRU<br>TDRU<br>TASU | DSU Ø355–1000<br><br>TDSU |   |  |   | TATU<br>TATBU |   |               |   | DTU Ø710–1000<br>DTHU Ø710–1000<br>DTBU Ø710–1000  |  |
|                | B | DAU<br>DA2EU<br>DAVU  |                           |   |  |   |               |   | DTPU Ø355–630 |   | DTU Ø355–630<br>DTMU Ø355–630<br>DTWU Ø355–630<br>DTHU Ø355–630<br>DTBU Ø355–630<br>DTBCU Ø355–630 |  |
|                | C |   |                           |   |  |   |               |   | DTPU Ø80–315  |   | DTU Ø80–315<br>DTMU Ø80–315<br>DTWU Ø80–315<br>DTHU Ø80–315<br>DTBU Ø80–315<br>DTBCU Ø80–315       |  |

## Summary, motorized dampers

This is the standard range. Other combinations of dampers and motors can be ordered

|                        | Forward Return          | el el                       | el el                       | el el             | el el             | el spring       | el spring       | el spring       | el el         | el el          | el el          | press. air spring | press. air spring | press. air spring |
|------------------------|-------------------------|-----------------------------|-----------------------------|-------------------|-------------------|-----------------|-----------------|-----------------|---------------|----------------|----------------|-------------------|-------------------|-------------------|
| Motor                  | Regulating              | 2 set-points                | 2 set-points                | 2 set-points      | 2 set-points      | 2 set-points    | 2 set-points    | 2 set-points    | cont.         | cont.          | cont.          | 2 set-points      | 2 set-points      | 2 set-points      |
|                        | Denomination            | LM 24A (-F)<br>LM 230A (-F) | NM 24A (-F)<br>NM 230A (-F) | SM 24A<br>SM 230A | GM 24A<br>GM 230A | TF 24<br>TF 230 | LF 24<br>LF 230 | AF 24<br>AF 230 | LM 24A<br>-SR | NM 24A<br>-SR  | SM 24A<br>-SR  | AK 31 P           | AK 41 P           | AK 42 P           |
| <b>Original damper</b> | <b>Motorized damper</b> |                             |                             |                   |                   |                 |                 |                 |               |                |                |                   |                   |                   |
| <b>DTU</b>             |                         | DTBU Ø80–315                | DTBU Ø400–500               | DTBU Ø630         | DTBU Ø710–1000    | DTBCU Ø80–200   | DTBCU Ø250–315  | DTBCU Ø400–630  |               |                |                | DTPU Ø80–200      | DTPU Ø250–315     | DTPU Ø400–630     |
| <b>TATU</b>            |                         |                             | TATBU Ø100–400              |                   |                   |                 |                 |                 |               |                |                |                   |                   |                   |
| <b>DAU</b>             |                         | DA2EU Ø80–315               |                             |                   |                   |                 |                 |                 | DAVU Ø80–315  |                |                |                   |                   |                   |
| <b>DIRU</b>            |                         |                             | DIRBU Ø100–200              | DIRBU Ø250–315    |                   |                 |                 |                 |               | DIRVU Ø100–200 | DIRVU Ø250–315 |                   |                   |                   |

## Accessories to be used at installation of damper motors on site

| Motor                 | Damper type                                  |  |
|-----------------------|--|--|
|                       | Normal damper with knob and normal spindle   | DTHU damper and long spindle                             |
| <b>Belimo LM</b>      | LÖMOK + VREDF 15 60                          | – (Motor fits directly)                                  |
| <b>Belimo NM</b>      | LÖMOK + VREDF 15 100 or KOMHY + VREDF 15 60  | – (Motor fits directly)                                  |
| <b>Belimo SM</b>      | KOMHY + VREDF 15 60                          | – (Motor fits directly)                                  |
| <b>Belimo GM</b>      | Motor does <b>not</b> fit                    | – (Motor fits directly)<br>NOTE! Ø900–1000 need 2 motors |
| <b>Belimo TF</b>      | LÖMOK + VREDF 15 100 or KOMHY + VREDF 15 100 | – (Motor fits directly)                                  |
| <b>Belimo LF</b>      | KOMHY + VREDF 15 100                         | – (Motor fits directly)                                  |
| <b>Belimo AF</b>      | KOMHY + VREDF 15 100                         | – (Motor fits directly)                                  |
| <b>Sauter AK 31 P</b> | KOMHY + VREDF 15 100 + MSATS AK 31 P         | MSATS AK 31 P  |
| <b>Sauter AK 41 P</b> | KOMHY + VREDF 15 100 + MSATS AK 41 P         | MSATS AK 41 P  |
| <b>Sauter AK 42 P</b> | Special shelf + VREDF 15 100 + MSATS AK 42 P | Motor does <b>not</b> fit                                |



# General

## Dampers for different purposes are used in a ventilation system

**Regulating dampers** are used to balance the plant so that the wanted air flow is achieved.

The damper blade is normally designed so that a certain flow of air can always leak through, even if the damper is closed. This makes the sensitivity to angle changes less than for a shut-off damper.

Dampers are available in both manual and automatic versions. The manual dampers are adjusted when the installation is commissioned, and are cheaper than the automatic ones. On the other hand, manual dampers need many more hours of adjustment, and means of flow measurement. For this reason, some dampers have measuring nozzles. In large systems, or where pressure variations occur, it is better to use automatic dampers. These are also referred to as constant flow dampers.

**Shut-off dampers** are used to save energy, to prevent the spread of poisonous gas etc. These dampers often have rubber seals on the damper blade. The damper can either be designed as a straight piece of ducting, or as a T-piece to switch the air flow from one duct to another. The blade is normally either fully open or fully closed.

## Tightness

Two types of tightness are applicable to dampers:

### 1. Tightness to the environment

This specifies the magnitude of the air leakage through joints and leaks in the duct sides in relation to the duct surface. This leakage is classified into tightness classes A, B, C and D. Most dampers can be used in installations/systems which require them to maintain tightness class D. Please refer to the Safe section.

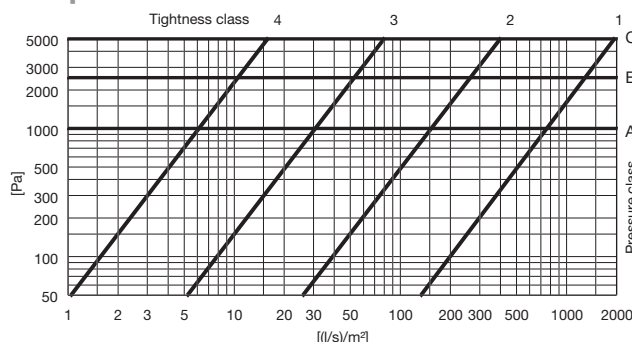
Fulfills the demands of the standard EN 1751.

### 2. Tightness past a closed damper shutter

This refers to the amount of air leaking past the closed blade, in relation to shutter area. This relationship is classified into five sealing classes 0–4. There is no tightness requirement for class 0. The classes 0 and 1 are regulating dampers. The highest class, tightness class 4, refers to very tight shut-off dampers.

Fulfills the demands of the standard EN 1751.

## Tightness past the closed damper blade and pressure classes



## Motorized dampers

Dampers can be supplied ex works with actuators installed. Various types of actuators are available, both electric and pneumatic.

## Material

### Standard

Bushings are made from polyamide. The bushings can withstand constant temperatures of up to 150 °C.

### Special

If a higher corrosivity class is required, the dampers can be supplied with a polyester coating, or made from aluminium or stainless steel. The blades can be provided with silicone rubber seals for higher temperature operation. The dampers can then withstand constant temperatures of 150 °C and 200 °C intermittent. In these cases, please contact Lindab.

## CE-labeling

Our dampers with electrical shifting motor are regarded as components of the duct system and need not to be separately CE-labeled. Their electrical shifting motor on the contrary is a part of the electrical system and is CE-labeled. Assurance of conformity can be found at [www.belimo.com](http://www.belimo.com).

## Blade setting

DRU and DSU dampers of dimensions Ø63–160 are supplied with their blades completely open, to facilitate adjustment preparations. Dampers of other dimensions are supplied with closed blades to prevent transport damage.

## Cleaning of duct system

Most dampers have components which obstruct the duct system to a greater or lesser extent, and thus obstruct or prevent cleaning.

Please refer to page 603.

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# Regulating damper

DRU



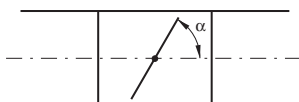
## Description

Has a turning, cut-off blade. The blade is stepless adjustable 0–90°. The damper admits an insulation thickness of approx. 50 mm.

The blade is designed to generate a minimum of noise. The noise is approx. the same as for a perforated blade. But the blade is less sensitive to clogging since it lacks perforations.

Setting angle  $\alpha$

$\alpha = 0^\circ =$  open blade,  $\alpha = 90^\circ =$  closed blade

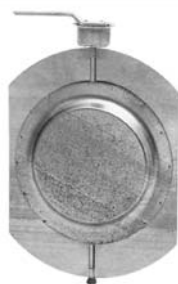


There is a separate assembly, measuring, balancing and maintenance instruction for this product.

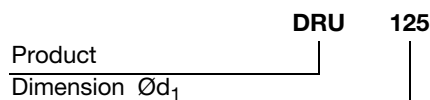
Ø 80–1000 fullfills pressure class A in closed position.

The cup at Ø 80–630 can be complemented with the special insulation cup IK at insulation thicker than 50 mm.

## Reinforced blade

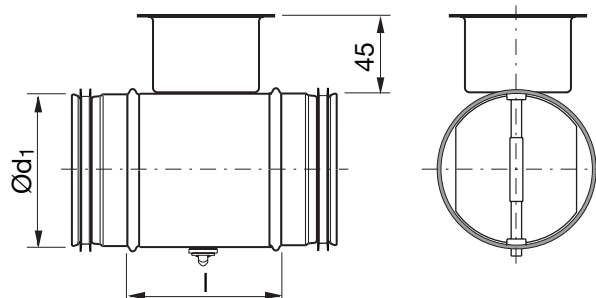


## Ordering example

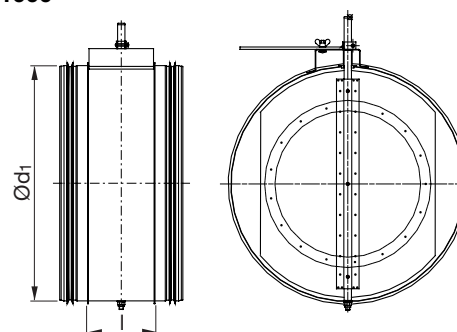


## Dimensions

Ø 80–630



Ø 800–1000



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg | Sealing class past<br>closed blade |
|------------------------|---------|---------|------------------------------------|
| 80                     | 100     | 0,34    | 0                                  |
| 100                    | 100     | 0,40    | 0                                  |
| 112                    | 100     | 0,43    | 0                                  |
| 125                    | 100     | 0,46    | 0                                  |
| 140                    | 100     | 0,54    | 0                                  |
| 150                    | 100     | 0,60    | 0                                  |
| 160                    | 100     | 0,65    | 0                                  |
| 180                    | 100     | 0,69    | 0                                  |
| 200                    | 100     | 0,80    | 0                                  |
| 224                    | 100     | 0,90    | 0                                  |
| 250                    | 100     | 1,28    | 0                                  |
| 280                    | 100     | 1,40    | 0                                  |
| 300                    | 100     | 1,62    | 0                                  |
| 315                    | 100     | 1,70    | 0                                  |
| 355                    | 100     | 2,01    | 0                                  |
| 400                    | 100     | 2,82    | 0                                  |
| 450                    | 100     | 3,70    | 0                                  |
| 500                    | 115     | 4,70    | 0                                  |
| 560                    | 115     | 5,51    | 0                                  |
| 600                    | 115     | 5,90    | 0                                  |
| 630                    | 115     | 6,21    | 0                                  |
| 800                    | 230     | 18,2    | 0                                  |
| 1000                   | 230     | 24,4    | 0                                  |



# Regulating damper

DRU

| Property  | Ø 80-315 | Ø 400 | Ø 500 | Ø 630 | Ø 800x1000 |
|---|----------|-------|-------|-------|------------|
| The blade is set via a knob in a protective cup.                                  | x        | x     | x     | x     |            |
| The setting of the blade is read against an embossed scale at the rim of the cup. | x        | x     | x     | x     |            |
| The blade is locked with two screws, type Pozidriv (PZD2).                        | x        | x     | x     | x     |            |
| The blade has reinforced locking with a sturdy wing nut.                          |          |       |       |       | x          |
| The blade is reinforced.  |          |       | x     | x     |            |
| The blade is additionally reinforced.   |          |       |       |       | x          |
| With sturdy handle.   |          | x     | x     | x     |            |
| With additionally reinforced handle.  |          |       |       |       | x          |
| With reinforced stop beads.   |          |       | x     | x     |            |
| The axle is reinforced.   |          |       |       |       | x          |
| The damper can be delivered prepared for motor.                                   | x        | x     | x     | x     |            |
| The damper can be delivered with motor.   | x        | x     | x     | x     | x          |

## Technical data

### Pressure drop graphs with noise data for dimensioning

The solid curves show the pressure drop,  $\Delta p_t$ , over the damper as a function of flow  $q$ , and setting angle  $\alpha$ . The dashed curves give the A-weighted sound power data,  $L_{WA}$ , in dB to the duct.

#### Example

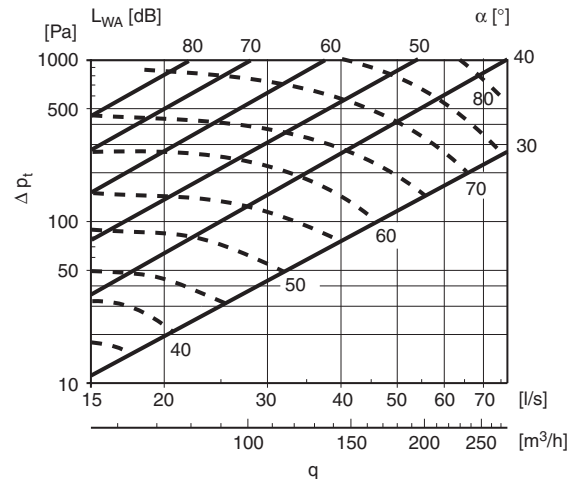
Given

- Dimension Ø100
- Flow 60 l/s
- Pressure drop 200 Pa

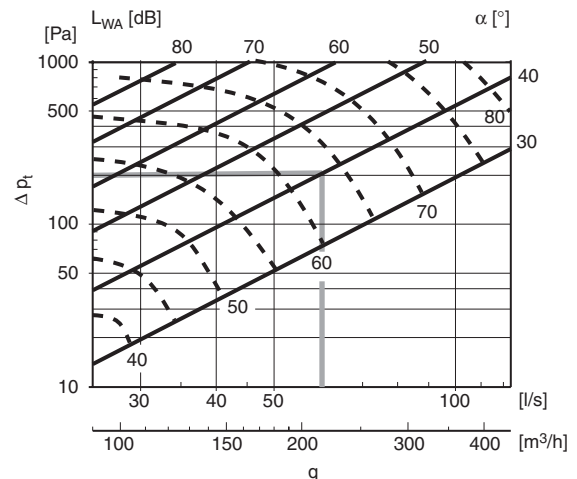
Obtained from graph

- Setting angle 40°
- Sound power level 63 dB (A)

### Ø80



### Ø100



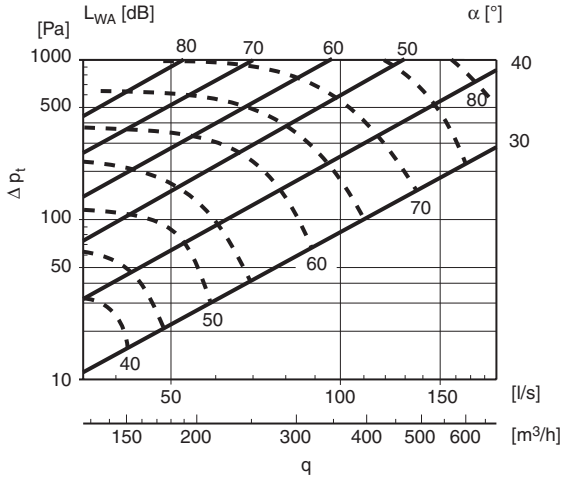


# Regulating damper

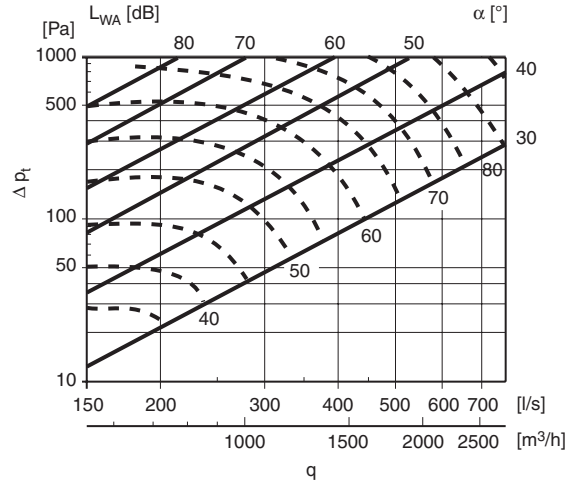
DRU

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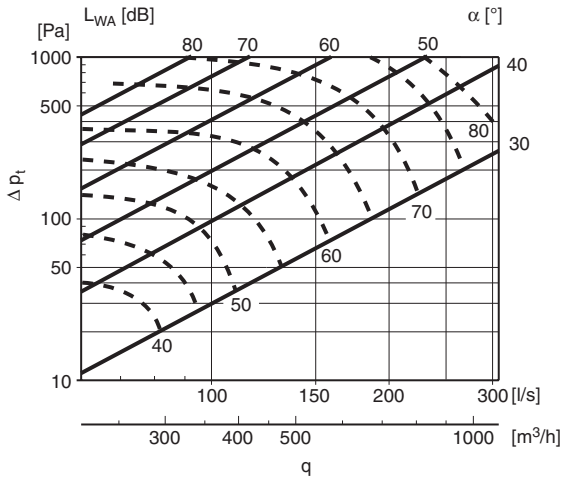
**Ø125**



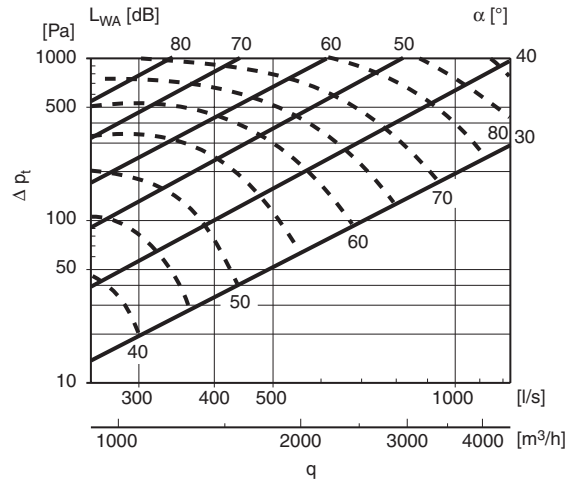
**Ø250**



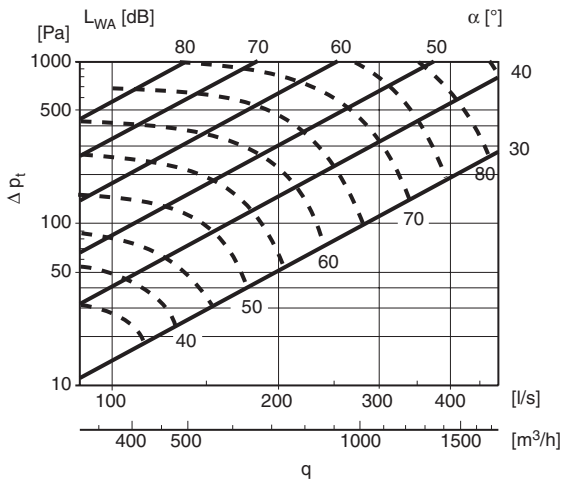
**Ø160**



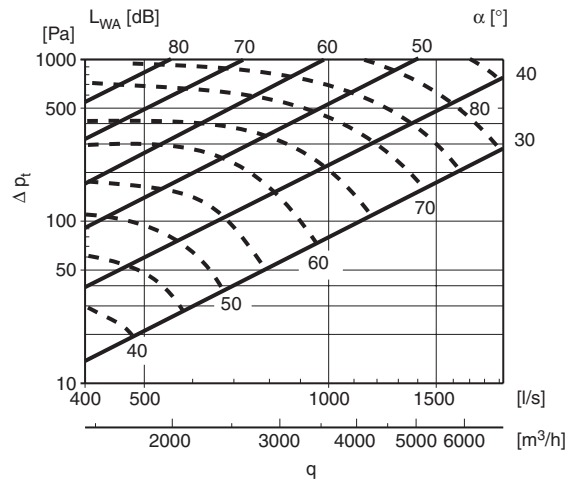
**Ø315**



**Ø200**



**Ø400**

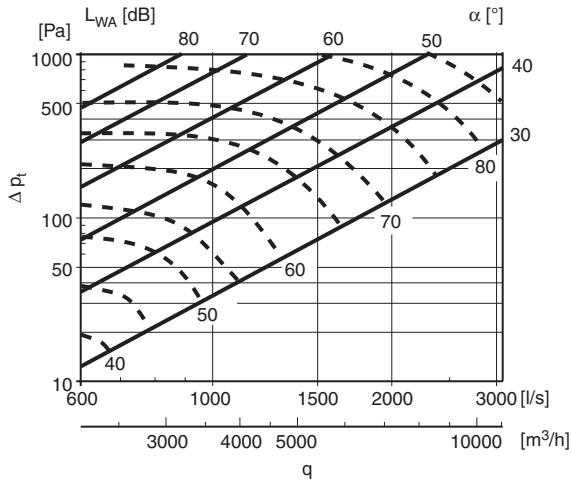




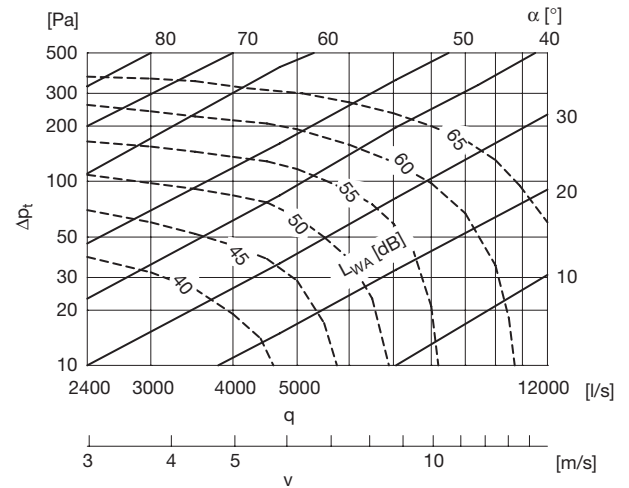
# Regulating damper

DRU

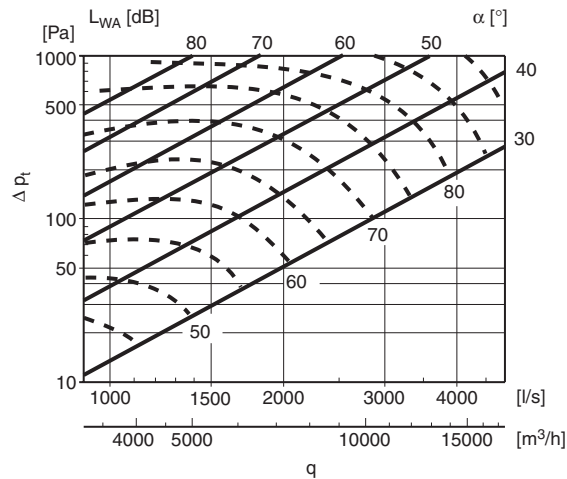
Ø500



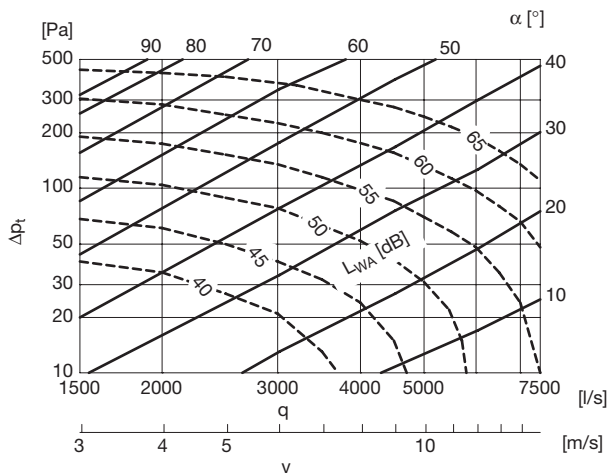
Ø1000



Ø630



Ø800



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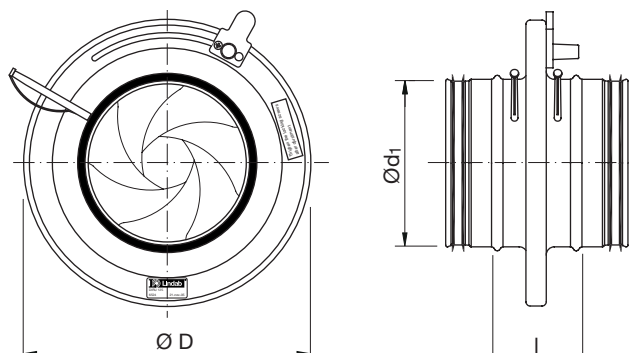


# Damper with flow meter

DIRU



## Dimensions



### Description

The damper DIRU with flow meter offers measurement of the air flow. DIRU has following characteristics: low noise level, centric flow, fixed measurement nozzles for accurate flow measurement and is equipped with regulating facilities which can be fully opened, which means that you do not need cleaning covers. It fulfils tightness class C.

The damper blades forms a measuring flange which allows flow measuring. By measuring the pressure difference between the measure nozzles, you can through the equation on the damper derive the flow  $q$  [l/s]. The setting value of the damper and the correction factor (k-factor) is the same number which means that you do not have to read a graphs in order to get the k-factor from a setting value.

The air flow is regulated with a handle.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 80–630 fullfills pressure class A in closed position.

#### Material

The damper is made of hot-dip galvanized sheet steel.

#### Installation

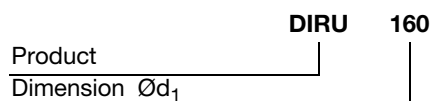
Consider required straight distance after or before disturbance, as mentioned on the card attached to the measurement nozzles, to obtain accurate flow measurement.

#### Cleaning

By fully open the damper, one get access to the duct. Do not forget to readjust the damper after cleaning.

| Ød <sub>1</sub><br>nom | ØD<br>mm | l<br>mm | m<br>kg |
|------------------------|----------|---------|---------|
| 80                     | 135      | 52      | 0,60    |
| 100                    | 163      | 54      | 0,80    |
| 125                    | 210      | 63      | 1,20    |
| 150                    | 230      | 53      | 1,40    |
| 160                    | 230      | 60      | 1,40    |
| 200                    | 285      | 62      | 2,00    |
| 250                    | 333      | 62      | 2,60    |
| 300                    | 406      | 65      | 3,00    |
| 315                    | 406      | 63      | 3,40    |
| 400                    | 560      | 70      | 6,90    |
| 500                    | 644      | 60      | 7,90    |
| 630                    | 811      | 60      | 11,9    |

### Ordering example





# Damper with flow meter

## DIRU

### Technical data for DIRU, DIRBU and DIRVU

| l = straight distance before and after disturbances | Method error<br>± 7% |
|---|----------------------|
|   | $l \geq 1 D$         |
|   | $l \geq 1 D$         |
|   | $l \geq 3 D$         |
|   | $l \geq 3 D$         |

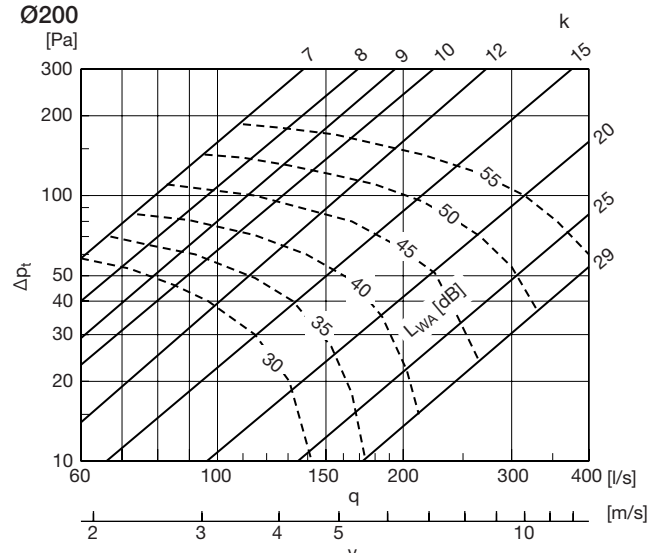
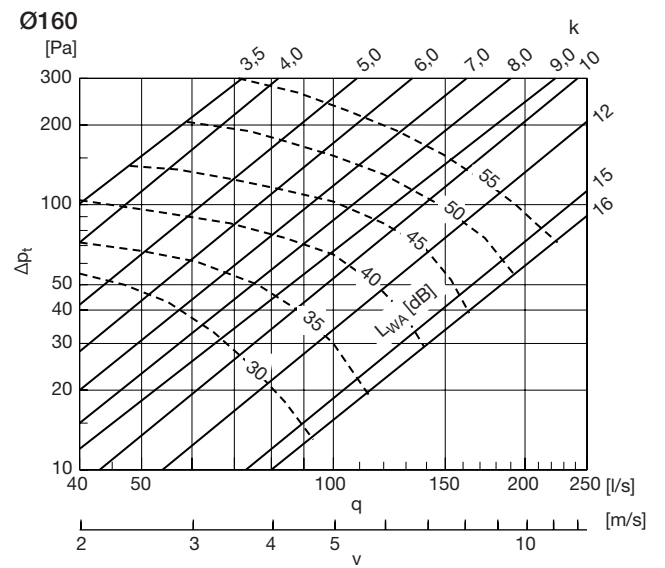
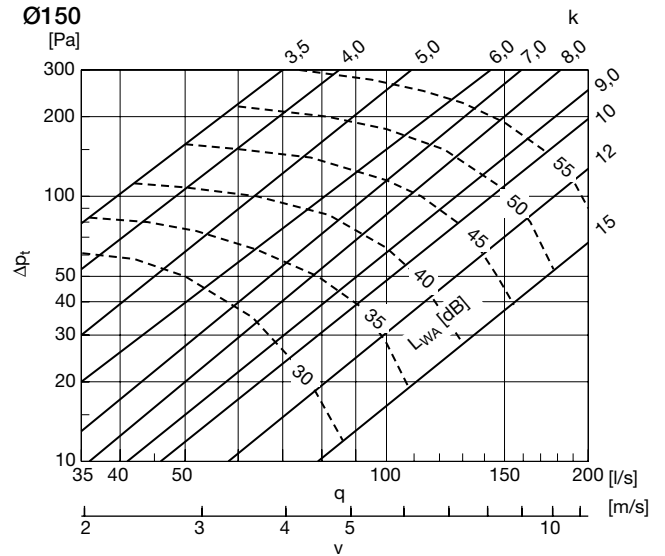
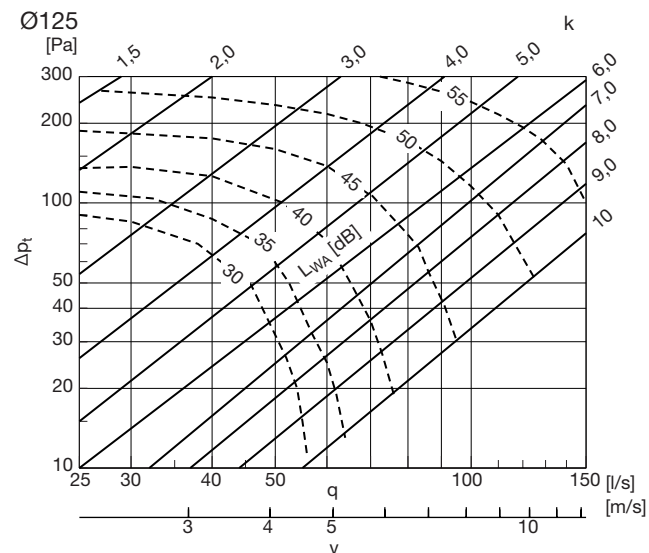
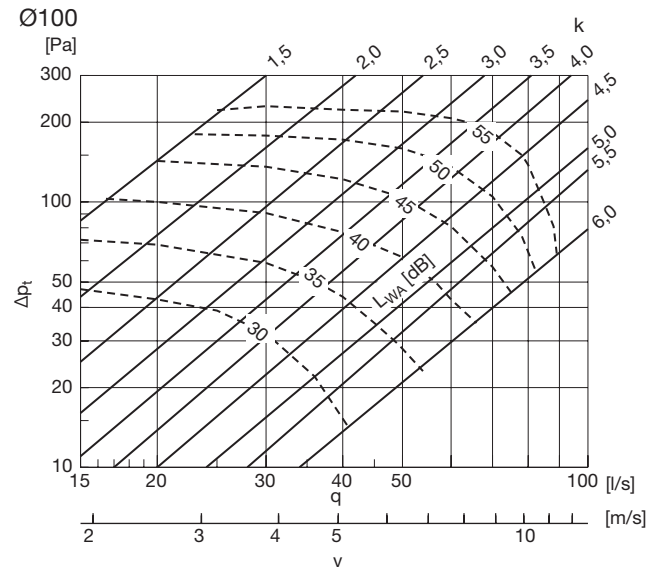
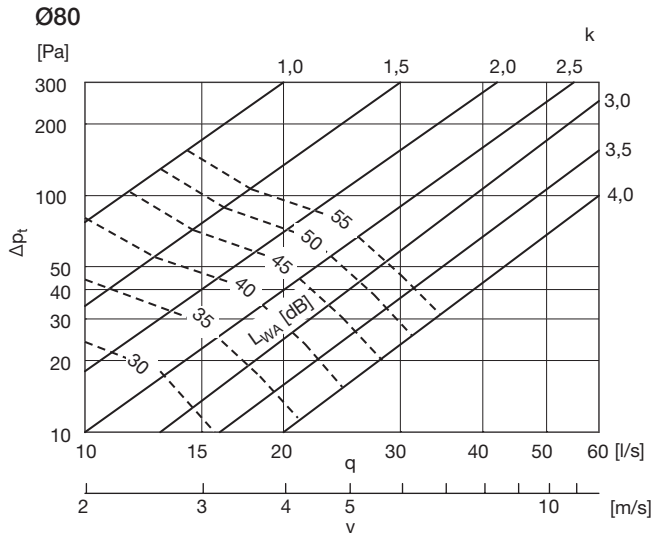
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# Damper with flow meter

# DIRU, DIRBU, DIRVU

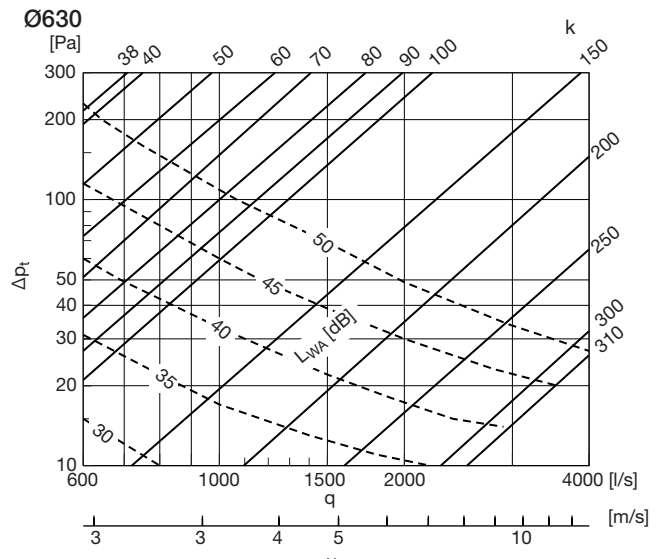
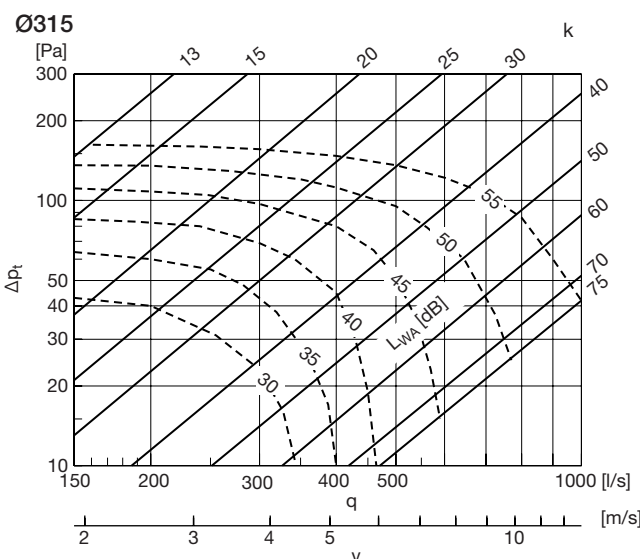
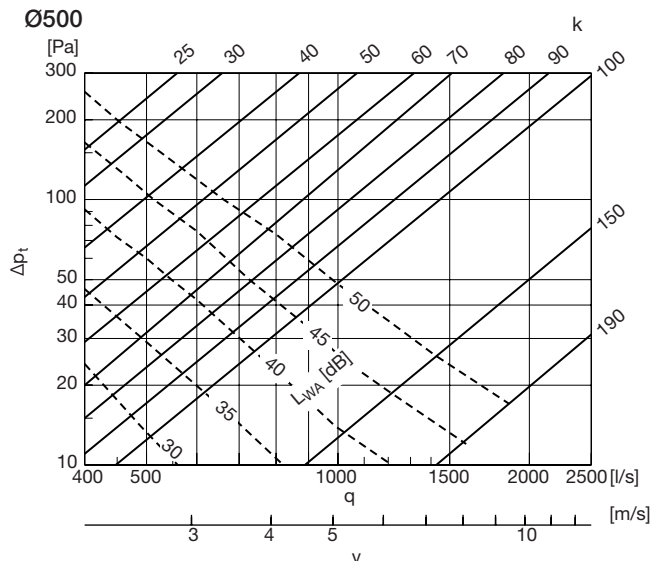
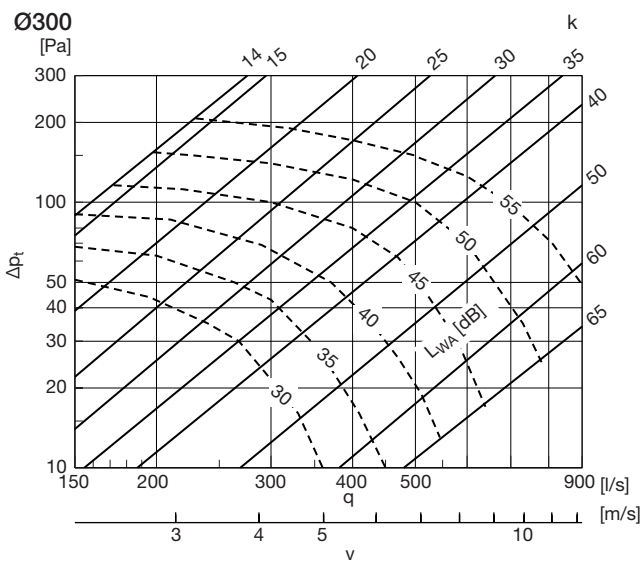
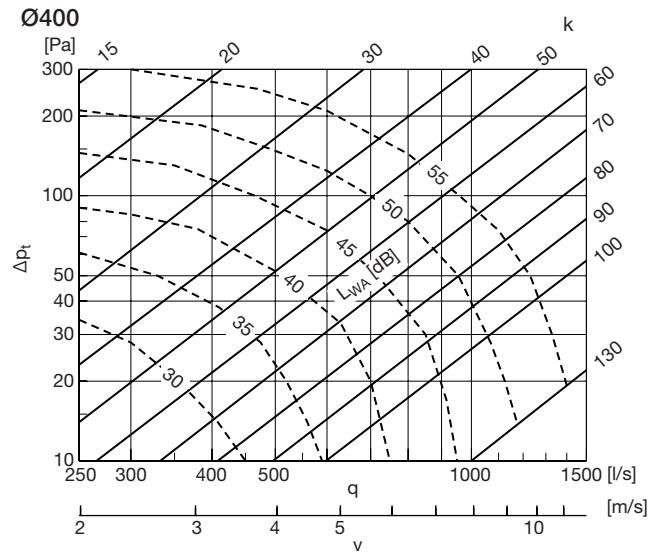
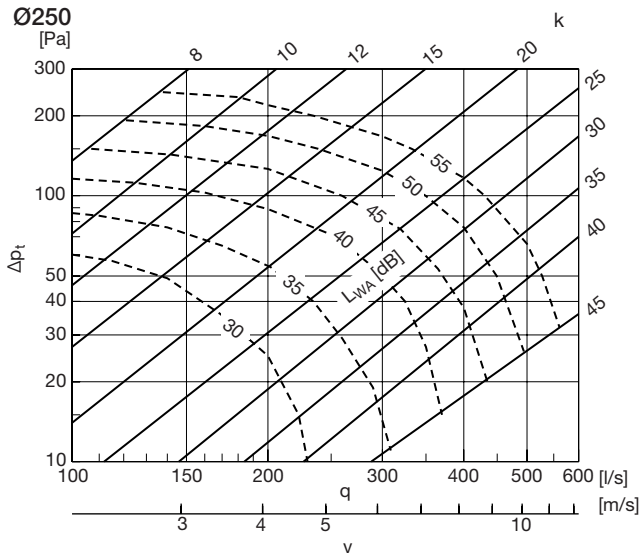
Pressure drop graph with noise data for dimensioning





# Damper with flow meter

# DIRU, DIRBU, DIRVU



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# Damper with flow meter

# DIRU, DIRBU, DIRVU

| dim Ød <sub>1</sub> | Pressure drop [Pa] | Velocity app. 9 [m/s] |          |          |          |          |          |          |          | Velocity app. 12 [m/s] |     |     |     |    |    |    |    |
|---------------------|--------------------|-----------------------|----------|----------|----------|----------|----------|----------|----------|------------------------|-----|-----|-----|----|----|----|----|
|                     |                    | Centre frequency [Hz] |          |          |          |          |          |          |          | Centre frequency [Hz]  |     |     |     |    |    |    |    |
|                     |                    | 63                    | 125      | 250      | 500      | 1k       | 2k       | 4k       | 8k       | 63                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                  |                    | Flow 45 [l/s]         |          |          |          |          |          |          |          | Flow 60[l/s]           |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 50<br>20           | 63<br>63              | 68<br>64 | 67<br>62 | 60<br>55 | 54<br>48 | 48<br>39 | 41<br>29 | 30<br>20 | -                      | -   | -   | -   | -  | -  | -  | -  |
| 100                 |                    | Flow 70 [l/s]         |          |          |          |          |          |          |          | Flow 95[l/s]           |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | 89                    | 82       | 69       | 59       | 50       | 41       | 32       | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | 83                    | 76       | 63       | 53       | 44       | 35       | 26       | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 50<br>20           | 77<br>-               | 70<br>-  | 57<br>-  | 47<br>-  | 38<br>-  | 29<br>-  | 20<br>-  | 16<br>-  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 125                 |                    | Flow 110 [l/s]        |          |          |          |          |          |          |          | Flow 145 [l/s]         |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | 81                    | 76       | 65       | 54       | 44       | 35       | 27       | 24       | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | 78                    | 73       | 62       | 51       | 41       | 32       | 24       | 21       | 81                     | 76  | 65  | 54  | 44 | 35 | 27 | 24 |
|                     | 50<br>20           | 75<br>-               | 70<br>-  | 59<br>-  | 48<br>-  | 38<br>-  | 29<br>-  | 21<br>-  | 18<br>-  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 150                 |                    | Flow 160 [l/s]        |          |          |          |          |          |          |          | Flow 200[l/s]          |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | 77                    | 71       | 59       | 49       | 41       | 33       | 24       | 21       | 81                     | 75  | 63  | 53  | 45 | 37 | 28 | 25 |
|                     | 50<br>20           | 73<br>-               | 67<br>-  | 55<br>-  | 45<br>-  | 37<br>-  | 29<br>-  | 20<br>-  | 17<br>-  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 160                 |                    | Flow 180 [l/s]        |          |          |          |          |          |          |          | Flow 240 [l/s]         |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | 81                    | 72       | 62       | 52       | 44       | 36       | 27       | 24       | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 50<br>20           | 75<br>-               | 66<br>-  | 56<br>-  | 46<br>-  | 38<br>-  | 30<br>-  | 21<br>-  | 18<br>-  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 200                 |                    | Flow 280 [l/s]        |          |          |          |          |          |          |          | Flow 380 [l/s]         |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | 79                    | 69       | 60       | 51       | 43       | 37       | 30       | 26       | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 50<br>20           | 73<br>-               | 63<br>-  | 54<br>-  | 45<br>-  | 37<br>-  | 31<br>-  | 24<br>-  | 20<br>-  | 78                     | 68  | 59  | 50  | 42 | 36 | 29 | 25 |
| 250                 |                    | Flow 440 [l/s]        |          |          |          |          |          |          |          | Flow 590 [l/s]         |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | 76                    | 66       | 56       | 54       | 44       | 39       | 32       | 29       | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 50<br>20           | 70<br>65              | 60<br>55 | 50<br>45 | 48<br>43 | 38<br>33 | 33<br>28 | 26<br>21 | 23<br>18 | -                      | -   | -   | -   | -  | -  | -  | -  |
| 300                 |                    | Flow 640 [l/s]        |          |          |          |          |          |          |          | Flow 850[l/s]          |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | 70                    | 62       | 53       | 51       | 44       | 39       | 30       | 29       | 70                     | 62  | 53  | 51  | 44 | 39 | 30 | 29 |
|                     | 50<br>20           | 66<br>62              | 58<br>54 | 49<br>45 | 47<br>43 | 40<br>36 | 35<br>31 | 26<br>22 | 25<br>21 | -                      | -   | -   | -   | -  | -  | -  | -  |
| 315                 |                    | Flow 700 [l/s]        |          |          |          |          |          |          |          | Flow 940 [l/s]         |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | 70                    | 63       | 54       | 52       | 46       | 41       | 32       | 32       | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 50<br>20           | 66<br>63              | 59<br>56 | 50<br>47 | 48<br>45 | 42<br>39 | 37<br>34 | 28<br>25 | 28<br>25 | 70                     | 63  | 54  | 52  | 46 | 41 | 32 | 32 |
| 400                 |                    | Flow 1130 [l/s]       |          |          |          |          |          |          |          | Flow 1500 [l/s]        |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 50<br>20           | 66<br>63              | 59<br>56 | 51<br>48 | 50<br>47 | 44<br>41 | 40<br>37 | 34<br>31 | 32<br>29 | -                      | -   | -   | -   | -  | -  | -  | -  |
| 500                 |                    | Flow 1770 [l/s]       |          |          |          |          |          |          |          | Flow 2360 [l/s]        |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 50<br>20           | 73<br>-               | 63<br>-  | 54<br>-  | 48<br>-  | 40<br>-  | 34<br>-  | 25<br>-  | 20<br>-  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 630                 |                    | Flow 2810 [l/s]       |          |          |          |          |          |          |          | Flow 3740 [l/s]        |     |     |     |    |    |    |    |
|                     | 300                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 200                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 100                | -                     | -        | -        | -        | -        | -        | -        | -        | -                      | -   | -   | -   | -  | -  | -  | -  |
|                     | 50<br>20           | 63<br>-               | 53<br>-  | 46<br>-  | 41<br>-  | 36<br>-  | 33<br>-  | 30<br>-  | 24<br>-  | 64                     | 54  | 47  | 42  | 37 | 34 | 31 | 25 |

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# Shut-off damper

DSU



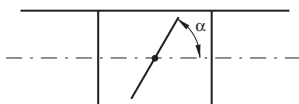
## Description

Has a turning, circular blade. The blade is stepless adjustable 0–90°. The damper is used when you have lower demands for shut-off capacity. The damper admits an insulation thickness of approx. 50 mm.

The damper can on occasions be used for regulation.

Setting angle  $\alpha$

$\alpha = 0^\circ =$  open blade,  $\alpha = 90^\circ =$  closed blade



There is a separate assembly, measuring, balancing and maintenance instruction for this product.

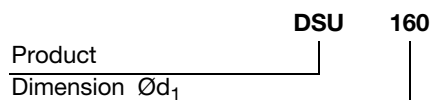
Ø 63–1000 fullfills pressure class A in closed position.

The cup at Ø 80–630 can be complemented with the special insulation cup IK at insulation thicker than 50 mm.

## Reinforced blade

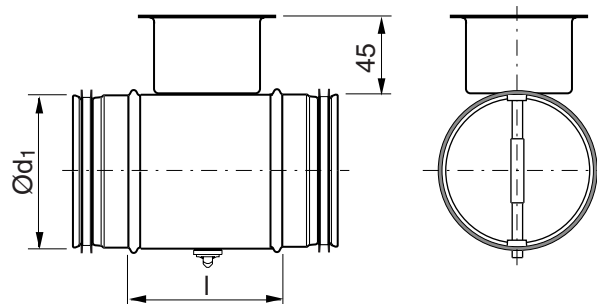


## Ordering example

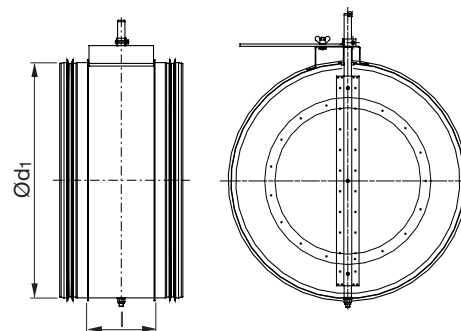


## Dimensions

Ø 80–630



Ø 800–1000



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg | Sealing class past<br>closed blade |
|------------------------|---------|---------|------------------------------------|
| 63                     | 100     | 0,30    | 0                                  |
| 80                     | 100     | 0,35    | 0                                  |
| 100                    | 100     | 0,40    | 0                                  |
| 112                    | 100     | 0,44    | 0                                  |
| 125                    | 100     | 0,49    | 0                                  |
| 140                    | 100     | 0,54    | 0                                  |
| 150                    | 100     | 0,57    | 0                                  |
| 160                    | 100     | 0,67    | 0                                  |
| 180                    | 100     | 0,73    | 0                                  |
| 200                    | 100     | 0,86    | 0                                  |
| 224                    | 100     | 1,10    | 0                                  |
| 250                    | 100     | 1,31    | 0                                  |
| 280                    | 100     | 1,51    | 0                                  |
| 300                    | 100     | 1,65    | 0                                  |
| 315                    | 100     | 1,81    | 0                                  |
| 355                    | 100     | 2,00    | 0                                  |
| 400                    | 100     | 2,91    | 1                                  |
| 450                    | 100     | 3,90    | 1                                  |
| 500                    | 115     | 4,92    | 1                                  |
| 560                    | 115     | 6,01    | 1                                  |
| 600                    | 115     | 6,40    | 1                                  |
| 630                    | 115     | 6,92    | 1                                  |
| 800                    | 230     | 19,0    | 1                                  |
| 1000                   | 230     | 30,0    | 1                                  |



# Shut-off damper

DSU

| Property  | Ø 80-315 | Ø 400 | Ø 500 | Ø 630 | Ø 800-1000 |
|---|----------|-------|-------|-------|------------|
| The blade is set via a knob in a protective cup.                                  | x        | x     | x     | x     |            |
| The setting of the blade is read against an embossed scale at the rim of the cup. | x        | x     | x     | x     |            |
| The blade is locked with two screws, type Pozidriv (PZD2).                        | x        | x     | x     | x     |            |
| The blade has reinforced locking with a sturdy wing nut.                          |          |       |       |       | x          |
| The blade is reinforced.  |          | x     | x     | x     |            |
| The blade is additionally reinforced.   |          |       |       |       | x          |
| With sturdy handle.   |          | x     | x     | x     |            |
| With additionally reinforced handle.  |          |       |       |       | x          |
| With reinforced stop beads.   |          |       | x     | x     |            |
| The axle is reinforced.   |          |       |       |       | x          |
| The damper can be delivered prepared for motor.                                   | x        | x     | x     | x     |            |
| The damper can be delivered with motor.   | x        | x     | x     | x     | x          |

## Technical data

### Pressure drop graphs with noise data for dimensioning

The solid curves show the pressure drop,  $\Delta p_t$ , over the damper as a function of flow  $q$ , and setting angle  $\alpha$ .

The dashed curves give the A-weighted sound power data,  $L_{WA}$ , in dB to the duct.

#### Example

Given Dimension Ø100

Flow 60 l/s

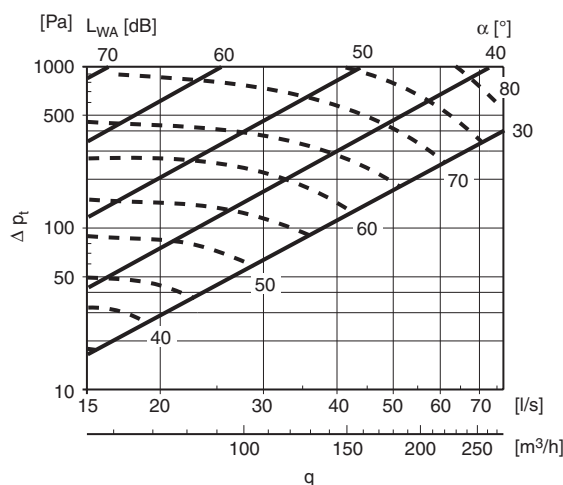
Pressure drop 200 Pa

Obtained from graph

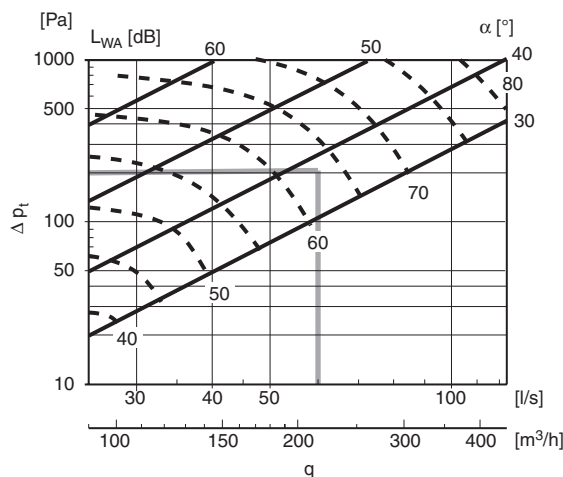
Setting angle 38°

Sound power level 63 dB (A)

### Ø80



### Ø100





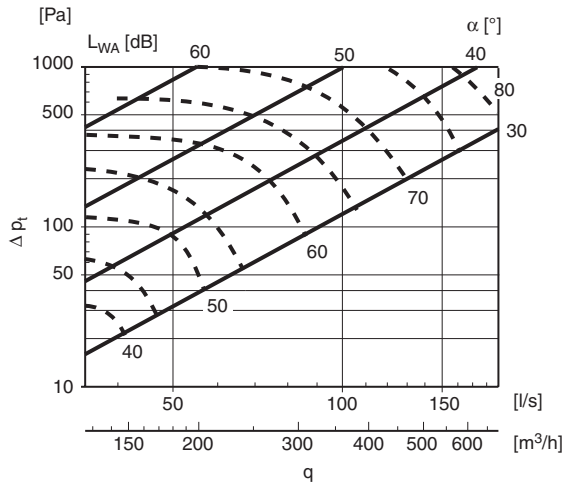


# Shut-off damper

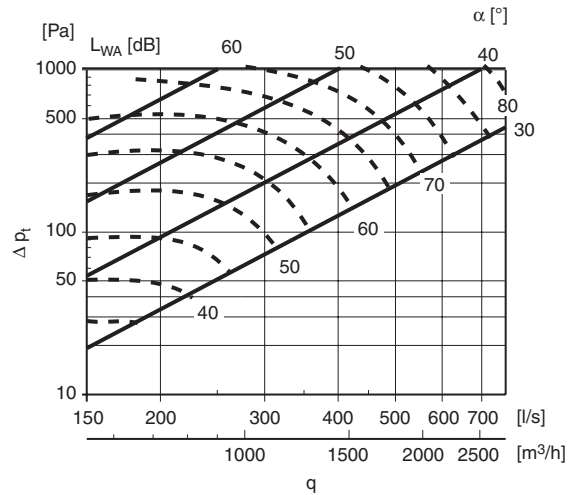
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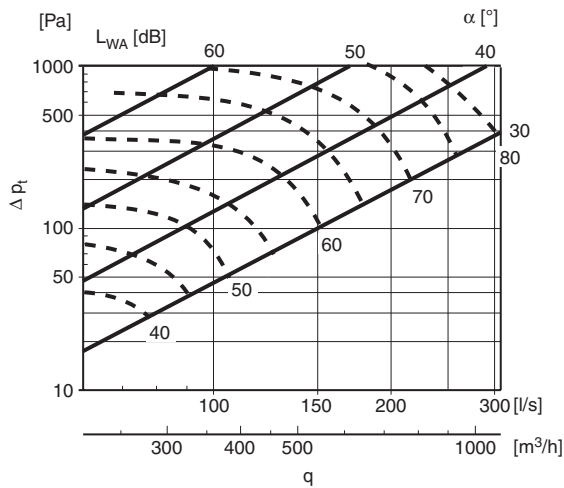
**Ø125**



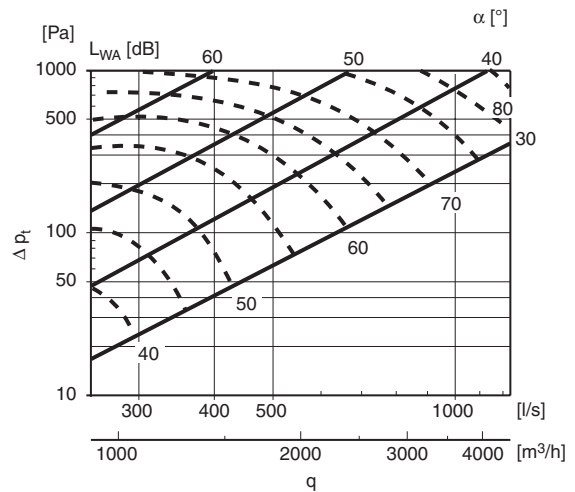
**Ø250**



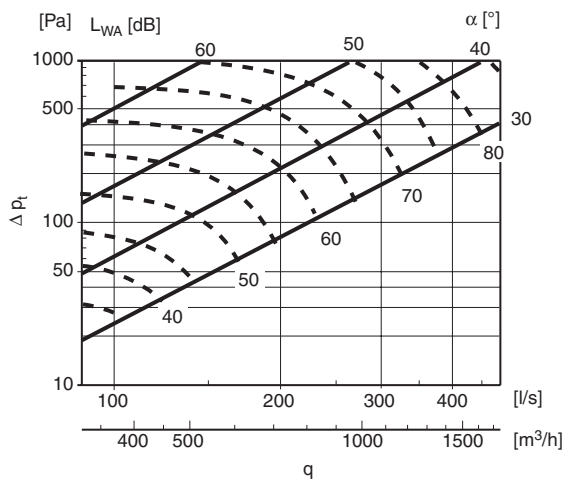
**Ø160**



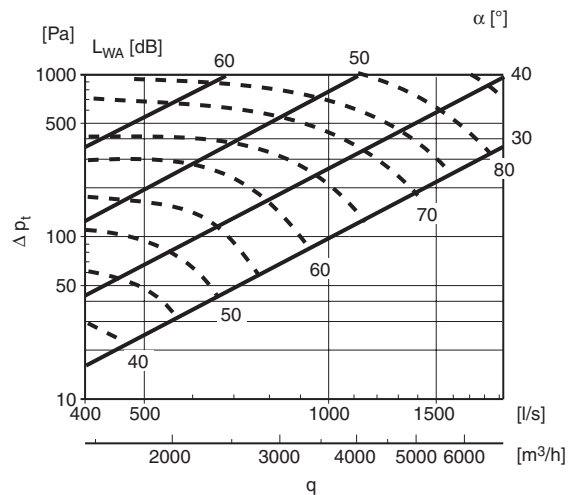
**Ø315**



**Ø200**



**Ø400**

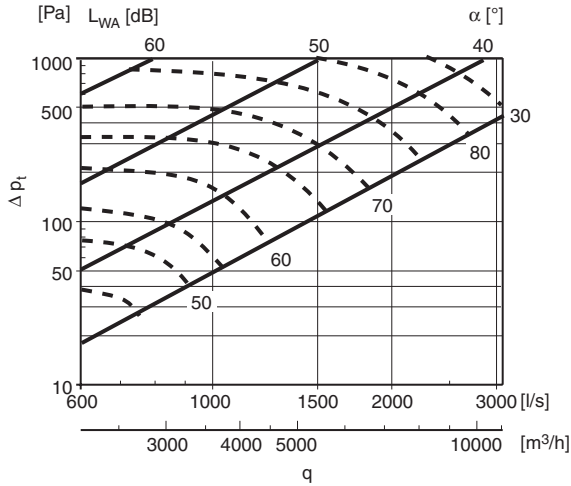




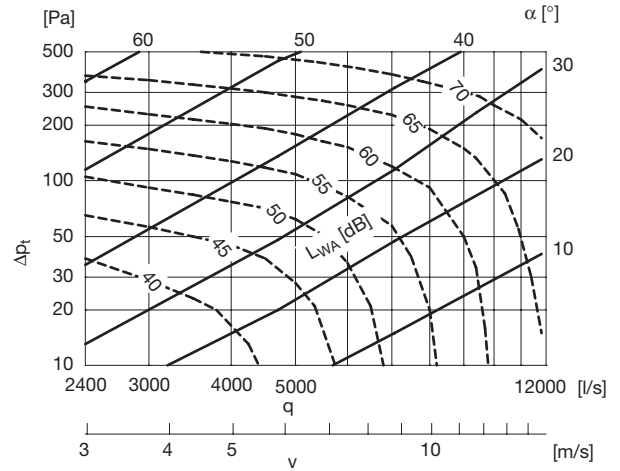
# Shut-off damper

# DSU

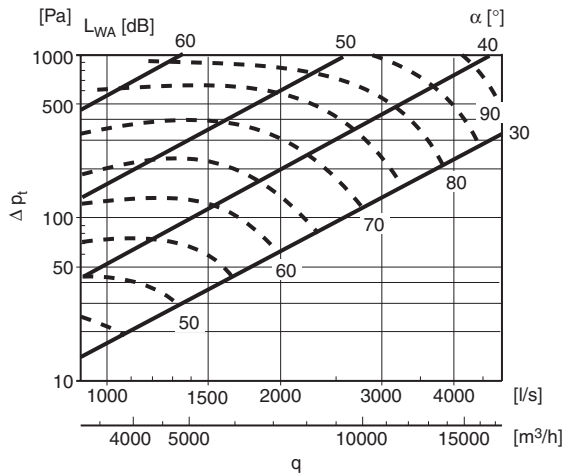
**Ø500**



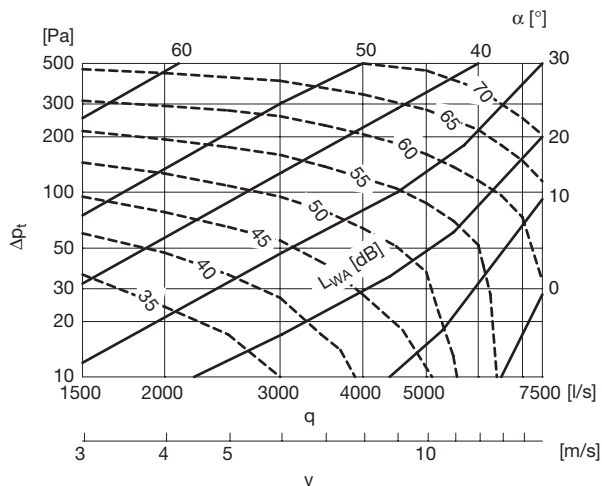
**Ø1000**



**Ø630**



**Ø800**



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# Shut-off damper

DSU

| dim<br>$\varnothing d_1$ | Pressure drop<br>[Pa] | Velocity app. 12 [m/s] |     |     |     |    |    |    |    | Velocity app. 15 [m/s] |     |     |     |    |    |    |    |
|--------------------------|-----------------------|------------------------|-----|-----|-----|----|----|----|----|------------------------|-----|-----|-----|----|----|----|----|
|                          |                       | Centre frequency [Hz]  |     |     |     |    |    |    |    | Centre frequency [Hz]  |     |     |     |    |    |    |    |
|                          |                       | 63                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                       |                       | Flow 60 [l/s]          |     |     |     |    |    |    |    | Flow 75 [l/s]          |     |     |     |    |    |    |    |
|                          | 500                   | 75                     | 75  | 75  | 75  | 68 | 64 | 56 | 53 | 80                     | 80  | 80  | 80  | 72 | 68 | 60 | 56 |
|                          | 300                   | 75                     | 75  | 71  | 71  | 64 | 57 | 50 | 43 | 79                     | 79  | 75  | 75  | 68 | 60 | 53 | 45 |
|                          | 200                   | 75                     | 75  | 71  | 65  | 61 | 51 | 41 | 34 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 100                   | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 50                    | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 100                      |                       | Flow 100 [l/s]         |     |     |     |    |    |    |    | Flow 120 [l/s]         |     |     |     |    |    |    |    |
|                          | 500                   | 84                     | 81  | 80  | 72  | 68 | 62 | 61 | 61 | 88                     | 85  | 84  | 76  | 72 | 65 | 64 | 64 |
|                          | 300                   | 81                     | 80  | 79  | 70  | 67 | 59 | 56 | 55 | 86                     | 85  | 84  | 74  | 70 | 62 | 59 | 58 |
|                          | 200                   | 80                     | 80  | 79  | 69  | 66 | 55 | 51 | 51 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 100                   | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 50                    | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 125                      |                       | Flow 160 [l/s]         |     |     |     |    |    |    |    | Flow 180 [l/s]         |     |     |     |    |    |    |    |
|                          | 500                   | 89                     | 85  | 81  | 73  | 69 | 62 | 62 | 58 | 91                     | 87  | 83  | 75  | 71 | 63 | 63 | 59 |
|                          | 300                   | 86                     | 86  | 79  | 71  | 68 | 60 | 56 | 53 | 89                     | 88  | 81  | 73  | 69 | 62 | 58 | 54 |
|                          | 200                   | 89                     | 85  | 78  | 70  | 63 | 56 | 52 | 52 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 100                   | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 50                    | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 160                      |                       | Flow 240 [l/s]         |     |     |     |    |    |    |    | Flow 300 [l/s]         |     |     |     |    |    |    |    |
|                          | 500                   | 84                     | 84  | 80  | 72  | 68 | 65 | 65 | 65 | 89                     | 89  | 85  | 77  | 73 | 69 | 69 | 69 |
|                          | 300                   | 81                     | 81  | 78  | 70  | 67 | 63 | 59 | 59 | 87                     | 87  | 83  | 76  | 72 | 68 | 64 | 64 |
|                          | 200                   | 84                     | 80  | 77  | 69  | 66 | 58 | 55 | 55 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 100                   | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 50                    | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 200                      |                       | Flow 400 [l/s]         |     |     |     |    |    |    |    | Flow 450 [l/s]         |     |     |     |    |    |    |    |
|                          | 500                   | 90                     | 82  | 78  | 72  | 67 | 66 | 71 | 70 | 93                     | 85  | 81  | 73  | 71 | 70 | 74 | 73 |
|                          | 300                   | 92                     | 84  | 78  | 71  | 67 | 63 | 67 | 66 | 95                     | 87  | 81  | 72  | 68 | 66 | 69 | 68 |
|                          | 200                   | 90                     | 83  | 79  | 69  | 65 | 62 | 61 | 60 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 100                   | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 50                    | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 250                      |                       | Flow 600 [l/s]         |     |     |     |    |    |    |    | Flow 750 [l/s]         |     |     |     |    |    |    |    |
|                          | 500                   | 87                     | 83  | 76  | 68  | 64 | 68 | 68 | 68 | 94                     | 90  | 82  | 74  | 70 | 74 | 74 | 74 |
|                          | 300                   | 84                     | 80  | 73  | 67  | 65 | 64 | 62 | 61 | 91                     | 87  | 80  | 72  | 70 | 69 | 72 | 68 |
|                          | 200                   | 82                     | 79  | 72  | 64  | 63 | 63 | 62 | 61 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 100                   | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 50                    | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 315                      |                       | Flow 1000 [l/s]        |     |     |     |    |    |    |    | Flow 1200 [l/s]        |     |     |     |    |    |    |    |
|                          | 500                   | 89                     | 85  | 77  | 69  | 68 | 67 | 69 | 65 | 92                     | 88  | 80  | 72  | 71 | 70 | 72 | 68 |
|                          | 300                   | 85                     | 81  | 74  | 66  | 64 | 64 | 66 | 59 | 89                     | 85  | 78  | 70  | 68 | 68 | 70 | 62 |
|                          | 200                   | 86                     | 79  | 72  | 65  | 63 | 62 | 64 | 58 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 100                   | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 50                    | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 400                      |                       | Flow 1600 [l/s]        |     |     |     |    |    |    |    | Flow 1800 [l/s]        |     |     |     |    |    |    |    |
|                          | 500                   | 95                     | 87  | 79  | 75  | 67 | 71 | 70 | 69 | 98                     | 90  | 82  | 78  | 70 | 74 | 73 | 72 |
|                          | 300                   | 91                     | 83  | 76  | 69  | 67 | 66 | 65 | 64 | 94                     | 86  | 79  | 71  | 70 | 69 | 68 | 67 |
|                          | 200                   | 89                     | 82  | 75  | 69  | 67 | 64 | 63 | 60 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 100                   | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 50                    | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 500                      |                       | Flow 2400 [l/s]        |     |     |     |    |    |    |    | Flow 3000 [l/s]        |     |     |     |    |    |    |    |
|                          | 500                   | 96                     | 88  | 80  | 72  | 70 | 73 | 72 | 71 | 102                    | 94  | 85  | 78  | 75 | 77 | 77 | 76 |
|                          | 300                   | 93                     | 85  | 78  | 70  | 66 | 66 | 70 | 70 | 99                     | 91  | 83  | 74  | 70 | 70 | 74 | 74 |
|                          | 200                   | 91                     | 84  | 76  | 70  | 68 | 66 | 65 | 61 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 100                   | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 50                    | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 630                      |                       | Flow 4000 [l/s]        |     |     |     |    |    |    |    | Flow 4500 [l/s]        |     |     |     |    |    |    |    |
|                          | 500                   | 103                    | 95  | 86  | 82  | 77 | 77 | 76 | 73 | 107                    | 98  | 90  | 85  | 81 | 81 | 80 | 76 |
|                          | 300                   | 100                    | 91  | 83  | 79  | 75 | 75 | 74 | 66 | 105                    | 96  | 88  | 83  | 79 | 79 | 79 | 70 |
|                          | 200                   | 98                     | 90  | 82  | 78  | 74 | 70 | 70 | 62 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 100                   | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 50                    | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 800                      |                       | Flow 6000 [l/s]        |     |     |     |    |    |    |    | Flow 7500 [l/s]        |     |     |     |    |    |    |    |
|                          | 500                   | 84                     | 74  | 69  | 68  | 66 | 66 | 63 | 60 | 88                     | 79  | 73  | 70  | 71 | 71 | 67 | 62 |
|                          | 300                   | 82                     | 72  | 66  | 63  | 61 | 61 | 57 | 53 | 84                     | 76  | 71  | 66  | 68 | 68 | 63 | 57 |
|                          | 200                   | 80                     | 69  | 63  | 60  | 57 | 57 | 53 | 47 | 82                     | 74  | 68  | 63  | 64 | 63 | 58 | 52 |
|                          | 100                   | 76                     | 64  | 59  | 55  | 52 | 51 | 46 | 41 | 79                     | 69  | 63  | 59  | 56 | 55 | 51 | 45 |
|                          | 50                    | 72                     | 60  | 56  | 51  | 48 | 46 | 41 | 35 | 77                     | 66  | 61  | 57  | 54 | 52 | 48 | 41 |
| 25                       | 70                    | 59                     | 55  | 51  | 48  | 44 | 39 | 32 | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 1000                     |                       | Flow 9400 [l/s]        |     |     |     |    |    |    |    | Flow 11800 [l/s]       |     |     |     |    |    |    |    |
|                          | 500                   | 85                     | 77  | 71  | 70  | 69 | 69 | 66 | 60 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 300                   | 82                     | 74  | 67  | 66  | 65 | 63 | 60 | 54 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 200                   | 80                     | 72  | 65  | 64  | 61 | 60 | 57 | 51 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 100                   | 76                     | 68  | 61  | 60  | 57 | 55 | 53 | 51 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                          | 50                    | 73                     | 66  | 59  | 58  | 55 | 52 | 51 | 48 | -                      | -   | -   | -   | -  | -  | -  | -  |
| 25                       | 70                    | 64                     | 57  | 57  | 53  | 50 | 49 | 43 | -  | -                      | -   | -   | -   | -  | -  | -  |    |



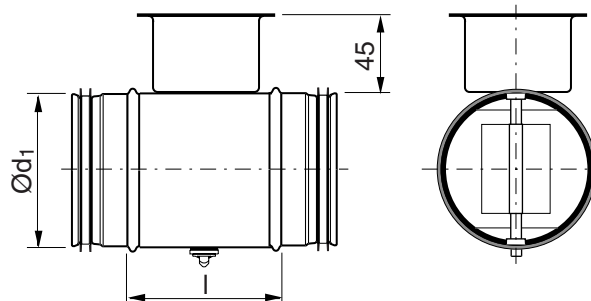
# Shut-off damper

DTU

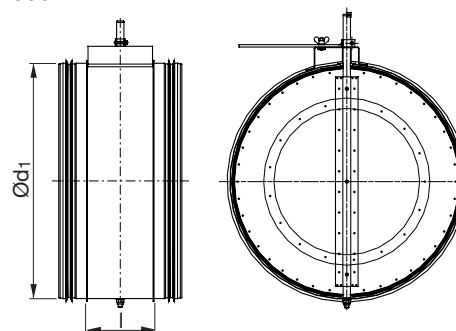


## Dimensions

Ø 80–630



Ø 710–1000



## Description

Has a turning circular blade with an EPDM-rubber seal which tightens against the inside of the damper when closed. The blade can be adjusted in a 0–90° angle.

The cup at Ø 80–630 can be complemented with the special insulation cup IK at insulation thicker than 50 mm.

The damper can be used for regulating at rare occasions.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 80–315 fullfills pressure class C in closed position.  
 Ø 355–630 fullfills pressure class B in closed position.  
 Ø 710–1000 fullfills pressure class A in closed position.

## Motorizing

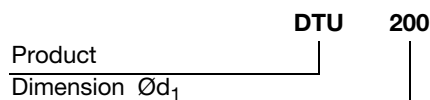
The torque needed for the motorizing is given in the adjacent table.

Ø710–1000 is not possible to motorize on site.

## Reinforced blade



## Ordering example



| Ød <sub>1</sub><br>nom | l<br>mm | M<br>Nm | m<br>kg | Sealing class<br>past closed<br>blade |
|------------------------|---------|---------|---------|---------------------------------------|
| 80                     | 100     | 2,0     | 0,30    | 4                                     |
| 100                    | 100     | 2,0     | 0,38    | 4                                     |
| 112                    | 100     | 2,0     | 0,48    | 4                                     |
| 125                    | 100     | 2,0     | 0,53    | 4                                     |
| 140                    | 100     | 2,0     | 0,60    | 4                                     |
| 150                    | 100     | 2,0     | 0,63    | 4                                     |
| 160                    | 100     | 2,0     | 0,74    | 4                                     |
| 180                    | 100     | 2,0     | 0,82    | 4                                     |
| 200                    | 100     | 2,0     | 1,04    | 4                                     |
| 224                    | 100     | 3,0     | 1,27    | 4                                     |
| 250                    | 100     | 3,0     | 1,52    | 4                                     |
| 280                    | 100     | 4,0     | 1,77    | 4                                     |
| 300                    | 100     | 4,0     | 1,98    | 4                                     |
| 315                    | 100     | 4,0     | 2,14    | 4                                     |
| 355                    | 100     | 8,0     | 2,44    | 4                                     |
| 400                    | 100     | 8,0     | 3,65    | 4                                     |
| 450                    | 100     | 10      | 4,84    | 4                                     |
| 500                    | 115     | 10      | 6,07    | 4                                     |
| 560                    | 115     | 15      | 7,47    | 4                                     |
| 600                    | 115     | 15      | 8,11    | 4                                     |
| 630                    | 115     | 15      | 8,80    | 4                                     |
| 710                    | 230     | 40      | 17,0    | 4                                     |
| 800                    | 230     | 40      | 19,5    | 4                                     |
| 900                    | 230     | 60      | 26,0    | 4                                     |
| 1000                   | 230     | 60      | 31,0    | 4                                     |



# Shut-off damper

DTU

| Property  | Ø 80-315 | Ø 400 | Ø 500 | Ø 630 | Ø 710-1000 |
|---|----------|-------|-------|-------|------------|
| The blade is set via a knob in a protective cup.  | x        | x     | x     | x     |            |
| The setting of the blade is read against an embossed scale at the rim of the cup.                           | x        | x     | x     | x     |            |
| The blade is locked with two screws, type Pozidriv (PZD2).  | x        | x     | x     | x     |            |
| The blade has reinforced locking with a sturdy wing nut.  |          |       |       |       | x          |
| The blade is reinforced.  |          | x     | x     | x     |            |
| The blade is additionally reinforced.   |          |       |       |       | x          |
| With sturdy handle.   |          | x     | x     | x     |            |
| With additionally reinforced handle.  |          |       |       |       | x          |
| With reinforced stop beads.   |          |       | x     | x     | x          |
| The axle is reinforced.   |          |       |       |       | x          |
| The damper can be delivered prepared for motor. Is then called DTHU.  | x        | x     | x     | x     | x          |
| The damper can be delivered with electric motor of On/Off-type without spring return. Is then called DTBU.  | x        | x     | x     | x     | x          |
| The damper can be delivered with electric motor of On/Off-type with spring return. Is then called DTBCU.    | x        | x     | x     | x     |            |
| The damper can be delivered with pneumatic actuator of On/Off-type with spring return. Is then called DTPU. | x        | x     | x     | x     |            |

## Technical data

### Pressure drop graphs with noise data for dimensioning

The solid curves show the pressure drop,  $\Delta p_t$ , over the damper as a function of flow  $q$ , and setting angle  $\alpha$ .

The dashed curves give the A-weighted sound power data,  $L_{WA}$ , in dB to the duct.

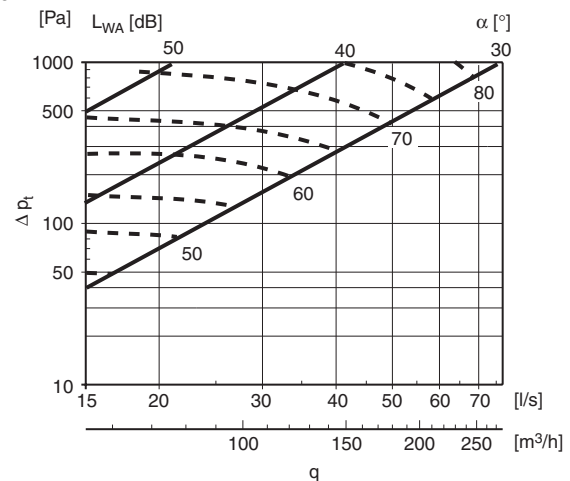
#### Example

Given            Dimension Ø100  
                     Flow 60 l/s  
                     Pressure drop 200 Pa

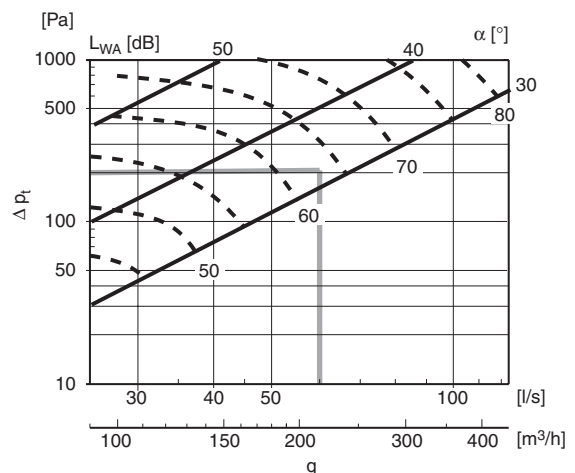
Obtained from graph

Setting angle 32°  
 Sound power level 63 dB (A)

### Ø80



### Ø100



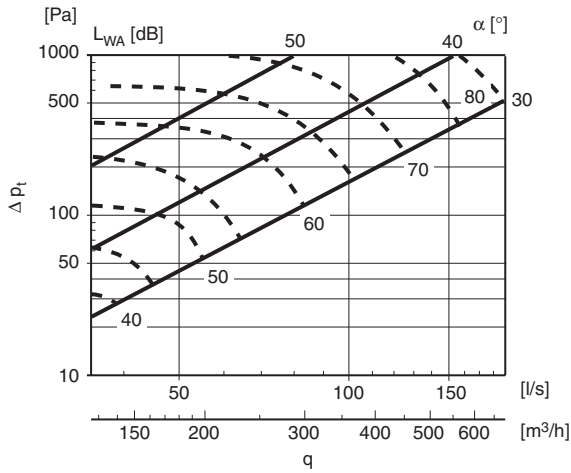


# Shut-off damper

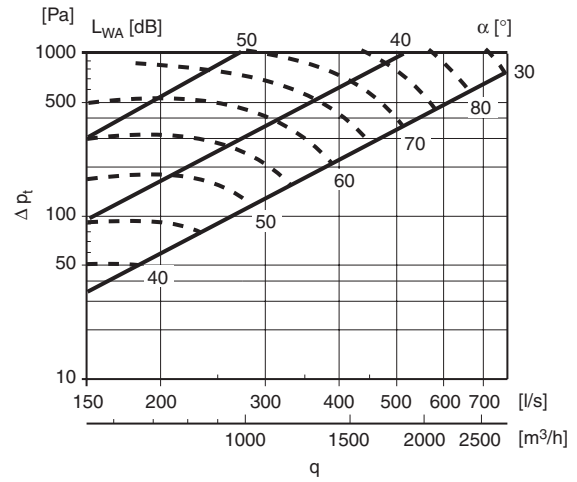
DTU

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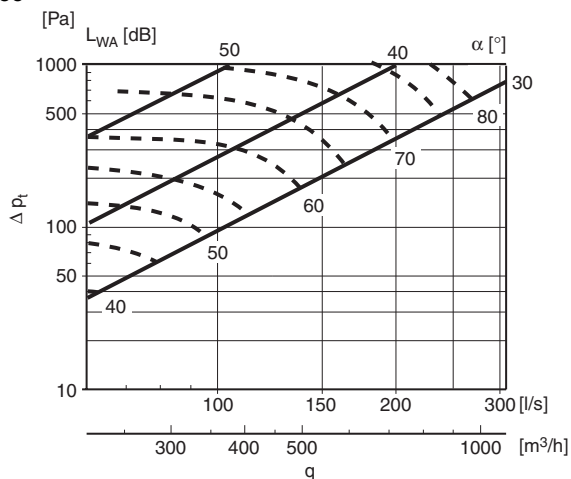
**Ø125**



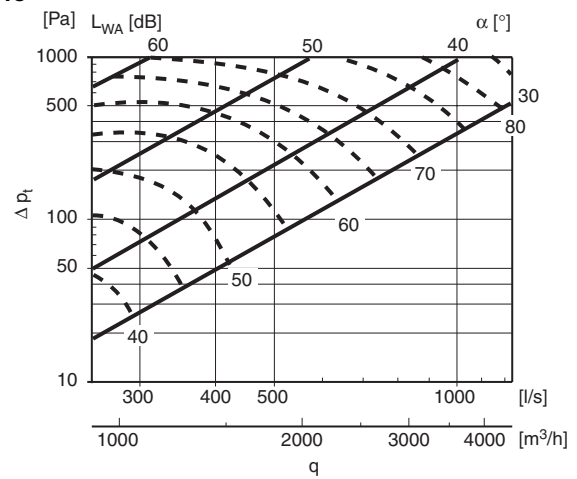
**Ø250**



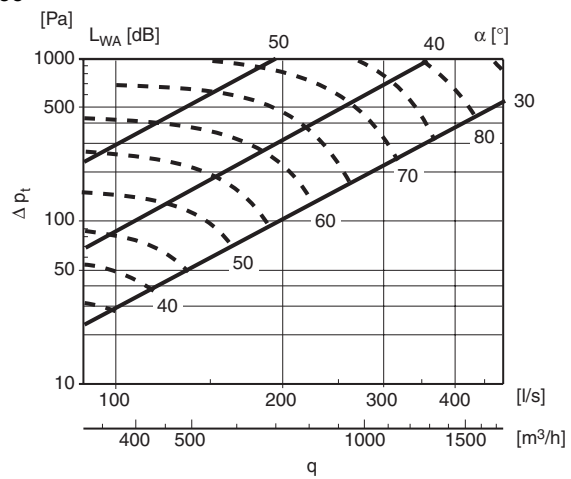
**Ø160**



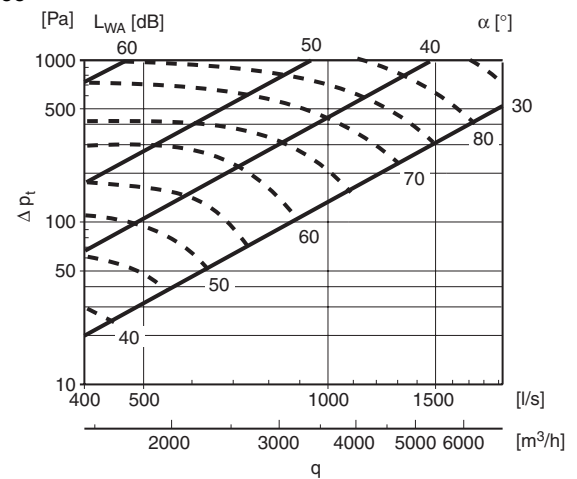
**Ø315**



**Ø200**



**Ø400**

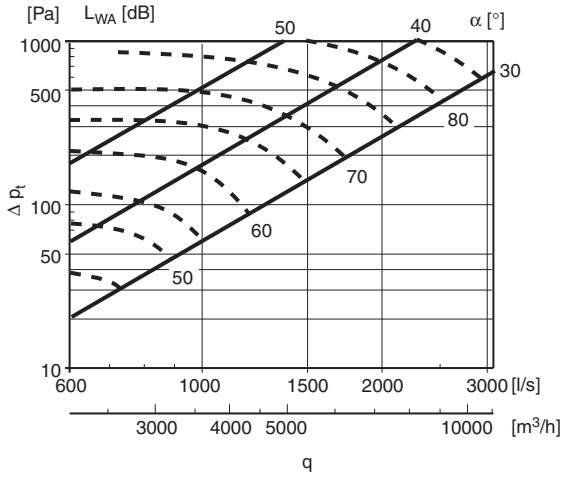




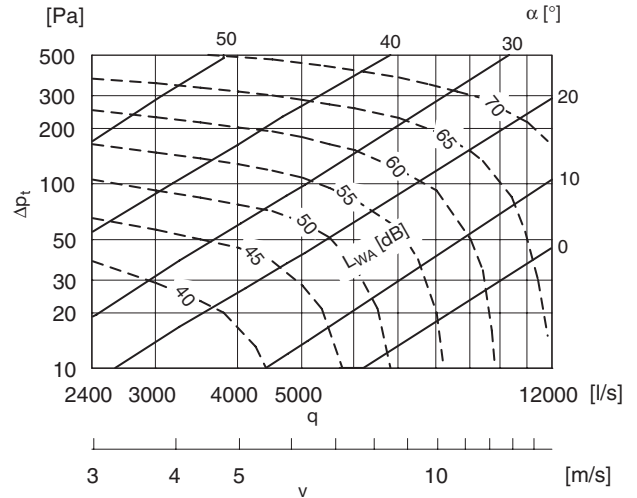
# Shut-off damper

DTU

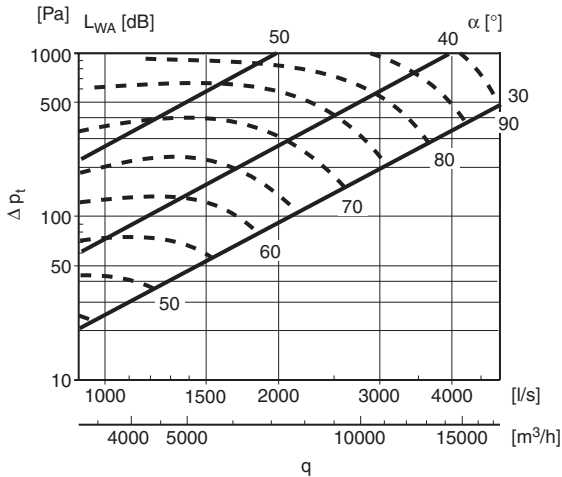
**Ø500**



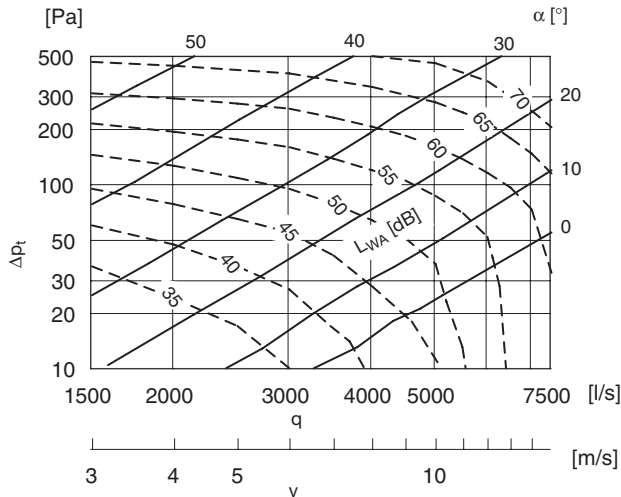
**Ø1000**



**Ø630**



**Ø800**



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# Shut-off damper

DTU

| dim<br>Ød <sub>1</sub> | Pressure<br>drop<br>[Pa] | Velocity app. 12 [m/s] |     |     |     |    |    |    |    | Velocity app. 15 [m/s] |     |     |     |    |    |    |    |
|------------------------|--------------------------|------------------------|-----|-----|-----|----|----|----|----|------------------------|-----|-----|-----|----|----|----|----|
|                        |                          | Centre frequency [Hz]  |     |     |     |    |    |    |    | Centre frequency [Hz]  |     |     |     |    |    |    |    |
|                        |                          | 63                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                     |                          | Flow 60 [l/s]          |     |     |     |    |    |    |    | Flow 75 [l/s]          |     |     |     |    |    |    |    |
|                        | 500                      | 75                     | 75  | 75  | 75  | 68 | 64 | 56 | 53 | 80                     | 80  | 80  | 80  | 72 | 68 | 60 | 56 |
|                        | 300                      | 75                     | 75  | 71  | 71  | 64 | 57 | 50 | 43 | 79                     | 79  | 75  | 75  | 68 | 60 | 53 | 45 |
|                        | 200                      | 75                     | 75  | 71  | 65  | 61 | 51 | 41 | 34 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 50                     | -                        | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 100                    |                          | Flow 100 [l/s]         |     |     |     |    |    |    |    | Flow 120 [l/s]         |     |     |     |    |    |    |    |
|                        | 500                      | 84                     | 81  | 80  | 72  | 68 | 62 | 61 | 61 | 88                     | 85  | 84  | 76  | 72 | 65 | 64 | 64 |
|                        | 300                      | 81                     | 80  | 79  | 70  | 67 | 59 | 56 | 55 | 86                     | 85  | 84  | 74  | 70 | 62 | 59 | 58 |
|                        | 200                      | 80                     | 80  | 79  | 69  | 66 | 55 | 51 | 51 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 50                     | -                        | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 125                    |                          | Flow 160 [l/s]         |     |     |     |    |    |    |    | Flow 180 [l/s]         |     |     |     |    |    |    |    |
|                        | 500                      | 89                     | 85  | 81  | 73  | 69 | 62 | 62 | 58 | 91                     | 87  | 83  | 75  | 71 | 63 | 63 | 59 |
|                        | 300                      | 86                     | 86  | 79  | 71  | 68 | 60 | 56 | 53 | 89                     | 88  | 81  | 73  | 69 | 62 | 58 | 54 |
|                        | 200                      | 89                     | 85  | 78  | 70  | 63 | 56 | 52 | 52 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 50                     | -                        | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 160                    |                          | Flow 240 [l/s]         |     |     |     |    |    |    |    | Flow 300 [l/s]         |     |     |     |    |    |    |    |
|                        | 500                      | 84                     | 84  | 80  | 72  | 68 | 65 | 65 | 65 | 89                     | 89  | 85  | 77  | 73 | 69 | 69 | 69 |
|                        | 300                      | 81                     | 81  | 78  | 70  | 67 | 63 | 59 | 59 | 87                     | 87  | 83  | 76  | 72 | 68 | 64 | 64 |
|                        | 200                      | 84                     | 80  | 77  | 69  | 66 | 58 | 55 | 55 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 50                     | -                        | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 200                    |                          | Flow 400 [l/s]         |     |     |     |    |    |    |    | Flow 450 [l/s]         |     |     |     |    |    |    |    |
|                        | 500                      | 90                     | 82  | 78  | 72  | 67 | 66 | 71 | 70 | 93                     | 85  | 81  | 73  | 71 | 70 | 74 | 73 |
|                        | 300                      | 92                     | 84  | 78  | 71  | 67 | 63 | 67 | 66 | 95                     | 87  | 81  | 72  | 68 | 66 | 69 | 68 |
|                        | 200                      | 90                     | 83  | 79  | 69  | 65 | 62 | 61 | 60 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 50                     | -                        | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 250                    |                          | Flow 600 [l/s]         |     |     |     |    |    |    |    | Flow 750 [l/s]         |     |     |     |    |    |    |    |
|                        | 500                      | 87                     | 83  | 76  | 68  | 64 | 68 | 68 | 68 | 94                     | 90  | 82  | 74  | 70 | 74 | 74 | 74 |
|                        | 300                      | 84                     | 80  | 73  | 67  | 65 | 64 | 62 | 61 | 91                     | 87  | 80  | 72  | 70 | 69 | 72 | 68 |
|                        | 200                      | 82                     | 79  | 72  | 64  | 63 | 63 | 62 | 61 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 50                     | -                        | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 315                    |                          | Flow 1000 [l/s]        |     |     |     |    |    |    |    | Flow 1200 [l/s]        |     |     |     |    |    |    |    |
|                        | 500                      | 89                     | 85  | 77  | 69  | 68 | 67 | 69 | 65 | 92                     | 88  | 80  | 72  | 71 | 70 | 72 | 68 |
|                        | 300                      | 85                     | 81  | 74  | 66  | 64 | 64 | 66 | 59 | 89                     | 85  | 78  | 70  | 68 | 68 | 70 | 62 |
|                        | 200                      | 86                     | 79  | 72  | 65  | 63 | 62 | 64 | 58 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 50                     | -                        | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 400                    |                          | Flow 1600 [l/s]        |     |     |     |    |    |    |    | Flow 1800 [l/s]        |     |     |     |    |    |    |    |
|                        | 500                      | 95                     | 87  | 79  | 75  | 67 | 71 | 70 | 69 | 98                     | 90  | 82  | 78  | 70 | 74 | 73 | 72 |
|                        | 300                      | 91                     | 83  | 76  | 69  | 67 | 66 | 65 | 64 | 94                     | 86  | 79  | 71  | 70 | 69 | 68 | 67 |
|                        | 200                      | 89                     | 82  | 75  | 69  | 67 | 64 | 63 | 60 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 50                     | -                        | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 500                    |                          | Flow 2400 [l/s]        |     |     |     |    |    |    |    | Flow 3000 [l/s]        |     |     |     |    |    |    |    |
|                        | 500                      | 96                     | 88  | 80  | 72  | 70 | 73 | 72 | 71 | 102                    | 94  | 85  | 78  | 75 | 77 | 77 | 76 |
|                        | 300                      | 93                     | 85  | 78  | 70  | 66 | 66 | 70 | 70 | 99                     | 91  | 83  | 74  | 70 | 70 | 74 | 74 |
|                        | 200                      | 91                     | 84  | 76  | 70  | 68 | 66 | 65 | 61 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 50                     | -                        | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 630                    |                          | Flow 4000 [l/s]        |     |     |     |    |    |    |    | Flow 4500 [l/s]        |     |     |     |    |    |    |    |
|                        | 500                      | 103                    | 95  | 86  | 82  | 77 | 77 | 76 | 73 | 107                    | 98  | 90  | 85  | 81 | 81 | 80 | 76 |
|                        | 300                      | 100                    | 91  | 83  | 79  | 75 | 75 | 74 | 66 | 105                    | 96  | 88  | 83  | 79 | 79 | 79 | 70 |
|                        | 200                      | 98                     | 90  | 82  | 78  | 74 | 70 | 70 | 62 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 50                     | -                        | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 800                    |                          | Flow 6000 [l/s]        |     |     |     |    |    |    |    | Flow 7500 [l/s]        |     |     |     |    |    |    |    |
|                        | 500                      | 84                     | 74  | 69  | 68  | 66 | 66 | 63 | 60 | 88                     | 79  | 73  | 70  | 71 | 71 | 67 | 62 |
|                        | 300                      | 82                     | 72  | 66  | 63  | 61 | 61 | 57 | 53 | 84                     | 76  | 71  | 66  | 68 | 68 | 63 | 57 |
|                        | 200                      | 80                     | 69  | 63  | 60  | 57 | 57 | 53 | 47 | 82                     | 74  | 68  | 63  | 64 | 63 | 58 | 52 |
|                        | 100                      | 76                     | 64  | 59  | 55  | 52 | 51 | 46 | 41 | 79                     | 69  | 63  | 59  | 56 | 55 | 51 | 45 |
|                        | 50                       | 72                     | 60  | 56  | 51  | 48 | 46 | 41 | 35 | 77                     | 66  | 61  | 57  | 54 | 52 | 48 | 41 |
| 25                     | 70                       | 59                     | 55  | 51  | 48  | 44 | 39 | 32 | -  | -                      | -   | -   | -   | -  | -  | -  |    |
| 1000                   |                          | Flow 9400 [l/s]        |     |     |     |    |    |    |    | Flow 11800 [l/s]       |     |     |     |    |    |    |    |
|                        | 500                      | 85                     | 77  | 71  | 70  | 69 | 69 | 66 | 60 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 300                      | 82                     | 74  | 67  | 66  | 65 | 63 | 60 | 54 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 200                      | 80                     | 72  | 65  | 64  | 61 | 60 | 57 | 51 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | 76                     | 68  | 61  | 60  | 57 | 55 | 53 | 51 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 50                       | 73                     | 66  | 59  | 58  | 55 | 52 | 51 | 48 | -                      | -   | -   | -   | -  | -  | -  | -  |
| 25                     | 70                       | 64                     | 57  | 57  | 53  | 50 | 49 | 43 | -  | -                      | -   | -   | -   | -  | -  | -  |    |

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# Shut-off damper with motor shelf

## DTHU



### Description

#### Shut-off damper with motor shelf KOMHY

Ø 80–630 consists of a DTU damper with a KOMHY combined motor shelf added. The damper has no knob, and has a longer spindle to avoid the need for extension spindle VREDF. The damper is designed to have a motor added on site.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 80–315 fullfills pressure class C in closed position.  
 Ø 355–630 fullfills pressure class B in closed position.  
 Ø 710–1000 fullfills pressure class A in closed position.

#### Motorizing

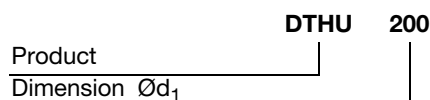
The motor shelf KOMHY is provided with suitable fixing holes for Belimo's LM, NM SM and AF motors, and for Sauter's pneumatic actuators AK 31 P and AK 41 P.

Ø 900 and 1000 has two motor shelves.

**NOTE!** AK 42 P does not fit this damper. The torque needed for motorizing is given in the adjacent table.

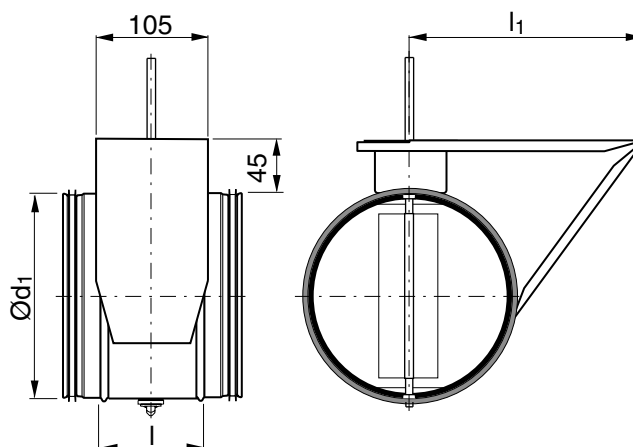
Also the dampers DRU and DSU can be ordered in this version.

### Ordering example

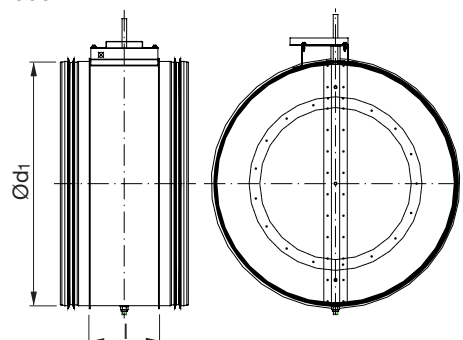


### Dimensions

Ø 80–630



Ø 710–1000



| Ød <sub>1</sub><br>nom | l<br>mm | l <sub>1</sub><br>mm | M<br>Nm | m<br>kg | Sealing class<br>past closed<br>blade |
|------------------------|---------|----------------------|---------|---------|---------------------------------------|
| 80                     | 100     | 230                  | 2,0     | 0,67    | 4                                     |
| 100                    | 100     | 230                  | 2,0     | 0,75    | 4                                     |
| 112                    | 100     | 230                  | 2,0     | 0,85    | 4                                     |
| 125                    | 100     | 230                  | 2,0     | 0,90    | 4                                     |
| 140                    | 100     | 230                  | 2,0     | 0,97    | 4                                     |
| 150                    | 100     | 230                  | 2,0     | 1,00    | 4                                     |
| 160                    | 100     | 230                  | 2,0     | 1,11    | 4                                     |
| 180                    | 100     | 230                  | 2,0     | 1,19    | 4                                     |
| 200                    | 100     | 230                  | 2,0     | 1,41    | 4                                     |
| 224                    | 100     | 230                  | 3,0     | 1,64    | 4                                     |
| 250                    | 100     | 230                  | 3,0     | 1,89    | 4                                     |
| 280                    | 100     | 230                  | 4,0     | 2,14    | 4                                     |
| 300                    | 100     | 230                  | 4,0     | 2,33    | 4                                     |
| 315                    | 100     | 230                  | 4,0     | 2,51    | 4                                     |
| 355                    | 100     | 230                  | 8,0     | 2,81    | 4                                     |
| 400                    | 100     | 230                  | 8,0     | 4,02    | 4                                     |
| 450                    | 100     | 230                  | 10      | 5,21    | 4                                     |
| 500                    | 115     | 230                  | 10      | 6,44    | 4                                     |
| 560                    | 115     | 230                  | 15      | 7,84    | 4                                     |
| 600                    | 115     | 230                  | 15      | 8,48    | 4                                     |
| 630                    | 115     | 315                  | 15      | 9,17    | 4                                     |



# Shut-off damper with motor shelf

## DTHU

| $\varnothing d_1$<br>nom | l<br>mm | l <sub>1</sub><br>mm | M<br>Nm | m<br>kg | Sealing class<br>past closed<br>blade |
|--------------------------|---------|----------------------|---------|---------|---------------------------------------|
| 710                      | 230     | 355                  | 40      | 18,2    | 4                                     |
| 800                      | 230     | 400                  | 40      | 20,7    | 4                                     |
| 900                      | 230     | 450                  | 60      | 27,6    | 4                                     |
| 1000                     | 230     | 500                  | 60      | 32,6    | 4                                     |

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# Shut-off damper

# DTMU/DTWU

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## Description

DTMU/DTWU are tight-closing shut-off dampers. The dampers can be used to completely shut off the air flow.

The blade consists of double sheet metal with a intermediate sealing of EPDM-rubber, which is in contact with the inside of the damper housing when in the closed position.

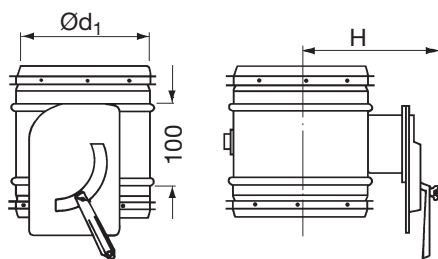
DTMU is equipped with a handle and a locking mechanism for stepless adjustment of 0–90°.

DTWU is equipped with a transverse lever, on which pulling ropes can be mounted for manual remote control.

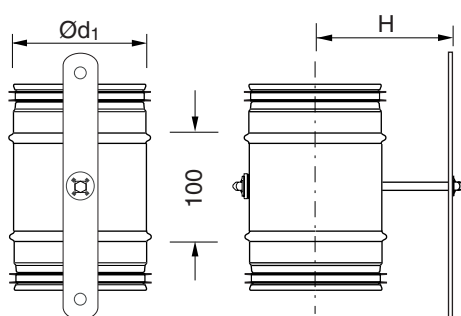
There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 80–315 fullfills pressure class C in closed position.  
 Ø 355–630 fullfills pressure class B in closed position.

DTMU



DTWU



## Dimensions

| Ød <sub>1</sub><br>nom | H<br>mm | m<br>kg | Sealing class<br>past closed<br>blade |
|------------------------|---------|---------|---------------------------------------|
| 80                     | 95      | 0,80    | 4                                     |
| 100                    | 105     | 0,90    | 4                                     |
| 112                    | 110     | 0,90    | 4                                     |
| 125                    | 118     | 1,00    | 4                                     |
| 140                    | 125     | 1,00    | 4                                     |
| 150                    | 130     | 1,10    | 4                                     |
| 160                    | 135     | 1,10    | 4                                     |
| 180                    | 145     | 1,30    | 4                                     |
| 200                    | 155     | 1,40    | 4                                     |
| 224                    | 165     | 1,60    | 4                                     |
| 250                    | 180     | 1,90    | 4                                     |
| 280                    | 195     | 2,20    | 4                                     |
| 300                    | 205     | 2,40    | 4                                     |
| 315                    | 215     | 2,60    | 4                                     |
| 355                    | 240     | 3,10    | 4                                     |
| 400                    | 260     | 3,90    | 4                                     |
| 450                    | 285     | 4,50    | 4                                     |
| 500                    | 310     | 5,20    | 4                                     |
| 560                    | 340     | 6,20    | 4                                     |
| 600                    | 360     | 7,20    | 4                                     |
| 630                    | 375     | 8,10    | 4                                     |

## Ordering example

Product **DTMU** **250**  
 Dimension Ød<sub>1</sub>



# Shut-off damper

# DTMU/DTWU

## Technical data

### Pressure drop graphs with noise data for dimensioning

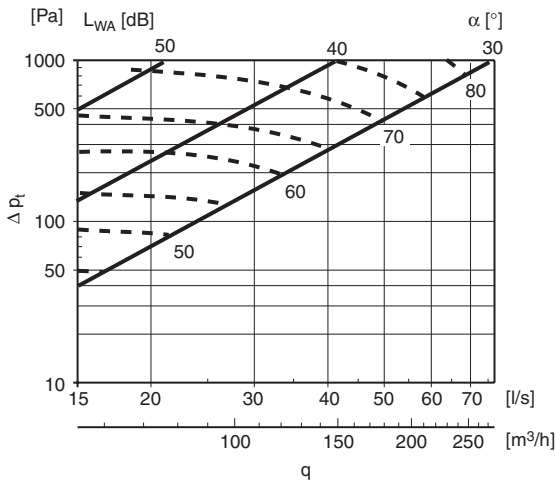
The solid curves show the pressure drop,  $\Delta p_t$ , over the damper as a function of the flow  $q$ , and setting angle  $\alpha$ . The dashed curves give the A-weighted sound power data,  $L_{WA}$ , in dB to the duct.

#### Example

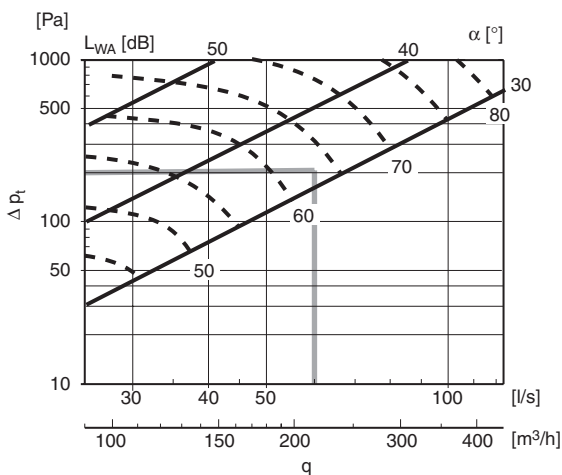
Given

- Dimension  $\text{Ø}100$
- Flow 60 l/s
- Pressure drop 200 Pa
- Obtained from the graph
- Setting angle  $32^\circ$
- Sound power level 63 dB (A)

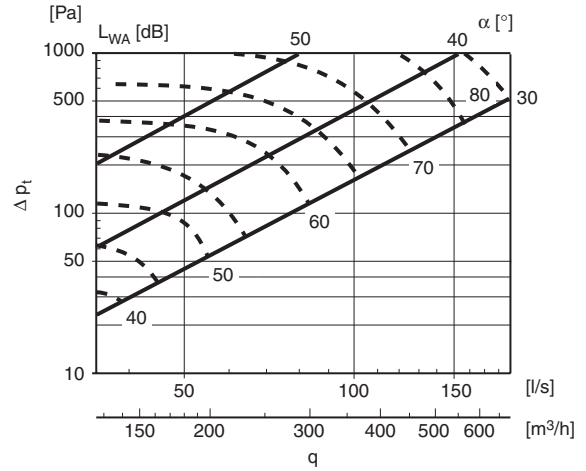
### Ø80



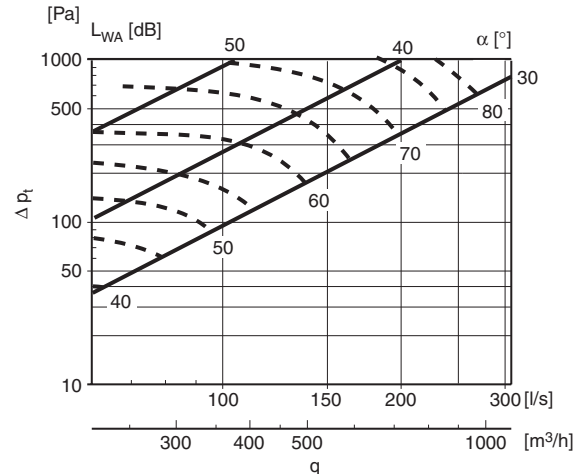
### Ø100



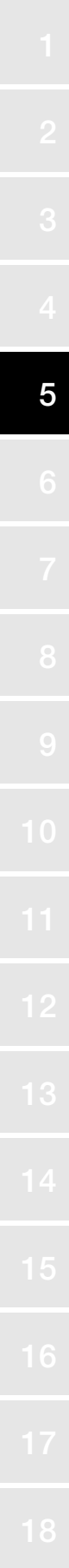
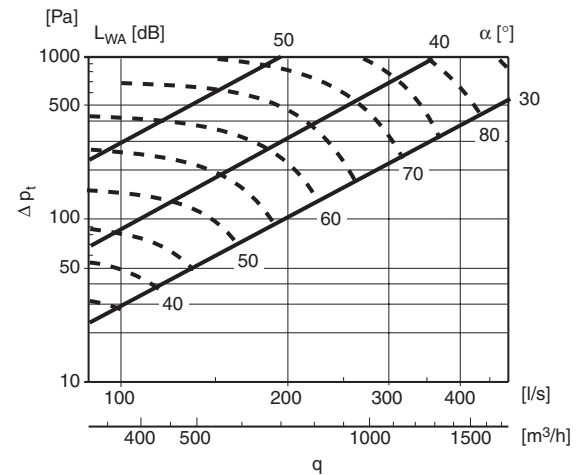
### Ø125



### Ø160



### Ø200



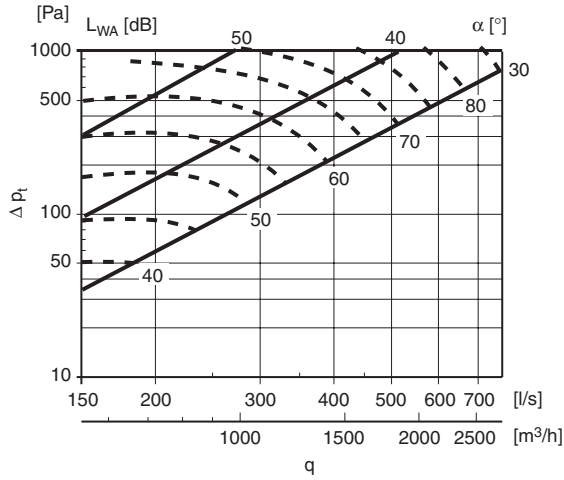


# Shut-off damper

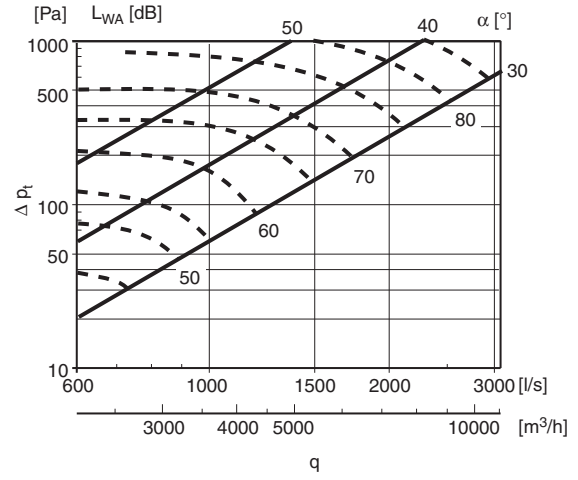
# DTMU/DTWU

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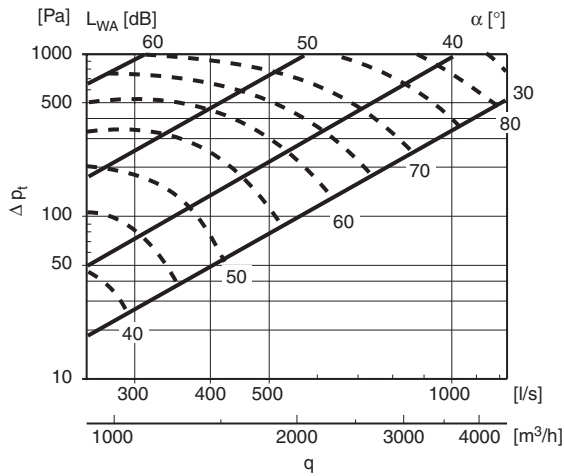
**Ø250**



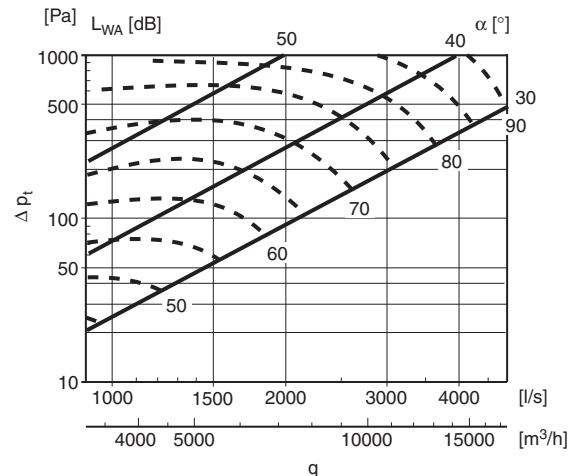
**Ø500**



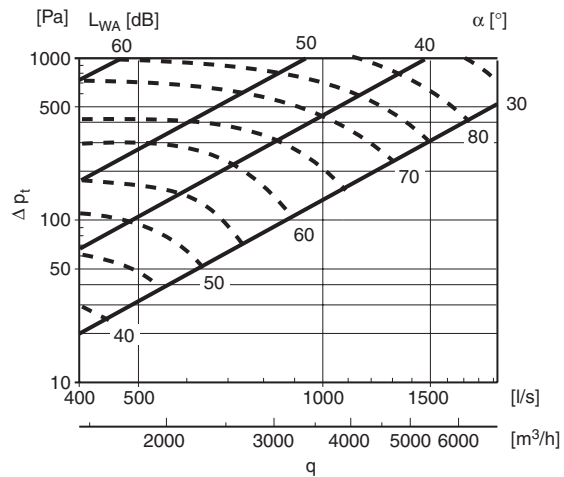
**Ø315**



**Ø630**



**Ø400**









# Shut-off damper

# DTMU/DTWU

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| dim<br>Ød <sub>1</sub> | Pressure<br>drop<br>[Pa] | Velocity app. 12 [m/s] |     |     |     |    |    |    |    | Velocity app. 15 [m/s] |     |     |     |    |    |    |    |
|------------------------|--------------------------|------------------------|-----|-----|-----|----|----|----|----|------------------------|-----|-----|-----|----|----|----|----|
|                        |                          | Centre frequency [Hz]  |     |     |     |    |    |    |    | Centre frequency [Hz]  |     |     |     |    |    |    |    |
|                        |                          | 63                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                     |                          | Flow 60 [l/s]          |     |     |     |    |    |    |    | Flow 75 [l/s]          |     |     |     |    |    |    |    |
|                        | 500                      | 75                     | 75  | 75  | 75  | 68 | 64 | 56 | 53 | 80                     | 80  | 80  | 80  | 72 | 68 | 60 | 56 |
|                        | 300                      | 75                     | 75  | 71  | 71  | 64 | 57 | 50 | 43 | 79                     | 79  | 75  | 75  | 68 | 60 | 53 | 45 |
|                        | 200                      | 75                     | 75  | 71  | 65  | 61 | 51 | 41 | 34 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 50                       | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 100                    |                          | Flow 100 [l/s]         |     |     |     |    |    |    |    | Flow 120 [l/s]         |     |     |     |    |    |    |    |
|                        | 500                      | 84                     | 81  | 80  | 72  | 68 | 62 | 61 | 61 | 88                     | 85  | 84  | 76  | 72 | 65 | 64 | 64 |
|                        | 300                      | 81                     | 80  | 79  | 70  | 67 | 59 | 56 | 55 | 86                     | 85  | 84  | 74  | 70 | 62 | 59 | 58 |
|                        | 200                      | 80                     | 80  | 79  | 69  | 66 | 55 | 51 | 51 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 50                       | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 125                    |                          | Flow 160 [l/s]         |     |     |     |    |    |    |    | Flow 180 [l/s]         |     |     |     |    |    |    |    |
|                        | 500                      | 89                     | 85  | 81  | 73  | 69 | 62 | 62 | 58 | 91                     | 87  | 83  | 75  | 71 | 63 | 63 | 59 |
|                        | 300                      | 86                     | 86  | 79  | 71  | 68 | 60 | 56 | 53 | 89                     | 88  | 81  | 73  | 69 | 62 | 58 | 54 |
|                        | 200                      | 89                     | 85  | 78  | 70  | 63 | 56 | 52 | 52 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 50                       | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 160                    |                          | Flow 240 [l/s]         |     |     |     |    |    |    |    | Flow 300 [l/s]         |     |     |     |    |    |    |    |
|                        | 500                      | 84                     | 84  | 80  | 72  | 68 | 65 | 65 | 65 | 89                     | 89  | 85  | 77  | 73 | 69 | 69 | 69 |
|                        | 300                      | 81                     | 81  | 78  | 70  | 67 | 63 | 59 | 59 | 87                     | 87  | 83  | 76  | 72 | 68 | 64 | 64 |
|                        | 200                      | 84                     | 80  | 77  | 69  | 66 | 58 | 55 | 55 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 50                       | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 200                    |                          | Flow 400 [l/s]         |     |     |     |    |    |    |    | Flow 450 [l/s]         |     |     |     |    |    |    |    |
|                        | 500                      | 90                     | 82  | 78  | 72  | 67 | 66 | 71 | 70 | 93                     | 85  | 81  | 73  | 71 | 70 | 74 | 73 |
|                        | 300                      | 92                     | 84  | 78  | 71  | 67 | 63 | 67 | 66 | 95                     | 87  | 81  | 72  | 68 | 66 | 69 | 68 |
|                        | 200                      | 90                     | 83  | 79  | 69  | 65 | 62 | 61 | 60 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 50                       | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 250                    |                          | Flow 600 [l/s]         |     |     |     |    |    |    |    | Flow 750 [l/s]         |     |     |     |    |    |    |    |
|                        | 500                      | 87                     | 83  | 76  | 68  | 64 | 68 | 68 | 68 | 94                     | 90  | 82  | 74  | 70 | 74 | 74 | 74 |
|                        | 300                      | 84                     | 80  | 73  | 67  | 65 | 64 | 62 | 61 | 91                     | 87  | 80  | 72  | 70 | 69 | 72 | 68 |
|                        | 200                      | 82                     | 79  | 72  | 64  | 63 | 63 | 62 | 61 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 50                       | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 315                    |                          | Flow 1000 [l/s]        |     |     |     |    |    |    |    | Flow 1200 [l/s]        |     |     |     |    |    |    |    |
|                        | 500                      | 89                     | 85  | 77  | 69  | 68 | 67 | 69 | 65 | 92                     | 88  | 80  | 72  | 71 | 70 | 72 | 68 |
|                        | 300                      | 85                     | 81  | 74  | 66  | 64 | 64 | 66 | 59 | 89                     | 85  | 78  | 70  | 68 | 68 | 70 | 62 |
|                        | 200                      | 86                     | 79  | 72  | 65  | 63 | 62 | 64 | 58 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 50                       | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 400                    |                          | Flow 1600 [l/s]        |     |     |     |    |    |    |    | Flow 1800 [l/s]        |     |     |     |    |    |    |    |
|                        | 500                      | 95                     | 87  | 79  | 75  | 67 | 71 | 70 | 69 | 98                     | 90  | 82  | 78  | 70 | 74 | 73 | 72 |
|                        | 300                      | 91                     | 83  | 76  | 69  | 67 | 66 | 65 | 64 | 94                     | 86  | 79  | 71  | 70 | 69 | 68 | 67 |
|                        | 200                      | 89                     | 82  | 75  | 69  | 67 | 64 | 63 | 60 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 50                       | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 500                    |                          | Flow 2400 [l/s]        |     |     |     |    |    |    |    | Flow 3000 [l/s]        |     |     |     |    |    |    |    |
|                        | 500                      | 96                     | 88  | 80  | 72  | 70 | 73 | 72 | 71 | 102                    | 94  | 85  | 78  | 75 | 77 | 77 | 76 |
|                        | 300                      | 93                     | 85  | 78  | 70  | 66 | 66 | 70 | 70 | 99                     | 91  | 83  | 74  | 70 | 70 | 74 | 74 |
|                        | 200                      | 91                     | 84  | 76  | 70  | 68 | 66 | 65 | 61 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 50                       | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
| 630                    |                          | Flow 4000 [l/s]        |     |     |     |    |    |    |    | Flow 4500 [l/s]        |     |     |     |    |    |    |    |
|                        | 500                      | 103                    | 95  | 86  | 82  | 77 | 77 | 76 | 73 | 107                    | 98  | 90  | 85  | 81 | 81 | 80 | 76 |
|                        | 300                      | 100                    | 91  | 83  | 79  | 75 | 75 | 74 | 66 | 105                    | 96  | 88  | 83  | 79 | 79 | 79 | 70 |
|                        | 200                      | 98                     | 90  | 82  | 78  | 74 | 70 | 70 | 62 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 100                      | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                        | 50                       | -                      | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |

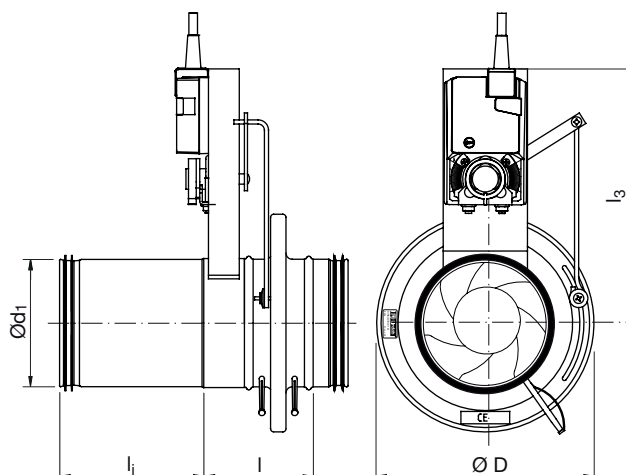


# Damper with flow meter

# DIRBU



## Dimensions



| Ød <sub>1</sub><br>nom | ØD<br>nom | l<br>mm | l <sub>i</sub><br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|-----------|---------|----------------------|----------------------|---------|
| 100                    | 163       | 94      | 130                  | 235                  | 1,90    |
| 125                    | 210       | 103     | 130                  | 249                  | 2,30    |
| 150                    | 230       | 100     | 130                  | 262                  | 2,50    |
| 160                    | 230       | 100     | 130                  | 268                  | 2,50    |
| 200                    | 285       | 102     | 130                  | 289                  | 3,40    |
| 250                    | 333       | 123     | 185                  | 315                  | 4,50    |
| 300                    | 406       | 123     | 185                  | 341                  | 5,10    |
| 315                    | 406       | 123     | 185                  | 350                  | 5,50    |

## Description

The motor-driven damper DIRBU with flow meter is suitable for systems where it should be possible to increase the air flow or lower it to the basic level. Examples of such systems are conference rooms and public areas.

It fulfils tightness class C. DIRBU is intended for use where you want to be able to set two air flows.

Maximum and minimum flow is set with the measurement nozzles and are fixed with the two end stop screws on the motor.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

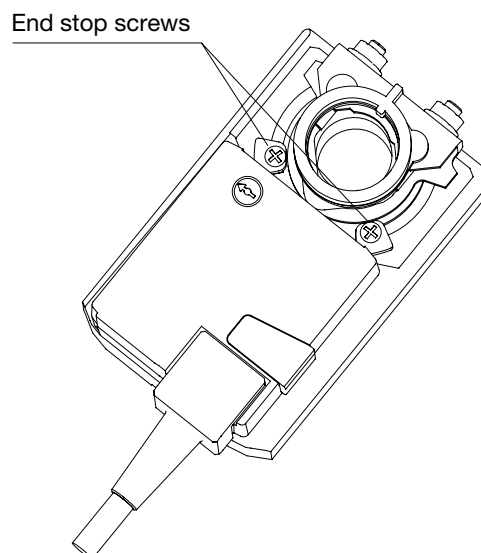
Ø 100–315 fullfills pressure class A in closed position.

## Cleaning

By fully open the damper, one get access to the duct. Do not forget to readjust the damper after cleaning.

## Installation

Consider required straight distance after or before disturbance, as mentioned on page 245 and on the card attached to the measurement nozzles, to obtain accurate flow measurement.



## Ordering example

|                           |              |            |           |           |
|---------------------------|--------------|------------|-----------|-----------|
| <b>Product</b>            | <b>DIRBU</b> | <b>160</b> | <b>24</b> | <b>NM</b> |
| Type                      |              |            |           |           |
| Dimension Ød <sub>1</sub> |              |            |           |           |
| Voltage                   |              |            |           |           |
| Motor type                |              |            |           |           |



# Damper with flow meter

DIRBU

## Technical data for the motors

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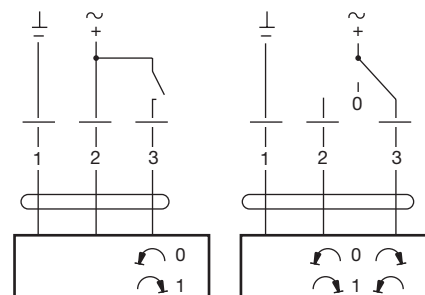
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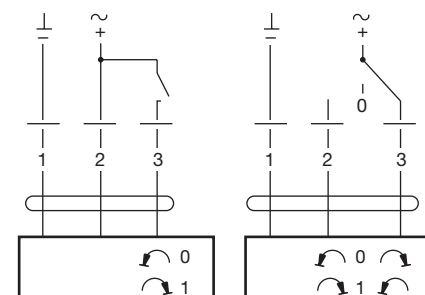
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|                           | <b>NM 24 A-F</b>                           | <b>NM 230 A-F</b>               |
|---------------------------|--|---------------------------------|
| Dimension                 | Ø100–200                                   | Ø100–200                        |
| Power supply              | AC 19,2–28,8 V, 50/60 Hz<br>DC 19,2–28,8 V | AC 85–265 V, 50/60 Hz           |
| Power consumption         | 1,5 W                                      | 2,5 W                           |
| For wire sizing           | 3,5 VA                                     | 6 VA                            |
| Connection                | Cable 1 m, 3x0,75 mm2                      | Cable 1 m, 3x0,75 mm2           |
| Operating angle           | Max. 95°, adjustable 0–100%                | Max. 95°, adjustable 0–100%     |
| Torque at rated voltage   | Min. 10 Nm                                 | Min. 10 Nm                      |
| Direction of rotation     | Switch selectable<br>0 ↺ or 1 ↻            | Switch selectable<br>0 ↺ or 1 ↻ |
| Position indication       | Mechanical                                 | Mechanical                      |
| Running time for 95°      | 150 s                                      | 150 s                           |
| Sound power level         | Max. 35 dB (A)                             | Max. 35 dB (A)                  |
| Protection class          | III Safety extra-low voltage               | II Safety insulated             |
| Protection type           | IP 54                                      | IP 54                           |
| Ambient temperature range | -30 to +50°C                               | -30 to +50°C                    |
| Ambient moisture          | 95 % RF                                    | 95 % RF                         |



|                           | <b>SM 24 A</b>                             | <b>SM 230 A</b>                 |
|---------------------------|--|---------------------------------|
| Dimension                 | Ø250–315                                   | Ø250–315                        |
| Power supply              | AC 19,2–28,8 V, 50/60 Hz<br>DC 19,2–28,8 V | AC 85–265 V, 50/60 Hz           |
| Power consumption         | 2 W  | 2,5 W                           |
| For wire sizing           | 4 VA                                       | 6 VA                            |
| Connection                | Kabel 1 m, 3x0,75 mm2                      | Kabel 1 m, 3x0,75 mm2           |
| Operating angle           | Max. 95°, adjustable 0–100%                | Max. 95°, adjustable 0–100%     |
| Torque at rated voltage   | Min. 20 Nm                                 | Min. 20 Nm                      |
| Direction of rotation     | Switch selectable<br>0 ↺ or 1 ↻            | Switch selectable<br>0 ↺ or 1 ↻ |
| Position indication       | Mechanical                                 | Mechanical                      |
| Running time for 95°      | 150 s                                      | 150 s                           |
| Sound power level         | Max. 35 dB (A)                             | Max. 35 dB (A)                  |
| Protection class          | III Safety extra-low voltage               | II Safety extra-low voltage     |
| Protection type           | IP 54                                      | IP 54                           |
| Ambient temperature range | -30 to +50°C                               | -30 to +50°C                    |
| Ambient moisture          | 95 % RF                                    | 95 % RF                         |



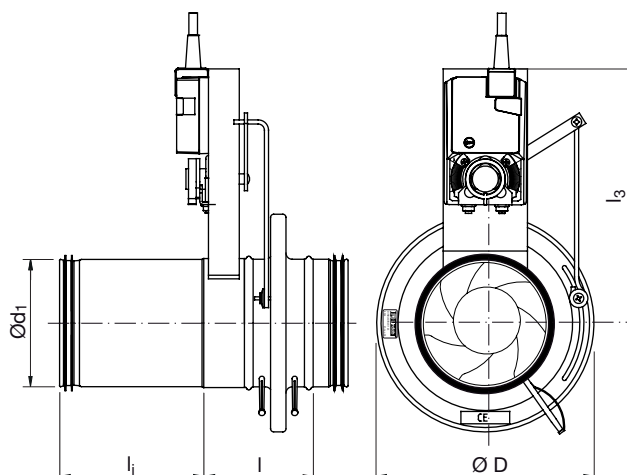


# Damper with flow meter

# DIRVU



## Dimensions



| Ød <sub>1</sub><br>nom | ØD<br>nom | l<br>mm | l <sub>1</sub><br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|-----------|---------|----------------------|----------------------|---------|
| 100                    | 163       | 94      | 130                  | 235                  | 1,90    |
| 125                    | 210       | 103     | 130                  | 249                  | 2,30    |
| 150                    | 230       | 100     | 130                  | 262                  | 2,50    |
| 160                    | 230       | 100     | 130                  | 268                  | 2,50    |
| 200                    | 285       | 102     | 130                  | 289                  | 3,40    |
| 250                    | 333       | 123     | 185                  | 315                  | 4,50    |
| 300                    | 406       | 123     | 185                  | 341                  | 5,10    |
| 315                    | 406       | 123     | 185                  | 350                  | 5,50    |

## Description

The motor-driven damper DIRVU with flow meter is suitable for systems where it should be possible to vary the air flow. Examples of such systems are conference rooms and public areas. It fulfills tightness class C.

Maximum and minimum flow is set with the measurement nozzles and are fixed with the two end stop screws on the motor. A special mounting, measuring, balancing and maintenance instruction exists for this product.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 100–315 fulfills pressure class A in closed position.

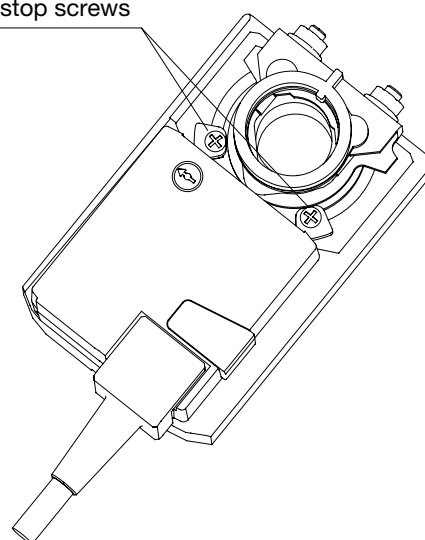
### Cleaning

By fully open the damper, one get access to the duct. Do not forget to readjust the damper after cleaning.

### Installation

Consider required straight distance after or before disturbance, as mentioned on page 245 and on the card attached to the measurement nozzles, to obtain accurate flow measurement.

End stop screws



## Ordering example

|                           |              |            |           |           |
|---------------------------|--------------|------------|-----------|-----------|
| <b>Product</b>            | <b>DIRVU</b> | <b>160</b> | <b>24</b> | <b>NM</b> |
| Type                      |              |            |           |           |
| Dimension Ød <sub>1</sub> |              |            |           |           |
| Voltage                   |              |            |           |           |
| Motor type                |              |            |           |           |





# Damper with flow meter

DIRVU

## Technical data for the motors

1

|                           |                                    |
|---------------------------|------------------------------------|
|                           | <b>NM 24 A-SR</b>                  |
| Dimension                 | Ø100–200                           |
| Power supply              | AC 24 V, 50/60 Hz<br>DC 24 V       |
| Power consumption         | 2 W                                |
| For wire sizing           | 4 VA                               |
| Connection                | Cable 1 m, 4x0,75 mm <sup>2</sup>  |
| Operating angle           | Max. 95°, adjustable 0–100%        |
| Torque at rated voltage   | Min. 10 Nm                         |
| Direction of rotation     | Switch selectable<br>0 ↺ eller 1 ↻ |
| Position indication       | Mechanical                         |
| Running time for 95°      | 150 s                              |
| Sound power level         | Max. 35 dB (A)                     |
| Protection class          | III Safety extra-low voltage       |
| Protection type           | IP 54                              |
| Ambient temperature range | -30 till +50°C                     |
| Ambient moisture          | 95 % RF                            |

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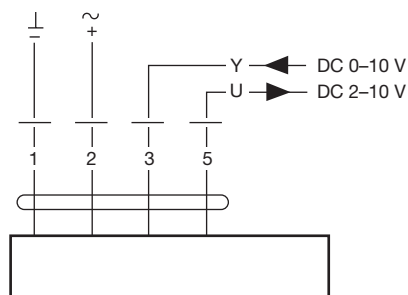
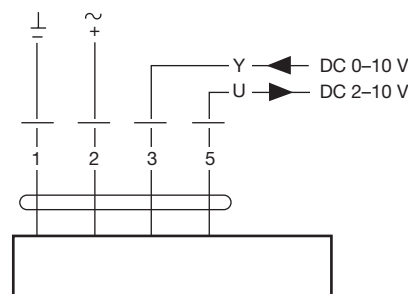
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|                           |                                    |
|---------------------------|------------------------------------|
|                           | <b>SM 24 A-SR</b>                  |
| Dimension                 | Ø100–200                           |
| Power supply              | AC 24 V, 50/60 Hz<br>DC 24 V       |
| Power consumption         | 2 W                                |
| For wire sizing           | 4 VA                               |
| Connection                | Kabel 1 m, 4x0,75 mm <sup>2</sup>  |
| Operating angle           | Max. 95°, justerbar 0–100%         |
| Torque at rated voltage   | Min. 20 Nm                         |
| Direction of rotation     | Switch selectable<br>0 ↺ eller 1 ↻ |
| Position indication       | Mechanical                         |
| Running time for 95°      | 150 s                              |
| Sound power level         | Max. 35 dB (A)                     |
| Protection class          | III Safety extra-low voltage       |
| Protection type           | IP 54                              |
| Ambient temperature range | -30 till +50°C                     |
| Ambient moisture          | 95 % RF                            |





# Motorized shut-off damper

# DTBU



## Description

Shut-off damper with electric motor – LM 24 A-F or LM 230 A-F

Consists of a DTU damper with a 24 or 230 V electric motor added.

The motor is controlled by a single-pole breaking contact. The motor has overload protection and stops automatically when the blade has reached its end stop. The stops can be continually adjusted. Although the current is connected, the motor is not damaged if blocked.

The spindle and motor can be disconnected from each other via a release button on the motor housing.

In outdoor installation, the motor should be protected from direct UV radiation.

The motor is installed at a distance from the damper, which makes it easy to insulate the ventilation duct.

Also the dampers DRU and DSU can be ordered with motor.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

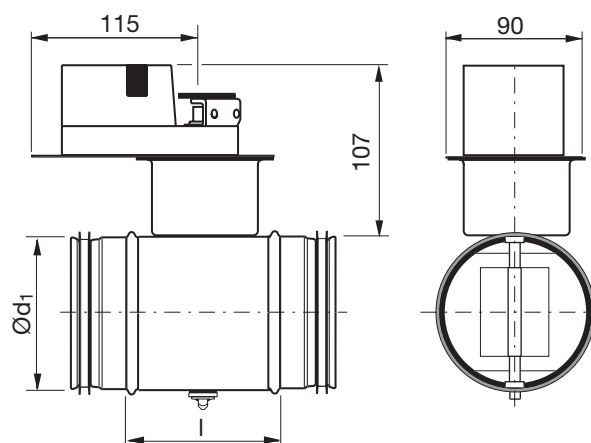
Ø 80–315 fullfills pressure class C in closed position.

## Technical data for the motors

|                                 |  |
|---------------------------------|--|
|                                 | <b>LM 24 A</b>                             |
| Power supply .....              | AC 19,2–28,8 V, 50/60 Hz<br>DC 19,2–28,8 V |
| Power consumption .....         | 1 W  |
| For wire sizing .....           | 2 VA                                       |
| Connection .....                | Cable 1 m, 3x0,75 mm <sup>2</sup>          |
| Operating angle .....           | Max. 95°, adjustable 0–100%                |
| Torque at rated voltage .....   | Min. 5 Nm                                  |
| Direction of rotation .....     | Switch selectable<br>0 ↻ or 1 ↻            |
| Position indication .....       | Mechanical                                 |
| Running time for 95° .....      | 150 s                                      |
| Sound power level .....         | Max. 35 dB (A)                             |
| Protection class .....          | III Safety extra-low voltage               |
| Protection type .....           | IP 54                                      |
| Ambient temperature range ..... | -30 to +50°C                               |
| Ambient moisture .....          | 95 % RH                                    |

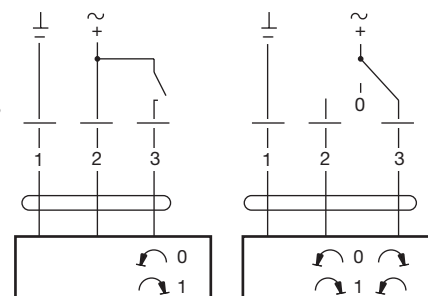
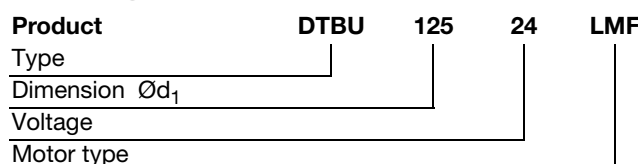
|                                 |                                   |
|---------------------------------|-----------------------------------|
|                                 | <b>LM 230 A</b>                   |
| Power supply .....              | AC 65–265 V, 50/60 Hz             |
| Power consumption .....         | 1,5 W                             |
| For wire sizing .....           | 4 VA                              |
| Connection .....                | Cable 1 m, 3x0,75 mm <sup>2</sup> |
| Operating angle .....           | Max. 95°, adjustable 0–100%       |
| Torque at rated voltage .....   | Min. 5 Nm                         |
| Direction of rotation .....     | Switch selectable<br>0 ↻ or 1 ↻   |
| Position indication .....       | Mechanical                        |
| Running time for 95° .....      | 150 s                             |
| Sound power level .....         | Max. 35 dB (A)                    |
| Protection class .....          | II Safety insulated               |
| Protection type .....           | IP 54                             |
| Ambient temperature range ..... | -30 to +50°C                      |
| Ambient moisture .....          | 95 % RH                           |

## Dimensions



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg | Sealing class past<br>closed blade |
|------------------------|---------|---------|------------------------------------|
| 80                     | 100     | 1,00    | 4                                  |
| 100                    | 100     | 1,08    | 4                                  |
| 125                    | 100     | 1,23    | 4                                  |
| 160                    | 100     | 1,44    | 4                                  |
| 200                    | 100     | 1,74    | 4                                  |
| 250                    | 100     | 2,22    | 4                                  |
| 315                    | 100     | 2,84    | 4                                  |

## Ordering example



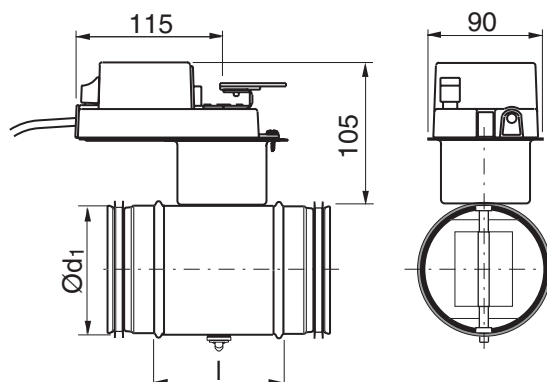


# Motorized shut-off damper

# DTBU



## Dimensions



| Ød <sub>1</sub> nom | l mm | m kg | Sealing class past closed blade |
|---------------------|------|------|---------------------------------|
| 400                 | 100  | 4,59 | 4                               |
| 500                 | 115  | 7,29 | 4                               |

## Description

**Shut-off damper with electric motor – NM 24 A-F or NM 230 A-F**

Consists of a DTU damper with a 24 or 230 V electric motor added.

The motor is controlled by a single-pole breaking contact. The motor has overload protection and stops automatically when the blade has reached its end stop. The stop can be continually adjusted. Although the current is connected, the motor is not damaged if blocked.

The spindle and motor can be disconnected from each other via a release button on the motor housing.

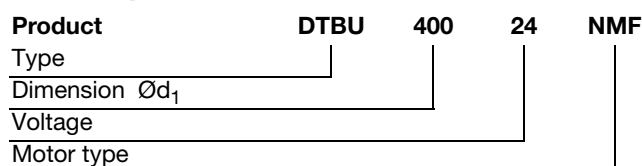
In outdoor installation, the motor should be protected from direct UV radiation.

The motor is installed at a distance from the damper, which makes it easy to insulate the ventilation duct.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

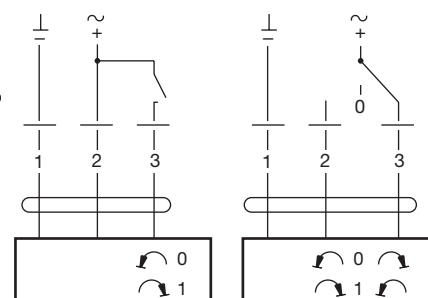
Ø 400–500 fullfills pressure class B in closed position.

## Ordering example



## Technical data for the motors

|                                 | <b>NM 24 A-F</b>                           | <b>NM 230 A-F</b>                 |
|---------------------------------|--|-----------------------------------|
| Power supply .....              | AC 19,2–28,8 V, 50/60 Hz<br>DC 19,2–28,8 V | AC 85–265 V, 50/60 Hz             |
| Power consumption .....         | 1,5 W                                      | 2,5 W                             |
| For wire sizing .....           | 3,5 VA                                     | 6 VA                              |
| Connection .....                | Cable 1 m, 3×0,75 mm <sup>2</sup>          | Cable 1 m, 3×0,75 mm <sup>2</sup> |
| Operating angle .....           | Max. 95°, adjustable 0–100%                | Max. 95°, adjustable 0–100%       |
| Torque at rated voltage .....   | Min. 10 Nm                                 | Min. 10 Nm                        |
| Direction of rotation .....     | Switch selectable<br>0 ↺ or 1 ↻            | Switch selectable<br>0 ↺ or 1 ↻   |
| Position indication .....       | Mechanical                                 | Mechanical                        |
| Running time for 95° .....      | 150 s                                      | 150 s                             |
| Sound power level .....         | Max. 35 dB (A)                             | Max. 35 dB (A)                    |
| Protection class .....          | III Safety extra-low voltage               | II Safety insulated               |
| Protection type .....           | IP 54                                      | IP 54                             |
| Ambient temperature range ..... | -30 to +50°C                               | -30 to +50°C                      |
| Ambient moisture .....          | 95 % RH                                    | 95 % RH                           |



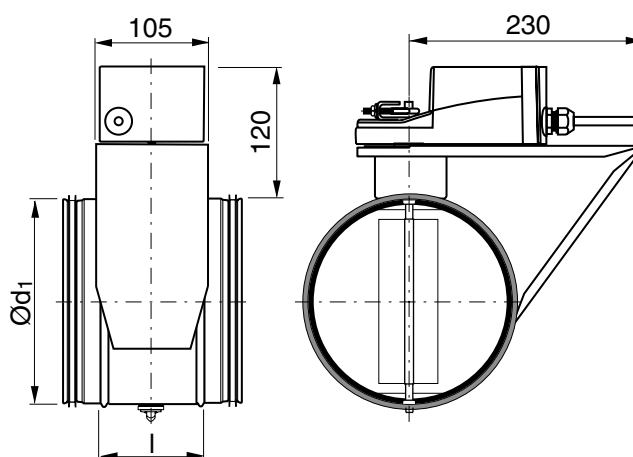


# Motorized shut-off damper

# DTBU



## Dimensions



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg | Sealing class past<br>closed blade |
|------------------------|---------|---------|------------------------------------|
| 630                    | 115     | 10,5    | 4                                  |

## Description

### Shut-off damper with electric motor – SM 24 A or SM 230 A

Consists of a DTU damper with a 24 or 230 V electric motor added.

The motor is controlled by a single-pole breaking contact. The motor has overload protection and stops automatically when the blade has reached its end stop. The stop can be continually adjusted. Although the current is connected, the motor is not damaged if blocked.

The spindle and motor can be disconnected from each other via a release button on the motor housing.

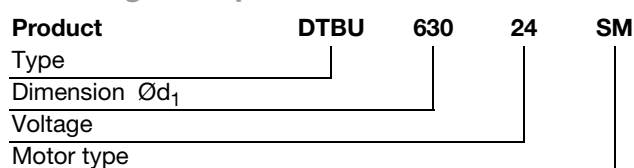
In outdoor installation, the motor should be protected from direct UV radiation.

The motor is installed at a distance from the damper, which makes it easy to insulate the ventilation duct.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

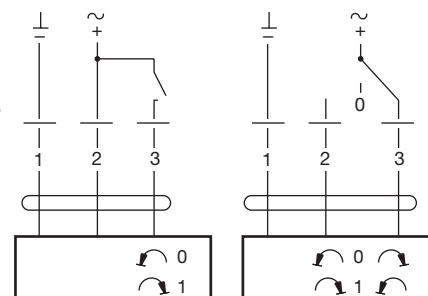
Ø 630 fullfills pressure class B in closed position.

## Ordering example



## Technical data for the motors

|                                 | SM 24 A                                    | SM 230 A                          |
|---------------------------------|--|-----------------------------------|
| Power supply .....              | AC 19,2–28,8 V, 50/60 Hz<br>DC 19,2–28,8 V | AC 85–265 V, 50/60 Hz             |
| Power consumption .....         | 2 W  | 2,5 W                             |
| For wire sizing .....           | 4 VA                                       | 6 VA                              |
| Connection .....                | Cable 1 m, 3x0,75 mm <sup>2</sup>          | Cable 1 m, 3x0,75 mm <sup>2</sup> |
| Operating angle .....           | Max. 95°, adjustable 0–100%                | Max. 95°, adjustable 0–100%       |
| Torque at rated voltage .....   | Min. 20 Nm                                 | Min. 20 Nm                        |
| Direction of rotation .....     | Switch selectable<br>0 ↻ or 1 ↻            | Switch selectable<br>0 ↻ or 1 ↻   |
| Position indication .....       | Mechanical                                 | Mechanical                        |
| Running time for 95° .....      | 150 s                                      | 150 s                             |
| Sound power level .....         | Max. 35 dB (A)                             | Max. 35 dB (A)                    |
| Protection class .....          | III Safety extra-low voltage               | II Safety insulated               |
| Protection type .....           | IP 54                                      | IP 54                             |
| Ambient temperature range ..... | -30 to +50°C                               | -30 to +50°C                      |
| Ambient moisture .....          | 95 % RH                                    | 95 % RH                           |





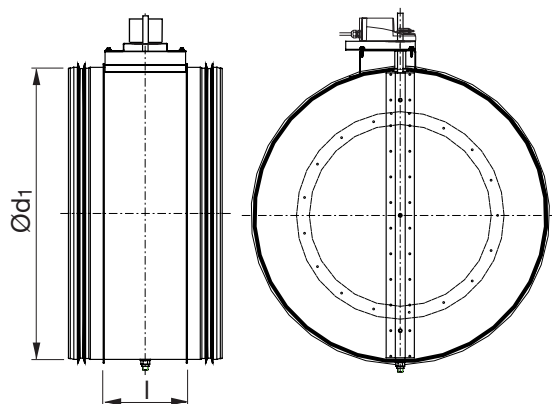


# Motorized shut-off damper

# DTBU



## Dimensions



## Description

### Shut-off damper with electric motor – GM 24 A or GM 230 A

Consists of a DTU damper with a 24 or 230 V electric motor added. Ø900 and 1000 has two motors.

The motor is controlled by a single-pole breaking contact. The motor has overload protection and stops automatically when the blade has reached its end stop. The stop can be continually adjusted. Although the current is connected, the motor is not damaged if blocked.

The spindle and motor can be disconnected from each other via a release button on the motor housing.

In outdoor installation, the motor should be protected from direct UV radiation.

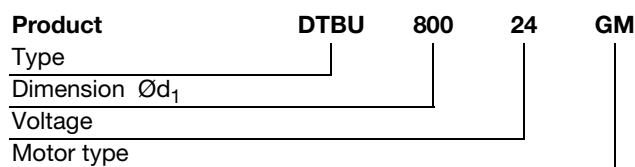
The motor is installed at a distance from the damper, which makes it easy to insulate the ventilation duct.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 710–1000 fullfills pressure class A in closed position.

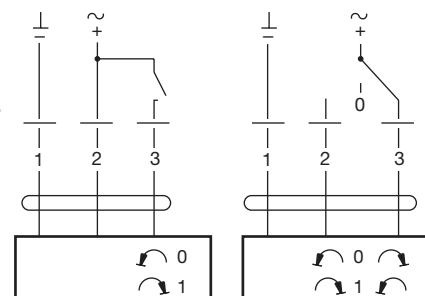
| Ød <sub>1</sub> nom | l mm | m kg | Sealing class past closed blade |
|---------------------|------|------|---------------------------------|
| 710                 | 230  | 19,9 | 4                               |
| 800                 | 230  | 22,4 | 4                               |
| 900                 | 230  | 31,0 | 4                               |
| 1000                | 230  | 36,0 | 4                               |

## Ordering example



## Technical data for the motors

|                                 | <b>GM 24 A</b>                             | <b>GM 230 A</b>                   |
|---------------------------------|--|-----------------------------------|
| Power supply .....              | AC 19,2–28,8 V, 50/60 Hz<br>DC 19,2–28,8 V | AC 85–265 V, 50/60 Hz             |
| Power consumption .....         | 4,5 W                                      | 4,5 W                             |
| For wire sizing .....           | 7 VA                                       | 7 VA                              |
| Connection .....                | Cable 1 m, 3x0,75 mm <sup>2</sup>          | Cable 1 m, 3x0,75 mm <sup>2</sup> |
| Operating angle .....           | Max. 95°, adjustable 0–100%                | Max. 95°, adjustable 0–100%       |
| Torque at rated voltage .....   | Min. 40 Nm                                 | Min. 40 Nm                        |
| Direction of rotation .....     | Switch selectable<br>0 ↻ or 1 ↻            | Switch selectable<br>0 ↻ or 1 ↻   |
| Position indication .....       | Mechanical                                 | Mechanical                        |
| Running time for 95° .....      | 150 s                                      | 150 s                             |
| Sound power level .....         | Max. 45 dB (A)                             | Max. 45 dB (A)                    |
| Protection class .....          | III Safety extra-low voltage               | II Safety insulated               |
| Protection type .....           | IP 54                                      | IP 54                             |
| Ambient temperature range ..... | -30 to +50 °C                              | -30 to +50 °C                     |
| Ambient moisture .....          | 95 % RH                                    | 95 % RH                           |



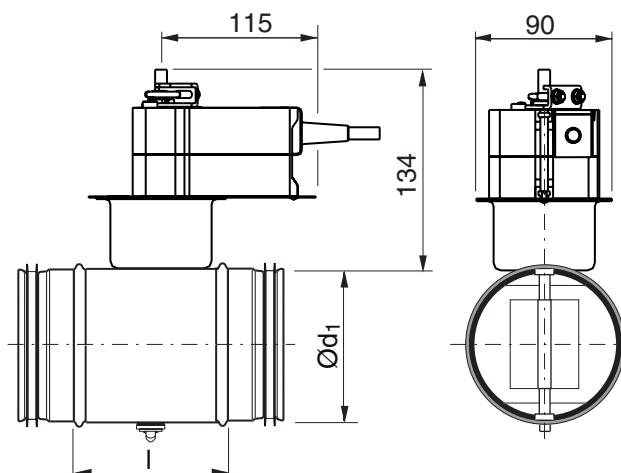


# Motorized shut-off damper

## DTBCU



### Dimensions



### Description

#### Shut-off damper with spring return motor – TF 24 or TF 230

Consists of a DTU damper with a 24 or 230 V electric motor added.

The motor is controlled by a single-pole breaking contact. The motor has overload protection and stops automatically when the blade has reached its end stop. Although the current is connected, the motor is not damaged if blocked.

When system voltage is connected, the motor starts and tensions the return spring at the same time. The motor stops at its end position and is not damaged by blockage, although system voltage remains.

When the power is cut, the damper closes when the drive motor freewheels and the return spring pulls the blade back to its original position.

If you want the damper to open instead of close, you can undo the two nuts on the spindle clamp, turn the spindle 90° and tighten the nuts again.

In outdoor installation, the motor should be protected from direct UV radiation.

The motor is installed at a distance from the damper, which makes it easy to insulate the ventilation duct.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 80–200 fullfills pressure class C in closed position.

| Ød <sub>1</sub> nom | l mm | 24 V m kg | 230 V m kg | Sealing class past closed blade |
|---------------------|------|-----------|------------|---------------------------------|
| 80                  | 100  | 1,06      | 1,06       | 4                               |
| 100                 | 100  | 1,14      | 1,14       | 4                               |
| 125                 | 100  | 1,29      | 1,29       | 4                               |
| 160                 | 100  | 1,50      | 1,50       | 4                               |
| 200                 | 100  | 1,90      | 1,90       | 4                               |

### Ordering example

|                           |              |            |           |           |
|---------------------------|--------------|------------|-----------|-----------|
| <b>Product</b>            | <b>DTBCU</b> | <b>200</b> | <b>24</b> | <b>TF</b> |
| Type                      |              |            |           |           |
| Dimension Ød <sub>1</sub> |              |            |           |           |
| Voltage                   |              |            |           |           |
| Motor type                |              |            |           |           |

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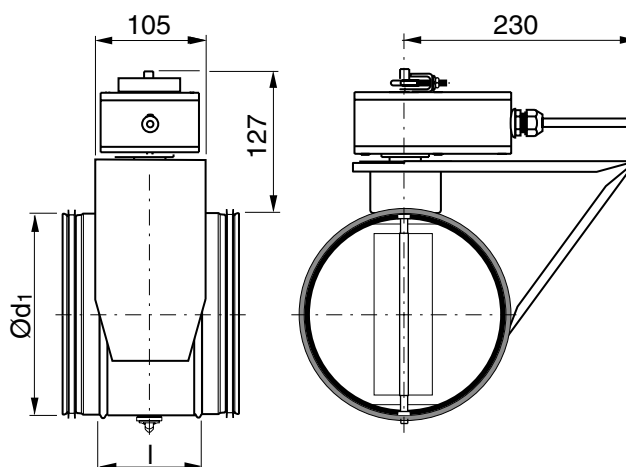


# Motorized shut-off damper

## DTBCU



### Dimensions



| Ød <sub>1</sub><br>nom | l<br>mm | 24 V<br>m<br>kg | 230 V<br>m<br>kg | Sealing class<br>past closed<br>blade |
|------------------------|---------|-----------------|------------------|---------------------------------------|
| 250                    | 100     | 3,29            | 3,44             | 4                                     |
| 315                    | 100     | 3,91            | 4,06             | 4                                     |

### Description

#### Shut-off damper with spring return motor – LF 24 or LF 230

Consists of a DTU damper with a 24 or 230 V electric motor added.

The motor is controlled by a single-pole breaking contact. The motor has overload protection and stops automatically when the blade has reached its end stop. Although the current is connected, the motor is not damaged if blocked.

When system voltage is connected, the motor starts and tensions the return spring at the same time. The motor stops at its end position and is not damaged by blockage, although system voltage remains.

When the power is cut, the damper closes when the drive motor freewheels and the return spring pulls the blade back to its original position.

If you want the damper to open instead of close, you can undo the two nuts on the spindle clamp, turn the spindle 90° and tighten the nuts again.

In outdoor installation, the motor should be protected from direct UV radiation.

The motor is installed at a distance from the damper, which makes it easy to insulate the ventilation duct.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 250–315 fullfills pressure class C in closed position.

### Ordering example

|                           |              |            |           |           |
|---------------------------|--------------|------------|-----------|-----------|
| <b>Product</b>            | <b>DTBCU</b> | <b>250</b> | <b>24</b> | <b>LF</b> |
| Type                      |              |            |           |           |
| Dimension Ød <sub>1</sub> |              |            |           |           |
| Voltage                   |              |            |           |           |
| Motor type                |              |            |           |           |



# Motorized shut-off damper

## DTBCU



### Description

#### Shut-off damper with spring return motor – AF 24 or AF 230

Consists of a DTU damper with a 24 or 230 V electric motor added.

The motor is controlled by a single-pole breaking contact. The motor has overload protection and stops automatically when the blade has reached its end stop. Although the current is connected, the motor is not damaged if blocked.

When system voltage is connected, the motor starts and tensions the return spring at the same time. The motor stops at its end position and is not damaged by blockage, although system voltage remains.

When the power is cut, the damper closes when the drive motor freewheels and the return spring pulls the blade back to its original position.

If you want the damper to open instead of close, you can undo the two nuts on the spindle clamp, turn the spindle 90° and tighten the nuts again.

In outdoor installation, the motor should be protected from direct UV radiation.

The motor is installed at a distance from the damper, which makes it easy to insulate the ventilation duct.

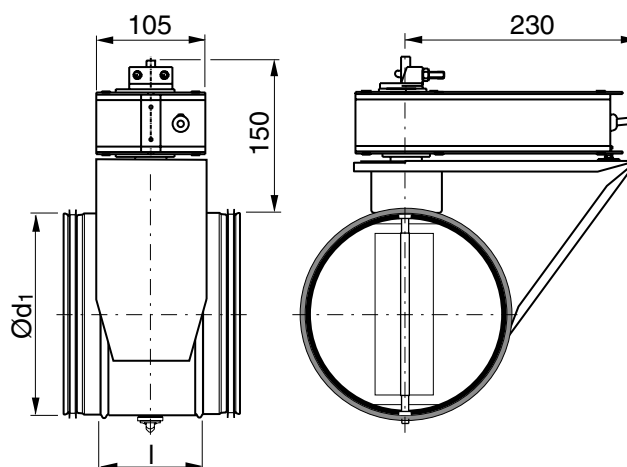
There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 400–630 fullfills pressure class B in closed position.

### Ordering example

|                           |              |            |           |           |
|---------------------------|--------------|------------|-----------|-----------|
| <b>Product</b>            | <b>DTBCU</b> | <b>400</b> | <b>24</b> | <b>AF</b> |
| Type                      |              |            |           |           |
| Dimension Ød <sub>1</sub> |              |            |           |           |
| Voltage                   |              |            |           |           |
| Motor type                |              |            |           |           |

### Dimensions



| Ød <sub>1</sub><br>nom | l<br>mm | 24 V<br>m<br>kg | 230 V<br>m<br>kg | Sealing class<br>past closed<br>blade |
|------------------------|---------|-----------------|------------------|---------------------------------------|
| 400                    | 100     | 7,02            | 7,32             | 4                                     |
| 500                    | 115     | 9,44            | 9,74             | 4                                     |
| 630                    | 115     | 11,2            | 11,5             | 4                                     |





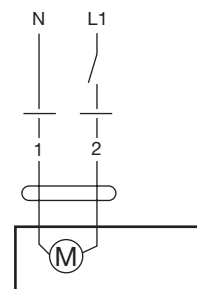
# Motorized shut-off damper

# DTBCU

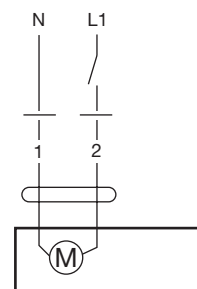
## Technical data for the motors

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|                                  | <b>TF 24</b>   | <b>TF 230</b>  |
|----------------------------------|--|--|
| Voltage range.....               | 2AC 19,2–28,8 V, 50/60 Hz<br>DC 21,6–28,8 V          | AC 85–265 V, 50/60 Hz                                |
| Power consumption                |  |  |
| – during opening.....            | 2,5 W  | 2,5 W  |
| – stand-by.....                  | 1,5 W  | 1,5 W  |
| For wire sizing.....             | 5 VA   | 5 VA   |
| Connection .....                 | Cable 1 m, 2×0,75 mm <sup>2</sup>                    | Cable 1 m, 2×0,75 mm <sup>2</sup>                    |
| Operating angle, adjustable..... | Mech. limited to 95°                                 | Mech. limited to 95°                                 |
| Torque at rated voltage          |  |  |
| – motor .....                    | Min. 2 Nm  | Min. 2 Nm  |
| – return spring.....             | Min. 2 Nm  | Min. 2 Nm  |
| Direction of rotation .....      | Optional through right or left-hand installation L/R | Optional through right or left-hand installation L/R |
| Position indication .....        | Mechanical   | Mechanical   |
| Running time                     |  |  |
| – motor .....                    | < 75 s (0–2 Nm)                                      | < 75 s (0–2 Nm)                                      |
| – return spring.....             | < 25 s   | < 25 s   |
| Degree of protection.....        | IP 42  | IP 42  |
| Ambient temperature range.....   | -30 to +50°C   | -30 to +50°C   |



|                                  | <b>LF 24</b>   | <b>LF 230</b>  |
|----------------------------------|--|--|
| Voltage range.....               | 2AC 19,2–28,8 V, 50/60 Hz<br>DC 21,6–28,8 V          | AC 198–264 V, 50/60 Hz                               |
| Power consumption                |  |  |
| – during opening.....            | 5 W  | 5 W  |
| – stand-by.....                  | 2,5 W  | 3 W  |
| For wire sizing.....             | 7 VA   | 7 VA   |
| Connection .....                 | Cable 1 m, 2×0,75 mm <sup>2</sup>                    | Cable 1 m, 2×0,75 mm <sup>2</sup>                    |
| Operating angle, adjustable..... | Mech. limited to 95°                                 | Mech. limited to 95°                                 |
| Torque at rated voltage          |  |  |
| – motor .....                    | Min. 4 Nm  | Min. 4 Nm  |
| – return spring.....             | Min. 4 Nm  | Min. 4 Nm  |
| Direction of rotation .....      | Optional through right or left-hand installation L/R | Optional through right or left-hand installation L/R |
| Position indication .....        | Mechanical   | Mechanical   |
| Running time                     |  |  |
| – motor .....                    | 40–75 s (0–4 Nm)                                     | 40–75 s (0–4 Nm)                                     |
| – return spring.....             | app. 20 s  | app. 20 s  |
| Sound power level                |  |  |
| – motor .....                    | max 50 dB (A)  | max 50 dB (A)  |
| – return spring.....             | app. 62 dB (A)                                       | app. 62 dB (A)                                       |
| Degree of protection.....        | IP 54  | IP 54  |
| Ambient temperature range.....   | -30 to +50°C   | -30 to +50°C   |

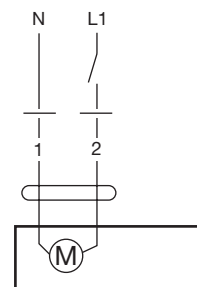




# Motorized shut-off damper

# DTBCU

|                                  | <b>AF 24</b>  | <b>AF 230</b>   |
|----------------------------------|---|---|
| Voltage rang .....               | AC 19,2–28,8 V, 50/60 Hz<br>DC 21,6–26,4 V              | AC 198–264 V, 50/60 Hz                                  |
| Power consumption                |   |   |
| – during opening .....           | 5 W   | 6,5 W   |
| – stand-by .....                 | 1,5 W   | 2,5 W   |
| For wire sizing .....            | 10 VA   | 11 VA   |
| Connection .....                 | Cable 1 m, 2×0,75 mm <sup>2</sup>                       | Cable 1 m, 2×0,75 mm <sup>2</sup>                       |
| Operating angle, adjustable..... | Mech. limited to 95°                                    | Mech. limited to 95°                                    |
| Torque at rated voltage          |   |   |
| – motor .....                    | Min. 15 Nm  | Min. 15 Nm  |
| – spring bias .....              | Min. 15 Nm  | Min. 15 Nm  |
| Direction of rotation .....      | Optional through right or<br>left-hand installation L/R | Optional through right or<br>left-hand installation L/R |
| Position indication .....        | Mechanical  | Mechanical  |
| Running time                     |   |   |
| – motor .....                    | app. 150 s  | app. 150 s  |
| – return spring.....             | app. 16 s   | app. 16 s   |
| Sound power level                |   |   |
| – motor .....                    | max 45 dB (A)   | max 45 dB (A)   |
| – return spring.....             | app. 62 dB (A)  | app. 62 dB (A)  |
| Degree of protection.....        | IP 54   | IP 54   |
| Ambient temperature range.....   | -30 to +50°C  | -30 to +50°C  |



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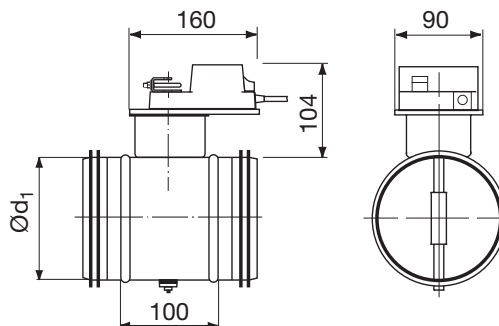


# Shut-off damper, fastrunning motor

# DTFU



## Dimensions



| Ød <sub>1</sub> nom | m kg | Sealing class past closed blade |
|---------------------|------|---------------------------------|
| 80                  | 1,30 | 4                               |
| 100                 | 1,40 | 4                               |
| 125                 | 1,50 | 4                               |
| 160                 | 1,80 | 4                               |
| 200                 | 2,10 | 4                               |
| 250                 | 2,50 | 4                               |

## Description

### Tight-closing shut-off damper with mounted setting motor:

Damper blade: Double sheet metal with a intermediate sealing of EPDM-rubber, which is in contact with the inside of the damper housing when in the closed position. Spacer sleeve for

Insulation up to 50 mm thickness.

LMQ 24A: Fast-running reversing on/off-motor, specially developed for extraction at working places, where a fast opening and closing of the damper is needed. Setting angle electronically limited, overload proof even at blocked damper blade.

The motor has overload protection and stops automatically when the blade has reached its end stop. The stops can be continually adjusted. Although the current is connected, the motor is not damaged if blocked.

LMQ 24A-SR: Fast-running, modulating motor, specially developed for the laboratory extraction, where a fast and accurate adaption of the volume flow is achieved through a sudden change of the damper blad position.

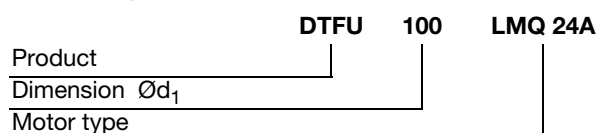
The motor has overload protection and stops automatically when the blade has reached its end stop. The stops can be continually adjusted. Although the current is connected, the motor is not damaged if blocked.

Note: At weather exposed mounting the motor housing must be protected from rain and direct UV-radiation!

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 80–250 fullfills pressure class C in closed position.

## Ordering example





# Motorized shut-off damper

# DTPU



## Description

### Shut-off damper with pneumatic actuator

Consists of a DTU damper with a pneumatic actuator installed. The actuator consists of a glass-reinforced polyamide housing with an internal rolling diaphragm to which the spindle is fixed.

When air pressure rises, the actuator spindle is forced out and operates the blade via a lever. When air pressure falls, the actuator spindle retracts under the tension of the return spring. The damper blade is closed when delivered, and the actuator fully retracted.

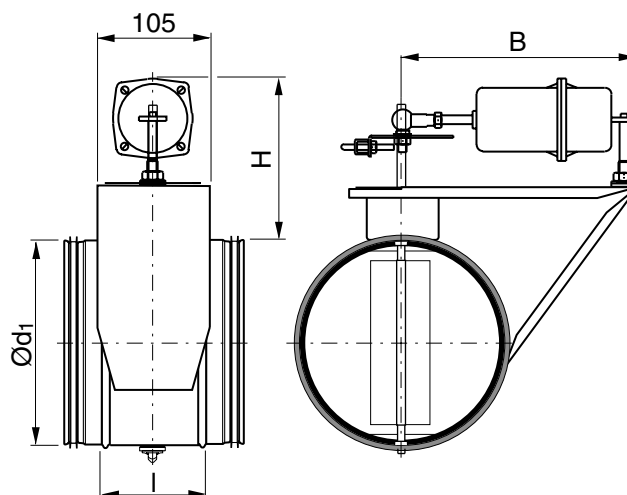
There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 80–315 fullfills pressure class C in closed position.  
Ø 400–630 fullfills pressure class B in closed position.

## Ordering example

|                           |             |            |             |
|---------------------------|-------------|------------|-------------|
|                           | <b>DTPU</b> | <b>200</b> | <b>AK31</b> |
| Product                   |             |            |             |
| Dimension Ød <sub>1</sub> |             |            |             |
| Motor type                |             |            |             |

## Dimensions



| Ød <sub>1</sub> nom | l mm | H mm | B mm | m kg | Sealing class past closed blade |
|---------------------|------|------|------|------|---------------------------------|
| 80                  | 100  | 144  | 230  | 1,07 | 3                               |
| 100                 | 100  | 144  | 230  | 1,15 | 3                               |
| 125                 | 100  | 144  | 230  | 1,30 | 3                               |
| 160                 | 100  | 144  | 230  | 1,51 | 3                               |
| 200                 | 100  | 144  | 230  | 1,81 | 3                               |
| 250                 | 100  | 160  | 230  | 2,39 | 3                               |
| 315                 | 100  | 160  | 230  | 3,01 | 3                               |
| 400                 | 100  | 195  | 325  | 5,42 | 3                               |
| 500                 | 115  | 195  | 325  | 7,84 | 3                               |
| 630                 | 115  | 195  | 325  | 10,6 | 3                               |

## Technical data for the motors

|  | <b>AK 31 P</b><br>Ø80–200 | <b>AK 41 P</b><br>Ø250–315 | <b>AK 42 P</b><br>Ø400–630 |
|--|---------------------------|----------------------------|----------------------------|
| Dimension.....                                   | Ø80–200                   | Ø250–315                   | Ø400–630                   |
| Air connection.....                              | Nozzle Ø4 mm              | 1/8"                       | 1/8"                       |
| Volume of free air required for full stroke .... | 0,3 l <sub>n</sub>        | 0,5 l <sub>n</sub>         | 1,7 l <sub>n</sub>         |
| Power pressure max.....                          | 150 kPa (1,5 bar)         | 150 kPa (1,5 bar)          | 150 kPa (1,5 bar)          |
| Ambient temperature range.....                   | -5 to +60°C               | -10 to +70°C               | -10 to +70°C               |
| Weight.....                                      | 0,3 kg                    | 0,5 kg                     | 1,4 kg                     |
| <b>Running time 0 – 90 °</b>                     |                           |                            |                            |
| At power pressure 90 kPa .....                   | 10 s10 s                  | 10 s                       |                            |
| At power pressure 150 kPa .....                  | 1 s1 s                    | 1 s                        |                            |
| At spring return.....                            | 2 s2 s                    | 2 s                        |                            |





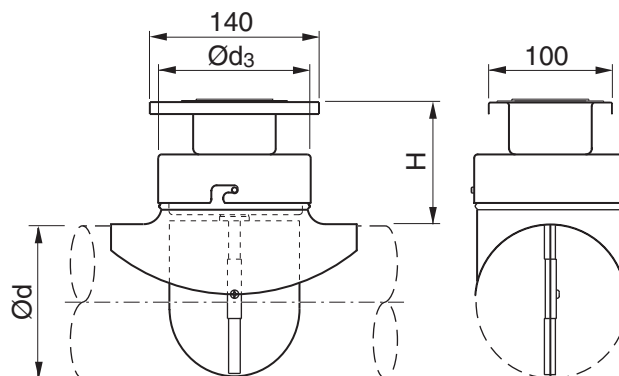


# Cleaning regulating damper

PSDRU



## Dimensions



| Ød nom | Ød <sub>3</sub> nom | H mm | m kg | Sealing class past closed blade |
|--------|---------------------|------|------|---------------------------------|
| 100    | 100                 | 100  | 0,70 | 0                               |
| 125    | 125                 | 105  | 0,95 | 0                               |
| 160    | 160                 | 110  | 1,30 | 0                               |
| 200    | 200                 | 110  | 1,75 | 0                               |
| 250    | 250                 | 120  | 2,60 | 0                               |
| 315    | 315                 | 120  | 3,80 | 0                               |
| 400    | 400                 | 175  | 5,70 | 0                               |

## Description

### Cleaning regulating damper

Consists of a KCU cleaning cover with a blade without rubber gasket similar to the DRU and a PSU collar saddle in whose branch the cleaning cover is fixed.

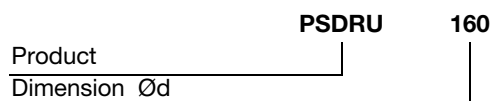
The branch is provided with a Safe seal.

Since it is easy to remove the cleaning cover together with the blade, it is easy to inspect and clean the ventilation system. The original pressure balance in the system is not affected since the blade and cleaning cover retain their mutual positions which they were given during balancing. The damper can be used to advantage, to complete an existing ventilation system.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 100–400 fullfills pressure class A in closed position.

## Ordering example





# Cleaning regulating damper

TDRU



## Description

### Cleaning regulating damper

Consists of a KCU cleaning cover with a blade without rubber gasket similar to the DRU and a TCPU T-piece in whose branch the cleaning cover is fixed.

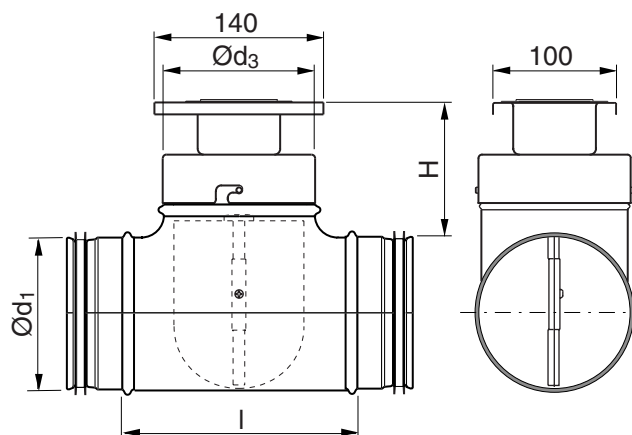
The branch is provided with a Safe seal.

Since it is easy to remove the cleaning cover together with the blade, it is easy to inspect and clean the ventilation system. The original pressure balance in the system is not affected since the blade and cleaning cover retain their mutual positions which they were given during balancing.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 100–400 fullfills pressure class A in closed position.

## Dimensions



| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | H<br>mm | m<br>kg | Sealing class<br>past closed<br>blade |
|------------------------|------------------------|---------|---------|---------|---------------------------------------|
| 100                    | 100                    | 130     | 100     | 0,71    | 0                                     |
| 125                    | 125                    | 165     | 105     | 1,28    | 0                                     |
| 160                    | 160                    | 209     | 110     | 1,80    | 0                                     |
| 200                    | 200                    | 249     | 110     | 2,80    | 0                                     |
| 250                    | 250                    | 296     | 120     | 3,51    | 0                                     |
| 315                    | 315                    | 363     | 120     | 4,03    | 0                                     |
| 400                    | 400                    | 510     | 175     | 9,30    | 0                                     |

## Ordering example

|                           |      |     |
|---------------------------|------|-----|
| Product                   | TDRU | 160 |
| Dimension Ød <sub>1</sub> |      |     |



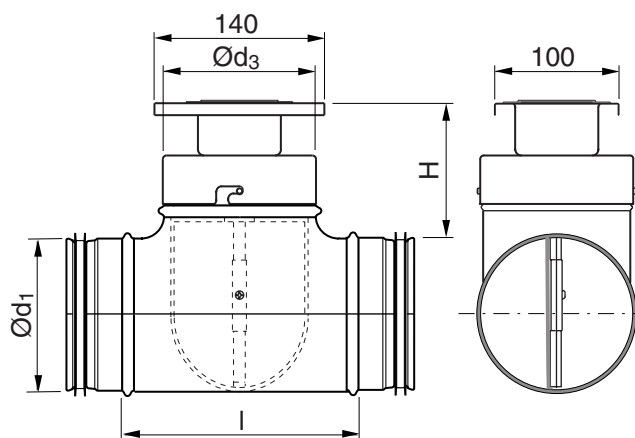


# Cleaning shut-off damper

TDSU



## Dimensions



## Description

### Cleaning shut-off damper

Consists of a KCU cleaning cover with a blade without rubber gasket similar to the DSU and a TCPU T-piece in whose branch the cleaning cover is fixed.

The branch is provided with a Safe seal.

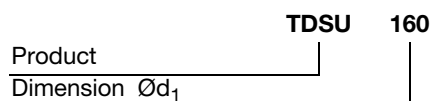
Since it is easy to remove the cleaning cover together with the blade, it is easy to inspect and clean the ventilation system. The original pressure balance in the system is not affected since the blade and cleaning cover retain their mutual positions which they were given during balancing.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 100–400 fullfills pressure class A in closed position.

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | I<br>mm | H<br>mm | m<br>kg | Sealing class<br>past closed<br>blade |
|------------------------|------------------------|---------|---------|---------|---------------------------------------|
| 100                    | 100                    | 130     | 100     | 0,75    | 1                                     |
| 125                    | 125                    | 165     | 105     | 1,33    | 1                                     |
| 160                    | 160                    | 209     | 110     | 2,00    | 1                                     |
| 200                    | 200                    | 249     | 110     | 2,80    | 1                                     |
| 250                    | 250                    | 296     | 120     | 3,71    | 1                                     |
| 315                    | 315                    | 363     | 120     | 4,33    | 1                                     |
| 400                    | 400                    | 510     | 175     | 9,90    | 1                                     |

## Ordering example





# Alternating shut-off damper

TASU

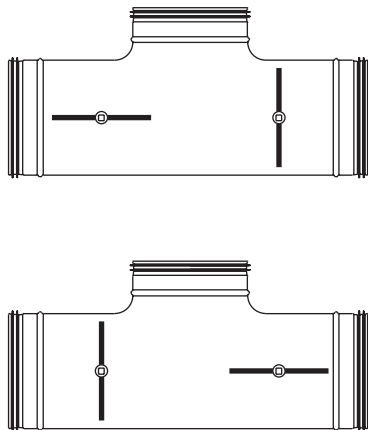


## Description

### Alternating shut-off damper

Consists of an extended T-piece and two linked DSU dampers.

Can be used for "by pass" ducts. It thereby replaces two conventional dampers + two couplings + one T-piece and is 20–30% shorter.



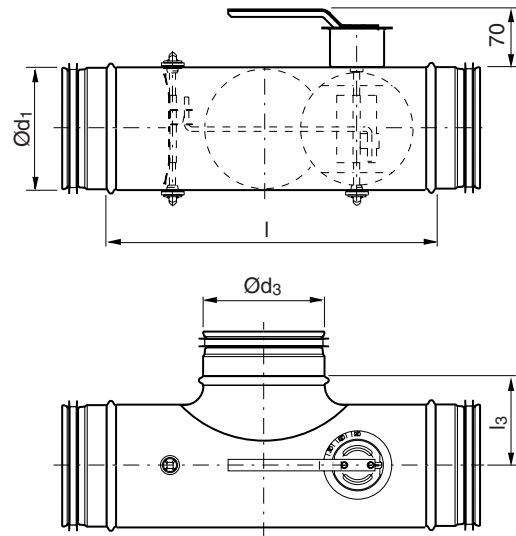
There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 100–400 fullfills pressure class A in closed position.

## Ordering example

|                           |      |     |     |
|---------------------------|------|-----|-----|
| Product                   | TASU | 160 | 160 |
| Dimension Ød <sub>1</sub> |      |     |     |
| Dimension Ød <sub>3</sub> |      |     |     |

## Dimensions



| Ød <sub>1</sub> nom | Ød <sub>3</sub> nom | l mm | l <sub>3</sub> mm | m kg | Sealing class past closed blade |
|---------------------|---------------------|------|-------------------|------|---------------------------------|
| 100                 | 100                 | 280  | 65                | 1,10 | 0                               |
| 125                 | 125                 | 345  | 83                | 1,50 | 0                               |
| 160                 | 160                 | 385  | 105               | 2,00 | 0                               |
| 200                 | 200                 | 425  | 125               | 2,80 | 0                               |
| 250                 | 250                 | 520  | 150               | 4,10 | 0                               |
| 315                 | 315                 | 585  | 182               | 5,90 | 0                               |
| 400                 | 400                 | 645  | 225               | 8,30 | 0                               |

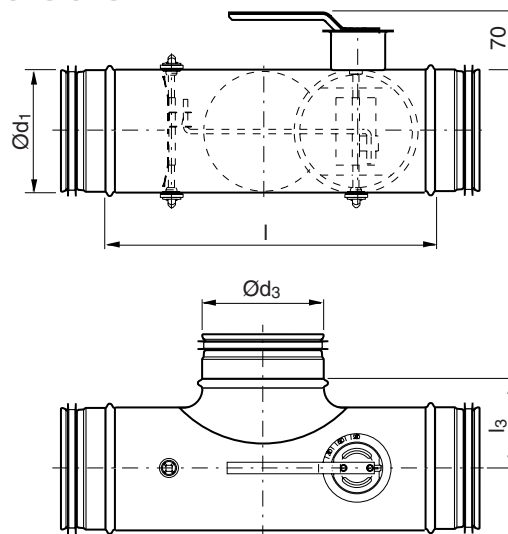
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# Alternating shut-off damper



## Dimensions

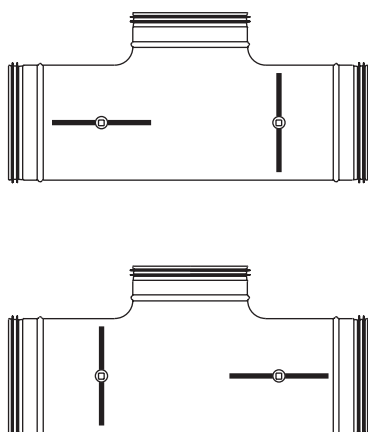


## Description

### Alternating shut-off damper

Consists of an extended T-piece and two linked DTU dampers.

Can be used for "by pass" ducts. It thereby replaces two conventional dampers + two couplings + one T-piece and is 20–30% shorter.

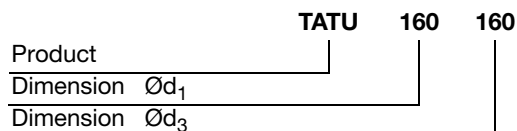


| Ød <sub>1</sub> nom | Ød <sub>3</sub> nom | l mm | l <sub>3</sub> mm | m kg | Sealing class past closed blade |
|---------------------|---------------------|------|-------------------|------|---------------------------------|
| 100                 | 100                 | 280  | 65                | 1,20 | 2                               |
| 125                 | 125                 | 345  | 83                | 1,60 | 2                               |
| 160                 | 160                 | 385  | 105               | 2,20 | 2                               |
| 200                 | 200                 | 425  | 125               | 3,15 | 2                               |
| 250                 | 250                 | 520  | 150               | 4,50 | 2                               |
| 315                 | 315                 | 585  | 182               | 6,60 | 2                               |
| 400                 | 400                 | 645  | 225               | 9,80 | 2                               |

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 100–400 fullfills pressure class A in closed position.

## Ordering example





# Motorized alternating shut-off damper

# TATBU



## Description

### Alternating shut-off damper with electric motor – NM 24 A-F or NM 230 A-F

Consists of an extended T-piece with two linked DTU dampers and a 24 or 230 V electric motor installed.

Can be used for "by pass" ducts. This means that it replaces two conventional dampers + two couplings + one T-piece and is 20–30% shorter.

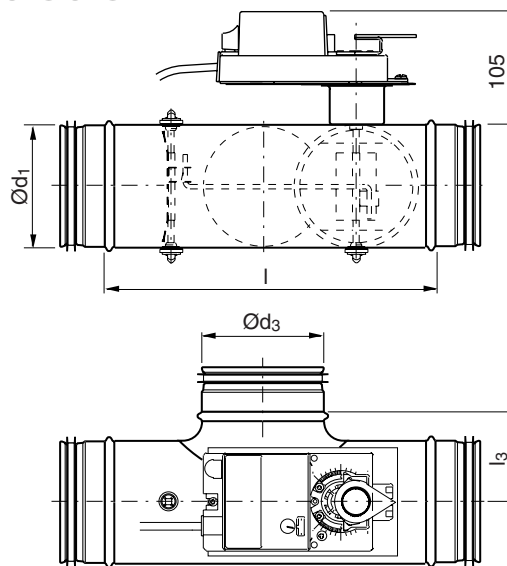
There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 100–400 fullfills pressure class A in closed position.

## Ordering example

|                           |              |            |           |            |
|---------------------------|--------------|------------|-----------|------------|
| <b>Product</b>            | <b>TATBU</b> | <b>400</b> | <b>24</b> | <b>NMF</b> |
| Type                      |              |            |           |            |
| Dimension Ød <sub>1</sub> |              |            |           |            |
| Voltage                   |              |            |           |            |
| Motor type                |              |            |           |            |

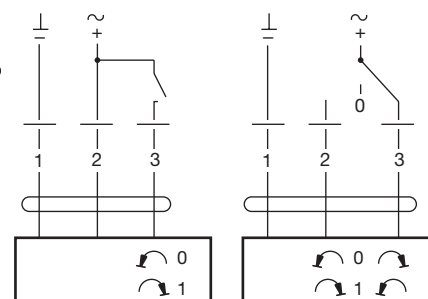
## Dimensions



| Ød <sub>1</sub> nom | Ød <sub>3</sub> nom | l mm | l <sub>3</sub> mm | m kg | Sealing class past closed blade |
|---------------------|---------------------|------|-------------------|------|---------------------------------|
| 100                 | 100                 | 280  | 65                | 2,00 | 2                               |
| 125                 | 125                 | 345  | 83                | 2,40 | 2                               |
| 160                 | 160                 | 385  | 105               | 3,00 | 2                               |
| 200                 | 200                 | 425  | 125               | 3,90 | 2                               |
| 250                 | 250                 | 520  | 150               | 5,20 | 2                               |
| 315                 | 315                 | 585  | 182               | 7,40 | 2                               |
| 400                 | 400                 | 645  | 225               | 10,6 | 2                               |

## Technical data for the motors

|                                 | <b>NM 24 A-F</b>                           | <b>NM 230 A-F</b>                 |
|---------------------------------|--|-----------------------------------|
| Power supply .....              | AC 19,2–28,8 V, 50/60 Hz<br>DC 19,2–28,8 V | AC 85–265 V, 50/60 Hz             |
| Power consumption .....         | 1,5 W                                      | 2,5 W                             |
| For wire sizing .....           | 3,5 VA                                     | 6 VA                              |
| Connection .....                | Cable 1 m, 3x0,75 mm <sup>2</sup>          | Cable 1 m, 3x0,75 mm <sup>2</sup> |
| Operating angle .....           | Max. 95°, adjustable 0–100%                | Max. 95°, adjustable 0–100%       |
| Torque at rated voltage .....   | Min. 10 Nm                                 | Min. 10 Nm                        |
| Direction of rotation .....     | Switch selectable<br>0 ↺ or 1 ↻            | Switch selectable<br>0 ↺ or 1 ↻   |
| Position indication .....       | Mechanical                                 | Mechanical                        |
| Running time for 95° .....      | 150 s                                      | 150 s                             |
| Sound power level.....          | Max. 35 dB (A)                             | Max. 35 dB (A)                    |
| Protection class.....           | III Safety extra-low voltage               | II Safety insulated               |
| Protection type.....            | IP 54                                      | IP 54                             |
| Ambient temperature range ..... | -30 to +50°C                               | -30 to +50°C                      |
| Ambient moisture .....          | 95 % RH                                    | 95 % RH                           |





# Motorized alternating shut-off dampers

TASU, TATU, TATBU

1

## Technical data

2

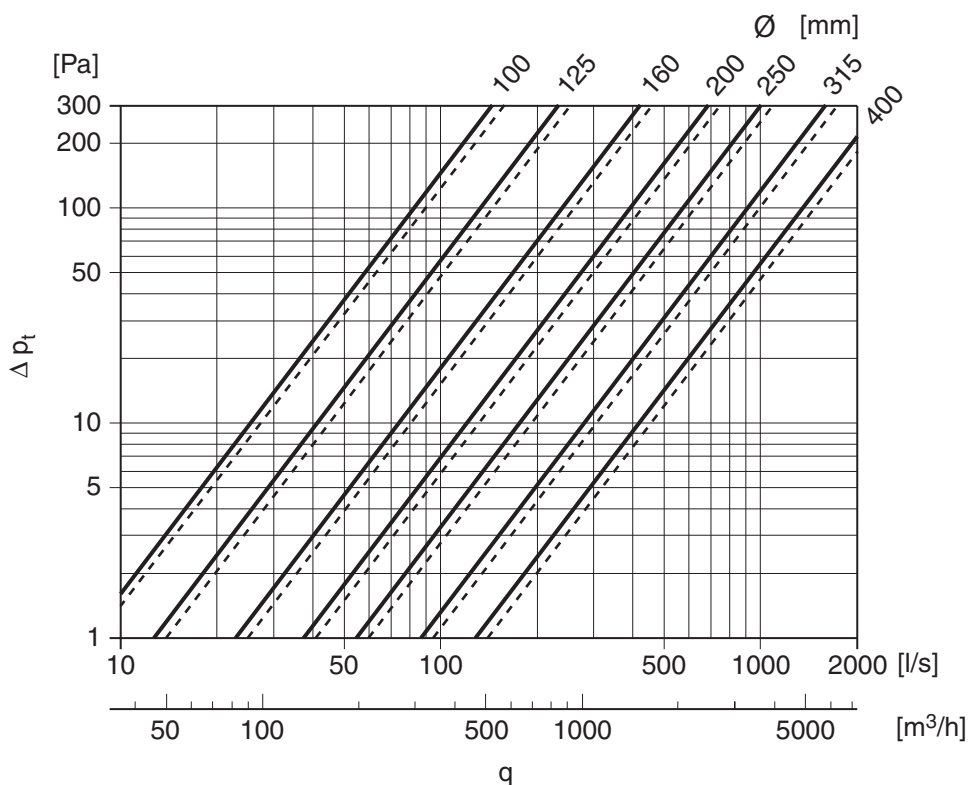
The dashed pressure drop curves refer to the flow direction in the right picture.

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# Constant-/variable flow damper

## Summary

- DAU - manual single flow unit
- DA2EU - motorized twin flow unit
- DAVU - motorized variable flow unit
- Diameters Ø 80–315
- Flow range 15–830 l/s (54–2988 m<sup>3</sup>/h)
- Pressure range 50–1000 Pa (over the unit)
- Independent of mounting direction
- Handles 50 mm duct insulation

## Function

The constant flow damper is an automatic damper, which at varying pressures wholly mechanical and independent of external energy sources maintains a set flow constant. The force, needed for regulation, is taken from the passing air stream. The air stream across the blade attempts to close it and generates a closing torque. This is balanced by an opposed opening force from a spring. The greater the pressure across the blade the more it closes. A bellow eliminates oscillations, which could occur at unfavourable conditions of operation.

## Types

The following types exist:

- DAU – one flow unit – with knob and arrow for manual setting of one flow.
- DA2EU – two flows unit – with electric motor for switching between two flows.
- DAVU – variable flow unit – with electric motor for continuous setting of one flow.

## Material

Housing and damper blade are of galvanized sheet metal and shaft is of stainless steel.

## Temperature

Working range: +5 to +70 °C.

## Insulation

The units can handle 50 mm duct insulation without the scale or the motor being hidden. DAU is available with an 45 mm external insulation and an outer sheet metal shell for lower sound radiation to the surroundings. Is then called DALU.

## Regulating accuracy

The units are calibrated from factory within their whole working range. In this the units keep the flow constant within approximately ±5 to ±10% of the set flow. Greater deviations occur at the lower flows, especially for small sizes.

## Flow setting

The units can not be delivered from factory with a preset flow. You can set the flow yourself very easy following to the instruction for each product.

# DAU, DA2EU, DAVU

## Disturbance tolerance

In order to achieve the stated accuracy for the pre-set flow a straight distance of at least 3×d before and at least 1,5×d after the units are required. A mounting close to a source of disturbance (bend, saddle etc.) decreases the regulation accuracy and the flow may deviate from the set value.

## Change of direction

The units are independent of their mounting direction and one may deviate from the specified direction and mount them in any direction without affecting the accuracy.

## Combinations

The units can be mounted together with e.g. a motorized shut off damper DTBU, see page side 273. Constant flow damper combined with shut off damper can with advantage be used in groups at installations where you want:

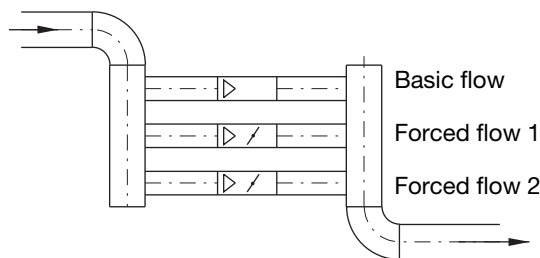
- two flows, that lies too far away from each other for a two flow unit to handle

or

- more than two flows

|                     |           |
|---------------------|-----------|
| Presume: Basic flow | = 80 l/s  |
| Forced flow 1       | = 100 l/s |
| Forced flow 2       | = 150 l/s |

Four flows will then be possible: 80, 180, 230 and 330 l/s.







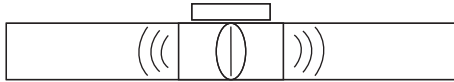
# Constant-/variable flow damper

# DAU, DA2EU, DAVU

1

## Technical data

### Pressure and flow ranges and sound to duct



The graphs show A-weighted sound **power** level,  $L_{WA}$  [dB], to duct. These curves are intended for brief comparison. For more accurate calculation, please use the tables.

### Example

Given: Diameter 125 mm  
 Flow 70 l/s  
 Pressure drop 200 Pa

The graph gives:

A-weighted sound power level approx. 57 dB

The table gives:

Sound power level as below

| Centre frequency [Hz]  | 63 | 125 | 250 | 500 | 1 k | 2 k | 4 k | 8 k |
|------------------------|----|-----|-----|-----|-----|-----|-----|-----|
| Sound power level [dB] | 52 | 52  | 49  | 49  | 49  | 51  | 51  | 46  |

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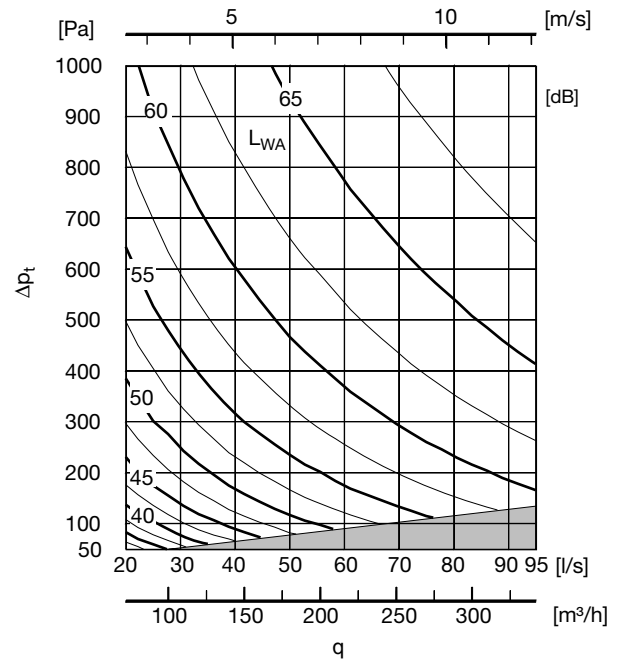
15

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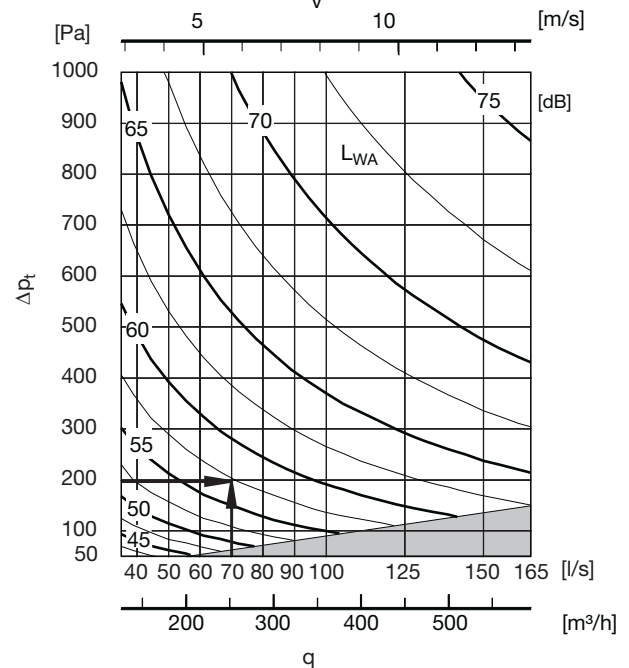
17

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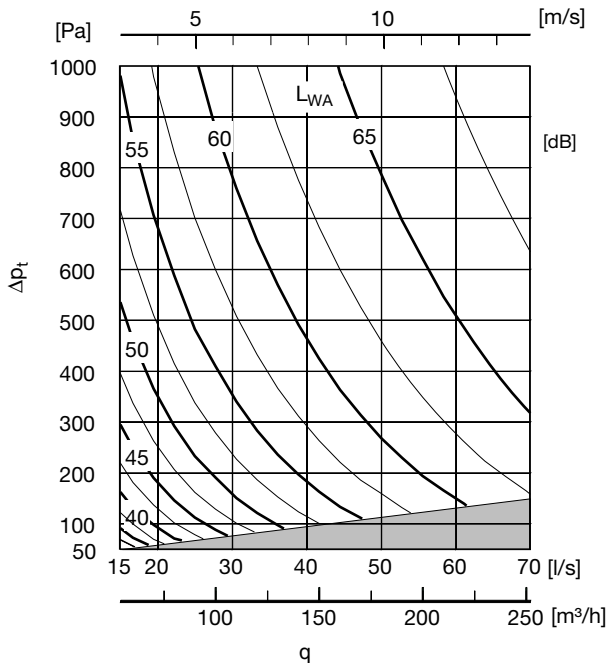
## Ø 100



## Ø 125



## Ø 80





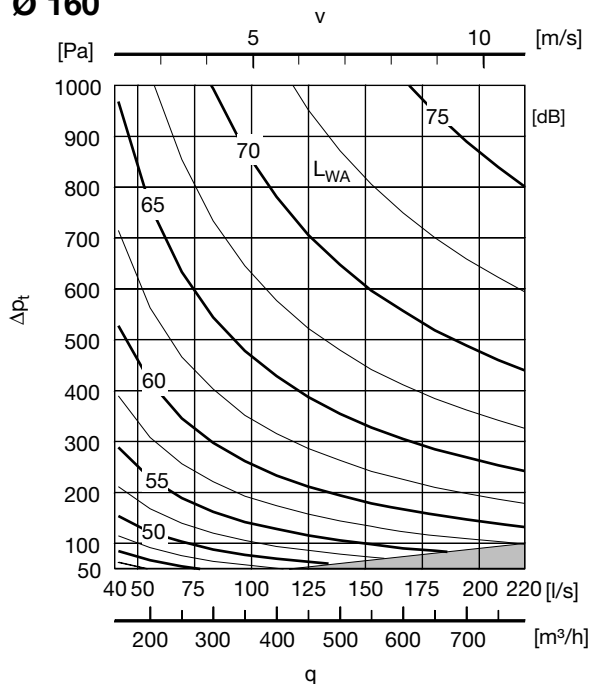
# Constant-/ variable flow damper

# DAU, DA2EU, DAVU

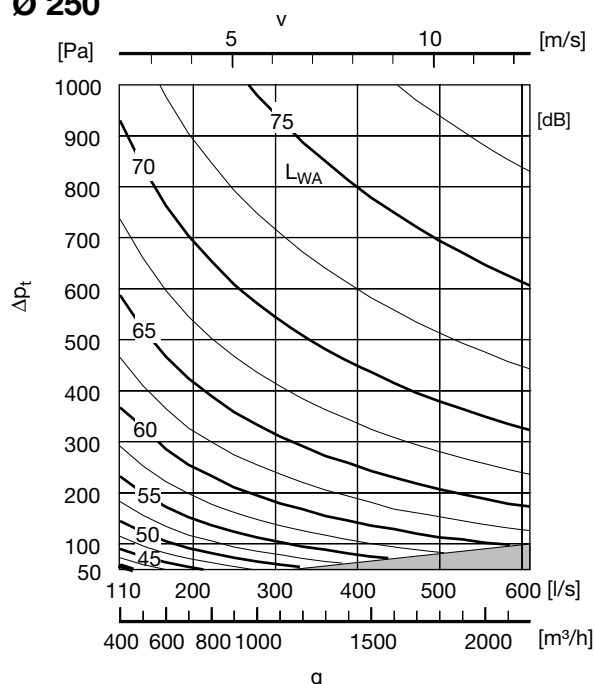
## Technical data

### Pressure and flow ranges and sound to duct

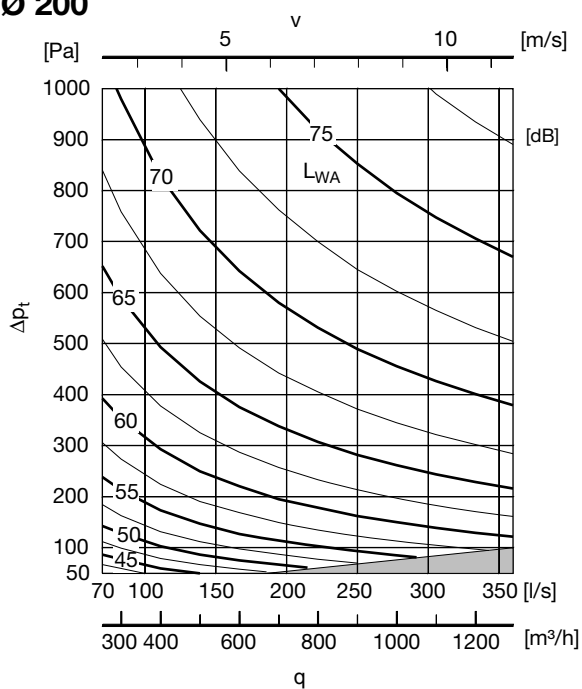
#### Ø 160



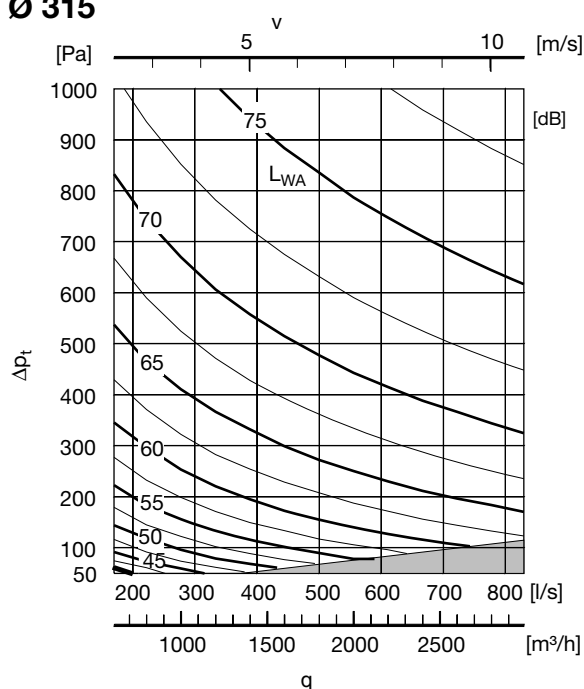
#### Ø 250



#### Ø 200



#### Ø 315



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# Constant-/ variable flow damper

# DAU, DA2EU, DAVU

## Technical data

### Sound to duct

Sound power level,  $L_W$  [dB], to duct in octave bands 1–8, 63–8000 Hz, as function of diameter, pressure drop and flow.

| Ød <sub>1</sub> | Pressure drop [Pa] | Velocity app. 2,5 [m/s] |     |     |     |    |    |    |    | Velocity app. 6 [m/s] |     |     |     |    |    |    |    |
|-----------------|--------------------|-------------------------|-----|-----|-----|----|----|----|----|-----------------------|-----|-----|-----|----|----|----|----|
|                 |                    | Centre frequency [Hz]   |     |     |     |    |    |    |    | Centre frequency [Hz] |     |     |     |    |    |    |    |
|                 |                    | 63                      | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63                    | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
|                 |                    | Flow 15 [l/s]           |     |     |     |    |    |    |    | Flow 30 [l/s]         |     |     |     |    |    |    |    |
| 80              | 1000               | 51                      | 49  | 44  | 44  | 46 | 49 | 49 | 44 | 56                    | 56  | 53  | 53  | 53 | 55 | 55 | 50 |
|                 | 500                | 45                      | 43  | 38  | 38  | 40 | 43 | 43 | 38 | 51                    | 51  | 49  | 49  | 49 | 51 | 50 | 46 |
|                 | 200                | 37                      | 35  | 30  | 30  | 32 | 35 | 35 | 30 | 45                    | 45  | 43  | 43  | 43 | 45 | 44 | 40 |
|                 | 100                | 32                      | 30  | 25  | 25  | 27 | 30 | 30 | 25 | 41                    | 41  | 39  | 39  | 39 | 41 | 40 | 35 |
|                 | 50                 | 26                      | 24  | 19  | 19  | 21 | 24 | 24 | 19 | –                     | –   | –   | –   | –  | –  | –  | –  |
|                 |                    | Flow 20 [l/s]           |     |     |     |    |    |    |    | Flow 45 [l/s]         |     |     |     |    |    |    |    |
| 100             | 1000               | 56                      | 53  | 48  | 48  | 50 | 53 | 54 | 48 | 59                    | 59  | 57  | 57  | 57 | 59 | 58 | 53 |
|                 | 500                | 49                      | 46  | 41  | 41  | 43 | 47 | 47 | 42 | 54                    | 54  | 51  | 51  | 51 | 53 | 53 | 48 |
|                 | 200                | 39                      | 37  | 31  | 31  | 33 | 37 | 37 | 32 | 47                    | 47  | 44  | 44  | 45 | 47 | 46 | 41 |
|                 | 100                | 34                      | 31  | 26  | 26  | 28 | 32 | 32 | 27 | 42                    | 42  | 39  | 39  | 40 | 42 | 41 | 36 |
|                 | 50                 | 26                      | 24  | 18  | 18  | 20 | 24 | 24 | 19 | –                     | –   | –   | –   | –  | –  | –  | –  |
|                 |                    | Flow 30 [l/s]           |     |     |     |    |    |    |    | Flow 70 [l/s]         |     |     |     |    |    |    |    |
| 125             | 1000               | 60                      | 58  | 52  | 52  | 54 | 58 | 58 | 53 | 64                    | 64  | 62  | 62  | 62 | 64 | 63 | 59 |
|                 | 500                | 54                      | 52  | 46  | 46  | 48 | 52 | 52 | 47 | 59                    | 59  | 56  | 57  | 57 | 59 | 58 | 53 |
|                 | 200                | 46                      | 44  | 38  | 38  | 40 | 44 | 44 | 39 | 52                    | 52  | 49  | 49  | 49 | 51 | 51 | 46 |
|                 | 100                | 40                      | 38  | 32  | 32  | 34 | 38 | 38 | 33 | 46                    | 46  | 44  | 44  | 44 | 46 | 45 | 40 |
|                 | 50                 | 34                      | 32  | 26  | 26  | 28 | 32 | 32 | 27 | –                     | –   | –   | –   | –  | –  | –  | –  |
|                 |                    | Flow 40 [l/s]           |     |     |     |    |    |    |    | Flow 120 [l/s]        |     |     |     |    |    |    |    |
| 160             | 1000               | 62                      | 59  | 52  | 52  | 55 | 59 | 60 | 54 | 67                    | 67  | 65  | 65  | 65 | 67 | 66 | 61 |
|                 | 500                | 56                      | 53  | 47  | 47  | 49 | 53 | 54 | 48 | 61                    | 61  | 59  | 59  | 59 | 61 | 60 | 55 |
|                 | 200                | 49                      | 46  | 39  | 39  | 42 | 46 | 47 | 41 | 53                    | 53  | 51  | 51  | 51 | 53 | 52 | 47 |
|                 | 100                | 43                      | 40  | 33  | 33  | 36 | 40 | 41 | 35 | 48                    | 48  | 46  | 46  | 46 | 48 | 47 | 42 |
|                 | 50                 | 37                      | 34  | 27  | 27  | 30 | 34 | 35 | 29 | –                     | –   | –   | –   | –  | –  | –  | –  |
|                 |                    | Flow 70 [l/s]           |     |     |     |    |    |    |    | Flow 180 [l/s]        |     |     |     |    |    |    |    |
| 200             | 1000               | 66                      | 63  | 57  | 57  | 59 | 63 | 63 | 58 | 69                    | 69  | 66  | 66  | 66 | 68 | 68 | 63 |
|                 | 500                | 59                      | 56  | 50  | 50  | 53 | 57 | 57 | 52 | 62                    | 62  | 60  | 60  | 60 | 62 | 61 | 57 |
|                 | 200                | 50                      | 47  | 41  | 41  | 43 | 47 | 47 | 42 | 54                    | 54  | 51  | 51  | 52 | 54 | 53 | 48 |
|                 | 100                | 43                      | 40  | 34  | 34  | 36 | 40 | 40 | 35 | 47                    | 47  | 45  | 45  | 45 | 47 | 46 | 42 |
|                 | 50                 | 37                      | 34  | 28  | 28  | 30 | 34 | 34 | 29 | –                     | –   | –   | –   | –  | –  | –  | –  |
|                 |                    | Flow 110 [l/s]          |     |     |     |    |    |    |    | Flow 300 [l/s]        |     |     |     |    |    |    |    |
| 250             | 1000               | 67                      | 64  | 59  | 59  | 61 | 65 | 65 | 60 | 70                    | 70  | 67  | 68  | 67 | 69 | 69 | 64 |
|                 | 500                | 60                      | 57  | 51  | 51  | 53 | 57 | 57 | 52 | 63                    | 63  | 61  | 61  | 61 | 63 | 62 | 57 |
|                 | 200                | 50                      | 47  | 41  | 41  | 43 | 47 | 47 | 42 | 55                    | 55  | 53  | 53  | 53 | 54 | 54 | 49 |
|                 | 100                | 43                      | 40  | 34  | 34  | 36 | 40 | 40 | 35 | 49                    | 49  | 47  | 47  | 47 | 48 | 48 | 43 |
|                 | 50                 | 35                      | 32  | 26  | 26  | 28 | 32 | 33 | 27 | 43                    | 43  | 40  | 41  | 40 | 42 | 42 | 37 |
|                 |                    | Flow 170 [l/s]          |     |     |     |    |    |    |    | Flow 470 [l/s]        |     |     |     |    |    |    |    |
| 315             | 1000               | 69                      | 66  | 60  | 60  | 62 | 66 | 67 | 61 | 70                    | 70  | 68  | 68  | 68 | 70 | 69 | 65 |
|                 | 500                | 61                      | 58  | 52  | 52  | 54 | 58 | 59 | 53 | 64                    | 64  | 62  | 62  | 62 | 64 | 63 | 59 |
|                 | 200                | 50                      | 47  | 41  | 41  | 44 | 48 | 48 | 43 | 56                    | 56  | 54  | 54  | 54 | 56 | 55 | 50 |
|                 | 100                | 42                      | 40  | 34  | 34  | 36 | 40 | 40 | 35 | 50                    | 50  | 47  | 47  | 47 | 49 | 49 | 44 |
|                 | 50                 | 35                      | 32  | 26  | 26  | 29 | 33 | 33 | 28 | –                     | –   | –   | –   | –  | –  | –  | –  |



# Constant-/variable flow damper

# DAU, DA2EU, DAVU

## Technical data

### Sound to duct

Sound power level,  $L_W$  [dB], to duct in octave bands 1–8, 63–8000 Hz, as function of diameter, pressure drop and flow.

| Ød <sub>1</sub> | Pressure drop [Pa] | Velocity app. 9 [m/s] |     |     |     |    |    |    |    | Velocity app. 12 [m/s] |     |     |     |    |    |    |    |
|-----------------|--------------------|-----------------------|-----|-----|-----|----|----|----|----|------------------------|-----|-----|-----|----|----|----|----|
|                 |                    | Centre frequency [Hz] |     |     |     |    |    |    |    | Centre frequency [Hz]  |     |     |     |    |    |    |    |
|                 |                    | 63                    | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
|                 |                    | Flow 45 [l/s]         |     |     |     |    |    |    |    | Flow 70 [l/s]          |     |     |     |    |    |    |    |
| 80              | 1000               | 58                    | 59  | 59  | 59  | 58 | 59 | 58 | 53 | 61                     | 64  | 65  | 65  | 63 | 63 | 61 | 57 |
|                 | 500                | 55                    | 56  | 55  | 55  | 54 | 55 | 54 | 50 | 59                     | 61  | 62  | 62  | 60 | 60 | 59 | 55 |
|                 | 200                | 50                    | 51  | 51  | 51  | 50 | 51 | 50 | 45 | 55                     | 58  | 59  | 59  | 57 | 57 | 55 | 51 |
|                 | 100                | -                     | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                 | 50                 | -                     | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                 |                    | Flow 70 [l/s]         |     |     |     |    |    |    |    | Flow 95 [l/s]          |     |     |     |    |    |    |    |
| 100             | 1000               | 61                    | 62  | 61  | 62  | 61 | 62 | 61 | 56 | 62                     | 64  | 65  | 65  | 63 | 63 | 62 | 58 |
|                 | 500                | 56                    | 58  | 57  | 57  | 56 | 57 | 56 | 51 | 59                     | 60  | 61  | 61  | 59 | 60 | 58 | 54 |
|                 | 200                | 51                    | 52  | 51  | 51  | 50 | 51 | 50 | 46 | 53                     | 55  | 56  | 56  | 54 | 54 | 53 | 49 |
|                 | 100                | 47                    | 48  | 47  | 47  | 46 | 47 | 46 | 42 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                 | 50                 | -                     | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                 |                    | Flow 110 [l/s]        |     |     |     |    |    |    |    | Flow 165 [l/s]         |     |     |     |    |    |    |    |
| 125             | 1000               | 66                    | 67  | 67  | 67  | 66 | 67 | 66 | 61 | 68                     | 71  | 71  | 72  | 70 | 70 | 68 | 64 |
|                 | 500                | 61                    | 62  | 62  | 62  | 61 | 62 | 61 | 56 | 63                     | 66  | 66  | 67  | 65 | 65 | 63 | 59 |
|                 | 200                | 54                    | 55  | 55  | 55  | 54 | 55 | 54 | 49 | 57                     | 59  | 60  | 60  | 58 | 58 | 57 | 52 |
|                 | 100                | 50                    | 51  | 50  | 50  | 49 | 50 | 49 | 45 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                 | 50                 | -                     | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                 |                    | Flow 180 [l/s]        |     |     |     |    |    |    |    | Flow 220 [l/s]         |     |     |     |    |    |    |    |
| 160             | 1000               | 69                    | 70  | 69  | 69  | 68 | 69 | 68 | 64 | 70                     | 71  | 71  | 71  | 70 | 71 | 69 | 65 |
|                 | 500                | 63                    | 64  | 63  | 63  | 62 | 63 | 62 | 58 | 64                     | 66  | 66  | 66  | 64 | 65 | 64 | 59 |
|                 | 200                | 55                    | 56  | 56  | 56  | 55 | 56 | 55 | 50 | 56                     | 58  | 58  | 58  | 57 | 57 | 56 | 52 |
|                 | 100                | 50                    | 51  | 50  | 50  | 49 | 50 | 49 | 45 | 51                     | 52  | 52  | 52  | 51 | 52 | 50 | 46 |
|                 | 50                 | -                     | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                 |                    | Flow 280 [l/s]        |     |     |     |    |    |    |    | Flow 360 [l/s]         |     |     |     |    |    |    |    |
| 200             | 1000               | 70                    | 71  | 71  | 71  | 70 | 71 | 70 | 65 | 71                     | 73  | 73  | 73  | 72 | 72 | 71 | 67 |
|                 | 500                | 64                    | 65  | 64  | 64  | 63 | 64 | 63 | 59 | 65                     | 67  | 67  | 67  | 65 | 66 | 65 | 60 |
|                 | 200                | 56                    | 57  | 56  | 56  | 55 | 56 | 55 | 51 | 57                     | 58  | 59  | 59  | 57 | 58 | 56 | 52 |
|                 | 100                | 50                    | 51  | 50  | 50  | 49 | 50 | 49 | 45 | 51                     | 53  | 53  | 53  | 52 | 52 | 51 | 47 |
|                 | 50                 | -                     | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                 |                    | Flow 450 [l/s]        |     |     |     |    |    |    |    | Flow 600 [l/s]         |     |     |     |    |    |    |    |
| 250             | 1000               | 71                    | 72  | 71  | 71  | 70 | 71 | 70 | 66 | 72                     | 73  | 74  | 74  | 72 | 73 | 71 | 67 |
|                 | 500                | 65                    | 66  | 65  | 65  | 64 | 65 | 64 | 60 | 66                     | 68  | 69  | 69  | 67 | 67 | 66 | 62 |
|                 | 200                | 57                    | 58  | 57  | 57  | 56 | 57 | 56 | 52 | 58                     | 60  | 61  | 61  | 59 | 59 | 58 | 54 |
|                 | 100                | 51                    | 52  | 52  | 52  | 51 | 52 | 51 | 46 | 54                     | 55  | 56  | 56  | 54 | 55 | 53 | 49 |
|                 | 50                 | -                     | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |
|                 |                    | Flow 700 [l/s]        |     |     |     |    |    |    |    | Flow 830 [l/s]         |     |     |     |    |    |    |    |
| 315             | 1000               | 71                    | 72  | 72  | 72  | 71 | 72 | 71 | 66 | 72                     | 73  | 73  | 73  | 72 | 73 | 71 | 67 |
|                 | 500                | 66                    | 67  | 66  | 66  | 65 | 66 | 65 | 61 | 66                     | 67  | 67  | 68  | 66 | 67 | 66 | 61 |
|                 | 200                | 58                    | 59  | 59  | 59  | 58 | 59 | 58 | 53 | 59                     | 60  | 60  | 60  | 59 | 60 | 58 | 54 |
|                 | 100                | 52                    | 53  | 53  | 53  | 52 | 53 | 52 | 47 | -                      | -   | -   | -   | -  | -  | -  | -  |
|                 | 50                 | -                     | -   | -   | -   | -  | -  | -  | -  | -                      | -   | -   | -   | -  | -  | -  | -  |



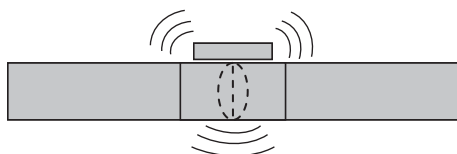


# Constant-/variable flow damper

# DAU, DA2EU, DAVU

## Technical data

### Pressure and flow ranges and sound to the surroundings



The graphs show A-weighted sound **power** level,  $L_{WA}$  [dB], to the surroundings.

#### Example:

Given: Diameter 125 mm  
Flow 70 l/s  
Pressure drop 200 Pa

The graph gives:

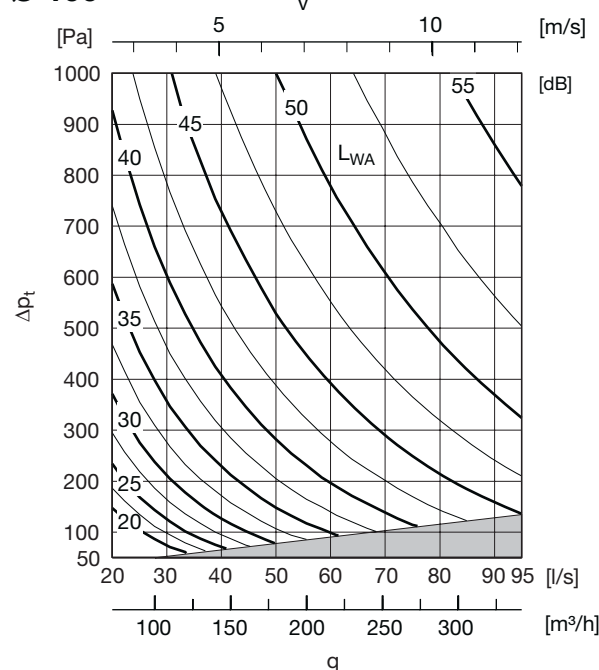
A-weighted sound power level approx. 40 dB

The A-weighted sound **pressure** level in the middle of the room becomes approx. 8 dB lower than these graph values.

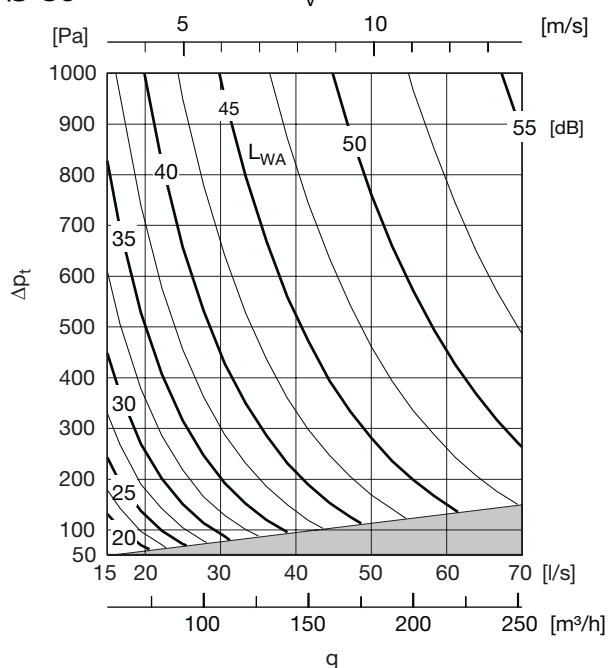
With insulation shell around the unit (the DALU unit) the A-weighted sound **pressure** level in the middle of the room becomes approx. 26 dB lower than the graph values on condition that also the connected ducts are attenuated (insulated) to the same extent.

Still lower sound **pressure** level can be achieved with additional constructional sound attenuation measures (false ceiling, high room attenuation).

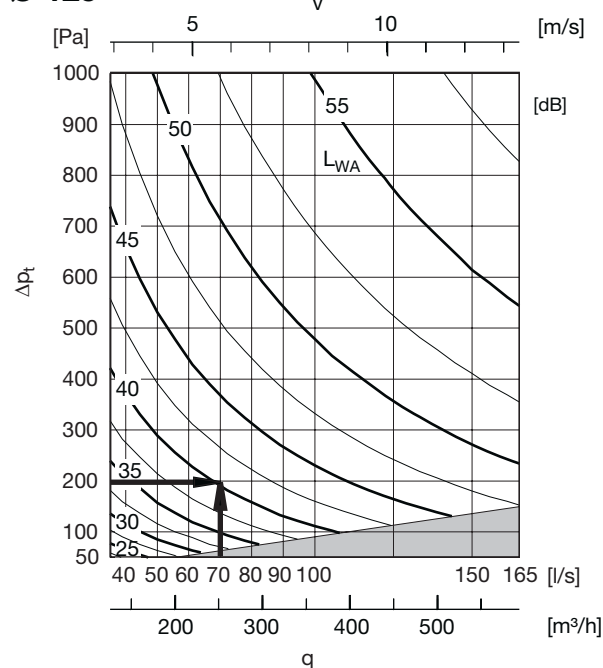
### Ø 100



### Ø 80



### Ø 125





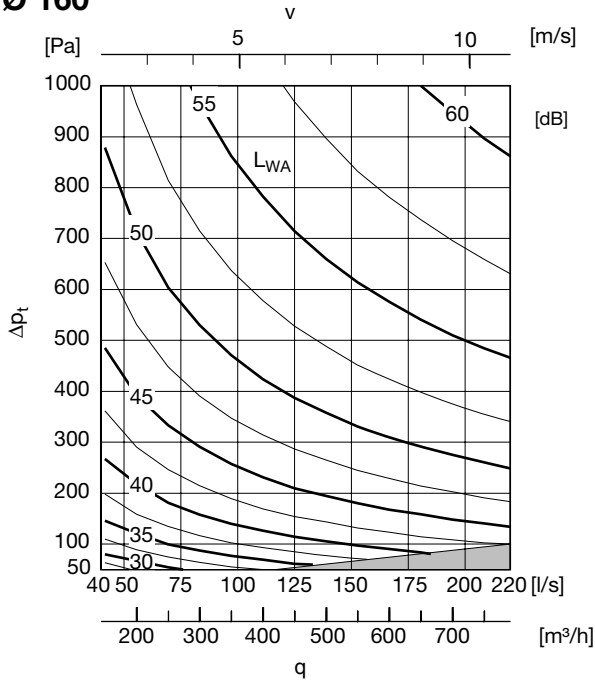
# Constant-/variable flow damper

# DAU, DA2EU, DAVU

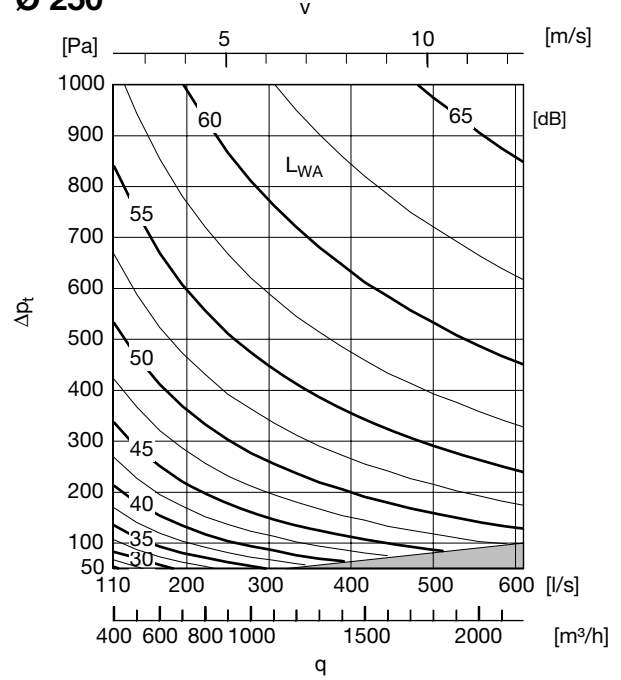
## Technical data

Pressure and flow ranges and sound to the surroundings

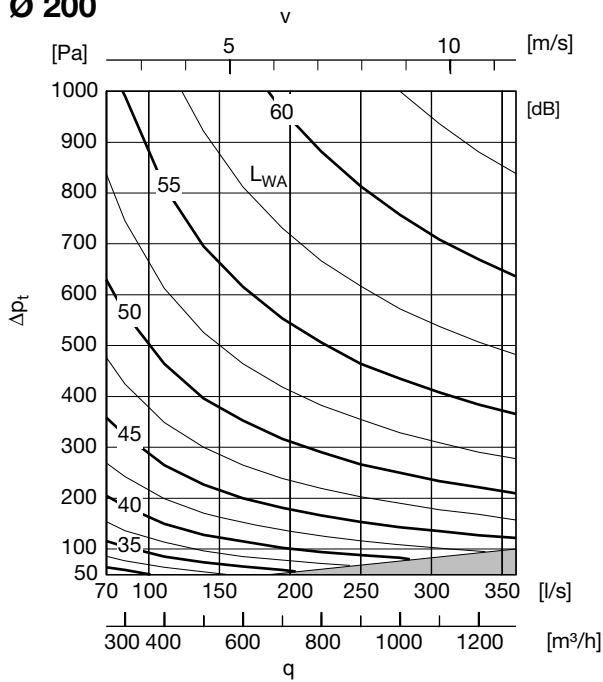
### Ø 160



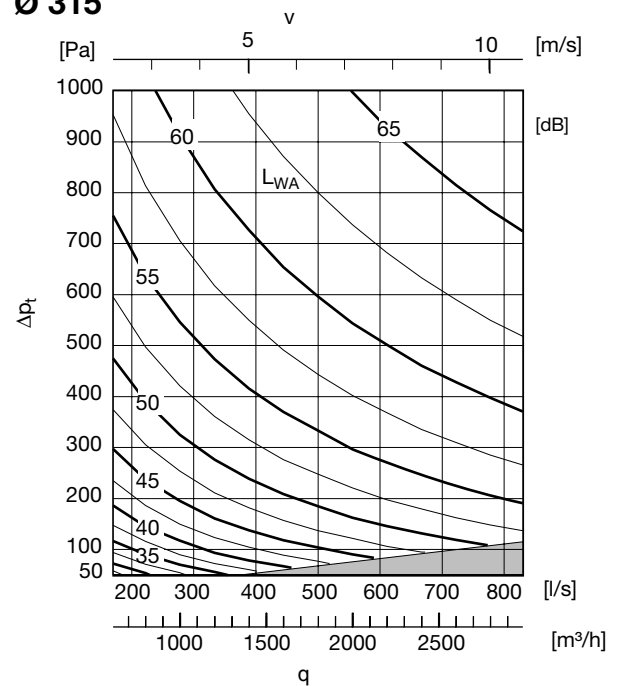
### Ø 250



### Ø 200



### Ø 315



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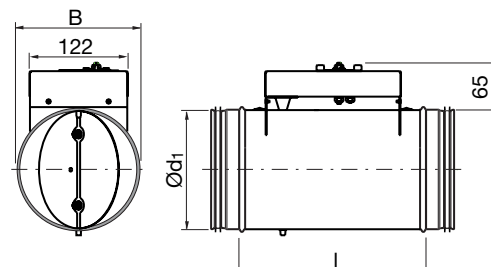


# Constant-/variable flow damper

# DAU



## Dimensions



## Description

### Constant flow damper with manual setting of one flow

DAU is a constant flow damper, which facilitates balancing of ventilation systems and gives correct flow from the start.

The unit compensates for e.g. connection and disconnection of system parts, clogging of filters and ducts, thermal lift forces, wind effects, window opening etc.

Ø 80–315 fullfills pressure class A in closed position.

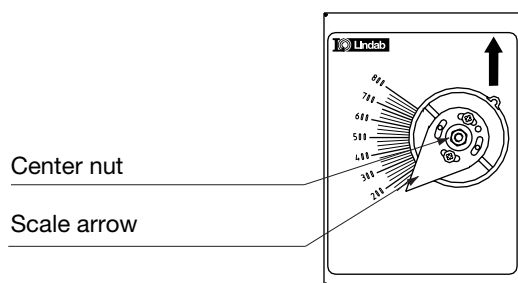
Fulfils tightness class C.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

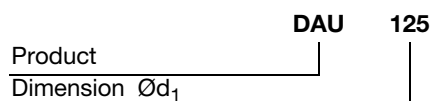
## Technical data

### Flow setting

The flow is set by loosening the center nut and via the knob turning the scale arrow so it points at the wanted flow on the scale. Then the center nut is tightened.

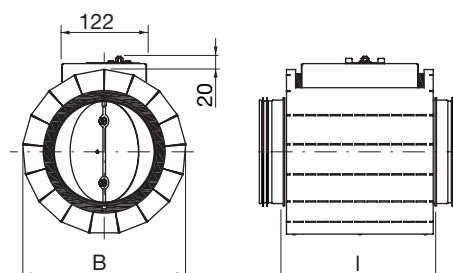


## Ordering example



| Ød <sub>1</sub> nom | l mm | B mm | m kg | Tightness class across closed blade |
|---------------------|------|------|------|-------------------------------------|
| 80                  | 240  | 122  | 1,35 | 0                                   |
| 100                 | 240  | 122  | 1,40 | 0                                   |
| 125                 | 240  | 135  | 1,65 | 0                                   |
| 160                 | 250  | 170  | 1,85 | 0                                   |
| 200                 | 268  | 210  | 2,26 | 0                                   |
| 250                 | 290  | 260  | 3,35 | 0                                   |
| 315                 | 332  | 325  | 4,75 | 0                                   |

DAU is available with an 45 mm external insulation and an outer sheet metal shell for lower sound radiation to the surroundings. Is then called DALU.



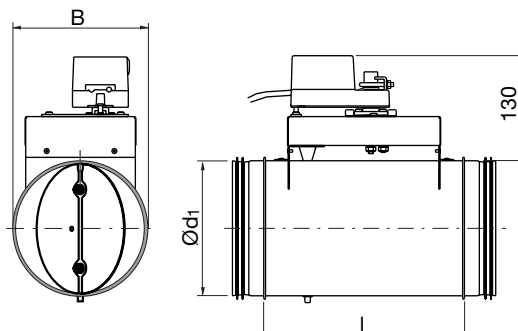
| Ød <sub>1</sub> nom | l mm | B mm | m kg | Tightness class across closed blade |
|---------------------|------|------|------|-------------------------------------|
| 80                  | 240  | 170  | 2,35 | 0                                   |
| 100                 | 240  | 190  | 2,50 | 0                                   |
| 125                 | 240  | 215  | 2,90 | 0                                   |
| 160                 | 250  | 250  | 3,45 | 0                                   |
| 200                 | 268  | 290  | 4,06 | 0                                   |
| 250                 | 290  | 340  | 6,05 | 0                                   |
| 315                 | 332  | 405  | 8,60 | 0                                   |



# Constant-/variable flow damper DA2EU



## Dimensions



## Description

### Constant flow damper with electric motor for switching between two flows

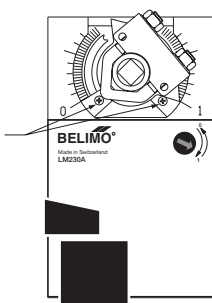
DA2EU is a constant flow damper, which facilitates balancing of ventilation systems and gives correct flow from the start. The unit compensates for e.g. connection and disconnection of system parts, clogging of filters and ducts, thermal lift forces, wind effects, window opening etc. The motors shall be completed with a switch. The switch can in turn be controlled either manually with timer, with on/off-thermostat, with attendance transmitter or similar. Ø 80–315 fullfills pressure class A in closed position. Fulfils tightness class C. There is a separate assembly, measuring, balancing and maintenance instruction for this product.

### Flow setting

The two flows are set by moving the end stoppers screws.

At delivery the screws are set at largest possible distance.

End stop screws



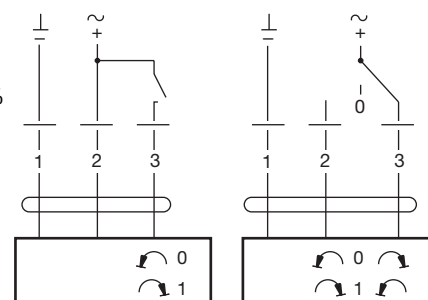
| Ød <sub>1</sub> nom | l mm | B mm | m kg | Tightness class across closed blade |
|---------------------|------|------|------|-------------------------------------|
| 80                  | 250  | 122  | 1,95 | 0                                   |
| 100                 | 250  | 122  | 2,00 | 0                                   |
| 125                 | 250  | 135  | 2,25 | 0                                   |
| 160                 | 250  | 170  | 2,45 | 0                                   |
| 200                 | 250  | 210  | 2,86 | 0                                   |
| 250                 | 290  | 260  | 3,95 | 0                                   |
| 315                 | 332  | 325  | 5,35 | 0                                   |

## Ordering example

|                           |              |            |           |           |
|---------------------------|--------------|------------|-----------|-----------|
| <b>Product</b>            | <b>DA2EU</b> | <b>125</b> | <b>24</b> | <b>LM</b> |
| Type                      |              |            |           |           |
| Dimension Ød <sub>1</sub> |              |            |           |           |
| Voltage                   |              |            |           |           |
| Motor type                |              |            |           |           |

## Technical data for the motors

|                                 | LM 24 A                                    | LM 230 A                          |
|---------------------------------|--|-----------------------------------|
| Power supply.....               | AC 19,2–28,8 V, 50/60 Hz<br>DC 19,2–28,8 V | AC 65–265 V, 50/60 Hz             |
| Power consumption .....         | 1 W  | 1,5 W                             |
| For wire sizing .....           | 2 VA                                       | 4 VA                              |
| Connection.....                 | Cable 1 m, 3×0,75 mm <sup>2</sup>          | Cable 1 m, 3×0,75 mm <sup>2</sup> |
| Operating angle.....            | Max. 95°, adjustable 0–100%                | Max. 95°, adjustable 0–100%       |
| Torque at rated voltage .....   | Min. 5 Nm                                  | Min. 5 Nm                         |
| Direction of rotation.....      | Switch selectable<br>0 ↻ or 1 ↻            | Switch selectable<br>0 ↻ or 1 ↻   |
| Position indication .....       | Mechanical                                 | Mechanical                        |
| Running time for 95° .....      | 150 s                                      | 150 s                             |
| Sound power level.....          | Max. 35 dB (A)                             | Max. 35 dB (A)                    |
| Protection class.....           | III Safety extra-low voltage               | II Safety insulated               |
| Protection type.....            | IP 54                                      | IP 54                             |
| Ambient temperature range ..... | -30 to +50°C                               | -30 to +50°C                      |
| Ambient moisture .....          | 95 % RH                                    | 95 % RH                           |





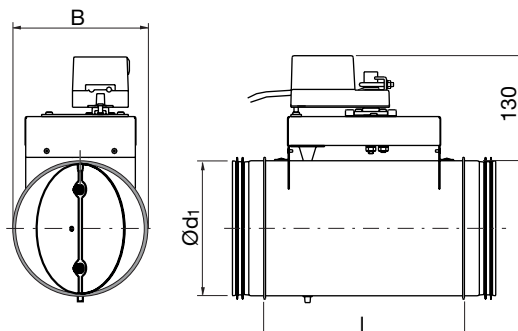


# Constant-/variable flow damper

# DAVU



## Dimensions



## Description

**Constant flow damper with electric motor for continuous setting of one flow**

DAVU is a constant flow damper, which facilitates balancing of ventilation systems and gives correct flow from the start. The unit compensates for e.g. connection and disconnection of system parts, clogging of filters and ducts, thermal lift forces, wind effects, window opening etc. The motor shall be completed with control signal transmitter e.g. an external potentiometer or a proportionally regulating thermostat. A special mounting, measuring, balancing and maintenance instruction exists for this product.

Ø 80–315 fullfills pressure class A in closed position.

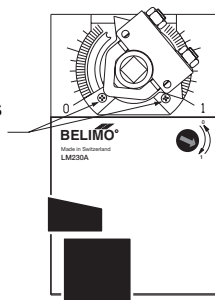
Fulfills tightness class C.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

## Flow setting

The two flows are set by moving the end stoppers screws.

End stop screws



At delivery the screws are set at largest possible distance.

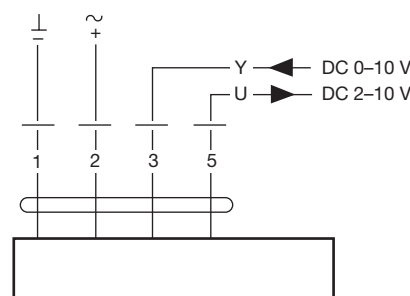
| Ød <sub>1</sub> nom | l mm | B mm | m kg | Tightness class across closed blade |
|---------------------|------|------|------|-------------------------------------|
| 80                  | 250  | 122  | 1,95 | 0                                   |
| 100                 | 250  | 122  | 2,00 | 0                                   |
| 125                 | 250  | 135  | 2,25 | 0                                   |
| 160                 | 250  | 170  | 2,45 | 0                                   |
| 200                 | 250  | 210  | 2,86 | 0                                   |
| 250                 | 290  | 260  | 3,95 | 0                                   |
| 315                 | 332  | 325  | 5,35 | 0                                   |

## Ordering example

|                           |             |            |           |             |
|---------------------------|-------------|------------|-----------|-------------|
| <b>Product</b>            | <b>DAVU</b> | <b>125</b> | <b>24</b> | <b>LMSR</b> |
| Type                      |             |            |           |             |
| Dimension Ød <sub>1</sub> |             |            |           |             |
| Voltage                   |             |            |           |             |
| Motor type                |             |            |           |             |

## Technical data for the motors

|                                 | <b>LM 24 A-SR</b>                          |
|---------------------------------|--|
| Power supply .....              | AC 19,2–28,8 V, 50/60 Hz<br>DC 19,2–28,8 V |
| Power consumption .....         | 1 W  |
| For wire sizing .....           | 2 VA                                       |
| Connection .....                | Cable 1 m, 4x0,75 mm <sup>2</sup>          |
| Operating angle .....           | Max. 95°, adjustable 0–100%                |
| Torque at rated voltage .....   | Min. 5 Nm                                  |
| Direction of rotation .....     | Switch selectable 0/1                      |
| Position at Y=0 V .....         | Switch selectable 0 or 1                   |
| Position indication .....       | Mechanical                                 |
| Running time for 95° .....      | 150 s                                      |
| Sound power level .....         | Max. 35 dB (A)                             |
| Protection class .....          | III Safety extra-low voltage               |
| Protection type .....           | IP 54                                      |
| Ambient temperature range ..... | -30 to +50°C                               |
| Ambient moisture .....          | 95 % RH                                    |



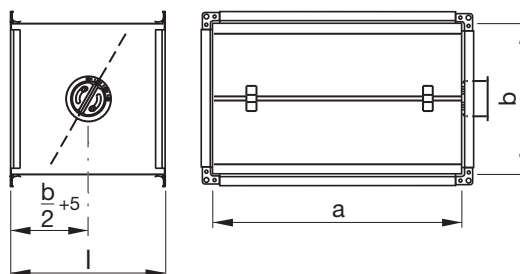


# Regulating damper

# LKSR



## Dimensions



## Description

### Rectangular regulating damper

Består av trapetskorrugerad kanal med vridbart blad. Bladet är steglöst inställbart 0–90° via vredet i dosan och avläsning av spjällvinkeln sker mot enpräglad gradering på doskanten. Låsning sker med två skruvar för Pozidriv (PZD2).

För allmän information om spjäll se sidan \*.

Spjällets förses med skarvprofil i båda ändar. Längden är normalt  $b+10$  men spjället kan även fås i speciallängder.

Dosan medger en isolertjocklek av ca 50 mm. Vid krav på tjockare isolering kompletteras spjället med den speciella isoleringskoppen IK.

Spjället är möjligt att motorisera i efterhand.

Täthetsklass förbi stängt blad: 0.

Maximal storlek på spjället är 600 × 600 mm.

LKSR levereras försedd med skarvprofil typ RJFP.

För vidare information om tillbehör se sidan \*.

## Ordering example

|                     |             |            |            |          |
|---------------------|-------------|------------|------------|----------|
|                     | <b>LKSR</b> | <b>500</b> | <b>300</b> | <b>1</b> |
| Product             |             |            |            |          |
| Side in mm          | a           |            |            |          |
| Knob side in mm     | b           |            |            |          |
| Normal length in mm |             |            |            |          |
| $l = b+10$          | 1           |            |            |          |

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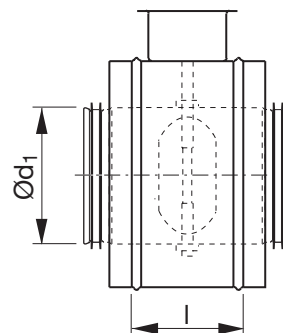
# Regulating damper

DRUI

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## Dimensions

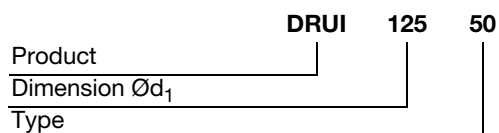


### Description

Preinsulated regulating damper of DRU type.  
 Ø 100–500 fullfills pressure class A in closed position.

| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg | Sealing class past<br>closed blade |
|------------------------|---------|---------|------------------------------------|
| 100                    | 100     | 1,25    | 0                                  |
| 125                    | 100     | 1,44    | 0                                  |
| 160                    | 100     | 1,70    | 0                                  |
| 200                    | 100     | 2,17    | 0                                  |
| 250                    | 100     | 3,24    | 0                                  |
| 315                    | 100     | 3,94    | 0                                  |
| 400                    | 100     | 6,15    | 0                                  |
| 500                    | 115     | 7,68    | 0                                  |

### Ordering example





# Sliding damper – manual

# SKMTR



## Description

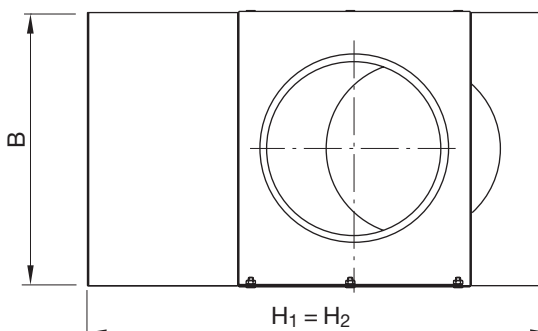
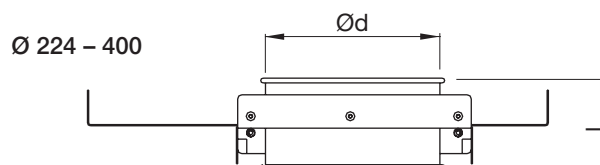
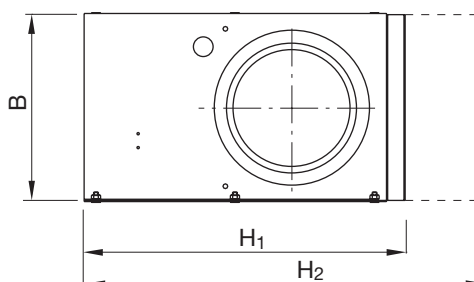
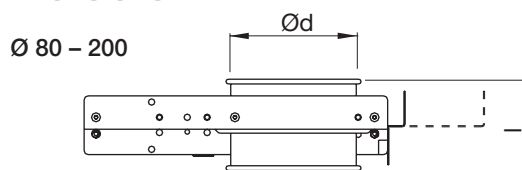
### Manual shut-off sliding damper with transfer joint

The damper meets the requirements for tightness class 4 at pressure class C.

The damper meets the requirements for tightness class C only in fully closed or fully opened position.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

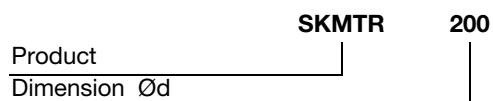
## Dimensions



| Ød nom | H <sub>1</sub> mm | H <sub>2</sub> mm | B mm | l mm | m kg |
|--------|-------------------|-------------------|------|------|------|
| 80     | 250               | 330               | 160  | 125  | 2,70 |
| 100    | 290               | 390               | 180  | 125  | 3,00 |
| 125    | 340               | 465               | 205  | 125  | 3,60 |
| 140    | 390               | 530               | 230  | 125  | 4,50 |
| 150    | 390               | 540               | 230  | 125  | 4,50 |
| 160    | 410               | 570               | 240  | 125  | 4,70 |
| 180    | 490               | 670               | 280  | 125  | 5,60 |
| 200    | 490               | 690               | 280  | 125  | 5,60 |
| 224 *  | 585               | 809               | 345  | 165  | 10,2 |
| 250 *  | 585               | 835               | 370  | 165  | 12,2 |
| 300 *  | 730               | 1030              | 420  | 165  | 18,1 |
| 315 *  | 730               | 1045              | 435  | 165  | 19,0 |
| 350 *  | 800               | 1150              | 470  | 165  | 22,5 |
| 400 *  | 905               | 1305              | 520  | 165  | 26,1 |

\* Has through blade

## Ordering example



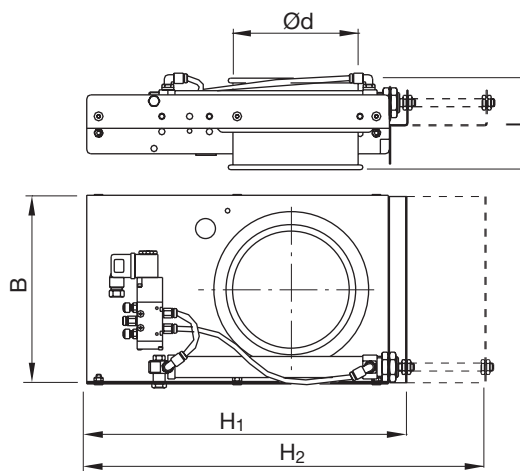


# Sliding damper – pneumatic

# SKPTR



## Dimensions



## Description

### Pneumatic shut-off sliding damper with transfer joint

The damper meets the requirements for tightness class 4 at pressure class C.

The damper meets the requirements for tightness class C only in fully closed or fully opened position.

Pressurized air cylinder with mounted regulation valve is included.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

## Technical data

### Cylinder

Power pressure, normal ..... 0,6 MPa (6 bar)  
 , max ..... 1,0 MPa (10 bar)  
 Ambient temperature range ..... -20 °C (dry air) to +80 °C  
 Working fluid ..... Air, clean and dry

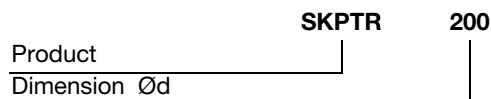
### Solenoid valve

Power pressure ..... max 7 bar  
 Ambient temperature ..... max +50 °C  
 Power supply, standard ..... 220 V~  
 , special ..... 24 V~ or 24 V-  
 Power tolerance ..... ±10 %  
 Power requirements ..... appr. 5 W  
 Protection class ..... IP 65  
 Insulation class ..... B  
 Air connection ..... Quick release for Ø 6 mm hose

| Ød nom | H <sub>1</sub> mm | H <sub>2</sub> mm | B mm | l mm | m kg |
|--------|-------------------|-------------------|------|------|------|
| 80     | 250               | 330               | 160  | 125  | 3,00 |
| 100    | 290               | 390               | 180  | 125  | 3,30 |
| 125    | 340               | 465               | 205  | 125  | 4,00 |
| 140    | 390               | 530               | 230  | 125  | 5,00 |
| 150    | 390               | 540               | 230  | 125  | 5,00 |
| 160    | 410               | 570               | 240  | 125  | 5,20 |
| 180 *  | 490               | 670               | 280  | 125  | 6,20 |
| 200 *  | 490               | 690               | 280  | 125  | 6,20 |
| 224 *  | 585               | 809               | 345  | 165  | 11,3 |
| 250 *  | 585               | 835               | 370  | 165  | 13,5 |
| 300 *  | 730               | 1030              | 420  | 165  | 20,1 |
| 315 *  | 730               | 1045              | 435  | 165  | 21,1 |
| 350 *  | 800               | 1150              | 470  | 165  | 25,0 |
| 400 *  | 905               | 1305              | 520  | 165  | 29,0 |

\* Provided with 2 compressed air cylinders

## Ordering example



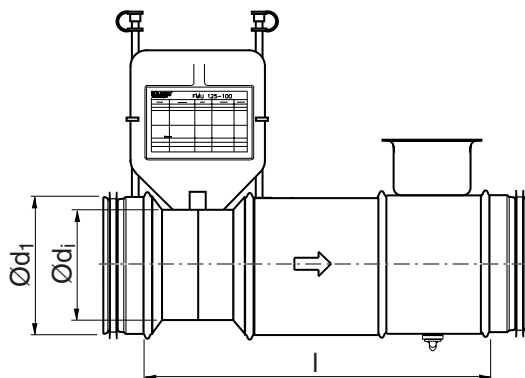


# Damper with flow meter

# FMDRU



## Dimensions



## Description

### Applications

The flow meter is suitable both for setting up and for continuous flow measurement. It is intended for permanent installation and must therefore be specified at the design stage.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 80–630 fullfills tightness class 0 and pressure class A .

### Design

The flow meter consists of two reducers joined together, with measurement nozzles. Each nozzle has a removable plastic plug which prevents dirt from entering. It also eliminates air leakage when measurement is not done.

The unit permits insulation of up to 100 mm thickness to be installed without concealing the measurement nozzles or the label plate. The plate can be rotated for best legibility, irrespective of the way the unit is installed and can easily be removed, to be located away from the unit.

The unit also contains a regulating damper DRU to allow balancing. The cup around the damper knob allows insulation up to 50 mm thick to be used. If thicker insulation is needed, add the special insulation cup IK.

The unit has components which partly block the duct system. You can use one of the tips on page 603 to facilitate cleaning.

The unit has components which partly block the duct system. You can use one of the tips on page 603 to facilitate cleaning.

## Ordering example

|                           |              |            |            |
|---------------------------|--------------|------------|------------|
|                           | <b>FMDRU</b> | <b>160</b> | <b>125</b> |
| Product                   | _____        |            |            |
| Dimension Ød <sub>1</sub> | _____        |            |            |
| Dimension Ød <sub>i</sub> | _____        |            |            |

| Ød <sub>1</sub><br>nom | Ød <sub>i</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|
| 80                     | 63                     | 300     | 0,78    |
| 100                    | 80                     | 300     | 0,94    |
| 125                    | 100                    | 310     | 1,21    |
| 160                    | 125                    | 315     | 1,52    |
| 200                    | 160                    | 380     | 2,20    |
| 250                    | 200                    | 440     | 3,31    |
| 315                    | 250                    | 570     | 4,92    |
| 400                    | 315                    | 660     | 7,81    |
| 500                    | 400                    | 845     | 12,0    |
| 630                    | 500                    | 1030    | 18,2    |

Flow meters with reductions of two dimension steps can be obtained, to give higher reading pressure in the measurement nozzles. This entails higher pressure drop and noise generation, however.

### Advantages

- Has low pressure drop due to good aerodynamic design.
- Has low noise generation due to good aerodynamic design.
- Suitable for use with insulation.





# Damper with flow meter

# FMDRU

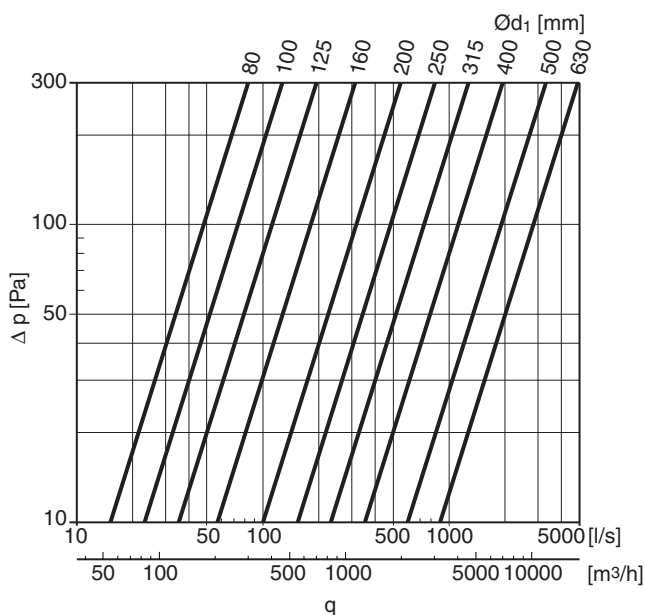
## Technical data

### Sound

Sound generation has been measured at the Swedish National Testing and Research Institute in an reverberation room, in accordance with ISO 5135 and ISO 3741.

### Flow graph for balancing

The graph show the flow,  $q$ , as a function of the pressure difference in the measurement nozzles. Flow data for dimensioning differs from this graph.

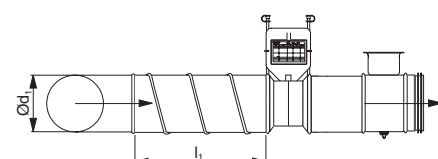


### Measurement function

Measure pressure difference,  $D_p$ , between the measurement nozzles, and use the equation on the units plate to derive the duct flow.

### Measurement accuracy

If the velocity profile is asymmetric, the measurement values can differ from the ideal values. For this reason, the flow meter should never be located right up to any flow disturbance. The method error in the table below will differ, depending on the distance to the flow disturbance.

| $l_1$ =straight distance before meter   | Method error $m_2$ |          |
|---|--------------------|----------|
| Type of disturbance   | 5%                 | 10%      |
| A 90° bend  |                    |          |
|  | 2· $d_1$           | 1· $d_1$ |
| $l_2$ = straight distance after meter   | 1· $d_1$           | 1· $d_1$ |



# Damper with flow meter

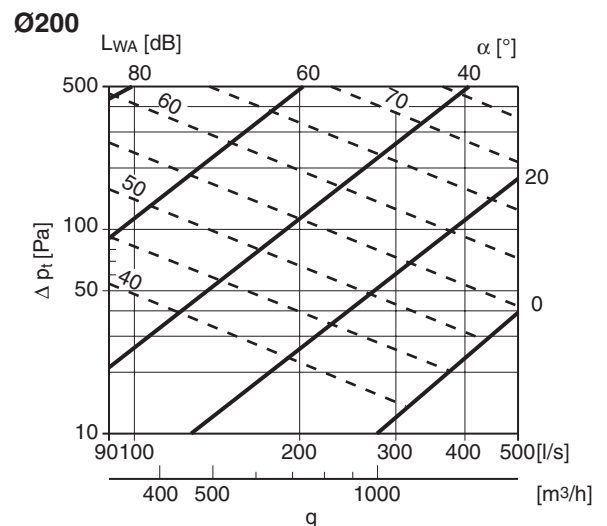
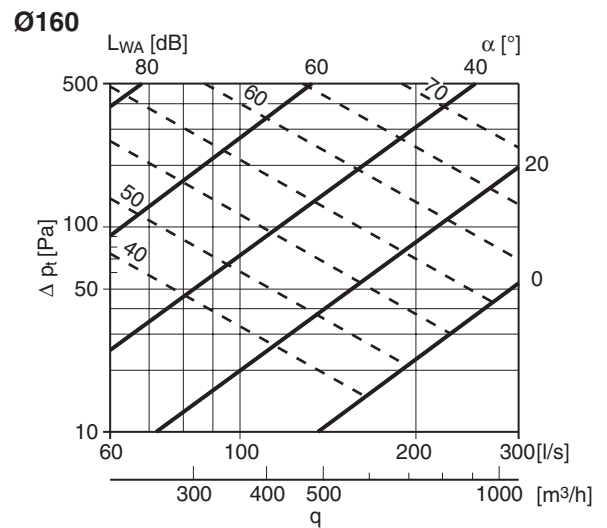
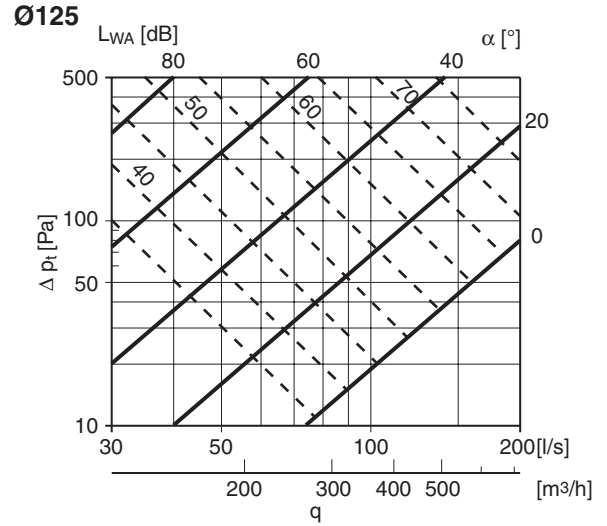
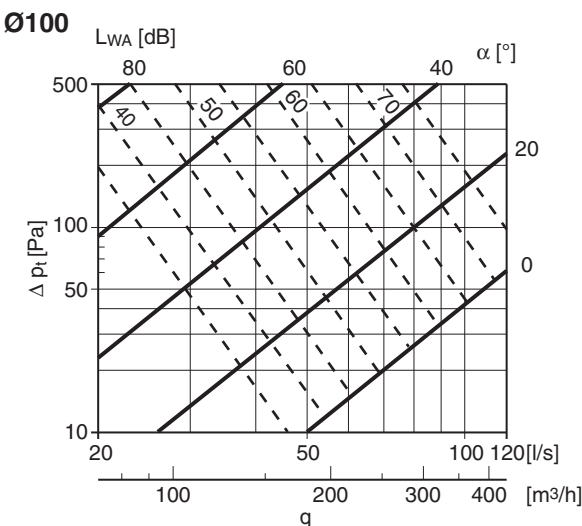
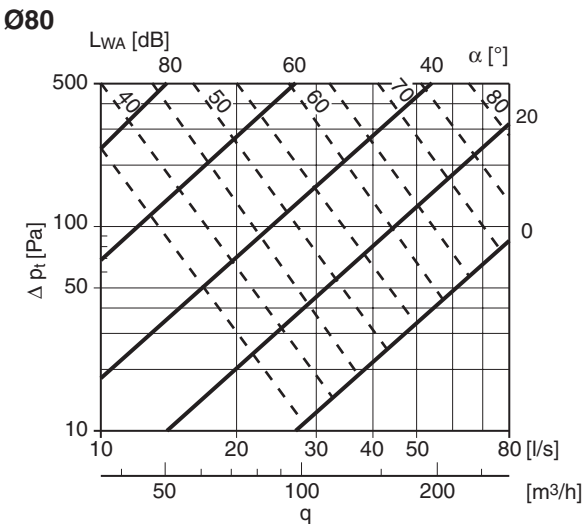
# FMDRU

## Pressure drop graphs with sound data for dimensioning

The solid lines show the pressure drop,  $\Delta p_t$ , across the unit as a function of flow,  $q$ .

The dashed lines give the A-weighted sound power data,  $L_{WA}$ , in dB to the duct.

Flow data for balancing differs from these graphs.



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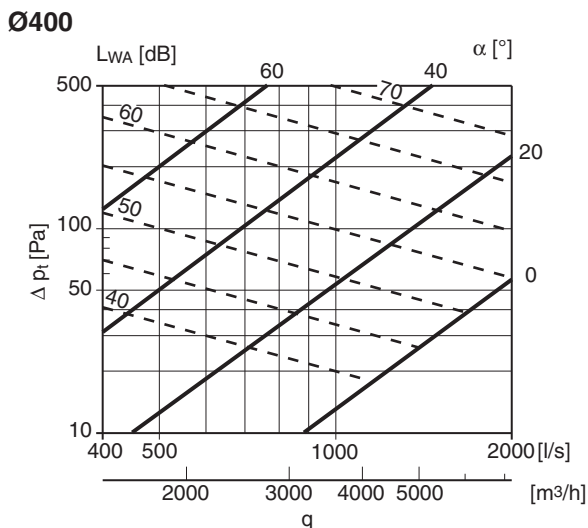
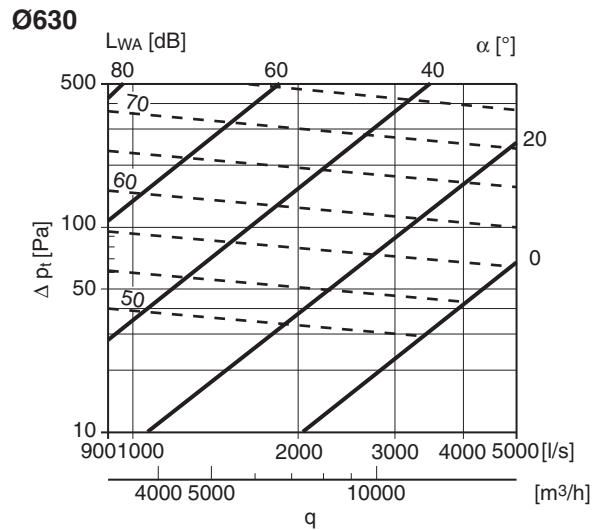
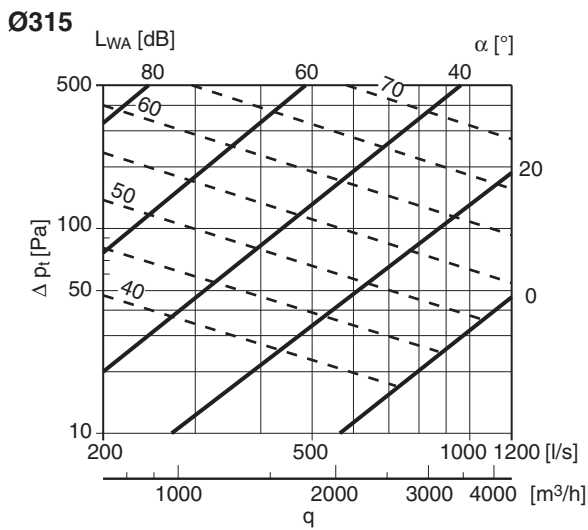
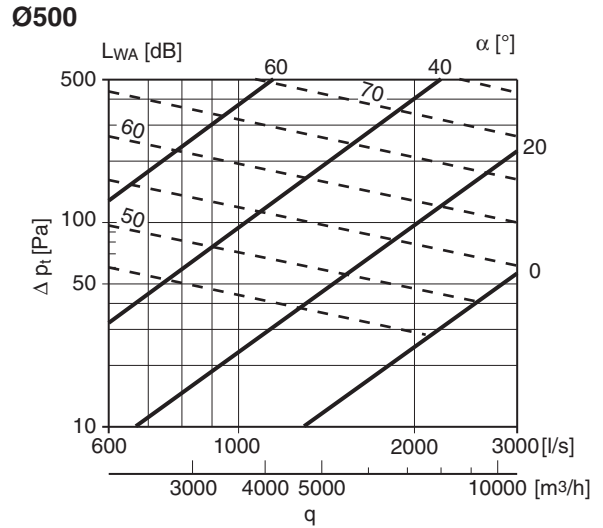
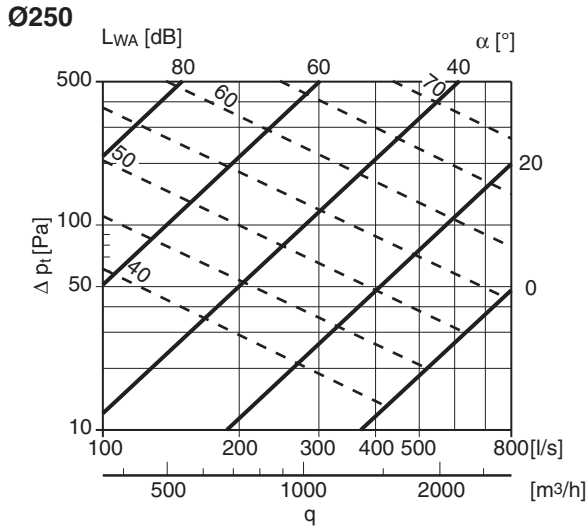




# Damper with flow meter

# FMDRU

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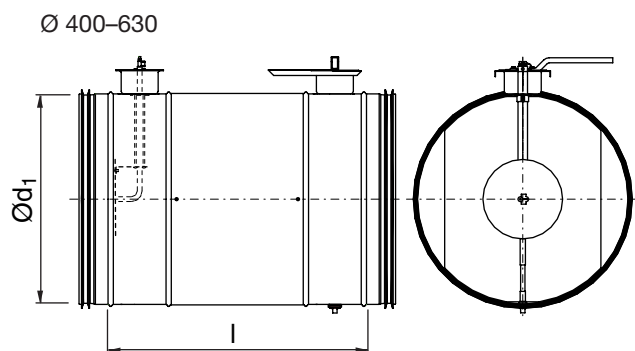
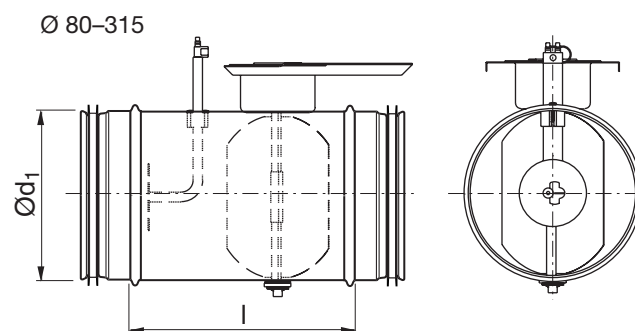


# Damper with flow meter

# FMDU



## Dimensions



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 80                     | 165     | 0,66    |
| 100                    | 165     | 0,76    |
| 125                    | 165     | 0,88    |
| 160                    | 165     | 1,08    |
| 200                    | 230     | 1,44    |
| 250                    | 275     | 2,10    |
| 315                    | 275     | 2,65    |
| 400                    | 450     | 6,10    |
| 500                    | 520     | 11,4    |
| 630                    | 570     | 16,0    |

## Description

### Applications

The meter is suitable both for setting up and for continuous flow measurement. It is intended for permanent installation and must therefore be specified at the design stage.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Ø 80–630 fullfills tightness class 0 and pressure class A .

### Design

The meter consists of a regulating shutter and a centrally located measurement plate. Each measurement nozzle has a removable plastic plug which prevents dirt from entering. It also eliminates air leakage when measurement is not done.

The unit permits insulation of up to 50 mm thickness to be installed without concealing the measurement nipples or the label plate.

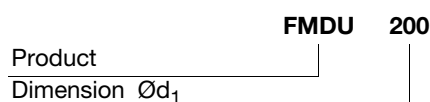
The plate can be rotated for best legibility, irrespective of the way the unit is installed and can easily be removed, to be located away from the unit. The cup around the damper knob allows insulation up to 50 mm thick to be used. If thicker insulation is needed, add the special insulation cup IK. The unit has components which partly block the duct system. You can use one of the tips on page 603 to facilitate cleaning.

### Advantages

- Short installation length.
- Suitable for use with insulation.

The unit has components which partly block the duct system. You can use one of the tips on page 603 to facilitate cleaning.

## Ordering example





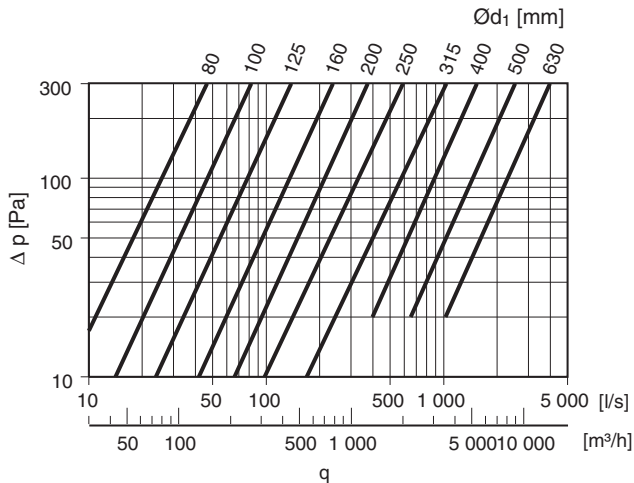
# Damper with flow meter

# FMDU

## Technical data

### Flow graph for balancing

The curves show the flow,  $q$ , as a function of the pressure difference in the measurement nozzles. Flow data for dimensioning differs from this graph.

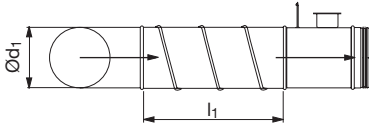
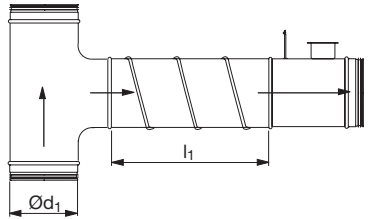


### Measurement function

By measuring the pressure difference,  $Dp$ , between the measurement nozzles, you can derive the flow in the duct by means of the equation on the units plate.

### Measurement accuracy

If the velocity profile is asymmetric, the measurement values can differ from the ideal values. For this reason, the flow meter should never be located right up to any flow disturbance. The method error in the table below will differ, depending on the distance to the flow disturbance.

| $l_1$ = straight distance before meter   | Method error $m_2$ |               |
|--|--------------------|---------------|
| Type of disturbance  | 5%                 | 10%           |
| A 90° bend   |                    |               |
|   | $6 \cdot d_1$      | $0 \cdot d_1$ |
| A branch   |                    |               |
|  | $6 \cdot d_1$      | $4 \cdot d_1$ |
| $l_2$ = straight distance after meter  | $1 \cdot d_1$      | $1 \cdot d_1$ |

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# Damper with flow meter

# FMDU

1

## Pressure drop graphs with sound data for dimensioning

The solid lines show the pressure drop,  $\Delta p_t$ , across the unit as a function of flow,  $q$ . The dashed lines give the A-weighted sound power data,  $L_{WA}$ , in dB to the duct. Flow data for balancing differ from these graphs.

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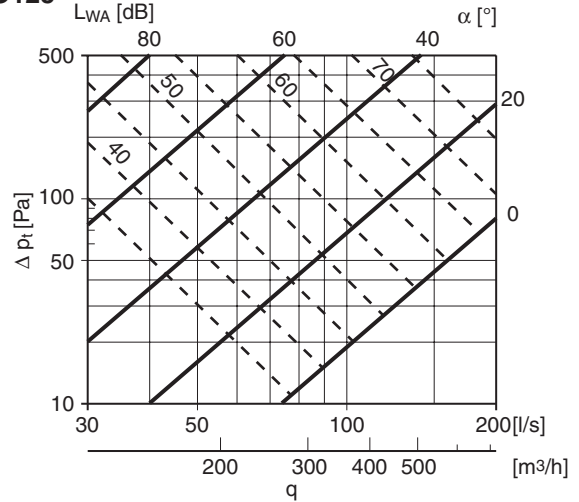
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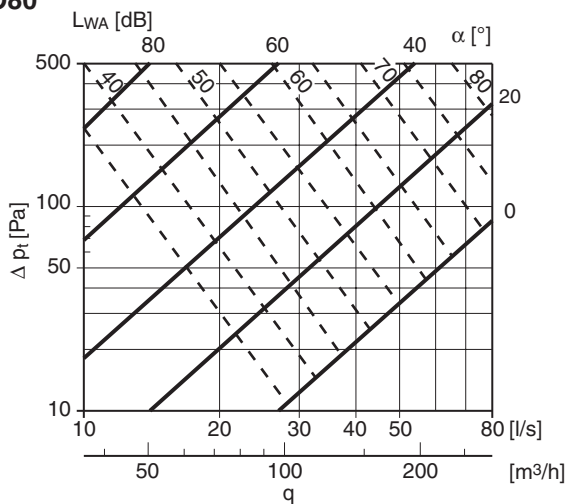
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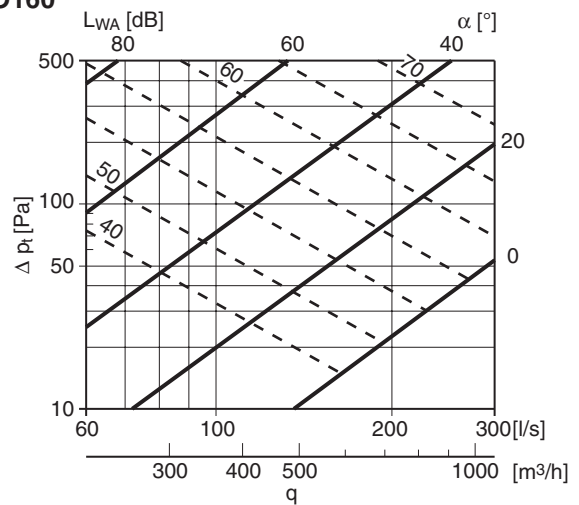
**Ø125**



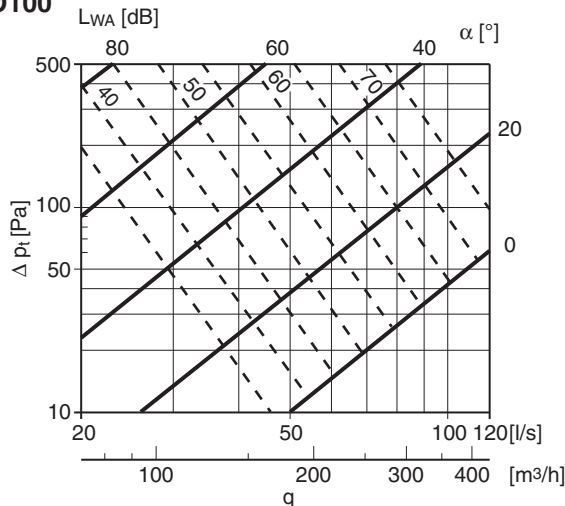
**Ø80**



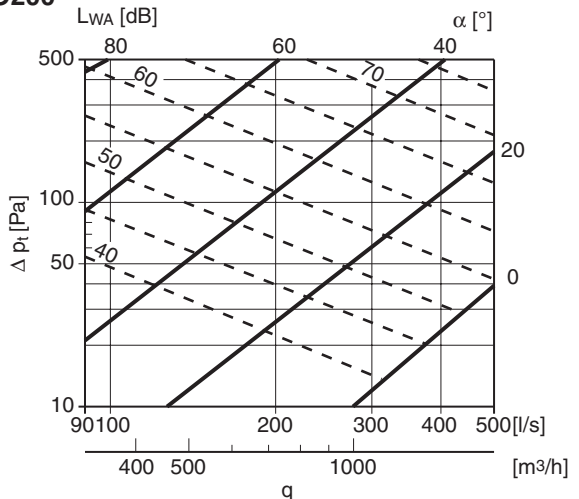
**Ø160**



**Ø100**



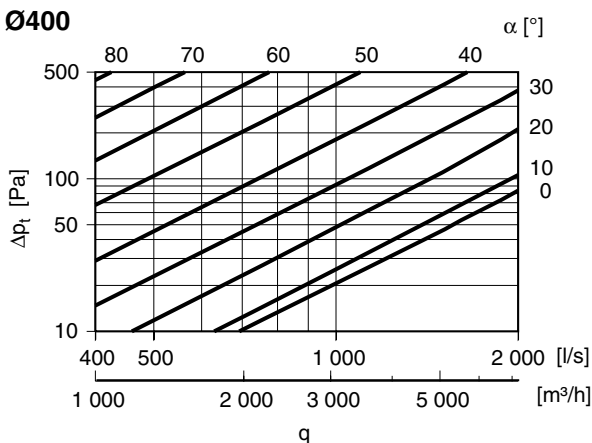
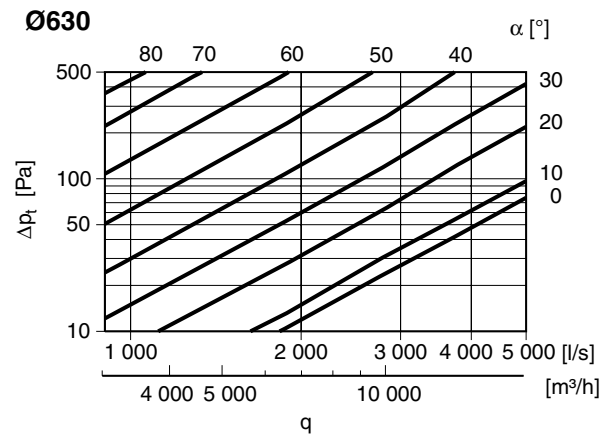
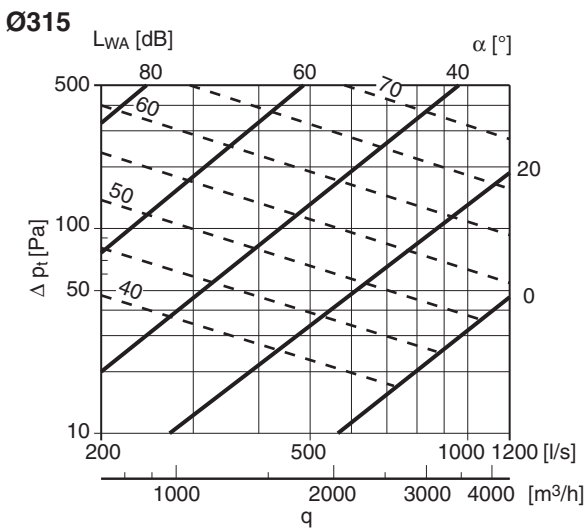
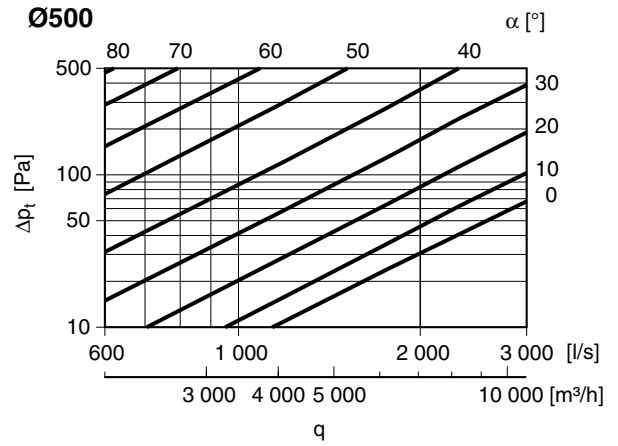
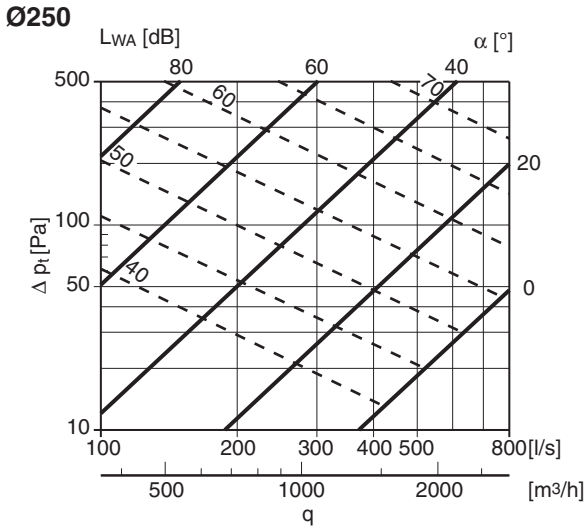
**Ø200**





# Damper with flow meter

# FMDU



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# Damper with flow meter

# FMDU

## Sound generation

| dim<br>Ød <sub>1</sub> | Pressure drop [Pa] | Velocity app. 5 [m/s] |    |    |    |    | Velocity app. 10 [m/s] |    |    |    |    | Velocity app. 15 [m/s] |    |    |    |    |    |                               |    |    |    |    |    |    |    |
|------------------------|--------------------|-----------------------|----|----|----|----|------------------------|----|----|----|----|------------------------|----|----|----|----|----|-------------------------------|----|----|----|----|----|----|----|
|                        |                    | Centre frequency [Hz] |    |    |    |    | Centre frequency [Hz]  |    |    |    |    | Centre frequency [Hz]  |    |    |    |    |    |                               |    |    |    |    |    |    |    |
|                        |                    | 631252505001k2k4k8k   |    |    |    |    | 631252505001k2k4k8k    |    |    |    |    | 631252505001k2k4k8k    |    |    |    |    |    |                               |    |    |    |    |    |    |    |
| 80                     |                    | Flow 25 [l/s]         |    |    |    |    | Flow 50 [l/s]          |    |    |    |    | Flow 75 [l/s]          |    |    |    |    |    |                               |    |    |    |    |    |    |    |
|                        | 500                | 64                    | 65 | 62 | 59 | 57 | 56                     | 52 | 51 | 68 | 76 | 76                     | 70 | 64 | 61 | 59 | 56 | 71                            | 80 | 80 | 73 | 67 | 63 | 61 | 58 |
|                        | 300                | 61                    | 62 | 58 | 55 | 52 | 50                     | 45 | 43 | 65 | 75 | 75                     | 67 | 61 | 57 | 53 | 49 | 68                            | 79 | 77 | 68 | 63 | 58 | 55 | 52 |
|                        | 200                | 59                    | 60 | 56 | 51 | 47 | 46                     | 40 | 38 | 63 | 75 | 74                     | 64 | 58 | 53 | 48 | 44 | 67                            | 78 | 75 | 64 | 59 | 54 | 51 | 47 |
|                        | 100                | 56                    | 56 | 51 | 45 | 40 | 38                     | 30 | 28 | 59 | 74 | 72                     | 59 | 52 | 47 | 40 | 35 | 63                            | 76 | 71 | 58 | 53 | 48 | 42 | 38 |
|                        | 50                 | 52                    | 52 | 47 | 40 | 33 | 30                     | 21 | 18 | 56 | 73 | 71                     | 54 | 47 | 41 | 32 | 26 | Pressure drop exceeds 50 [Pa] |    |    |    |    |    |    |    |
| 100                    |                    | Flow 40 [l/s]         |    |    |    |    | Flow 80 [l/s]          |    |    |    |    | Flow 120 [l/s]         |    |    |    |    |    |                               |    |    |    |    |    |    |    |
|                        | 500                | 64                    | 63 | 62 | 58 | 56 | 55                     | 53 | 54 | 67 | 76 | 76                     | 69 | 63 | 60 | 61 | 61 | 70                            | 81 | 82 | 70 | 66 | 64 | 64 | 64 |
|                        | 300                | 61                    | 60 | 58 | 54 | 51 | 50                     | 46 | 46 | 65 | 76 | 76                     | 65 | 59 | 55 | 56 | 56 | 68                            | 81 | 80 | 65 | 62 | 60 | 60 | 59 |
|                        | 200                | 59                    | 58 | 55 | 51 | 47 | 46                     | 40 | 40 | 62 | 75 | 75                     | 62 | 55 | 51 | 52 | 53 | 65                            | 81 | 79 | 61 | 58 | 57 | 56 | 55 |
|                        | 100                | 56                    | 54 | 51 | 45 | 40 | 40                     | 31 | 30 | 59 | 75 | 75                     | 57 | 49 | 44 | 46 | 46 | 62                            | 81 | 78 | 54 | 52 | 51 | 50 | 49 |
|                        | 50                 | 52                    | 50 | 46 | 39 | 34 | 33                     | 22 | 20 | 55 | 75 | 74                     | 52 | 43 | 37 | 39 | 40 | Pressure drop exceeds 50 [Pa] |    |    |    |    |    |    |    |
| 125                    |                    | Flow 60 [l/s]         |    |    |    |    | Flow 120 [l/s]         |    |    |    |    | Flow 180 [l/s]         |    |    |    |    |    |                               |    |    |    |    |    |    |    |
|                        | 500                | 66                    | 64 | 62 | 59 | 56 | 56                     | 54 | 53 | 72 | 76 | 75                     | 68 | 63 | 60 | 61 | 59 | 75                            | 81 | 79 | 71 | 66 | 63 | 63 | 61 |
|                        | 300                | 63                    | 61 | 58 | 55 | 51 | 51                     | 47 | 45 | 69 | 75 | 73                     | 65 | 59 | 56 | 55 | 53 | 73                            | 79 | 76 | 67 | 62 | 59 | 58 | 56 |
|                        | 200                | 61                    | 59 | 56 | 51 | 47 | 47                     | 42 | 40 | 67 | 74 | 71                     | 62 | 56 | 52 | 50 | 49 | 71                            | 78 | 74 | 63 | 58 | 55 | 53 | 51 |
|                        | 100                | 57                    | 55 | 51 | 46 | 41 | 40                     | 33 | 30 | 64 | 72 | 69                     | 57 | 50 | 45 | 43 | 41 | 67                            | 76 | 70 | 57 | 52 | 49 | 46 | 43 |
|                        | 50                 | 53                    | 51 | 46 | 40 | 35 | 32                     | 25 | 21 | 60 | 71 | 66                     | 51 | 44 | 38 | 36 | 34 | Pressure drop exceeds 50 [Pa] |    |    |    |    |    |    |    |
| 160                    |                    | Flow 100 [l/s]        |    |    |    |    | Flow 200 [l/s]         |    |    |    |    | Flow 300 [l/s]         |    |    |    |    |    |                               |    |    |    |    |    |    |    |
|                        | 500                | 66                    | 63 | 61 | 57 | 54 | 54                     | 53 | 52 | 77 | 78 | 73                     | 67 | 63 | 59 | 59 | 58 | 80                            | 81 | 76 | 71 | 66 | 62 | 61 | 59 |
|                        | 300                | 63                    | 60 | 57 | 53 | 50 | 49                     | 47 | 45 | 75 | 77 | 70                     | 63 | 59 | 54 | 54 | 53 | 78                            | 79 | 72 | 67 | 62 | 57 | 55 | 53 |
|                        | 200                | 61                    | 58 | 55 | 50 | 47 | 45                     | 42 | 40 | 74 | 75 | 68                     | 60 | 56 | 50 | 49 | 48 | 76                            | 77 | 69 | 64 | 58 | 53 | 50 | 48 |
|                        | 100                | 58                    | 54 | 50 | 45 | 41 | 38                     | 34 | 31 | 71 | 73 | 64                     | 55 | 51 | 43 | 42 | 41 | 74                            | 74 | 63 | 59 | 53 | 46 | 42 | 39 |
|                        | 50                 | 55                    | 51 | 45 | 39 | 36 | 31                     | 26 | 23 | 69 | 71 | 60                     | 50 | 46 | 36 | 34 | 33 | 71                            | 71 | 58 | 54 | 47 | 39 | 34 | 31 |
| 200                    |                    | Flow 150 [l/s]        |    |    |    |    | Flow 300 [l/s]         |    |    |    |    | Flow 450 [l/s]         |    |    |    |    |    |                               |    |    |    |    |    |    |    |
|                        | 500                | 71                    | 68 | 65 | 61 | 58 | 58                     | 57 | 55 | 75 | 77 | 70                     | 63 | 60 | 54 | 54 | 53 | 80                            | 82 | 78 | 71 | 67 | 65 | 66 | 63 |
|                        | 300                | 67                    | 64 | 60 | 57 | 53 | 53                     | 50 | 47 | 74 | 75 | 68                     | 60 | 56 | 50 | 49 | 48 | 77                            | 79 | 74 | 67 | 63 | 60 | 60 | 57 |
|                        | 200                | 65                    | 61 | 57 | 53 | 49 | 49                     | 45 | 42 | 71 | 73 | 68                     | 61 | 56 | 53 | 52 | 50 | 74                            | 77 | 71 | 63 | 58 | 56 | 55 | 52 |
|                        | 100                | 60                    | 56 | 52 | 48 | 43 | 41                     | 36 | 32 | 66 | 69 | 64                     | 55 | 50 | 46 | 45 | 42 | 70                            | 71 | 66 | 57 | 52 | 50 | 48 | 44 |
|                        | 50                 | 55                    | 52 | 46 | 42 | 37 | 34                     | 28 | 23 | 62 | 66 | 60                     | 50 | 44 | 38 | 37 | 34 | 65                            | 69 | 51 | 50 | 46 | 41 | 40 | 35 |
| 250                    |                    | Flow 250 [l/s]        |    |    |    |    | Flow 500 [l/s]         |    |    |    |    | Flow 750 [l/s]         |    |    |    |    |    |                               |    |    |    |    |    |    |    |
|                        | 500                | 69                    | 66 | 64 | 61 | 57 | 59                     | 58 | 56 | 79 | 76 | 72                     | 67 | 62 | 61 | 64 | 63 | 83                            | 81 | 76 | 72 | 65 | 64 | 67 | 66 |
|                        | 300                | 66                    | 63 | 60 | 58 | 53 | 54                     | 53 | 49 | 77 | 73 | 68                     | 63 | 57 | 56 | 59 | 58 | 81                            | 77 | 72 | 68 | 60 | 59 | 61 | 60 |
|                        | 200                | 64                    | 60 | 57 | 55 | 49 | 50                     | 49 | 44 | 75 | 70 | 65                     | 60 | 53 | 52 | 54 | 53 | 78                            | 74 | 69 | 65 | 56 | 55 | 57 | 55 |
|                        | 100                | 60                    | 56 | 52 | 50 | 43 | 44                     | 41 | 34 | 72 | 65 | 59                     | 54 | 47 | 45 | 47 | 46 | 75                            | 69 | 63 | 60 | 50 | 48 | 50 | 47 |
|                        | 50                 | 56                    | 51 | 47 | 45 | 37 | 37                     | 34 | 25 | 69 | 61 | 54                     | 49 | 40 | 38 | 39 | 38 | 71                            | 64 | 58 | 55 | 43 | 41 | 42 | 39 |
| 315                    |                    | Flow 400 [l/s]        |    |    |    |    | Flow 800 [l/s]         |    |    |    |    | Flow 1200 [l/s]        |    |    |    |    |    |                               |    |    |    |    |    |    |    |
|                        | 500                | 76                    | 71 | 67 | 62 | 60 | 60                     | 60 | 57 | 82 | 79 | 74                     | 68 | 66 | 64 | 65 | 63 | 86                            | 83 | 77 | 71 | 68 | 66 | 69 | 64 |
|                        | 300                | 72                    | 67 | 62 | 58 | 55 | 55                     | 54 | 49 | 78 | 75 | 69                     | 64 | 61 | 58 | 49 | 57 | 82                            | 79 | 72 | 66 | 63 | 61 | 62 | 58 |
|                        | 200                | 69                    | 64 | 59 | 55 | 51 | 50                     | 48 | 44 | 74 | 72 | 66                     | 60 | 57 | 54 | 54 | 51 | 78                            | 75 | 69 | 62 | 59 | 56 | 57 | 53 |
|                        | 100                | 63                    | 58 | 53 | 49 | 45 | 43                     | 39 | 34 | 69 | 66 | 60                     | 54 | 51 | 46 | 46 | 43 | 73                            | 67 | 62 | 56 | 52 | 51 | 49 | 44 |
|                        | 50                 | 58                    | 52 | 47 | 43 | 39 | 36                     | 30 | 24 | 63 | 61 | 54                     | 48 | 44 | 38 | 38 | 34 | 67                            | 64 | 56 | 49 | 45 | 41 | 41 | 36 |



# Flow meter

# FMU



## Description

### Applications

The meter is suitable both for setting up and for continuous flow measurement. It is intended for permanent installation and must therefore be specified at the design stage.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

### Design

The meter consists of two reductions joined together, with measurement nozzles. Each nozzle has a removable plastic plug which prevents dirt from entering. It also eliminates air leakage when measurement is not done.

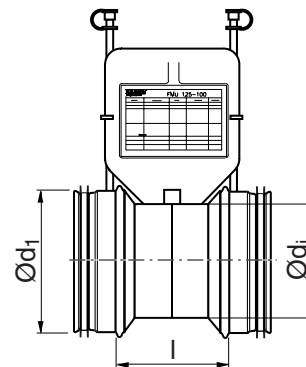
The unit permits insulation of up to 100 mm thickness to be installed without concealing the measurement nozzles or label plate. The plate can be rotated for best legibility, irrespective of the way the fitting is installed and can easily be removed, to be located away from the unit.

Flow meters with reductions of two dimension steps can be obtained, to give higher reading pressure in the measurement nozzles. This entails higher pressure drop and noise generation, however.

## Ordering example

|                             |     |     |     |
|-----------------------------|-----|-----|-----|
| Product                     | FMU | 160 | 125 |
| Dimension $\varnothing d_1$ |     |     |     |
| Dimension $\varnothing d_i$ |     |     |     |

## Dimensions



| $\varnothing d_1$<br>nom | $\varnothing d_i$<br>nom | l<br>mm | m<br>kg |
|--------------------------|--------------------------|---------|---------|
| 80                       | 63                       | 110     | 0,33    |
| 100                      | 80                       | 120     | 0,42    |
| 125                      | 100                      | 111     | 0,48    |
| 160                      | 125                      | 123     | 0,62    |
| 200                      | 160                      | 129     | 0,83    |
| 250                      | 200                      | 131     | 1,15    |
| 315                      | 250                      | 195     | 1,81    |
| 400                      | 315                      | 206     | 2,60    |
| 500                      | 400                      | 275     | 3,92    |
| 630                      | 500                      | 355     | 6,38    |

### Advantages

- Has low pressure drop due to good aerodynamic design.
- Has low noise generation due to good aerodynamic design.
- Does not obstruct duct cleaning.
- Suitable for use with insulation.







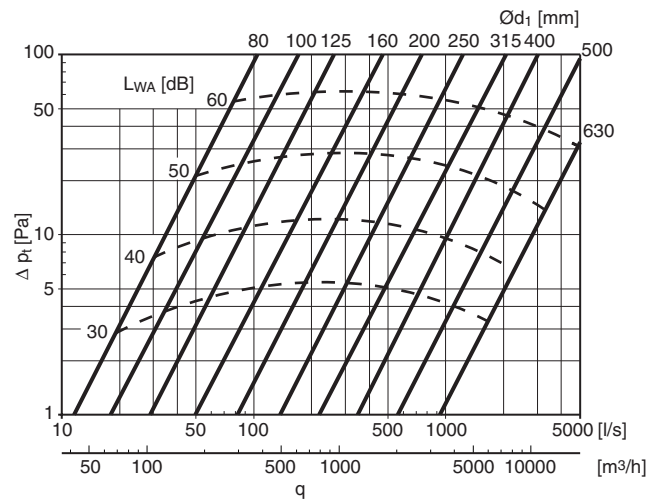
# Flow meter

FMU

## Technical data

### Pressure drop graph with sound data for dimensioning

The solid lines give the pressure drop,  $\Delta p$ , as a function of flow,  $q$ . The dashed lines give the A-weighted sound power data,  $L_{WA}$ , in dB to the duct. Flow data for balancing differ from this graph.

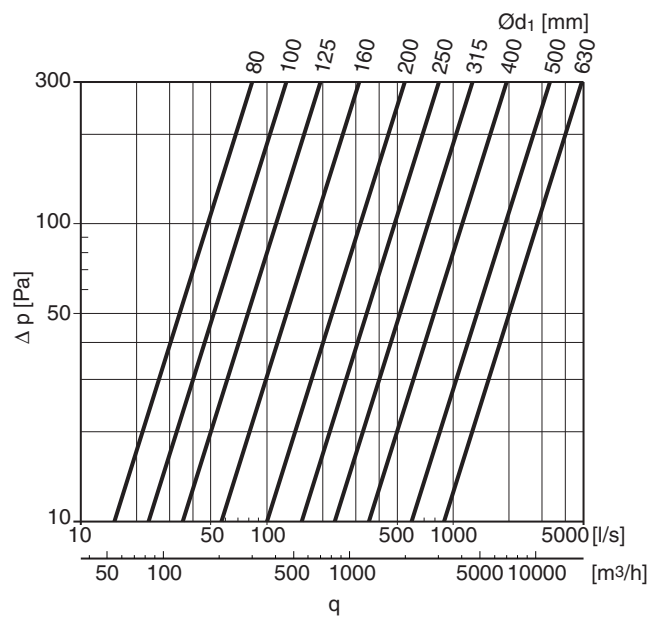


### Sound

Sound generation has been measured at the Swedish National Testing and Research Institute in reverberation room, in accordance with ISO 5135 and ISO 3741.

### Flow graph for balancing

The curves show the flow,  $q$ , as a function of the pressure difference in the measurement nozzles. Flow data for dimensioning differ from this graph.

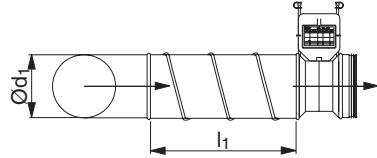
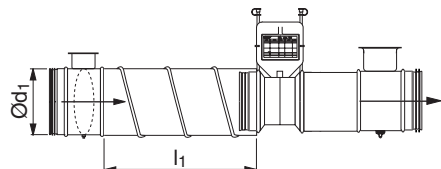


### Measurement function

By measuring the pressure difference,  $\Delta p$ , between the measurement nozzles, you can derive the flow in the duct by means of the equation on the units plate.

### Measurement accuracy

If the velocity profile is asymmetric, the measurement values can differ from the ideal values. For this reason, the flow meter should never be located right up to any flow disturbance. The method error in the table below will differ, depending on the distance to the flow disturbance.

| $l_1$ = straight distance before meter  | Method error $m_2$ |          |
|---|--------------------|----------|
| Type of disturbance   | 5%                 | 10%      |
| A 90° bend<br>   | 2· $d_1$           | 1· $d_1$ |
| A rotary damper (45°). Shaft in line with measurement nozzles<br> | 4· $d_1$           | 3· $d_1$ |
| $l_2$ = straight distance after meter   | 1· $d_1$           | 1· $d_1$ |



# Flow meter

FMU

## Sound generation

| dim<br>Ød <sub>1</sub> | Velocity app. 5 [m/s] |     |     |     |    |    |    |    | Velocity app. 10 [m/s] |     |     |     |    |    |    |    | Velocity app. 15 [m/s] |     |     |     |    |    |    |    |
|------------------------|-----------------------|-----|-----|-----|----|----|----|----|------------------------|-----|-----|-----|----|----|----|----|------------------------|-----|-----|-----|----|----|----|----|
|                        | Centre frequency [Hz] |     |     |     |    |    |    |    | Centre frequency [Hz]  |     |     |     |    |    |    |    | Centre frequency [Hz]  |     |     |     |    |    |    |    |
|                        | 63                    | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k | 63                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 80                     | Flow 25 [l/s]         |     |     |     |    |    |    |    | Flow 50 [l/s]          |     |     |     |    |    |    |    | Flow 75 [l/s]          |     |     |     |    |    |    |    |
|                        | 49                    | 45  | 42  | 33  | 22 | 14 | 11 | 11 | 54                     | 56  | 56  | 51  | 42 | 34 | 29 | 21 | 68                     | 62  | 61  | 59  | 54 | 44 | 41 | 34 |
| 100                    | Flow 40 [l/s]         |     |     |     |    |    |    |    | Flow 80 [l/s]          |     |     |     |    |    |    |    | Flow 120 [l/s]         |     |     |     |    |    |    |    |
|                        | 50                    | 45  | 39  | 30  | 18 | 6  | 2  | 7  | 51                     | 59  | 54  | 48  | 38 | 30 | 22 | 16 | 60                     | 64  | 62  | 59  | 50 | 43 | 38 | 34 |
| 125                    | Flow 60 [l/s]         |     |     |     |    |    |    |    | Flow 120 [l/s]         |     |     |     |    |    |    |    | Flow 180 [l/s]         |     |     |     |    |    |    |    |
|                        | 45                    | 40  | 33  | 24  | 11 | 1  | 1  | 8  | 53                     | 55  | 50  | 42  | 34 | 26 | 21 | 16 | 61                     | 62  | 61  | 53  | 45 | 38 | 35 | 33 |
| 160                    | Flow 100 [l/s]        |     |     |     |    |    |    |    | Flow 200 [l/s]         |     |     |     |    |    |    |    | Flow 300 [l/s]         |     |     |     |    |    |    |    |
|                        | 41                    | 39  | 31  | 24  | 13 | 0  | 0  | 3  | 58                     | 54  | 50  | 42  | 34 | 27 | 19 | 15 | 66                     | 64  | 61  | 52  | 46 | 41 | 35 | 31 |
| 200                    | Flow 150 [l/s]        |     |     |     |    |    |    |    | Flow 300 [l/s]         |     |     |     |    |    |    |    | Flow 450 [l/s]         |     |     |     |    |    |    |    |
|                        | 41                    | 36  | 32  | 23  | 7  | 0  | 0  | 4  | 55                     | 52  | 47  | 39  | 30 | 27 | 20 | 17 | 64                     | 62  | 58  | 48  | 42 | 38 | 34 | 31 |
| 250                    | Flow 250 [l/s]        |     |     |     |    |    |    |    | Flow 500 [l/s]         |     |     |     |    |    |    |    | Flow 750 [l/s]         |     |     |     |    |    |    |    |
|                        | 44                    | 37  | 31  | 22  | 17 | 15 | 17 | 17 | 64                     | 53  | 48  | 39  | 28 | 27 | 26 | 22 | 72                     | 64  | 58  | 49  | 44 | 40 | 39 | 29 |
| 315                    | Flow 400 [l/s]        |     |     |     |    |    |    |    | Flow 800 [l/s]         |     |     |     |    |    |    |    | Flow 1200 [l/s]        |     |     |     |    |    |    |    |
|                        | 51                    | 35  | 29  | 19  | 14 | 10 | 5  | 6  | 64                     | 55  | 46  | 38  | 34 | 31 | 32 | 28 | 72                     | 65  | 57  | 48  | 45 | 42 | 42 | 41 |
| 400                    | Flow 600 [l/s]        |     |     |     |    |    |    |    | Flow 1200 [l/s]        |     |     |     |    |    |    |    | Flow 1800 [l/s]        |     |     |     |    |    |    |    |
|                        | 46                    | 37  | 30  | 22  | 19 | 14 | 9  | 7  | 64                     | 58  | 47  | 41  | 40 | 40 | 37 | 30 | 75                     | 69  | 59  | 53  | 51 | 52 | 51 | 46 |
| 500                    | Flow 1000 [l/s]       |     |     |     |    |    |    |    | Flow 2000 [l/s]        |     |     |     |    |    |    |    | Flow 3000 [l/s]        |     |     |     |    |    |    |    |
|                        | 54                    | 40  | 29  | 24  | 22 | 15 | 8  | 5  | 64                     | 58  | 47  | 41  | 40 | 40 | 37 | 30 | 75                     | 69  | 59  | 53  | 51 | 52 | 51 | 46 |
| 630                    | Flow 1500 [l/s]       |     |     |     |    |    |    |    | Flow 3000 [l/s]        |     |     |     |    |    |    |    | Flow 4500 [l/s]        |     |     |     |    |    |    |    |
|                        | 53                    | 43  | 32  | 28  | 25 | 19 | 14 | 10 | 68                     | 61  | 50  | 44  | 43 | 45 | 42 | 35 | 78                     | 73  | 62  | 56  | 54 | 58 | 57 | 48 |

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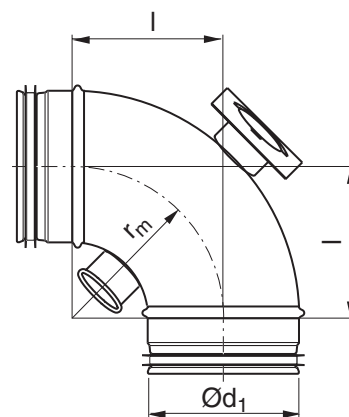


# Measuring bend

MBU



## Dimensions



$$r_m \approx 1 \cdot d_1$$

| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 100                    | 100     | 0,40    |
| 125                    | 125     | 0,60    |
| 160                    | 160     | 1,02    |
| 200                    | 200     | 1,23    |
| 250                    | 250     | 1,74    |

## Description

### Applications

The measuring bend is suitable both for balancing and for continuous flow measurement. It is intended for permanent installation and must therefore be specified at the design stage. The measuring bend is a good choice, since bends are normally used in all installations.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

### Design

The measuring bend consists of a pressed and seam welded 90° Safe bend with measurement nozzles on the inner and outer radii. The nozzles are asymmetrically located on the centreline, for manufacturing reasons. Each nozzle has a removable plastic plug which prevents dirt from entering. It also eliminates air leakage when measurement is not done.

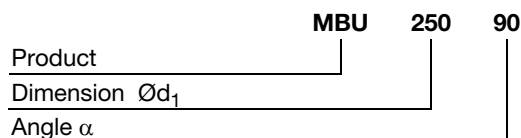
The unit allows insulation of up to 50 mm thickness to be installed without concealing the measurement nozzle or the label plate. The plate can be rotated for best legibility, irrespective of the way the unit is installed and can easily be removed, to be located away from the unit. If thicker insulation is needed, add the insulation cup IK to the standard cup.

Thanks to the robust design of the standard cup, the measurement nozzles are securely protected both before and after installation.

## Advantages

- Has a double function – both as bend and as flow meter.
- Does not increase pressure drop, compared with a standard Safe bend.
- Does not cause any noise, due to projecting components in the duct.
- Does not obstruct duct cleaning.

## Ordering example





# Measuring bend

# MBFU



## Description

### Applications

The measuring bend is suitable both for balancing and for continuous flow measurement. It is intended for permanent installation and must therefore be specified at the design stage. The measuring bend is a good choice, since bends are normally used in all installations.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

### Design

The measuring bend consists of a segmented and lock-seamed 90° Safe bend with measuring nozzles on the inner and outer radii. The nozzles are asymmetrically located on the centreline, for manufacturing reasons. Each nozzle has a removable plastic plug which prevents dirt from entering. It also eliminates air leakage when measurement is not done.

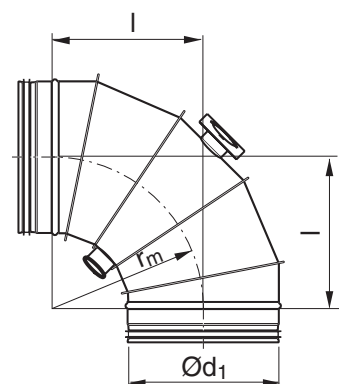
The unit allows insulation of up to 50 mm thickness to be installed without concealing the measurement nozzle or the label plate. The plate can be rotated for best legibility, irrespective of the way the unit is installed and can easily be removed, to be located away from the unit. If thicker insulation is needed, add the insulation cup IK to the standard cup.

Thanks to the robust design of the standard cup, the measurement nozzles are securely protected both before and after installation.

## Ordering example

|                           |             |            |           |
|---------------------------|-------------|------------|-----------|
|                           | <b>MBFU</b> | <b>500</b> | <b>90</b> |
| Product                   |             |            |           |
| Dimension Ød <sub>1</sub> |             |            |           |
| Angle α                   |             |            |           |

## Dimensions



$$r_m \approx 0,9 \cdot d_1$$

| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 315                    | 300     | 3,18    |
| 400                    | 360     | 5,82    |
| 500                    | 454     | 8,38    |
| 630                    | 566     | 13,1    |

## Advantages

- Has a double function – both as a bend and as a meter.
- Does not increase pressure drop, compared with a standard Safe bend.
- Does not cause any noise, due to projecting components in the duct.
- Does not obstruct duct cleaning.



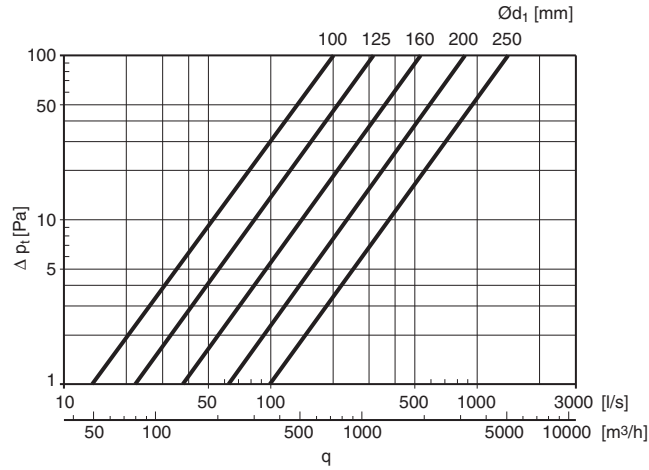


# Measuring bends

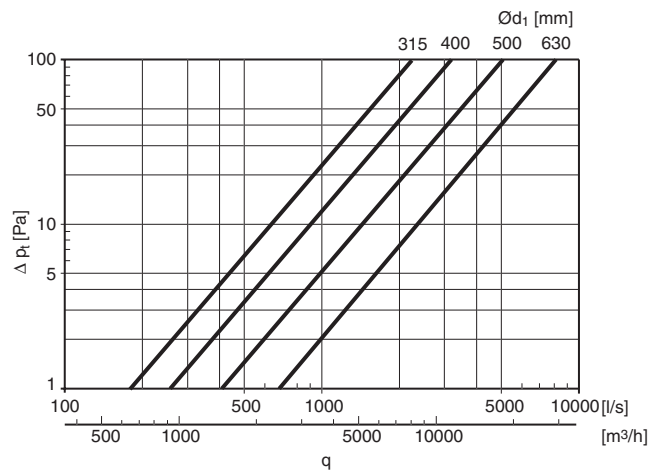
# MBU, MBFU

## Technical data

### Pressure drop graph for dimensioning of MBU

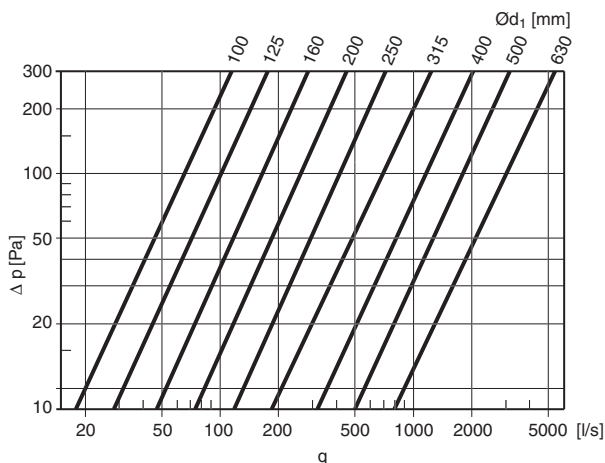


### Pressure drop graph for dimensioning of MBFU



### Flow graph for balancing

The curves show the flow,  $q$ , as a function of the pressure difference in the measurement nipples. Flow data for dimensioning differ from this graph



### Measurement function

By measuring the pressure difference,  $\Delta p$ , between the inner and outer bend radii, you can derive the flow in the duct by means of the equation on the units plate.

### Measurement accuracy

If the velocity profile is asymmetric, the measurement values can differ from the ideal values. For this reason, the measuring bend should never be located right up to any flow disturbance. The method error, as shown in the table below will differ, depending on the distance to the flow disturbance.

| $l_1$ = straight distance before measuring bends. Type of disturbance    | Method error $m_2$ |            |
|--|--------------------|------------|
|  | 5%                 | 10%        |
| <p>A 90° bend</p>  | 8,5· $d_1$         | 4,5· $d_1$ |
| <p>A rotary damper (45°). Shaft in line with the measurement nozzles</p> | 9,0· $d_1$         | 6,0· $d_1$ |
| $l_2$ = straight distance after measuring bend                           | 2· $d_1$           | 2· $d_1$   |

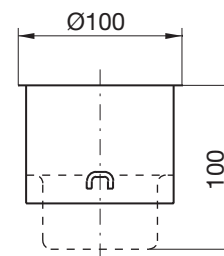


# Accessories



## Insulation cup IK

If the insulation is thicker than 50 mm, there is a risk that the insulation will cover the knob cup and make it difficult to find or use. The insulation cup allows about 100 mm of insulation to be used at the same time as it gives good access to the damper knob. It is quick and easy to fit - just snap it over the edge of the cup. It fits all Lindab dampers with cup, both circular and rectangular.



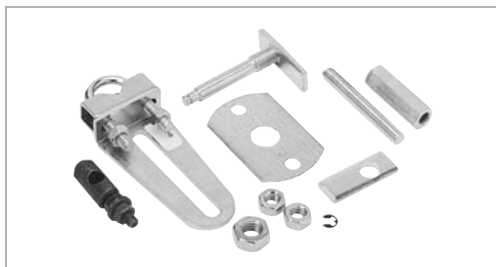
## Handle DRHTG

Strong handle to facilitate setting. Suits all manual dampers.



## Handle HANDLE

Handle suitable for damper with motor shelf DTHU – without motor. Can be used for temporary setting/locking of the damper blade before the motor is mounted or as a permanent alternative to the motor. Can be set stepless 0–90°. Fits axle 8×8 mm. Is advisably fixed with one or two sheet metal screws/rivets.



## Assembly kit MSATS AK 31

Kit for installing a Sauter AK 31 P pneumatic actuator. The kit contains all components needed.



## Assembly kit MSATS AK 41

Kit for installing a Sauter AK 41 P pneumatic actuator. The kit contains all components needed.



## Assembly kit MSATS AK 42

Kit for installing a Sauter AK 42 P pneumatic actuator. The kit contains all components needed.

## Extension spindle VREDF 8 35

With a 35 mm long and 8×8 mm spindle. Fixed to the knob with 2 self-tapping screws.

## Extension spindle VREDF 15 60

With a 60 mm long and Ø15 mm spindle. Used for motorising standard dampers. Fits Belimo's LM, NM and AM motors. Fixed to the knob with 2 self-tapping screws.

## Extension spindle VREDF 15 100

With a 100 mm long and Ø15 mm spindle. Used for motorising standard dampers. Fits Belimo's NM, AM, LF and AF motors and Sauter's AK 31 P and AK 41 P actuators. Fixed to the knob with 2 self-tapping screws.

## Installation shelf KOMHY

Fits Belimo's LM, NM, AM, LF and AF motors and Sauter's AK 31 P and AK 41 P actuators. Thread it over the edge of the cup and blind rivet it to the damper body.

## Installation shelf LÖMOK

Fits Belimo's LM and NM motors. Screwed to the edge of the cup.



# Fire dampers & Smoke evacuation




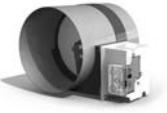
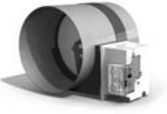


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## – Fire dampers & Smoke evacuation

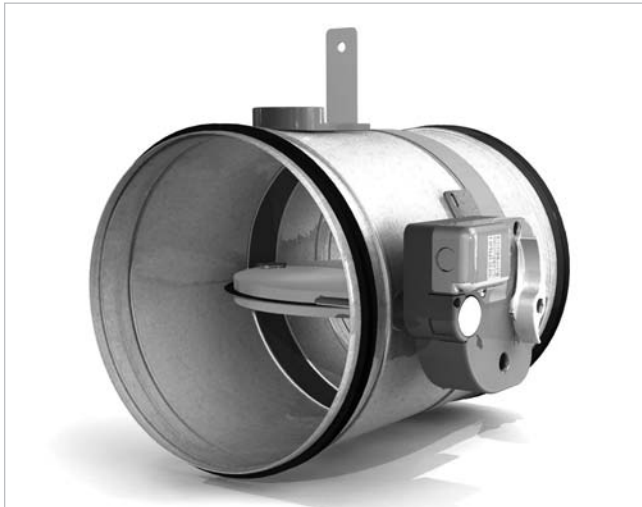
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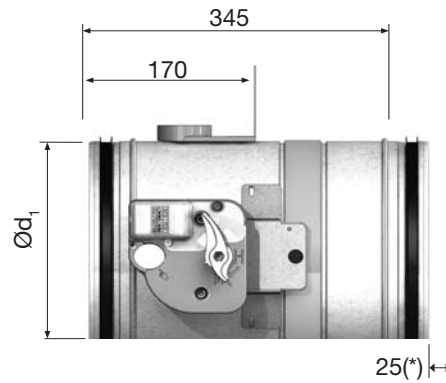


# Fire dampers

# CR60



## Dimensions



\* Extending damper blade only for Ø 315

## Description

The CR60 is a very light circular fire damper with a fire resistance up to 90 minutes, which is installed in ventilation ducts passing through a construction element in order to stop the propagation of fire. The refractory casing is made of galvanised steel. The blade consists of asbestos free panels, which are resistant to humidity. The CR60 can be equipped with a fusible link mechanism up to a motorised mechanism, completely out of the wall. The damper is especially designed for smaller diameters up to 315 mm.

## Standard

Galvanised steel tunnel

Damper blade (thickness 20 mm)

Operating mechanism with:

- manual command
- manual locking
- blade position indicator
- identification label
- electrical connections
- fusible link 72°C

Rubber air sealing ring

Intumescent strip

Fusible link base plate

Positioning plate

Damper sealing ring

## Fire resistance

Up to 90 minutes

## Ordering example

|                           | CR60 | 125 | 24 | MFUS |
|---------------------------|------|-----|----|------|
| Product                   |      |     |    |      |
| Dimension Ød <sub>1</sub> |      |     |    |      |
| Voltage                   |      |     |    |      |
| Motor type                |      |     |    |      |

| Ød <sub>1</sub><br>nom |
|------------------------|
| 100                    |
| 125                    |
| 160                    |
| 200                    |
| 250                    |
| 315                    |

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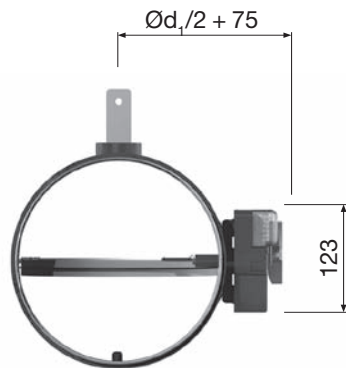


# Fire dampers

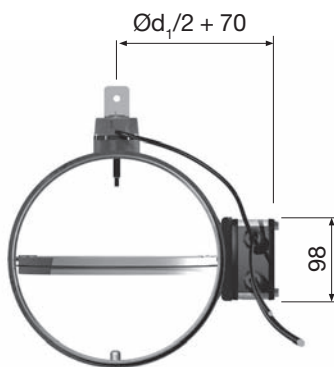
CR60

## Technical data for the motors

### MFUS



### BLFT



## Installation

- In rigid wall, floor and in flexible wall
- Provide an additional zone of 200 mm to have free access to the mechanism
- Avoid deflection of the tunnel
- Installation and air movement may be from either direction
- Verify the free movement of the blade
- Installation according to test report
- On the side of the mechanism the damper exceeds the wall by 170 mm.
- Minimal size of opening to incorporate =  $\text{Ø}d_1 + 80$  mm in rigid wall and rigid floor/ceiling

## Mechanism

### MFUS

Automatic command with fusible link 72°C

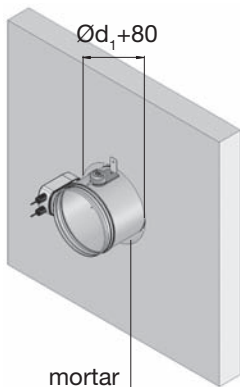
### MFUS + FDCU

End and begin of range switch in option

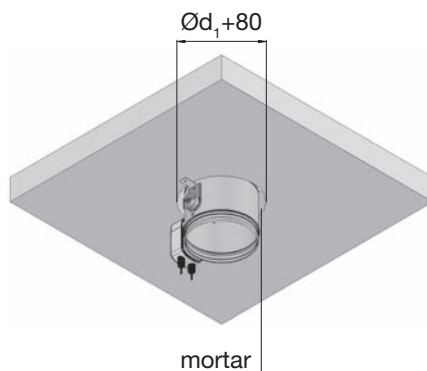
### BLFT

Springreturn actuator 24/230V

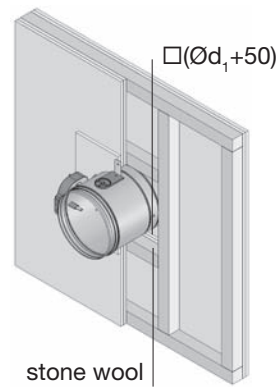
rigid wall



rigid floor/ceiling



flexible wall





# Fire dampers

CR2



## Description

The circular fire damper CR2 with a fire resistance of 120 minutes is installed in ventilation ducts passing through a construction element in order to stop the propagation of fire. The fire damper can be equipped with a common fusible link mechanism up to a motorised mechanism, positioned completely outside the wall. The refractory tunnel is made of galvanised steel. The CR2 fire damper is especially designed for larger dimensions up to 630 mm.

## Standard

Galvanised steel tunnel

Damper blade

Operating mechanism with:

- manual command
- manual locking
- blade position indicator
- identification label
- electrical connections

Sealing cold smoke

Blade bumper

Intumescent strip

Fusible link 72°C

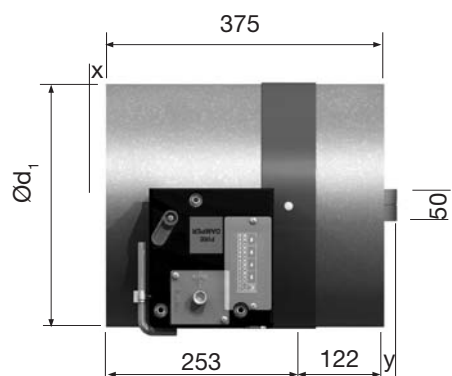
## Fire resistance

2 hours

## Ordering example

|                         |            |            |            |             |
|-------------------------|------------|------------|------------|-------------|
|                         | <b>CR2</b> | <b>400</b> | <b>230</b> | <b>CFTH</b> |
| Product                 |            |            |            |             |
| Dimension $\text{Ø}d_1$ |            |            |            |             |
| Voltage                 |            |            |            |             |
| Motor type              |            |            |            |             |

## Dimensions



|                                    | Exceeding damper blade               |
|------------------------------------|--------------------------------------|
| $x = \text{Ø}d_1 - 253 \text{ mm}$ | if $\text{Ø}d_1 \geq 560 \text{ mm}$ |
| $y = \text{Ø}d_1 - 122 \text{ mm}$ | if $\text{Ø}d_1 \geq 250 \text{ mm}$ |

| $\text{Ø}d_1$<br>nom |
|----------------------|
| 200                  |
| 250                  |
| 315                  |
| 355                  |
| 400                  |
| 450                  |
| 500                  |
| 560                  |
| 630                  |

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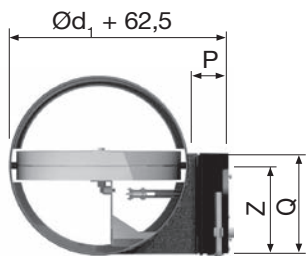


# Fire dampers

CR2

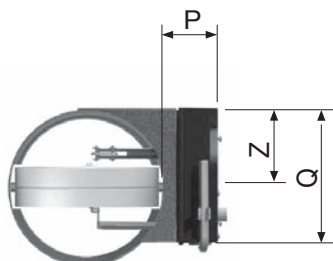
## Technical data for the motors

$\varnothing d_1 \geq 315 \text{ mm}$



|   | CFTH | MANO (+ME) | BLF (T) | BF (T) | DB (T) |
|---|------|------------|---------|--------|--------|
| P | 65   | 115        | 110     | 110    | 145    |
| Q | 180  | 190        | 210     | 210    | 210    |
| Z | 155  | 180        | 180     | 180    | 180    |

$\varnothing d_1 < 315 \text{ mm}$



|   | CFTH | MANO (+ME) | BLF (T) | BF (T) | DB (T) |
|---|------|------------|---------|--------|--------|
| P | 65   | 115        | 110     | 110    | 145    |
| Q | 180  | 190        | 210     | 210    | 210    |
| Z | 60   | 85         | 80      | -      | 90     |

## Installation

- Installation in rigid wall with horizontal or vertical axis
- Installation in massive floor or ceiling with horizontal axis
- Provide an additional zone of 200 mm to have free access to the mechanism
- Avoid deflection of the tunnel
- Installation and air movement may be from either direction
- Verify the free movement of the blade
- Installation according to test report
- On the side of the mechanism the damper exceeds the wall by 230 mm
- Minimal size of opening to incorporate =  $\varnothing d_1 + 50 \text{ mm}$

## Mechanism

### CFTH

Automatic command

### MANO

Automatic and remote controlled command

### BLF/BF/DB

Spring return actuator 24/230V

## Function

see MEC, see page 331.



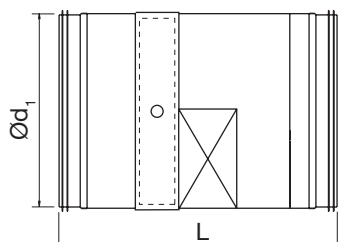
# Fire dampers

## CR2

### Variants for CR2

Round connection with rubber sealing ring.  
Delivered in sets of 2 pieces.

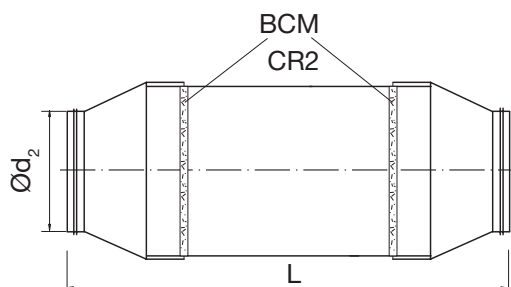
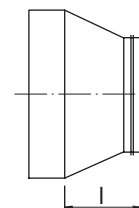
#### RCJ



| $\varnothing d_1$ | L   |
|-------------------|-----|
| 200               | 447 |
| 250               | 487 |
| 315               | 497 |
| 355               | 487 |
| 400               | 527 |
| 450               | 527 |
| 500               | 517 |
| 560               | 517 |
| 630               | 527 |

Reducer for connection on a duct with a smaller diameter than the damper.  
Delivered per piece.

#### RCVF



| $\varnothing d_2$ | $\varnothing d$ CR2 | L   | I   |
|-------------------|---------------------|-----|-----|
| 80                | 200                 | 665 | 145 |
| 100               | 200                 | 545 | 85  |
| 125               | 200                 | 525 | 75  |
| 160               | 200                 | 495 | 60  |
| 180               | 200                 | 595 | 110 |
| 224               | 250                 | 625 | 125 |

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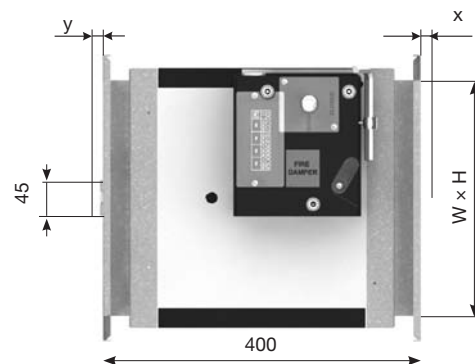


# Fire dampers

## CU2



### Dimensions



| Exceeding damper blade     |                            |
|----------------------------|----------------------------|
| $x = H/2 - 274 \text{ mm}$ | if $H \geq 550 \text{ mm}$ |
| $y = H/2 - 148 \text{ mm}$ | if $H \geq 300 \text{ mm}$ |

### Description

The CU2 is a rectangular fire damper with a fire resistance up to 120 minutes, which is installed in ventilation ducts passing through a construction element in order to stop the propagation of fire. The fire damper can be equipped with a common fusible link mechanism up to a motorised mechanism, completely out of the wall. The refractory casing is made of asbestos free panels, which are resistant to humidity. Suitable for installation in rigid and flexible walls.

### Standard

- Connection frame PG30
- Casing of refractory material
- Damper blade
- Operating mechanism with:

- manual command
- manual locking
- blade position indicator
- identification label
- electrical connections

- Sealing cold smoke
- Blade bumper
- Intumescent strip
- Transmission with locking open/closed
- Fusible link 72°C

### Fire resistance

|               |   | EI 120 S                      | E 120 S                        | EI 90 S                       | EI 60 S                       |
|---------------|---|-------------------------------|--------------------------------|-------------------------------|-------------------------------|
| Rigid wall    | Concrete wall<br>100 mm<br>( $v_e$ i <-> o)       | up to<br>600x600<br>(500 Pa)  | up to<br>1500x1000<br>(500 Pa) | up to<br>1500x800<br>(300 Pa) | up to<br>1500x1000<br>(500Pa) |
|               | Concrete floor<br>150 mm<br>( $h_o$ i <-> o)      | up to<br>1200x800<br>(500 Pa) |                                |                               |                               |
| Rigid floor   | Concrete floor<br>125 mm<br>( $h_o$ i <-> o)      | up to<br>1500x800<br>(300 Pa) |                                |                               |                               |
|               | Metal stud wall<br>100 mm<br>( $v_e$ i <-> o)     |                               |                                | up to<br>1200x800<br>(500Pa)  | up to<br>1200x800<br>(500Pa)  |
| Flexible wall |   |                               |                                | up to<br>1500x800<br>(300Pa)  | up to<br>1500x800<br>(300Pa)  |
|               | Gypsum block<br>wall<br>70 mm<br>( $v_e$ i <-> o) | up to<br>1200x800<br>(500 Pa) | up to<br>1200x800<br>(500Pa)   | up to<br>1200x800<br>(500 Pa) | up to<br>1200x800<br>(500 Pa) |

$v_e$  = damper mounted directly in the wall  
 $h_o$  = damper mounted directly in a floor/ceiling  
 i<->o = fire side randomly

### Ordering example

|            |     |     |     |    |     |
|------------|-----|-----|-----|----|-----|
|            | CU2 | 600 | 500 | 24 | BLF |
| Product    |     |     |     |    |     |
| Width      |     |     |     |    |     |
| Height     |     |     |     |    |     |
| Voltage    |     |     |     |    |     |
| Motor type |     |     |     |    |     |

### Types of frames

see PG page 336.

### Options

- EQ** – Equipotential connection
- UL** – Inspection shutter

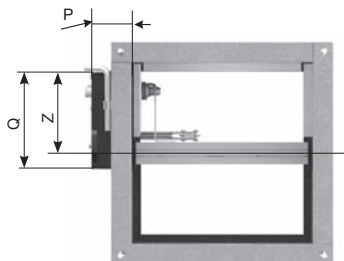


# Fire dampers

CU2

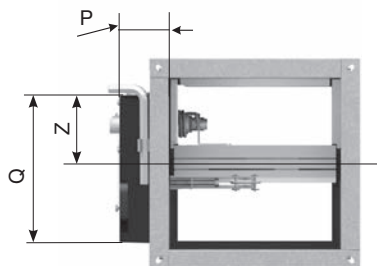
## Technical data for the motors

H ≥ 300 mm



|          | CFTH | MANO<br>(+ME) | BLF<br>(T) | BF<br>(T) | DB<br>(T) |
|----------|------|---------------|------------|-----------|-----------|
| <b>P</b> | 65   | 115           | 110        | 110       | 145       |
| <b>Q</b> | 180  | 190           | 210        | 210       | 210       |
| <b>Z</b> | 155  | 180           | 180        | 180       | 180       |

H < 300 mm



|          | CFTH | MANO<br>(+ME) | BLF<br>(T) | BF<br>(T) | DB<br>(T) |
|----------|------|---------------|------------|-----------|-----------|
| <b>P</b> | 65   | 115           | 110        | 110       | 145       |
| <b>Q</b> | 180  | 190           | 210        | 210       | 210       |
| <b>Z</b> | 60   | 85            | 80         | -         | 90        |

## Installation

- Installation in rigid or flexible wall with horizontal or vertical axis
- Installation in rigid floor or ceiling with horizontal axis
- Provide an additional zone of 200 mm to have free access to the mechanism
- Installation and air movement may be from either direction
- Verify the free movement of the blade
- Installation according to test report
- On the side of the mechanism the damper exceeds the wall by 240 mm
- Minimal size of opening to incorporate = (W+100) x (H+100) mm

## Mechanism

### CFTH

Automatic command

### MANO

Automatic and remote controlled command

### BL/BLF/DB/RMEX/EMEX

Spring return actuator 24/230V

## Function

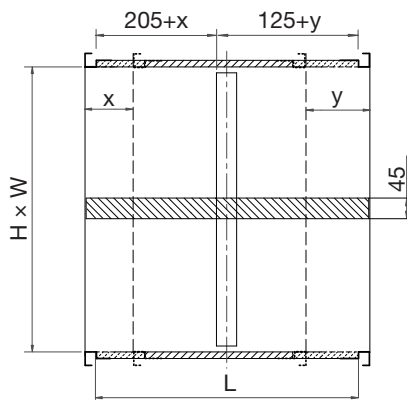
see MEC page 331.

|          |
|----------|
| 1        |
| 2        |
| 3        |
| 4        |
| 5        |
| <b>6</b> |
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| 12       |
| 13       |
| 14       |
| 15       |
| 16       |
| 17       |
| 18       |



# Fire dampers

## CU2L



### Dimension

|            |         |                                    |   |
|------------|---------|------------------------------------|---|
| L          | 330+x+y | X = (H/2) - 230<br>Y = (H/2) - 100 | Prolongation on the other side of the mechanism |
| x or y > 0 |         |                                    |   |

1

2

3

4

5

6

### Description

#### Elongated duct

The damper CU2L is a damper CU2 of which the duct is extended along one or both sides.

7

8

#### Applications

- the damper blade must not extend beyond one or both sides of the duct
- to allow an easy connection in case of a thick wall
- to allow the installation of a grill on the damper duct

9

10

#### Options

**EQ** – Equipotential connection

**UL** – Inspection shutter

11

12

13

14

15

16

17

#### Ordering example

|         |       |     |     |
|---------|-------|-----|-----|
|         | CU2L  | 600 | 500 |
| Product | _____ |     |     |
| Width   | _____ |     |     |
| Height  | _____ |     |     |

18





# Fire dampers

MEC

## MANO (+ME)

The unlocking mechanism MANO unlatches the fire damper blade via remote control by sending an electric impulse (VD) or by interruption (VM) of the magnet's power supply, or automatically, as the fusible link melts when the temperature in the duct rises above 72°C. For high temperatures, the mechanism is supplied with a fusible link of 100 or 140°C. By unlocking, the internal torsion spring unwinds and releases the damper blade into its closed safety position.

To indicate the open or closed position of the fire damper blade, the mechanism is standard provided with an end and begin of range switch FDCU.

The rearmation has to be done manually (MANO).

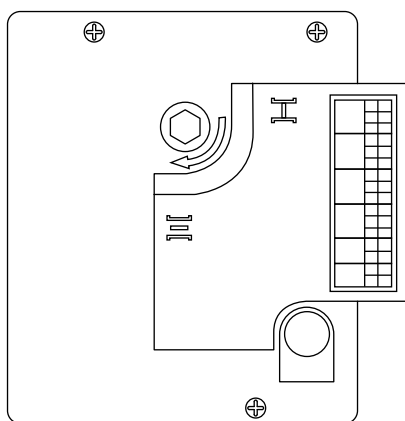
The rearmation can be done by a remote controlled electric rearmation motor ME.

## Type of magnet

VD: natural magnet

VM: electromagnet

|          | VM24                             | VM48   | VD24                        | VD48   |
|----------|----------------------------------|--------|-----------------------------|--------|
| Voltage  | 24 Vdc                           | 48 Vdc | 24 Vdc                      | 48 Vdc |
| Capacity | 1,5 W<br>interruption of current |        | 3,5 W<br>impulse of current |        |



|     | ME | DCU | FCU | DCB | FCB |
|-----|----|-----|-----|-----|-----|
| +   | 1  | 2   | 3   | 4   | 5   |
| -   | 6  | 7   | 8   | 9   | 10  |
| +/- | 11 | 12  | 13  | 14  | 15  |
| -/+ | 16 | 17  | 18  | 19  | 20  |

## Unlocking

- Manually : by pressing the yellow button
- Automatically : as the fusible link melts at 72° in the duct
- Remote control : by an electric impulse (VD) or by interruption (VM) of the magnets power supply

## Rearmation

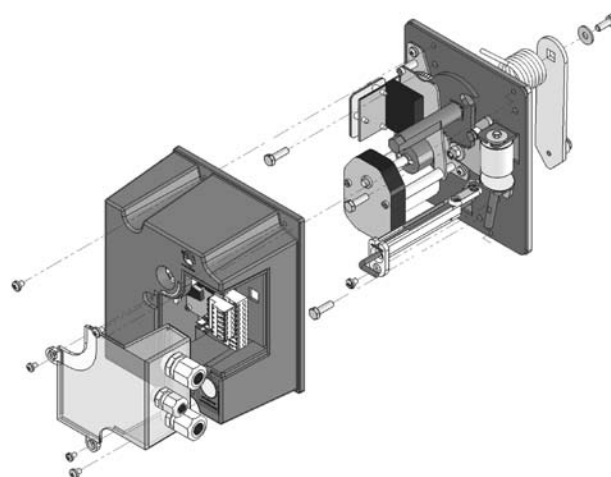
- Manually : turn 90° with hexagon key 13 mm  
A magnet with interruption (VM) needs power supply for rearmation
- By electric rearmation motor

## Options

Bipolar end and begin of range switch FDCB

Rearmation motor ME.

|           |                 |
|-----------|-----------------|
| Voltage   | 24/48 Vdc ± 10% |
|           | 24/48 Vac ± 10% |
| $I_{rms}$ | 1A              |
| $I_{max}$ | ± 1,5A          |





# Fire dampers

MEC

## BLF – Belimo





When connected to the power supply the servomotor moves the damper blade into its stand-by position.

When the power is interrupted, the internal armed spring returns the damper blade into its safety position.

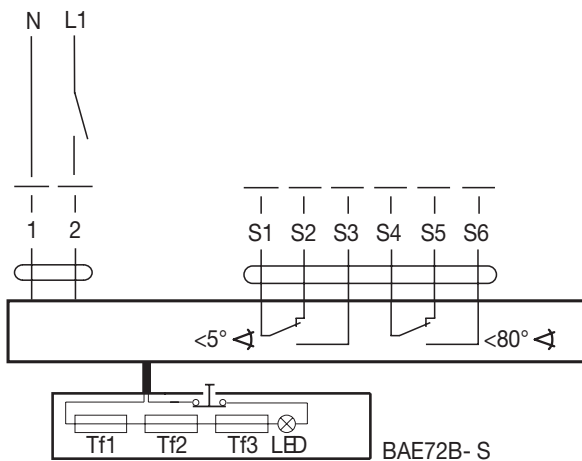
|                        | BLF 24                             | BLF 230      |
|------------------------|------------------------------------|--------------|
| Voltage                | 24 Vdc -10%<br>+20%<br>24 Vac ±20% | 230 Vac ±15% |
| Consumption holding    | 2,5 W                              | 3 W          |
| Consumption rearmation | 5 W                                | 6 W          |
| Capacity               | 7 VA                               | 7 VA         |



W + H ≤ 1200 mm or Ø ≤ 400 mm.

|  |  |   |   |
|--|--|---|---|
| <b>BLF24   BLF230</b><br>24V   230V<br> | <b>BLF24-ST</b><br>24V<br>+ plug (ST)<br> | <b>BLFT24   BLFT230</b><br>24V   230V<br>+ thermo-electric fuse (T)<br> | <b>BLFT24-ST</b><br>24V<br>+ plug (ST)<br>+ thermo-electric fuse (T)<br> |
|--|--|---|---|

## BLF, BLFT





# Fire dampers

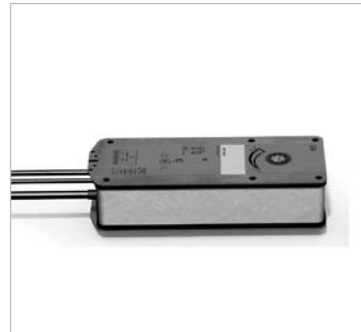
MEC

## BF – Belimo





When connected to the power supply the servomotor moves the damper blade into its stand-by position.

When the power is interrupted, the internal armed spring returns the damper blade into its safety position.

|                        | BF 24                              | BF 230       |
|------------------------|------------------------------------|--------------|
| Voltage                | 24 Vdc -10%<br>+20%<br>24 Vac ±20% | 230 Vac ±15% |
| Consumption holding    | 2 W                                | 3 W          |
| Consumption rearmation | 7 W                                | 8 W          |
| Capacity               | 10 VA                              | 12,5 VA      |



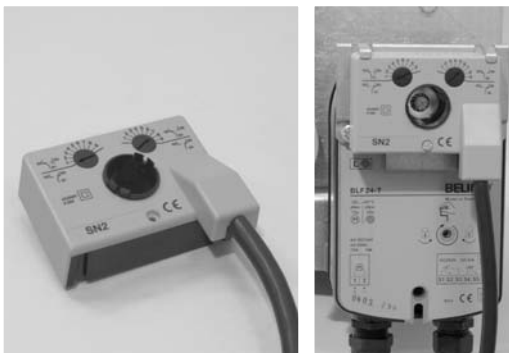
W + H > 1200 mm or Ø > 400 mm.

|  |   |   |   |
|--|---|---|---|
| <b>BF24   BF230</b><br>24V   230V<br> | <b>BF24-ST</b><br>24V<br>+ plug (ST)<br> | <b>BFT24   BFT230</b><br>24V   230V<br>+ thermo-electric fuse (T)<br> | <b>BFT24-ST   BFT24-TL-ST</b><br>24V   24V TOPLINE<br>+ plug (ST)<br>+ thermo-electric fuse (T)<br><br>For bussystem<br>BFT24-TwL-ST |
|--|---|---|---|

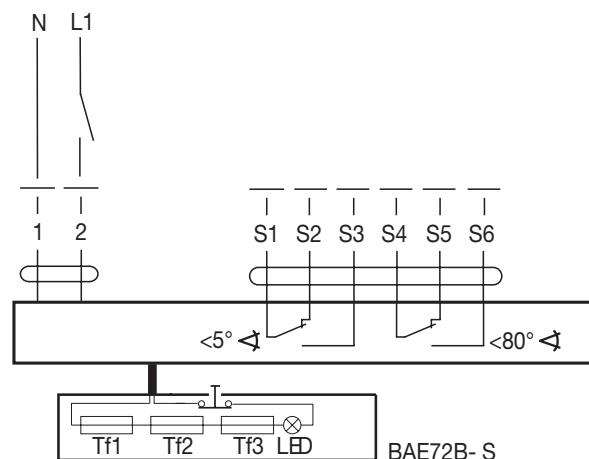
## Option

Bipolar end and begin of range switches

### SN2



### BF, BFT



- 1
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# Fire dampers

MEC

## DB – Joventa

When connected to the power supply the servomotor moves the damper blade into its stand-by position.

When the power is interrupted, the internal armed spring returns the damper blade into its safety position.

|                        | DB 24                      | DB 230       |
|------------------------|----------------------------|--------------|
| Voltage                | 24 Vdc ±10%<br>24 Vac ±20% | 230 Vac ±10% |
| Consumption holding    | 4 W                        | 4,5 W        |
| Consumption rearmation | 10 W                       | 8 W          |
| Capacity               | 18 VA                      | 13 VA        |



**DB24 | DB230**  
24V | 230V



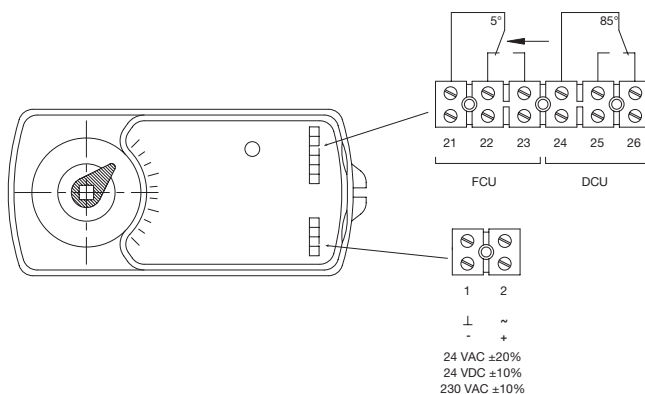
**DBT24 | DBT230**  
24V | 230V  
+ thermo-electric fuse (T)



**DBT24 – SLC**  
24V  
+ thermo-electric fuse (T)  
Option: BSLC



## DB, DBT



## Option

Module for bus system

### BSLC





# Fire dampers

MEC

## EX-Schischek

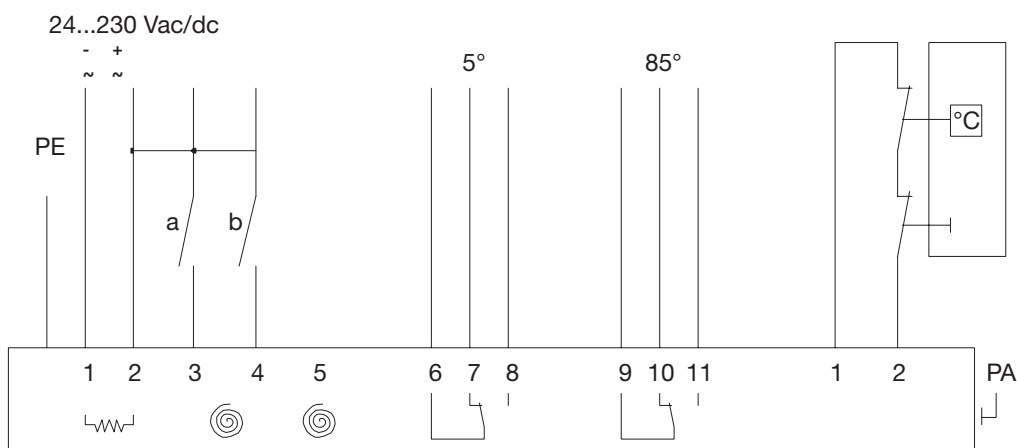
When connected to the power supply the explosion proof motor moves the damper blade into its standby position. When the power is interrupted, the internal armed spring returns the damper blade into its closed safety position. For deflagration risk between several risk areas are distinguished:

- Zone 1/21 :  
midling risk of explosion  
>100h/year explosive surroundings
- Zone 2/22 :  
low risk of explosion  
<10h/year of explosive surroundings



|  |                          |                            |                          |
|--|--------------------------|----------------------------|--------------------------|
|  |                          | <b>EX 24/230</b>           |                          |
| Voltage                                    |                          | 24...230 Vac/Vdc +15%/-20% |                          |
| $I_{rms}$                                  |                          | 24V: 1,45A<br>230V: 0,3A   |                          |
| <b>RMAX</b>                                | <b>RMAXT</b>             | <b>EMEX</b>                | <b>EMEXT</b>             |
| RedMax 24V/230V                            | RedMax 24V/230V          | ExMax 24V/230V             | ExMax 24V/230V           |
|  | Thermo-electric fuse (T) |                            | Thermo-electric fuse (T) |
| Zone 2/22                                  | Zone 2/22                | Zone 1/2/21/22             | Zone 1/2/21/22           |
| Explosion proof ACTUATOR for CR2/CU2, CU2L |                          |                            |                          |

## EX



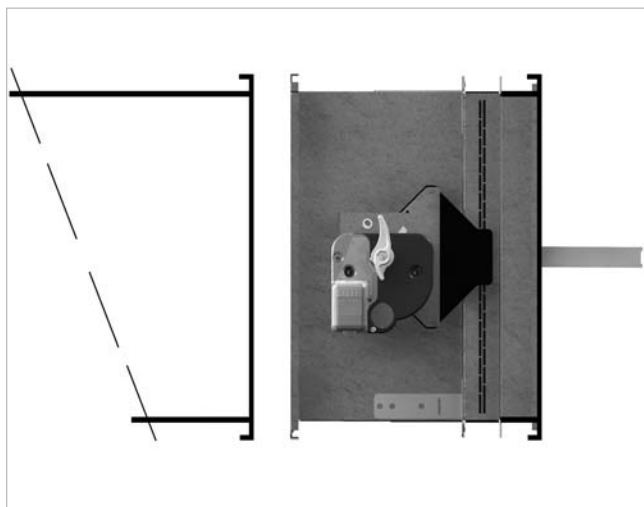
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# Frame

# PG

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## Standard for the damper CU2

### PG30

Connection with ducts via frames of 30 mm:

Junction of damper/duct:

- either by sliding profile
- or with bolts
- or with clamps/clips

The four corners of the flange are provided with elliptical holes  $\varnothing 8,5 \times 16$  mm.

### Variants

#### PG20

Connection with ducts via frames of 20 mm:

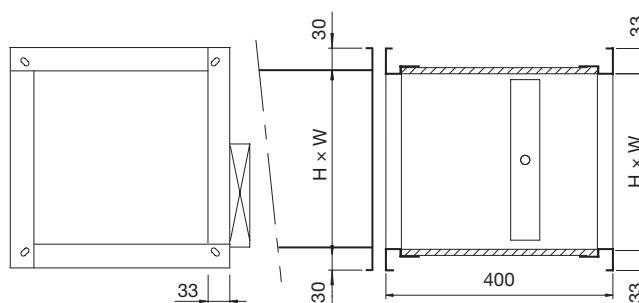
The four corners of the flange are provided with elliptical holes  $\varnothing 6,5 \times 16$  mm.

#### PG40

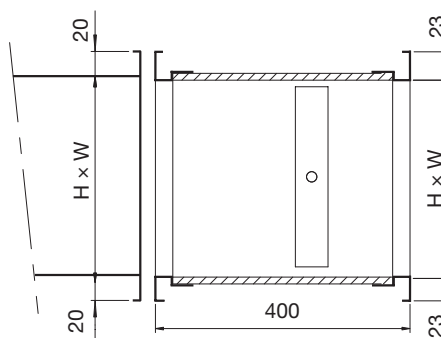
Connection with ducts via frames of 40 mm:

The four corners of the flange are provided with elliptical holes  $\varnothing 8,5 \times 16$  mm.

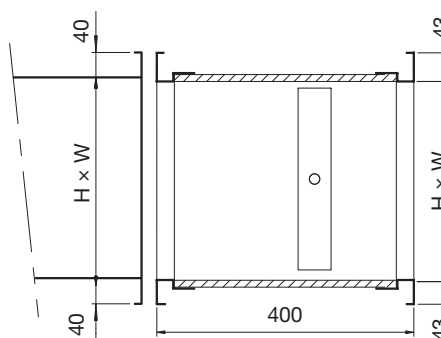
### PG30



### PG20



### PG40





# Frame

PG

## Variants

### PM

Connection with ducts by socket joint. This type of frame is used in case of shortage of space for standard frames PG30.

### PP

No connection

This type of frame is used on transfer dampers or on one side of a damper that opens into a room.

## Elongated frame

Elongated frame to avoid that the damper blade extends beyond the damper.

Connection with ducts via frames of 30 mm:

Junction of damper / duct:

- either by sliding profile
- or with bolts
- or with clamps/clips

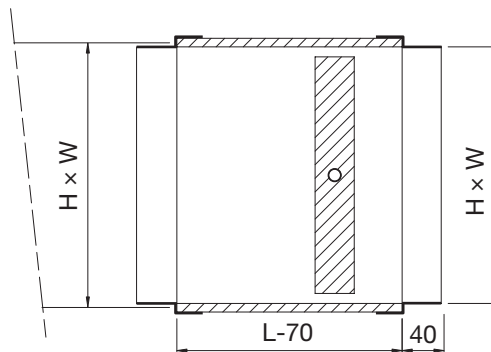
The four corners of the flange are provided with elliptical holes  $\varnothing 8,5 \times 16$  mm

Maximum elongation on 1 side = 500 mm

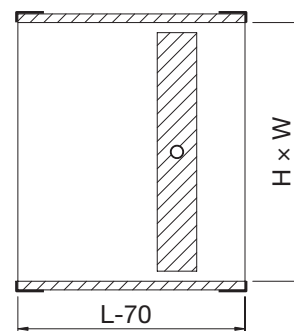
Maximum elongation on 2 sides = 600 mm

Elongation in steps of 50 mm

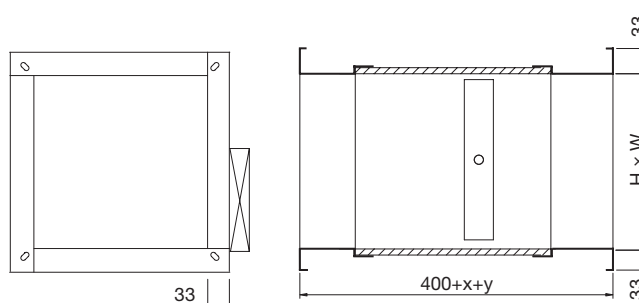
PM



PP



PG3V



|    |
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| 1  |
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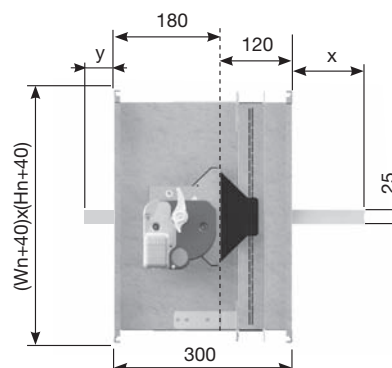


# Fire dampers

## CU-LT



### Dimensions



The damper blade exceeds the tunnel:

$$x = (Hn-6)/2 - 70$$

$$y = (Hn-6)/2 - 230$$

### Description

Rectangular fire dampers CU-LT are installed in ventilation ducts passing through a construction element in order to stop the propagation of fire. They consist of a modular operating mechanism positioned completely outside the wall.

The rectangular fire damper CU-LT has a fire resistance up to 120 minutes. The casing is made of galvanised steel.

This fire damper is especially designed for smaller dimensions from 200 x 100 to 800 x 600 mm.

The fire damper can be equipped with a fusible link mechanism up to a motorized mechanism.

### Standard

- Tested according to EN 1366-2 up to 500Pa
- Minimal pressure drop - very thin damper blade 25 mm
- Air tightness according to EN 1751 minimum class B (class C on demand)
- Suitable for mounting in rigid wall/floor and flexible wall (metal stud gypsum plasterboard)
- Operating mechanism completely outside the wall
- Easy to install
- Maintenance free
- For interior applications

### Fire resistance according to EN13501-3 : 2005

|               |  | EI 60 S<br>(500 Pa) | EI 90 S<br>(500 Pa) | EI 120 S<br>(500 Pa) |
|---------------|--|---------------------|---------------------|----------------------|
| Rigid wall    | <b>Aerated concrete wall 100mm (ve i ↔ o)</b>  | up to 800x600 (*)   | up to 800x600 (**)  | up to 800x600 (**)   |
|               | <b>Aerated concrete floor 110mm (ho i ↔ o)</b> | up to 800x600 (*)   | -                   | -                    |
| Rigid floor   | <b>Aerated concrete floor 150mm (ho i ↔ o)</b> | up to 800x600 (*)   | up to 800x600 (**)  | up to 800x600 (**)   |
|               | <b>Light partition wall 100mm (ve i ↔ o)</b>   | up to 800x600       | up to 800x600       | -                    |
| Flexible wall |  |                     |                     |                      |

(\*) sealing with standard concrete mortar or plaster

(\*\*) sealing with plaster

$v_e$  = damper mounted directly in the wall

$h_o$  = damper mounted directly in a floor/ceiling

$i \leftrightarrow o$  = fire can come from either direction

Pa = Pascal

E = integrity

I = thermal insulation

S = smoke leakage

### Ordering example

|         |              |            |            |             |           |
|---------|--------------|------------|------------|-------------|-----------|
|         | <b>CU-LT</b> | <b>200</b> | <b>200</b> | <b>MMAG</b> | <b>ME</b> |
| Product |              |            |            |             |           |
| Width   |              |            |            |             |           |
| Height  |              |            |            |             |           |
| Type    |              |            |            |             |           |
| Options |              |            |            |             |           |



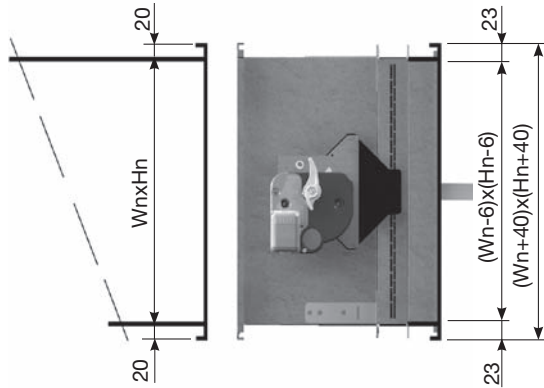


# Fire dampers

# CU-LT

## Types of frames

### PG20



- Connection to ducts with 20 mm flanges (and 30 mm flanges)
- Connection of damper/duct:
  - either with sliding profile (flanges of 20 mm only)
  - or with bolts
- The four corners of the frame are provided with elliptical holes  $\varnothing 8,5 \times 16$  mm.

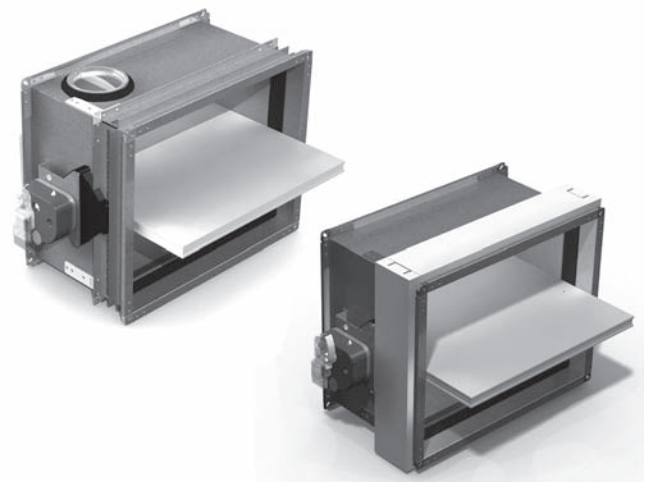
## Option

### Inspection shutter UL:

An inspection shutter can be used to visually determine the state and the condition (e.g. filth) of the damper. The inspection shutter is always mounted two-fold, one on the lower side and one on the upper side of the fire damper.

### Positioning kit flexible wall IFW:

In order to facilitate the installation in a flexible wall, the kit Installation Flexible Wall is available. When ordered together, this kit is mounted on the damper.



## Technical data for the motors

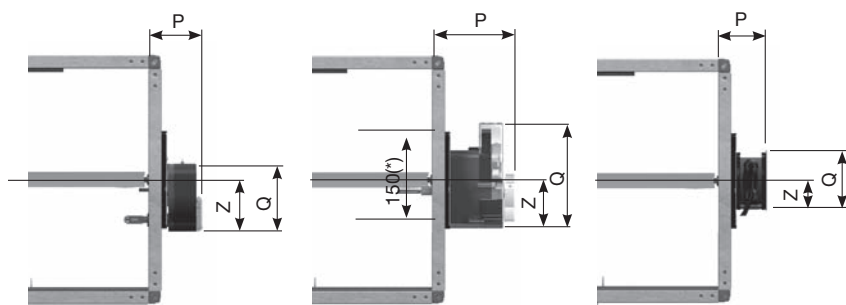


fig. CU-LT + MFUSP

fig. CU-LT + MMAG

fig. CU-LT + BLF(T)

(\*) the mechanism and the transmission exceed the damper when  $H_n = 100$ mm

If the height < 200 mm the mechanisms MFUSP and MMAG are turned 90° for the assembly.

| Height < 200 mm | MFUSP | MMAG   | BLF(T) |
|-----------------|-------|--------|--------|
| P               | 103   | 150,50 | 92     |
| Z               | 62    | 62     | 49     |
| Q               | 125   | 173    | 98     |

| Height ≥ 200 mm | MFUSP | MMAG   | BLF(T) |
|-----------------|-------|--------|--------|
| P               | 103   | 150,50 | 92     |
| Z               | 95    | 95     | 49     |
| Q               | 120   | 125    | 98     |





# Fire dampers

# CU-LT

## Weights

### Weight CU-LT + MFUSP [kg]

| H\W [mm] | 200 | 250 | 300  | 350  | 400  | 450  | 500  | 550  | 600  | 650  | 700  | 750  | 800  |
|----------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| 100      | 3,7 | 4,0 | 4,4  | 4,8  | 5,2  | 5,5  | 5,9  | 6,3  | 6,6  | 7,0  | 7,4  | 7,8  | 8,1  |
| 150      | 4,1 | 4,6 | 5,0  | 5,4  | 5,9  | 6,3  | 6,7  | 7,1  | 7,6  | 8,0  | 8,4  | 8,9  | 9,3  |
| 200      | 4,6 | 5,1 | 5,6  | 6,1  | 6,6  | 7,1  | 7,5  | 8,0  | 8,5  | 9,0  | 9,5  | 10,0 | 10,4 |
| 250      | 5,1 | 5,7 | 6,2  | 6,7  | 7,3  | 7,8  | 8,4  | 8,9  | 9,4  | 10,0 | 10,5 | 11,1 | 11,6 |
| 300      | 5,6 | 6,2 | 6,8  | 7,4  | 8,0  | 8,6  | 9,2  | 9,8  | 10,4 | 11,0 | 11,6 | 12,1 | 12,7 |
| 350      | 6,1 | 6,7 | 7,4  | 8,0  | 8,7  | 9,3  | 10,0 | 10,6 | 11,3 | 11,9 | 12,6 | 13,2 | 13,9 |
| 400      | 6,6 | 7,3 | 8,0  | 8,7  | 9,4  | 10,1 | 10,8 | 11,5 | 12,2 | 12,9 | 13,6 | 14,3 | 15,0 |
| 450      | 7,1 | 7,8 | 8,6  | 9,3  | 10,1 | 10,9 | 11,6 | 12,4 | 13,1 | 13,9 | 14,7 | 15,4 | 16,2 |
| 500      | 7,5 | 8,4 | 9,2  | 10,0 | 10,8 | 11,6 | 12,4 | 13,3 | 14,1 | 14,9 | 15,7 | 16,5 | 17,3 |
| 550      | 8,0 | 8,9 | 9,8  | 10,6 | 11,5 | 12,4 | 13,3 | 14,1 | 15,0 | 15,9 | 16,8 | 17,6 | 18,5 |
| 600      | 8,5 | 9,4 | 10,4 | 11,3 | 12,2 | 13,1 | 14,1 | 15,0 | 15,9 | 16,9 | 17,8 | 18,7 | 19,7 |

### Weight CU-LT + MMAG (automatic) [kg]

| H\W [mm] | 200 | 250 | 300  | 350  | 400  | 450  | 500  | 550  | 600  | 650  | 700  | 750  | 800  |
|----------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| 100      | 3,9 | 4,3 | 4,7  | 5,0  | 5,4  | 5,8  | 6,1  | 6,5  | 6,9  | 7,3  | 7,6  | 8,0  | 8,4  |
| 150      | 4,4 | 4,8 | 5,3  | 5,7  | 6,1  | 6,5  | 7,0  | 7,4  | 7,8  | 8,3  | 8,7  | 9,1  | 9,5  |
| 200      | 4,9 | 5,4 | 5,8  | 6,3  | 6,8  | 7,3  | 7,8  | 8,3  | 8,8  | 9,2  | 9,7  | 10,2 | 10,7 |
| 250      | 5,4 | 5,9 | 6,4  | 7,0  | 7,5  | 8,1  | 8,6  | 9,1  | 9,7  | 10,2 | 10,8 | 11,3 | 11,8 |
| 300      | 5,8 | 6,4 | 7,0  | 7,6  | 8,2  | 8,8  | 9,4  | 10,0 | 10,6 | 11,2 | 11,8 | 12,4 | 13,0 |
| 350      | 6,3 | 7,0 | 7,6  | 8,3  | 8,9  | 9,6  | 10,2 | 10,9 | 11,5 | 12,2 | 12,8 | 13,5 | 14,1 |
| 400      | 6,8 | 7,5 | 8,2  | 8,9  | 9,6  | 10,3 | 11,1 | 11,8 | 12,5 | 13,2 | 13,9 | 14,6 | 15,3 |
| 450      | 7,3 | 8,1 | 8,8  | 9,6  | 10,3 | 11,1 | 11,9 | 12,6 | 13,4 | 14,2 | 14,9 | 15,7 | 16,4 |
| 500      | 7,8 | 8,6 | 9,4  | 10,2 | 11,1 | 11,9 | 12,7 | 13,5 | 14,3 | 15,1 | 16,0 | 16,8 | 17,6 |
| 550      | 8,3 | 9,1 | 10,0 | 10,9 | 11,8 | 12,6 | 13,5 | 14,4 | 15,3 | 16,1 | 17,0 | 17,9 | 18,7 |
| 600      | 8,8 | 9,7 | 10,6 | 11,5 | 12,5 | 13,4 | 14,3 | 15,3 | 16,2 | 17,1 | 18,0 | 19,0 | 19,9 |

### Weight CU-LT + BLF(T) [kg]

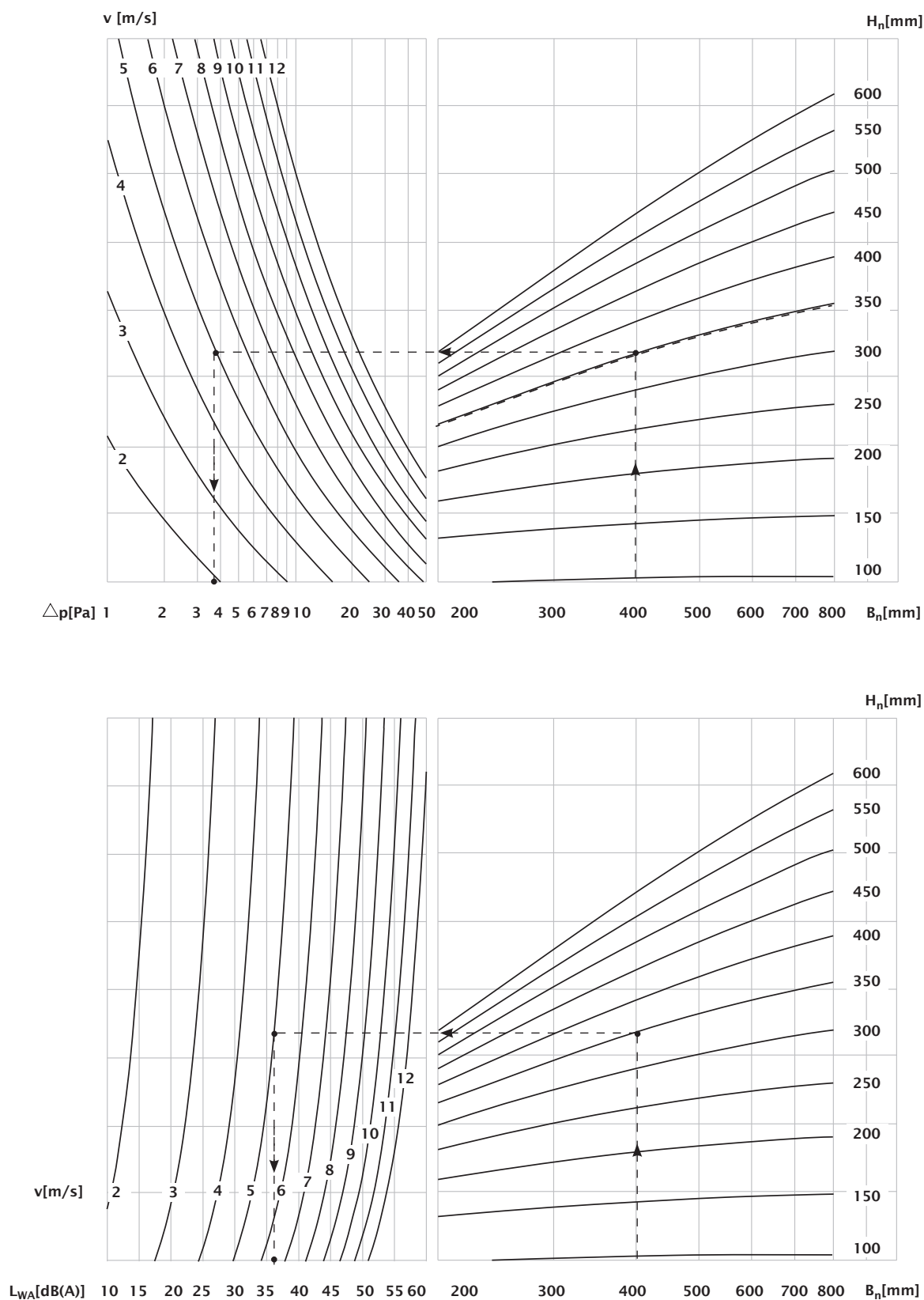
| H\W [mm] | 200 | 250  | 300  | 350  | 400  | 450  | 500  | 550  | 600  | 650  | 700  | 750  | 800  |
|----------|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| 100      | 5,0 | 5,4  | 5,8  | 6,1  | 6,5  | 6,9  | 7,2  | 7,6  | 8,0  | 8,4  | 8,7  | 9,1  | 9,5  |
| 150      | 5,5 | 5,9  | 6,4  | 6,8  | 7,2  | 7,6  | 8,1  | 8,5  | 8,9  | 9,4  | 9,8  | 10,2 | 10,6 |
| 200      | 6,0 | 6,5  | 6,9  | 7,4  | 7,9  | 8,4  | 8,9  | 9,4  | 9,9  | 10,3 | 10,8 | 11,3 | 11,8 |
| 250      | 6,5 | 7,0  | 7,5  | 8,1  | 8,6  | 9,2  | 9,7  | 10,2 | 10,8 | 11,3 | 11,9 | 12,4 | 12,9 |
| 300      | 6,9 | 7,5  | 8,1  | 8,7  | 9,3  | 9,9  | 10,5 | 11,1 | 11,7 | 12,3 | 12,9 | 13,5 | 14,1 |
| 350      | 7,4 | 8,1  | 8,7  | 9,4  | 10,0 | 10,7 | 11,3 | 12,0 | 12,6 | 13,3 | 13,9 | 14,6 | 15,2 |
| 400      | 7,9 | 8,6  | 9,3  | 10,0 | 10,7 | 11,4 | 12,2 | 12,9 | 13,6 | 14,3 | 15,0 | 15,7 | 16,4 |
| 450      | 8,4 | 9,2  | 9,9  | 10,7 | 11,4 | 12,2 | 13,0 | 13,7 | 14,5 | 15,3 | 16,0 | 16,8 | 17,5 |
| 500      | 8,9 | 9,7  | 10,5 | 11,3 | 12,2 | 13,0 | 13,8 | 14,6 | 15,4 | 16,2 | 17,1 | 17,9 | 18,7 |
| 550      | 9,4 | 10,2 | 11,1 | 12,0 | 12,9 | 13,7 | 14,6 | 15,5 | 16,4 | 17,2 | 18,1 | 19,0 | 19,8 |
| 600      | 9,9 | 10,8 | 11,7 | 12,6 | 13,6 | 14,5 | 15,4 | 16,4 | 17,3 | 18,2 | 19,1 | 20,1 | 21,0 |



# Fire dampers

# CU-LT

## Selection graph



Elaborated example p. 15

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# Fire dampers

CU-LT

## Pressure drop coefficient cu-lt $\zeta$ [-]

| H\W [mm] | 200  | 250  | 300  | 350  | 400  | 450  | 500  | 550  | 600  | 650  | 700  | 750  | 800  |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 100      | 1,69 | 1,65 | 1,62 | 1,60 | 1,59 | 1,58 | 1,57 | 1,56 | 1,55 | 1,55 | 1,54 | 1,54 | 1,54 |
| 150      | 0,98 | 0,93 | 0,89 | 0,87 | 0,85 | 0,83 | 0,82 | 0,81 | 0,80 | 0,80 | 0,79 | 0,79 | 0,78 |
| 200      | 0,69 | 0,63 | 0,60 | 0,57 | 0,55 | 0,54 | 0,52 | 0,51 | 0,51 | 0,50 | 0,49 | 0,49 | 0,49 |
| 250      | 0,54 | 0,48 | 0,44 | 0,42 | 0,40 | 0,39 | 0,37 | 0,37 | 0,36 | 0,35 | 0,35 | 0,34 | 0,34 |
| 300      | 0,45 | 0,39 | 0,35 | 0,33 | 0,31 | 0,30 | 0,29 | 0,28 | 0,27 | 0,26 | 0,26 | 0,26 | 0,25 |
| 350      | 0,39 | 0,33 | 0,30 | 0,27 | 0,25 | 0,24 | 0,23 | 0,22 | 0,22 | 0,21 | 0,21 | 0,20 | 0,20 |
| 400      | 0,34 | 0,29 | 0,26 | 0,23 | 0,22 | 0,20 | 0,19 | 0,18 | 0,18 | 0,17 | 0,17 | 0,16 | 0,16 |
| 450      | 0,31 | 0,26 | 0,23 | 0,20 | 0,19 | 0,17 | 0,16 | 0,16 | 0,15 | 0,15 | 0,14 | 0,14 | 0,13 |
| 500      | 0,29 | 0,24 | 0,20 | 0,18 | 0,17 | 0,15 | 0,14 | 0,14 | 0,13 | 0,13 | 0,12 | 0,12 | 0,12 |
| 550      | 0,27 | 0,22 | 0,19 | 0,16 | 0,15 | 0,14 | 0,13 | 0,12 | 0,12 | 0,11 | 0,11 | 0,10 | 0,10 |
| 600      | 0,25 | 0,20 | 0,17 | 0,15 | 0,14 | 0,12 | 0,12 | 0,11 | 0,10 | 0,10 | 0,10 | 0,09 | 0,09 |

$$\Delta p = v^2 \times 0,6 \times \zeta \quad v = \frac{q}{A}$$

q = air flow in the duct [m<sup>3</sup>/h]

$\Delta p$  = static pressure drop [Pa]

$\zeta$  = pressure drop coefficient zeta [-]

A = internal surface of the duct [m<sup>2</sup>]

v = air speed in the duct [m/s]

L<sub>WA</sub> = A-weighted sound power level

H<sub>n</sub>/B<sub>n</sub> = Nominal height/width of the damper

### Example:

Data: H<sub>n</sub> = 350 mm                      Wn = 400 mm      v = 5 m/s

Required:  $\Delta p = \text{ca. } 3,9 \text{ Pa}$   
 L<sub>WA</sub> = ca. 36 dB(A)      }      cfr. selection graph CU-LT

Calculation:  $\Delta p = (5\text{m/s})^2 \times 0,6 \times 0,25 = 3,75 \text{ Pa}$



# Fire dampers

# CU-LT

## Elaborated example of a pressure drop calculation $\Delta p$ with air speed $v = 4\text{m/s}$

| $\Delta p[\text{Pa}]$ | 200   | 250   | 300   | 350   | 400   | 450   | 500   | 550   | 600   | 650   | 700   | 750   | 800   |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 100                   | 16,22 | 15,84 | 15,55 | 15,36 | 15,26 | 15,17 | 15,07 | 14,98 | 14,88 | 14,88 | 14,78 | 14,78 | 14,78 |
| 150                   | 9,41  | 8,93  | 8,54  | 8,35  | 8,16  | 7,97  | 7,87  | 7,78  | 7,68  | 7,68  | 7,58  | 7,58  | 7,49  |
| 200                   | 6,62  | 6,05  | 5,76  | 5,47  | 5,28  | 5,18  | 4,99  | 4,90  | 4,90  | 4,80  | 4,70  | 4,70  | 4,70  |
| 250                   | 5,18  | 4,61  | 4,22  | 4,03  | 3,84  | 3,74  | 3,55  | 3,55  | 3,46  | 3,36  | 3,36  | 3,26  | 3,26  |
| 300                   | 4,32  | 3,74  | 3,36  | 3,17  | 2,98  | 2,88  | 2,78  | 2,69  | 2,59  | 2,50  | 2,50  | 2,50  | 2,40  |
| 350                   | 3,74  | 3,17  | 2,88  | 2,59  | 2,40  | 2,30  | 2,21  | 2,11  | 2,11  | 2,02  | 2,02  | 1,92  | 1,92  |
| 400                   | 3,26  | 2,78  | 2,50  | 2,21  | 2,11  | 1,92  | 1,82  | 1,73  | 1,73  | 1,63  | 1,63  | 1,54  | 1,54  |
| 450                   | 2,98  | 2,50  | 2,21  | 1,92  | 1,82  | 1,63  | 1,54  | 1,54  | 1,44  | 1,44  | 1,34  | 1,34  | 1,25  |
| 500                   | 2,78  | 2,30  | 1,92  | 1,73  | 1,63  | 1,44  | 1,34  | 1,34  | 1,25  | 1,25  | 1,15  | 1,15  | 1,15  |
| 550                   | 2,59  | 2,11  | 1,82  | 1,54  | 1,44  | 1,34  | 1,25  | 1,15  | 1,15  | 1,06  | 1,06  | 0,96  | 0,96  |
| 600                   | 2,40  | 1,92  | 1,63  | 1,44  | 1,34  | 1,15  | 1,15  | 1,06  | 0,96  | 0,96  | 0,96  | 0,86  | 0,86  |

## Elaborated example of a pressure drop calculation $\Delta p$ with air speed $v = 7\text{m/s}$

| $\Delta p[\text{Pa}]$ | 200   | 250   | 300   | 350   | 400   | 450   | 500   | 550   | 600   | 650   | 700   | 750   | 800   |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 100                   | 49,69 | 48,51 | 47,63 | 47,04 | 46,75 | 46,45 | 46,16 | 45,86 | 45,57 | 45,57 | 45,28 | 45,28 | 45,28 |
| 150                   | 28,81 | 27,34 | 26,17 | 25,58 | 24,99 | 24,40 | 24,11 | 23,81 | 23,52 | 23,52 | 23,23 | 23,23 | 22,93 |
| 200                   | 20,29 | 18,52 | 17,64 | 16,76 | 16,17 | 15,88 | 15,29 | 14,99 | 14,99 | 14,70 | 14,41 | 14,41 | 14,41 |
| 250                   | 15,88 | 14,11 | 12,94 | 12,35 | 11,76 | 11,47 | 10,88 | 10,88 | 10,58 | 10,29 | 10,29 | 10,00 | 10,00 |
| 300                   | 13,23 | 11,47 | 10,29 | 9,70  | 9,11  | 8,82  | 8,53  | 8,23  | 7,94  | 7,64  | 7,64  | 7,64  | 7,35  |
| 350                   | 11,47 | 9,70  | 8,82  | 7,94  | 7,35  | 7,06  | 6,76  | 6,47  | 6,47  | 6,17  | 6,17  | 5,88  | 5,88  |
| 400                   | 10,00 | 8,53  | 7,64  | 6,76  | 6,47  | 5,88  | 5,59  | 5,29  | 5,29  | 5,00  | 5,00  | 4,70  | 4,70  |
| 450                   | 9,11  | 7,64  | 6,76  | 5,88  | 5,59  | 5,00  | 4,70  | 4,70  | 4,41  | 4,41  | 4,12  | 4,12  | 3,82  |
| 500                   | 8,53  | 7,06  | 5,88  | 5,29  | 5,00  | 4,41  | 4,12  | 4,12  | 3,82  | 3,82  | 3,53  | 3,53  | 3,53  |
| 550                   | 7,94  | 6,47  | 5,59  | 4,70  | 4,41  | 4,12  | 3,82  | 3,53  | 3,53  | 3,23  | 3,23  | 2,94  | 2,94  |
| 600                   | 7,35  | 5,88  | 5,00  | 4,41  | 4,12  | 3,53  | 3,53  | 3,23  | 2,94  | 2,94  | 2,94  | 2,65  | 2,65  |

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# Fire dampers

# CU-LT

## Selection data CU-LT

A-weighted sound power level  $L_{WA}$  of 45 dB(A) in the duct

Sn = Free air passage  
 Q = Air flow  
 $\Delta p$  = Pressure drop

| H/W [mm] | 200    | 250    | 300    | 350    | 400    | 450    | 500    | 550    | 600    | 650    | 700    | 750    | 800    |                       |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------|
| 100      | 0,0099 | 0,0127 | 0,0154 | 0,0182 | 0,0209 | 0,0237 | 0,0264 | 0,0292 | 0,0319 | 0,0347 | 0,0374 | 0,0402 | 0,0429 | Sn [m <sup>2</sup> ]  |
|          | 54,29  | 55,15  | 55,72  | 56,13  | 56,43  | 56,67  | 56,85  | 57,00  | 57,13  | 57,24  | 57,33  | 57,41  | 57,48  | Sn [%]                |
|          | 690    | 860    | 1030   | 1200   | 1360   | 1530   | 1700   | 1870   | 2030   | 2200   | 2370   | 2540   | 2700   | Q [m <sup>3</sup> /h] |
|          | 93     | 90     | 88     | 87     | 85     | 84     | 84     | 83     | 82     | 82     | 82     | 82     | 81     | $\Delta p$ [Pa]       |
| 150      | 0,0189 | 0,0242 | 0,0294 | 0,0347 | 0,0399 | 0,0452 | 0,0504 | 0,0557 | 0,0609 | 0,0662 | 0,0714 | 0,0767 | 0,0819 | Sn [m <sup>2</sup> ]  |
|          | 67,65  | 68,73  | 69,44  | 69,95  | 70,33  | 70,62  | 70,85  | 71,04  | 71,20  | 71,33  | 71,45  | 71,54  | 71,63  | Sn [%]                |
|          | 940    | 1170   | 1390   | 1610   | 1840   | 2060   | 2290   | 2510   | 2730   | 2960   | 3180   | 3410   | 3630   | Q [m <sup>3</sup> /h] |
|          | 24     | 23     | 22     | 21     | 20     | 20     | 20     | 19     | 19     | 19     | 19     | 19     | 18     | $\Delta p$ [Pa]       |
| 200      | 0,0279 | 0,0357 | 0,0434 | 0,0512 | 0,0589 | 0,0667 | 0,0744 | 0,0822 | 0,0899 | 0,0977 | 0,1054 | 0,1132 | 0,1209 | Sn [m <sup>2</sup> ]  |
|          | 74,13  | 75,31  | 76,09  | 76,65  | 77,06  | 77,38  | 77,63  | 77,84  | 78,01  | 78,16  | 78,29  | 78,39  | 78,49  | Sn [%]                |
|          | 1190   | 1470   | 1750   | 2030   | 2310   | 2590   | 2860   | 3140   | 3420   | 3700   | 3980   | 4260   | 4530   | Q [m <sup>3</sup> /h] |
|          | 28     | 25     | 23     | 22     | 21     | 21     | 20     | 19     | 19     | 19     | 19     | 18     | 18     | $\Delta p$ [Pa]       |
| 250      | 0,0369 | 0,0472 | 0,0574 | 0,0677 | 0,0779 | 0,0882 | 0,0984 | 0,1087 | 0,1189 | 0,1292 | 0,1394 | 0,1497 | 0,1599 | Sn [m <sup>2</sup> ]  |
|          | 77,95  | 79,20  | 80,02  | 80,60  | 81,03  | 81,37  | 81,64  | 81,85  | 82,04  | 82,19  | 82,32  | 82,44  | 82,53  | Sn [%]                |
|          | 1440   | 1770   | 2100   | 2440   | 2770   | 3100   | 3430   | 3760   | 4090   | 4420   | 4750   | 5090   | 5420   | Q [m <sup>3</sup> /h] |
|          | 21     | 18     | 16     | 15     | 14     | 14     | 13     | 13     | 12     | 12     | 12     | 12     | 11     | $\Delta p$ [Pa]       |
| 300      | 0,0459 | 0,0587 | 0,0714 | 0,0842 | 0,0969 | 0,1097 | 0,1224 | 0,1352 | 0,1479 | 0,1607 | 0,1734 | 0,1862 | 0,1989 | Sn [m <sup>2</sup> ]  |
|          | 80,48  | 81,76  | 82,60  | 83,20  | 83,65  | 84,00  | 84,28  | 84,50  | 84,69  | 84,85  | 84,99  | 85,10  | 85,21  | Sn [%]                |
|          | 1690   | 2070   | 2450   | 2840   | 3220   | 3600   | 3990   | 4370   | 4750   | 5130   | 5520   | 5900   | 6280   | Q [m <sup>3</sup> /h] |
|          | 16     | 14     | 12     | 11     | 10     | 10     | 9      | 9      | 9      | 8      | 8      | 8      | 8      | $\Delta p$ [Pa]       |
| 350      | 0,0549 | 0,0702 | 0,0854 | 0,1007 | 0,1159 | 0,1312 | 0,1464 | 0,1617 | 0,1769 | 0,1922 | 0,2074 | 0,2227 | 0,2379 | Sn [m <sup>2</sup> ]  |
|          | 82,26  | 83,58  | 84,44  | 85,05  | 85,51  | 85,87  | 86,15  | 86,38  | 86,57  | 86,74  | 86,87  | 86,99  | 87,10  | Sn [%]                |
|          | 1930   | 2370   | 2800   | 3240   | 3670   | 4100   | 4540   | 4970   | 5400   | 5830   | 6260   | 6700   | 7130   | Q [m <sup>3</sup> /h] |
|          | 14     | 11     | 10     | 9      | 8      | 8      | 7      | 7      | 7      | 6      | 6      | 6      | 6      | $\Delta p$ [Pa]       |
| 400      | 0,0639 | 0,0817 | 0,0994 | 0,1172 | 0,1349 | 0,1527 | 0,1704 | 0,1882 | 0,2059 | 0,2237 | 0,2414 | 0,2592 | 0,2769 | Sn [m <sup>2</sup> ]  |
|          | 83,60  | 84,93  | 85,81  | 86,43  | 86,90  | 87,26  | 87,55  | 87,78  | 87,98  | 88,14  | 88,28  | 88,41  | 88,51  | Sn [%]                |
|          | 2170   | 2660   | 3150   | 3630   | 4110   | 4600   | 5080   | 5560   | 6040   | 6520   | 7000   | 7480   | 7960   | Q [m <sup>3</sup> /h] |
|          | 12     | 9      | 8      | 7      | 7      | 6      | 6      | 5      | 5      | 5      | 5      | 5      | 5      | $\Delta p$ [Pa]       |
| 450      | 0,0729 | 0,0932 | 0,1134 | 0,1337 | 0,1539 | 0,1742 | 0,1944 | 0,2147 | 0,2349 | 0,2552 | 0,2754 | 0,2957 | 0,3159 | Sn [m <sup>2</sup> ]  |
|          | 84,63  | 85,98  | 86,87  | 87,50  | 87,98  | 88,34  | 88,63  | 88,87  | 89,07  | 89,23  | 89,38  | 89,50  | 89,61  | Sn [%]                |
|          | 2420   | 2960   | 3490   | 4020   | 4560   | 5090   | 5620   | 6150   | 6680   | 7200   | 7730   | 8260   | 8790   | Q [m <sup>3</sup> /h] |
|          | 10     | 8      | 7      | 6      | 6      | 5      | 5      | 4      | 4      | 4      | 4      | 4      | 4      | $\Delta p$ [Pa]       |
| 500      | 0,0819 | 0,1047 | 0,1274 | 0,1502 | 0,1729 | 0,1957 | 0,2184 | 0,2412 | 0,2639 | 0,2867 | 0,3094 | 0,3322 | 0,3549 | Sn [m <sup>2</sup> ]  |
|          | 85,46  | 86,82  | 87,72  | 88,36  | 88,83  | 89,20  | 89,49  | 89,73  | 89,93  | 90,10  | 90,25  | 90,37  | 90,48  | Sn [%]                |
|          | 2660   | 3250   | 3830   | 4410   | 4990   | 5570   | 6150   | 6730   | 7300   | 7880   | 8460   | 9030   | 9610   | Q [m <sup>3</sup> /h] |
|          | 9      | 7      | 6      | 5      | 5      | 4      | 4      | 4      | 4      | 3      | 3      | 3      | 3      | $\Delta p$ [Pa]       |
| 550      | 0,0909 | 0,1162 | 0,1414 | 0,1667 | 0,1919 | 0,2172 | 0,2424 | 0,2677 | 0,2929 | 0,3182 | 0,3434 | 0,3687 | 0,3939 | Sn [m <sup>2</sup> ]  |
|          | 86,13  | 87,50  | 88,41  | 89,05  | 89,53  | 89,90  | 90,20  | 90,44  | 90,64  | 90,81  | 90,96  | 91,08  | 91,19  | Sn [%]                |
|          | 2900   | 3540   | 4170   | 4800   | 5430   | 6060   | 6680   | 7300   | 7930   | 8550   | 9170   | 9790   | 10420  | Q [m <sup>3</sup> /h] |
|          | 9      | 7      | 5      | 5      | 4      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | 3      | $\Delta p$ [Pa]       |
| 600      | 0,0999 | 0,1277 | 0,1554 | 0,1832 | 0,2109 | 0,2387 | 0,2664 | 0,2942 | 0,3219 | 0,3497 | 0,3774 | 0,4052 | 0,4329 | Sn [m <sup>2</sup> ]  |
|          | 86,69  | 88,07  | 88,99  | 89,63  | 90,11  | 90,49  | 90,79  | 91,03  | 91,23  | 91,40  | 91,55  | 91,68  | 91,79  | Sn [%]                |
|          | 3140   | 3830   | 4510   | 5190   | 5860   | 6540   | 7210   | 7880   | 8550   | 9220   | 9880   | 10550  | 11220  | Q [m <sup>3</sup> /h] |
|          | 8      | 6      | 5      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | 2      | 2      | 2      | $\Delta p$ [Pa]       |

Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level 45dB(A), for the respective dimension.



# Fire dampers

CU-LT

A-weighted sound power level  $L_{WA}$  of 40 dB(A) in the duct

| H/W [mm] | 200    | 250    | 300    | 350    | 400    | 450    | 500    | 550    | 600    | 650    | 700    | 750    | 800    |                       |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------|
| 100      | 0,0099 | 0,0127 | 0,0154 | 0,0182 | 0,0209 | 0,0237 | 0,0264 | 0,0292 | 0,0319 | 0,0347 | 0,0374 | 0,0402 | 0,0429 | Sn [m <sup>2</sup> ]  |
|          | 54,29  | 55,15  | 55,72  | 56,13  | 56,43  | 56,67  | 56,85  | 57,00  | 57,13  | 57,24  | 57,33  | 57,41  | 57,48  | Sn [%]                |
|          | 560    | 700    | 840    | 970    | 1110   | 1250   | 1380   | 1520   | 1650   | 1790   | 1930   | 2060   | 2200   | Q [m <sup>3</sup> /h] |
|          | 61     | 60     | 59     | 57     | 57     | 56     | 55     | 55     | 54     | 54     | 54     | 54     | 54     | Δp [Pa]               |
| 150      | 0,0189 | 0,0242 | 0,0294 | 0,0347 | 0,0399 | 0,0452 | 0,0504 | 0,0557 | 0,0609 | 0,0662 | 0,0714 | 0,0767 | 0,0819 | Sn [m <sup>2</sup> ]  |
|          | 67,65  | 68,73  | 69,44  | 69,95  | 70,33  | 70,62  | 70,85  | 71,04  | 71,20  | 71,33  | 71,45  | 71,54  | 71,63  | Sn [%]                |
|          | 770    | 950    | 1130   | 1310   | 1490   | 1680   | 1860   | 2040   | 2220   | 2400   | 2590   | 2770   | 2950   | Q [m <sup>3</sup> /h] |
|          | 30     | 28     | 26     | 25     | 24     | 24     | 23     | 23     | 23     | 22     | 22     | 22     | 22     | Δp [Pa]               |
| 200      | 0,0279 | 0,0357 | 0,0434 | 0,0512 | 0,0589 | 0,0667 | 0,0744 | 0,0822 | 0,0899 | 0,0977 | 0,1054 | 0,1132 | 0,1209 | Sn [m <sup>2</sup> ]  |
|          | 74,13  | 75,31  | 76,09  | 76,65  | 77,06  | 77,38  | 77,63  | 77,84  | 78,01  | 78,16  | 78,29  | 78,39  | 78,49  | Sn [%]                |
|          | 970    | 1200   | 1420   | 1650   | 1880   | 2100   | 2330   | 2550   | 2780   | 3010   | 3230   | 3460   | 3690   | Q [m <sup>3</sup> /h] |
|          | 19     | 17     | 15     | 15     | 14     | 14     | 13     | 13     | 13     | 12     | 12     | 12     | 12     | Δp [Pa]               |
| 250      | 0,0369 | 0,0472 | 0,0574 | 0,0677 | 0,0779 | 0,0882 | 0,0984 | 0,1087 | 0,1189 | 0,1292 | 0,1394 | 0,1497 | 0,1599 | Sn [m <sup>2</sup> ]  |
|          | 77,95  | 79,20  | 80,02  | 80,60  | 81,03  | 81,37  | 81,64  | 81,85  | 82,04  | 82,19  | 82,32  | 82,44  | 82,53  | Sn [%]                |
|          | 1170   | 1440   | 1710   | 1980   | 2250   | 2520   | 2790   | 3060   | 3330   | 3600   | 3870   | 4130   | 4400   | Q [m <sup>3</sup> /h] |
|          | 14     | 12     | 11     | 10     | 9      | 9      | 9      | 8      | 8      | 8      | 8      | 8      | 8      | Δp [Pa]               |
| 300      | 0,0459 | 0,0587 | 0,0714 | 0,0842 | 0,0969 | 0,1097 | 0,1224 | 0,1352 | 0,1479 | 0,1607 | 0,1734 | 0,1862 | 0,1989 | Sn [m <sup>2</sup> ]  |
|          | 96,97  | 98,51  | 99,53  | 100,25 | 100,79 | 101,21 | 101,55 | 101,82 | 102,05 | 102,24 | 102,40 | 102,54 | 102,67 | Sn [%]                |
|          | 1370   | 1680   | 2000   | 2310   | 2620   | 2930   | 3240   | 3550   | 3860   | 4170   | 4480   | 4790   | 5110   | Q [m <sup>3</sup> /h] |
|          | 11     | 9      | 8      | 7      | 7      | 6      | 6      | 6      | 6      | 6      | 5      | 5      | 5      | Δp [Pa]               |
| 350      | 0,0549 | 0,0702 | 0,0854 | 0,1007 | 0,1159 | 0,1312 | 0,1464 | 0,1617 | 0,1769 | 0,1922 | 0,2074 | 0,2227 | 0,2379 | Sn [m <sup>2</sup> ]  |
|          | 82,26  | 83,58  | 84,44  | 85,05  | 85,51  | 85,87  | 86,15  | 86,38  | 86,57  | 86,74  | 86,87  | 86,99  | 87,10  | Sn [%]                |
|          | 1570   | 1930   | 2280   | 2630   | 2980   | 3340   | 3690   | 4040   | 4390   | 4740   | 5090   | 5440   | 5790   | Q [m <sup>3</sup> /h] |
|          | 9      | 7      | 6      | 6      | 5      | 5      | 5      | 5      | 4      | 4      | 4      | 4      | 4      | Δp [Pa]               |
| 400      | 0,0639 | 0,0817 | 0,0994 | 0,1172 | 0,1349 | 0,1527 | 0,1704 | 0,1882 | 0,2059 | 0,2237 | 0,2414 | 0,2592 | 0,2769 | Sn [m <sup>2</sup> ]  |
|          | 83,60  | 84,93  | 85,81  | 86,43  | 86,90  | 87,26  | 87,55  | 87,78  | 87,98  | 88,14  | 88,28  | 88,41  | 88,51  | Sn [%]                |
|          | 1770   | 2160   | 2560   | 2950   | 3350   | 3740   | 4130   | 4520   | 4910   | 5300   | 5690   | 6080   | 6470   | Q [m <sup>3</sup> /h] |
|          | 8      | 6      | 5      | 5      | 4      | 4      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | Δp [Pa]               |
| 450      | 0,0729 | 0,0932 | 0,1134 | 0,1337 | 0,1539 | 0,1742 | 0,1944 | 0,2147 | 0,2349 | 0,2552 | 0,2754 | 0,2957 | 0,3159 | Sn [m <sup>2</sup> ]  |
|          | 84,63  | 85,98  | 86,87  | 87,50  | 87,98  | 88,34  | 88,63  | 88,87  | 89,07  | 89,23  | 89,38  | 89,50  | 89,61  | Sn [%]                |
|          | 1970   | 2400   | 2840   | 3270   | 3700   | 4140   | 4570   | 5000   | 5430   | 5860   | 6290   | 6720   | 7150   | Q [m <sup>3</sup> /h] |
|          | 7      | 5      | 5      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | 3      | 3      | 2      | Δp [Pa]               |
| 500      | 0,0819 | 0,1047 | 0,1274 | 0,1502 | 0,1729 | 0,1957 | 0,2184 | 0,2412 | 0,2639 | 0,2867 | 0,3094 | 0,3322 | 0,3549 | Sn [m <sup>2</sup> ]  |
|          | 85,46  | 86,82  | 87,72  | 88,36  | 88,83  | 89,20  | 89,49  | 89,73  | 89,93  | 90,10  | 90,25  | 90,37  | 90,48  | Sn [%]                |
|          | 2160   | 2640   | 3120   | 3590   | 4060   | 4530   | 5000   | 5470   | 5940   | 6410   | 6870   | 7340   | 7810   | Q [m <sup>3</sup> /h] |
|          | 6      | 5      | 4      | 4      | 3      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]               |
| 550      | 0,0909 | 0,1162 | 0,1414 | 0,1667 | 0,1919 | 0,2172 | 0,2424 | 0,2677 | 0,2929 | 0,3182 | 0,3434 | 0,3687 | 0,3939 | Sn [m <sup>2</sup> ]  |
|          | 86,13  | 87,50  | 88,41  | 89,05  | 89,53  | 89,90  | 90,20  | 90,44  | 90,64  | 90,81  | 90,96  | 91,08  | 91,19  | Sn [%]                |
|          | 2360   | 2880   | 3390   | 3900   | 4410   | 4920   | 5430   | 5940   | 6440   | 6950   | 7460   | 7960   | 8470   | Q [m <sup>3</sup> /h] |
|          | 6      | 4      | 4      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]               |
| 600      | 0,0999 | 0,1277 | 0,1554 | 0,1832 | 0,2109 | 0,2387 | 0,2664 | 0,2942 | 0,3219 | 0,3497 | 0,3774 | 0,4052 | 0,4329 | Sn [m <sup>2</sup> ]  |
|          | 86,69  | 88,07  | 88,99  | 89,63  | 90,11  | 90,49  | 90,79  | 91,03  | 91,23  | 91,40  | 91,55  | 91,68  | 91,79  | Sn [%]                |
|          | 2560   | 3110   | 3670   | 4220   | 4770   | 5310   | 5860   | 6400   | 6950   | 7490   | 8040   | 8580   | 9120   | Q [m <sup>3</sup> /h] |
|          | 5      | 4      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 1      | Δp [Pa]               |

Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level 40dB(A), for the respective dimension.





# Fire dampers

CU-LT

**A-weighted sound power level  $L_{WA}$  of 35 dB(A) in the duct**

| H/W [mm] | 200    | 250    | 300    | 350    | 400    | 450    | 500    | 550    | 600    | 650    | 700    | 750    | 800    |          |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|
| 100      | 0,0099 | 0,0127 | 0,0154 | 0,0182 | 0,0209 | 0,0237 | 0,0264 | 0,0292 | 0,0319 | 0,0347 | 0,0374 | 0,0402 | 0,0429 | Sn [m²]  |
|          | 54,29  | 55,15  | 55,72  | 56,13  | 56,43  | 56,67  | 56,85  | 57,00  | 57,13  | 57,24  | 57,33  | 57,41  | 57,48  | Sn [%]   |
|          | 460    | 570    | 680    | 790    | 900    | 1010   | 1120   | 1230   | 1350   | 1460   | 1570   | 1680   | 1790   | Q [m³/h] |
|          | 41     | 40     | 39     | 38     | 37     | 37     | 36     | 36     | 36     | 36     | 36     | 36     | 36     | Δp [Pa]  |
| 150      | 0,0189 | 0,0242 | 0,0294 | 0,0347 | 0,0399 | 0,0452 | 0,0504 | 0,0557 | 0,0609 | 0,0662 | 0,0714 | 0,0767 | 0,0819 | Sn [m²]  |
|          | 67,65  | 68,73  | 69,44  | 69,95  | 70,33  | 70,62  | 70,85  | 71,04  | 71,20  | 71,33  | 71,45  | 71,54  | 71,63  | Sn [%]   |
|          | 620    | 770    | 920    | 1070   | 1220   | 1360   | 1510   | 1660   | 1810   | 1960   | 2100   | 2250   | 2400   | Q [m³/h] |
|          | 19     | 18     | 17     | 17     | 16     | 16     | 15     | 15     | 15     | 15     | 15     | 15     | 14     | Δp [Pa]  |
| 200      | 0,0279 | 0,0357 | 0,0434 | 0,0512 | 0,0589 | 0,0667 | 0,0744 | 0,0822 | 0,0899 | 0,0977 | 0,1054 | 0,1132 | 0,1209 | Sn [m²]  |
|          | 74,13  | 75,31  | 76,09  | 76,65  | 77,06  | 77,38  | 77,63  | 77,84  | 78,01  | 78,16  | 78,29  | 78,39  | 78,49  | Sn [%]   |
|          | 790    | 970    | 1160   | 1340   | 1530   | 1710   | 1890   | 2080   | 2260   | 2450   | 2630   | 2810   | 3000   | Q [m³/h] |
|          | 13     | 11     | 10     | 10     | 9      | 9      | 9      | 9      | 8      | 8      | 8      | 8      | 8      | Δp [Pa]  |
| 250      | 0,0369 | 0,0472 | 0,0574 | 0,0677 | 0,0779 | 0,0882 | 0,0984 | 0,1087 | 0,1189 | 0,1292 | 0,1394 | 0,1497 | 0,1599 | Sn [m²]  |
|          | 77,95  | 79,20  | 80,02  | 80,60  | 81,03  | 81,37  | 81,64  | 81,85  | 82,04  | 82,19  | 82,32  | 82,44  | 82,53  | Sn [%]   |
|          | 950    | 1170   | 1390   | 1610   | 1830   | 2050   | 2270   | 2490   | 2710   | 2920   | 3140   | 3360   | 3580   | Q [m³/h] |
|          | 9      | 8      | 7      | 7      | 6      | 6      | 6      | 6      | 5      | 5      | 5      | 5      | 5      | Δp [Pa]  |
| 300      | 0,0459 | 0,0587 | 0,0714 | 0,0842 | 0,0969 | 0,1097 | 0,1224 | 0,1352 | 0,1479 | 0,1607 | 0,1734 | 0,1862 | 0,1989 | Sn [m²]  |
|          | 80,48  | 81,76  | 82,60  | 83,20  | 83,65  | 84,00  | 84,28  | 84,50  | 84,69  | 84,85  | 84,99  | 85,10  | 85,21  | Sn [%]   |
|          | 1120   | 1370   | 1620   | 1880   | 2130   | 2380   | 2640   | 2890   | 3140   | 3390   | 3650   | 3900   | 4150   | Q [m³/h] |
|          | 7      | 6      | 5      | 5      | 5      | 4      | 4      | 4      | 4      | 4      | 4      | 4      | 3      | Δp [Pa]  |
| 350      | 0,0549 | 0,0702 | 0,0854 | 0,1007 | 0,1159 | 0,1312 | 0,1464 | 0,1617 | 0,1769 | 0,1922 | 0,2074 | 0,2227 | 0,2379 | Sn [m²]  |
|          | 82,26  | 83,58  | 84,44  | 85,05  | 85,51  | 85,87  | 86,15  | 86,38  | 86,57  | 86,74  | 86,87  | 86,99  | 87,10  | Sn [%]   |
|          | 1280   | 1570   | 1850   | 2140   | 2430   | 2710   | 3000   | 3280   | 3570   | 3850   | 4140   | 4430   | 4710   | Q [m³/h] |
|          | 6      | 5      | 4      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | 3      | 3      | 3      | Δp [Pa]  |
| 400      | 0,0639 | 0,0817 | 0,0994 | 0,1172 | 0,1349 | 0,1527 | 0,1704 | 0,1882 | 0,2059 | 0,2237 | 0,2414 | 0,2592 | 0,2769 | Sn [m²]  |
|          | 83,60  | 84,93  | 85,81  | 86,43  | 86,90  | 87,26  | 87,55  | 87,78  | 87,98  | 88,14  | 88,28  | 88,41  | 88,51  | Sn [%]   |
|          | 1440   | 1760   | 2080   | 2400   | 2720   | 3040   | 3360   | 3670   | 3990   | 4310   | 4630   | 4950   | 5260   | Q [m³/h] |
|          | 5      | 4      | 4      | 3      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]  |
| 450      | 0,0729 | 0,0932 | 0,1134 | 0,1337 | 0,1539 | 0,1742 | 0,1944 | 0,2147 | 0,2349 | 0,2552 | 0,2754 | 0,2957 | 0,3159 | Sn [m²]  |
|          | 84,63  | 85,98  | 86,87  | 87,50  | 87,98  | 88,34  | 88,63  | 88,87  | 89,07  | 89,23  | 89,38  | 89,50  | 89,61  | Sn [%]   |
|          | 1600   | 1950   | 2310   | 2660   | 3010   | 3360   | 3710   | 4060   | 4410   | 4760   | 5110   | 5460   | 5810   | Q [m³/h] |
|          | 5      | 4      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]  |
| 500      | 0,0819 | 0,1047 | 0,1274 | 0,1502 | 0,1729 | 0,1957 | 0,2184 | 0,2412 | 0,2639 | 0,2867 | 0,3094 | 0,3322 | 0,3549 | Sn [m²]  |
|          | 85,46  | 86,82  | 87,72  | 88,36  | 88,83  | 89,20  | 89,49  | 89,73  | 89,93  | 90,10  | 90,25  | 90,37  | 90,48  | Sn [%]   |
|          | 1760   | 2150   | 2530   | 2920   | 3300   | 3680   | 4060   | 4450   | 4830   | 5210   | 5590   | 5970   | 6350   | Q [m³/h] |
|          | 4      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 1      | 1      | 1      | Δp [Pa]  |
| 550      | 0,0909 | 0,1162 | 0,1414 | 0,1667 | 0,1919 | 0,2172 | 0,2424 | 0,2677 | 0,2929 | 0,3182 | 0,3434 | 0,3687 | 0,3939 | Sn [m²]  |
|          | 86,13  | 87,50  | 88,41  | 89,05  | 89,53  | 89,90  | 90,20  | 90,44  | 90,64  | 90,81  | 90,96  | 91,08  | 91,19  | Sn [%]   |
|          | 1920   | 2340   | 2760   | 3170   | 3590   | 4000   | 4420   | 4830   | 5240   | 5650   | 6060   | 6470   | 6880   | Q [m³/h] |
|          | 4      | 3      | 2      | 2      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]  |
| 600      | 0,0999 | 0,1277 | 0,1554 | 0,1832 | 0,2109 | 0,2387 | 0,2664 | 0,2942 | 0,3219 | 0,3497 | 0,3774 | 0,4052 | 0,4329 | Sn [m²]  |
|          | 86,69  | 88,07  | 88,99  | 89,63  | 90,11  | 90,49  | 90,79  | 91,03  | 91,23  | 91,40  | 91,55  | 91,68  | 91,79  | Sn [%]   |
|          | 2080   | 2530   | 2980   | 3430   | 3880   | 4320   | 4760   | 5210   | 5650   | 6090   | 6530   | 6970   | 7410   | Q [m³/h] |
|          | 4      | 3      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]  |

Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level 35dB(A), for the respective dimension.





# Fire dampers

CU-LT

## A-weighted sound power level $L_{WA}$ of 30 dB(A) in the duct

| H/W [mm] | 200    | 250    | 300    | 350    | 400    | 450    | 500    | 550    | 600    | 650    | 700    | 750    | 800    |                       |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------|
| 100      | 0,0099 | 0,0127 | 0,0154 | 0,0182 | 0,0209 | 0,0237 | 0,0264 | 0,0292 | 0,0319 | 0,0347 | 0,0374 | 0,0402 | 0,0429 | Sn [m <sup>2</sup> ]  |
|          | 54,29  | 55,15  | 55,72  | 56,13  | 56,43  | 56,67  | 56,85  | 57,00  | 57,13  | 57,24  | 57,33  | 57,41  | 57,48  | Sn [%]                |
|          | 370    | 460    | 550    | 640    | 730    | 820    | 910    | 1000   | 1090   | 1180   | 1270   | 1360   | 1450   | Q [m <sup>3</sup> /h] |
|          | 27     | 26     | 25     | 25     | 24     | 24     | 24     | 24     | 24     | 24     | 24     | 24     | 23     | Δp [Pa]               |
| 150      | 0,0189 | 0,0242 | 0,0294 | 0,0347 | 0,0399 | 0,0452 | 0,0504 | 0,0557 | 0,0609 | 0,0662 | 0,0714 | 0,0767 | 0,0819 | Sn [m <sup>2</sup> ]  |
|          | 67,65  | 68,73  | 69,44  | 69,95  | 70,33  | 70,62  | 70,85  | 71,04  | 71,20  | 71,33  | 71,45  | 71,54  | 71,63  | Sn [%]                |
|          | 510    | 630    | 750    | 870    | 990    | 1110   | 1230   | 1350   | 1470   | 1590   | 1710   | 1830   | 1950   | Q [m <sup>3</sup> /h] |
|          | 13     | 12     | 11     | 11     | 11     | 10     | 10     | 10     | 10     | 10     | 10     | 10     | 10     | Δp [Pa]               |
| 200      | 0,0279 | 0,0357 | 0,0434 | 0,0512 | 0,0589 | 0,0667 | 0,0744 | 0,0822 | 0,0899 | 0,0977 | 0,1054 | 0,1132 | 0,1209 | Sn [m <sup>2</sup> ]  |
|          | 74,13  | 75,31  | 76,09  | 76,65  | 77,06  | 77,38  | 77,63  | 77,84  | 78,01  | 78,16  | 78,29  | 78,39  | 78,49  | Sn [%]                |
|          | 640    | 790    | 940    | 1090   | 1240   | 1390   | 1540   | 1690   | 1840   | 1990   | 2140   | 2290   | 2440   | Q [m <sup>3</sup> /h] |
|          | 8      | 7      | 7      | 6      | 6      | 6      | 6      | 6      | 6      | 5      | 5      | 5      | 5      | Δp [Pa]               |
| 250      | 0,0369 | 0,0472 | 0,0574 | 0,0677 | 0,0779 | 0,0882 | 0,0984 | 0,1087 | 0,1189 | 0,1292 | 0,1394 | 0,1497 | 0,1599 | Sn [m <sup>2</sup> ]  |
|          | 77,95  | 79,20  | 80,02  | 80,60  | 81,03  | 81,37  | 81,64  | 81,85  | 82,04  | 82,19  | 82,32  | 82,44  | 82,53  | Sn [%]                |
|          | 780    | 950    | 1130   | 1310   | 1490   | 1670   | 1840   | 2020   | 2200   | 2380   | 2560   | 2730   | 2910   | Q [m <sup>3</sup> /h] |
|          | 6      | 5      | 5      | 4      | 4      | 4      | 4      | 4      | 4      | 3      | 3      | 3      | 3      | Δp [Pa]               |
| 300      | 0,0459 | 0,0587 | 0,0714 | 0,0842 | 0,0969 | 0,1097 | 0,1224 | 0,1352 | 0,1479 | 0,1607 | 0,1734 | 0,1862 | 0,1989 | Sn [m <sup>2</sup> ]  |
|          | 80,48  | 81,76  | 82,60  | 83,20  | 83,65  | 84,00  | 84,28  | 84,50  | 84,69  | 84,85  | 84,99  | 85,10  | 85,21  | Sn [%]                |
|          | 910    | 1110   | 1320   | 1530   | 1730   | 1940   | 2140   | 2350   | 2550   | 2760   | 2960   | 3170   | 3370   | Q [m <sup>3</sup> /h] |
|          | 5      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | Δp [Pa]               |
| 350      | 0,0549 | 0,0702 | 0,0854 | 0,1007 | 0,1159 | 0,1312 | 0,1464 | 0,1617 | 0,1769 | 0,1922 | 0,2074 | 0,2227 | 0,2379 | Sn [m <sup>2</sup> ]  |
|          | 82,26  | 83,58  | 84,44  | 85,05  | 85,51  | 85,87  | 86,15  | 86,38  | 86,57  | 86,74  | 86,87  | 86,99  | 87,10  | Sn [%]                |
|          | 1040   | 1270   | 1510   | 1740   | 1970   | 2210   | 2440   | 2670   | 2900   | 3130   | 3370   | 3600   | 3830   | Q [m <sup>3</sup> /h] |
|          | 4      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]               |
| 400      | 0,0639 | 0,0817 | 0,0994 | 0,1172 | 0,1349 | 0,1527 | 0,1704 | 0,1882 | 0,2059 | 0,2237 | 0,2414 | 0,2592 | 0,2769 | Sn [m <sup>2</sup> ]  |
|          | 83,60  | 84,93  | 85,81  | 86,43  | 86,90  | 87,26  | 87,55  | 87,78  | 87,98  | 88,14  | 88,28  | 88,41  | 88,51  | Sn [%]                |
|          | 1170   | 1430   | 1690   | 1950   | 2210   | 2470   | 2730   | 2990   | 3250   | 3500   | 3760   | 4020   | 4280   | Q [m <sup>3</sup> /h] |
|          | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 450      | 0,0729 | 0,0932 | 0,1134 | 0,1337 | 0,1539 | 0,1742 | 0,1944 | 0,2147 | 0,2349 | 0,2552 | 0,2754 | 0,2957 | 0,3159 | Sn [m <sup>2</sup> ]  |
|          | 84,63  | 85,98  | 86,87  | 87,50  | 87,98  | 88,34  | 88,63  | 88,87  | 89,07  | 89,23  | 89,38  | 89,50  | 89,61  | Sn [%]                |
|          | 1300   | 1590   | 1880   | 2160   | 2450   | 2730   | 3020   | 3300   | 3590   | 3870   | 4150   | 4440   | 4720   | Q [m <sup>3</sup> /h] |
|          | 3      | 2      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 500      | 0,0819 | 0,1047 | 0,1274 | 0,1502 | 0,1729 | 0,1957 | 0,2184 | 0,2412 | 0,2639 | 0,2867 | 0,3094 | 0,3322 | 0,3549 | Sn [m <sup>2</sup> ]  |
|          | 85,46  | 86,82  | 87,72  | 88,36  | 88,83  | 89,20  | 89,49  | 89,73  | 89,93  | 90,10  | 90,25  | 90,37  | 90,48  | Sn [%]                |
|          | 1430   | 1750   | 2060   | 2370   | 2680   | 2990   | 3300   | 3610   | 3920   | 4230   | 4540   | 4850   | 5160   | Q [m <sup>3</sup> /h] |
|          | 3      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 550      | 0,0909 | 0,1162 | 0,1414 | 0,1667 | 0,1919 | 0,2172 | 0,2424 | 0,2677 | 0,2929 | 0,3182 | 0,3434 | 0,3687 | 0,3939 | Sn [m <sup>2</sup> ]  |
|          | 86,13  | 87,50  | 88,41  | 89,05  | 89,53  | 89,90  | 90,20  | 90,44  | 90,64  | 90,81  | 90,96  | 91,08  | 91,19  | Sn [%]                |
|          | 1560   | 1900   | 2240   | 2580   | 2920   | 3250   | 3590   | 3920   | 4260   | 4590   | 4930   | 5260   | 5600   | Q [m <sup>3</sup> /h] |
|          | 3      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 600      | 0,0999 | 0,1277 | 0,1554 | 0,1832 | 0,2109 | 0,2387 | 0,2664 | 0,2942 | 0,3219 | 0,3497 | 0,3774 | 0,4052 | 0,4329 | Sn [m <sup>2</sup> ]  |
|          | 86,69  | 88,07  | 88,99  | 89,63  | 90,11  | 90,49  | 90,79  | 91,03  | 91,23  | 91,40  | 91,55  | 91,68  | 91,79  | Sn [%]                |
|          | 1690   | 2060   | 2420   | 2790   | 3150   | 3510   | 3870   | 4230   | 4590   | 4950   | 5310   | 5670   | 6030   | Q [m <sup>3</sup> /h] |
|          | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |

Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level 30dB(A), for the respective dimension.





# Fire dampers

CU-LT

## A-weighted sound power level LWA of 25dB(A) in the duct

| H/W [mm] | 200    | 250    | 300    | 350    | 400    | 450    | 500    | 550    | 600    | 650    | 700    | 750    | 800    |                       |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------|
| 100      | 0,0099 | 0,0127 | 0,0154 | 0,0182 | 0,0209 | 0,0237 | 0,0264 | 0,0292 | 0,0319 | 0,0347 | 0,0374 | 0,0402 | 0,0429 | Sn [m <sup>2</sup> ]  |
|          | 54,29  | 55,15  | 55,72  | 56,13  | 56,43  | 56,67  | 56,85  | 57,00  | 57,13  | 57,24  | 57,33  | 57,41  | 57,48  | Sn [%]                |
|          | 310    | 380    | 450    | 520    | 600    | 670    | 740    | 820    | 890    | 960    | 1040   | 1110   | 1180   | Q [m <sup>3</sup> /h] |
|          | 19     | 18     | 17     | 16     | 17     | 16     | 16     | 16     | 16     | 16     | 16     | 16     | 15     | Δp [Pa]               |
| 150      | 0,0189 | 0,0242 | 0,0294 | 0,0347 | 0,0399 | 0,0452 | 0,0504 | 0,0557 | 0,0609 | 0,0662 | 0,0714 | 0,0767 | 0,0819 | Sn [m <sup>2</sup> ]  |
|          | 67,65  | 68,73  | 69,44  | 69,95  | 70,33  | 70,62  | 70,85  | 71,04  | 71,20  | 71,33  | 71,45  | 71,54  | 71,63  | Sn [%]                |
|          | 410    | 510    | 610    | 710    | 810    | 900    | 1000   | 1100   | 1200   | 1290   | 1390   | 1490   | 1590   | Q [m <sup>3</sup> /h] |
|          | 9      | 8      | 8      | 7      | 7      | 7      | 7      | 7      | 7      | 6      | 6      | 6      | 6      | Δp [Pa]               |
| 200      | 0,0279 | 0,0357 | 0,0434 | 0,0512 | 0,0589 | 0,0667 | 0,0744 | 0,0822 | 0,0899 | 0,0977 | 0,1054 | 0,1132 | 0,1209 | Sn [m <sup>2</sup> ]  |
|          | 74,13  | 75,31  | 76,09  | 76,65  | 77,06  | 77,38  | 77,63  | 77,84  | 78,01  | 78,16  | 78,29  | 78,39  | 78,49  | Sn [%]                |
|          | 520    | 640    | 770    | 890    | 1010   | 1130   | 1250   | 1370   | 1500   | 1620   | 1740   | 1860   | 1980   | Q [m <sup>3</sup> /h] |
|          | 5      | 5      | 5      | 4      | 4      | 4      | 4      | 4      | 4      | 4      | 4      | 3      | 3      | Δp [Pa]               |
| 250      | 0,0369 | 0,0472 | 0,0574 | 0,0677 | 0,0779 | 0,0882 | 0,0984 | 0,1087 | 0,1189 | 0,1292 | 0,1394 | 0,1497 | 0,1599 | Sn [m <sup>2</sup> ]  |
|          | 77,95  | 79,20  | 80,02  | 80,60  | 81,03  | 81,37  | 81,64  | 81,85  | 82,04  | 82,19  | 82,32  | 82,44  | 82,53  | Sn [%]                |
|          | 630    | 780    | 920    | 1070   | 1210   | 1360   | 1500   | 1640   | 1790   | 1930   | 2080   | 2220   | 2370   | Q [m <sup>3</sup> /h] |
|          | 4      | 3      | 3      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]               |
| 300      | 0,0459 | 0,0587 | 0,0714 | 0,0842 | 0,0969 | 0,1097 | 0,1224 | 0,1352 | 0,1479 | 0,1607 | 0,1734 | 0,1862 | 0,1989 | Sn [m <sup>2</sup> ]  |
|          | 80,48  | 81,76  | 82,60  | 83,20  | 83,65  | 84,00  | 84,28  | 84,50  | 84,69  | 84,85  | 84,99  | 85,10  | 85,21  | Sn [%]                |
|          | 740    | 910    | 1070   | 1240   | 1410   | 1580   | 1740   | 1910   | 2080   | 2240   | 2410   | 2580   | 2740   | Q [m <sup>3</sup> /h] |
|          | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]               |
| 350      | 0,0549 | 0,0702 | 0,0854 | 0,1007 | 0,1159 | 0,1312 | 0,1464 | 0,1617 | 0,1769 | 0,1922 | 0,2074 | 0,2227 | 0,2379 | Sn [m <sup>2</sup> ]  |
|          | 82,26  | 83,58  | 84,44  | 85,05  | 85,51  | 85,87  | 86,15  | 86,38  | 86,57  | 86,74  | 86,87  | 86,99  | 87,10  | Sn [%]                |
|          | 850    | 1040   | 1230   | 1420   | 1600   | 1790   | 1980   | 2170   | 2360   | 2550   | 2740   | 2930   | 3110   | Q [m <sup>3</sup> /h] |
|          | 3      | 2      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 400      | 0,0639 | 0,0817 | 0,0994 | 0,1172 | 0,1349 | 0,1527 | 0,1704 | 0,1882 | 0,2059 | 0,2237 | 0,2414 | 0,2592 | 0,2769 | Sn [m <sup>2</sup> ]  |
|          | 83,60  | 84,93  | 85,81  | 86,43  | 86,90  | 87,26  | 87,55  | 87,78  | 87,98  | 88,14  | 88,28  | 88,41  | 88,51  | Sn [%]                |
|          | 950    | 1160   | 1380   | 1590   | 1800   | 2010   | 2220   | 2430   | 2640   | 2850   | 3060   | 3270   | 3480   | Q [m <sup>3</sup> /h] |
|          | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 450      | 0,0729 | 0,0932 | 0,1134 | 0,1337 | 0,1539 | 0,1742 | 0,1944 | 0,2147 | 0,2349 | 0,2552 | 0,2754 | 0,2957 | 0,3159 | Sn [m <sup>2</sup> ]  |
|          | 84,63  | 85,98  | 86,87  | 87,50  | 87,98  | 88,34  | 88,63  | 88,87  | 89,07  | 89,23  | 89,38  | 89,50  | 89,61  | Sn [%]                |
|          | 1060   | 1290   | 1530   | 1760   | 1990   | 2220   | 2450   | 2690   | 2920   | 3150   | 3380   | 3610   | 3840   | Q [m <sup>3</sup> /h] |
|          | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 500      | 0,0819 | 0,1047 | 0,1274 | 0,1502 | 0,1729 | 0,1957 | 0,2184 | 0,2412 | 0,2639 | 0,2867 | 0,3094 | 0,3322 | 0,3549 | Sn [m <sup>2</sup> ]  |
|          | 85,46  | 86,82  | 87,72  | 88,36  | 88,83  | 89,20  | 89,49  | 89,73  | 89,93  | 90,10  | 90,25  | 90,37  | 90,48  | Sn [%]                |
|          | 1160   | 1420   | 1680   | 1930   | 2180   | 2430   | 2690   | 2940   | 3190   | 3440   | 3690   | 3940   | 4200   | Q [m <sup>3</sup> /h] |
|          | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 550      | 0,0909 | 0,1162 | 0,1414 | 0,1667 | 0,1919 | 0,2172 | 0,2424 | 0,2677 | 0,2929 | 0,3182 | 0,3434 | 0,3687 | 0,3939 | Sn [m <sup>2</sup> ]  |
|          | 86,13  | 87,50  | 88,41  | 89,05  | 89,53  | 89,90  | 90,20  | 90,44  | 90,64  | 90,81  | 90,96  | 91,08  | 91,19  | Sn [%]                |
|          | 1270   | 1550   | 1820   | 2100   | 2370   | 2650   | 2920   | 3190   | 3460   | 3730   | 4010   | 4280   | 4550   | Q [m <sup>3</sup> /h] |
|          | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 0      | Δp [Pa]               |
| 600      | 0,0999 | 0,1277 | 0,1554 | 0,1832 | 0,2109 | 0,2387 | 0,2664 | 0,2942 | 0,3219 | 0,3497 | 0,3774 | 0,4052 | 0,4329 | Sn [m <sup>2</sup> ]  |
|          | 86,69  | 88,07  | 88,99  | 89,63  | 90,11  | 90,49  | 90,79  | 91,03  | 91,23  | 91,40  | 91,55  | 91,68  | 91,79  | Sn [%]                |
|          | 1380   | 1670   | 1970   | 2270   | 2560   | 2860   | 3150   | 3440   | 3730   | 4030   | 4320   | 4610   | 4900   | Q [m <sup>3</sup> /h] |
|          | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 0      | 0      | 0      | 0      | Δp [Pa]               |

Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level 25dB(A), for the respective dimension. Additional data can be consulted on our website.



# Fire dampers

## CU-LT

### Correction factor $\Delta L$

To obtain the sound power level for the  $L_{W \text{ oct}}$  octave midband

$L_{WA}$  = A-weighted sound power level

$\Delta L$  = Correction factor

$L_{W \text{ oct}}$  = Sound power level for each octave midband

$$L_{W \text{ oct}} = \Delta L + L_{WA}$$

| [Hz]        | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|-------------|----|-----|-----|-----|------|------|------|------|
| 2 - 4 m/s   | 22 | 9   | -2  | -11 | -18  | -21  | -17  | -8   |
| 6 - 8 m/s   | 17 | 10  | 1   | -4  | -8   | -13  | -19  | -21  |
| 10 - 12 m/s | 15 | 9   | 0   | -4  | -7   | -10  | -14  | -20  |

Deduct  $L_{WA}$  from the selection graph on page 342.

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# Fire dampers

## CU-LT

### Operating mechanisms

**MFUSP:** simple operating mechanism with fusible link  
The operating mechanism MFUSP automatically unlocks the blade when the temperature in the duct exceeds 72°C.

The damper needs to be rearmed manually.

- Standard:**
- Fusible link 72° C
  - Manual unlocking possible
  - Manual rearmation, use the rearmation handle (turn clockwise)
  - IP42
- Options:**
- FDCU: Unipolar beginning and end of range switches

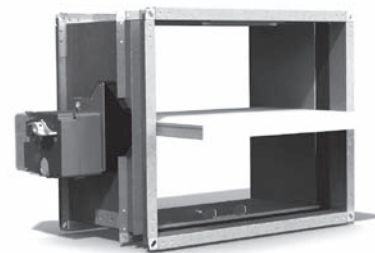


fig. CU-LT + MFUSP

**MMAG:** Upgradable automatic / remote controlled operating mechanism with fusible link  
The operating mechanism MMAG automatically unlocks the blade when the temperature in the duct exceeds 72°C. It can also close the damper by sending an electrical impulse (VD) or by interrupting the power supply (VM) to the magnet.  
Manual or motorized rearmation (ME MMAG).

- Standard:**
- Fusible link 72° C
  - Manual unlocking possible
  - Manual rearmation, use a rearmation handle (turn clockwise)
  - IP42
- Options:**
- Remote controlled by means of a dual voltage magnet 24/48V
- Types of magnets:**
- VD = natural magnet
  - VM = electromagnet
- FDCU : Unipolar beginning and end of range switches
  - FDCB : Bipolar beginning and end of range switches
  - ME : Rearmation motor

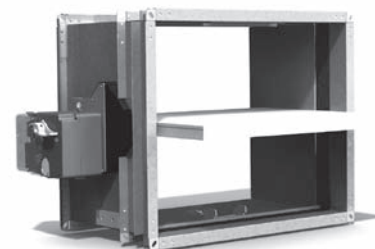


fig. CU-LT + MMAG

**BLF(T) :** spring-return actuator (with thermo-electric fuse)  
When connected to the power supply, the actuator moves the blade into its standby position (open). When the power is interrupted, an internal armed spring closes the blade (safety position).

If the motor is equipped with a thermo-electric fuse BLFT, this will interrupt the power supply when the temperature in the duct exceeds 72°C.

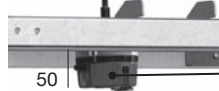


fig. thermo-electric fuse

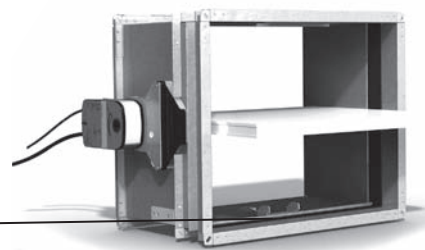







fig. CU-LT + BLFT

### Technical data

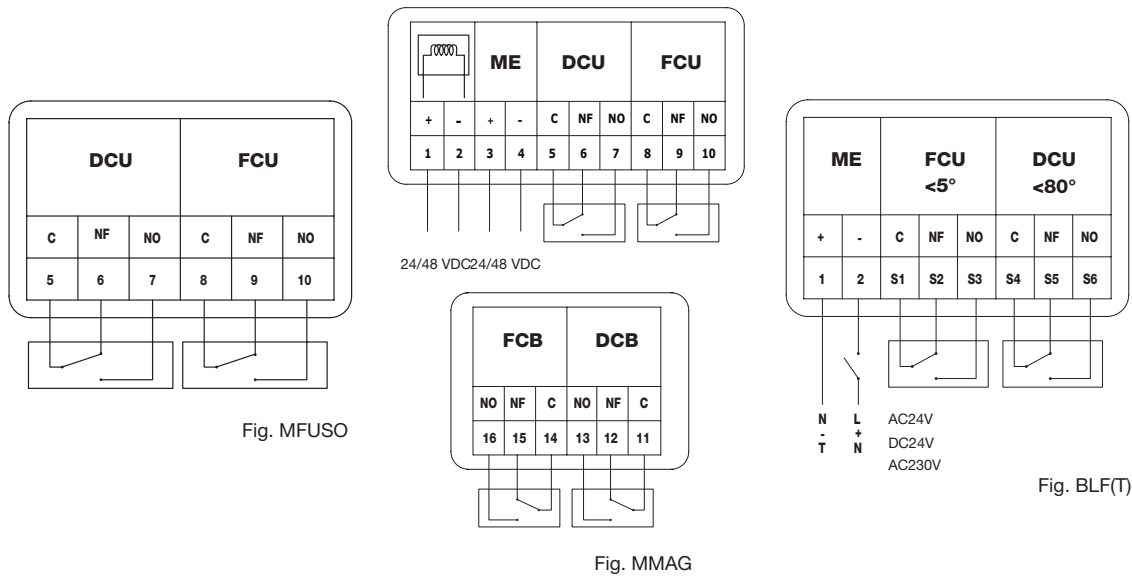
| Operating mechanism   | CU-LT MFUSP  | CU-LT MMAG  | CU-LT BLF(T)  |
|-----------------------|--|---|---|
| <b>Description</b>    | Automatic fire damper  | Upgradable automatic and remote controlled damper                                   | Motorized remote controlled damper with spring-return actuator  |
| <b>Certifications</b> |    |  |   |
| <b>Classification</b> | Fire resistance :<br>- EI 120 (ve i↔o) S : range until 800 x 600 : Mounting in rigid wall min. 100 mm<br>- EI 90 (ve i↔o) S : range until 800 x 600 : Mounting in flexible wall 60' min. 100 mm<br>- EI 60 (ho i↔o) S : range until 800 x 600 : Mounting in rigid floor/ceiling min. 110 mm<br>- EI 60 (ve i↔o) S : range until 800 x 600 : Mounting in rigid wall min. 110 mm<br>- EI 120 (ho i↔o) S : range until 800 x 600 : Mounting in rigid floor/ceiling min. 150 mm<br>Pressure during test : 500 Pa |   |   |



# Fire dampers

# CU-LT

## Electrical connections



| MFUSP                              | MMAG  | BLF(T)  |
|------------------------------------|---|---|
| <b>Power supply MFUSP</b>          | <b>Power supply motor/ magnet MMAG</b>  | <b>Power supply motor BLF(T)</b>  |
| n.a.                               | Rearmation motor (ME): 24/48 VDC (automatic switch)<br><br>Magnet: 24/48 VDC (automatic switch)                         | BLF(T)24: 24VAC / 24VDC<br><br>BLF(T)230: 230VAC  |
| <b>Power consumption</b>           | <b>Power consumption</b>  | <b>Power consumption</b>  |
| n.a.<br><br>n.a.<br><br>n.a.       | Rearmation motor (ME):<br>24VDC : Pmax = 10W<br>48VDC : Pmax = 15W<br><br>Magnet:<br>VM: Pnom = 1,5W<br>VD: Pmax = 3,5W | BLF(T)24:<br><br>motoring: 5W<br>holding: 2,5W<br><br>BLF(T)230:<br><br>motoring: 6W<br>holding: 3W |
| <b>Position switches</b>           | <b>Position switches</b>  | <b>Position switches</b>  |
| Standard: 1mA...1A, DC 5V...AC 48V | Standard: 1mA...500mA, DC 5V...AC 48V   | Standard: 1mA...3A, DC 5V...AC 250V<br>SN2: 1mA...3A, DC 5V...AC 250V                               |
| <b>Running time</b>                | <b>Running time</b>   | <b>Running time</b>   |
| motor: n.a<br>spring: 1s           | Motor: < 30 s<br>spring: 1s   | motor: 40 ... 75s<br>spring: 20s  |
| <b>Noise level</b>                 | <b>Noise level</b>  | <b>Noise level</b>  |
| n.a.                               | Motor: max 66 DB (A)  | motor: max 45 dB (A)<br>spring: ca. 62 dB (A)   |
| <b>Degree of protection</b>        | <b>Degree of protection</b>   | <b>Degree of protection</b>   |
| IP 45                              | IP 45   | IP 54   |





# Fire dampers

# CU-LT

## Position of the thermo-electric fuse for BLFT(T)

| Height  | Width   | Position                                     |
|---------|---------|--|
| ≤ 300mm | = 200mm | on the side opposite to the mechanism        |
|         | > 200mm | on the W-side next to the inspection shutter |
| > 300mm |         | on the same side of the mechanism            |

The mechanism is always mounted on the H-side.

### Standard:

- Thermo-electric fuse 72°C for BLFT
- Motorized unlocking and rearmation
- Manual rearmation possible, use the enclosed handle turn clockwise
- 24V or 230V
- Integrated unipolar begin and end of range switches
- IP 54

### Options:

- SN2 Bipolar begin and end of range switches
- ST plug





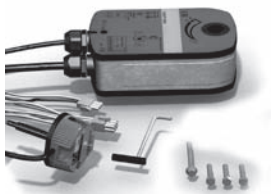


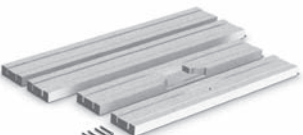
# Fire dampers

CU-LT

## Evolution kits

|   |   |                          |
|---|---|--------------------------|
|    | <b>KITS MFUSP</b>   |                          |
|   | Automatic operating mechanism MFUSP with fusible link 72°C    |                          |
|    | <b>KITS FUS 72 MFUS(P)</b>                                    |                          |
|   | Fusible link 72°C for MFUS(P)                                 |                          |
|    | <b>KITS FDCU MFUS(P)</b>                                      |                          |
|   | Unipolar beginning and end of range switches FDCU for MFUS(P) |                          |
|   | <b>KITS MMAG</b>  |                          |
|   | Upgradable operating mechanism MMAG with fusible link 72°C    |                          |
|  | <b>KITS FUS 72 MMAG</b>                                       |                          |
|   | Fusible link 72°C for MMAG                                    |                          |
|  | <b>KITS VD MMAG FDCU</b>                                      | <b>KITS VM MMAG FDCU</b> |
|   | Magnet VD24/48, VM24/48 with FDCU for MMAG                    |                          |
|  | <b>KITS ME MMAG</b>   |                          |
|   | Rearmation motor ME 24/48 for MMAG                            |                          |
|  | <b>KITS FDCU MMAG</b>   |                          |
|   | Unipolar beginning and end of range switches FDCU for MMAG    |                          |

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|--|---|---|------------------------|
| 1  |    | <b>KITS FDCB MMAG</b>   |                        |
|  |   | Bipolar beginning and end of range switches FDCB for MMAG         |                        |
| 3  |    | <b>KITS BLF 24</b>  | <b>KITS BLF 24-ST</b>  |
|  |   | <b>KITS BLF 230</b>   |                        |
| Actuator Belimo BLF 24V/230V or BLF 24V with plug (ST), without thermo-electric fuse (T) |   |   |                        |
| 5  |    | <b>KITS BLFT 24</b>   | <b>KITS BLFT 24-ST</b> |
|  |   | <b>KITS BLFT 230</b>  |                        |
| Actuator Belimo BLF 24V/230V or BLF 24V with plug (ST) and thermo-electric fuse (T)      |   |   |                        |
| 7  |   | <b>KITS SN2 BLF</b>   |                        |
|  |   | Bipolar beginning and end of range switches FDCB for BLF actuator |                        |
| 9  |  | <b>KITS BAE 72</b>  |                        |
|  |   | Thermo-electric fuse 72°C (T) for Belimo BLFT 24V                 |                        |
| 11   |  | <b>KITS CULT-IFW</b>  |                        |
|  |   | Positioning kit flexible wall                                     |                        |





# Fire dampers

## CU-LT-1s



### Description

Rectangular fire dampers CU-LT-1s are installed wall mounted in ventilation ducts passing through a construction element in order to stop the propagation of fire. They exist of a modular operating mechanism positioned completely outside the wall.

The rectangular fire damper CU-LT-1s has a fire resistance up to 120 minutes. The casing is made of galvanised steel. This fire damper is especially designed for smaller dimensions from 200x100 up to 800x600mm.

The fire damper can be equipped with a fusible link mechanism up to a motorized mechanism.

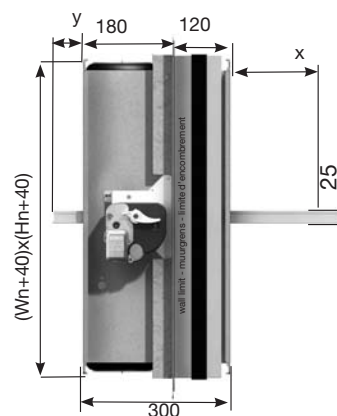
### Standard

- Tested according to EN 1366-2 up to 500Pa
- Minimal pressure drop - very thin damper blade 25mm
- Air tightness according to EN 1751 minimum class B (class C on demand)
- Suitable for installing wall mounted on rigid wall/floor and flexible wall (metal stud gypsum plasterboard and gypsum blocs)
- Operating mechanism completely outside the wall
- Easy to install
- Maintenance free
- For interior applications

### Ordering example

|         |                 |            |            |             |           |
|---------|-----------------|------------|------------|-------------|-----------|
|         | <b>CU-LT-1s</b> | <b>200</b> | <b>200</b> | <b>MMAG</b> | <b>ME</b> |
| Product |                 |            |            |             |           |
| Width   |                 |            |            |             |           |
| Height  |                 |            |            |             |           |
| Type    |                 |            |            |             |           |
| Options |                 |            |            |             |           |

### Dimensions



The damper blade exceeds the tunnel:

$$x = (Hn-6)/2 - 70$$

$$y = (Hn-6)/2 - 230$$

### Fire resistance according to EN 13501-3 : 2005

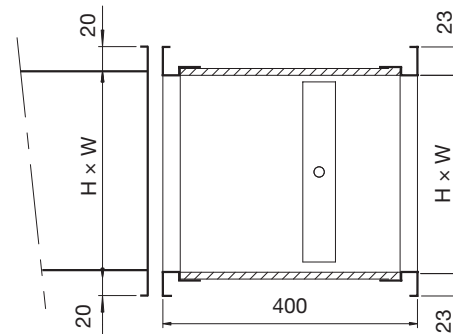
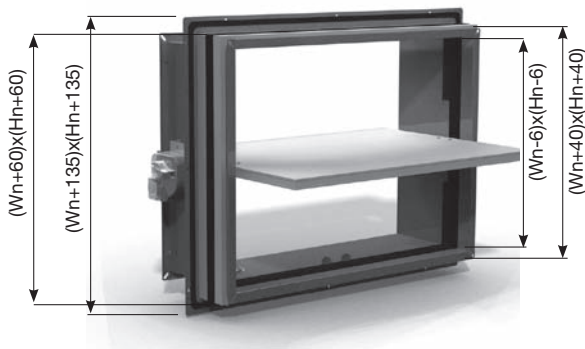
|               |   | EI 120 S<br>(500 Pa) | EI 90 S<br>(500 Pa) |
|---------------|---|----------------------|---------------------|
| Rigid wall    | Aerated concrete wall<br>100mm<br>(ve i ↔ o)  | up to 800x600        |                     |
| Rigid floor   | Aerated concrete floor<br>150mm<br>(ho i ↔ o) | (*)                  | (*)                 |
| Flexible wall | Light partition wall<br>100mm<br>(ve i ↔ o)   |                      | up to 800x600       |
| Flexible wall | Gypsum blocks wall<br>70mm<br>(ve i ↔ o)      | up to 800x600        |                     |

v<sub>e</sub> = damper mounted directly in the wall  
 h<sub>o</sub> = damper mounted directly in a floor/ceiling  
 i ↔ o = fire can come from either direction  
 Pa = Pascal  
 E = integrity  
 I = thermal insulation  
 S = smoke leakage  
 (\*) result is not yet available



## Types of frames

### PG20



- Connection to ducts with 20 mm flanges ( and 30 mm flanges)
- Connection of damper/duct:
  - either with sliding profile (flanges of 20 mm only)
  - or with bolts
- The four corners of the frame are provided with elliptical holes  $\varnothing 8,5 \times 16$  mm.

### Option : inspection shutter ul

An inspection shutter can be used to visualise the position and the condition (e.g. filth) of the damper. The inspection shutter is always mounted two-fold, one on the lower side and one on the upper side of the fire damper.



## Technical data for the motors

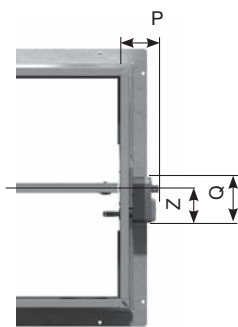


fig. CU-LT-1s + MFUSP

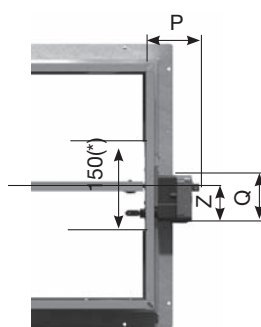


fig. CU-LT-1s + MMAG

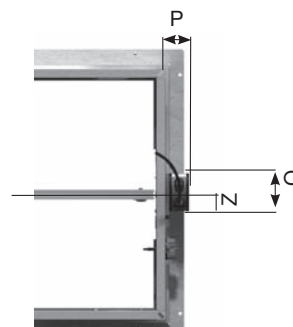


fig. CU-LT-1s + BLF(T)

(\*) The mechanism and the transmission stick out with  $H_n = 100$  mm

If the height < 200 mm the mechanisms MFUSP and MMAG are turned 90° for the assembly.

| Height < 200 mm | MFUSP | MMAG   | BLF(T) |
|-----------------|-------|--------|--------|
| P               | 103   | 150,50 | 92     |
| Z               | 62    | 62     | 49     |
| Q               | 125   | 173    | 98     |

| Height $\geq$ 200 mm | MFUSP | MMAG   | BLF(T) |
|----------------------|-------|--------|--------|
| P                    | 103   | 150,50 | 92     |
| Z                    | 95    | 95     | 49     |
| Q                    | 120   | 125    | 98     |



# Fire dampers

# CU-LT-1s

## Weights

### Weight CU-LT-1s + MFUSP [kg]

| H\W [mm] | 200 | 250 | 300  | 350  | 400  | 450  | 500  | 550  | 600  | 650  | 700  | 750  | 800  |
|----------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| 100      | 3,7 | 4,0 | 4,4  | 4,8  | 5,2  | 5,5  | 5,9  | 6,3  | 6,6  | 7,0  | 7,4  | 7,8  | 8,1  |
| 150      | 4,1 | 4,6 | 5,0  | 5,4  | 5,9  | 6,3  | 6,7  | 7,1  | 7,6  | 8,0  | 8,4  | 8,9  | 9,3  |
| 200      | 4,6 | 5,1 | 5,6  | 6,1  | 6,6  | 7,1  | 7,5  | 8,0  | 8,5  | 9,0  | 9,5  | 10,0 | 10,4 |
| 250      | 5,1 | 5,7 | 6,2  | 6,7  | 7,3  | 7,8  | 8,4  | 8,9  | 9,4  | 10,0 | 10,5 | 11,1 | 11,6 |
| 300      | 5,6 | 6,2 | 6,8  | 7,4  | 8,0  | 8,6  | 9,2  | 9,8  | 10,4 | 11,0 | 11,6 | 12,1 | 12,7 |
| 350      | 6,1 | 6,7 | 7,4  | 8,0  | 8,7  | 9,3  | 10,0 | 10,6 | 11,3 | 11,9 | 12,6 | 13,2 | 13,9 |
| 400      | 6,6 | 7,3 | 8,0  | 8,7  | 9,4  | 10,1 | 10,8 | 11,5 | 12,2 | 12,9 | 13,6 | 14,3 | 15,0 |
| 450      | 7,1 | 7,8 | 8,6  | 9,3  | 10,1 | 10,9 | 11,6 | 12,4 | 13,1 | 13,9 | 14,7 | 15,4 | 16,2 |
| 500      | 7,5 | 8,4 | 9,2  | 10,0 | 10,8 | 11,6 | 12,4 | 13,3 | 14,1 | 14,9 | 15,7 | 16,5 | 17,3 |
| 550      | 8,0 | 8,9 | 9,8  | 10,6 | 11,5 | 12,4 | 13,3 | 14,1 | 15,0 | 15,9 | 16,8 | 17,6 | 18,5 |
| 600      | 8,5 | 9,4 | 10,4 | 11,3 | 12,2 | 13,1 | 14,1 | 15,0 | 15,9 | 16,9 | 17,8 | 18,7 | 19,7 |

### Weight CU-LT-1s + MMAG (automatic) [kg]

| H\W [mm] | 200 | 250 | 300  | 350  | 400  | 450  | 500  | 550  | 600  | 650  | 700  | 750  | 800  |
|----------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| 100      | 3,9 | 4,3 | 4,7  | 5,0  | 5,4  | 5,8  | 6,1  | 6,5  | 6,9  | 7,3  | 7,6  | 8,0  | 8,4  |
| 150      | 4,4 | 4,8 | 5,3  | 5,7  | 6,1  | 6,5  | 7,0  | 7,4  | 7,8  | 8,3  | 8,7  | 9,1  | 9,5  |
| 200      | 4,9 | 5,4 | 5,8  | 6,3  | 6,8  | 7,3  | 7,8  | 8,3  | 8,8  | 9,2  | 9,7  | 10,2 | 10,7 |
| 250      | 5,4 | 5,9 | 6,4  | 7,0  | 7,5  | 8,1  | 8,6  | 9,1  | 9,7  | 10,2 | 10,8 | 11,3 | 11,8 |
| 300      | 5,8 | 6,4 | 7,0  | 7,6  | 8,2  | 8,8  | 9,4  | 10,0 | 10,6 | 11,2 | 11,8 | 12,4 | 13,0 |
| 350      | 6,3 | 7,0 | 7,6  | 8,3  | 8,9  | 9,6  | 10,2 | 10,9 | 11,5 | 12,2 | 12,8 | 13,5 | 14,1 |
| 400      | 6,8 | 7,5 | 8,2  | 8,9  | 9,6  | 10,3 | 11,1 | 11,8 | 12,5 | 13,2 | 13,9 | 14,6 | 15,3 |
| 450      | 7,3 | 8,1 | 8,8  | 9,6  | 10,3 | 11,1 | 11,9 | 12,6 | 13,4 | 14,2 | 14,9 | 15,7 | 16,4 |
| 500      | 7,8 | 8,6 | 9,4  | 10,2 | 11,1 | 11,9 | 12,7 | 13,5 | 14,3 | 15,1 | 16,0 | 16,8 | 17,6 |
| 550      | 8,3 | 9,1 | 10,0 | 10,9 | 11,8 | 12,6 | 13,5 | 14,4 | 15,3 | 16,1 | 17,0 | 17,9 | 18,7 |
| 600      | 8,8 | 9,7 | 10,6 | 11,5 | 12,5 | 13,4 | 14,3 | 15,3 | 16,2 | 17,1 | 18,0 | 19,0 | 19,9 |

### Weight CU-LT-1s + BLF(T) [kg]

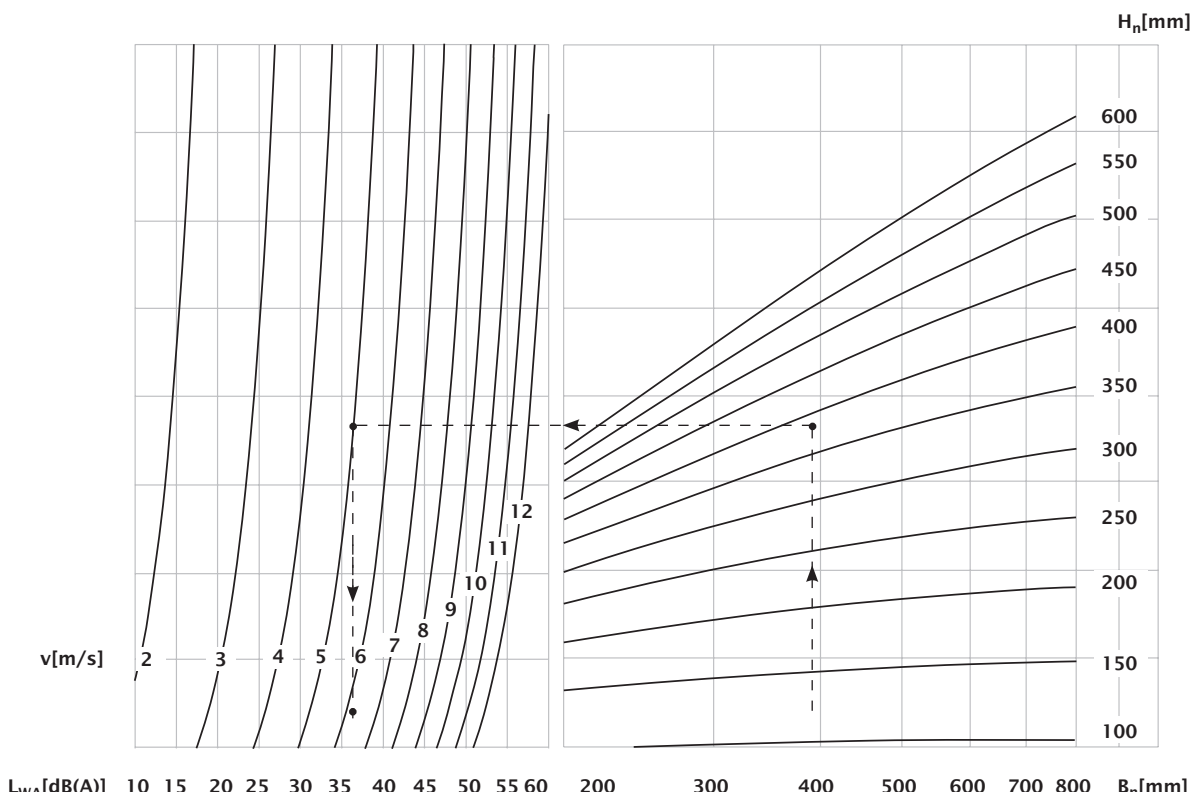
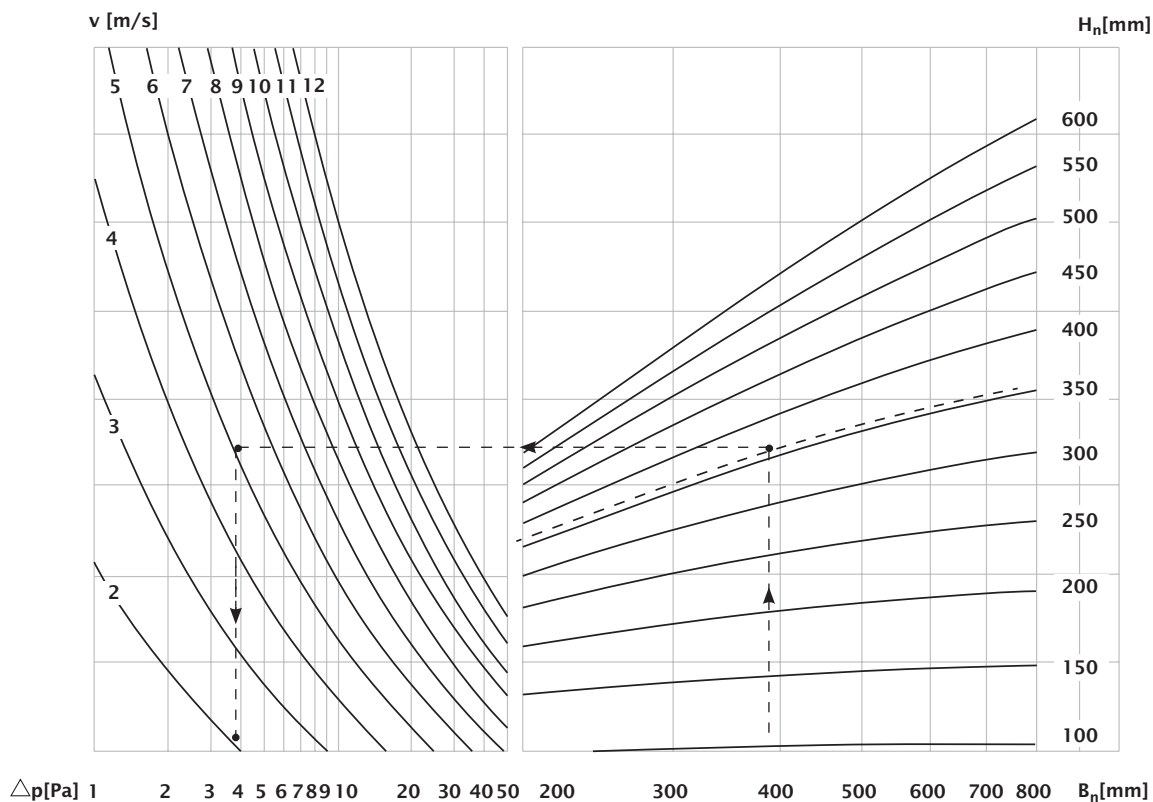
| H\W [mm] | 200 | 250  | 300  | 350  | 400  | 450  | 500  | 550  | 600  | 650  | 700  | 750  | 800  |
|----------|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| 100      | 5,0 | 5,4  | 5,8  | 6,1  | 6,5  | 6,9  | 7,2  | 7,6  | 8,0  | 8,4  | 8,7  | 9,1  | 9,5  |
| 150      | 5,5 | 5,9  | 6,4  | 6,8  | 7,2  | 7,6  | 8,1  | 8,5  | 8,9  | 9,4  | 9,8  | 10,2 | 10,6 |
| 200      | 6,0 | 6,5  | 6,9  | 7,4  | 7,9  | 8,4  | 8,9  | 9,4  | 9,9  | 10,3 | 10,8 | 11,3 | 11,8 |
| 250      | 6,5 | 7,0  | 7,5  | 8,1  | 8,6  | 9,2  | 9,7  | 10,2 | 10,8 | 11,3 | 11,9 | 12,4 | 12,9 |
| 300      | 6,9 | 7,5  | 8,1  | 8,7  | 9,3  | 9,9  | 10,5 | 11,1 | 11,7 | 12,3 | 12,9 | 13,5 | 14,1 |
| 350      | 7,4 | 8,1  | 8,7  | 9,4  | 10,0 | 10,7 | 11,3 | 12,0 | 12,6 | 13,3 | 13,9 | 14,6 | 15,2 |
| 400      | 7,9 | 8,6  | 9,3  | 10,0 | 10,7 | 11,4 | 12,2 | 12,9 | 13,6 | 14,3 | 15,0 | 15,7 | 16,4 |
| 450      | 8,4 | 9,2  | 9,9  | 10,7 | 11,4 | 12,2 | 13,0 | 13,7 | 14,5 | 15,3 | 16,0 | 16,8 | 17,5 |
| 500      | 8,9 | 9,7  | 10,5 | 11,3 | 12,2 | 13,0 | 13,8 | 14,6 | 15,4 | 16,2 | 17,1 | 17,9 | 18,7 |
| 550      | 9,4 | 10,2 | 11,1 | 12,0 | 12,9 | 13,7 | 14,6 | 15,5 | 16,4 | 17,2 | 18,1 | 19,0 | 19,8 |
| 600      | 9,9 | 10,8 | 11,7 | 12,6 | 13,6 | 14,5 | 15,4 | 16,4 | 17,3 | 18,2 | 19,1 | 20,1 | 21,0 |



# Fire dampers

# CU-LT-1s

## Selection graph



Elaborated example p. 15



# Fire dampers

# CU-LT-1s

## Pressure drop coefficient cu-lt-1s $\zeta$ [-]

| H/W [mm] | 200  | 250  | 300  | 350  | 400  | 450  | 500  | 550  | 600  | 650  | 700  | 750  | 800  |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 100      | 1,69 | 1,65 | 1,62 | 1,60 | 1,59 | 1,58 | 1,57 | 1,56 | 1,55 | 1,55 | 1,54 | 1,54 | 1,54 |
| 150      | 0,98 | 0,93 | 0,89 | 0,87 | 0,85 | 0,83 | 0,82 | 0,81 | 0,80 | 0,80 | 0,79 | 0,79 | 0,78 |
| 200      | 0,69 | 0,63 | 0,60 | 0,57 | 0,55 | 0,54 | 0,52 | 0,51 | 0,51 | 0,50 | 0,49 | 0,49 | 0,49 |
| 250      | 0,54 | 0,48 | 0,44 | 0,42 | 0,40 | 0,39 | 0,37 | 0,37 | 0,36 | 0,35 | 0,35 | 0,34 | 0,34 |
| 300      | 0,45 | 0,39 | 0,35 | 0,33 | 0,31 | 0,30 | 0,29 | 0,28 | 0,27 | 0,26 | 0,26 | 0,26 | 0,25 |
| 350      | 0,39 | 0,33 | 0,30 | 0,27 | 0,25 | 0,24 | 0,23 | 0,22 | 0,22 | 0,21 | 0,21 | 0,20 | 0,20 |
| 400      | 0,34 | 0,29 | 0,26 | 0,23 | 0,22 | 0,20 | 0,19 | 0,18 | 0,18 | 0,17 | 0,17 | 0,16 | 0,16 |
| 450      | 0,31 | 0,26 | 0,23 | 0,20 | 0,19 | 0,17 | 0,16 | 0,16 | 0,15 | 0,15 | 0,14 | 0,14 | 0,13 |
| 500      | 0,29 | 0,24 | 0,20 | 0,18 | 0,17 | 0,15 | 0,14 | 0,14 | 0,13 | 0,13 | 0,12 | 0,12 | 0,12 |
| 550      | 0,27 | 0,22 | 0,19 | 0,16 | 0,15 | 0,14 | 0,13 | 0,12 | 0,12 | 0,11 | 0,11 | 0,10 | 0,10 |
| 600      | 0,25 | 0,20 | 0,17 | 0,15 | 0,14 | 0,12 | 0,12 | 0,11 | 0,10 | 0,10 | 0,10 | 0,09 | 0,09 |

$$\Delta p = v^2 \times 0,6 \times \zeta \quad v = \frac{q}{A}$$

q = air flow in the duct [m³/h]

$\Delta p$  = static pressure drop [Pa]

$\zeta$  = pressure drop coefficient zeta [-]

A = internal surface of the duct [m²]

v = air speed in the duct [m/s]

$L_{WA}$  = A-weighted sound power level

$H_n/B_n$  = Nominal height/width of the damper

### Example:

Data:  $H_n = 350 \text{ mm}$        $W_n = 400 \text{ mm}$        $v = 5 \text{ m/s}$   
 Required:  $\Delta p = \text{ca. } 3,9 \text{ Pa}$   
 $L_{WA} = \text{ca. } 36 \text{ dB(A)}$       }      cfr. selection graph CU-LT-1s  
 Calculation:  $\Delta p = (5\text{m/s})^2 \times 0,6 \times 0,25 = 3,75 \text{ Pa}$

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



# Fire dampers

# CU-LT-1s

Elaborated example of a pressure drop calculation  $\Delta p$  with air speed  $v = 4\text{m/s}$

| $\Delta p[\text{Pa}]$ | 200   | 250   | 300   | 350   | 400   | 450   | 500   | 550   | 600   | 650   | 700   | 750   | 800   |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 100                   | 16,22 | 15,84 | 15,55 | 15,36 | 15,26 | 15,17 | 15,07 | 14,98 | 14,88 | 14,88 | 14,78 | 14,78 | 14,78 |
| 150                   | 9,41  | 8,93  | 8,54  | 8,35  | 8,16  | 7,97  | 7,87  | 7,78  | 7,68  | 7,68  | 7,58  | 7,58  | 7,49  |
| 200                   | 6,62  | 6,05  | 5,76  | 5,47  | 5,28  | 5,18  | 4,99  | 4,90  | 4,90  | 4,80  | 4,70  | 4,70  | 4,70  |
| 250                   | 5,18  | 4,61  | 4,22  | 4,03  | 3,84  | 3,74  | 3,55  | 3,55  | 3,46  | 3,36  | 3,36  | 3,26  | 3,26  |
| 300                   | 4,32  | 3,74  | 3,36  | 3,17  | 2,98  | 2,88  | 2,78  | 2,69  | 2,59  | 2,50  | 2,50  | 2,50  | 2,40  |
| 350                   | 3,74  | 3,17  | 2,88  | 2,59  | 2,40  | 2,30  | 2,21  | 2,11  | 2,11  | 2,02  | 2,02  | 1,92  | 1,92  |
| 400                   | 3,26  | 2,78  | 2,50  | 2,21  | 2,11  | 1,92  | 1,82  | 1,73  | 1,73  | 1,63  | 1,63  | 1,54  | 1,54  |
| 450                   | 2,98  | 2,50  | 2,21  | 1,92  | 1,82  | 1,63  | 1,54  | 1,54  | 1,44  | 1,44  | 1,34  | 1,34  | 1,25  |
| 500                   | 2,78  | 2,30  | 1,92  | 1,73  | 1,63  | 1,44  | 1,34  | 1,34  | 1,25  | 1,25  | 1,15  | 1,15  | 1,15  |
| 550                   | 2,59  | 2,11  | 1,82  | 1,54  | 1,44  | 1,34  | 1,25  | 1,15  | 1,15  | 1,06  | 1,06  | 0,96  | 0,96  |
| 600                   | 2,40  | 1,92  | 1,63  | 1,44  | 1,34  | 1,15  | 1,15  | 1,06  | 0,96  | 0,96  | 0,96  | 0,86  | 0,86  |

Elaborated example of a pressure drop calculation  $\Delta p$  with air speed  $v = 7\text{m/s}$

| $\Delta p[\text{Pa}]$ | 200   | 250   | 300   | 350   | 400   | 450   | 500   | 550   | 600   | 650   | 700   | 750   | 800   |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 100                   | 49,69 | 48,51 | 47,63 | 47,04 | 46,75 | 46,45 | 46,16 | 45,86 | 45,57 | 45,57 | 45,28 | 45,28 | 45,28 |
| 150                   | 28,81 | 27,34 | 26,17 | 25,58 | 24,99 | 24,40 | 24,11 | 23,81 | 23,52 | 23,52 | 23,23 | 23,23 | 22,93 |
| 200                   | 20,29 | 18,52 | 17,64 | 16,76 | 16,17 | 15,88 | 15,29 | 14,99 | 14,99 | 14,70 | 14,41 | 14,41 | 14,41 |
| 250                   | 15,88 | 14,11 | 12,94 | 12,35 | 11,76 | 11,47 | 10,88 | 10,88 | 10,58 | 10,29 | 10,29 | 10,00 | 10,00 |
| 300                   | 13,23 | 11,47 | 10,29 | 9,70  | 9,11  | 8,82  | 8,53  | 8,23  | 7,94  | 7,64  | 7,64  | 7,64  | 7,35  |
| 350                   | 11,47 | 9,70  | 8,82  | 7,94  | 7,35  | 7,06  | 6,76  | 6,47  | 6,47  | 6,17  | 6,17  | 5,88  | 5,88  |
| 400                   | 10,00 | 8,53  | 7,64  | 6,76  | 6,47  | 5,88  | 5,59  | 5,29  | 5,29  | 5,00  | 5,00  | 4,70  | 4,70  |
| 450                   | 9,11  | 7,64  | 6,76  | 5,88  | 5,59  | 5,00  | 4,70  | 4,70  | 4,41  | 4,41  | 4,12  | 4,12  | 3,82  |
| 500                   | 8,53  | 7,06  | 5,88  | 5,29  | 5,00  | 4,41  | 4,12  | 4,12  | 3,82  | 3,82  | 3,53  | 3,53  | 3,53  |
| 550                   | 7,94  | 6,47  | 5,59  | 4,70  | 4,41  | 4,12  | 3,82  | 3,53  | 3,53  | 3,23  | 3,23  | 2,94  | 2,94  |
| 600                   | 7,35  | 5,88  | 5,00  | 4,41  | 4,12  | 3,53  | 3,53  | 3,23  | 2,94  | 2,94  | 2,94  | 2,65  | 2,65  |



# Fire dampers

# CU-LT-1s

## Selection data CU-LT-1s

A-weighted sound power level  $L_{WA}$  of 45 dB(A) in the duct

$S_n$  = Free air passage

$Q$  = Air flow

$\Delta p$  = Pressure drop

| H/W [mm] | 200    | 250    | 300    | 350    | 400    | 450    | 500    | 550    | 600    | 650    | 700    | 750    | 800    |                         |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------------------|
| 100      | 0,0099 | 0,0127 | 0,0154 | 0,0182 | 0,0209 | 0,0237 | 0,0264 | 0,0292 | 0,0319 | 0,0347 | 0,0374 | 0,0402 | 0,0429 | $S_n$ [m <sup>2</sup> ] |
|          | 54,29  | 55,15  | 55,72  | 56,13  | 56,43  | 56,67  | 56,85  | 57,00  | 57,13  | 57,24  | 57,33  | 57,41  | 57,48  | $S_n$ [%]               |
|          | 690    | 860    | 1030   | 1200   | 1360   | 1530   | 1700   | 1870   | 2030   | 2200   | 2370   | 2540   | 2700   | $Q$ [m <sup>3</sup> /h] |
|          | 93     | 90     | 88     | 87     | 85     | 84     | 84     | 83     | 82     | 82     | 82     | 82     | 81     | $\Delta p$ [Pa]         |
| 150      | 0,0189 | 0,0242 | 0,0294 | 0,0347 | 0,0399 | 0,0452 | 0,0504 | 0,0557 | 0,0609 | 0,0662 | 0,0714 | 0,0767 | 0,0819 | $S_n$ [m <sup>2</sup> ] |
|          | 67,65  | 68,73  | 69,44  | 69,95  | 70,33  | 70,62  | 70,85  | 71,04  | 71,20  | 71,33  | 71,45  | 71,54  | 71,63  | $S_n$ [%]               |
|          | 940    | 1170   | 1390   | 1610   | 1840   | 2060   | 2290   | 2510   | 2730   | 2960   | 3180   | 3410   | 3630   | $Q$ [m <sup>3</sup> /h] |
|          | 24     | 23     | 22     | 21     | 20     | 20     | 20     | 19     | 19     | 19     | 19     | 19     | 18     | $\Delta p$ [Pa]         |
| 200      | 0,0279 | 0,0357 | 0,0434 | 0,0512 | 0,0589 | 0,0667 | 0,0744 | 0,0822 | 0,0899 | 0,0977 | 0,1054 | 0,1132 | 0,1209 | $S_n$ [m <sup>2</sup> ] |
|          | 74,13  | 75,31  | 76,09  | 76,65  | 77,06  | 77,38  | 77,63  | 77,84  | 78,01  | 78,16  | 78,29  | 78,39  | 78,49  | $S_n$ [%]               |
|          | 1190   | 1470   | 1750   | 2030   | 2310   | 2590   | 2860   | 3140   | 3420   | 3700   | 3980   | 4260   | 4530   | $Q$ [m <sup>3</sup> /h] |
|          | 28     | 25     | 23     | 22     | 21     | 21     | 20     | 19     | 19     | 19     | 19     | 18     | 18     | $\Delta p$ [Pa]         |
| 250      | 0,0369 | 0,0472 | 0,0574 | 0,0677 | 0,0779 | 0,0882 | 0,0984 | 0,1087 | 0,1189 | 0,1292 | 0,1394 | 0,1497 | 0,1599 | $S_n$ [m <sup>2</sup> ] |
|          | 77,95  | 79,20  | 80,02  | 80,60  | 81,03  | 81,37  | 81,64  | 81,85  | 82,04  | 82,19  | 82,32  | 82,44  | 82,53  | $S_n$ [%]               |
|          | 1440   | 1770   | 2100   | 2440   | 2770   | 3100   | 3430   | 3760   | 4090   | 4420   | 4750   | 5090   | 5420   | $Q$ [m <sup>3</sup> /h] |
|          | 21     | 18     | 16     | 15     | 14     | 14     | 13     | 13     | 12     | 12     | 12     | 12     | 11     | $\Delta p$ [Pa]         |
| 300      | 0,0459 | 0,0587 | 0,0714 | 0,0842 | 0,0969 | 0,1097 | 0,1224 | 0,1352 | 0,1479 | 0,1607 | 0,1734 | 0,1862 | 0,1989 | $S_n$ [m <sup>2</sup> ] |
|          | 80,48  | 81,76  | 82,60  | 83,20  | 83,65  | 84,00  | 84,28  | 84,50  | 84,69  | 84,85  | 84,99  | 85,10  | 85,21  | $S_n$ [%]               |
|          | 1690   | 2070   | 2450   | 2840   | 3220   | 3600   | 3990   | 4370   | 4750   | 5130   | 5520   | 5900   | 6280   | $Q$ [m <sup>3</sup> /h] |
|          | 16     | 14     | 12     | 11     | 10     | 10     | 9      | 9      | 9      | 8      | 8      | 8      | 8      | $\Delta p$ [Pa]         |
| 350      | 0,0549 | 0,0702 | 0,0854 | 0,1007 | 0,1159 | 0,1312 | 0,1464 | 0,1617 | 0,1769 | 0,1922 | 0,2074 | 0,2227 | 0,2379 | $S_n$ [m <sup>2</sup> ] |
|          | 82,26  | 83,58  | 84,44  | 85,05  | 85,51  | 85,87  | 86,15  | 86,38  | 86,57  | 86,74  | 86,87  | 86,99  | 87,10  | $S_n$ [%]               |
|          | 1930   | 2370   | 2800   | 3240   | 3670   | 4100   | 4540   | 4970   | 5400   | 5830   | 6260   | 6700   | 7130   | $Q$ [m <sup>3</sup> /h] |
|          | 14     | 11     | 10     | 9      | 8      | 8      | 7      | 7      | 7      | 6      | 6      | 6      | 6      | $\Delta p$ [Pa]         |
| 400      | 0,0639 | 0,0817 | 0,0994 | 0,1172 | 0,1349 | 0,1527 | 0,1704 | 0,1882 | 0,2059 | 0,2237 | 0,2414 | 0,2592 | 0,2769 | $S_n$ [m <sup>2</sup> ] |
|          | 83,60  | 84,93  | 85,81  | 86,43  | 86,90  | 87,26  | 87,55  | 87,78  | 87,98  | 88,14  | 88,28  | 88,41  | 88,51  | $S_n$ [%]               |
|          | 2170   | 2660   | 3150   | 3630   | 4110   | 4600   | 5080   | 5560   | 6040   | 6520   | 7000   | 7480   | 7960   | $Q$ [m <sup>3</sup> /h] |
|          | 12     | 9      | 8      | 7      | 7      | 6      | 6      | 5      | 5      | 5      | 5      | 5      | 5      | $\Delta p$ [Pa]         |
| 450      | 0,0729 | 0,0932 | 0,1134 | 0,1337 | 0,1539 | 0,1742 | 0,1944 | 0,2147 | 0,2349 | 0,2552 | 0,2754 | 0,2957 | 0,3159 | $S_n$ [m <sup>2</sup> ] |
|          | 84,63  | 85,98  | 86,87  | 87,50  | 87,98  | 88,34  | 88,63  | 88,87  | 89,07  | 89,23  | 89,38  | 89,50  | 89,61  | $S_n$ [%]               |
|          | 2420   | 2960   | 3490   | 4020   | 4560   | 5090   | 5620   | 6150   | 6680   | 7200   | 7730   | 8260   | 8790   | $Q$ [m <sup>3</sup> /h] |
|          | 10     | 8      | 7      | 6      | 6      | 5      | 5      | 4      | 4      | 4      | 4      | 4      | 4      | $\Delta p$ [Pa]         |
| 500      | 0,0819 | 0,1047 | 0,1274 | 0,1502 | 0,1729 | 0,1957 | 0,2184 | 0,2412 | 0,2639 | 0,2867 | 0,3094 | 0,3322 | 0,3549 | $S_n$ [m <sup>2</sup> ] |
|          | 85,46  | 86,82  | 87,72  | 88,36  | 88,83  | 89,20  | 89,49  | 89,73  | 89,93  | 90,10  | 90,25  | 90,37  | 90,48  | $S_n$ [%]               |
|          | 2660   | 3250   | 3830   | 4410   | 4990   | 5570   | 6150   | 6730   | 7300   | 7880   | 8460   | 9030   | 9610   | $Q$ [m <sup>3</sup> /h] |
|          | 9      | 7      | 6      | 5      | 5      | 4      | 4      | 4      | 4      | 3      | 3      | 3      | 3      | $\Delta p$ [Pa]         |
| 550      | 0,0909 | 0,1162 | 0,1414 | 0,1667 | 0,1919 | 0,2172 | 0,2424 | 0,2677 | 0,2929 | 0,3182 | 0,3434 | 0,3687 | 0,3939 | $S_n$ [m <sup>2</sup> ] |
|          | 86,13  | 87,50  | 88,41  | 89,05  | 89,53  | 89,90  | 90,20  | 90,44  | 90,64  | 90,81  | 90,96  | 91,08  | 91,19  | $S_n$ [%]               |
|          | 2900   | 3540   | 4170   | 4800   | 5430   | 6060   | 6680   | 7300   | 7930   | 8550   | 9170   | 9790   | 10420  | $Q$ [m <sup>3</sup> /h] |
|          | 9      | 7      | 5      | 5      | 4      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | 3      | $\Delta p$ [Pa]         |
| 600      | 0,0999 | 0,1277 | 0,1554 | 0,1832 | 0,2109 | 0,2387 | 0,2664 | 0,2942 | 0,3219 | 0,3497 | 0,3774 | 0,4052 | 0,4329 | $S_n$ [m <sup>2</sup> ] |
|          | 86,69  | 88,07  | 88,99  | 89,63  | 90,11  | 90,49  | 90,79  | 91,03  | 91,23  | 91,40  | 91,55  | 91,68  | 91,79  | $S_n$ [%]               |
|          | 3140   | 3830   | 4510   | 5190   | 5860   | 6540   | 7210   | 7880   | 8550   | 9220   | 9880   | 10550  | 11220  | $Q$ [m <sup>3</sup> /h] |
|          | 8      | 6      | 5      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | 2      | 2      | 2      | $\Delta p$ [Pa]         |

Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level 45dB(A), for the respective dimension.





# Fire dampers

# CU-LT-1s

## A-weighted sound power level $L_{WA}$ of 40 dB(A) in the duct

| H/W [mm] | 200    | 250    | 300    | 350    | 400    | 450    | 500    | 550    | 600    | 650    | 700    | 750    | 800    |                       |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------|
| 100      | 0,0099 | 0,0127 | 0,0154 | 0,0182 | 0,0209 | 0,0237 | 0,0264 | 0,0292 | 0,0319 | 0,0347 | 0,0374 | 0,0402 | 0,0429 | Sn [m <sup>2</sup> ]  |
|          | 54,29  | 55,15  | 55,72  | 56,13  | 56,43  | 56,67  | 56,85  | 57,00  | 57,13  | 57,24  | 57,33  | 57,41  | 57,48  | Sn [%]                |
|          | 560    | 700    | 840    | 970    | 1110   | 1250   | 1380   | 1520   | 1650   | 1790   | 1930   | 2060   | 2200   | Q [m <sup>3</sup> /h] |
|          | 61     | 60     | 59     | 57     | 57     | 56     | 55     | 55     | 54     | 54     | 54     | 54     | 54     | Δp [Pa]               |
| 150      | 0,0189 | 0,0242 | 0,0294 | 0,0347 | 0,0399 | 0,0452 | 0,0504 | 0,0557 | 0,0609 | 0,0662 | 0,0714 | 0,0767 | 0,0819 | Sn [m <sup>2</sup> ]  |
|          | 67,65  | 68,73  | 69,44  | 69,95  | 70,33  | 70,62  | 70,85  | 71,04  | 71,20  | 71,33  | 71,45  | 71,54  | 71,63  | Sn [%]                |
|          | 770    | 950    | 1130   | 1310   | 1490   | 1680   | 1860   | 2040   | 2220   | 2400   | 2590   | 2770   | 2950   | Q [m <sup>3</sup> /h] |
|          | 30     | 28     | 26     | 25     | 24     | 24     | 23     | 23     | 23     | 22     | 22     | 22     | 22     | Δp [Pa]               |
| 200      | 0,0279 | 0,0357 | 0,0434 | 0,0512 | 0,0589 | 0,0667 | 0,0744 | 0,0822 | 0,0899 | 0,0977 | 0,1054 | 0,1132 | 0,1209 | Sn [m <sup>2</sup> ]  |
|          | 74,13  | 75,31  | 76,09  | 76,65  | 77,06  | 77,38  | 77,63  | 77,84  | 78,01  | 78,16  | 78,29  | 78,39  | 78,49  | Sn [%]                |
|          | 970    | 1200   | 1420   | 1650   | 1880   | 2100   | 2330   | 2550   | 2780   | 3010   | 3230   | 3460   | 3690   | Q [m <sup>3</sup> /h] |
|          | 19     | 17     | 15     | 15     | 14     | 14     | 13     | 13     | 13     | 12     | 12     | 12     | 12     | Δp [Pa]               |
| 250      | 0,0369 | 0,0472 | 0,0574 | 0,0677 | 0,0779 | 0,0882 | 0,0984 | 0,1087 | 0,1189 | 0,1292 | 0,1394 | 0,1497 | 0,1599 | Sn [m <sup>2</sup> ]  |
|          | 77,95  | 79,20  | 80,02  | 80,60  | 81,03  | 81,37  | 81,64  | 81,85  | 82,04  | 82,19  | 82,32  | 82,44  | 82,53  | Sn [%]                |
|          | 1170   | 1440   | 1710   | 1980   | 2250   | 2520   | 2790   | 3060   | 3330   | 3600   | 3870   | 4130   | 4400   | Q [m <sup>3</sup> /h] |
|          | 14     | 12     | 11     | 10     | 9      | 9      | 9      | 8      | 8      | 8      | 8      | 8      | 8      | Δp [Pa]               |
| 300      | 0,0459 | 0,0587 | 0,0714 | 0,0842 | 0,0969 | 0,1097 | 0,1224 | 0,1352 | 0,1479 | 0,1607 | 0,1734 | 0,1862 | 0,1989 | Sn [m <sup>2</sup> ]  |
|          | 96,97  | 98,51  | 99,53  | 100,25 | 100,79 | 101,21 | 101,55 | 101,82 | 102,05 | 102,24 | 102,40 | 102,54 | 102,67 | Sn [%]                |
|          | 1370   | 1680   | 2000   | 2310   | 2620   | 2930   | 3240   | 3550   | 3860   | 4170   | 4480   | 4790   | 5110   | Q [m <sup>3</sup> /h] |
|          | 11     | 9      | 8      | 7      | 7      | 6      | 6      | 6      | 6      | 6      | 5      | 5      | 5      | Δp [Pa]               |
| 350      | 0,0549 | 0,0702 | 0,0854 | 0,1007 | 0,1159 | 0,1312 | 0,1464 | 0,1617 | 0,1769 | 0,1922 | 0,2074 | 0,2227 | 0,2379 | Sn [m <sup>2</sup> ]  |
|          | 82,26  | 83,58  | 84,44  | 85,05  | 85,51  | 85,87  | 86,15  | 86,38  | 86,57  | 86,74  | 86,87  | 86,99  | 87,10  | Sn [%]                |
|          | 1570   | 1930   | 2280   | 2630   | 2980   | 3340   | 3690   | 4040   | 4390   | 4740   | 5090   | 5440   | 5790   | Q [m <sup>3</sup> /h] |
|          | 9      | 7      | 6      | 6      | 5      | 5      | 5      | 5      | 4      | 4      | 4      | 4      | 4      | Δp [Pa]               |
| 400      | 0,0639 | 0,0817 | 0,0994 | 0,1172 | 0,1349 | 0,1527 | 0,1704 | 0,1882 | 0,2059 | 0,2237 | 0,2414 | 0,2592 | 0,2769 | Sn [m <sup>2</sup> ]  |
|          | 83,60  | 84,93  | 85,81  | 86,43  | 86,90  | 87,26  | 87,55  | 87,78  | 87,98  | 88,14  | 88,28  | 88,41  | 88,51  | Sn [%]                |
|          | 1770   | 2160   | 2560   | 2950   | 3350   | 3740   | 4130   | 4520   | 4910   | 5300   | 5690   | 6080   | 6470   | Q [m <sup>3</sup> /h] |
|          | 8      | 6      | 5      | 5      | 4      | 4      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | Δp [Pa]               |
| 450      | 0,0729 | 0,0932 | 0,1134 | 0,1337 | 0,1539 | 0,1742 | 0,1944 | 0,2147 | 0,2349 | 0,2552 | 0,2754 | 0,2957 | 0,3159 | Sn [m <sup>2</sup> ]  |
|          | 84,63  | 85,98  | 86,87  | 87,50  | 87,98  | 88,34  | 88,63  | 88,87  | 89,07  | 89,23  | 89,38  | 89,50  | 89,61  | Sn [%]                |
|          | 1970   | 2400   | 2840   | 3270   | 3700   | 4140   | 4570   | 5000   | 5430   | 5860   | 6290   | 6720   | 7150   | Q [m <sup>3</sup> /h] |
|          | 7      | 5      | 5      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | 3      | 3      | 2      | Δp [Pa]               |
| 500      | 0,0819 | 0,1047 | 0,1274 | 0,1502 | 0,1729 | 0,1957 | 0,2184 | 0,2412 | 0,2639 | 0,2867 | 0,3094 | 0,3322 | 0,3549 | Sn [m <sup>2</sup> ]  |
|          | 85,46  | 86,82  | 87,72  | 88,36  | 88,83  | 89,20  | 89,49  | 89,73  | 89,93  | 90,10  | 90,25  | 90,37  | 90,48  | Sn [%]                |
|          | 2160   | 2640   | 3120   | 3590   | 4060   | 4530   | 5000   | 5470   | 5940   | 6410   | 6870   | 7340   | 7810   | Q [m <sup>3</sup> /h] |
|          | 6      | 5      | 4      | 4      | 3      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]               |
| 550      | 0,0909 | 0,1162 | 0,1414 | 0,1667 | 0,1919 | 0,2172 | 0,2424 | 0,2677 | 0,2929 | 0,3182 | 0,3434 | 0,3687 | 0,3939 | Sn [m <sup>2</sup> ]  |
|          | 86,13  | 87,50  | 88,41  | 89,05  | 89,53  | 89,90  | 90,20  | 90,44  | 90,64  | 90,81  | 90,96  | 91,08  | 91,19  | Sn [%]                |
|          | 2360   | 2880   | 3390   | 3900   | 4410   | 4920   | 5430   | 5940   | 6440   | 6950   | 7460   | 7960   | 8470   | Q [m <sup>3</sup> /h] |
|          | 6      | 4      | 4      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]               |
| 600      | 0,0999 | 0,1277 | 0,1554 | 0,1832 | 0,2109 | 0,2387 | 0,2664 | 0,2942 | 0,3219 | 0,3497 | 0,3774 | 0,4052 | 0,4329 | Sn [m <sup>2</sup> ]  |
|          | 86,69  | 88,07  | 88,99  | 89,63  | 90,11  | 90,49  | 90,79  | 91,03  | 91,23  | 91,40  | 91,55  | 91,68  | 91,79  | Sn [%]                |
|          | 2560   | 3110   | 3670   | 4220   | 4770   | 5310   | 5860   | 6400   | 6950   | 7490   | 8040   | 8580   | 9120   | Q [m <sup>3</sup> /h] |
|          | 5      | 4      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 1      | Δp [Pa]               |

Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level 40dB(A), for the respective dimension.





# Fire dampers

# CU-LT-1s

## A-weighted sound power level $L_{wa}$ of 35 dB(A) in the duct

| H/W [mm] | 200    | 250    | 300    | 350    | 400    | 450    | 500    | 550    | 600    | 650    | 700    | 750    | 800    |          |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|
| 100      | 0,0099 | 0,0127 | 0,0154 | 0,0182 | 0,0209 | 0,0237 | 0,0264 | 0,0292 | 0,0319 | 0,0347 | 0,0374 | 0,0402 | 0,0429 | Sn [m²]  |
|          | 54,29  | 55,15  | 55,72  | 56,13  | 56,43  | 56,67  | 56,85  | 57,00  | 57,13  | 57,24  | 57,33  | 57,41  | 57,48  | Sn [%]   |
|          | 460    | 570    | 680    | 790    | 900    | 1010   | 1120   | 1230   | 1350   | 1460   | 1570   | 1680   | 1790   | Q [m³/h] |
|          | 41     | 40     | 39     | 38     | 37     | 37     | 36     | 36     | 36     | 36     | 36     | 36     | 36     | Δp [Pa]  |
| 150      | 0,0189 | 0,0242 | 0,0294 | 0,0347 | 0,0399 | 0,0452 | 0,0504 | 0,0557 | 0,0609 | 0,0662 | 0,0714 | 0,0767 | 0,0819 | Sn [m²]  |
|          | 67,65  | 68,73  | 69,44  | 69,95  | 70,33  | 70,62  | 70,85  | 71,04  | 71,20  | 71,33  | 71,45  | 71,54  | 71,63  | Sn [%]   |
|          | 620    | 770    | 920    | 1070   | 1220   | 1360   | 1510   | 1660   | 1810   | 1960   | 2100   | 2250   | 2400   | Q [m³/h] |
|          | 19     | 18     | 17     | 17     | 16     | 16     | 15     | 15     | 15     | 15     | 15     | 15     | 14     | Δp [Pa]  |
| 200      | 0,0279 | 0,0357 | 0,0434 | 0,0512 | 0,0589 | 0,0667 | 0,0744 | 0,0822 | 0,0899 | 0,0977 | 0,1054 | 0,1132 | 0,1209 | Sn [m²]  |
|          | 74,13  | 75,31  | 76,09  | 76,65  | 77,06  | 77,38  | 77,63  | 77,84  | 78,01  | 78,16  | 78,29  | 78,39  | 78,49  | Sn [%]   |
|          | 790    | 970    | 1160   | 1340   | 1530   | 1710   | 1890   | 2080   | 2260   | 2450   | 2630   | 2810   | 3000   | Q [m³/h] |
|          | 13     | 11     | 10     | 10     | 9      | 9      | 9      | 9      | 8      | 8      | 8      | 8      | 8      | Δp [Pa]  |
| 250      | 0,0369 | 0,0472 | 0,0574 | 0,0677 | 0,0779 | 0,0882 | 0,0984 | 0,1087 | 0,1189 | 0,1292 | 0,1394 | 0,1497 | 0,1599 | Sn [m²]  |
|          | 77,95  | 79,20  | 80,02  | 80,60  | 81,03  | 81,37  | 81,64  | 81,85  | 82,04  | 82,19  | 82,32  | 82,44  | 82,53  | Sn [%]   |
|          | 950    | 1170   | 1390   | 1610   | 1830   | 2050   | 2270   | 2490   | 2710   | 2920   | 3140   | 3360   | 3580   | Q [m³/h] |
|          | 9      | 8      | 7      | 7      | 6      | 6      | 6      | 6      | 5      | 5      | 5      | 5      | 5      | Δp [Pa]  |
| 300      | 0,0459 | 0,0587 | 0,0714 | 0,0842 | 0,0969 | 0,1097 | 0,1224 | 0,1352 | 0,1479 | 0,1607 | 0,1734 | 0,1862 | 0,1989 | Sn [m²]  |
|          | 80,48  | 81,76  | 82,60  | 83,20  | 83,65  | 84,00  | 84,28  | 84,50  | 84,69  | 84,85  | 84,99  | 85,10  | 85,21  | Sn [%]   |
|          | 1120   | 1370   | 1620   | 1880   | 2130   | 2380   | 2640   | 2890   | 3140   | 3390   | 3650   | 3900   | 4150   | Q [m³/h] |
|          | 7      | 6      | 5      | 5      | 5      | 4      | 4      | 4      | 4      | 4      | 4      | 4      | 3      | Δp [Pa]  |
| 350      | 0,0549 | 0,0702 | 0,0854 | 0,1007 | 0,1159 | 0,1312 | 0,1464 | 0,1617 | 0,1769 | 0,1922 | 0,2074 | 0,2227 | 0,2379 | Sn [m²]  |
|          | 82,26  | 83,58  | 84,44  | 85,05  | 85,51  | 85,87  | 86,15  | 86,38  | 86,57  | 86,74  | 86,87  | 86,99  | 87,10  | Sn [%]   |
|          | 1280   | 1570   | 1850   | 2140   | 2430   | 2710   | 3000   | 3280   | 3570   | 3850   | 4140   | 4430   | 4710   | Q [m³/h] |
|          | 6      | 5      | 4      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | 3      | 3      | 3      | Δp [Pa]  |
| 400      | 0,0639 | 0,0817 | 0,0994 | 0,1172 | 0,1349 | 0,1527 | 0,1704 | 0,1882 | 0,2059 | 0,2237 | 0,2414 | 0,2592 | 0,2769 | Sn [m²]  |
|          | 83,60  | 84,93  | 85,81  | 86,43  | 86,90  | 87,26  | 87,55  | 87,78  | 87,98  | 88,14  | 88,28  | 88,41  | 88,51  | Sn [%]   |
|          | 1440   | 1760   | 2080   | 2400   | 2720   | 3040   | 3360   | 3670   | 3990   | 4310   | 4630   | 4950   | 5260   | Q [m³/h] |
|          | 5      | 4      | 4      | 3      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]  |
| 450      | 0,0729 | 0,0932 | 0,1134 | 0,1337 | 0,1539 | 0,1742 | 0,1944 | 0,2147 | 0,2349 | 0,2552 | 0,2754 | 0,2957 | 0,3159 | Sn [m²]  |
|          | 84,63  | 85,98  | 86,87  | 87,50  | 87,98  | 88,34  | 88,63  | 88,87  | 89,07  | 89,23  | 89,38  | 89,50  | 89,61  | Sn [%]   |
|          | 1600   | 1950   | 2310   | 2660   | 3010   | 3360   | 3710   | 4060   | 4410   | 4760   | 5110   | 5460   | 5810   | Q [m³/h] |
|          | 5      | 4      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]  |
| 500      | 0,0819 | 0,1047 | 0,1274 | 0,1502 | 0,1729 | 0,1957 | 0,2184 | 0,2412 | 0,2639 | 0,2867 | 0,3094 | 0,3322 | 0,3549 | Sn [m²]  |
|          | 85,46  | 86,82  | 87,72  | 88,36  | 88,83  | 89,20  | 89,49  | 89,73  | 89,93  | 90,10  | 90,25  | 90,37  | 90,48  | Sn [%]   |
|          | 1760   | 2150   | 2530   | 2920   | 3300   | 3680   | 4060   | 4450   | 4830   | 5210   | 5590   | 5970   | 6350   | Q [m³/h] |
|          | 4      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 1      | 1      | 1      | Δp [Pa]  |
| 550      | 0,0909 | 0,1162 | 0,1414 | 0,1667 | 0,1919 | 0,2172 | 0,2424 | 0,2677 | 0,2929 | 0,3182 | 0,3434 | 0,3687 | 0,3939 | Sn [m²]  |
|          | 86,13  | 87,50  | 88,41  | 89,05  | 89,53  | 89,90  | 90,20  | 90,44  | 90,64  | 90,81  | 90,96  | 91,08  | 91,19  | Sn [%]   |
|          | 1920   | 2340   | 2760   | 3170   | 3590   | 4000   | 4420   | 4830   | 5240   | 5650   | 6060   | 6470   | 6880   | Q [m³/h] |
|          | 4      | 3      | 2      | 2      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]  |
| 600      | 0,0999 | 0,1277 | 0,1554 | 0,1832 | 0,2109 | 0,2387 | 0,2664 | 0,2942 | 0,3219 | 0,3497 | 0,3774 | 0,4052 | 0,4329 | Sn [m²]  |
|          | 86,69  | 88,07  | 88,99  | 89,63  | 90,11  | 90,49  | 90,79  | 91,03  | 91,23  | 91,40  | 91,55  | 91,68  | 91,79  | Sn [%]   |
|          | 2080   | 2530   | 2980   | 3430   | 3880   | 4320   | 4760   | 5210   | 5650   | 6090   | 6530   | 6970   | 7410   | Q [m³/h] |
|          | 4      | 3      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]  |

Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level 35dB(A), for the respective dimension.





# Fire dampers

# CU-LT-1s

A-weighted sound power level  $L_{WA}$  of 30 dB(A) in the duct

| H/W [mm] | 200    | 250    | 300    | 350    | 400    | 450    | 500    | 550    | 600    | 650    | 700    | 750    | 800    |                       |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------|
| 100      | 0,0099 | 0,0127 | 0,0154 | 0,0182 | 0,0209 | 0,0237 | 0,0264 | 0,0292 | 0,0319 | 0,0347 | 0,0374 | 0,0402 | 0,0429 | Sn [m <sup>2</sup> ]  |
|          | 54,29  | 55,15  | 55,72  | 56,13  | 56,43  | 56,67  | 56,85  | 57,00  | 57,13  | 57,24  | 57,33  | 57,41  | 57,48  | Sn [%]                |
|          | 370    | 460    | 550    | 640    | 730    | 820    | 910    | 1000   | 1090   | 1180   | 1270   | 1360   | 1450   | Q [m <sup>3</sup> /h] |
|          | 27     | 26     | 25     | 25     | 24     | 24     | 24     | 24     | 24     | 24     | 24     | 24     | 23     | Δp [Pa]               |
| 150      | 0,0189 | 0,0242 | 0,0294 | 0,0347 | 0,0399 | 0,0452 | 0,0504 | 0,0557 | 0,0609 | 0,0662 | 0,0714 | 0,0767 | 0,0819 | Sn [m <sup>2</sup> ]  |
|          | 67,65  | 68,73  | 69,44  | 69,95  | 70,33  | 70,62  | 70,85  | 71,04  | 71,20  | 71,33  | 71,45  | 71,54  | 71,63  | Sn [%]                |
|          | 510    | 630    | 750    | 870    | 990    | 1110   | 1230   | 1350   | 1470   | 1590   | 1710   | 1830   | 1950   | Q [m <sup>3</sup> /h] |
|          | 13     | 12     | 11     | 11     | 11     | 10     | 10     | 10     | 10     | 10     | 10     | 10     | 10     | Δp [Pa]               |
| 200      | 0,0279 | 0,0357 | 0,0434 | 0,0512 | 0,0589 | 0,0667 | 0,0744 | 0,0822 | 0,0899 | 0,0977 | 0,1054 | 0,1132 | 0,1209 | Sn [m <sup>2</sup> ]  |
|          | 74,13  | 75,31  | 76,09  | 76,65  | 77,06  | 77,38  | 77,63  | 77,84  | 78,01  | 78,16  | 78,29  | 78,39  | 78,49  | Sn [%]                |
|          | 640    | 790    | 940    | 1090   | 1240   | 1390   | 1540   | 1690   | 1840   | 1990   | 2140   | 2290   | 2440   | Q [m <sup>3</sup> /h] |
|          | 8      | 7      | 7      | 6      | 6      | 6      | 6      | 6      | 6      | 5      | 5      | 5      | 5      | Δp [Pa]               |
| 250      | 0,0369 | 0,0472 | 0,0574 | 0,0677 | 0,0779 | 0,0882 | 0,0984 | 0,1087 | 0,1189 | 0,1292 | 0,1394 | 0,1497 | 0,1599 | Sn [m <sup>2</sup> ]  |
|          | 77,95  | 79,20  | 80,02  | 80,60  | 81,03  | 81,37  | 81,64  | 81,85  | 82,04  | 82,19  | 82,32  | 82,44  | 82,53  | Sn [%]                |
|          | 780    | 950    | 1130   | 1310   | 1490   | 1670   | 1840   | 2020   | 2200   | 2380   | 2560   | 2730   | 2910   | Q [m <sup>3</sup> /h] |
|          | 6      | 5      | 5      | 4      | 4      | 4      | 4      | 4      | 4      | 3      | 3      | 3      | 3      | Δp [Pa]               |
| 300      | 0,0459 | 0,0587 | 0,0714 | 0,0842 | 0,0969 | 0,1097 | 0,1224 | 0,1352 | 0,1479 | 0,1607 | 0,1734 | 0,1862 | 0,1989 | Sn [m <sup>2</sup> ]  |
|          | 80,48  | 81,76  | 82,60  | 83,20  | 83,65  | 84,00  | 84,28  | 84,50  | 84,69  | 84,85  | 84,99  | 85,10  | 85,21  | Sn [%]                |
|          | 910    | 1110   | 1320   | 1530   | 1730   | 1940   | 2140   | 2350   | 2550   | 2760   | 2960   | 3170   | 3370   | Q [m <sup>3</sup> /h] |
|          | 5      | 4      | 4      | 3      | 3      | 3      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | Δp [Pa]               |
| 350      | 0,0549 | 0,0702 | 0,0854 | 0,1007 | 0,1159 | 0,1312 | 0,1464 | 0,1617 | 0,1769 | 0,1922 | 0,2074 | 0,2227 | 0,2379 | Sn [m <sup>2</sup> ]  |
|          | 82,26  | 83,58  | 84,44  | 85,05  | 85,51  | 85,87  | 86,15  | 86,38  | 86,57  | 86,74  | 86,87  | 86,99  | 87,10  | Sn [%]                |
|          | 1040   | 1270   | 1510   | 1740   | 1970   | 2210   | 2440   | 2670   | 2900   | 3130   | 3370   | 3600   | 3830   | Q [m <sup>3</sup> /h] |
|          | 4      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]               |
| 400      | 0,0639 | 0,0817 | 0,0994 | 0,1172 | 0,1349 | 0,1527 | 0,1704 | 0,1882 | 0,2059 | 0,2237 | 0,2414 | 0,2592 | 0,2769 | Sn [m <sup>2</sup> ]  |
|          | 83,60  | 84,93  | 85,81  | 86,43  | 86,90  | 87,26  | 87,55  | 87,78  | 87,98  | 88,14  | 88,28  | 88,41  | 88,51  | Sn [%]                |
|          | 1170   | 1430   | 1690   | 1950   | 2210   | 2470   | 2730   | 2990   | 3250   | 3500   | 3760   | 4020   | 4280   | Q [m <sup>3</sup> /h] |
|          | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 450      | 0,0729 | 0,0932 | 0,1134 | 0,1337 | 0,1539 | 0,1742 | 0,1944 | 0,2147 | 0,2349 | 0,2552 | 0,2754 | 0,2957 | 0,3159 | Sn [m <sup>2</sup> ]  |
|          | 84,63  | 85,98  | 86,87  | 87,50  | 87,98  | 88,34  | 88,63  | 88,87  | 89,07  | 89,23  | 89,38  | 89,50  | 89,61  | Sn [%]                |
|          | 1300   | 1590   | 1880   | 2160   | 2450   | 2730   | 3020   | 3300   | 3590   | 3870   | 4150   | 4440   | 4720   | Q [m <sup>3</sup> /h] |
|          | 3      | 2      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 500      | 0,0819 | 0,1047 | 0,1274 | 0,1502 | 0,1729 | 0,1957 | 0,2184 | 0,2412 | 0,2639 | 0,2867 | 0,3094 | 0,3322 | 0,3549 | Sn [m <sup>2</sup> ]  |
|          | 85,46  | 86,82  | 87,72  | 88,36  | 88,83  | 89,20  | 89,49  | 89,73  | 89,93  | 90,10  | 90,25  | 90,37  | 90,48  | Sn [%]                |
|          | 1430   | 1750   | 2060   | 2370   | 2680   | 2990   | 3300   | 3610   | 3920   | 4230   | 4540   | 4850   | 5160   | Q [m <sup>3</sup> /h] |
|          | 3      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 550      | 0,0909 | 0,1162 | 0,1414 | 0,1667 | 0,1919 | 0,2172 | 0,2424 | 0,2677 | 0,2929 | 0,3182 | 0,3434 | 0,3687 | 0,3939 | Sn [m <sup>2</sup> ]  |
|          | 86,13  | 87,50  | 88,41  | 89,05  | 89,53  | 89,90  | 90,20  | 90,44  | 90,64  | 90,81  | 90,96  | 91,08  | 91,19  | Sn [%]                |
|          | 1560   | 1900   | 2240   | 2580   | 2920   | 3250   | 3590   | 3920   | 4260   | 4590   | 4930   | 5260   | 5600   | Q [m <sup>3</sup> /h] |
|          | 3      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |
| 600      | 0,0999 | 0,1277 | 0,1554 | 0,1832 | 0,2109 | 0,2387 | 0,2664 | 0,2942 | 0,3219 | 0,3497 | 0,3774 | 0,4052 | 0,4329 | Sn [m <sup>2</sup> ]  |
|          | 86,69  | 88,07  | 88,99  | 89,63  | 90,11  | 90,49  | 90,79  | 91,03  | 91,23  | 91,40  | 91,55  | 91,68  | 91,79  | Sn [%]                |
|          | 1690   | 2060   | 2420   | 2790   | 3150   | 3510   | 3870   | 4230   | 4590   | 4950   | 5310   | 5670   | 6030   | Q [m <sup>3</sup> /h] |
|          | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]               |

Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level 30dB(A), for the respective dimension.



# Fire dampers

# CU-LT-1s

## A-weighted sound power level LWA of 25dB(A) in the duct

| H/W [mm] | 200    | 250    | 300    | 350    | 400    | 450    | 500    | 550    | 600    | 650    | 700    | 750    | 800    |          |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|
| 100      | 0,0099 | 0,0127 | 0,0154 | 0,0182 | 0,0209 | 0,0237 | 0,0264 | 0,0292 | 0,0319 | 0,0347 | 0,0374 | 0,0402 | 0,0429 | Sn [m²]  |
|          | 54,29  | 55,15  | 55,72  | 56,13  | 56,43  | 56,67  | 56,85  | 57,00  | 57,13  | 57,24  | 57,33  | 57,41  | 57,48  | Sn [%]   |
|          | 310    | 380    | 450    | 520    | 600    | 670    | 740    | 820    | 890    | 960    | 1040   | 1110   | 1180   | Q [m³/h] |
|          | 19     | 18     | 17     | 16     | 17     | 16     | 16     | 16     | 16     | 16     | 16     | 16     | 15     | Δp [Pa]  |
| 150      | 0,0189 | 0,0242 | 0,0294 | 0,0347 | 0,0399 | 0,0452 | 0,0504 | 0,0557 | 0,0609 | 0,0662 | 0,0714 | 0,0767 | 0,0819 | Sn [m²]  |
|          | 67,65  | 68,73  | 69,44  | 69,95  | 70,33  | 70,62  | 70,85  | 71,04  | 71,20  | 71,33  | 71,45  | 71,54  | 71,63  | Sn [%]   |
|          | 410    | 510    | 610    | 710    | 810    | 900    | 1000   | 1100   | 1200   | 1290   | 1390   | 1490   | 1590   | Q [m³/h] |
|          | 9      | 8      | 8      | 7      | 7      | 7      | 7      | 7      | 7      | 7      | 6      | 6      | 6      | Δp [Pa]  |
| 200      | 0,0279 | 0,0357 | 0,0434 | 0,0512 | 0,0589 | 0,0667 | 0,0744 | 0,0822 | 0,0899 | 0,0977 | 0,1054 | 0,1132 | 0,1209 | Sn [m²]  |
|          | 74,13  | 75,31  | 76,09  | 76,65  | 77,06  | 77,38  | 77,63  | 77,84  | 78,01  | 78,16  | 78,29  | 78,39  | 78,49  | Sn [%]   |
|          | 520    | 640    | 770    | 890    | 1010   | 1130   | 1250   | 1370   | 1500   | 1620   | 1740   | 1860   | 1980   | Q [m³/h] |
|          | 5      | 5      | 5      | 4      | 4      | 4      | 4      | 4      | 4      | 4      | 4      | 4      | 3      | Δp [Pa]  |
| 250      | 0,0369 | 0,0472 | 0,0574 | 0,0677 | 0,0779 | 0,0882 | 0,0984 | 0,1087 | 0,1189 | 0,1292 | 0,1394 | 0,1497 | 0,1599 | Sn [m²]  |
|          | 77,95  | 79,20  | 80,02  | 80,60  | 81,03  | 81,37  | 81,64  | 81,85  | 82,04  | 82,19  | 82,32  | 82,44  | 82,53  | Sn [%]   |
|          | 630    | 780    | 920    | 1070   | 1210   | 1360   | 1500   | 1640   | 1790   | 1930   | 2080   | 2220   | 2370   | Q [m³/h] |
|          | 4      | 3      | 3      | 3      | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]  |
| 300      | 0,0459 | 0,0587 | 0,0714 | 0,0842 | 0,0969 | 0,1097 | 0,1224 | 0,1352 | 0,1479 | 0,1607 | 0,1734 | 0,1862 | 0,1989 | Sn [m²]  |
|          | 80,48  | 81,76  | 82,60  | 83,20  | 83,65  | 84,00  | 84,28  | 84,50  | 84,69  | 84,85  | 84,99  | 85,10  | 85,21  | Sn [%]   |
|          | 740    | 910    | 1070   | 1240   | 1410   | 1580   | 1740   | 1910   | 2080   | 2240   | 2410   | 2580   | 2740   | Q [m³/h] |
|          | 3      | 3      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | 2      | Δp [Pa]  |
| 350      | 0,0549 | 0,0702 | 0,0854 | 0,1007 | 0,1159 | 0,1312 | 0,1464 | 0,1617 | 0,1769 | 0,1922 | 0,2074 | 0,2227 | 0,2379 | Sn [m²]  |
|          | 82,26  | 83,58  | 84,44  | 85,05  | 85,51  | 85,87  | 86,15  | 86,38  | 86,57  | 86,74  | 86,87  | 86,99  | 87,10  | Sn [%]   |
|          | 850    | 1040   | 1230   | 1420   | 1600   | 1790   | 1980   | 2170   | 2360   | 2550   | 2740   | 2930   | 3110   | Q [m³/h] |
|          | 3      | 2      | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]  |
| 400      | 0,0639 | 0,0817 | 0,0994 | 0,1172 | 0,1349 | 0,1527 | 0,1704 | 0,1882 | 0,2059 | 0,2237 | 0,2414 | 0,2592 | 0,2769 | Sn [m²]  |
|          | 83,60  | 84,93  | 85,81  | 86,43  | 86,90  | 87,26  | 87,55  | 87,78  | 87,98  | 88,14  | 88,28  | 88,41  | 88,51  | Sn [%]   |
|          | 950    | 1160   | 1380   | 1590   | 1800   | 2010   | 2220   | 2430   | 2640   | 2850   | 3060   | 3270   | 3480   | Q [m³/h] |
|          | 2      | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]  |
| 450      | 0,0729 | 0,0932 | 0,1134 | 0,1337 | 0,1539 | 0,1742 | 0,1944 | 0,2147 | 0,2349 | 0,2552 | 0,2754 | 0,2957 | 0,3159 | Sn [m²]  |
|          | 84,63  | 85,98  | 86,87  | 87,50  | 87,98  | 88,34  | 88,63  | 88,87  | 89,07  | 89,23  | 89,38  | 89,50  | 89,61  | Sn [%]   |
|          | 1060   | 1290   | 1530   | 1760   | 1990   | 2220   | 2450   | 2690   | 2920   | 3150   | 3380   | 3610   | 3840   | Q [m³/h] |
|          | 2      | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]  |
| 500      | 0,0819 | 0,1047 | 0,1274 | 0,1502 | 0,1729 | 0,1957 | 0,2184 | 0,2412 | 0,2639 | 0,2867 | 0,3094 | 0,3322 | 0,3549 | Sn [m²]  |
|          | 85,46  | 86,82  | 87,72  | 88,36  | 88,83  | 89,20  | 89,49  | 89,73  | 89,93  | 90,10  | 90,25  | 90,37  | 90,48  | Sn [%]   |
|          | 1160   | 1420   | 1680   | 1930   | 2180   | 2430   | 2690   | 2940   | 3190   | 3440   | 3690   | 3940   | 4200   | Q [m³/h] |
|          | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | Δp [Pa]  |
| 550      | 0,0909 | 0,1162 | 0,1414 | 0,1667 | 0,1919 | 0,2172 | 0,2424 | 0,2677 | 0,2929 | 0,3182 | 0,3434 | 0,3687 | 0,3939 | Sn [m²]  |
|          | 86,13  | 87,50  | 88,41  | 89,05  | 89,53  | 89,90  | 90,20  | 90,44  | 90,64  | 90,81  | 90,96  | 91,08  | 91,19  | Sn [%]   |
|          | 1270   | 1550   | 1820   | 2100   | 2370   | 2650   | 2920   | 3190   | 3460   | 3730   | 4010   | 4280   | 4550   | Q [m³/h] |
|          | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 0      | Δp [Pa]  |
| 600      | 0,0999 | 0,1277 | 0,1554 | 0,1832 | 0,2109 | 0,2387 | 0,2664 | 0,2942 | 0,3219 | 0,3497 | 0,3774 | 0,4052 | 0,4329 | Sn [m²]  |
|          | 86,69  | 88,07  | 88,99  | 89,63  | 90,11  | 90,49  | 90,79  | 91,03  | 91,23  | 91,40  | 91,55  | 91,68  | 91,79  | Sn [%]   |
|          | 1380   | 1670   | 1970   | 2270   | 2560   | 2860   | 3150   | 3440   | 3730   | 4030   | 4320   | 4610   | 4900   | Q [m³/h] |
|          | 2      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 1      | 0      | 0      | 0      | Δp [Pa]  |

Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level 25dB(A), for the respective dimension. Additional data can be consulted on our website.





# Fire dampers

## CU-LT-1s

### Correction factor $\Delta L$

To obtain the sound power level for the  $L_{W \text{ oct}}$  octave midband

$L_{WA}$  = A-weighted sound power level

$\Delta L$  = Correction factor

$L_{W \text{ oct}}$  = Sound power level for each octave midband

$$L_{W \text{ oct}} = \Delta L + L_{WA}$$

| [Hz]        | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|-------------|----|-----|-----|-----|------|------|------|------|
| 2 - 4 m/s   | 22 | 9   | -2  | -11 | -18  | -21  | -17  | -8   |
| 6 - 8 m/s   | 17 | 10  | 1   | -4  | -8   | -13  | -19  | -21  |
| 10 - 12 m/s | 15 | 9   | 0   | -4  | -7   | -10  | -14  | -20  |

Deduct  $L_{WA}$  from the selection graph on page 360.



# Fire dampers

## CU-LT-1s

### Operating mechanism

**MFUSP:** operating mechanism with fusible link

The operating mechanism MFUSP automatically unlocks the blade when the temperature in the duct exceeds 72°C.

The damper needs to be rearmed manually.

- Standard:**
- Fusible link 72° C
  - Manual unlocking possible
  - Manual rearmation, use the rearmation handle turn clockwise)
  - IP42
- Options:**
- FDCU: Unipolar begin and end of range switches



fig. CU-LT-1s + MFUSP

**MMAG:** upgradable automatic / remote controlled operating mechanism with fusible link

The operating mechanism MMAG automatically unlocks the blade when the temperature in the duct exceeds 72°C by sending an electrical impulse (VD) or a by interrupting the power supply (VM) to the magnet. Manual or motorized rearmation (ME MMAG).

- Standard:**
- Fusible link 72° C
  - Manual unlocking possible
  - Manual rearmation, use a rearmation handle (turn clockwise)
  - IP42
- Options:**
- Remote controlled by means of a dual voltage magnet 24/48V
- Types of magnets:**
- VD = natural magnet
  - VM = electromagnet
- FDCU : Unipolar begin and end of range switches
  - FDCB : Bipolar begin and end of range switches
  - ME : Rearmation motor



fig. CU-LT-1s + MMAG

**BLF(T) :** spring-return actuator (with thermo-electric fuse)

When connected to the power supply, the actuator moves the blade into its standby position (open). When the power is interrupted, an internal armed spring closes the blade (safety position).

If the motor is equipped with a thermo-electric fuse BLFT, this will interrupt the power supply when the temperature in the duct exceeds 72°C.

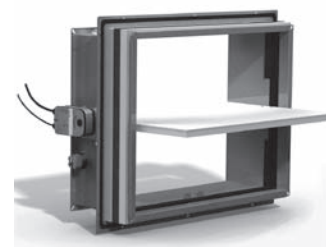







fig. CU-LT-1s + BLF(T)

### Technical data

| Operating mechanism   | CU-LT-1s MFUSP   | CU-LT-1s MMAG   | CU-LT-1s BLF(T)   |
|-----------------------|--|---|---|
| <b>Description</b>    | Automatic fire damper  | Upgradable automatic and remote controlled damper                                   | Motorized remote controlled damper with spring-return actuator  |
| <b>Certifications</b> |    |  |   |
| <b>Classification</b> | Fire resistance :<br>- EI 120 (ve i↔o) S : range until 800 x 600 : Mounting in rigid wall min. 100 mm<br>- EI 90 (ve i↔o) S : range until 800 x 600 : Mounting in flexible wall 120' min. 100 mm<br>- EI 120 (ho i↔o) S : range until 800 x 600 : Mounting in rigid floor/ceiling min. 110 mm<br>Pressure during test : 500 Pa |   |   |

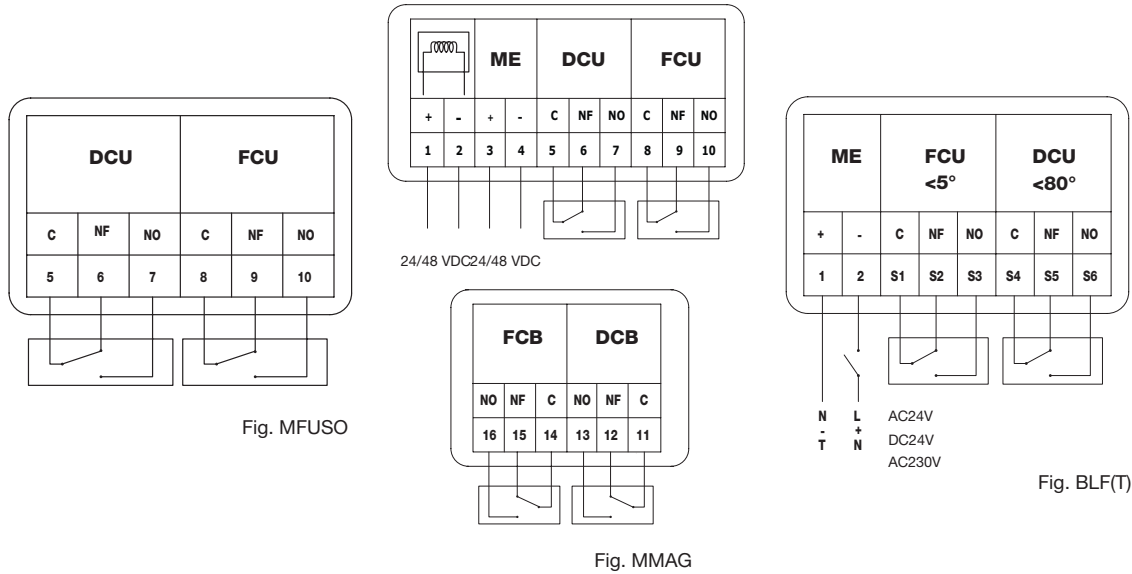




# Fire dampers

# CU-LT-1s

## Electrical connections



| MFUSP                              | MMAG  | BLF(T)  |
|------------------------------------|---|---|
| <b>Power supply MFUSP</b>          | <b>Power supply motor/ magnet MMAG</b>  | <b>Power supply motor BLF(T)</b>  |
| n.a.                               | Rearmation motor (ME): 24/48 VDC (automatic switch)<br><br>Magnet: 24/48 VDC (automatic switch)                         | BLF(T)24: 24VAC / 24VDC<br><br>BLF(T)230: 230VAC  |
| <b>Power consumption</b>           | <b>Power consumption</b>  | <b>Power consumption</b>  |
| n.a.<br><br>n.a.<br><br>n.a.       | Rearmation motor (ME):<br>24VDC : Pmax = 10W<br>48VDC : Pmax = 15W<br><br>Magnet:<br>VM: Pnom = 1,5W<br>VD: Pmax = 3,5W | BLF(T)24:<br><br>motoring: 5W<br>holding: 2,5W<br><br>BLF(T)230:<br><br>motoring: 6W<br>holding: 3W |
| <b>Position switches</b>           | <b>Position switches</b>  | <b>Position switches</b>  |
| Standard: 1mA...1A, DC 5V...AC 48V | Standard: 1mA...500mA, DC 5V...AC 48V   | Standard: 1mA...3A, DC 5V...AC 250V<br>SN2: 1mA...3A, DC 5V...AC 250V                               |
| <b>Running time</b>                | <b>Running time</b>   | <b>Running time</b>   |
| motor: n.a<br>spring: 1s           | Motor: < 30 s<br>spring: 1s   | motor: 40 ... 75s<br>spring: 20s  |
| <b>Noise level</b>                 | <b>Noise level</b>  | <b>Noise level</b>  |
| n.a.                               | Motor: max 66 DB (A)  | motor: max 45 dB (A)<br>spring: ca. 62 dB (A)   |
| <b>Degree of protection</b>        | <b>Degree of protection</b>   | <b>Degree of protection</b>   |
| IP 45                              | IP 45   | IP 54   |



# Fire dampers

## CU-LT-1s

### Position of the thermo-electric fuse for BLFT(T)

| Height  | Width   | Position                                     |
|---------|---------|--|
| ≤ 300mm | = 200mm | on the side opposite to the mechanism        |
|         | > 200mm | on the W-side next to the inspection shutter |
| > 300mm |         | on the same side of the mechanism            |

The mechanism is always mounted on the H-side.

#### Standard:

- Thermo-electric fuse 72°C for BLFT
- Motorized unlocking and rearmation
- Manual rearmation possible, use the enclosed handle turn clockwise
- 24V or 230V
- Integrated unipolar begin and end of range switches
- IP 54

#### Options:

- SN2 Bipolar begin and end of range switches
- ST plug

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# Fire dampers

## CU-LT-1s

### Evolution kits



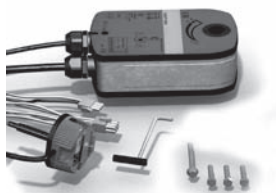


|    |   |   |                          |
|----|---|---|--------------------------|
| 1  |    | <b>KITS MFUSP</b>   |                          |
|    |   | Automatic operating mechanism MFUSP with fusible link 72°C    |                          |
| 2  |    | <b>KITS FUS 72 MFUS(P)</b>                                    |                          |
| 3  |   | Fusible link 72°C for MFUS(P)                                 |                          |
| 4  |    | <b>KITS FDCU MFUS(P)</b>                                      |                          |
| 5  |   | Unipolar beginning and end of range switches FDCU for MFUS(P) |                          |
| 6  |   | <b>KITS MMAG</b>  |                          |
| 7  |   | Upgradable operating mechanism MMAG with fusible link 72°C    |                          |
| 8  |  | <b>KITS FUS 72 MMAG</b>                                       |                          |
| 9  |   | Fusible link 72°C for MMAG                                    |                          |
| 10 |  | <b>KITS VD MMAG FDCU</b>                                      | <b>KITS VM MMAG FDCU</b> |
| 11 |   | Magnet VD24/48, VM24/48 with FDCU for MMAG                    |                          |
| 12 |  | <b>KITS ME MMAG</b>   |                          |
| 13 |   | Rearmation motor ME 24/48 for MMAG                            |                          |
| 14 |  | <b>KITS FDCU MMAG</b>   |                          |
| 15 |   | Unipolar beginning and end of range switches FDCU for MMAG    |                          |
| 16 |   |   |                          |
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# Fire dampers

# CU-LT-1s

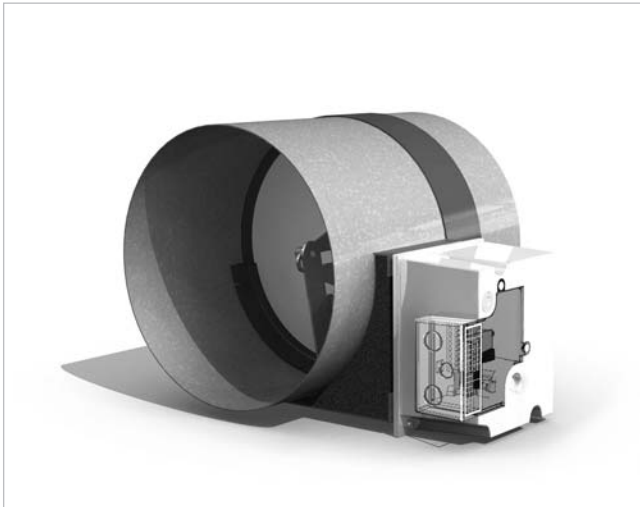
|   |  |                        |
|---|--|------------------------|
|    | <b>KITS FDCB MMAG</b>  |                        |
|   | Bipolar beginning and end of range switches FDCB for MMAG                                |                        |
|    | <b>KITS BLF 24</b>   | <b>KITS BLF 24-ST</b>  |
|   | <b>KITS BLF 230</b>  |                        |
|   | Actuator Belimo BLF 24V/230V or BLF 24V with plug (ST), without thermo-electric fuse (T) |                        |
|    | <b>KITS BLFT 24</b>  | <b>KITS BLFT 24-ST</b> |
|   | <b>KITS BLFT 230</b>   |                        |
|   | Actuator Belimo BLF 24V/230V or BLF 24V with plug (ST) and thermo-electric fuse (T)      |                        |
|   | <b>KITS SN2 BLF</b>  |                        |
|   | Bipolar beginning and end of range switches FDCB for BLF actuator                        |                        |
|  | <b>KITS BAE 72</b>   |                        |
|   | Thermo-electric fuse 72°C (T) for Belimo BLFT 24V  |                        |

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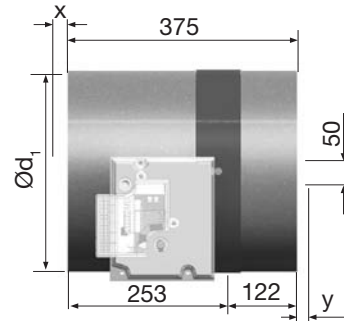


# Smoke evacuation

# VR2



## Dimensions



|                                      | Exceeding damper blade             |
|--------------------------------------|------------------------------------|
| $x = \text{Ød}_1/2 - 253 \text{ mm}$ | if $\text{Ød}_1 \geq 560\text{mm}$ |
| $y = \text{Ød}_1/2 - 122 \text{ mm}$ | if $\text{Ød}_1 \geq 250\text{mm}$ |

| $\text{Ød}_1$<br>nom |
|----------------------|
| 200                  |
| 250                  |
| 315                  |
| 355                  |
| 400                  |
| 450                  |
| 500                  |
| 560                  |
| 630                  |

## Description

The VR2 is a circular smoke evacuation damper, normally closed, remote controlled and fire resistant in closed position. The damper opens in case of fire to permit smoke evacuation.

## Standard

Steel tunnel

Damper blade

Operating mechanism with:

- manual command
- manual locking
- blade position indicator
- identification label
- electric connections

Rubber sealing ring

Blade bumper

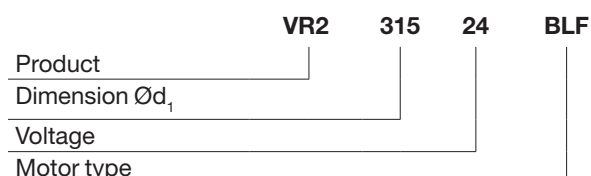
Intumescent packing

Transmission with locking open/closed

## Fire resistance

2 hours

## Ordering example



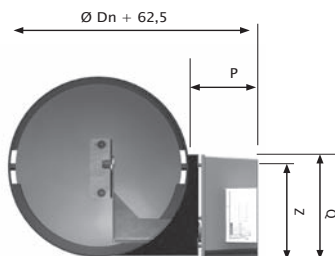


# Smoke evacuation

VR2

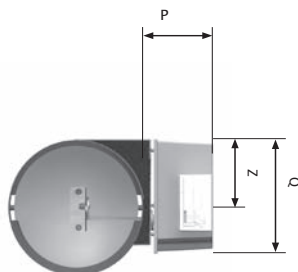
## Technical data for the motors

$\varnothing d_1 \geq 315 \text{ mm}$



|   | MANF (+ME) | BF  | DB  |
|---|------------|-----|-----|
| P | 115        | 85  | 115 |
| Q | 190        | 250 | 250 |
| Z | 180        | 170 | 175 |

$\varnothing d_1 < 315 \text{ mm}$



|   | MANF (+ME) | BF  | DB  |
|---|------------|-----|-----|
| P | 115        | 85  | 115 |
| Q | 190        | 250 | 250 |
| Z | 185        | -   | 80  |

## Installation

- Placement in rigid wall with horizontal or vertical axis
- Approval for mounting in rigid ceiling and floor
- Provide an additional zone of 200 mm to have free access to the mechanism
- Avoid deflection of the tunnel while sealing the damper
- Installation and air movement may be from either direction
- Verify the free movement of the blade
- Installation according to test report
- On the side of the mechanism the damper extends 230 mm from the wall
- Minimal size of installation opening =  $\varnothing d_1 + 50 \text{ mm}$

## Mechanism

### MANF

Remote controlled command

### BF/DB

Springreturn actuator 24/230 V page

## Function

See MEC page 381.

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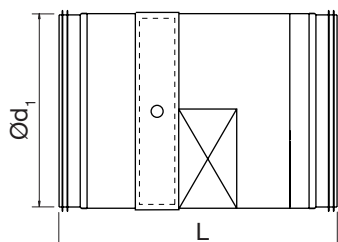
# Smoke evacuation

## VR2

### Variants for VR2

Round connection with rubber sealing ring.

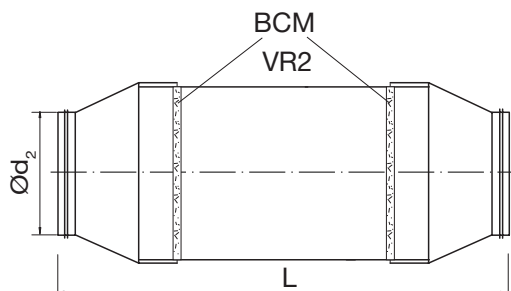
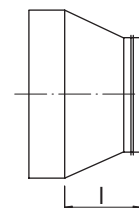
#### RCJ



| $\varnothing d_1$ | L   |
|-------------------|-----|
| 200               | 447 |
| 250               | 487 |
| 315               | 497 |
| 355               | 487 |
| 400               | 527 |
| 450               | 527 |
| 500               | 517 |
| 560               | 517 |
| 630               | 527 |

Reducer for connection on a duct with a smaller diameter than the damper.

#### RCVF



| $\varnothing d_2$ | $\varnothing d$ VR2 | L   | I   |
|-------------------|---------------------|-----|-----|
| 80                | 200                 | 665 | 145 |
| 100               | 200                 | 545 | 85  |
| 125               | 200                 | 525 | 75  |
| 160               | 200                 | 495 | 60  |
| 180               | 200                 | 595 | 110 |
| 224               | 250                 | 625 | 125 |

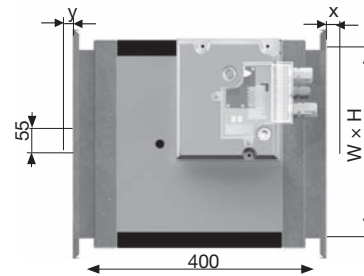


# Smoke evacuation

## VU2



### Dimensions



### Description

The VU2 is a fire resistant smoke evacuation damper with a normally closed position. The damper opens in case of fire to permit smoke evacuation. The VU2 has a fire resistance up to 120 minutes. The smoke evacuation damper can be equipped with a remote controlled mechanism or a motorised mechanism.

### Standard

Connection frame PG30

Casing from refractory material

Damper blade

Operating mechanism with:

- manual command
- manual locking
- blade position indicator
- identification label
- electric connections

Rubber sealing ring

Blade bumper

Intumescent packing

Transmission with locking open/closed

### Fire resistance

2 hours

### Ordering example

|            |            |            |            |           |             |
|------------|------------|------------|------------|-----------|-------------|
|            | <b>VU2</b> | <b>600</b> | <b>500</b> | <b>24</b> | <b>MANF</b> |
| Product    |            |            |            |           |             |
| Width      |            |            |            |           |             |
| Height     |            |            |            |           |             |
| Voltage    |            |            |            |           |             |
| Motor type |            |            |            |           |             |

|                            | Exceeding damper blade   |
|----------------------------|--------------------------|
| $x = H/2 - 274 \text{ mm}$ | if $H \geq 550\text{mm}$ |
| $y = H/2 - 148 \text{ mm}$ | if $H \geq 300\text{mm}$ |

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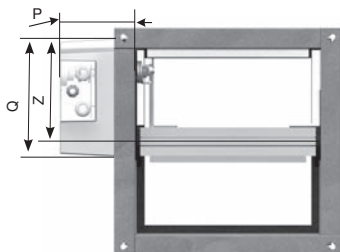


# Smoke evacuation

# VU2

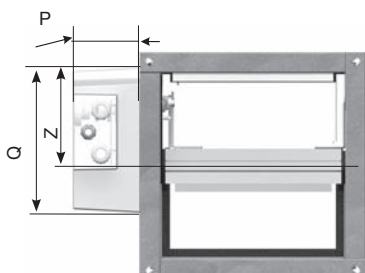
## Technical data for the motors

**H ≥ 300 mm**



|          | MANF (+ME) | BF  | DB  |
|----------|------------|-----|-----|
| <b>P</b> | 115        | 85  | 115 |
| <b>Q</b> | 190        | 250 | 250 |
| <b>Z</b> | 180        | 170 | 175 |

**H < 300 mm**



|          | MANF (+ME) | BF  | DB  |
|----------|------------|-----|-----|
| <b>P</b> | 115        | 85  | 115 |
| <b>Q</b> | 190        | 250 | 250 |
| <b>Z</b> | 185        | -   | 80  |

## Installation

- Placement in rigid wall with horizontal or vertical axis
- Approval for mounting in rigid ceiling and floor
- Provide an additional zone of 200 mm to have free access to the mechanism
- Install the damper perpendicularly and avoid deflection of the tunnel
- Installation and air movement may be from either direction
- Verify the free movement of the blade
- Installation according to test report
- On the side of the mechanism the damper extends 240 mm from the wall
- Minimal size of installation opening = (W+100) × (H+100) mm

## Mechanism

### MANF

Remote controlled command

### BF/DB

Springreturn actuator 24/230 V

## Function

See MEC page 381.

## VU2/B

### Battery assembly

A damper in battery assembly is a composition of several dampers VU2 with maximum 6 individual smoke evacuation dampers.

## VU2L

### Elongated duct

The damper VU2L is a damper VU2 of which the duct is extended along one or both sides.

## Applications

- The smoke evacuation damper blade must not extend beyond one or both sides of the duct
- to allow an easy connection in case of a thick wall
- to allow the installation of a grill on the damper duct

## Options

**EQ** – Equipotential connection

**UL** – Inspection shutter



# Smoke evacuation

# VAN1V



## Description

The “VANTAGE”-shutters are used for the smoke evacuation in residential buildings in order to facilitate a safe evacuation of people.

## Standard

- locking mechanism
- connection box
- blocking
- 1 shutter [1V]
- hinge
- front frame
- gaz spring (type ceiling)

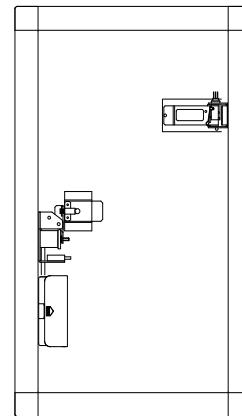
## Options

- begin of range switch
- end of range switch

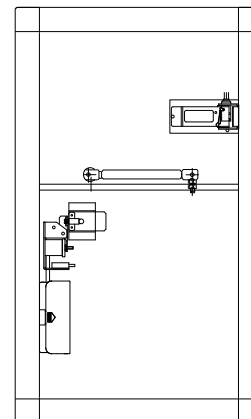
## Ordering example

|         |           |     |     |
|---------|-----------|-----|-----|
|         | VANTAGE 1 | 400 | 505 |
| Product |           |     |     |
| Width   |           |     |     |
| Height  |           |     |     |

## 1V



## 1V/P



## Fire resistance

| Type                    | 1h                        | 1h 30               | 2h                    |
|-------------------------|---------------------------|---------------------|-----------------------|
|                         | Finishing frame obligated |                     |                       |
| Wall mounting           | VANTAGE - 1H/2V           |                     | VANTAGE - 2H/2V       |
| Wall mounting motorised | VANTAGE - 1H/1V/M + ME    |                     | VANTAGE - 2H/1V/M +ME |
| Ceiling mounting        | VANTAGE - 1H/2V/P         | VANTAGE - 1H30/2V/P |                       |

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# Smoke evacuation

## VAN1V

### Installation

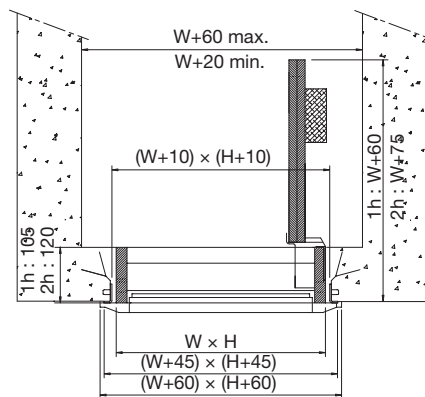
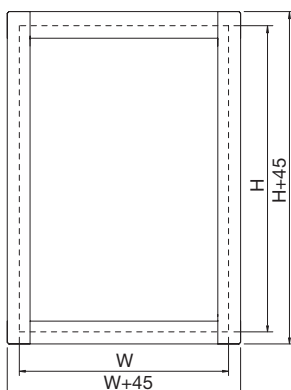
- Respect the top/bottom indication
- Cable-entry via a hole drilled in the refractory casing in one of the corners of the metallic front frame
- Direction of installation: mechanism on the fire-free side
- Verify the free movement of the blade

| H/W [mm] | 300 | 350 | 390 | 400 | 450 | 500 | 550 | 600 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|
| 385      |     |     |     |     |     |     |     |     |
| 415      |     |     |     |     |     |     |     |     |
| 445      |     |     |     |     |     |     |     |     |
| 475      |     |     |     |     |     |     |     |     |
| 505      |     |     |     |     |     |     |     |     |
| 535      |     |     |     |     |     |     |     |     |
| 565      |     |     |     |     |     |     |     |     |
| 595      |     |     |     |     |     |     |     |     |
| 625      |     |     |     |     |     |     |     |     |
| 655      |     |     |     |     |     |     |     |     |
| 685      |     |     |     |     |     |     |     |     |
| 715      |     |     |     |     |     |     |     |     |
| 745      |     |     |     |     |     |     |     |     |
| 775      |     |     |     |     |     |     |     |     |

Reversible models

- (W+10) × (H+10)
- (W+20) × (H+20)
- CF 1h: W+60, CF 2h: W+75
- (W+45) × (H+45)
- (W+60) × (H+60)

- Installation space without build in frame
- Installation space with build in frame
- Depth opened shutter
- Ext. dimensions shutter
- Ext. dimensions grill







# Smoke evacuation

# VAN2V



## Description

The “VANTAGE”-shutters are used for the smoke evacuation in residential buildings in order to facilitate a safe evacuation of people.

## Standard

- centre support
- locking mechanism
- connection box
- blocking
- 2 shutters [2V]
- hinge
- front frame
- gaz springs (type ceiling)

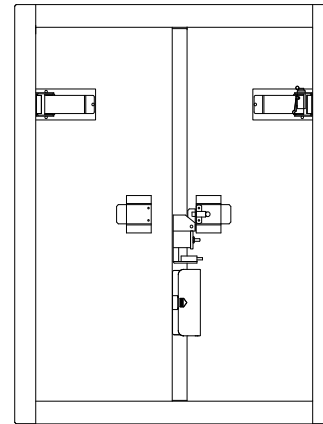
## Options

- begin of range switch
- end of range switch

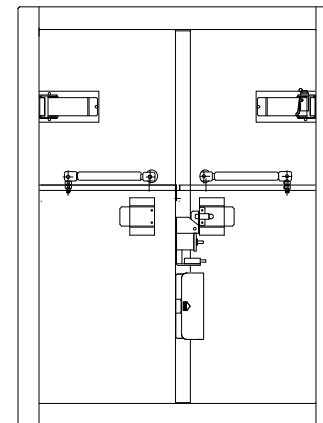
## Ordering example

|         |           |     |     |
|---------|-----------|-----|-----|
|         | VANTAGE 1 | 400 | 505 |
| Product |           |     |     |
| Width   |           |     |     |
| Height  |           |     |     |

## 2V



## 2V/P



## Fire resistance

| Type             | 1h                        | 1h30                | 2 h             |
|------------------|---------------------------|---------------------|-----------------|
|                  | Finishing frame obligated |                     |                 |
| Wall mounting    | VANTAGE - 1H/2V           |                     | VANTAGE - 2H/2V |
| Ceiling mounting | VANTAGE - 1H/2V/P         | VANTAGE - 1H30/2V/P |                 |

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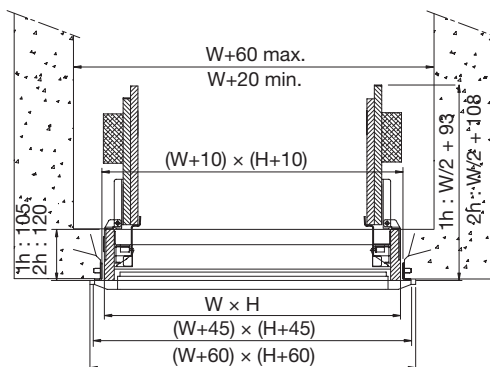
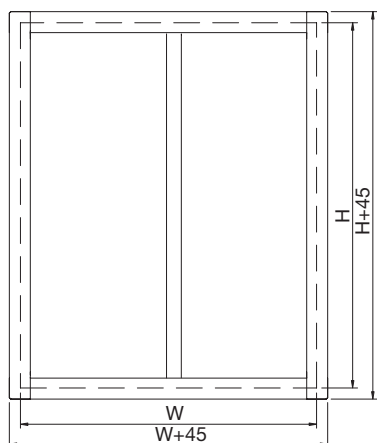
# Smoke evacuation

# VAN2V

## Installation

- Respect the top/bottom indication
- Cable-entry via a hole drilled in the refractory casing in one of the corners of the metallic front frame
- Direction of installation: mechanism on the fire-free side
- Verify the free movement of the blade

|                          |   |
|--------------------------|---|
| (W+10) × (H+10)          | Installation space without build in frame |
| (W+20) × (H+20)          | Installation space with build in frame    |
| CF 1h: W+60, CF 2h: W+75 | Depth opened shutter                      |
| (W+45) × (H+45)          | Ext. dimensions shutter                   |
| (W+60) × (H+60)          | Ext. dimensions grill                     |





# Smoke evacuation

# MEC

## MANF (+ME)

The unlocking mechanism MANF unlatches the smoke evacuation damper blade via remote control by sending an electric impulse (VD) or by interruption (VM) of the magnet's power supply.

By unlocking, the internal torsion spring unwinds and releases the damper blade into its safety position

To indicate the open or closed position of the fire damper blade, the mechanism is standard provided with an end and begin of range switch FDCU.

The rearmation has to be done manually (MANF).

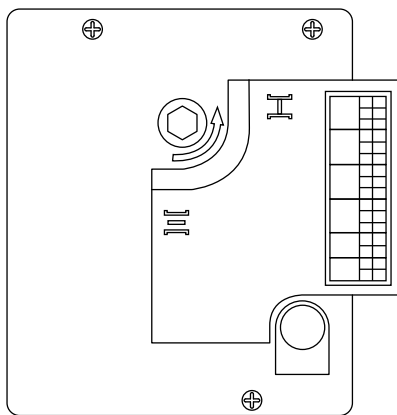
The rearmation can be done by a remote controlled electric rearmation motor ME.

## Type of magnet

VD: natural magnet

VM: electromagnet

|          | VM24                          | VM48   | VD24                     | VD48   |
|----------|-------------------------------|--------|--------------------------|--------|
| Voltage  | 24 Vdc                        | 48 Vdc | 24 Vdc                   | 48 Vdc |
| Capacity | 1,5 W interruption of current |        | 3,5 W impulse of current |        |



|    | ME  | FCU | DCU | FCB | DCB |
|----|-----|-----|-----|-----|-----|
| 1  | +   | NF  | NF  | NF  | NF  |
| 2  | -   | ND  | ND  | ND  | ND  |
| 3  | +/- | C   | C   | C   | C   |
| 4  | -/+ | NF  | NF  | NF  | NF  |
| 5  | -/+ | ND  | ND  | ND  | ND  |
| 6  | C   | NF  | NF  | NF  | NF  |
| 7  | ND  | C   | C   | C   | C   |
| 8  | NF  | ND  | ND  | ND  | ND  |
| 9  | C   | NF  | NF  | NF  | NF  |
| 10 | ND  | C   | C   | C   | C   |
| 11 | NF  | ND  | ND  | ND  | ND  |
| 12 | C   | NF  | NF  | NF  | NF  |
| 13 | ND  | C   | C   | C   | C   |
| 14 | NF  | ND  | ND  | ND  | ND  |
| 15 | C   | NF  | NF  | NF  | NF  |
| 16 | ND  | C   | C   | C   | C   |

## Unlocking

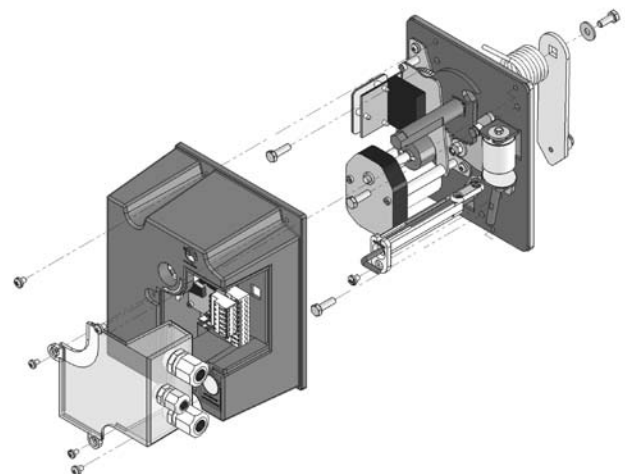
- Manually : by pressing the yellow button
- Remote control : by an electric impulse (VD) or by interruption (VM) of the magnets power supply

## Rearmation

- Manually : turn 90° with hexagon key 13 mm  
A magnet with interruption (VM) needs power supply for rearmation
- By electric rearmation motor

MANF (+ME) pg C/35

|           |                                    |
|-----------|------------------------------------|
| Voltage   | 24/48 Vdc ± 10%<br>24/48 Vac ± 10% |
| $I_{rms}$ | 1A                                 |
| $I_{max}$ | ± 1,5A                             |



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# Smoke evacuation

MEC



## BF – Belimo

When connected to the power supply the servomotor moves the smoke evacuation damper blade into its stand-by position.

When the power is interrupted, the internal armed spring returns the damper blade into its safety position.

|                        | BF 24                              | BF 230       |
|------------------------|------------------------------------|--------------|
| Voltage                | 24 Vdc -10%<br>+20%<br>24 Vac ±20% | 230 Vac ±15% |
| Consumption holding    | 2 W                                | 3 W          |
| Consumption rearmation | 7 W                                | 8 W          |
| Capacity               | 10 VA                              | 12,5 VA      |

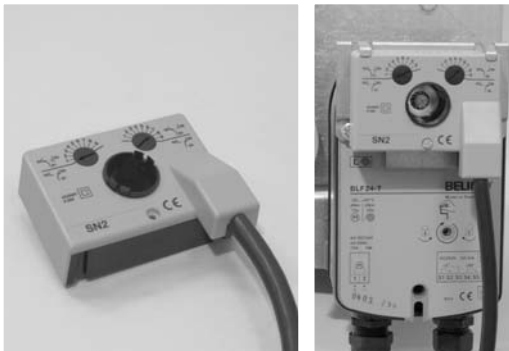


| BF24   BF230<br>24V   230V  | BF24-ST<br>24V<br>+ plug  |
|---|---|
|  |  |

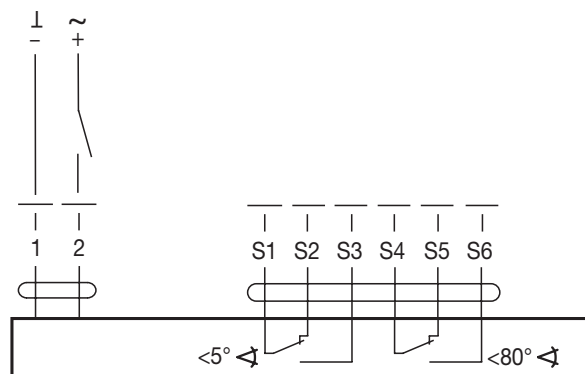
## Option

Bipolar end and begin of range switches

### SN2



### BF



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# Smoke evacuation

# MEC

## DB – Joventa

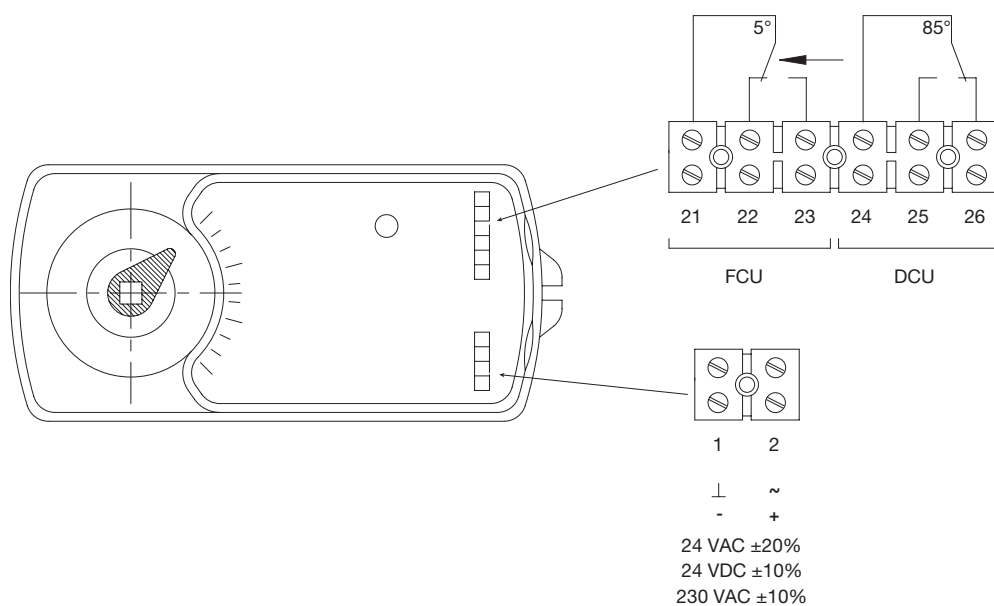
When connected to the power supply the servomotor moves the smoke evacuation damper blade into its stand-by position.

When the power is interrupted, the internal armed spring returns the damper blade into its safety position.

|                        | DB 24                      | DB 230       |
|------------------------|----------------------------|--------------|
| Voltage                | 24 Vdc ±10%<br>24 Vac ±20% | 230 Vac ±10% |
| Consumption holding    | 4 W                        | 4,5 W        |
| Consumption rearmation | 10 W                       | 8 W          |
| Capacity               | 18 VA                      | 13 VA        |



DB



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# Smoke evacuation

MEC

## EX – Schischek

When connected to the power supply the explosion proof motor moves the smoke evacuation damper blade into its stand-by position.

When the power is interrupted, the internal armed spring returns the damper blade into its safety position.

For deflagration risk between several risk areas are distinguished:

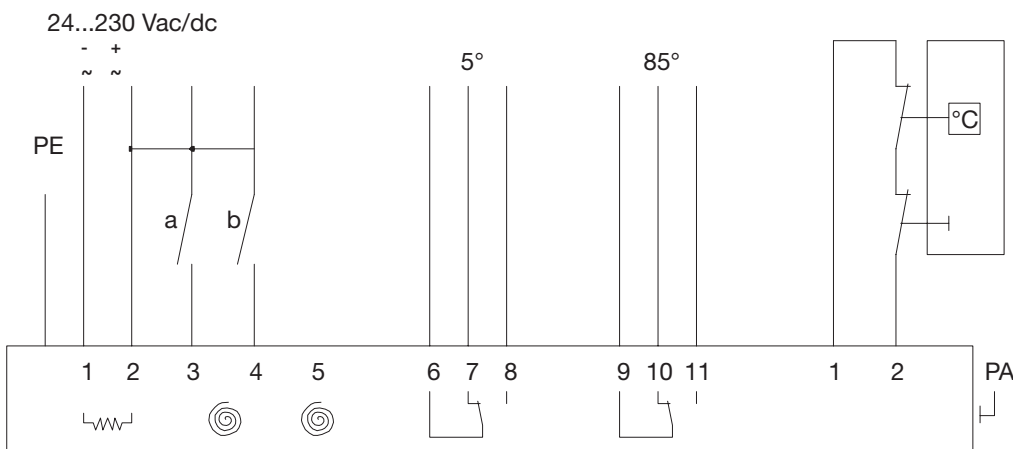
- Zone 1/21 :  
midling risk of explosion  
>100h/year explosive surroundings
- Zone 2/22 :  
low risk of explosion  
<10h/year of explosive surroundings



|           |                            |
|-----------|----------------------------|
|           | <b>EX 24/230</b>           |
| Voltage   | 24...230 Vac/Vdc +15%/-20% |
| $I_{rms}$ | 24V: 1,45A<br>230V: 0,3A   |

| RMEX                                 | EMEX           |
|--------------------------------------|----------------|
| RedMax 24V/230V                      | ExMax 24V/230V |
| Zone 2/22                            | Zone 1/2/21/22 |
| Explosion proof ACTUATOR for VR2/VU2 |                |

## EX





# Air valves



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# Overview diffusers, valves and cover

|                        |      |          |   | Connects to   |   |   |   |   |  |   |               |
|------------------------|------|----------|---|---|---|---|---|---|--|---|---------------|
| Unit                   |      |          |   | Socket with thread for units with bayonet holder  |   |   | Socket with groove for units with spring holder   |   | Cover socket with groove for units with wire spring holder                                 | Smooth socket for units with plate spring holder  | Duct/Fitting  |
| Supply air             | VTK  | Diffuser |    |   |   |   | VRFU<br> | VRFM<br> | VRR<br> |   |               |
|                        | VTTB | Diffuser |    |   |   |   | VRFU<br> | VRFM<br> | VRR<br> |   |               |
|                        | KPT  | Valve    |    |   |   |   |   |   |  | IL<br> | Duct/Fittings |
|                        | KI   | Valve    |  | VRGU<br> | VRGL<br> | VRGM<br> |   |   |  |   |               |
|                        | KIR  | Valve    |  | VRGU<br> | VRGL<br> | VRGM<br> |   |   |  |   |               |
| Supply and exhaust air | TAV  | Valve    |  |   |   |   |   |   |  |   | Duct          |

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|             |                         |                       |   | Connects to  |  |  |  |  |  |   |               |
|-------------|-------------------------|-----------------------|---|--|--|--|--|--|--|---|---------------|
| Unit        |                         |                       |   | Socket with thread for units with bayonet holder   |  |  | Socket with groove for units with spring holder  |  | Cover socket with groove for units with wire spring holder   | Smooth socket for units with plate spring holder  | Duct/Fitting  |
| Exhaust air | <b>KVB</b>              | Valve                 |    |  |  |  | <b>VRFU</b><br> | <b>VRFM</b><br>   | <b>VRR</b><br>  |   |               |
|             | <b>KDPF</b>             | Valve                 |    | <b>VRGU</b><br>   | <b>VRGL</b><br>   | <b>VRGM</b><br>   | <b>VRFU</b><br> | <b>VRFM</b><br>   | <b>VRR</b><br>  |   |               |
|             | <b>KVG</b><br>Ø 100–160 | Valve                 |    |  |  |  | <b>VRFU</b><br> | <b>VRFM</b><br>   | <b>VRR</b><br>  |   |               |
|             | <b>KVG</b><br>Ø 200     | Valve                 |   | <b>VRGU</b><br> | <b>VRGL</b><br> | <b>VRGM</b><br> |  |  |  |   |               |
|             | <b>KU</b>               | Valve                 |  | <b>VRGU</b><br> | <b>VRGL</b><br> | <b>VRGM</b><br> |  |  |  |   |               |
|             | <b>KSU</b>              | Valve                 |  | <b>VRGU</b><br> | <b>VRGL</b><br> | <b>VRGM</b><br> |  |  |  |   |               |
|             | <b>KSUL</b>             | Valve                 |  | <b>VRGU</b><br> | <b>VRGL</b><br> | <b>VRGM</b><br> |  |  |  |   |               |
|             | <b>KSUB</b>             | Valve and fire damper |  | <b>VRGU</b><br> | <b>VRGL</b><br> | <b>VRGM</b><br> |  |  |  |   |               |
|             | <b>KPF</b>              | Valve                 |  |  |  |  |  |  |  | <b>IL</b><br>  | Duct/Fittings |
|             | <b>No air</b>           | <b>TLO</b>            | Cover   |                 |  |  |  | <b>VRFU</b><br> | <b>VRFM</b><br> | <b>VRR</b><br> |               |



# Diffuser

# VVTK



## Description

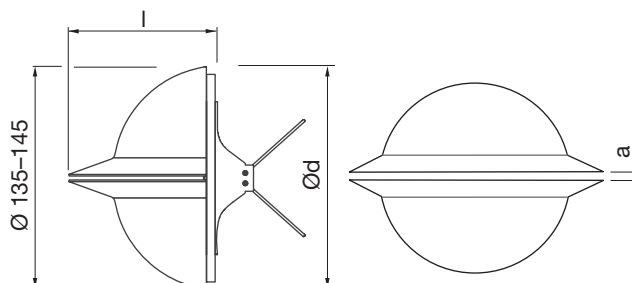
Diffuser for supply air.  
Designed for wall mounting.  
Spring holders connect to socket VRFU, VRFM or VRR.

\* For Ø125 the outer part of the brim of the socket is visible.  
If this is not acceptable the cover plate VVTKR can be used  
to hide the brim.

**Material**  
Painted galvanized sheet metal.

**Colour**  
White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

## Dimensions



| Ød<br>nom | l<br>mm | m<br>kg |
|-----------|---------|---------|
| 100       | 90      | 0,31    |
| 125 *     | 90      | 0,31    |

## Ordering example

|              |      |     |
|--------------|------|-----|
| Product      | VVTK | 100 |
| Dimension Ød |      |     |





# Diffuser

VWTK

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], throw length,  $l_{0,2}$  [m], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graph.

Note! The A-weighted sound power level,  $L_{WA}$ , will increase by 3 dB when the valve is mounted in a bend.

## Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

| Ød<br>nom | Diffuser<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |     |     |
|-----------|------------------------|--------------------------|-----|-----|-----|----|----|-----|-----|
|           |                        | 63                       | 125 | 250 | 500 | 1K | 2K | 4K  | 8K  |
| 100       | Duct                   | -2                       | -7  | -7  | -4  | -4 | -7 | -10 | -14 |
| 125       | Duct                   | -2                       | -7  | -7  | -4  | -4 | -7 | -10 | -14 |

## Sound attenuation, $\Delta L$ , [dB]

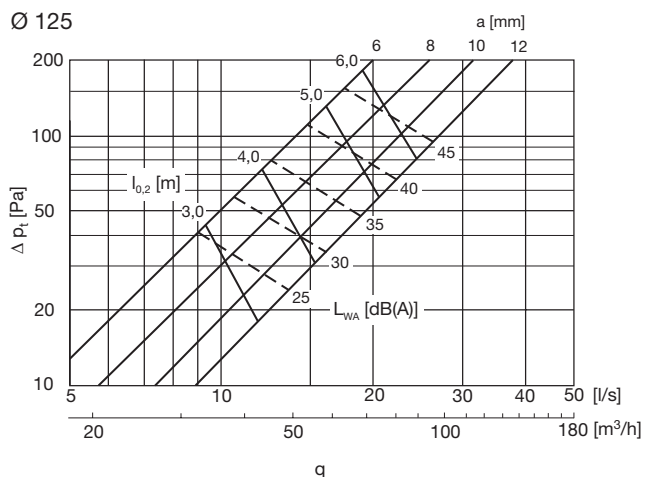
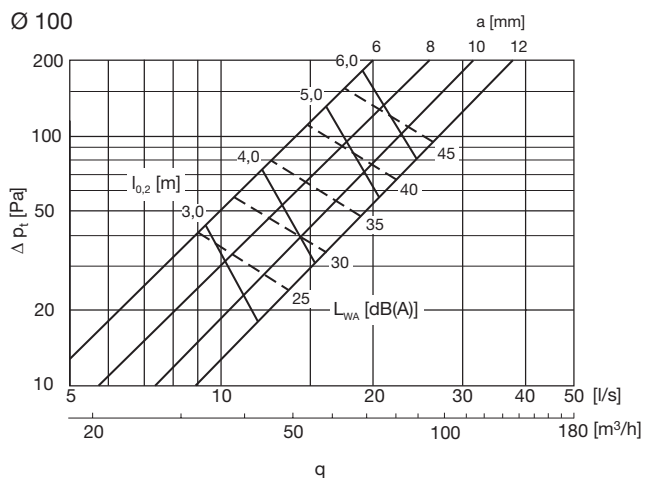
| Ød<br>nom | Diffuser<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |    |    |
|-----------|------------------------|--------------------------|-----|-----|-----|----|----|----|----|
|           |                        | 63                       | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 100       | Duct                   | 24                       | 20  | 18  | 12  | 10 | 10 | 10 | 10 |
| 125       | Duct                   | 24                       | 20  | 18  | 12  | 10 | 10 | 10 | 10 |

## Air jet diffusion pattern

Maximum vertical width,  $b_v = 0,1 \times l_{0,2}$  m  
Maximum horizontal width,  $b_h = 0,6 \times l_{0,2}$  m

## Measurement of air flow

Data is available in a separate brochure.



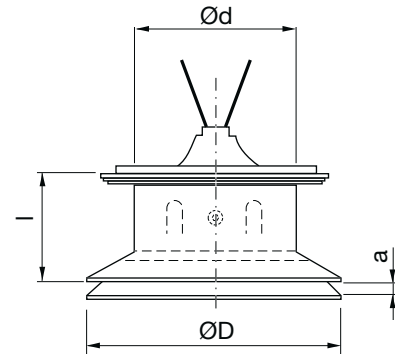


# Diffuser

# VTTB



## Dimensions



### Description

Diffuser for supply air.  
 Designed with a prolonged neck for ceiling mounting. Is equipped with a fixed blanking-off segment for preventing the air flow in a desired direction.  
 Spring holders connect to socket VRFU, VRFM or VRR.

### Material

Painted galvanized sheet metal.

### Colour

White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

| Ød<br>nom | ØD<br>mm | l<br>mm | m<br>kg |
|-----------|----------|---------|---------|
| 100       | 155      | 70      | 0,44    |
| 125       | 185      | 76      | 0,60    |
| 160       | 226      | 83      | 0,85    |

### Ordering example



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# Diffuser

VTTTB

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], throw length,  $l_{0,2}$  [m], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graphs.

Note! The A-weighted sound power level,  $L_{WA}$ , will increase by 3 dB when the valve is mounted in a bend.

### Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

| Ød<br>nom | Diffuser<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |     |     |
|-----------|------------------------|--------------------------|-----|-----|-----|----|----|-----|-----|
|           |                        | 63                       | 125 | 250 | 500 | 1K | 2K | 4K  | 8K  |
| 100       | Duct                   | -2                       | -7  | -7  | -4  | -5 | -5 | -13 | -20 |
| 125       | Duct                   | -1                       | -2  | -3  | -3  | -4 | -7 | -13 | -16 |
| 160       | Duct                   | 1                        | 2   | -2  | -2  | -4 | -9 | -14 | -9  |

### Sound attenuation, $\Delta L$ , [dB]

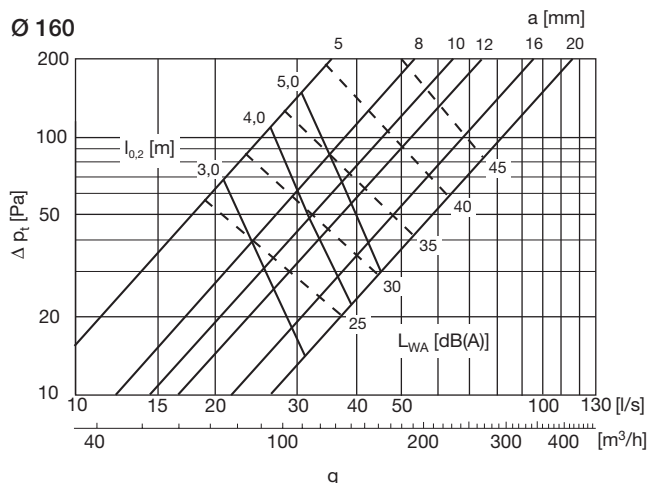
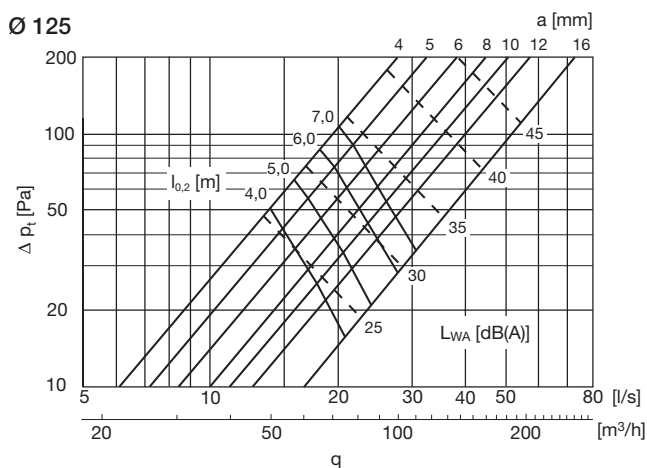
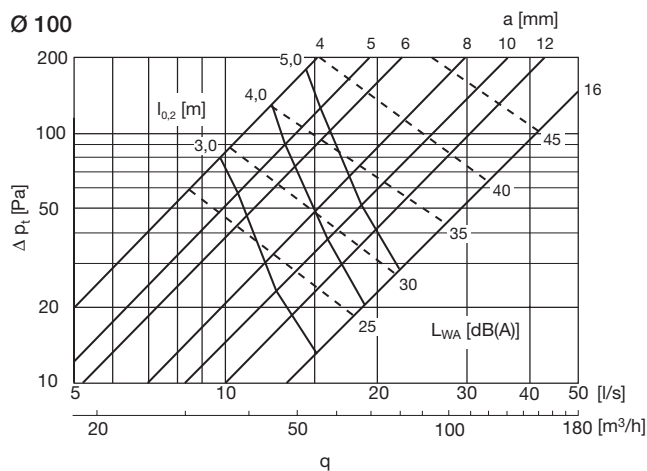
| Ød<br>nom | Diffuser<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |    |    |
|-----------|------------------------|--------------------------|-----|-----|-----|----|----|----|----|
|           |                        | 63                       | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 100       | Duct                   | 25                       | 22  | 17  | 13  | 12 | 11 | 11 | 11 |
| 125       | Duct                   | 25                       | 20  | 15  | 12  | 11 | 9  | 9  | 9  |
| 160       | Duct                   | 26                       | 17  | 13  | 12  | 11 | 7  | 7  | 8  |

### Air jet diffusion pattern

Maximum vertical width,  $b_v = 0,1 \times l_{0,2}$  m

### Measurement of air flow

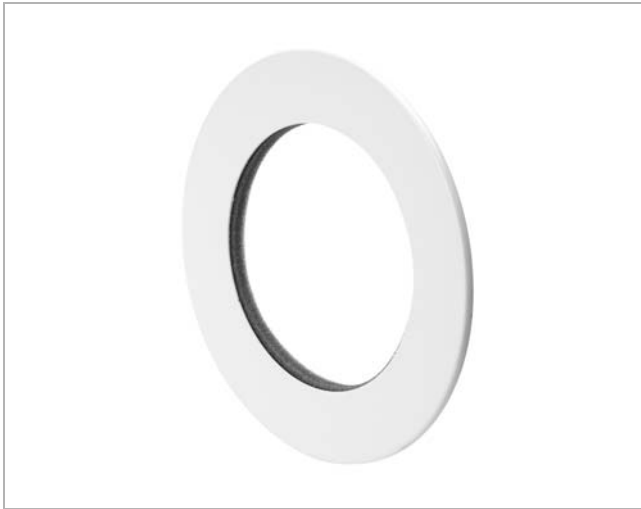
Data is available in a separate brochure.





# Cover plate

# VVKR



### Description

Plate to cover the outer part of the brim of the socket.

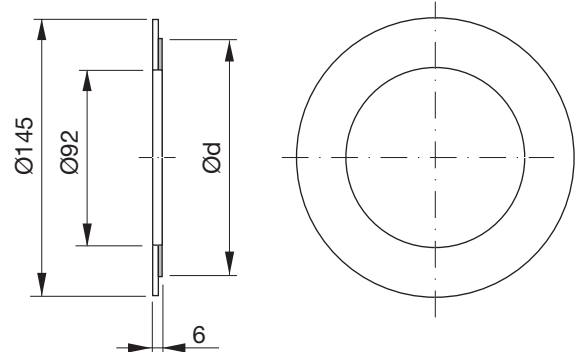
### Material

Painted galvanized sheet metal.

### Colour

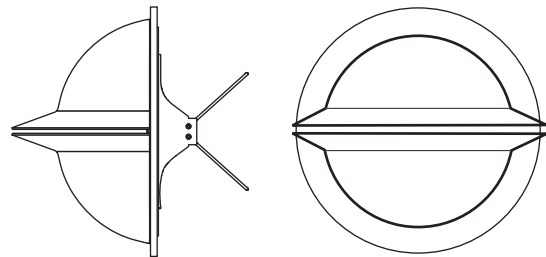
White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

### Dimensions



| Ød<br>nom | m<br>kg |
|-----------|---------|
| 125       | 0,07    |

### Cover plate together with valve VVK Ø125



### Ordering example

|              |      |     |
|--------------|------|-----|
| Product      | VVKR | 125 |
| Dimension Ød |      |     |

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# Valve

# KPT

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## Description

Valve for supply air.  
Designed for ceiling mounting.  
Flat spring holders connect to duct.

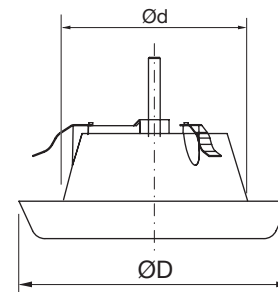
## Material

Plastic.

## Colour

White RAL 9010.

## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 80        | 118      | 0,08    |
| 100       | 148      | 0,10    |
| 125       | 180      | 0,16    |
| 160       | 203      | 0,22    |
| 200       | 246      | 0,55    |

## Ordering example

Product **KPT**  
Dimension Ød **125**





# Valve

KPT

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $n$  [number of opening turns], are shown in the graphs.

**Sound power level,  $L_{WA}$  [dB], A-weighted** is shown in the graphs.

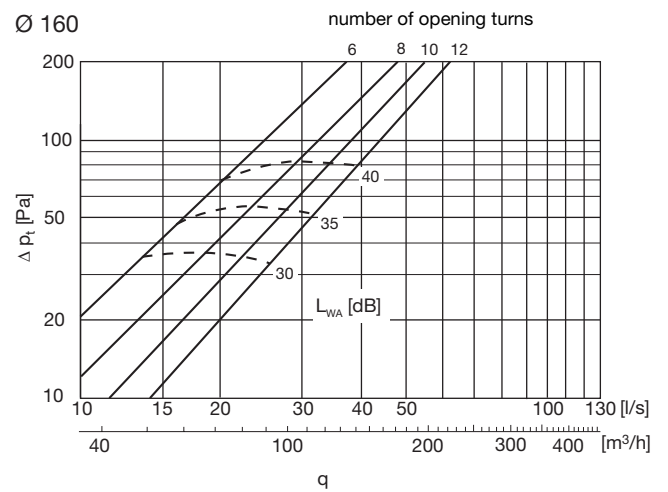
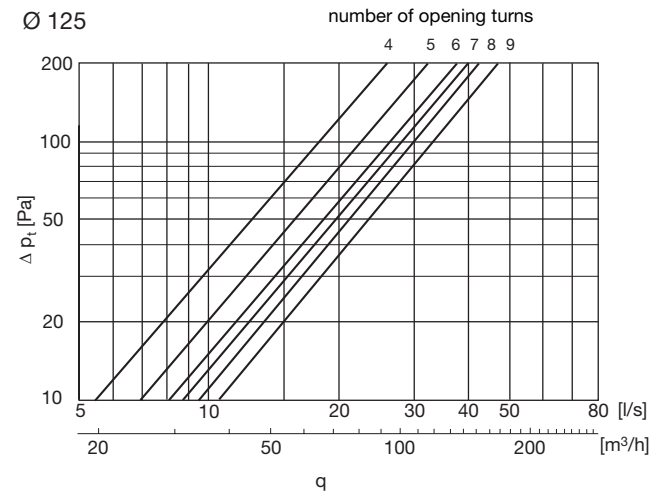
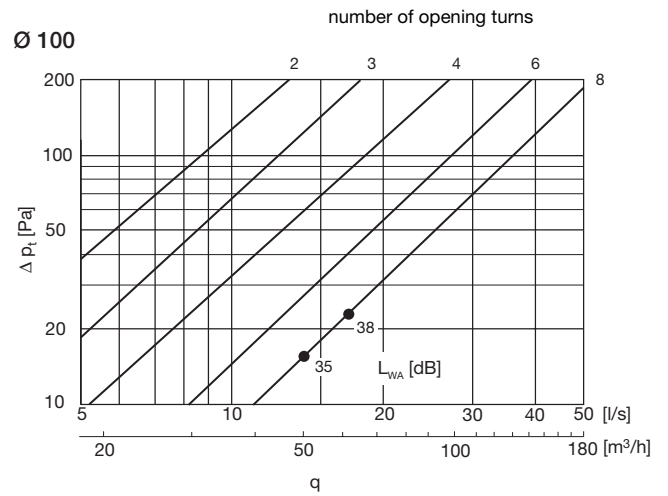
## Sound attenuation, $\Delta L_A$ , [dB]

| $\varnothing d$ nom | Valve mounted in | Setting $n$ [number of opening turns] | Attenuation $\Delta L_A$ [dB] |
|---------------------|------------------|---------------------------------------|-------------------------------|
| 100                 | Duct             | 0                                     | 8,5                           |
|                     |                  | 2                                     | 8,5                           |
|                     |                  | 3                                     | 8,5                           |
|                     |                  | 4                                     | 8                             |
|                     |                  | 6                                     | 8                             |
|                     |                  | 8                                     | 8                             |
| 125                 | Duct             | 10                                    | 8                             |
|                     |                  | 0                                     | 14                            |
|                     |                  | 4                                     | 8                             |
|                     |                  | 5                                     | 8                             |
|                     |                  | 6                                     | 7,5                           |
| 160                 | Duct             | 7                                     | 7                             |
|                     |                  | 8                                     | 6,5                           |
|                     |                  | 9                                     | 6                             |
|                     |                  | 0                                     | 14,5                          |
| 200                 | Duct             | 6                                     | 6,5                           |
|                     |                  | 8                                     | 6                             |
|                     |                  | 10                                    | 6                             |
|                     |                  | 12                                    | 6                             |
| 200                 | Duct             | 0                                     | 15,5                          |
|                     |                  | 7                                     | 6,5                           |
|                     |                  | 9                                     | 6                             |
|                     |                  | 11                                    | 5,5                           |
|                     |                  | 13                                    | 5,5                           |
|                     |                  | 15                                    | 5,5                           |

Tolerance  $\pm 1$

## Measurement of air flow

Data is available in a separate brochure.



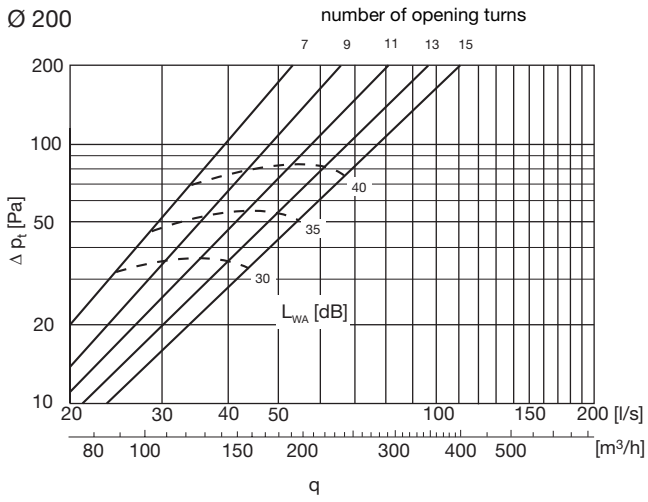
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# Valve

KPT

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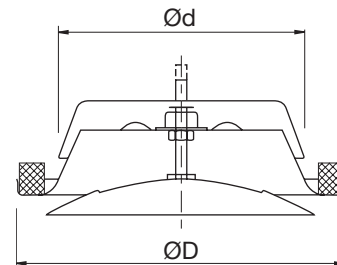


# Valve

KI



## Dimensions



### Description

Valve for supply air.  
Designed for ceiling mounting.  
Bayonet holders connect to socket VRGU, VRGL or VRGM.

### Material

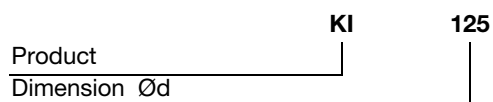
Painted galvanized sheet metal.

### Colour

White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 80        | 111      | 0,14    |
| 100       | 130      | 0,21    |
| 125       | 160      | 0,30    |
| 150       | 190      | 0,39    |
| 160       | 190      | 0,41    |
| 200       | 245      | 0,65    |

### Ordering example



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- 18



# Valve

KI

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], throw length,  $l_{0,2}$  [m], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graphs.

### Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{Ok}$ .  $K_{Ok}$  is found in the table below.

| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |     |     |     |
|-----------|---------------------|--------------------------|-----|-----|-----|----|-----|-----|-----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K  | 4K  | 8K  |
| 80        | Duct                | -                        | 3   | 2   | -1  | -6 | -15 | -27 | -39 |
| 100       | Duct                | -                        | 2   | 2   | -1  | -6 | -14 | -25 | -37 |
| 125       | Duct                | -                        | 2   | 4   | -2  | -7 | -14 | -25 | -37 |
| 160       | Duct                | -                        | 6   | 5   | -3  | -9 | -14 | -25 | -36 |
| 200       | Duct                | -                        | 5   | 5   | -2  | -8 | -16 | -24 | -36 |

|           |   |    |    |    |    |    |    |    |    |
|-----------|---|----|----|----|----|----|----|----|----|
| Tolerance | - | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|---|----|----|----|----|----|----|----|----|

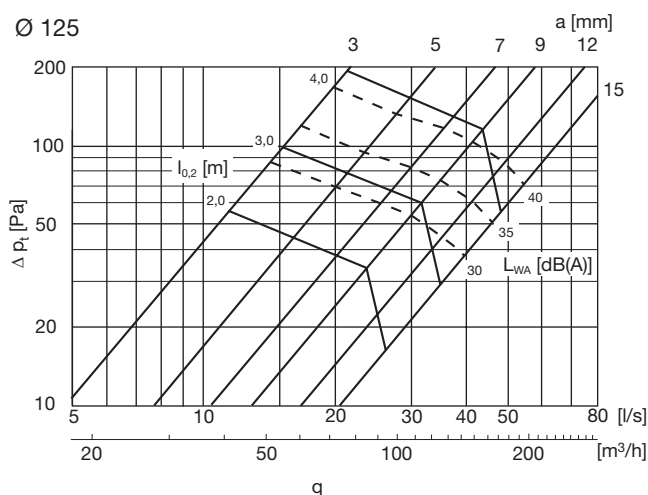
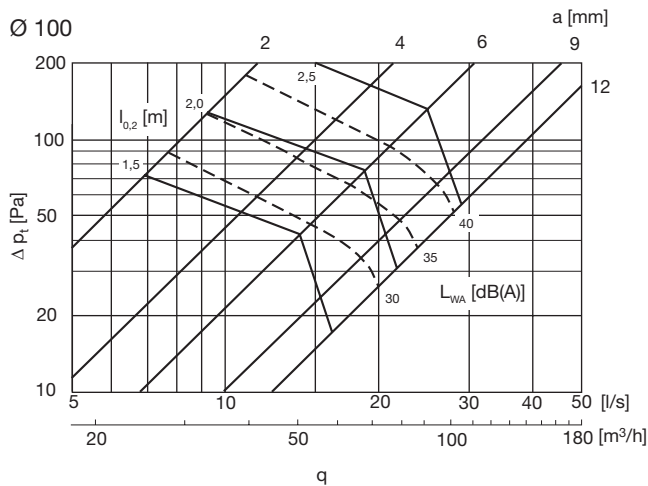
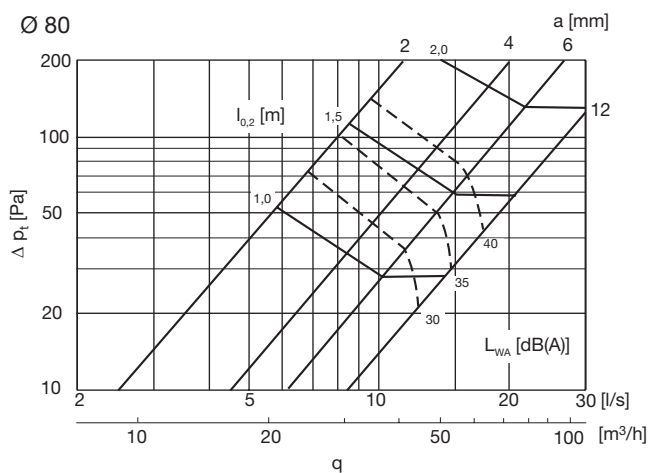
### Sound attenuation, $\Delta L$ , [dB]

| Ød<br>nom | Valve<br>mounted in | Setting<br>$a$<br>[mm] | Centre frequency<br>[Hz] |     |     |     |    |    |    |    |
|-----------|---------------------|------------------------|--------------------------|-----|-----|-----|----|----|----|----|
|           |                     |                        | 63                       | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 80        | Duct                | 2                      | 26                       | 20  | 15  | 14  | 11 | 8  | 10 | 9  |
|           |                     | 6                      | 24                       | 19  | 13  | 11  | 8  | 5  | 8  | 6  |
|           |                     | 12                     | 24                       | 19  | 13  | 10  | 6  | 4  | 5  | 6  |
| 100       | Duct                | 2                      | 22                       | 19  | 14  | 12  | 11 | 12 | 10 | 12 |
|           |                     | 6                      | 22                       | 17  | 11  | 9   | 8  | 9  | 6  | 9  |
|           |                     | 12                     | 22                       | 17  | 11  | 8   | 6  | 7  | 4  | 7  |
| 125       | Duct                | 3                      | 20                       | 17  | 12  | 11  | 9  | 9  | 8  | 8  |
|           |                     | 7                      | 19                       | 15  | 10  | 8   | 7  | 7  | 5  | 5  |
|           |                     | 12                     | 19                       | 15  | 9   | 7   | 5  | 5  | 4  | 4  |
| 160       | Duct                | 4                      | 18                       | 14  | 10  | 10  | 10 | 10 | 8  | 8  |
|           |                     | 9                      | 18                       | 13  | 9   | 8   | 7  | 7  | 6  | 6  |
|           |                     | 20                     | 18                       | 13  | 8   | 7   | 6  | 5  | 5  | 5  |
| 200       | Duct                | 5                      | 17                       | 13  | 10  | 9   | 11 | 10 | 9  | 9  |
|           |                     | 9                      | 16                       | 12  | 8   | 8   | 9  | 9  | 8  | 7  |
|           |                     | 20                     | 15                       | 11  | 7   | 6   | 7  | 6  | 7  | 6  |

|           |    |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|----|
| Tolerance | ±6 | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|----|----|----|----|----|----|----|----|----|

### Measurement of air flow

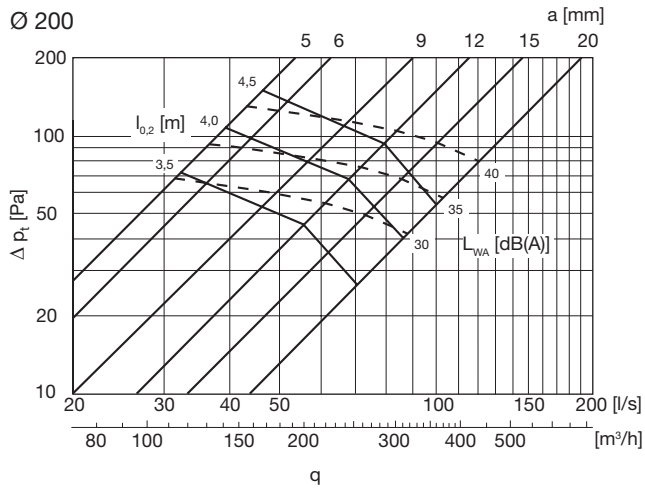
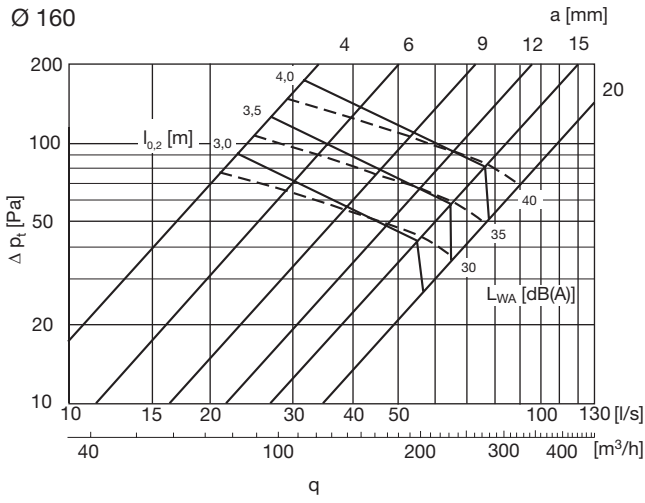
Data is available in a separate brochure.





# Valve

KI



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# Valve

KIR

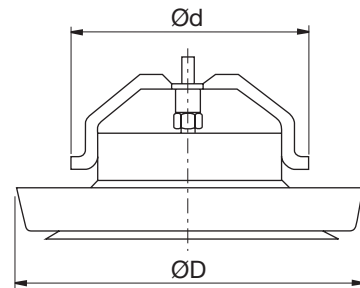
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## Description

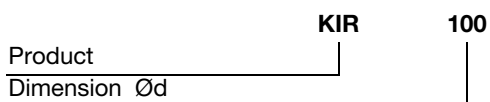
Valve for supply air.  
 Designed for ceiling mounting.  
 Equipped with a removable blanking-off sector plate for preventing the air flow in a desired direction.  
 Bayonet holders connect to socket VRGU, VRGL or VRGM.

## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 100       | 135      | 0,28    |
| 125       | 165      | 0,44    |
| 160       | 205      | 0,62    |

## Ordering example





# Valve

KIR

## Technical data

### Without sector plate

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], throw length,  $l_{0,2}$  [m], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graphs.

Maximal vertical width,  $b_v$  [m] and Maximal horizontal width,  $b_h$  [m], are shown in the tables.

### Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |     |     |     |
|-----------|---------------------|--------------------------|-----|-----|-----|----|-----|-----|-----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K  | 4K  | 8K  |
| 100       | Duct                | -                        | -6  | -2  | -3  | -5 | -8  | -9  | -15 |
| 125       | Duct                | -                        | 0   | 1   | -1  | -5 | -15 | -21 | -33 |
| 160       | Duct                | -                        | 3   | 2   | -1  | -6 | -15 | -23 | -36 |

|           |   |    |    |    |    |    |    |    |    |
|-----------|---|----|----|----|----|----|----|----|----|
| Tolerance | - | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|---|----|----|----|----|----|----|----|----|

### Sound attenuation, $\Delta L$ , [dB]

| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |    |    |
|-----------|---------------------|--------------------------|-----|-----|-----|----|----|----|----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 100       | Duct                | 22                       | 18  | 13  | 11  | 9  | 8  | 7  | 8  |
| 125       | Duct                | 20                       | 16  | 11  | 9   | 9  | 7  | 6  | 5  |
| 160       | Duct                | 18                       | 14  | 10  | 9   | 9  | 7  | 6  | 6  |

|           |    |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|----|
| Tolerance | ±6 | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|----|----|----|----|----|----|----|----|----|

### Measurement of air flow

Data is available in a separate brochure.

### Air jet diffusion pattern

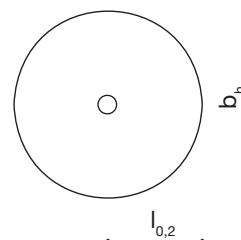
Maximal vertical width,  $b_v$  [m]:

| Setting<br>a<br>[mm] | Supply air temperature difference<br>$\Delta t$ |                            |
|----------------------|---|----------------------------|
|                      | ±0 °C   | -10 °C                     |
| 4                    | $b_v = 0,04 \cdot l_{02}$                       | $b_v = 0,064 \cdot l_{02}$ |
| 12                   | $b_v = 0,04 \cdot l_{02}$                       | $b_v = 0,075 \cdot l_{02}$ |



Maximal horizontal width,  $b_h$  [m]:

| Setting<br>a<br>[mm] | Supply air temperature difference<br>$\Delta t$ |                        |
|----------------------|---|------------------------|
|                      | ±0 °C   | -10 °C                 |
| 4                    | $b_h = 2 \cdot l_{02}$                          | $b_h = 2 \cdot l_{02}$ |
| 12                   | $b_h = 2 \cdot l_{02}$                          | $b_h = 2 \cdot l_{02}$ |



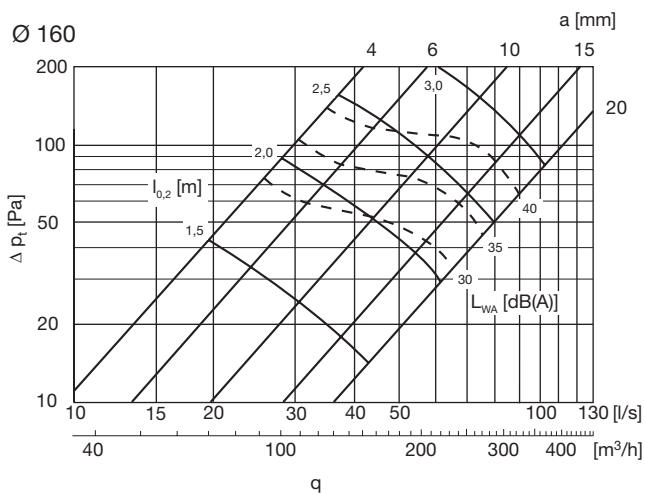
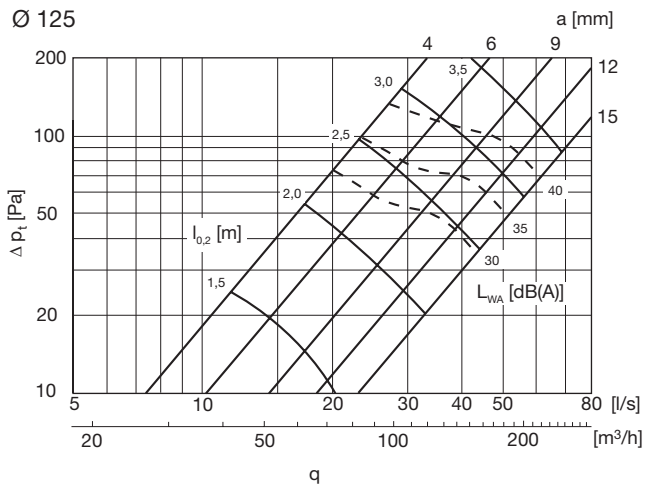
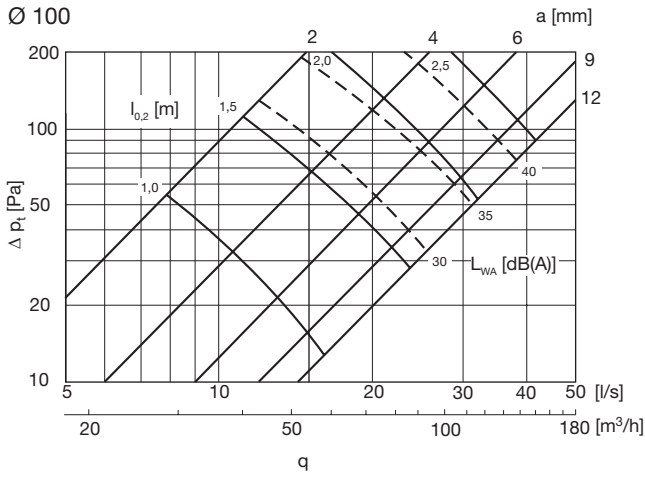
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# Valve

KIR

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# Valve

KIR

## Technical data

### With sector plate

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], throw length,  $l_{0,2}$  [m], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graphs.

Maximal vertical width,  $b_v$  [m] and Maximal horizontal width,  $b_h$  [m], are shown in the tables.

### Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |     |     |     |
|-----------|---------------------|--------------------------|-----|-----|-----|----|-----|-----|-----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K  | 4K  | 8K  |
| 100       | Duct                | -                        | -2  | -2  | -4  | -6 | -8  | -8  | -16 |
| 125       | Duct                | -                        | -1  | -1  | -1  | -4 | -12 | -19 | -33 |
| 160       | Duct                | -                        | 3   | 0   | -2  | -5 | -10 | -21 | -35 |

|           |   |    |    |    |    |    |    |    |    |
|-----------|---|----|----|----|----|----|----|----|----|
| Tolerance | - | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|---|----|----|----|----|----|----|----|----|

### Sound attenuation, $\Delta L$ , [dB]

| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |    |    |
|-----------|---------------------|--------------------------|-----|-----|-----|----|----|----|----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 100       | Duct                | 22                       | 18  | 13  | 11  | 9  | 8  | 7  | 8  |
| 125       | Duct                | 20                       | 16  | 11  | 9   | 9  | 7  | 6  | 5  |
| 160       | Duct                | 18                       | 14  | 10  | 9   | 9  | 7  | 6  | 6  |

|           |    |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|----|
| Tolerance | ±6 | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|----|----|----|----|----|----|----|----|----|

### Measurement of air flow

Data is available in a separate brochure.

### Air jet diffusion pattern

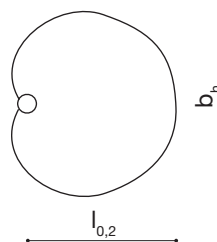
Maximal vertical width,  $b_v$  [m]:

| Setting<br>a<br>[mm] | Supply air temperature difference<br>$\Delta t$ |                             |
|----------------------|---|-----------------------------|
|                      | ±0 °C   | -10 °C                      |
| 4                    | $b_v = 0,04 \cdot l_{0,2}$                      | $b_v = 0,064 \cdot l_{0,2}$ |
| 12                   | $b_v = 0,04 \cdot l_{0,2}$                      | $b_v = 0,075 \cdot l_{0,2}$ |



Maximal horizontal width,  $b_h$  [m]:

| Setting<br>a<br>[mm] | Supply air temperature difference<br>$\Delta t$ |                            |
|----------------------|---|----------------------------|
|                      | ±0 °C   | -10 °C                     |
| 4                    | $b_h = 1,45 \cdot l_{0,2}$                      | $b_h = 1,15 \cdot l_{0,2}$ |
| 12                   | $b_h = 1,45 \cdot l_{0,2}$                      | $b_h = 1,09 \cdot l_{0,2}$ |



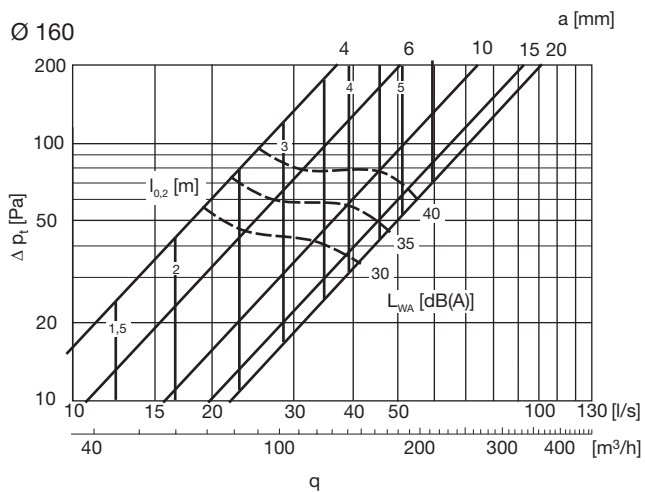
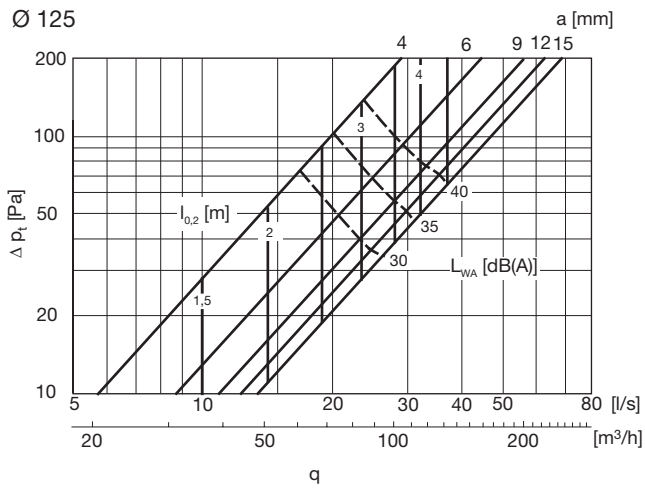
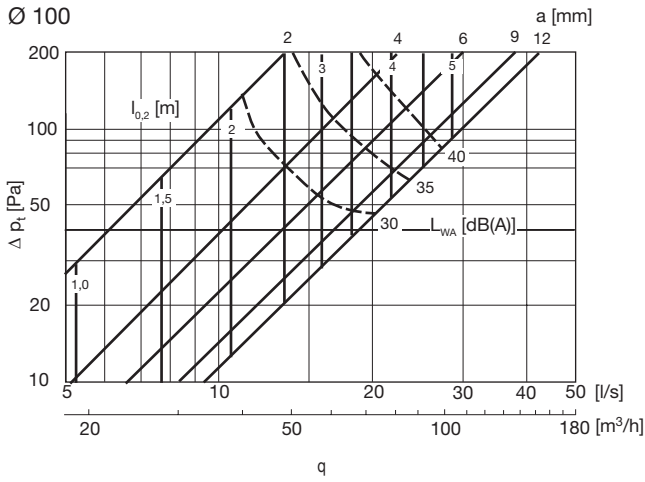
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# Valve

KIR

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# Valve

TAV



## Description

Valve for supply and exhaust air.  
Designed for natural ventilation. Can also be used as an outdoor air valve.  
Screws connect to a duct.

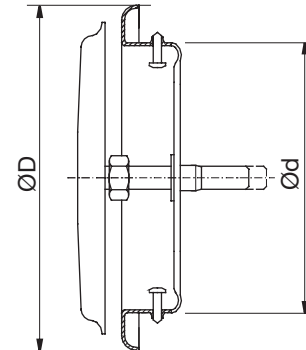
## Material

Painted galvanized sheet metal.

## Colour

White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 63        | 92       | 0,10    |
| 80        | 105      | 0,12    |
| 100       | 140      | 0,19    |
| 125       | 155      | 0,26    |
| 160       | 200      | 0,39    |
| 200       | 235      | 0,53    |
| 250       | 270      | 0,70    |
| 315       | 330      | 0,90    |

## Ordering example

|              |     |     |
|--------------|-----|-----|
| Product      | TAV | 160 |
| Dimension Ød |     |     |

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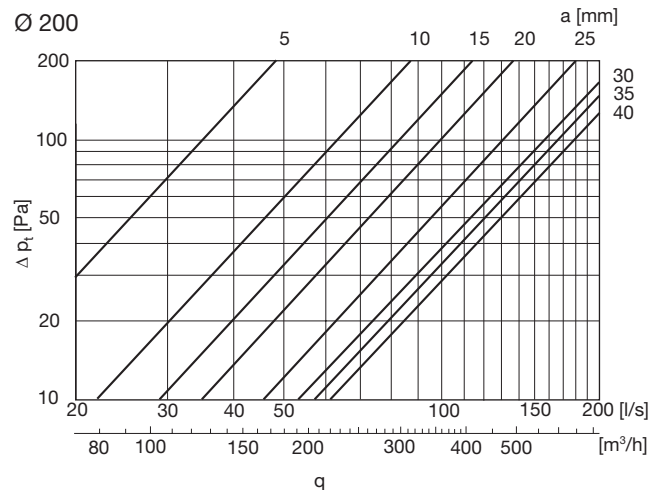
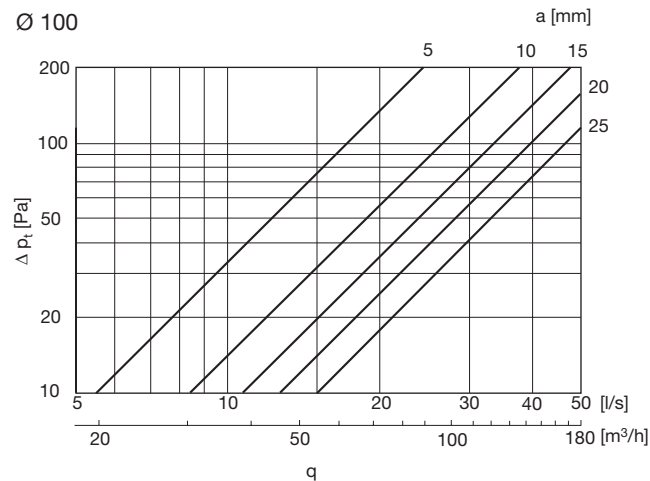
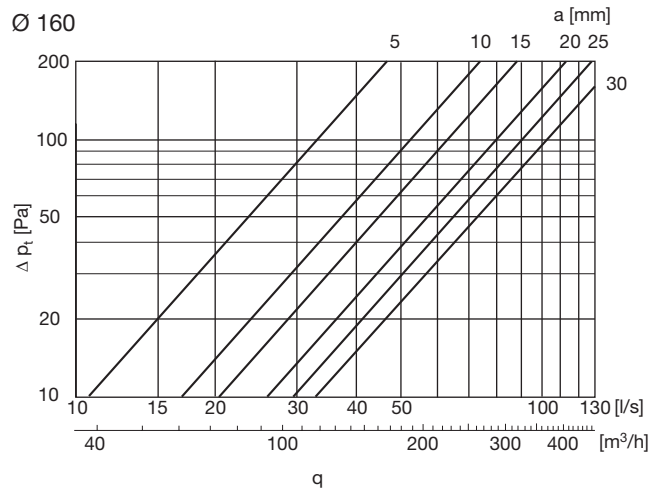
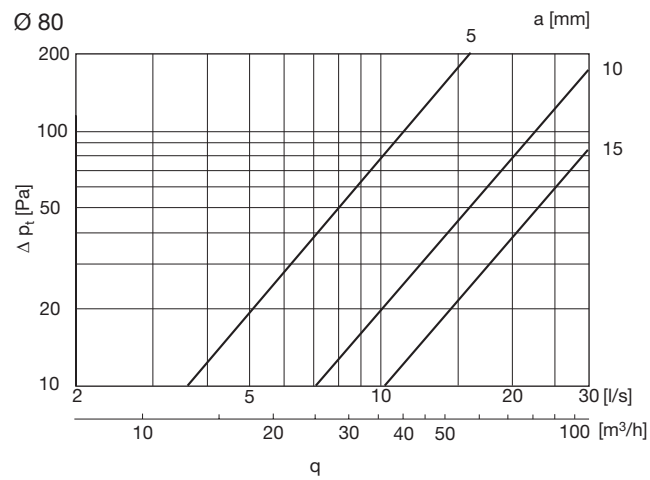
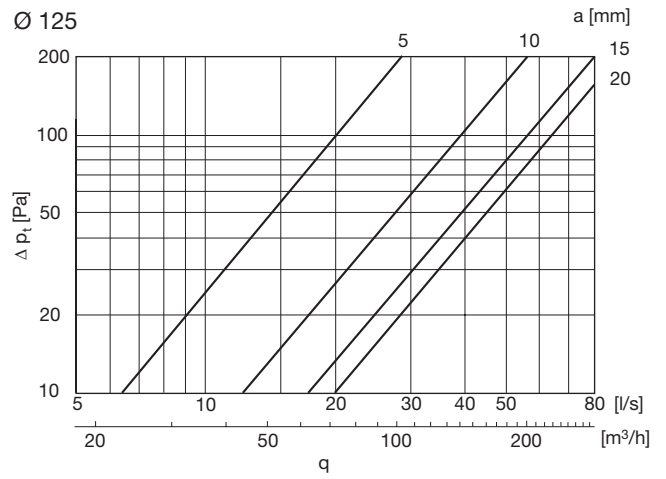
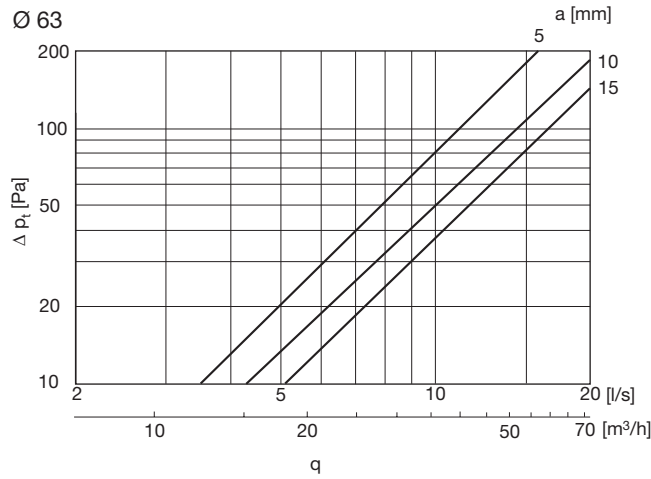


# Valve

TAV

## Technical data

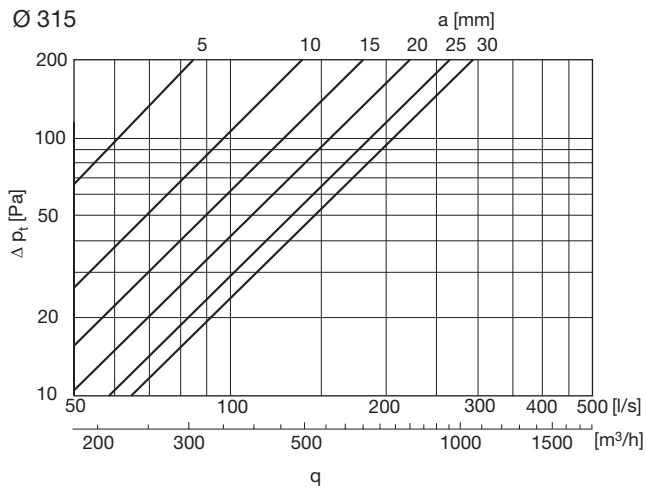
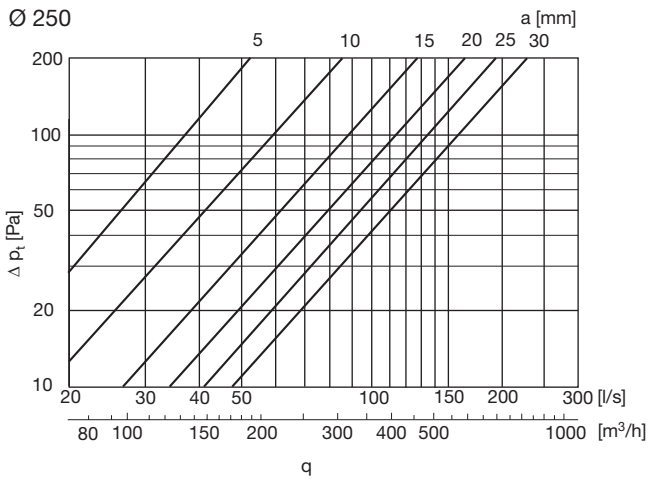
Air flow,  $q$  [l/s] and [m<sup>3</sup>/h] and total pressure drop,  $\Delta p_t$  [Pa], for different settings,  $a$  [mm], are shown in the graphs.





# Valve

# TAV



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# Valve

# KVB

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## Description

Valve for exhaust air.  
Designed for wall or ceiling mounting.  
Spring holders connect to socket VRFU, VRFM or VRR.

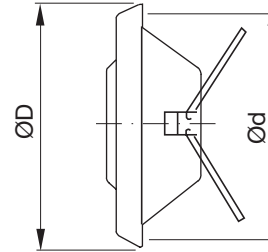
## Material

Painted galvanized sheet metal.

## Colour

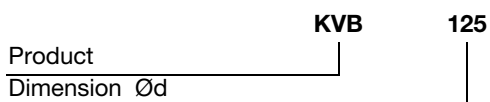
White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 100       | 125      | 0,27    |
| 125       | 150      | 0,36    |
| 160       | 190      | 0,54    |

## Ordering example





# Valve

KVB

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graphs.

### Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

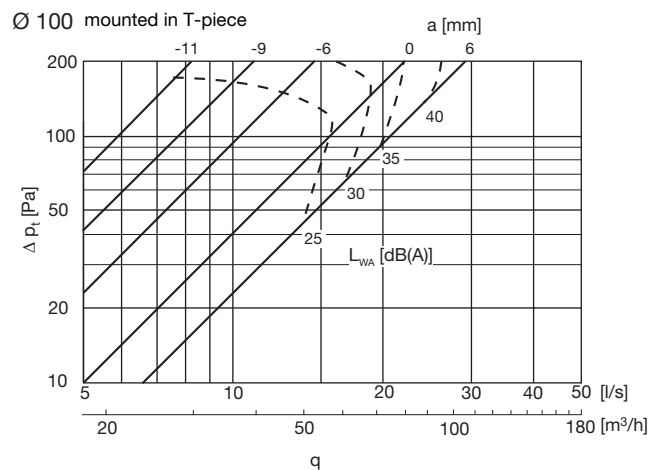
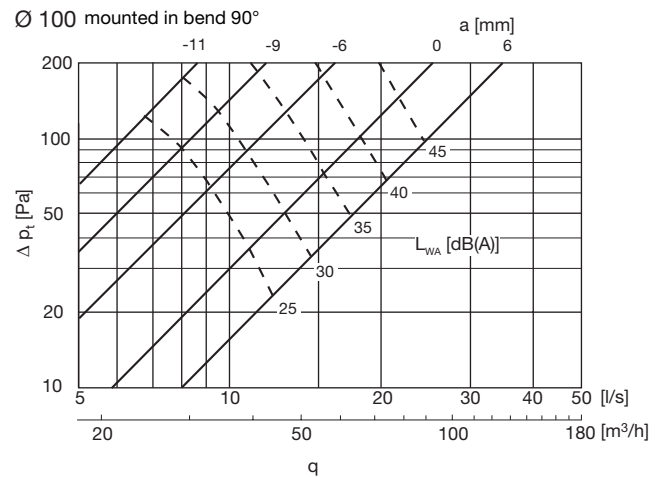
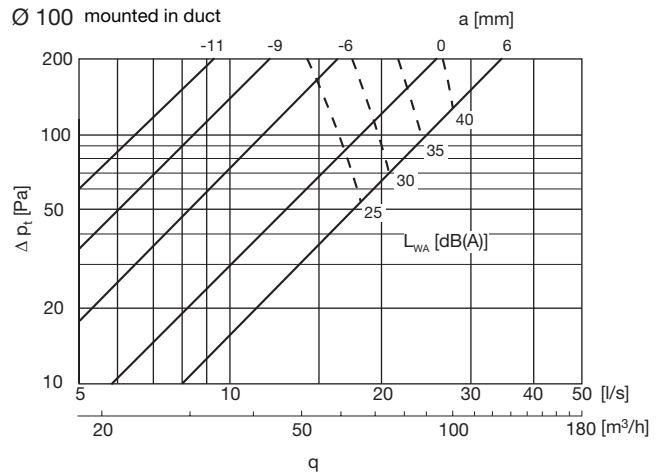
| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |     |     |
|-----------|---------------------|--------------------------|-----|-----|-----|----|----|-----|-----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K | 4K  | 8K  |
| 100       | Duct                | 6                        | 2   | 1   | -3  | -6 | -8 | -11 | -16 |
|           | Bend 90°            | 6                        | 2   | 1   | -3  | -6 | -8 | -11 | -16 |
|           | T-piece             | 6                        | 2   | 1   | -3  | -6 | -8 | -11 | -16 |
| 125       | Duct                | 13                       | -2  | -1  | -5  | -5 | -8 | -12 | -16 |
|           | Bend 90°            | 13                       | -2  | -1  | -5  | -5 | -8 | -12 | -16 |
|           | T-piece             | 13                       | -2  | -1  | -5  | -5 | -8 | -12 | -16 |
| 160       | Duct                | 14                       | 0   | -1  | -4  | -3 | -8 | -16 | -18 |
|           | T-piece             | 14                       | 0   | -1  | -4  | -3 | -8 | -16 | -18 |

### Sound attenuation, $\Delta L$ , [dB]

| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |    |    |
|-----------|---------------------|--------------------------|-----|-----|-----|----|----|----|----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 100       | Duct                | 25                       | 22  | 21  | 20  | 14 | 18 | 9  | 10 |
|           | Bend 90°            | 30                       | 27  | 23  | 17  | 16 | 19 | 12 | 13 |
|           | T-piece             | 25                       | 22  | 21  | 20  | 14 | 18 | 9  | 10 |
| 125       | Duct                | 24                       | 20  | 17  | 15  | 11 | 12 | 7  | 7  |
|           | Bend 90°            | 29                       | 25  | 19  | 12  | 13 | 13 | 10 | 10 |
|           | T-piece             | 24                       | 20  | 17  | 15  | 11 | 12 | 7  | 7  |
| 160       | Duct                | 22                       | 18  | 16  | 12  | 14 | 10 | 9  | 8  |
|           | T-piece             | 22                       | 18  | 16  | 12  | 14 | 10 | 9  | 8  |

### Measurement of air flow

Data is available in a separate brochure.



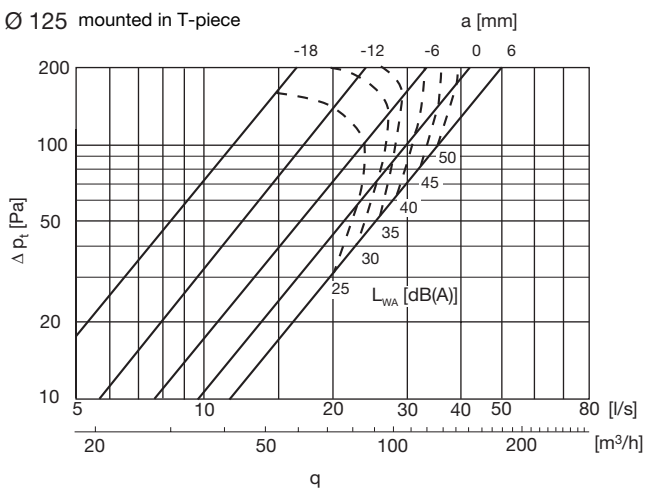
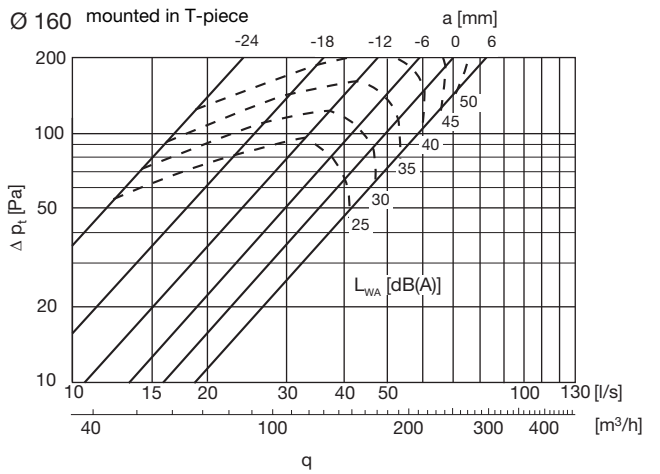
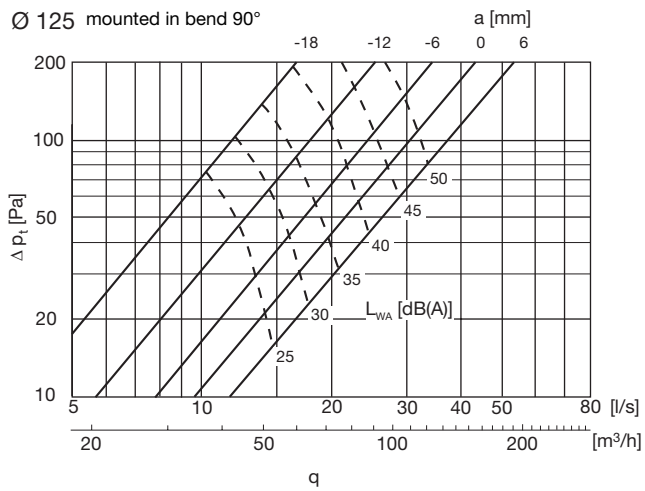
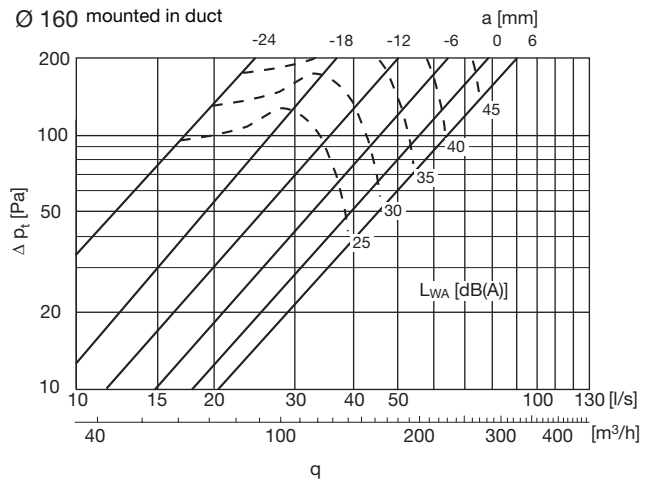
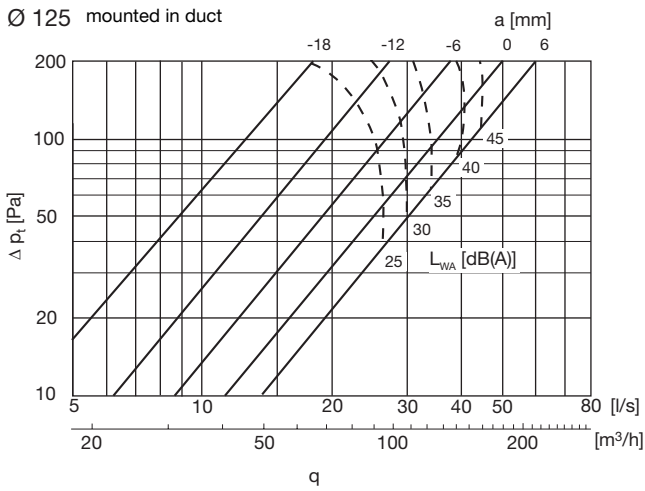
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# Valve

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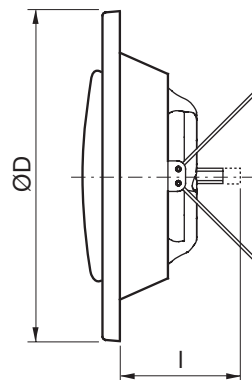


# Valve

KVG



## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 100       | 132      | 0,18    |
| 125       | 162      | 0,25    |
| 160       | 192      | 0,37    |
| 200       | 243      | 0,59    |

### Description

Valve for exhaust air.

Designed for wall or ceiling mounting.

Ø 100–160 have spring holders which connect to socket VRFU, VRFM or VRR.

Ø 200 has bayonet holders which connect to socket VRGU, VRGL or VRGM.

### Material

Painted galvanized sheet metal.

### Colour

White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

### Ordering example



- 1
- 2
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# Valve

KVG

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graphs.

### Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

| Ød nom | Valve mounted in | Centre frequency [Hz] |     |     |     |    |    |     |     |
|--------|------------------|-----------------------|-----|-----|-----|----|----|-----|-----|
|        |                  | 63                    | 125 | 250 | 500 | 1K | 2K | 4K  | 8K  |
| 100    | Duct             | 4                     | -4  | -6  | -7  | -6 | -4 | -13 | -18 |
|        | Bend 90°         | -1                    | -1  | -3  | -3  | -5 | -7 | -16 | -27 |
|        | T-piece          | 7                     | 0   | -2  | -7  | -6 | -5 | -11 | -21 |
| 125    | Duct             | 6                     | -1  | -6  | -6  | -7 | -4 | -16 | -27 |
|        | T-piece          | 7                     | 0   | -7  | -7  | -6 | -5 | -13 | -24 |
| 160    | Duct             | 5                     | -5  | -4  | -6  | -3 | -7 | -18 | -30 |
|        | T-piece          | 5                     | 1   | -5  | -8  | -6 | -4 | -18 | -29 |
| 200    | Duct             | 3                     | -2  | -5  | -6  | -2 | -9 | -16 | -26 |

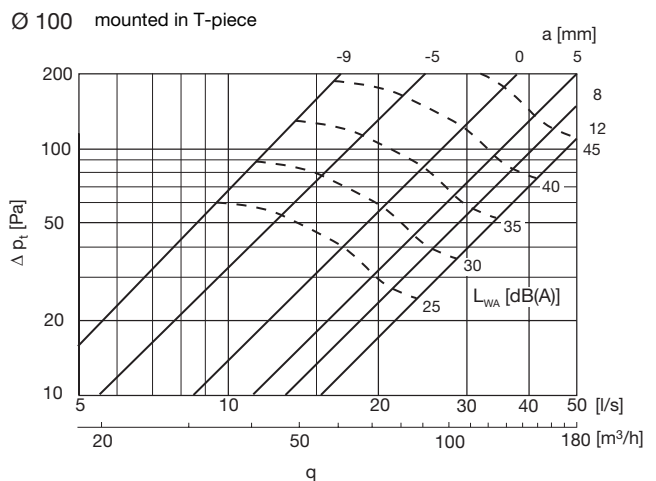
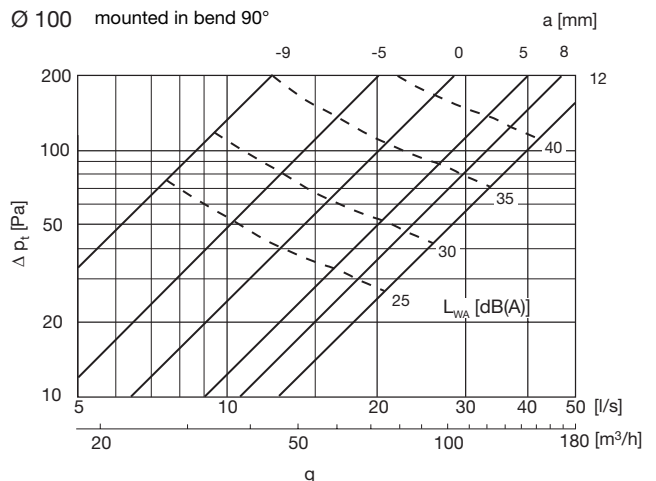
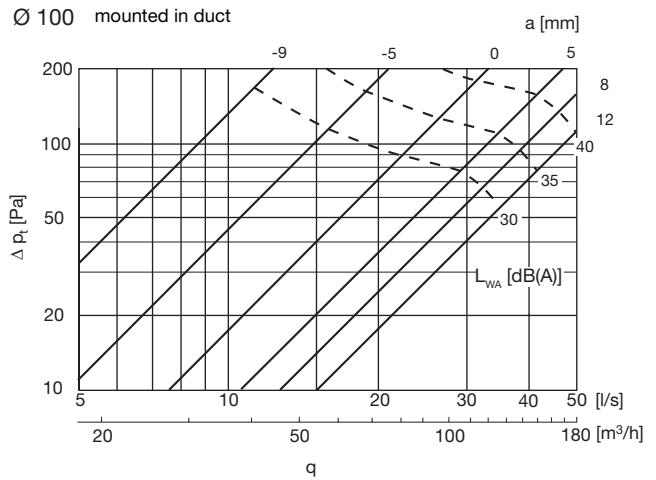
|           |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|
| Tolerance | ±6 | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|----|----|----|----|----|----|----|----|

### Sound attenuation, $\Delta L$ , [dB]

| Ød nom  | Valve mounted in | Setting a [mm] | Centre frequency [Hz] |     |     |     |    |    |    |    |
|---------|------------------|----------------|-----------------------|-----|-----|-----|----|----|----|----|
|         |                  |                | 63                    | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 100     | Duct             | -12            | 23                    | 19  | 14  | 14  | 12 | 11 | 13 | 16 |
|         |                  | 0              | 22                    | 16  | 9   | 8   | 6  | 6  | 6  | 10 |
|         |                  | 8              | 22                    | 16  | 9   | 7   | 5  | 5  | 4  | 8  |
|         | Bend 90°         | -12            | 25                    | 20  | 15  | 13  | 12 | 12 | 12 | 15 |
|         |                  | 0              | 24                    | 17  | 11  | 7   | 6  | 7  | 6  | 11 |
|         |                  | 8              | 24                    | 17  | 11  | 6   | 5  | 5  | 5  | 11 |
| T-piece | -12              | 23             | 19                    | 14  | 14  | 12  | 11 | 13 | 16 |    |
|         | 0                | 22             | 16                    | 9   | 8   | 6   | 6  | 6  | 10 |    |
|         | 8                | 22             | 16                    | 9   | 7   | 5   | 5  | 4  | 8  |    |
| 125     | Duct             | -17            | 21                    | 15  | 12  | 10  | 8  | 8  | 11 | 14 |
|         |                  | -6             | 20                    | 14  | 10  | 7   | 5  | 5  | 6  | 7  |
|         |                  | 5              | 19                    | 14  | 9   | 6   | 4  | 4  | 4  | 8  |
| 160     | Duct             | -18            | 19                    | 14  | 10  | 8   | 7  | 9  | 13 | 13 |
|         |                  | 5              | 18                    | 13  | 8   | 6   | 5  | 5  | 10 | 8  |
|         |                  | 6              | 18                    | 12  | 7   | 5   | 4  | 4  | 10 | 6  |
| 200     | Duct             | -20            | 17                    | 14  | 9   | 8   | 8  | 10 | 11 | 12 |
|         |                  | 0              | 17                    | 12  | 7   | 5   | 5  | 6  | 8  | 8  |
|         |                  | 20             | 15                    | 12  | 6   | 5   | 3  | 4  | 8  | 7  |

### Measurement of air flow

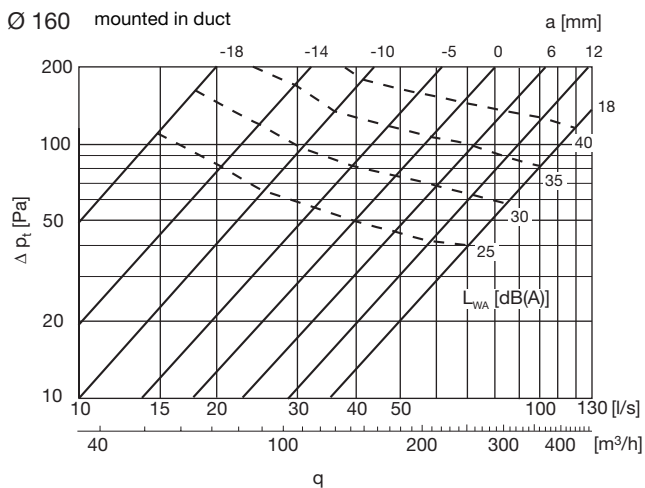
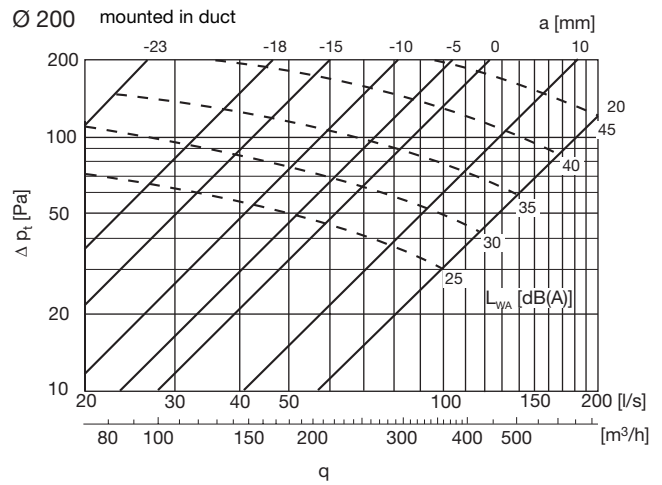
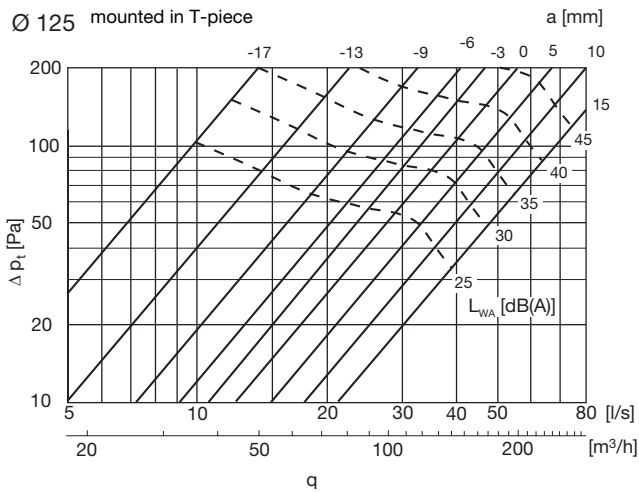
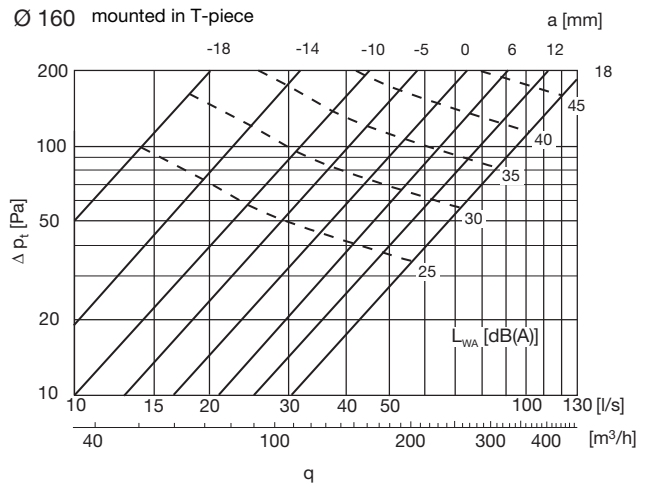
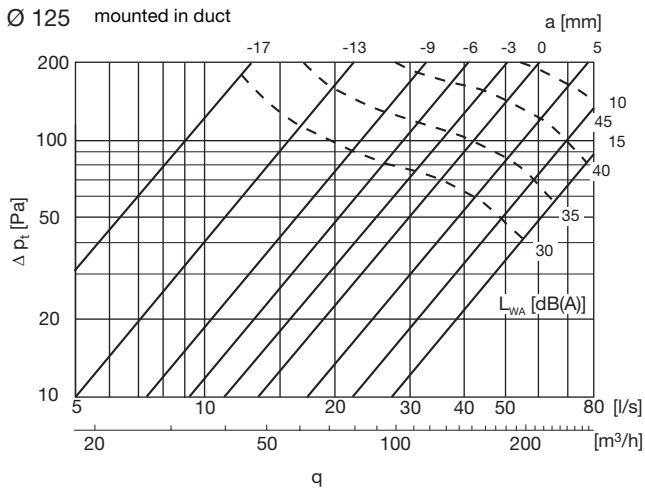
Data is available in a separate brochure.





# Valve

# KVG



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# Valve

KU

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## Description

Valve for exhaust air.  
Designed for wall or ceiling mounting.  
Bayonet holders connect to socket VRGU, VRGL or VRGM.

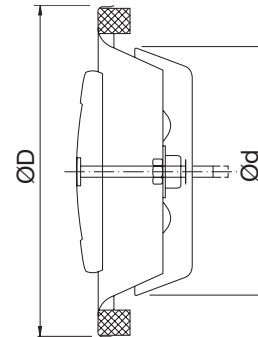
## Material

Painted galvanized sheet metal.

## Colour

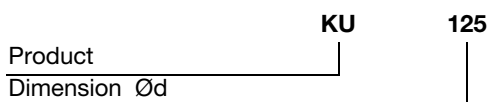
White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 80        | 110      | 0,13    |
| 100       | 130      | 0,19    |
| 125       | 160      | 0,27    |
| 150       | 188      | 0,36    |
| 160       | 190      | 0,38    |
| 200       | 245      | 0,58    |

## Ordering example





# Valve

KU

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graphs.

### Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

| Ød nom | Valve mounted in | Centre frequency [Hz] |     |     |     |    |    |     |     |
|--------|------------------|-----------------------|-----|-----|-----|----|----|-----|-----|
|        |                  | 63                    | 125 | 250 | 500 | 1K | 2K | 4K  | 8K  |
| 100    | Duct             | -                     | -8  | -5  | -6  | -6 | -4 | -12 | -21 |
| 125    | Duct             | -                     | -11 | -4  | -6  | -7 | -3 | -16 | -25 |
| 160    | Duct             | -                     | -7  | -4  | -6  | -3 | -6 | -18 | -31 |
| 200    | Duct             | -                     | -7  | -6  | -7  | -2 | -9 | -18 | -27 |

|           |   |    |    |    |    |    |    |    |
|-----------|---|----|----|----|----|----|----|----|
| Tolerance | - | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|---|----|----|----|----|----|----|----|

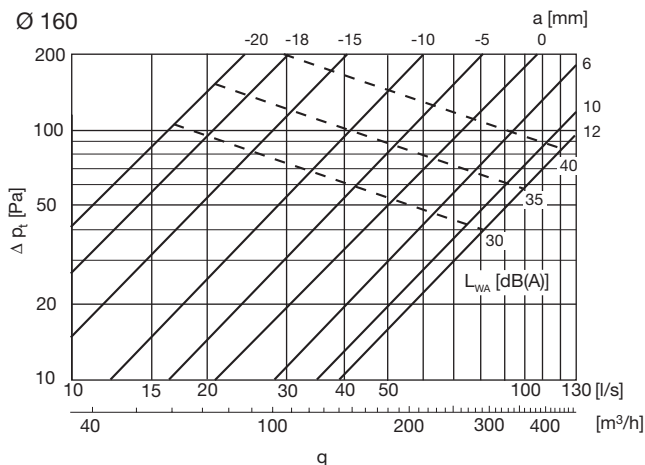
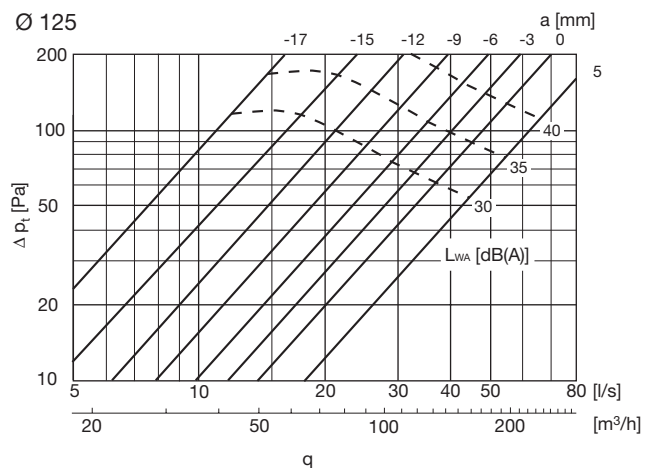
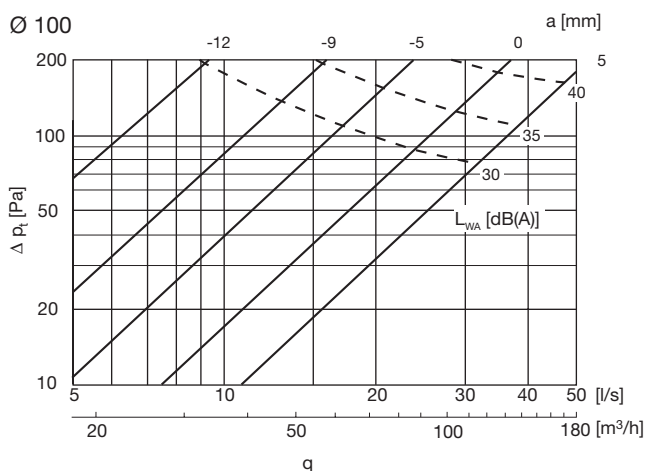
### Sound attenuation, $\Delta L$ , [dB]

| Ød nom | Valve mounted in | Setting a [mm] | Centre frequency [Hz] |     |     |     |    |    |    |    |
|--------|------------------|----------------|-----------------------|-----|-----|-----|----|----|----|----|
|        |                  |                | 63                    | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 100    | Duct             | -12            | 21                    | 18  | 12  | 14  | 12 | 11 | 12 | 15 |
|        |                  | -5             | 21                    | 16  | 9   | 11  | 9  | 8  | 8  | 12 |
|        |                  | 5              | 21                    | 16  | 8   | 10  | 8  | 7  | 5  | 11 |
| 125    | Duct             | -17            | 22                    | 16  | 11  | 9   | 7  | 7  | 9  | 12 |
|        |                  | -9             | 21                    | 16  | 9   | 8   | 5  | 5  | 7  | 8  |
|        |                  | 5              | 20                    | 15  | 9   | 6   | 4  | 3  | 4  | 7  |
| 160    | Duct             | -15            | 19                    | 14  | 9   | 8   | 6  | 7  | 9  | 10 |
|        |                  | -5             | 19                    | 13  | 9   | 6   | 5  | 4  | 6  | 8  |
|        |                  | 5              | 18                    | 13  | 8   | 5   | 4  | 3  | 6  | 6  |
| 200    | Duct             | -25            | 17                    | 12  | 10  | 9   | 9  | 12 | 14 | 12 |
|        |                  | 0              | 16                    | 10  | 7   | 6   | 6  | 6  | 10 | 7  |
|        |                  | 20             | 16                    | 10  | 6   | 4   | 4  | 5  | 9  | 6  |

|           |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|
| Tolerance | ±6 | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|----|----|----|----|----|----|----|----|

### Measurement of air flow

Data is available in a separate brochure.



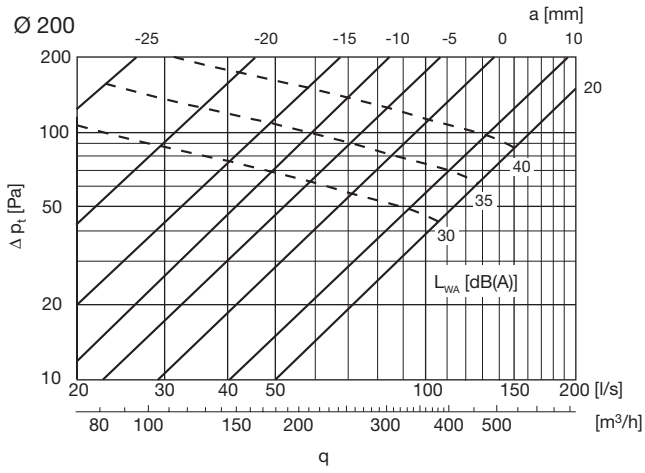
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# Valve

KU

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# Valve

# KSU



## Description

Valve for exhaust air.  
Designed for wall or ceiling mounting.  
Bayonet holders connect to socket VRGU, VRGL or VRGM.

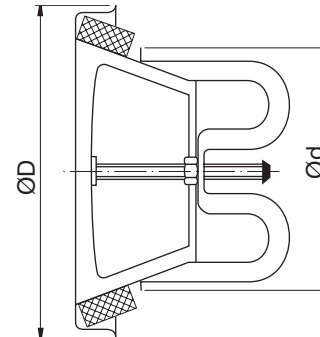
## Material

Painted galvanized sheet metal.

## Colour

White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 100       | 130      | 0,30    |
| 125       | 160      | 0,39    |
| 150       | 188      | 0,52    |
| 160       | 190      | 0,52    |
| 200       | 235      | 0,78    |

## Ordering example



- 1
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# Valve

KSU

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graphs.

### Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |     |     |     |
|-----------|---------------------|--------------------------|-----|-----|-----|----|-----|-----|-----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K  | 4K  | 8K  |
| 100       | Duct                | -6                       | -6  | -3  | -3  | -4 | -9  | -13 | -27 |
| 125       | Duct                | -7                       | -7  | -6  | -5  | -8 | -4  | -12 | -28 |
| 160       | Duct                | -3                       | -3  | -7  | -5  | -2 | -12 | -16 | -29 |
| 200       | Duct                | -5                       | -5  | -7  | -8  | -2 | -9  | -13 | -30 |

|           |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|
| Tolerance | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|----|----|----|----|----|----|----|----|

### Sound attenuation, $\Delta L$ , [dB]

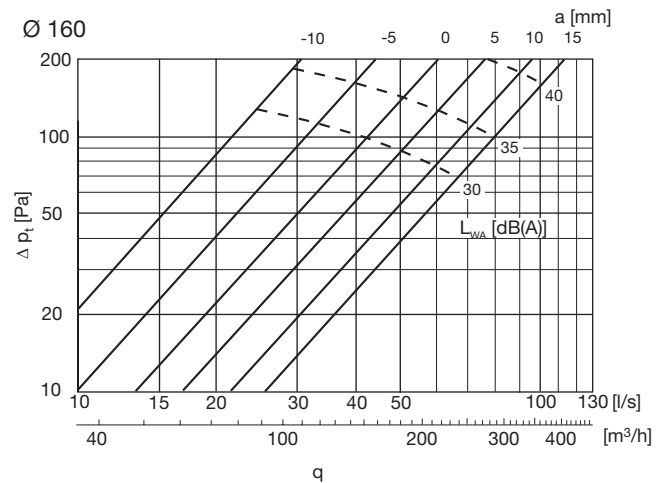
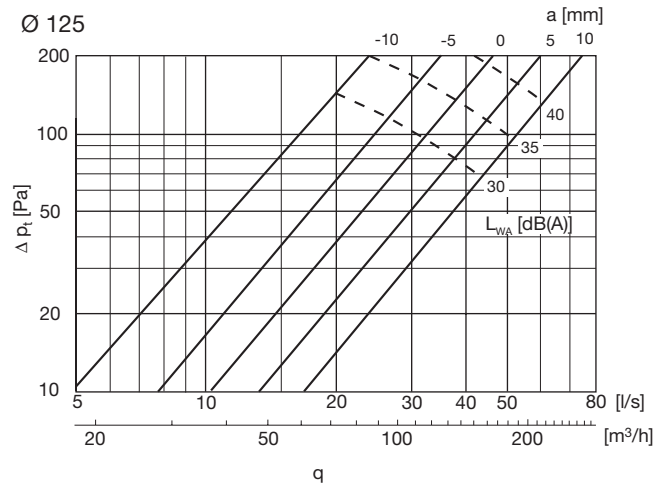
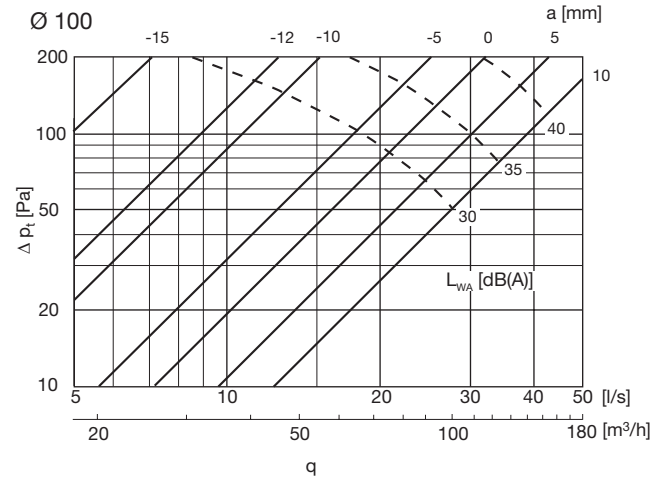
| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |    |    |
|-----------|---------------------|--------------------------|-----|-----|-----|----|----|----|----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 100       | Duct                | 23                       | 18  | 14  | 12  | 12 | 14 | 5  | 6  |
| 125       | Duct                | 21                       | 17  | 12  | 11  | 12 | 11 | 7  | 6  |
| 160       | Duct                | 19                       | 14  | 12  | 11  | 11 | 14 | 5  | 7  |
| 200       | Duct                | 15                       | 13  | 11  | 11  | 13 | 12 | 7  | 7  |

|           |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|
| Tolerance | ±6 | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|----|----|----|----|----|----|----|----|

### Measurement of air flow

Data is available in a separate brochure.

xx

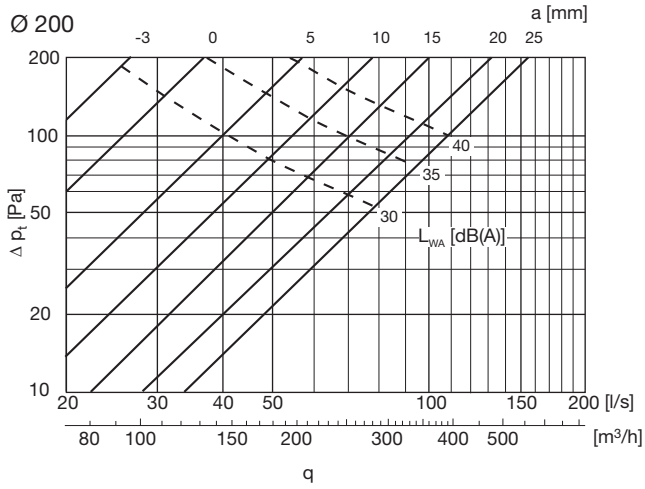






# Valve

# KSU



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# Valve

# KSUL

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## Description

Valve for exhaust air.  
 Has built-in silencer for extra noise attenuation.  
 Designed for wall or ceiling mounting.  
 Bayonet holders connect to socket VRGU, VRGL or VRGM.

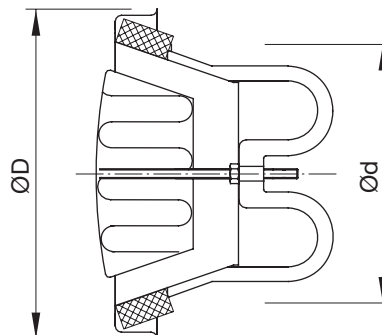
## Material

Painted galvanized sheet metal.

## Colour

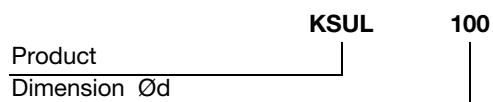
White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 100       | 130      | 0,30    |
| 125       | 160      | 0,32    |
| 160       | 190      | 0,48    |
| 200       | 235      | 0,71    |

## Ordering example





# Valve

KSUL

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graphs.

### Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |     |     |     |
|-----------|---------------------|--------------------------|-----|-----|-----|----|-----|-----|-----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K  | 4K  | 8K  |
| 100       | Duct                | -                        | 2   | 2   | -2  | -7 | 10  | -13 | -31 |
| 125       | Duct                | -                        | 3   | 4   | -2  | -8 | -12 | -17 | -33 |
| 160       | Duct                | -                        | 4   | 1   | -4  | -8 | -7  | -10 | -28 |
| 200       | Duct                | -                        | -2  | -1  | -5  | -7 | -7  | -9  | -28 |

|           |   |    |    |    |    |    |    |    |
|-----------|---|----|----|----|----|----|----|----|
| Tolerance | - | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|---|----|----|----|----|----|----|----|

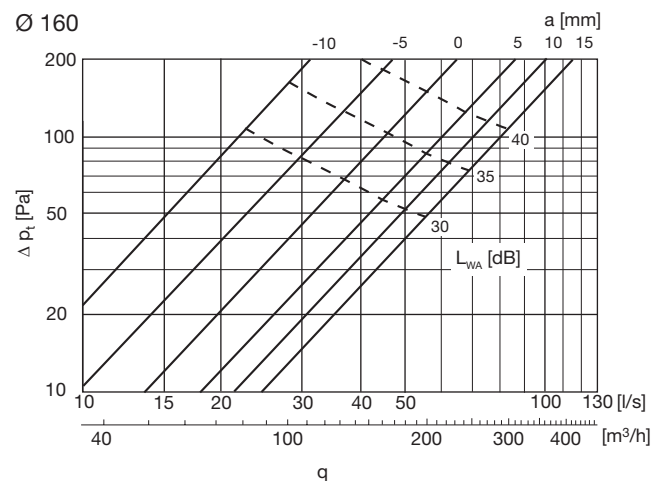
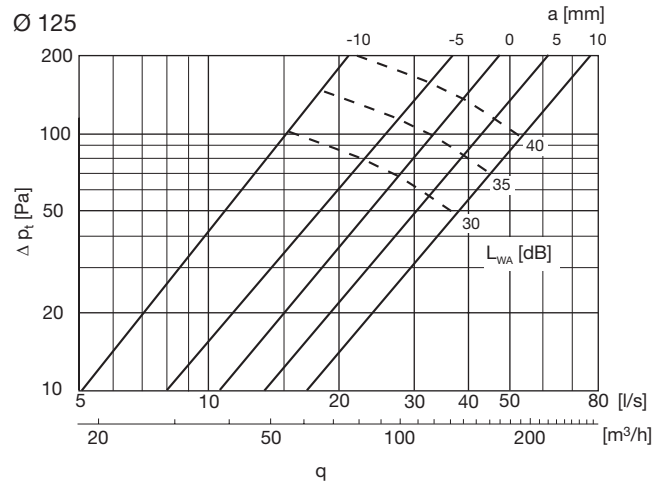
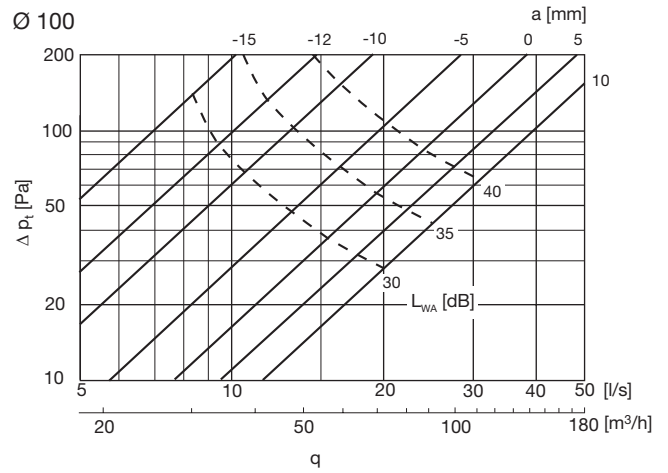
### Sound attenuation, $\Delta L$ , [dB]

| Ød<br>nom | Valve<br>mounted in | Setting<br>$a$<br>[mm] | Centre frequency<br>[Hz] |     |     |     |    |    |    |    |
|-----------|---------------------|------------------------|--------------------------|-----|-----|-----|----|----|----|----|
|           |                     |                        | 63                       | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 100       | Duct                | 0                      | 22                       | 18  | 14  | 14  | 13 | 12 | 5  | 8  |
| 125       | Duct                | 0                      | 20                       | 16  | 12  | 13  | 12 | 9  | 6  | 8  |
| 160       | Duct                | 0                      | 19                       | 14  | 11  | 12  | 13 | 12 | 6  | 8  |
| 200       | Duct                | 10                     | 14                       | 12  | 10  | 13  | 14 | 12 | 8  | 9  |

|           |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|
| Tolerance | ±6 | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|----|----|----|----|----|----|----|----|

### Measurement of air flow

Data is available in a separate brochure.



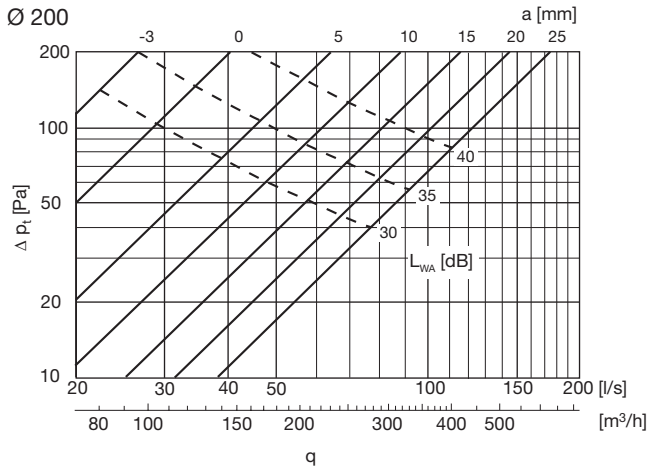
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# Valve

KSUL

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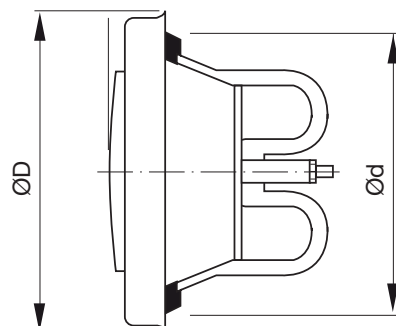


# Valve and fire damper

# KSUB



## Dimensions



| Ød nom | ØD mm | m kg |
|--------|-------|------|
| 100    | 130   | 0,32 |
| 125    | 160   | 0,42 |
| 150    | 188   | 0,56 |
| 160    | 190   | 0,56 |
| 200    | 235   | 0,81 |

## Description

Valve and fire damper for exhaust air. Is used to prevent spreading of fire and smoke into duct systems. A spring loaded melting fuse shuts the valve when the temperature exceeds +70° C. Bayonet holders connect to socket VRGU, VRGL or VRGM. Socket VRGL is as standard delivered together with KSUB. This case is shown in the ordering example below. If socket VRGU or VRGM is wanted instead this socket has to be specified in the type field. The product holds a Swedish type approval with number 0901. Certification body is Swedcert.

### Material

Painted galvanized sheet metal.

### Colour

White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

## Ordering example



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



# Valve and fire damper

KSUB

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graphs.

### Sound power level, $L_{WA}$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

| Ød nom | Valve mounted in | Centre frequency [Hz] |     |     |     |    |     |     |     |
|--------|------------------|-----------------------|-----|-----|-----|----|-----|-----|-----|
|        |                  | 63                    | 125 | 250 | 500 | 1K | 2K  | 4K  | 8K  |
| 100    | Duct             | -                     | -2  | -5  | -5  | -3 | -8  | -12 | -26 |
| 125    | Duct             | -                     | -7  | -7  | -7  | -6 | -4  | -11 | -28 |
| 160    | Duct             | -                     | -4  | -7  | -5  | -2 | -11 | -15 | -29 |
| 200    | Duct             | -                     | -3  | -7  | -8  | -1 | -12 | -16 | -33 |

|           |   |    |    |    |    |    |    |    |
|-----------|---|----|----|----|----|----|----|----|
| Tolerance | - | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|---|----|----|----|----|----|----|----|

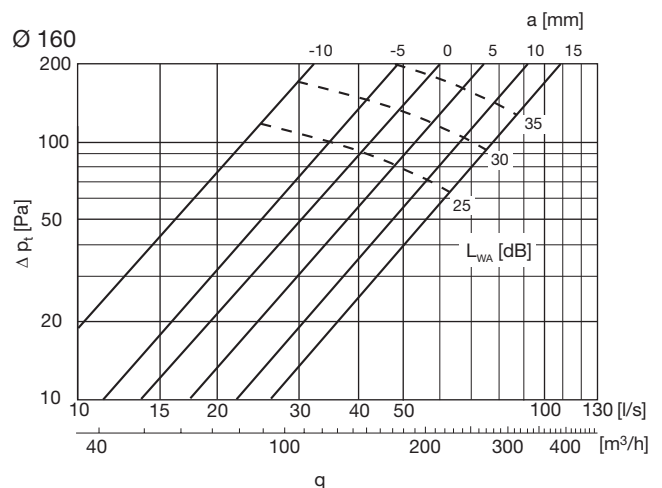
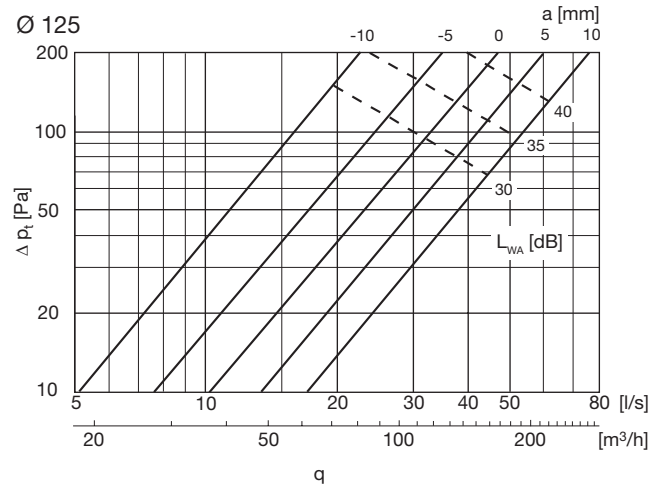
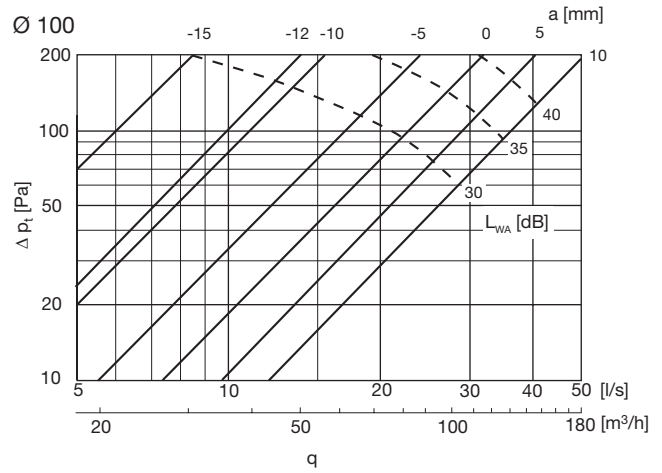
### Sound attenuation, $\Delta L$ , [dB]

| Ød nom | Valve mounted in | Setting a [mm] | Centre frequency [Hz] |     |     |     |    |    |    |    |
|--------|------------------|----------------|-----------------------|-----|-----|-----|----|----|----|----|
|        |                  |                | 63                    | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 100    | Duct             | -10            | 22                    | 19  | 16  | 16  | 16 | 18 | 9  | 9  |
|        |                  | 0              | 22                    | 18  | 13  | 12  | 12 | 13 | 6  | 7  |
|        |                  | 10             | 22                    | 17  | 12  | 9   | 8  | 11 | 4  | 6  |
| 125    | Duct             | -10            | 21                    | 18  | 15  | 14  | 15 | 14 | 10 | 7  |
|        |                  | 0              | 19                    | 17  | 12  | 11  | 11 | 10 | 6  | 5  |
|        |                  | 10             | 20                    | 16  | 10  | 9   | 9  | 8  | 5  | 5  |
| 160    | Duct             | -10            | 19                    | 16  | 14  | 14  | 14 | 16 | 8  | 8  |
|        |                  | 0              | 18                    | 14  | 11  | 11  | 11 | 13 | 5  | 7  |
|        |                  | 10             | 18                    | 14  | 10  | 9   | 9  | 11 | 4  | 6  |
| 200    | Duct             | 0              | 14                    | 12  | 11  | 10  | 12 | 12 | 7  | 7  |
|        |                  | 10             | 13                    | 11  | 8   | 8   | 9  | 10 | 6  | 6  |

|           |    |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|
| Tolerance | ±6 | ±3 | ±2 | ±2 | ±2 | ±2 | ±2 | ±3 |
|-----------|----|----|----|----|----|----|----|----|

### Measurement of air flow

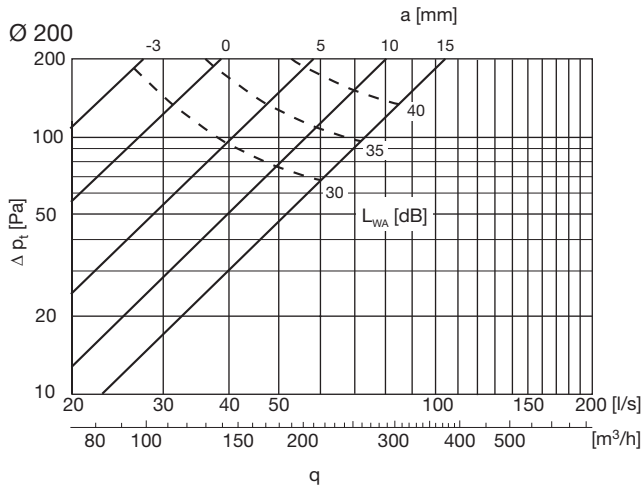
Data is available in a separate brochure.





# Valve and fire damper

KSUB



- 1
- 2
- 3
- 4
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- 7**
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- 14
- 15
- 16
- 17
- 18



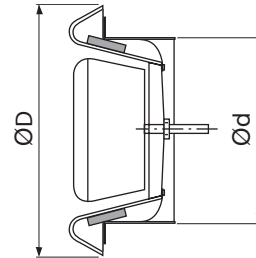
# Valve

# KPF

- 1
- 2
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- 17
- 18



## Dimensions



### Description

Valve for exhaust air.  
Designed for wall or ceiling mounting.  
Flat spring holders connect to duct.

### Material

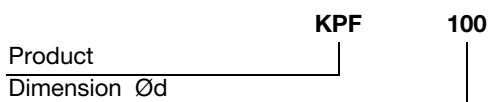
Plastic.

### Colour

White RAL 9010.

| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 80        | 114      | 0,07    |
| 100       | 138      | 0,09    |
| 125       | 164      | 0,11    |
| 160       | 190      | 0,24    |
| 200       | 246      | 0,33    |

### Ordering example







# Valve

KPF

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $n$  [number of opening turns], are shown in the graphs.

### Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

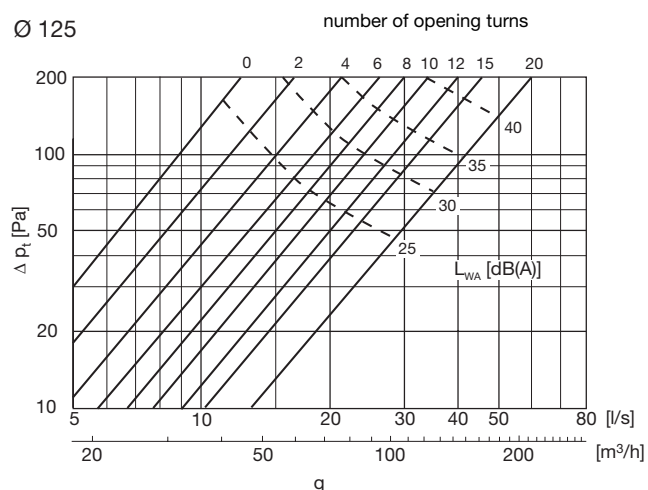
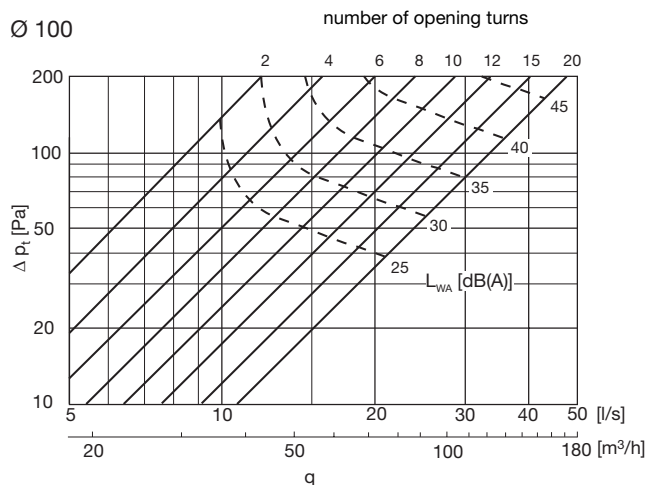
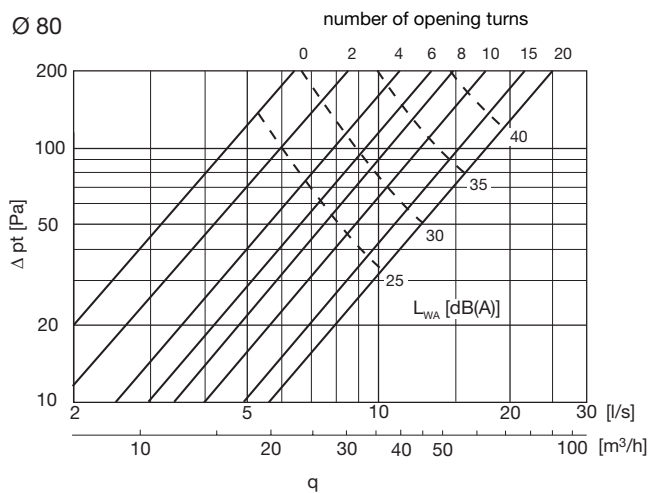
| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |     |     |
|-----------|---------------------|--------------------------|-----|-----|-----|----|----|-----|-----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K | 4K  | 8K  |
| 80        | Duct                | -12                      | -11 | -9  | -8  | -5 | -6 | -9  | -16 |
| 100       | Duct                | -11                      | -10 | -10 | -8  | -6 | -5 | -8  | -15 |
| 125       | Duct                | -10                      | -9  | -7  | -8  | -6 | -5 | -8  | -17 |
| 160       | Duct                | -3                       | -2  | -3  | -5  | -3 | -8 | -13 | -22 |
| 200       | Duct                | -3                       | -2  | 0   | -4  | -5 | -8 | -14 | -22 |

### Sound attenuation, $\Delta L$ , [dB]

| Ød<br>nom | Valve<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |    |    |
|-----------|---------------------|--------------------------|-----|-----|-----|----|----|----|----|
|           |                     | 63                       | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 80        | Duct                | 23                       | 23  | 16  | 15  | 13 | 10 | 6  | 9  |
| 100       | Duct                | 22                       | 21  | 15  | 13  | 11 | 10 | 6  | 9  |
| 125       | Duct                | 21                       | 19  | 13  | 11  | 10 | 10 | 7  | 9  |
| 160       | Duct                | 20                       | 16  | 12  | 10  | 9  | 10 | 8  | 8  |
| 200       | Duct                | 17                       | 12  | 7   | 5   | 4  | 4  | 7  | 5  |

### Measurement of air flow

Data is available in a separate brochure.



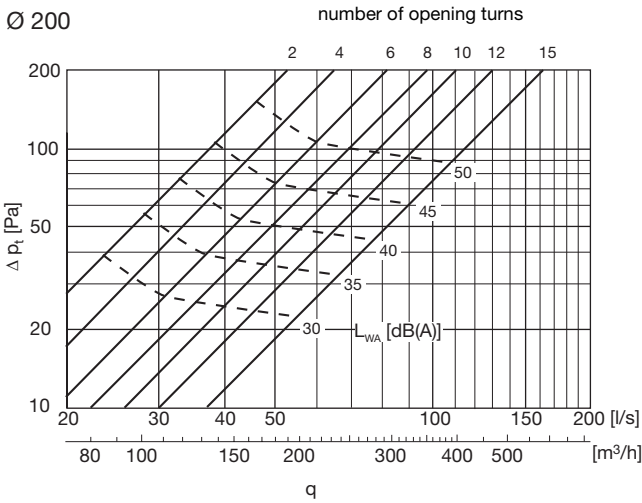
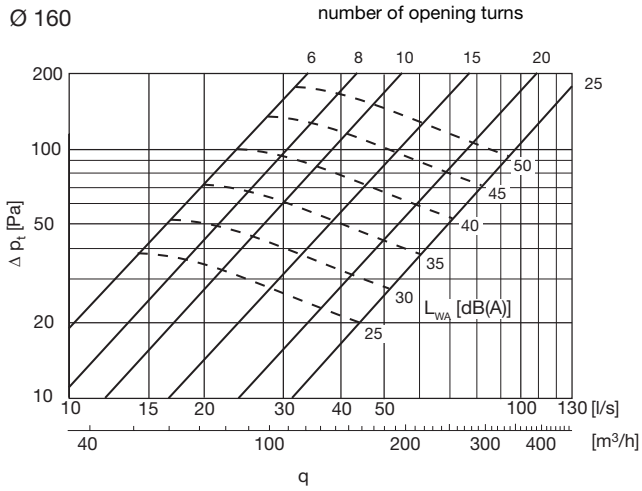
- 1
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# Valve

# KPF

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- 2
- 3
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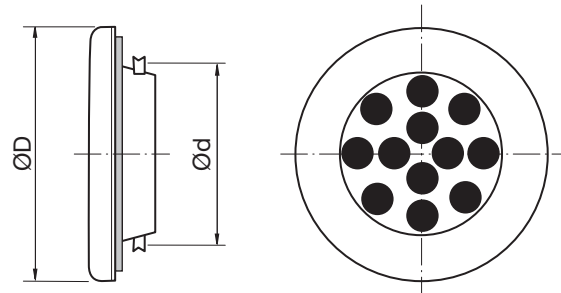


# Valve

# KDPF



## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 100       | 133      | 0,06    |

### Description

Valve for exhaust air.  
Designed for wall or ceiling mounting.  
Flat spring holders connect to socket VRGU, VRGL, VRGM, VRFU or VRFM.

### Material

Plastic.

### Colour

White RAL 9010.

### Ordering example



- 1
- 2
- 3
- 4
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- 7
- 8
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- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



# Valve

KDPF

1

## Technical data

Air flow,  $q$  [l/s] and [m<sup>3</sup>/h], total pressure drop,  $\Delta p_t$  [Pa], and A-weighted sound power level,  $L_{WA}$  [dB], for different settings,  $a$  [mm], are shown in the graphs.

2

### Measurement of air flow

Data is available in a separate brochure.

3

### Sound power level, $L_W$ [dB], in octave bands

is calculated as  $L_{WA} + K_{ok}$ .  $K_{ok}$  is found in the table below.

4

| Ød<br>nom | Diffuser<br>mounted in | Centre frequency<br>[Hz] |     |     |     |    |    |     |     |
|-----------|------------------------|--------------------------|-----|-----|-----|----|----|-----|-----|
|           |                        | 63                       | 125 | 250 | 500 | 1K | 2K | 4K  | 8K  |
| 100       | Duct                   | -                        | -5  | -4  | -3  | -3 | -8 | -13 | -16 |

5

6

### Sound attenuation, $\Delta L$ , [dB]

| Ød<br>nom | Valve<br>mounted<br>in | Number<br>of open<br>holes | Centre frequency<br>[Hz] |     |     |     |    |    |    |    |
|-----------|------------------------|----------------------------|--------------------------|-----|-----|-----|----|----|----|----|
|           |                        |                            | 63                       | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 100       | Duct                   | 2                          | -                        | 23  | 22  | 24  | 18 | 16 | 15 | 10 |
|           |                        | 6                          | -                        | 19  | 16  | 15  | 12 | 8  | 10 | 7  |
|           |                        | 12                         | -                        | 19  | 15  | 12  | 9  | 5  | 5  | 3  |

7

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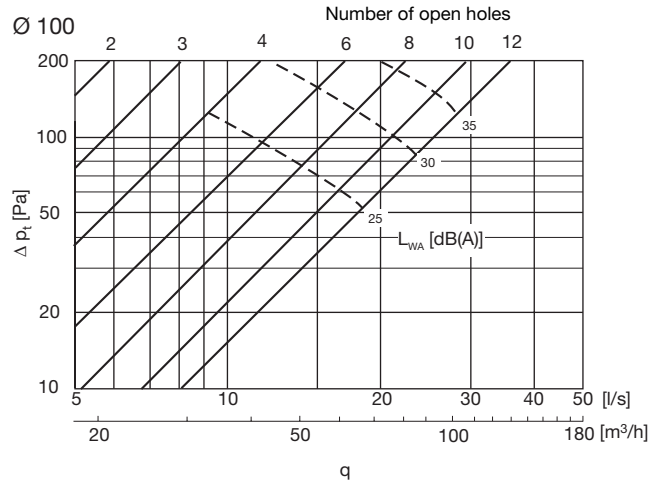
14

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16

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18





# Cover

# TLO



### Description

Cover or access door.  
Designed for wall or ceiling mounting.  
Spring holders connect to socket VRFU, VRFM or VRR.

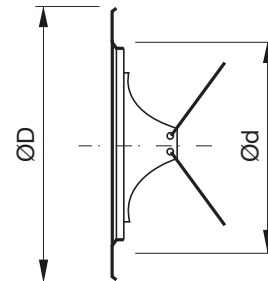
### Material

Painted galvanized sheet metal.

### Colour

White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

### Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 100       | 140      | 0,13    |
| 125       | 170      | 0,20    |
| 160       | 200      | 0,28    |

### Ordering example



- 1
- 2
- 3
- 4
- 5
- 6
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- 8
- 9
- 10
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- 14
- 15
- 16
- 17
- 18



# Socket

# VRFU

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



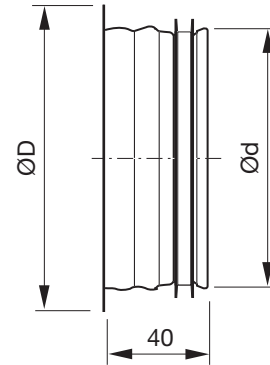
## Description

Socket with groove for unit with spring holder.  
 Supplied with Safe gasket in the far end.  
 Connects to duct.

## Material

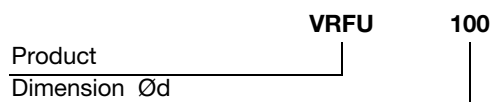
Galvanized sheet metal.

## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 100       | 125      | 0,09    |
| 125       | 150      | 0,11    |
| 160       | 185      | 0,14    |

## Ordering example



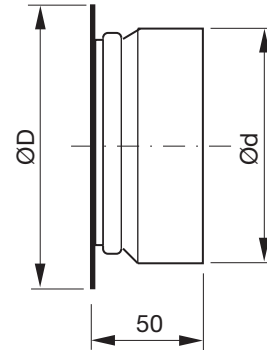


# Socket

# VRFM



## Dimensions



### Description

Socket with groove for unit with spring holder.  
Has female connection in the far end.  
Connects to fitting.

### Material

Galvanized sheet metal.

| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 100       | 125      | 0,09    |
| 125       | 150      | 0,12    |
| 160       | 185      | 0,16    |

- 1
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- 11
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- 13
- 14
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- 16
- 17
- 18

### Ordering example





# Socket

# VRGU

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
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- 17
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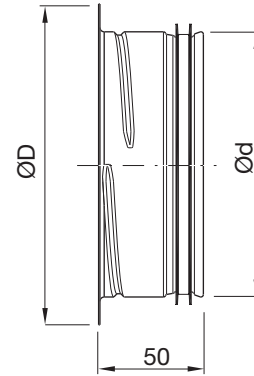
## Description

Socket with thread for unit with bayonet holder.  
 Supplied with Safe gasket in the far end.  
 Connects to duct.

## Material

Galvanized sheet metal.

## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 80        | 105      | 0,08    |
| 100       | 125      | 0,10    |
| 125       | 150      | 0,12    |
| 150       | 175      | 0,15    |
| 160       | 185      | 0,16    |
| 200       | 225      | 0,22    |

Material: Galvanized sheet metal.

## Ordering example





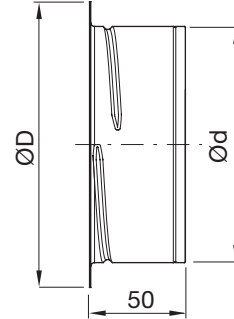


# Socket

# VRGL



## Dimensions



### Description

Socket with thread for unit with bayonet holder.  
 Supplied without any gasket.  
 Connects to duct.

### Material

Galvanized sheet metal.

| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 80        | 105      | 0,07    |
| 100       | 125      | 0,09    |
| 125       | 150      | 0,11    |
| 150       | 175      | 0,14    |
| 160       | 185      | 0,15    |
| 200       | 225      | 0,18    |

Material: Galvanized sheet metal.

### Ordering example



- 1
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# Socket

# VRGM

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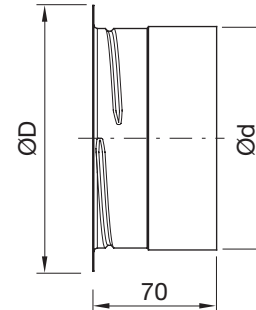
## Description

Socket with thread for unit with bayonet holder.  
Has female connection in the far end.  
Connects to fitting.

## Material

Galvanized sheet metal.

## Dimensions



| Ød<br>nom | ØD<br>mm | m<br>kg |
|-----------|----------|---------|
| 100       | 125      | 0,11    |
| 125       | 150      | 0,14    |
| 150       | 175      | 0,17    |
| 160       | 185      | 0,19    |
| 200       | 225      | 0,25    |

Material: Galvanized sheet metal.

## Ordering example





# Cover socket

# VRR



## Description

Cover socket with groove for unit with spring holder. Are used where older valve types are replaced.

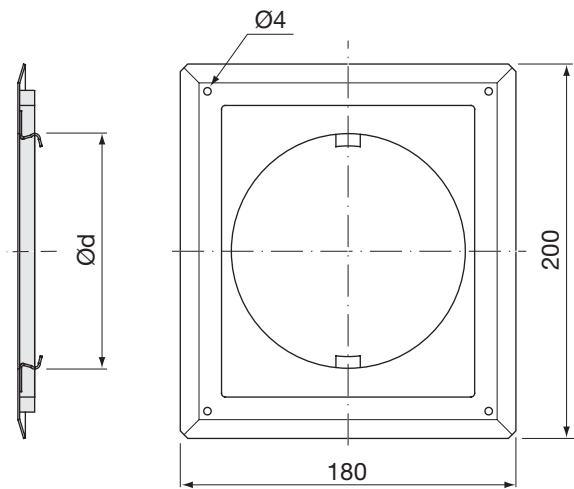
## Material

Painted sheet metal.

## Colour

White RAL 9010, gloss 70, equivalent to NCS S 0502 Y.

## Dimensions



| Ød<br>nom | m<br>kg |
|-----------|---------|
| 100       | 0,23    |
| 125       | 0,20    |

## Ordering example

|              |     |     |
|--------------|-----|-----|
| Product      | VRR | 125 |
| Dimension Ød |     |     |

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# Valve adjustment kit

# VAK

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## Description

VAK is a kit of three tools for adjustment of valves.

The kit consists of:

7

- a a bent pipe for measuring of adjustment pressure for valves with a cone,
- b a straight lance for measuring of adjustment pressure for valves with a gap and
- c an adjustable combination tool for measuring the position of the cone or the size of the gap.

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## Ordering example

18

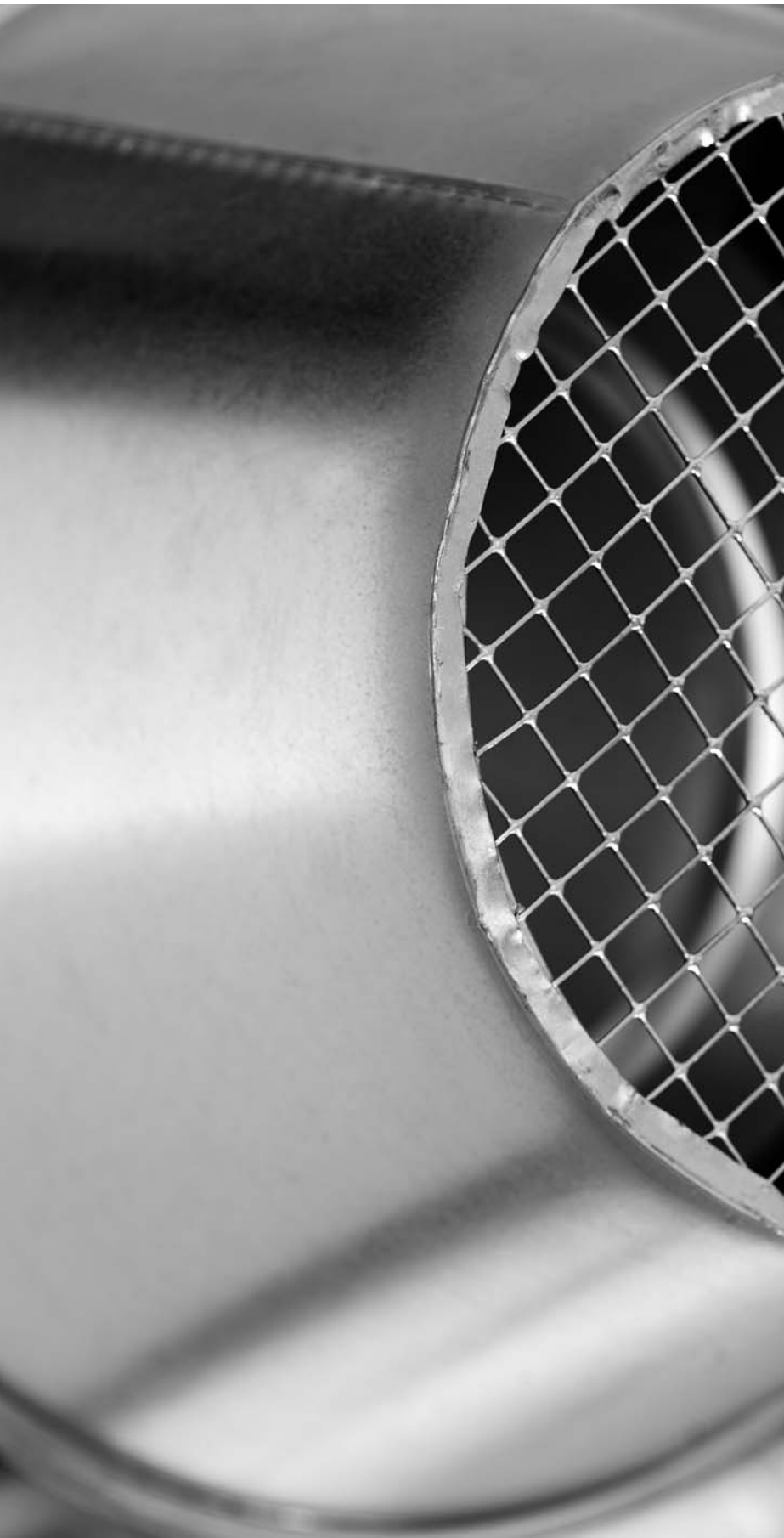
Product VAK

## Advantages

- The combination tool is adjustable to fit valves  $\varnothing$  100–200.
- The position of the cone (-25 to +25 mm) or the size of the gap (0 to 20 mm) is directly readable.










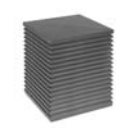



# Roof hoods



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| General information and theory     | 2        |
| Safe                               | 3        |
| Silencers                          | 4        |
| Dampers & Measure units            | 5        |
| Fire dampers & Smoke evacuation    | 6        |
| Air valves                         | 7        |
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| Rectangular                        | 11       |
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| 14 |   |                         |     |
| 15 |   |                         |     |
| 16 |   |                         |     |
| 17 |   |                         |     |
| 18 |   |                         |     |



# Roof hoods

## General

**Extract air** – All Lindab’s roof hoods are suitable for use as extract air hoods. When choosing extract air hood, the architectural design is important to ensure that the hood is in harmony with the rest of the building. Our range includes ribbed hoods, rectangular and circular roof hoods, models that are available with inclines adapted to the angle of the roof, as well as products with a horizontal profile, of course. If a high extract velocity and long ejection distance are required, choose our HN and HF roof hoods.

NOTE! When fans are not running there is always a risk for drifting snow and damp to penetrate into ducts. At some occasions also condensation can cause trouble.

**Outdoor air** – Out of Lindab’s range of roof hoods, HN and HF are not suitable as outdoor air hoods. When choosing outdoor air hoods, too, the architectural design is important to ensure that it is in harmony with the rest of the building. Lindab’s range of outdoor air hoods includes the same design as for extract air hoods (see above).

**Connection options** – Connection to a sleeve, flange or directly to the roof through connection must always be specified where these alternatives are possible. The recommended roof through connection is specified for each hood.

## Dimensioning

**Extract air** – If high extract velocities are not required, as low a pressure drop as possible is desirable. The pressure drop should not exceed 100 Pa in order to minimise self-generated noise emissions and energy consumption.

**Outdoor air** – When outdoor air hoods are used, there is always a risk of water and snow entering the duct. In order to minimise this risk, the velocity over the free area must not exceed 2 m/s.

**Location** – When locating roof hoods, the design of the roof should be taken into consideration to ensure that there are no ‘snow pockets’. The hoods must also be positioned so that extract fumes from vehicles etc. cannot be drawn into the outdoor air hood. In the same way, it is necessary to avoid short-circuits arising between outdoor air and extract air. If there is a risk of short-circuits, our combination hood HKOMR should be chosen in the first instance.

**Noise** – To avoid self-generated noise emissions, the pressure drop must not exceed 100 Pa. At this pressure drop, self-generated noise emissions are so low that they do not need to be added to the fan noise. To calculate noise to the surrounding environment, the calculation example shown to the right can be used.

## Version

**Material** – Lindab’s roof hoods are manufactured as follows.

Galvanised sheet metal, aluzink sheet AZ185, stainless steel sheet 2343, and painted as detailed below.

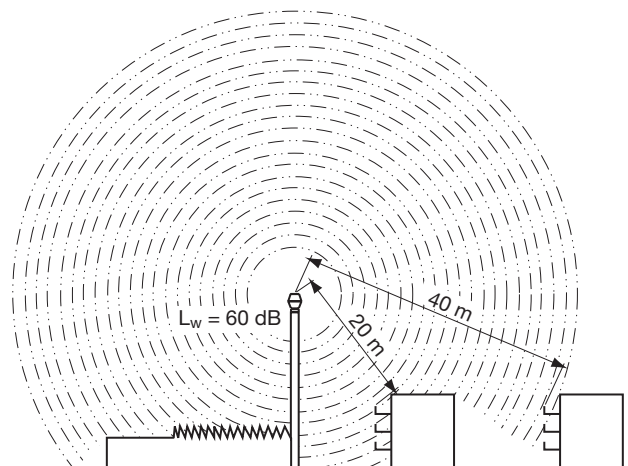
With these alternatives we cover up to and including corrosion class C5.

**Painting** – We have 3 standard colours (see below) but can also supply other colours to specification.

**Standard colours** – Black 015 RAL 9005, brick red 742 RAL 8004, zinc grey 244 RAL 7040.

However, this does not apply to VHL and LHR, where black RAL 9005 and grey RAL 7024 are the standard colours.

## Noise dispersion outdoors without obstacle



- $L_w$  = Sound power level radiated from sound source [dB]
- $r$  = Distance from sound source to point of listening [m]
- $L_p$  = Sound pressure level at point of listening [dB]
- $Q$  = Direction factor [-]
- 1 = in free field, far from all surfaces
- 2 = on one surface
- 4 = in the corner between two surfaces
- 8 = in the corner between three surfaces

$$L_p = L_w - 10 \cdot \log \left( \frac{4 \cdot \pi \cdot r^2}{Q} \right)$$

$$L_p = 60 - 10 \cdot \log \left( \frac{4 \cdot \pi \cdot 20^2}{1} \right) = 23 \text{ dB}$$

$$L_p = 60 - 10 \cdot \log \left( \frac{4 \cdot \pi \cdot 40^2}{1} \right) = 17 \text{ dB}$$

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18

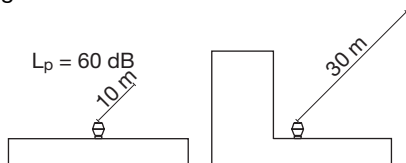


# Roof hoods

## Example – Noise from roof hood

**Conditions** – A level of 60 dB(A) has been measured 10 metres from an existing roof hood, the noise output level of which we do not know.

This is now to be moved, and we want to know the sound pressure level 30 metres from its new location closer to a vertical wall surface. We assume that the noise from the fan is unchanged in the two cases.



First you extract the sound power level  $L_W$  from the equation above.

$$L_W = L_p + 10 \cdot \log \left( \frac{4 \cdot \pi \cdot r^2}{Q} \right)$$

$$L_W = 60 + 10 \cdot \log \left( \frac{4 \cdot \pi \cdot 10^2}{2} \right) = 88 \text{ dB}$$

I.e. the radiated sound power level  $L_W$  from the hood = 88 dB.

$$L_p = L_W - 10 \cdot \log \left( \frac{4 \cdot \pi \cdot r^2}{Q} \right)$$

$$L_p = 88 - 10 \cdot \log \left( \frac{4 \cdot \pi \cdot 30^2}{4} \right) = 53 \text{ dB}$$

I.e. the sound pressure level at 30 m distance from the new location is 53 dB.





# Roof hood

H



## Description

Circular roof hood intended for outdoor air and extract air. The hood is designed for location above the roof with or without a roof through connection. The air runs both on the top- and downside of the hood. This is valid both for outdoor and extract air. The hood is free-draining downwards. Can also be supplied with a pest-proof mesh. NOTE! When fans are not running there is always a risk for drifting snow and damp to penetrate into ducts. At some occasions also condensation can cause trouble.

H is manufactured as standard from galvanised steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless acid-resistant steel 2343 or painted.

H in dimensions 100 – 315 has a sleeve connection as standard and fits on the outside of ventilation ducts.

Dimensions 400 – 1250 are supplied with flange connection (including counter-flange) as standard. They are also supplied with twistable lifting and anchoring eyelets. An individual anchoring eyelet must not be subjected to forces in excess of 1 500 N.

All dimensions can also be obtained with connections that fit directly to the roof through connection TGR.

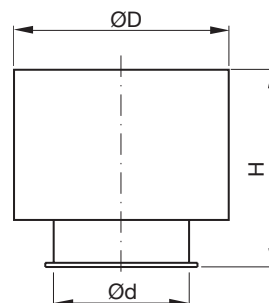
## Ordering example

|   |   |      |   |
|---|---|------|---|
| Product                                     | H | 315  | 1 |
| Dimension Ød                                |   |      |   |
| Connection options                          |   |      |   |
| Sleeve (standard 100 – 315)                 |   | 1    |   |
| Flange (standard 400 – 1250)                |   | 2    |   |
| Transition piece to roof through connection |   | 3-15 |   |

Specify size of roof through connection according to the measurement table to the right. Specify separately if the hood is to be supplied with a pest-proof mesh from the factory.

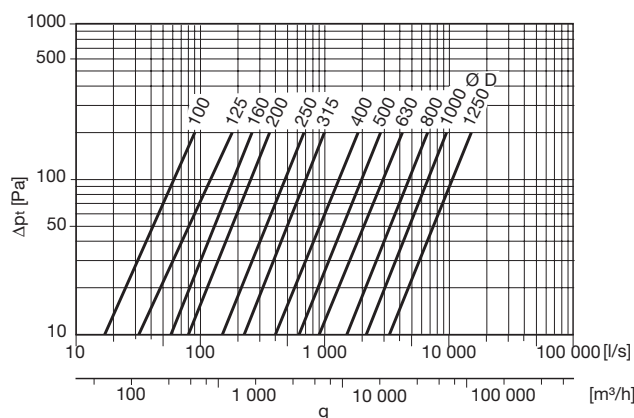
Standard colours, see page 443.

## Dimensions



| Ød nom | ØD mm | H mm | Free area m <sup>2</sup> | m kg | Roof through connection TGR |        |
|--------|-------|------|--------------------------|------|-----------------------------|--------|
|        |       |      |                          |      | 50 mm                       | 100 mm |
|        |       |      |                          |      | Size                        |        |
| 100    | 163   | 180  | 0,008                    | 0,70 | 3                           | 3      |
| 125    | 203   | 200  | 0,012                    | 1,00 | 3                           | 4      |
| 160    | 260   | 245  | 0,020                    | 1,30 | 3                           | 4      |
| 200    | 330   | 300  | 0,031                    | 2,20 | 3                           | 4      |
| 250    | 410   | 355  | 0,049                    | 3,60 | 4                           | 5      |
| 315    | 515   | 460  | 0,078                    | 5,30 | 5                           | 6      |
| 400    | 690   | 550  | 0,126                    | 16,0 | 5                           | 6      |
| 500    | 860   | 630  | 0,196                    | 27,8 | 6                           | 7      |
| 630    | 1150  | 780  | 0,312                    | 41,9 | 8                           | 9      |
| 800    | 1385  | 950  | 0,503                    | 74,0 | 9                           | 10     |
| 1000   | 1690  | 1180 | 0,785                    | 107  | 11                          | 12     |
| 1250   | 2070  | 1520 | 1,230                    | 246  | 14                          | 15     |

## Technical data





# Roof hood

HV



## Description

Circular roof hood with angled upper side intended for outdoor air and extract air. The hood is designed for location above the roof with or without a roof through connection. The air runs both on the top- and downside of the hood. This is valid both for outdoor and extract air. The hood is free-draining downwards. Can also be supplied with a pest-proof mesh.

NOTE! When fans are not running there is always a risk for drifting snow and damp to penetrate into ducts. At some occasions also condensation can cause trouble.

HV is manufactured as standard from galvanised steel plate Z275, but is also available in aluminium zinc AZ 185, stainless acid-resistant steel 2343 or painted.

HV is available with different angles in order to be in harmony with the architectural design of the building.

HV in dimensions 100 – 315 has a sleeve connection as standard and fits on the outside of ventilation ducts. Dimensions 400 – 1250 are supplied with flange connection (including counter-flange) as standard. They are also supplied with twistable lifting and anchoring eyelets. An individual anchoring eyelet must not be subjected to forces in excess of 1 500 N.

All dimensions can also be obtained with connections that fit directly to the roof through connection TGR.

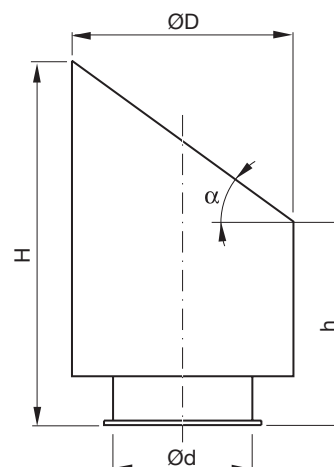
## Ordering example

|   |           |            |          |
|---|-----------|------------|----------|
|   | <b>HV</b> | <b>315</b> | <b>1</b> |
| Product                                     |           |            |          |
| Dimension Ød                                |           |            |          |
| Connection options                          |           |            |          |
| Sleeve (standard 100 – 315)                 |           | 1          |          |
| Flange (standard 400 – 1250)                |           | 2          |          |
| Transition piece to roof through connection |           | 3-15       |          |

Specify size of roof through connection according to the measurement table to the right.

Specify separately if the hood is to be supplied with a pest-proof mesh from the factory and if a special angle is required. Standard colours, see page 443.

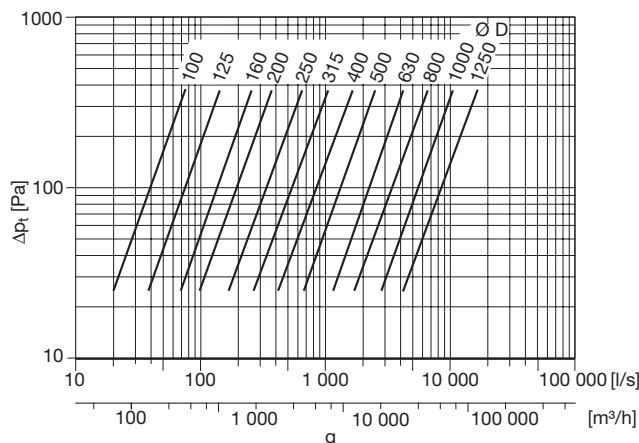
## Dimensions



....

| Ød<br>nom | ØD<br>mm | h<br>mm | H<br>mm | α<br>° | Free<br>area<br>m <sup>2</sup> | m<br>kg | Roof<br>through<br>connection<br>TGR |                   |
|-----------|----------|---------|---------|--------|--------------------------------|---------|--------------------------------------|-------------------|
|           |          |         |         |        |                                |         | 50<br>mm<br>Size                     | 100<br>mm<br>Size |
| 100       | 163      | 180     | 343     | 45     | 0,008                          | 0,77    | 3                                    | 3                 |
| 125       | 203      | 200     | 403     | 45     | 0,012                          | 1,10    | 3                                    | 4                 |
| 160       | 260      | 245     | 479     | 42     | 0,020                          | 1,43    | 3                                    | 4                 |
| 200       | 330      | 300     | 567     | 39     | 0,031                          | 2,42    | 3                                    | 4                 |
| 250       | 410      | 355     | 664     | 37     | 0,049                          | 3,96    | 4                                    | 5                 |
| 315       | 515      | 460     | 834     | 36     | 0,078                          | 5,83    | 5                                    | 6                 |
| 400       | 690      | 550     | 1015    | 34     | 0,126                          | 16,8    | 5                                    | 6                 |
| 500       | 860      | 630     | 1188    | 33     | 0,196                          | 29,2    | 6                                    | 7                 |
| 630       | 1150     | 780     | 1470    | 32     | 0,312                          | 44,0    | 8                                    | 9                 |
| 800       | 1385     | 1040    | 1872    | 31     | 0,503                          | 75,5    | 9                                    | 10                |
| 1000      | 1690     | 1270    | 2285    | 31     | 0,785                          | 109     | 11                                   | 12                |
| 1250      | 2070     | 1610    | 2805    | 30     | 1,230                          | 251     | 14                                   | 15                |

## Technical data





# Roof hood

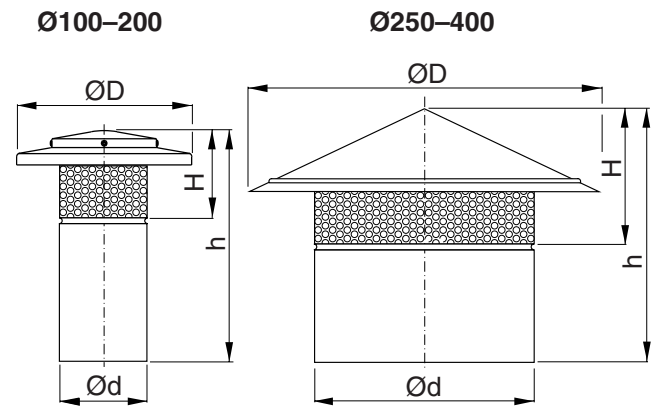
HU



## Description

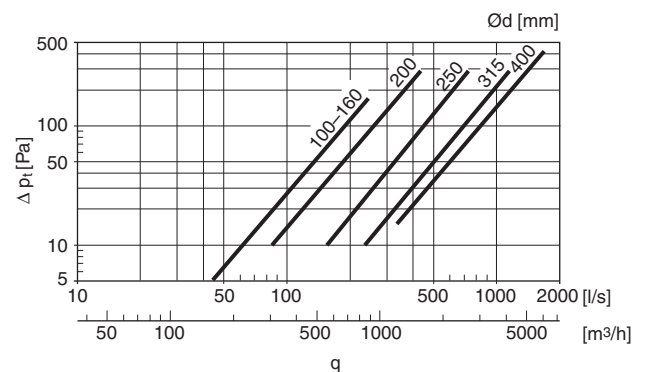
For air exit above roof.  
 Provided with a female connection which fits outside a ventilation duct.

## Dimensions

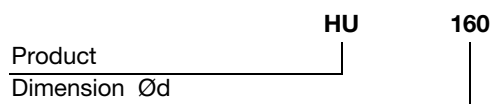


| Ød nom | ØD mm | H mm | h mm | m kg | Roof through connection TGR |        |
|--------|-------|------|------|------|-----------------------------|--------|
|        |       |      |      |      | 50 mm                       | 100 mm |
| Size   |       |      |      |      |                             |        |
| 100    | 200   | 99   | 264  | 0,51 | 3                           | 3      |
| 125    | 225   | 102  | 267  | 0,65 | 3                           | 4      |
| 160    | 260   | 105  | 270  | 0,81 | 3                           | 4      |
| 200    | 315   | 114  | 273  | 1,09 | 3                           | 4      |
| 250    | 400   | 156  | 291  | 1,45 | 4                           | 5      |
| 315    | 500   | 185  | 303  | 1,99 | 5                           | 6      |
| 400    | 600   | 226  | 344  | 2,70 | 5                           | 6      |

## Technical data



## Ordering example



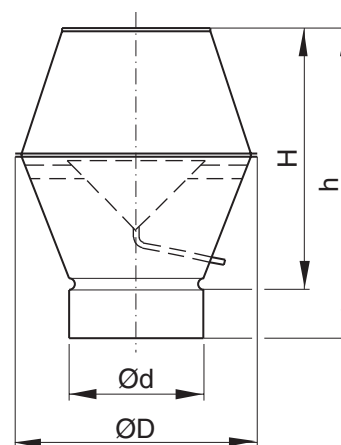


# Roof hood

HN



## Dimensions



## Description

Ventilation hood for air exit above roof, suitable for both industrial and comfort ventilation. The air is ejected in an upwards-directed jet. This avoids contaminating the air in the vicinity of the hood, and soiling of the area around the hood. The ejection is so effective that you can install a fresh air inlet in the immediate vicinity of the hood, without any special precautions.

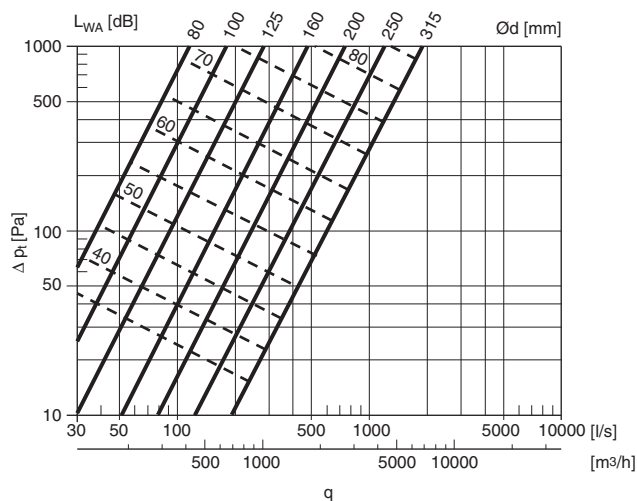
The hood is made of galvanised sheet steel, and can also be supplied in other materials such as stainless steel, aluzinc and painted in various colours, to special order. It has a net over the opening and an internal rain funnel to collect rain-water and snow, which is drained out of the hood through a hose. The hose can withstand temperatures of between -45 and +65 °C.

The hood has a female connection, which fits outside a ventilation duct. The hood can be ordered with other connections, however.

As special delivery the hood can be supplied with three anchoring wire-loops.

| Ød<br>nom | ØD<br>mm | H<br>mm | h<br>mm | m<br>kg | Roof through connection<br>TGR |           |
|-----------|----------|---------|---------|---------|--------------------------------|-----------|
|           |          |         |         |         | 50<br>mm                       | 100<br>mm |
|           |          |         |         |         | Size                           |           |
| 80        | 130      | 160     | 310     | 0,66    | 3                              | 3         |
| 100       | 180      | 220     | 360     | 0,96    | 3                              | 3         |
| 125       | 225      | 240     | 380     | 1,26    | 3                              | 4         |
| 160       | 280      | 340     | 475     | 1,95    | 3                              | 4         |
| 200       | 345      | 420     | 555     | 2,92    | 3                              | 4         |
| 250       | 430      | 505     | 640     | 4,31    | 4                              | 5         |
| 315       | 550      | 620     | 755     | 6,75    | 5                              | 6         |

## Technical data



## Ordering example

Product **HN**  
 Dimension **Ød** **315**



# Roof hood

HF



## Description

Ventilation hood for air exit above roof, suitable for both industrial and comfort ventilation. The air is ejected in an upwards-directed jet. This avoids contaminating the air in the vicinity of the hood, and soiling of the area around the hood. The ejection is so effective that you can install a fresh air inlet in the immediate vicinity of the hood, without any special precautions.

The hood is made of galvanised sheet steel, and can also be supplied in other materials such as stainless steel, aluzinc and painted in various colours, to special order. It has a net over the opening and an internal rain funnel to collect rain-water and snow, which is drained out of the hood through a hose. The hose can withstand temperatures of between -45 and +65 °C.

The hood has a flange connection, which includes a mating flange. The hood can be ordered with other connections, however.

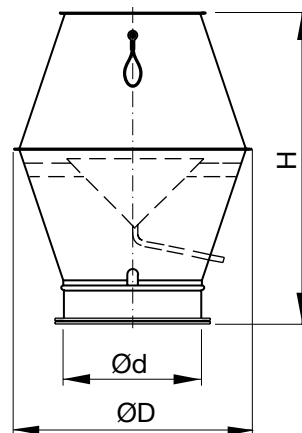
To avoid damage to the net in the opening the hood is supplied with transport protection. This must be removed before the hood is taken into service.

The hood is delivered with three turnable lifting and anchoring wire-loops. A single wire-loop shall not be exposed for forces exceeding 1500 N.

## Ordering example

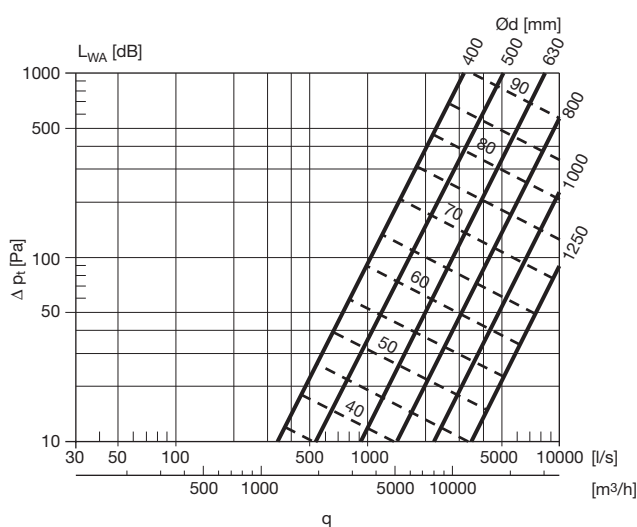
Product **HF** **630**  
 Dimension Ød

## Dimensions



| Ød nom | ØD mm | H mm | m kg | Roof through connection TGR |        |
|--------|-------|------|------|-----------------------------|--------|
|        |       |      |      | 50 mm                       | 100 mm |
|        |       |      |      | Size                        |        |
| 400    | 685   | 905  | 11,1 | 5                           | 6      |
| 500    | 855   | 1055 | 20,0 | 6                           | 7      |
| 630    | 1075  | 1295 | 38,0 | 8                           | 9      |
| 800    | 1360  | 1640 | 63,0 | 9                           | 10     |
| 1000   | 1600  | 2110 | 89,1 | 11                          | 12     |
| 1250   | 2020  | 2615 | 118  | 14                          | 15     |

## Technical data



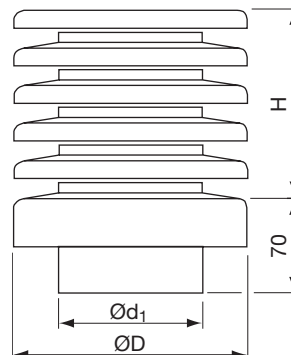


# Roof hood

VHL



## Dimensions



### Description

VHL roof hood with ribs is specially developed to achieve an architecturally correct way of terminating outdoor air intakes and extract air ejectors on the roof. The ribbed hood is supplied as standard in galvanised form, but are also available painted.

VHL can be installed with duct dimensions corresponding to  $\text{\O}d$  or  $\text{\O}D$ .

When connecting to the roof through connection TGR, the special transition piece TGR-VHL must be used (see page 458).

| $\text{\O}d$<br>nom | $\text{\O}D$<br>mm | H<br>mm | Free<br>area<br>$\text{m}^2$ | m<br>kg | Roof through<br>connection<br>TGR |           |
|---------------------|--------------------|---------|------------------------------|---------|-----------------------------------|-----------|
|                     |                    |         |                              |         | 50<br>mm                          | 100<br>mm |
|                     |                    |         |                              |         | Size                              |           |
| 100                 | 160                | 110     | 0,019                        | 1,00    | 3                                 | 3         |
| 125                 | 200                | 145     | 0,033                        | 1,50    | 3                                 | 4         |
| 160                 | 250                | 180     | 0,055                        | 2,00    | 3                                 | 4         |
| 200                 | 315                | 250     | 0,100                        | 2,90    | 3                                 | 4         |
| 250                 | 315                | 250     | 0,125                        | 3,20    | 4                                 | 5         |
| 315                 | 400                | 290     | 0,182                        | 6,40    | 5                                 | 6         |
| 400                 | 500                | 370     | 0,306                        | 10,1    | 5                                 | 6         |
| 500                 | 630                | 410     | 0,441                        | 15,9    | 6                                 | 7         |

### Ordering example



Standard colours, see page 443.

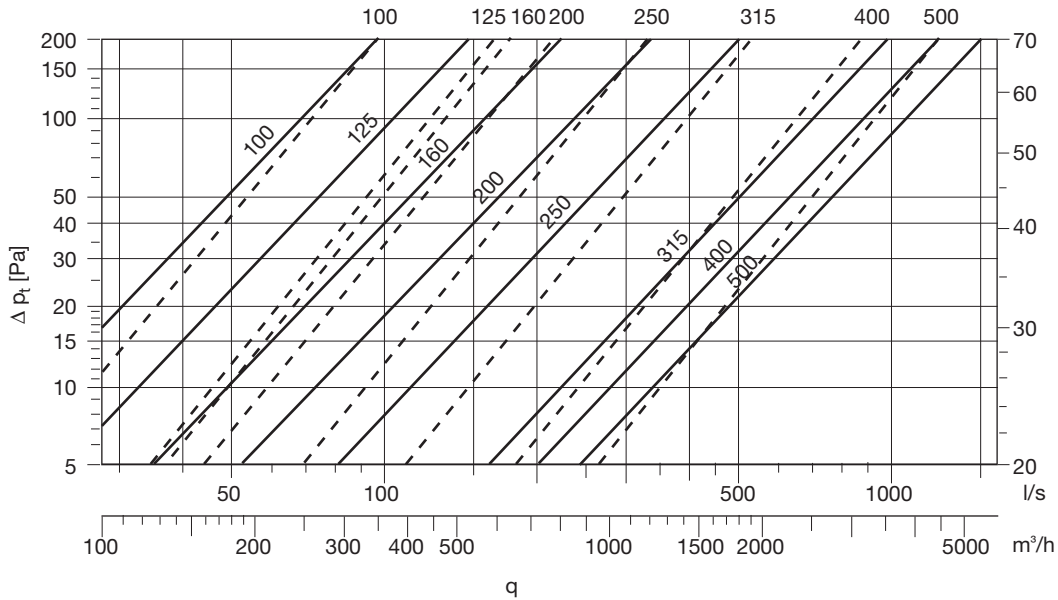


# Roof hood

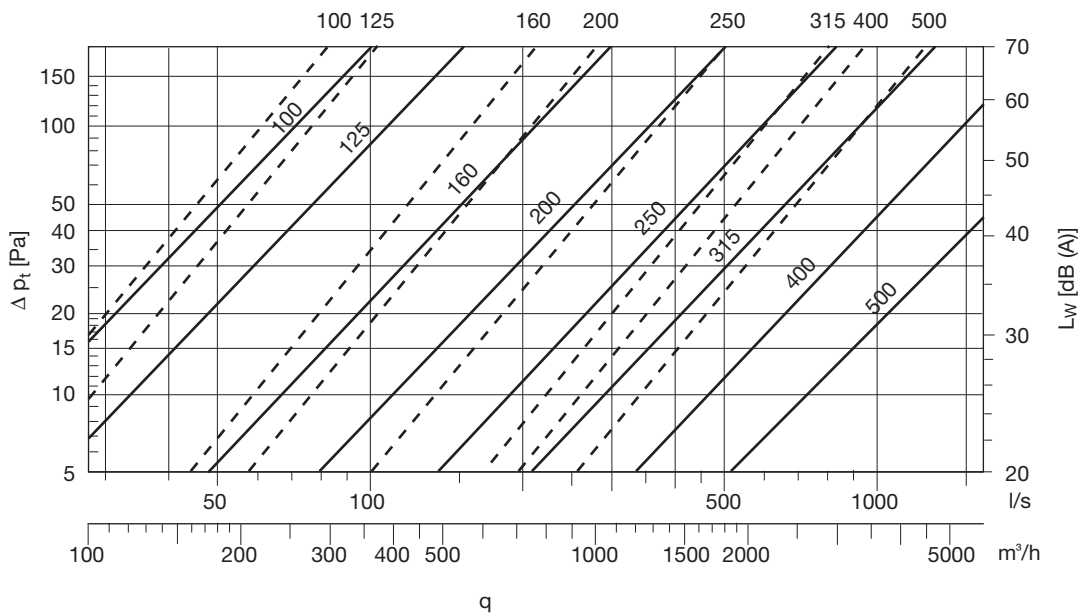
VHL

## Technical data

### Outdoor air



### Extract air



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18

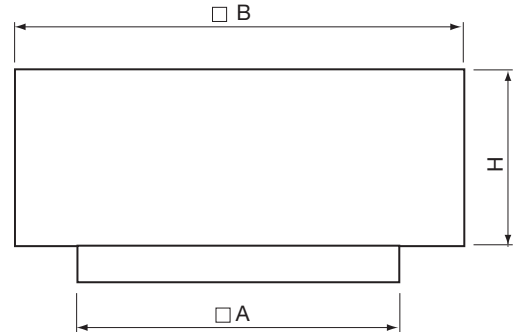


# Roof hood

# HRR



## Dimensions



## Description

Rectangular roof hood intended for outdoor air and extract air. HRR is designed for positioning above the outer roof on the roof through connection. The air runs both on the top- and downside of the hood. This is valid both for outdoor and extract air. The hood is free-draining downwards.

Can also be supplied with a pest-proof mesh.

HRR is manufactured as standard from galvanised steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless, acid-resistant steel 2343 or painted.

Sizes 7 and 9 are supplied with four twistable lifting and anchoring wire-loops. An individual anchoring eyelet must not be subjected to forces in excess of 1 500 N.

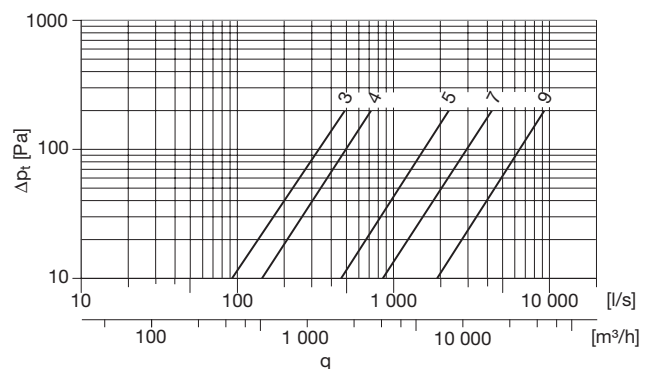
| Size | A mm | B mm | H mm | Free area m <sup>2</sup> | m kg | Roof through connection TGR |        |
|------|------|------|------|--------------------------|------|-----------------------------|--------|
|      |      |      |      |                          |      | 50 mm                       | 100 mm |
| 3    | 400  | 450  | 150  | 0,045                    | 5,00 | 3                           | 3      |
| 4    | 500  | 550  | 205  | 0,100                    | 7,80 | 4                           | 4      |
| 5    | 600  | 750  | 300  | 0,260                    | 11,9 | 5                           | 5      |
| 7    | 800  | 1050 | 450  | 0,500                    | 27,2 | 7                           | 7      |
| 9    | 1000 | 1350 | 575  | 0,720                    | 48,4 | 9                           | 9      |

## Ordering example

Product **HRR** **4**  
 Type \_\_\_\_\_  
 Size \_\_\_\_\_

Specify separately if the hood is to be supplied with a pest-proof mesh from the factory.  
 Standard colours, see page 443.

## Technical data







# Roof hood

# HVR



## Description

Rectangular roof hood with angled upper side intended for outdoor air and extract air. HVR is designed for positioning above the outer roof on the roof through connection. The air runs both on the top- and downside of the hood. This is valid both for outdoor and extract air. The hood is free-draining downwards.

Can also be supplied with a pest-proof mesh.

HVR is manufactured as standard from galvanised steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless, acid-resistant steel 2343 or painted.

HVR is available with different angles in order to be in harmony with the architectural design of the building.

Sizes 7 and 9 are supplied with four twistable lifting and anchoring wire-loops. An individual anchoring eyelet must not be subjected to forces in excess of 1 500 N.

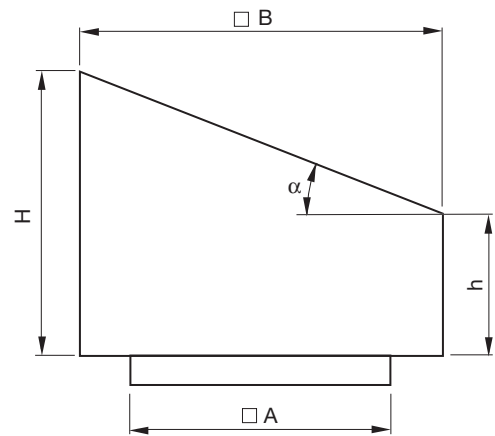
## Ordering example

|                |            |          |
|----------------|------------|----------|
| <b>Product</b> | <b>HVR</b> | <b>4</b> |
| Type           |            |          |
| Size           |            |          |

Specify separately if the hood is to be supplied with a pest-proof mesh from the factory and if a special angle is required.

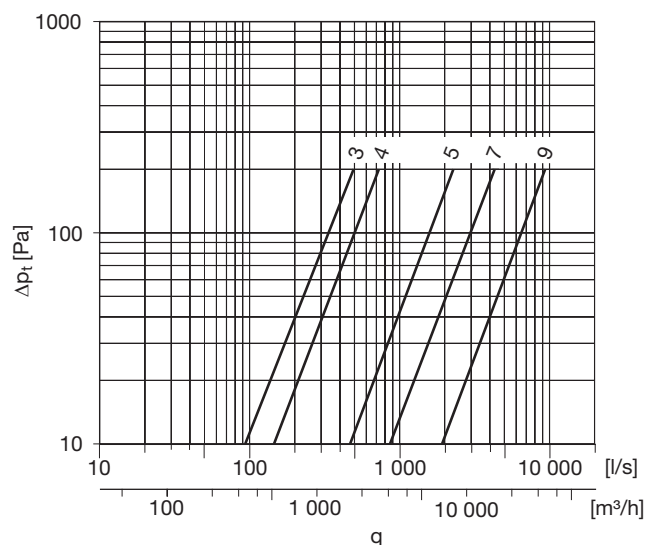
Standard colours, see page 443.

## Dimensions



| Size | A mm | B mm | h mm | H mm | $\alpha$ ° | Free area m <sup>2</sup> | m kg | Roof through connection TGR |        |
|------|------|------|------|------|------------|--------------------------|------|-----------------------------|--------|
|      |      |      |      |      |            |                          |      | 50 mm                       | 100 mm |
| 3    | 400  | 450  | 150  | 410  | 30         | 0,045                    | 6,40 | 3                           | 3      |
| 4    | 500  | 550  | 205  | 525  | 30         | 0,100                    | 9,90 | 4                           | 4      |
| 5    | 600  | 750  | 300  | 735  | 30         | 0,260                    | 17,0 | 5                           | 5      |
| 7    | 800  | 1050 | 450  | 1060 | 30         | 0,500                    | 34,3 | 7                           | 7      |
| 9    | 1000 | 1350 | 575  | 1360 | 30         | 0,720                    | 67,5 | 9                           | 9      |

## Technical data



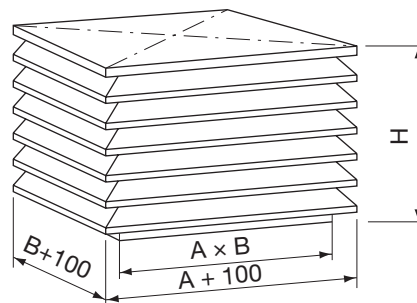


# Roof hood

LHR



## Dimensions



### Description

LHR is a rectangular roof hood with ribs that is used for both outdoor air and extract air.

The hood is supplied as standard in galvanised form, but is also available painted.

LHR is supplied as standard with LS joint for guiding.

When connecting to the roof through connection TGR, the special transition piece TGR-LHR must be used. (see page 458).

When connecting to the roof through connection TGR, the special transition piece TGR-LHR must be used. (see page 458).

| A<br>mm | B<br>mm | H<br>mm | Num-<br>ber of<br>ribs | Free<br>area<br>m <sup>2</sup> | m<br>kg | Roof<br>through<br>connection<br>TGR |                   |
|---------|---------|---------|------------------------|--------------------------------|---------|--------------------------------------|-------------------|
|         |         |         |                        |                                |         | 50<br>mm<br>Size                     | 100<br>mm<br>Size |
| 300     | 300     | 370     | 5                      | 0,216                          | 5,40    | 4                                    | 5                 |
| 400     | 400     | 390     | 6                      | 0,384                          | 8,7     | 5                                    | 6                 |
| 500     | 500     | 450     | 7                      | 0,600                          | 12,6    | 6                                    | 7                 |
| 600     | 600     | 450     | 7                      | 0,720                          | 15,1    | 7                                    | 8                 |
| 700     | 700     | 510     | 8                      | 1,008                          | 20,2    | 8                                    | 9                 |
| 800     | 800     | 570     | 9                      | 1,344                          | 25,9    | 9                                    | 10                |
| 900     | 900     | 630     | 10                     | 1,728                          | 32,4    | 10                                   | 11                |
| 1000    | 1000    | 690     | 11                     | 2,160                          | 47,4    | 11                                   | 12                |
| 1100    | 1100    | 750     | 12                     | 2,640                          | 56,9    | 12                                   | 13                |
| 1200    | 1200    | 750     | 12                     | 2,880                          | 62,1    | 13                                   | 14                |
| 1300    | 1300    | 810     | 13                     | 3,432                          | 72,1    | 14                                   | 15                |
| 1400    | 1400    | 870     | 14                     | 4,032                          | 84,5    | 15                                   | 16                |
| 1500    | 1500    | 930     | 15                     | 4,680                          | 97,0    | 16                                   | -                 |

A x B = Duct dimensions

### Ordering example

|                          |            |          |            |            |          |           |
|--------------------------|------------|----------|------------|------------|----------|-----------|
|                          | <b>LHR</b> | <b>S</b> | <b>300</b> | <b>300</b> | <b>1</b> | <b>LS</b> |
| Product                  |            |          |            |            |          |           |
| Colour, if desired       |            |          |            |            |          |           |
| A in mm                  |            |          |            |            |          |           |
| B in mm                  |            |          |            |            |          |           |
| Duct connection          |            |          |            |            |          |           |
| Joining methods (Type 1) |            |          |            |            |          |           |

Standard colours, see page 443.

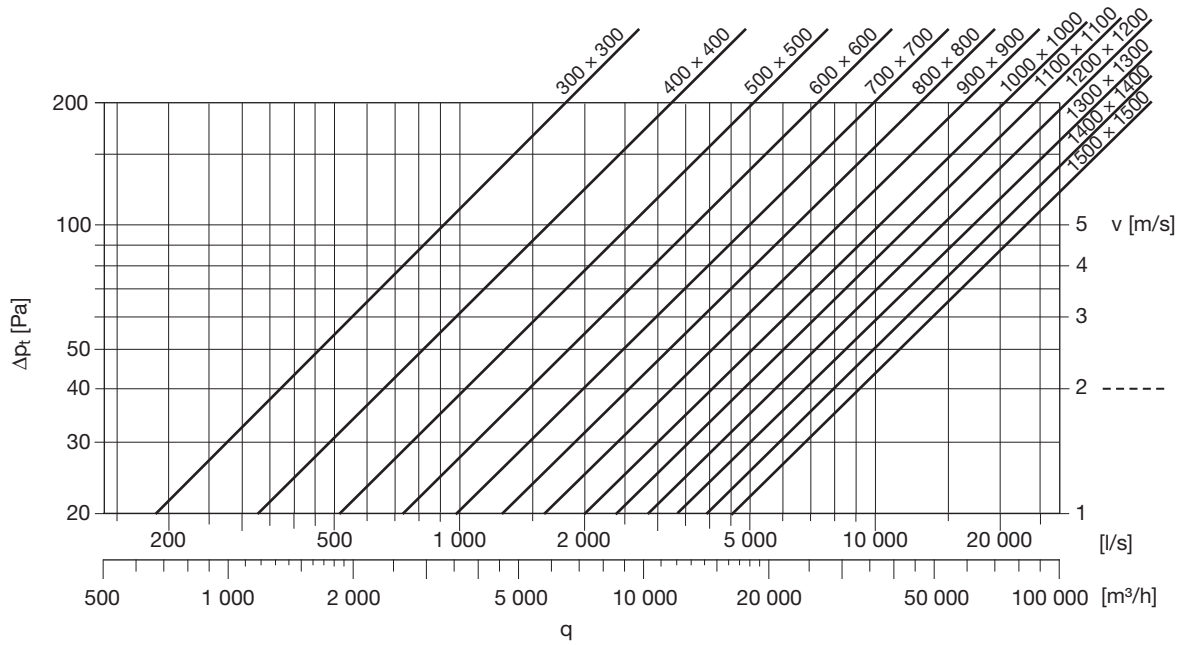


# Roof hood

LHR

## Technical data

Outdoor air/extract air



....

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8**
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18

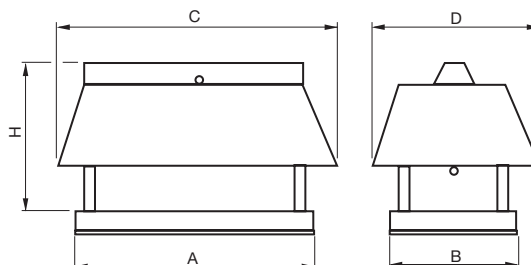


# Roof hood

# HKOMR



## Dimensions



## Description

Combi-hood intended for outdoor air intake and the expelling of extract air.

HKOMR is designed for location above the roof with or without a roof through connection.

The intake and extract sections are separated with an internal wall. The intake section is protected against precipitation with a roof and pest-proof mesh. The extract section has a high-speed device and water-collection vessel. This part is also available with a pest-proof mesh. Air short circuit is prevented by the air intake's roof and the extract's high-speed device that ensures a long ejection distance.

HKOMR is manufactured as standard from galvanised steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless, acid-resistant steel 2343 or painted.

HKOMR is produced as standard for installation on Lindab's roof through connection TGKOMR, but can also be supplied with an adapted connection hose for guiding directly on to the duct.

## Ordering example

|                |              |          |
|----------------|--------------|----------|
| <b>Product</b> | <b>HKOMR</b> | <b>3</b> |
| Type           |              |          |
| Size           |              |          |

Alternatives that should be specified separately if required:

- With pest-proof mesh on the extract section
- With adapted connection hose for guiding directly into the duct.

Standard colours, see page 443.

| Size | A mm | B mm | C mm | D mm | H mm |
|------|------|------|------|------|------|
| 2    | 750  | 400  | 850  | 500  | 560  |
| 3    | 950  | 500  | 1050 | 600  | 590  |
| 4    | 1150 | 600  | 1450 | 900  | 640  |
| 5    | 1350 | 700  | 1650 | 1000 | 740  |
| 6    | 1550 | 800  | 1850 | 1100 | 840  |
| 8    | 1950 | 1000 | 2450 | 1500 | 910  |
| 10   | 2350 | 1200 | 2850 | 1700 | 1090 |
| 12   | 2750 | 1400 | 3350 | 2000 | 1170 |
| 14   | 3150 | 1600 | 3850 | 2300 | 1345 |

| Size | Free area                  |                            | m kg |
|------|----------------------------|----------------------------|------|
|      | outdoor air m <sup>2</sup> | extract air m <sup>2</sup> |      |
| 2    | 0,138                      | 0,030                      | 16,7 |
| 3    | 0,202                      | 0,059                      | 23,1 |
| 4    | 0,291                      | 0,098                      | 36,6 |
| 5    | 0,501                      | 0,162                      | 50,3 |
| 6    | 0,764                      | 0,256                      | 65,9 |
| 8    | 1,159                      | 0,420                      | 102  |
| 10   | 1,948                      | 0,624                      | 148  |
| 12   | 2,639                      | 1,055                      | 244  |
| 14   | 3,180                      | 1,331                      | 320  |

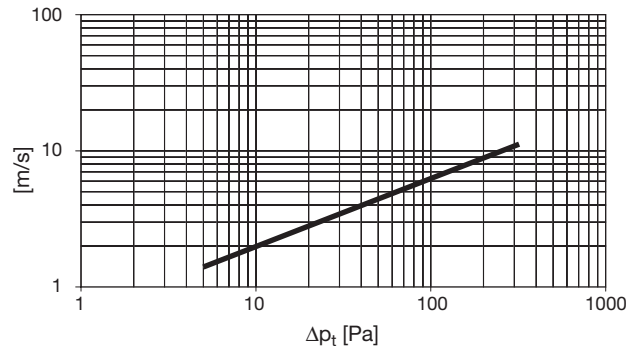


# Roof hood

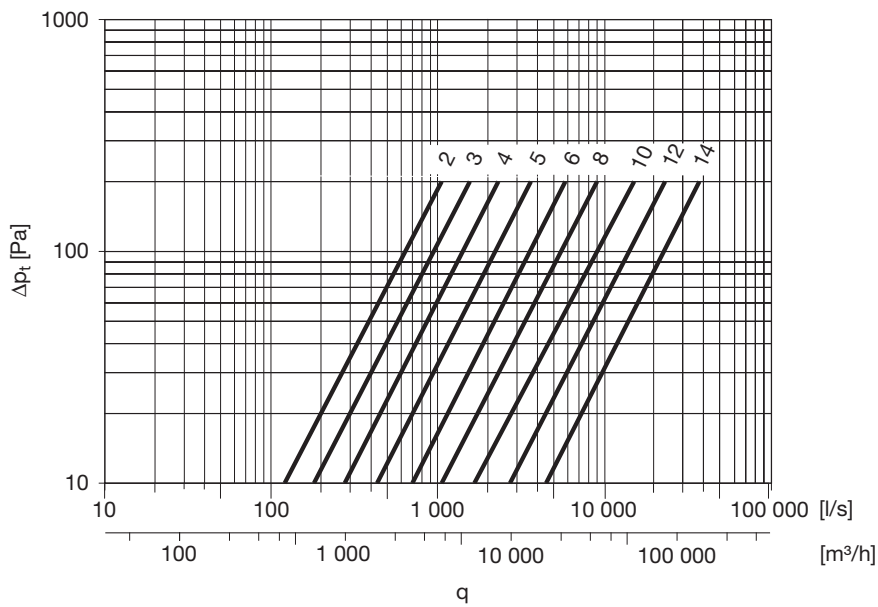
# HKOMR

## Technical data

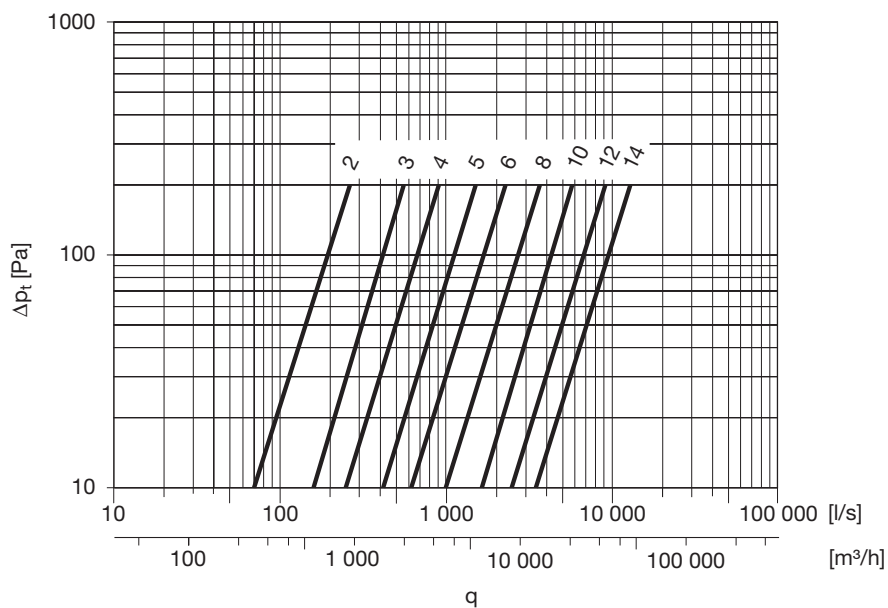
### Expelling velocity extract air



### Outdoor air



### Extract air



- 1
- 2
- 3
- 4
- 5
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- 7
- 8
- 9
- 10
- 11
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- 13
- 14
- 15
- 16
- 17
- 18



# Roof transition

TGR

- 1
- 2
- 3
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- 8
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- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



## Description

Intended for connection to roof hood and roof fan. Available with various types of insulation for condensation or fire protection. Two fixing profiles are supplied to suit the roof pitch.

The upper connection in sizes 100-315 suits roof hood HN, for example.

The upper connection in sizes 400-1200 is supplied without flange and is made so that you can use the enclosed mating flange from roof hood HF for instance.

TGR can as addition be provided with two through-connections for electric power and control voltage.

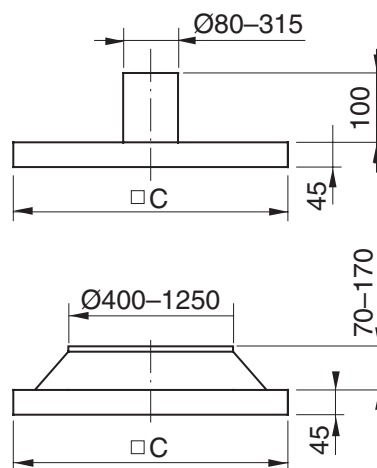
TGR is manufactured as standard from galvanized steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless steel 2333, stainless acid-resistant steel 2343 or painted.

The duct connection is supplied with RJFP joint for guiding.

## Dimensions

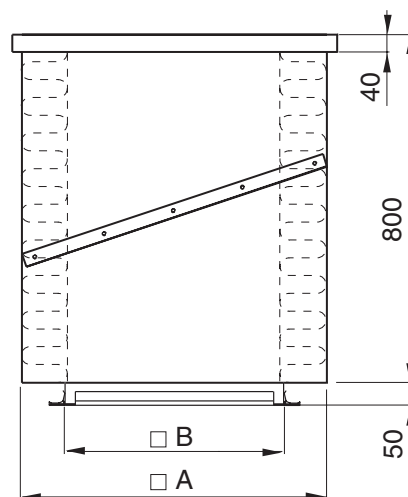
### TGR-OA

- Upper connection



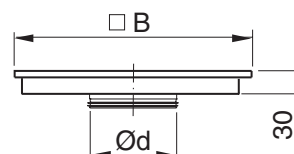
The C-measure of the upper connection (TGR-OA) shall fit the A-measure of the roof transition (TGR).

### TGR



### TGR-NA

- Lower connection



The B-measure of the lower connection (TGR-NA) shall fit the B-measure of the roof transition (TGR).



# Roof transition

TGR

## Dimensions

| Size | B mm |              |               | C mm | Weight kg    |               |
|------|------|--------------|---------------|------|--------------|---------------|
|      | A mm | 50 mm insul. | 100 mm insul. |      | 50 mm insul. | 100 mm insul. |
| 3    | 300  | 200          | 100           | 400  | 16,9         | 21,9          |
| 4    | 400  | 300          | 200           | 500  | 22,9         | 30,1          |
| 5    | 500  | 400          | 300           | 600  | 29,7         | 39,2          |
| 6    | 600  | 500          | 400           | 700  | 37,4         | 49,6          |
| 7    | 700  | 600          | 500           | 800  | 43,9         | 58,4          |
| 8    | 800  | 700          | 600           | 900  | 50,3         | 67,1          |
| 9    | 900  | 800          | 700           | 1000 | 59,2         | 78,8          |
| 10   | 1000 | 900          | 800           | 1100 | 65,9         | 87,9          |
| 11   | 1100 | 1000         | 900           | 1200 | 72,7         | 97,0          |
| 12   | 1200 | 1100         | 1000          | 1300 | 82,6         | 110,3         |
| 13   | 1300 | 1200         | 1100          | 1400 | 99,1         | 129,9         |
| 14   | 1400 | 1300         | 1200          | 1500 | 124,8        | 159,1         |
| 15   | 1500 | 1400         | 1300          | 1600 | 138,9        | 177,2         |
| 16   | 1600 | 1500         | 1400          | 1700 | 153,8        | 196,3         |

Hole punching dimensions (A + 20 mm) × (A + 20 mm)

## Ordering example

|   | TGR | 3 | 1 | 2 | 1 |
|---|-----|---|---|---|---|
| Product   |     |   |   |   |   |
| Size  |     |   |   |   |   |
| Type of insulation  |     |   |   |   |   |
| Fire protection 50 mm   |     | 1 |   |   |   |
| Fire protection 100 mm  |     |   | 2 |   |   |
| Condensation 50 mm  |     |   |   | 3 |   |
| Internal cladding of insulation                                   |     |   |   |   |   |
| Zink plated steel   |     |   |   | 1 |   |
| Zink plated perf. steel   |     |   |   |   | 2 |
| Aluzink sheet metal AZ 185  |     |   |   |   | 3 |
| Aluzink sheet metal AZ185 perf.                                   |     |   |   |   | 4 |
| Stainl. acid-res. steel 2343                                      |     |   |   |   | 5 |
| Stainl. acid-res. steel perf. 2343                                |     |   |   |   | 6 |
| No internal cladding (Only applicable at condensation insulation) |     |   |   |   | 7 |
| Stainless steel 2333  |     |   |   |   | 8 |
| External material   |     |   |   |   |   |
| Zink plated steel   |     |   |   |   | 1 |
| Aluzink sheet metal AZ 185  |     |   |   |   | 2 |
| Stainl. acid-res. steel 2343                                      |     |   |   |   | 3 |
| Stainless steel 2333  |     |   |   |   | 4 |

## Accessories

| Upper connection             | TGR-OA | 3 | 125 | 1 |
|------------------------------|--------|---|-----|---|
| Product                      |        |   |     |   |
| Size                         |        |   |     |   |
| Hood dimension               |        |   |     |   |
| Material                     |        |   |     |   |
| Zink plated steel            |        |   | 1   |   |
| Aluzink sheet metal AZ 185   |        |   |     | 2 |
| Stainl. acid-res. steel 2343 |        |   |     | 3 |
| Stainless steel 2333         |        |   |     | 4 |

| Lower connection             | TGR-NA | 3 | 125 | 1 | 50 |
|------------------------------|--------|---|-----|---|----|
| Product                      |        |   |     |   |    |
| Size                         |        |   |     |   |    |
| Connection Measure           |        |   |     |   |    |
| Material                     |        |   |     |   |    |
| Zink plated steel            |        |   |     | 1 |    |
| Aluzink sheet metal AZ 185   |        |   |     |   | 2  |
| Stainl. acid-res. steel 2343 |        |   |     |   | 3  |
| Stainless steel 2333         |        |   |     |   | 4  |
| Insulation thickness         |        |   |     |   |    |

## Upper connection only for roof hood VHL

|                              | TGR-VHL | - | 3 | - | 125 | - | 1 |
|------------------------------|---------|---|---|---|-----|---|---|
| Product                      |         |   |   |   |     |   |   |
| Size                         |         |   |   |   |     |   |   |
| Hood dimension               |         |   |   |   |     |   |   |
| Material                     |         |   |   |   |     |   |   |
| Zink plated steel            |         |   |   |   |     |   | 1 |
| Aluzink sheet metal AZ 185   |         |   |   |   |     |   | 2 |
| Stainl. acid-res. steel 2343 |         |   |   |   |     |   | 3 |
| Stainless steel 2333         |         |   |   |   |     |   | 4 |

## Upper connection only for roof hood LHR

|                              | TGR-LHR | - | 5 | - | 400 | - | 400 | - | 1 |
|------------------------------|---------|---|---|---|-----|---|-----|---|---|
| Product                      |         |   |   |   |     |   |     |   |   |
| Size                         |         |   |   |   |     |   |     |   |   |
| A mm                         |         |   |   |   |     |   |     |   |   |
| B mm                         |         |   |   |   |     |   |     |   |   |
| Material                     |         |   |   |   |     |   |     |   |   |
| Zink plated steel            |         |   |   |   |     |   |     |   | 1 |
| Aluzink sheet metal AZ 185   |         |   |   |   |     |   |     |   | 2 |
| Stainl. acid-res. steel 2343 |         |   |   |   |     |   |     |   | 3 |
| Stainless steel 2333         |         |   |   |   |     |   |     |   | 4 |





# Roof transition

# TGKOMR



## Description

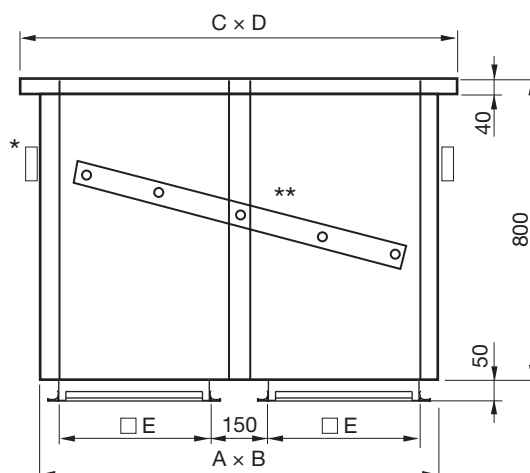
Roof transition adapted for combi-hood HKOMR. The transition is produced with 50 mm fire or condensation insulation. At connection to circular duct two lower connections TGR-NA are used. The roof transition is manufactured as standard in galvanised steel plate, but is available in stainless acid-resistant steel 2343, aluminium zinc AZ 185 or painted. Two angle brackets are supplied for adaptation to the relevant roof incline. Sizes and dimensions according to drawing and table, but is available in extended version which is specified separately. The duct connections are supplied with RJFP joints for guiding.

## Ordering example

|  |                       |
|--|-----------------------|
|  | <b>TGKOMR 3 1 2 1</b> |
| Product  |                       |
| Size   |                       |
| Type of insulation   |                       |
| Fire protection 50 mm  | 1                     |
| Condensation 50 mm   | 2                     |
| Internal cladding of insulation                                      |                       |
| Zink plated steel  | 1                     |
| Zink plated perf. steel  | 2                     |
| Aluzink sheet metal AZ 185   | 3                     |
| Aluzink sheet metal AZ185 perf.                                      | 4                     |
| Stainl. acid-res. steel 2343   | 5                     |
| Stainl. acid-res. steel perf. 2343                                   | 6                     |
| No internal cladding<br>(Only applicable at condensation insulation) | 7                     |
| External material  |                       |
| Zink plated steel  | 1                     |
| Aluzink sheet metal AZ 185   | 2                     |
| Stainl. acid-res. steel 2343   | 3                     |

Standard colours see page 443.

## Dimensions



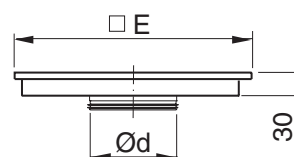
| Size | A mm | B mm | C mm | D mm | E mm | m kg |
|------|------|------|------|------|------|------|
| 2    | 650  | 300  | 740  | 390  | 200  | 32,5 |
| 3    | 850  | 400  | 940  | 490  | 300  | 43,5 |
| 4    | 1050 | 500  | 1140 | 590  | 400  | 54,3 |
| 5    | 1250 | 600  | 1340 | 690  | 500  | 72,4 |
| 6    | 1450 | 700  | 1540 | 790  | 600  | 84,5 |
| 8    | 1850 | 900  | 1940 | 990  | 800  | 113  |
| 10   | 2250 | 1100 | 2340 | 1190 | 1000 | 138  |
| 12   | 2650 | 1300 | 2740 | 1390 | 1200 | 190  |
| 14   | 3050 | 1500 | 3140 | 1590 | 1400 | 251  |

Hole punching dimensions =  $(A + 20) \times (B + 20)$

\* and \*\* are alternative positions for angle brackets

## TGKOMR-NA

- Lower connection



The E-measure of the lower connection (TGKOMR-NA) shall fit the E-measure of the roof transition (TGKOMR).

## Accessories

|                              |                          |
|------------------------------|--------------------------|
| <b>Lower connection</b>      | <b>TGKOMR-NA 3 125 1</b> |
| Product                      |                          |
| Size                         |                          |
| Connection measure           |                          |
| Material                     |                          |
| Zink plated steel            | 1                        |
| Aluzink sheet metal AZ 185   | 2                        |
| Stainl. acid-res. steel 2343 | 3                        |














# Other circular products



|                                    |          |
|------------------------------------|----------|
| Lindab                             | 1        |
| General information and theory     | 2        |
| Safe                               | 3        |
| Silencers                          | 4        |
| Dampers & Measure units            | 5        |
| Fire dampers & Smoke evacuation    | 6        |
| Air valves                         | 7        |
| Roof hoods                         | 8        |
| <b>Other circular products</b>     | <b>9</b> |
| Transfer                           | 10       |
| Rectangular                        | 11       |
| Flexible ducting                   | 12       |
| Isol                               | 13       |
| Access doors                       | 14       |
| Smart tools                        | 15       |
| Duct suspensions & Support systems | 16       |
| Fastening material                 | 17       |
| Index                              | 18       |



# Content – Other circular products

|    |   |                                  |
|----|---|----------------------------------|
| 1  | <b>Air entry nozzle</b>   | IMSKU..... 463                   |
| 2  |    |                                  |
| 3  | <b>Jet for air entry nozzle</b>   | DY ..... 464                     |
| 4  |    |                                  |
| 5  | <b>Plenum or distribution chamber</b>   | SLRU..... 465                    |
| 6  |    |                                  |
| 7  | <b>Duct filter</b>  | STR ..... 466                    |
| 8  |   |                                  |
| 9  | <b>Sealing clamp</b>  | SVK ..... 467                    |
| 10 |  |                                  |
| 11 | <b>End cover</b>  | EP..... 468                      |
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| 13 | <b>Flanges</b>  | FL ..... 469                     |
| 14 |  |                                  |
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| 16 |  |                                  |
| 17 | <b>Membrane lead-through</b>  | MG ..... 472<br>MGL ..... 473    |
| 18 |  |                                  |



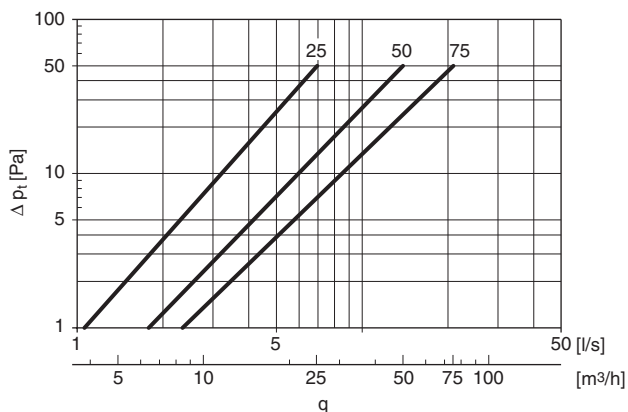
# Air entry nozzle

# IMSKU



## Description

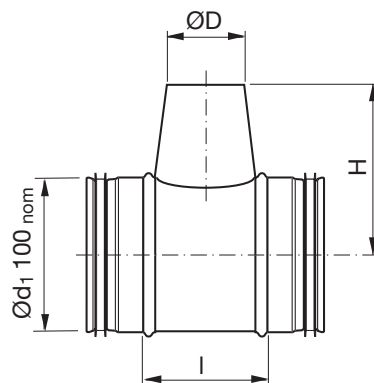
Used for ducting in bomb shelters, and is dimensioned for the air volumes specified by the Civil Defence Board regulations.



## Ordering example

|         |       |    |
|---------|-------|----|
| Product | IMSKU | 75 |
| Type    |       |    |
| Size    |       |    |

## Dimensions



| Size nom | ØD mm | l mm | H mm | m kg |
|----------|-------|------|------|------|
| 25       | 35    | 85   | 95   | 0,31 |
| 50       | 50    | 110  | 110  | 0,38 |
| 75       | 60    | 110  | 110  | 0,39 |

| Size nom | q <sub>max</sub> m³/h | Maximum no. of persons |
|----------|-----------------------|------------------------|
| 25       | 25                    | 10                     |
| 50       | 50                    | 20                     |
| 75       | 75                    | 30                     |

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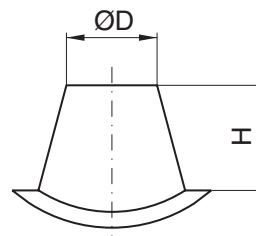
# Jet for air entry nozzle

DY

- 1
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- 3
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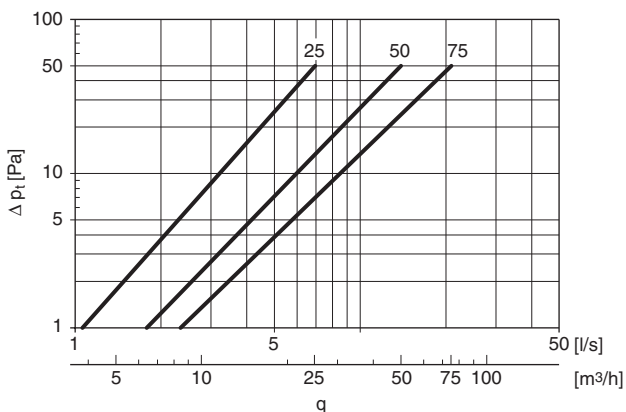
## Dimensions



## Description

Used for ducting in bomb shelters, and is dimensioned for the air volumes specified by the Civil Defence Board regulations.

| Size nom | ØD mm | H mm | m kg |
|----------|-------|------|------|
| 25       | 35    | 45   | 0,04 |
| 50       | 50    | 60   | 0,09 |
| 75       | 60    | 60   | 0,10 |



| Size nom | q <sub>max</sub> m³/h | Maximum no. of persons |
|----------|-----------------------|------------------------|
| 25       | 25                    | 10                     |
| 50       | 50                    | 20                     |
| 75       | 75                    | 30                     |

## Ordering example

|         |    |    |
|---------|----|----|
| Product | DY | 75 |
| Type    |    |    |
| Size    |    |    |



# Plenum or distribution chamber

# SLRU



## Description

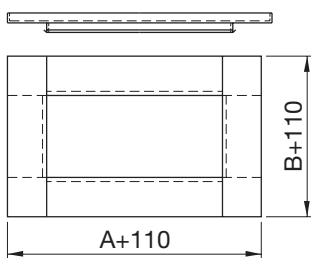
Intended for installation beneath joists, for collection or distribution of connected ducts underneath. The number of ducts for each size is noted in the table.

The plenum or distribution chamber is clad internally with fire protection insulation of 50 or 100 mm thickness. The insulation is protected by perforated sheet metal steel against damages from cleaning procedures.

The chamber has a simply removable lid.

## RAM

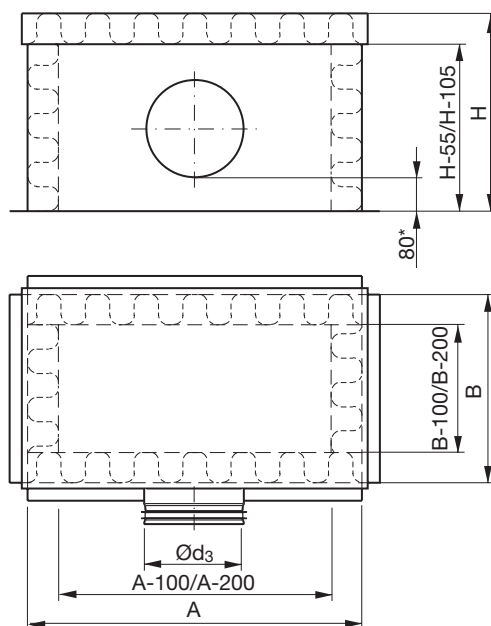
- Casting-in frame



Used to locate plenum or distribution chamber SLRU in. The chamber is locked to the frame with folding flaps.

Other dimensions can be made to order.

## Dimensions



## Ordering example

|                      |                       |             |            |            |           |          |
|----------------------|-----------------------|-------------|------------|------------|-----------|----------|
|                      | <b>SLRU</b>           | <b>1300</b> | <b>310</b> | <b>355</b> | <b>50</b> | <b>0</b> |
| Product              |                       |             |            |            |           |          |
| Length               | A                     |             |            |            |           |          |
| Width                | B                     |             |            |            |           |          |
| Height               | H                     |             |            |            |           |          |
| Insulation thickness | 50 alt. 100           |             |            |            |           |          |
| Casting-in frame     | 0 = without, 1 = with |             |            |            |           |          |

| Ød <sub>3</sub><br>Nm | Insulation thickness |          |          |         |          |          |          |         | Maximum no. of connected ducts |    |     |     |     |     | Frame   |
|-----------------------|----------------------|----------|----------|---------|----------|----------|----------|---------|--------------------------------|----|-----|-----|-----|-----|---------|
|                       | 50 mm                |          |          |         | 100 mm   |          |          |         | Ød <sub>nom</sub>              |    |     |     |     |     |         |
|                       | A*<br>mm             | B*<br>mm | H*<br>mm | m<br>kg | A*<br>mm | B*<br>mm | H*<br>mm | m<br>kg | 63                             | 80 | 100 | 125 | 160 | 200 | m<br>kg |
| 160                   | 310                  | 310      | 355      | 7,23    | 410      | 410      | 405      |         | 1                              | 1  | 1   | 1   | 1   | 1   | 3,08    |
| 160                   | 550                  | 310      | 355      | 10,6    | 650      | 410      | 405      |         | 3                              | 3  | 3   | 2   | 2   | 2   | 3,52    |
| 200                   | 700                  | 310      | 355      | 12,8    | 800      | 410      | 405      |         | 4                              | 4  | 4   | 4   | 3   | 2   | 4,28    |
| 200                   | 900                  | 310      | 355      | 15,7    | 1000     | 410      | 405      |         | 5                              | 5  | 5   | 5   | 4   | 3   | 4,90    |
| 200                   | 1100                 | 310      | 355      | 18,5    | 1200     | 410      | 405      |         | 7                              | 7  | 6   | 6   | 5   | 4   | 5,52    |
| 200                   | 1300                 | 310      | 355      | 21,4    | 1400     | 410      | 405      |         | 8                              | 8  | 8   | 8   | 6   | 5   | 6,14    |

\* Tolerance ±5 mm

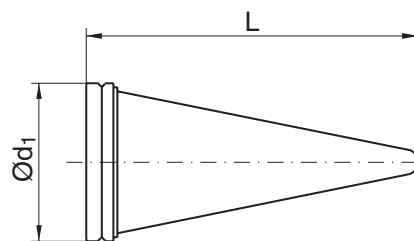


# Duct filter

# STR



## Dimensions



| Ød <sub>1</sub><br>Nm | L<br>mm | tolerance<br>mm | area<br>m <sup>2</sup> | m<br>kg |
|-----------------------|---------|-----------------|------------------------|---------|
| 100                   | 220     | ± 20            | 0,04                   | 0,04    |
| 125                   | 260     | ± 20            | 0,05                   | 0,08    |
| 160                   | 340     | ± 20            | 0,09                   | 0,12    |
| 200                   | 420     | ± 25            | 0,14                   | 0,16    |
| 250                   | 540     | ± 30            | 0,22                   | 0,23    |
| 315                   | 670     | ± 30            | 0,34                   | 0,36    |
| 400                   | 860     | ± 35            | 0,55                   | 0,59    |
| 500                   | 1100    | ± 50            | 0,89                   | 0,72    |
| 630                   | 1350    | ± 50            | 1,37                   | 0,91    |

## Description

The duct filter fits in all fittings with a Safe-groove. To install the filter in a T-piece means a simple mounting and replacing.

The special tapered shape gives 4–5 times larger filter area than the equivalent duct cross section area, giving lower pressure drop and longer exchange intervals than the equivalent flat filter.

Standard filter class is G4, but class F5 is optionally available. The diagram shows the pressure drop across a clean filter, including T-piece. The filter can be used to twice this pressure drop. It is a good idea to dimension the system for the average value.

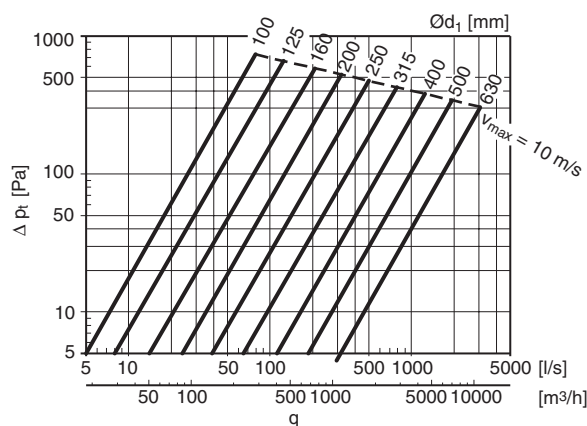
$$\Delta p_{t \text{ dim}} = 1,5 \cdot \Delta p_{t \text{ clean}}$$

Max temperature = 120 °C

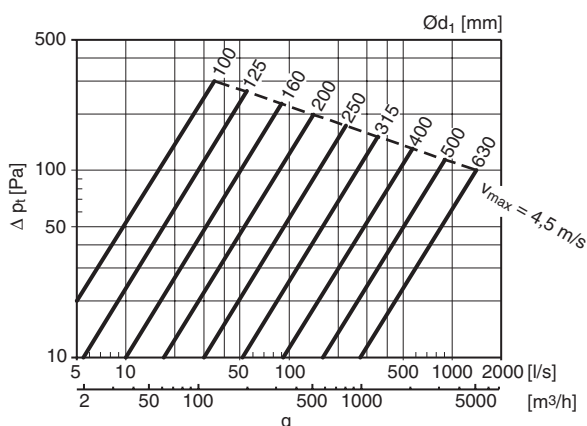
Highest recommended air speed in the duct.

| Filter class | v <sub>max</sub> (m/s) |
|--------------|------------------------|
| G4           | 10                     |
| F5           | 4,5                    |

## Filter class G4



## Filter class F5



## Ordering example

Product STR 200 G4

Dimension Ød<sub>1</sub>

Filter class

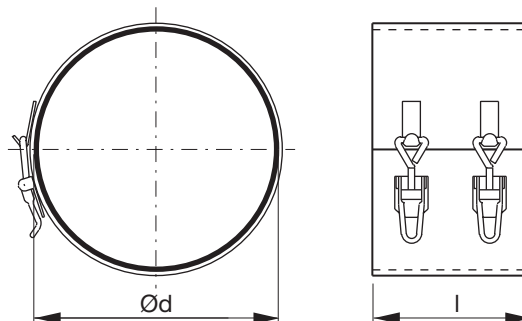


# Sealing clamp

SVK



## Dimensions



## Description

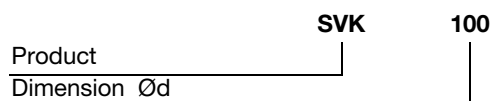
Removable sealing clamp made from galvanised sheet steel. Coated internally with a thick EPDM foam rubber seal.

The sealing clamp can join two ducts together, fitting to duct or duct to fitting.

The sealing clamp is very useful when you want to be able to remove a fitting or a unit from a ventilation system, and can also be used to advantage for repairing a duct system.

| Ød<br>nom | l<br>mm | m<br>kg |
|-----------|---------|---------|
| 80        | 130     | 0,30    |
| 100       | 130     | 0,34    |
| 125       | 130     | 0,40    |
| 160       | 130     | 0,46    |
| 200       | 130     | 0,59    |
| 250       | 190     | 0,94    |
| 315       | 190     | 1,17    |
| 400       | 250     | 1,42    |
| 500       | 250     | 1,75    |

## Ordering example



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# End cap

EP

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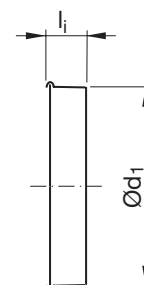
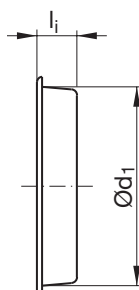
## Description

Fits inside a duct.

## Dimensions

Ø 63–500

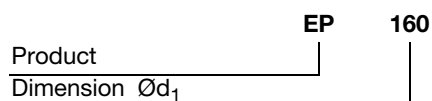
Ø 630–1250



| Ød <sub>1</sub><br>nom | l <sub>i</sub><br>mm | m<br>kg |
|------------------------|----------------------|---------|
| 63                     | 20                   | 0,03    |
| 80                     | 21                   | 0,05    |
| 100                    | 23                   | 0,09    |
| 125                    | 20                   | 0,09    |
| 160                    | 22                   | 0,14    |
| 200                    | 20                   | 0,19    |
| 250                    | 26                   | 0,27    |
| 315                    | 21                   | 0,51    |
| 400                    | 20                   | 0,76    |
| 500                    | 20                   | 1,22    |
| 630 *                  | 80                   | 2,41    |
| 800 *                  | 100                  | 4,87    |
| 1000 *                 | 100                  | 7,09    |
| 1250 *                 | 120                  | 15,5    |

\* Hand made

## Ordering example





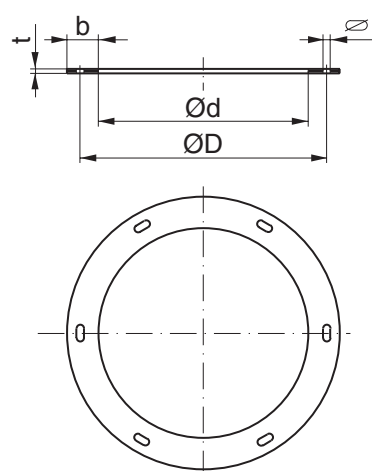


# Flat bar flange

FL



## Dimensions

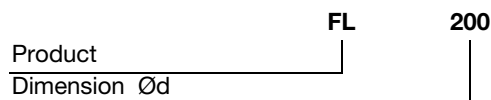


## Description

Heavy flange made from flat bar which then is hot dip galvanized. It suits both spirally swaged and lengthways swaged ducts. Oval bolt holes facilitate assembly.

Other dimensions and hole spacings can be provided for large orders.

## Ordering example



## Dimensions

| Ød        |            |                 | ØD         |                 | f<br>mm   | Bolts to DIN 601 |     |         | b x t<br>mm | m<br>kg |
|-----------|------------|-----------------|------------|-----------------|-----------|------------------|-----|---------|-------------|---------|
| nom<br>mm | real<br>mm | tolerance<br>mm | real<br>mm | tolerance<br>mm |           | quantity<br>pcs  | dim | L<br>mm |             |         |
| 80        | 82,5       |                 | 108        |                 | 7,0 x 16  | 4                | M6  | 16      | 25 x 3      | 0,18    |
| 100       | 102        | +1,0            | 129        |                 |           |                  |     |         |             | 0,22    |
| 112       | 114        | -0,0            | 141        |                 |           |                  |     |         |             | 0,25    |
| 125       | 127        |                 | 155        |                 |           |                  |     |         |             | 0,30    |
| 140       | 142        | +1,5<br>-0,0    | 176        | ±1,0            | 9,5 x 20  | 6                | M8  | 20      | 30 x 4      | 0,49    |
| 150       | 152        |                 | 184        |                 |           |                  |     |         |             | 0,52    |
| 160       | 162        |                 | 194        |                 |           |                  |     |         |             | 0,55    |
| 180       | 182        |                 | 213        |                 |           |                  |     |         |             | 0,60    |
| 200       | 203        |                 | 235        |                 |           |                  |     |         |             | 0,70    |
| 224       | 227        |                 | 259        |                 |           |                  |     |         |             | 0,74    |
| 250       | 253        |                 | 286        |                 |           |                  |     |         |             | 0,81    |
| 280       | 283        | +2,0<br>-0,0    | 322        | ±1,5            | 11,5 x 24 | 8                | M10 | 25      | 35 x 5      | 1,31    |
| 300       | 303        |                 | 341        |                 |           |                  |     |         |             | 1,40    |
| 315       | 318        |                 | 356        |                 |           |                  |     |         |             | 1,47    |
| 355       | 358        |                 | 395        |                 |           |                  |     |         |             | 1,63    |
| 400       | 404        | +2,0<br>-0,0    | 438        | ±1,5            | 11,5 x 24 | 12               | M10 | 25      | 40 x 5      | 1,80    |
| 450       | 454        |                 | 487        |                 |           |                  |     |         |             | 2,02    |
| 500       | 504        |                 | 541        |                 |           |                  |     |         |             | 2,35    |
| 560       | 564        |                 | 605        |                 |           |                  |     |         |             | 2,81    |
| 600       | 604        |                 | 644        |                 |           |                  |     |         |             | 3,00    |
| 630       | 634        |                 | 674        |                 |           |                  |     |         |             | 3,15    |
| 710       | 714        |                 | 751        |                 |           |                  |     |         |             | 3,54    |
| 800       | 804        | +2,0<br>-0,0    | 837        | ±1,5            | 11,5 x 24 | 16               | M10 | 25      | 50 x 6      | 3,90    |
| 900       | 904        |                 | 934        |                 |           |                  |     |         |             | 4,39    |
| 1000      | 1005       |                 | 1043       |                 |           |                  |     |         |             | 4,89    |
| 1120      | 1125       |                 | 1174       |                 |           |                  |     |         |             | 8,36    |
| 1250      | 1255       | 1311            | 9,32       |                 |           |                  |     |         |             |         |
| 1400      | 1407       | 1465            | 10,4       |                 |           |                  |     |         |             |         |
| 1600      | 1607       | 1637            | 11,8       |                 |           |                  |     |         |             |         |



# Casting-in programme – Wall stub

TVILU

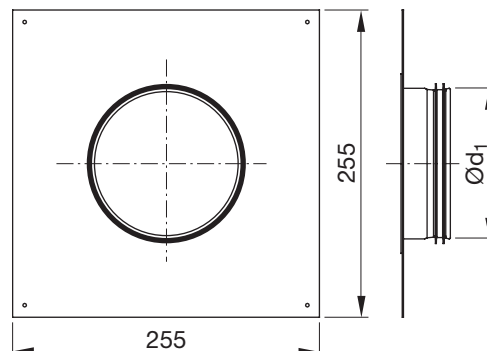
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## Description

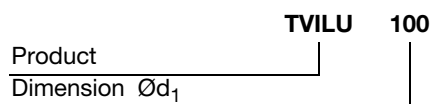
With Safe connection.

## Dimensions



| Ød <sub>1</sub><br>nom | m<br>kg |
|------------------------|---------|
| 100                    | 0,29    |
| 125                    | 0,31    |
| 160                    | 0,32    |

## Ordering example





# Casting-in programme – Wall stub

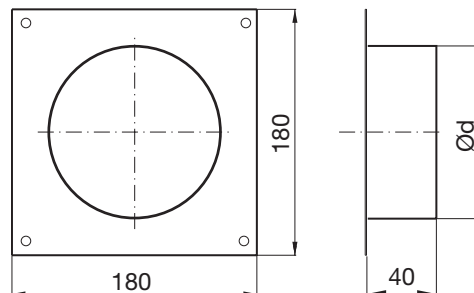
TVIL



## Description

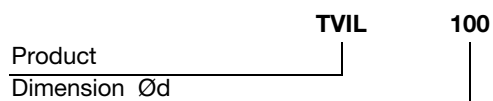
With female end.

## Dimensions



| Ød<br>nom | m<br>kg |
|-----------|---------|
| 100       | 0,15    |
| 125       | 0,20    |

## Ordering example

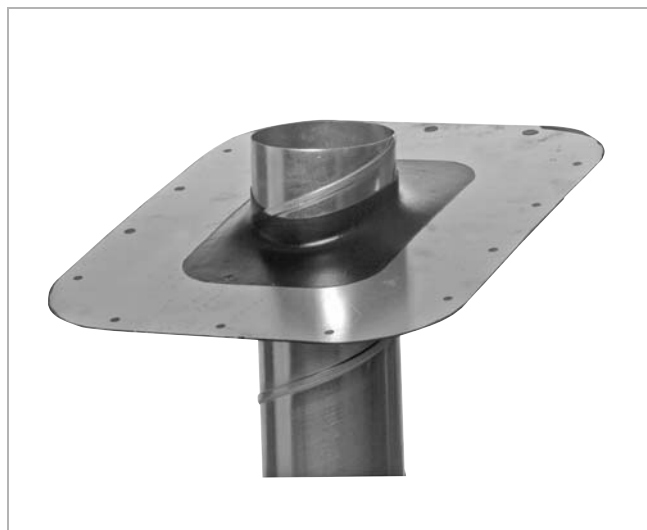


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# Membrane lead-through

MG



## Description

The product is based on a special flexible 2-component rubber (1) that is integrated with a 1 mm aluminium plate (2).

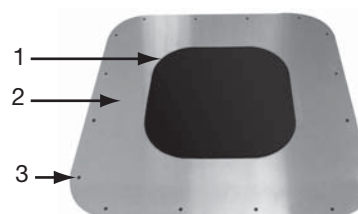
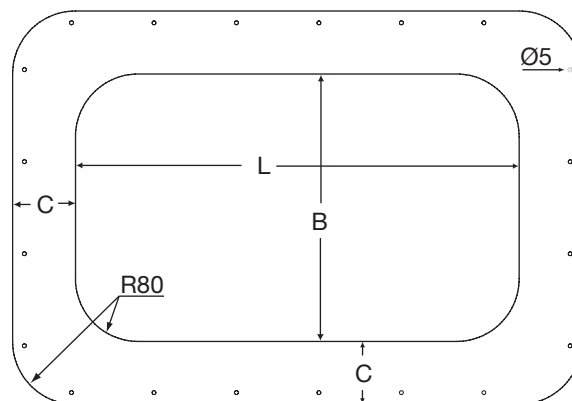
Used for sealing of the building envelope for all types of pipes and ducts, which is lead trough a vapour barrier of roofing underlay.

The product can be used as a roofing underlay transition or as a vapour barrier sheet, in the ridge as well as on the inclined roof area.

You will also find screwholes (3) ready for fixed roofing underlay, concrete floor or floor structures.

A special mounting instruction exists for this product.

## Dimensions



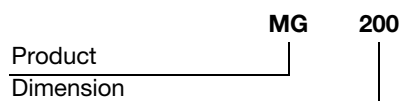
**Special transition designet for ceiling, shaft etc. used for ducts from Ø100 - Ø160**

| Type    | Max. duct measure<br>□ / Ø<br>mm | B x L x C<br>mm | m<br>kg |
|---------|----------------------------------|-----------------|---------|
| MG 1016 | 160                              | 200 x 200 x 50  | 0,32    |

## Standard transition

| Type   | Max. duct measure<br>□ / Ø<br>mm | B x L x C<br>mm | m<br>kg |
|--------|----------------------------------|-----------------|---------|
| MG 100 | 110                              | 150 x 235 x 80  | 0,40    |
| MG 200 | 200                              | 240 x 390 x 80  | 0,78    |
| MG 315 | 315                              | 355 x 565 x 80  | 1,36    |
| MG 400 | 405                              | 445 x 750 x 80  | 1,76    |
| MG 710 | 710                              | 750 x 1280 x 80 | 2,00    |

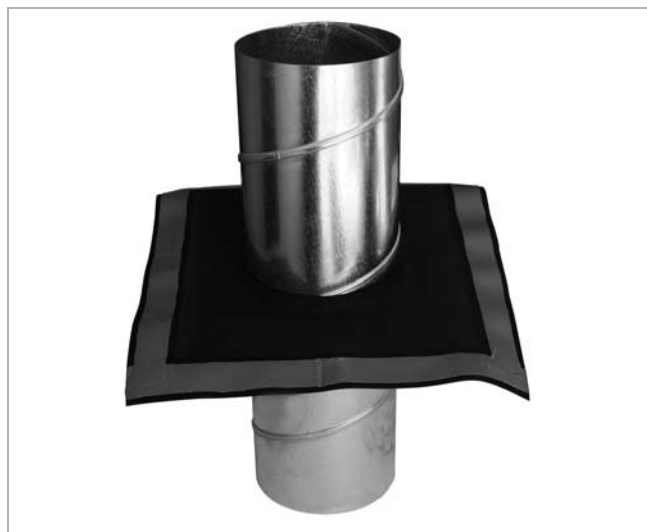
## Ordering example





# Membrane lead-through

# MGL



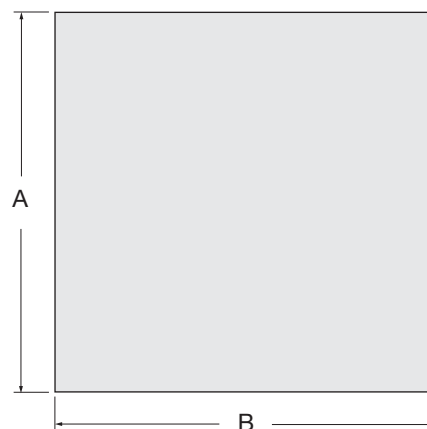
## Description

Made from a special flexible syntetic rubber and provided with tape with adhesive on both sides.

Is used for sealing of the climate shield to all sorts of pipes and ducts, which passes through moisture barrier or roofing underlay.

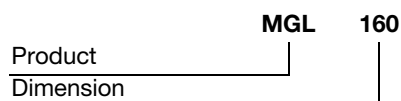
A special mounting instruction exists for this product.

## Dimensions



| Type    | Max. duct dimension<br>□ / Ø<br>mm | A × B<br>mm | m<br>kg |
|---------|------------------------------------|-------------|---------|
| MGL 80  | 80                                 | 200 × 200   | 0,10    |
| MGL 125 | 125                                | 250 × 250   | 0,10    |
| MGL 160 | 160                                | 300 × 300   | 0,15    |
| MGL 250 | 250                                | 400 × 400   | 0,20    |
| MGL 355 | 355                                | 500 × 500   | 0,25    |

## Ordering example



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# Transfer






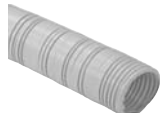






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# Description

## Transfer – the duct system which is quick and easy to assemble and take apart

Transfer is the circular duct system with tension clips for quick assembly and disassembly. The system is supplied as standard with clips in dimensions Ø80 to Ø500 and with FL flanges in dimensions Ø560 to Ø900. Please refer to page 469.

### Dust explosions

There is always a risk of dust explosion in installations where finely-divided material is transported.

A dust explosion occurs when a critical mixture of finely divided material and air is ignited and burns rapidly with consequent rapid expansion and pressure rise. A common cause of ignition is a spark from electrostatic discharge. Dust and sawdust extraction installations must be designed to minimise sources of fire and explosion.

### Noise

In particle transport systems, where the pressure difference between in- and outside is big and where a little leakage may cause noise, the joints ought to be taped if low noise levels are required.

### Applications

The duct system is suitable for

- Particle transportation from woodworking, such as saw mills, carpenters, furniture manufacturers and craft workshops.
- Comfort ventilation.
- Extraction systems for better working environment.
- Plasma cutters.
- Specially designed ventilation plants where you have extra demands for form, colour and appearance.

Please contact Lindab if you need other applications or to transport other materials, and if there are special operation circumstances.

### Mountings

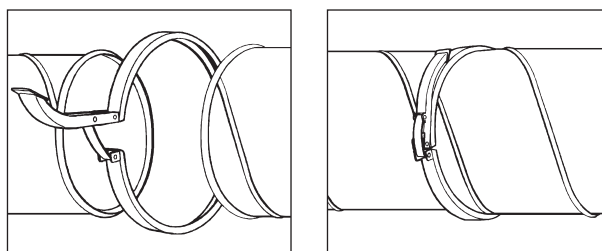
The types of mountings and their distances shall be chosen so that no sagging occurs in the system, and as justified for safe installation.

### Maintenance

The duct system does not normally need any maintenance, but regular checks for wear should be made.

### Advantages of the Transfer system

- Facilitates inspection and cleaning thanks to quick and simple disassembly.
- Facilitates environmental checking of the duct system.
- Rational joining, without screws or blind rivets.
- Has well-protected seal mouldings inside the clips.
- Can be twisted and adjusted after installation.
- Gives straight assembly.
- Does not have any sharp edges in the joints, since the bead is swaged directly on the fittings.
- Is highly suitable for transporting light material by means of air (chip extraction).
- Thanks to the bead, components are round and stiff.
- Does not require couplings.
- Transition pieces available for the Safe systems etc.
- Has lower pressure drop than the Safe system.
- Quick and easy to assemble and disassemble.



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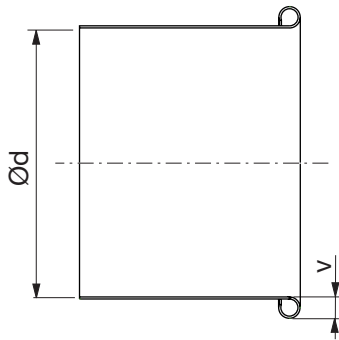
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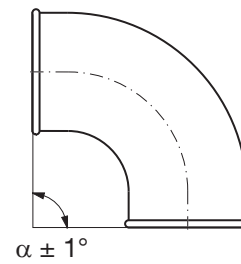
# General

## Dimensions of ducts and fittings



| Ød nom               | Ød mm | v mm |
|----------------------|-------|------|
| 80                   | 78    | 6    |
| 100                  | 98    | 6    |
| 125                  | 123   | 6    |
| 140                  | 138   | 6    |
| 150                  | 148   | 6    |
| 160                  | 158   | 6    |
| 180                  | 178   | 8    |
| 200                  | 198   | 8    |
| 224                  | 224   | 8    |
| 250                  | 250   | 8    |
| 300                  | 300   | 10   |
| 315                  | 315   | 10   |
| 350                  | 350   | 10   |
| 400                  | 400   | 10   |
| 450                  | 450   | 10   |
| 500                  | 500   | 10   |
| 560–900 with flanges |       |      |

## Angle tolerances





# Spiral swaged duct

# SRTR



## Description

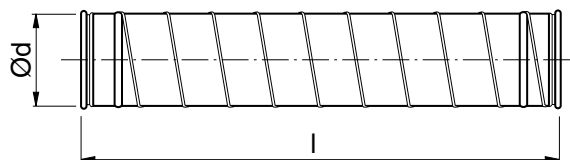
Circular spiral swaged duct with projecting seam.

The duct has end stubs swaged on, with Transfer beads at each end.

Please refer to page 51 for technical data about ducts.

Please refer to pages 51 for technical data about ducts.

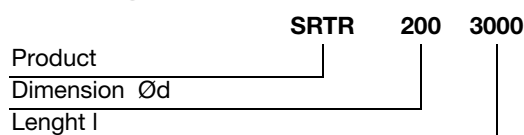
## Dimensions



| Ød<br>nom                              | t<br>std<br>mm | 500<br>mm | 1000<br>mm | 1500<br>mm | 2000<br>mm | 3000<br>mm | 6000<br>mm |
|--|----------------|-----------|------------|------------|------------|------------|------------|
| <b>Weight for standard lengths, kg</b> |                |           |            |            |            |            |            |
| 80                                     | 0,45           | 0,55      | 1,10       | 1,65       | 2,20       | 3,30       | 6,60       |
| 100                                    | 0,45           | 0,74      | 1,37       | 2,11       | 2,74       | 4,11       | 8,22       |
| 125                                    | 0,45           | 0,82      | 1,64       | 2,46       | 3,28       | 4,92       | 9,84       |
| 140                                    | 0,5            | 1,00      | 2,00       | 3,00       | 4,00       | 6,00       | 12,0       |
| 150                                    | 0,5            | 1,10      | 2,20       | 3,30       | 4,40       | 6,60       | 13,2       |
| 160                                    | 0,5            | 1,20      | 2,30       | 3,50       | 4,60       | 6,90       | 13,8       |
| 180                                    | 0,5            | 1,30      | 2,60       | 3,90       | 5,20       | 7,80       | 15,6       |
| 200                                    | 0,5            | 1,40      | 2,90       | 4,30       | 5,80       | 8,70       | 17,4       |
| 224                                    | 0,6            | 1,90      | 3,80       | 5,80       | 7,70       | 11,5       | 23,0       |
| 250                                    | 0,5            | 1,80      | 3,60       | 5,40       | 7,20       | 10,8       | 21,6       |
| 300                                    | 0,6            | 2,60      | 5,20       | 7,80       | 10,4       | 15,6       | 31,2       |
| 315                                    | 0,6            | 2,80      | 5,50       | 8,30       | 11,0       | 16,5       | 33,0       |
| 350                                    | 0,6            | 3,10      | 6,20       | 9,30       | 12,4       | 18,6       | 37,2       |
| 400                                    | 0,6            | 3,50      | 7,00       | 10,5       | 14,0       | 21,0       | 42,0       |
| 450                                    | 0,6            | 3,90      | 7,80       | 11,7       | 15,6       | 23,4       | 46,8       |
| 500                                    | 0,7            | 5,10      | 10,2       | 15,2       | 20,3       | 30,5       | 60,9       |
| 560 *                                  | 0,8            | 11,7      | 18,2       | 24,7       | 31,2       | 44,2       | 83,3       |
| 600 *                                  | 0,8            | 12,5      | 19,5       | 26,5       | 33,4       | 47,4       | 89,2       |
| 630 *                                  | 0,7            | 11,3      | 17,6       | 23,9       | 30,2       | 42,8       | 80,6       |
| 710 *                                  | 0,8            | 14,8      | 23,0       | 31,2       | 39,4       | 55,9       | 105        |
| 800 *                                  | 0,8            | 16,5      | 25,7       | 35,1       | 44,4       | 63,0       | 119        |
| 900 *                                  | 0,8            | 17,8      | 28,3       | 38,8       | 49,2       | 70,2       | 133        |

\* Supplied with flange FL

## Ordering example



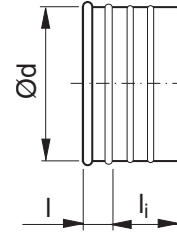


# Slide-on stub

# TSRTR



## Dimensions



## Description

Slide-on stub for installation in ducts of type SR.

After the duct has been shortened/fitted, add sealant etc between the swaged seams on the slide-on stub, after which the slide-on stub is inserted into the duct. The two swaged seams guide and retain the slide-on stub.

To finish off, the edge of the stub is swaged, both to remove the sharp edge of the transition and to fix the slide-on stub.

Please refer to the shortening instruction on page 486.

Is also used as transition piece OTRTH between Transfer and flexible hose THVTR. See page 522.

| Ød<br>nom | t<br>mm | l<br>mm | l <sub>i</sub><br>mm | m<br>kg |
|-----------|---------|---------|----------------------|---------|
| 80        | 0,7     | 18      | 44                   | 0,10    |
| 100       | 0,7     | 18      | 44                   | 0,10    |
| 125       | 0,7     | 18      | 44                   | 0,20    |
| 140       | 0,7     | 18      | 44                   | 0,20    |
| 150       | 0,7     | 18      | 44                   | 0,20    |
| 160       | 0,7     | 18      | 44                   | 0,20    |
| 180       | 0,7     | 20      | 37                   | 0,30    |
| 200       | 0,7     | 20      | 37                   | 0,30    |
| 224       | 0,7     | 20      | 37                   | 0,30    |
| 250       | 0,7     | 20      | 37                   | 0,30    |
| 300       | 0,9     | 22      | 32                   | 0,40    |
| 315       | 0,9     | 22      | 32                   | 0,50    |
| 350       | 0,9     | 22      | 32                   | 0,50    |
| 400       | 0,9     | 22      | 32                   | 0,70    |
| 450       | 0,9     | 22      | 32                   | 0,80    |
| 500       | 0,9     | 22      | 32                   | 0,90    |

## Ordering example

|              |       |     |
|--------------|-------|-----|
| Product      | TSRTR | 200 |
| Dimension Ød |       |     |



# Slide-on stub

# ILRTR



## Description

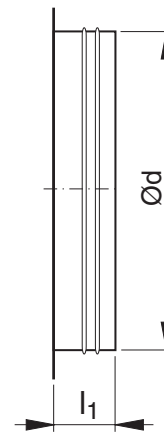
Slide-on stub for installation in ducts of type SR in dimension range Ø560–900 where flange FL is used for joining.

After the duct has been shortened/fitted, add sealant etc between the swaged seams on the slide-on stub, after which the slide-on stub is inserted into the duct. The two swaged seams guide and retain the slide-on stub.

To finish off, the edge of the stub is swaged to both remove the sharp edge of the transition, and to fix the slide-on stub.

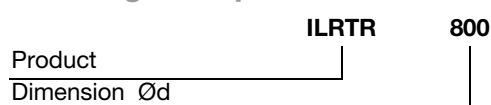
Please refer to the shortening instruction on page 486.

## Dimensions



| Ød<br>nom | l <sub>1</sub><br>mm | m<br>kg |
|-----------|----------------------|---------|
| 560       | 80                   | 0,90    |
| 600       | 80                   | 1,00    |
| 630       | 80                   | 1,00    |
| 710       | 100                  | 1,40    |
| 800       | 100                  | 2,00    |
| 900       | 100                  | 2,20    |

## Ordering example



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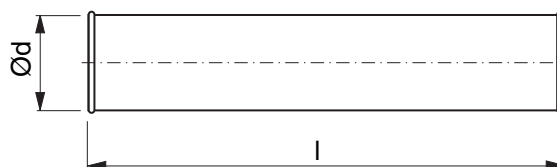


# Lengthways swaged duct

# LRTR



## Dimensions



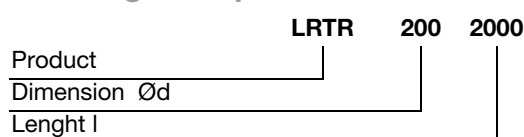
## Description

Circular lengthways swaged duct with external seam.

| Ød<br>nom | t<br>std<br>mm | 1000 mm<br>Max permissible static negative<br>pressure, kPa | 2000 mm | 3000 mm |
|-----------|----------------|---|---------|---------|
| 80        | 0,6            | 36,0  |         |         |
| 100       | 0,6            | 34,0  | 25,0    |         |
| 125       | 0,6            | 32,0  | 24,0    |         |
| 140       | 0,6            | 29,0  | 21,0    |         |
| 150       | 0,6            | 25,0  | 18,0    |         |
| 160       | 0,6            | 22,0  | 16,0    |         |
| 180       | 0,7            | 21,0  | 15,5    |         |
| 200       | 0,7            | 21,0  | 15,0    |         |
| 224       | 0,7            | 20,0  | 14,5    |         |
| 250       | 0,7            | 19,5  | 14,0    | 10,0    |
| 300       | 0,7            | 18,5  | 13,5    | 9,5     |
| 315       | 0,7            | 18,0  | 13,0    | 9,0     |
| 350       | 0,7            | 16,0  | 12,0    | 8,0     |
| 400       | 0,9            | 19,0  | 14,0    | 8,5     |
| 450       | 0,9            | 16,0  | 12,0    | 7,0     |
| 500       | 0,9            | 14,0  | 10,0    | 6,0     |

| Ød<br>nom                              | t<br>std<br>mm | 500<br>mm | 1000<br>mm | 1500<br>mm | 2000<br>mm | 2960**<br>mm |
|--|----------------|-----------|------------|------------|------------|--------------|
| <b>Weight for standard lengths, kg</b> |                |           |            |            |            |              |
| 80                                     | 0,6            | 0,70      | 1,30       |            |            |              |
| 100                                    | 0,6            | 0,80      | 1,68       | 2,50       | 3,40       |              |
| 125                                    | 0,6            | 1,00      | 2,09       | 3,10       | 4,20       |              |
| 140                                    | 0,6            | 1,10      | 2,29       | 3,40       | 4,60       |              |
| 150                                    | 0,6            | 1,20      | 2,49       | 3,70       | 5,00       |              |
| 160                                    | 0,6            | 1,30      | 2,69       | 4,00       | 5,40       |              |
| 180                                    | 0,7            | 1,80      | 3,6        | 5,40       | 7,20       |              |
| 200                                    | 0,7            | 1,90      | 3,89       | 5,80       | 7,80       |              |
| 224                                    | 0,7            | 2,20      | 4,4        | 6,60       | 8,80       |              |
| 250                                    | 0,7            | 2,40      | 4,88       | 7,30       | 9,80       | 14,6*        |
| 300                                    | 0,7            | 2,90      | 5,88       | 8,80       | 11,8       | 17,6**       |
| 315                                    | 0,7            | 3,10      | 6,2        | 9,30       | 12,4       | 18,6**       |
| 350                                    | 0,7            | 3,50      | 7          | 10,5       | 14,0       | 21,0**       |
| 400                                    | 0,9            | 4,70      | 9,4        | 14,1       | 18,8       | 28,2**       |
| 450                                    | 0,9            | 5,30      | 10,6       | 15,9       | 21,2       | 31,8**       |
| 500                                    | 0,9            | 5,90      | 11,8       | 17,7       | 23,6       | 35,4**       |
| 560***                                 | 0,9            | 11,8      | 18,4       | 25,0       |            |              |
| 600***                                 | 0,9            | 12,6      | 19,7       | 26,7       |            |              |
| 630***                                 | 0,9            | 13,2      | 20,7       | 27,1       |            |              |
| 650***                                 | 0,9            | 13,6      | 21,3       | 28,9       |            |              |
| 710***                                 | 0,9            | 14,9      | 23,3       | 31,6       |            |              |
| 750***                                 | 0,9            | 15,7      | 24,6       | 33,4       |            |              |
| 800***                                 | 0,9            | 16,6      | 26,1       | 35,5       |            |              |
| 900***                                 | 0,9            | 18,8      | 29,4       | 40,0       |            |              |

## Ordering example



\* t = 0,9; l = 2970

\*\* t = 0,9

\*\*\* Supplied with flange FL



# Slide-on stub

PTR



## Description

Slide-on stub for installation in ducts of type LRTR.

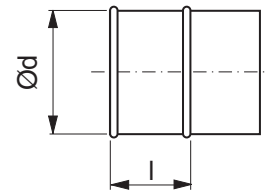
After the duct has been shortened/fitted the slide-on stub is inserted into the duct, after which the slide-on stub is sealed and fixed with putty or an sealing clamp such as MFK.

Turn the join during assembly, to face away from the direction of air flow.

Please refer to the shortening instruction on page 486.

Please refer to the shortening instruction on page 486.

## Dimensions



| Ød<br>nom | t<br>mm | l<br>mm | m<br>kg |
|-----------|---------|---------|---------|
| 80        | 0,5     | 58      | 0,20    |
| 100       | 0,5     | 58      | 0,20    |
| 125       | 0,5     | 58      | 0,30    |
| 140       | 0,5     | 58      | 0,30    |
| 150       | 0,5     | 58      | 0,40    |
| 160       | 0,5     | 58      | 0,40    |
| 180       | 0,5     | 53      | 0,40    |
| 200       | 0,5     | 53      | 0,40    |
| 224       | 0,5     | 53      | 0,40    |
| 250       | 0,5     | 53      | 0,30    |
| 300       | 0,9     | 49      | 0,60    |
| 315       | 0,9     | 49      | 0,40    |
| 350       | 0,9     | 49      | 0,80    |
| 400       | 0,9     | 49      | 1,20    |
| 450       | 0,9     | 49      | 1,30    |
| 500       | 0,9     | 49      | 1,50    |

## Ordering example

|              |            |            |
|--------------|------------|------------|
|              | <b>PTR</b> | <b>200</b> |
| Product      |            |            |
| Dimension Ød |            |            |

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# Telescopic duct

## TLTR1



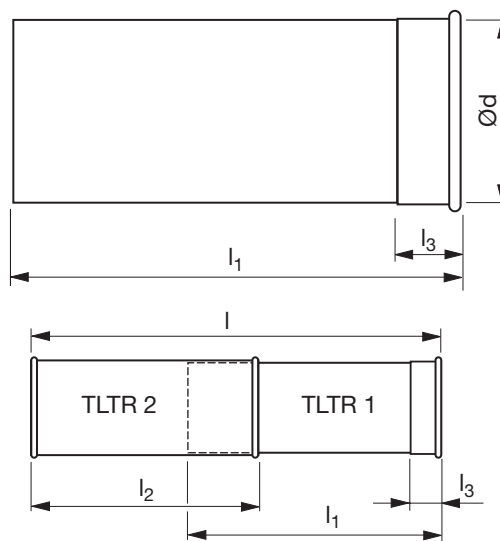
### Description

Used together with telescopic duct TLTR 2 where it is necessary to adjust duct length when the standard lengths are not sufficient.

Fits also inside ducts of type SRTR Ø 80–200 and LRTR Ø 80–500.

For SRTR Ø 224–500 use the special duct TLSR.

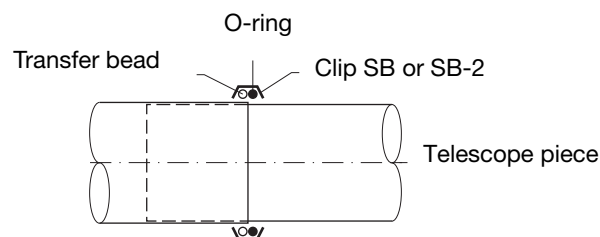
### Dimensions



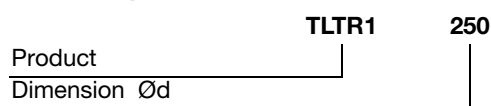
| Ød nom | t mm | l <sub>1</sub> , l <sub>2</sub> mm | l <sub>3</sub> mm | l <sub>min</sub> mm | l <sub>max</sub> mm | m kg |
|--------|------|------------------------------------|-------------------|---------------------|---------------------|------|
| 80     | 0,7  | 220                                | 30                | 250                 | 410                 | 0,40 |
| 100    | 0,7  | 220                                | 30                | 250                 | 410                 | 0,45 |
| 125    | 0,7  | 220                                | 30                | 250                 | 410                 | 0,55 |
| 140    | 0,7  | 220                                | 60                | 280                 | 410                 | 0,60 |
| 150    | 0,7  | 220                                | 30                | 250                 | 410                 | 0,65 |
| 160    | 0,7  | 220                                | 30                | 250                 | 410                 | 0,70 |
| 180    | 0,7  | 220                                | 30                | 250                 | 410                 | 0,80 |
| 200    | 0,7  | 350                                | 30                | 380                 | 670                 | 1,35 |
| 224    | 0,7  | 350                                | 30                | 380                 | 670                 | 1,50 |
| 250    | 0,7  | 350                                | 30                | 380                 | 670                 | 1,70 |
| 300    | 0,7  | 350                                | 60                | 410                 | 670                 | 2,05 |
| 315    | 0,7  | 350                                | 30                | 380                 | 670                 | 2,15 |
| 350    | 0,7  | 350                                | 60                | 410                 | 670                 | 2,40 |
| 400    | 0,9  | 350                                | 60                | 410                 | 670                 | 3,30 |
| 450    | 0,9  | 350                                | 60                | 410                 | 670                 | 3,70 |
| 500    | 0,9  | 350                                | 60                | 410                 | 670                 | 4,10 |

Seal the joint after assembly by using either:

- Mastic or tape
- O-ring ORINGTR + clip SB or SB-2



### Ordering example





# Telescopic duct

# TLTR2

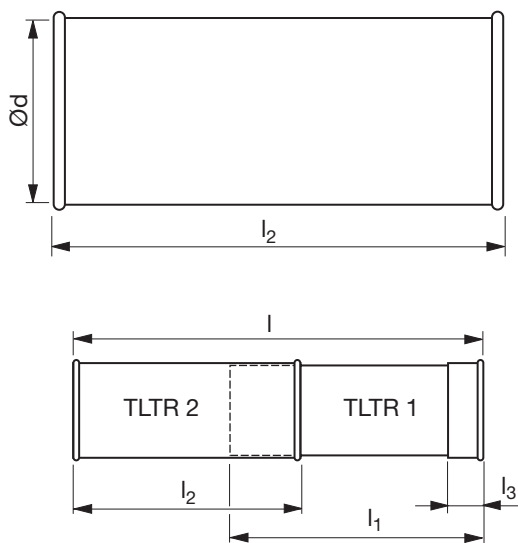


### Description

Used together with telescopic duct TLTR 1 where it is necessary to adjust duct length when the standard lengths are not sufficient.

Can also be used as an ordinary duct.

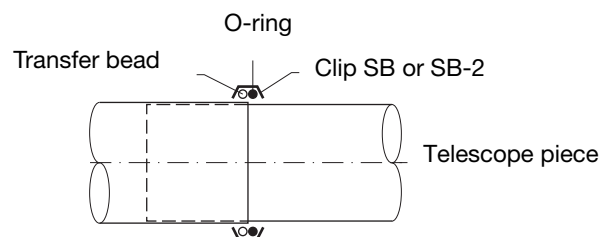
### Dimensions



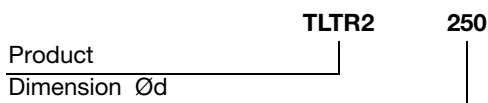
| $\varnothing d$<br>nom | t<br>mm | $l_1, l_2$<br>mm | $l_3$<br>mm | $l_{min}$<br>mm | $l_{max}$<br>mm | m<br>kg |
|------------------------|---------|------------------|-------------|-----------------|-----------------|---------|
| 80                     | 0,7     | 220              | 30          | 250             | 410             | 0,40    |
| 100                    | 0,7     | 220              | 30          | 250             | 410             | 0,45    |
| 125                    | 0,7     | 220              | 30          | 250             | 410             | 0,55    |
| 140                    | 0,7     | 220              | 60          | 280             | 410             | 0,60    |
| 150                    | 0,7     | 220              | 30          | 250             | 410             | 0,65    |
| 160                    | 0,7     | 220              | 30          | 250             | 410             | 0,70    |
| 180                    | 0,7     | 220              | 30          | 250             | 410             | 0,80    |
| 200                    | 0,7     | 350              | 30          | 380             | 670             | 1,35    |
| 224                    | 0,7     | 350              | 30          | 380             | 670             | 1,50    |
| 250                    | 0,7     | 350              | 30          | 380             | 670             | 1,70    |
| 300                    | 0,7     | 350              | 60          | 410             | 670             | 2,05    |
| 315                    | 0,7     | 350              | 30          | 380             | 670             | 2,15    |
| 350                    | 0,7     | 350              | 60          | 410             | 670             | 2,40    |
| 400                    | 0,9     | 350              | 60          | 410             | 670             | 3,30    |
| 450                    | 0,9     | 350              | 60          | 410             | 670             | 3,70    |
| 500                    | 0,9     | 350              | 60          | 410             | 670             | 4,10    |

Seal the joint after assembly by using either:

- Mastic or tape
- O-ring ORINGTR + clip SB or SB-2



### Ordering example





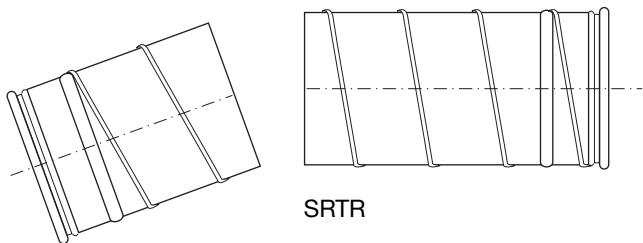


# Instruction for shortening for length adaptation of Transfer ducts

1

## Spiral swaged duct SRTR

### Adaption with fixed length



SRTR

Shorten the duct to the desired length. Also consider the installation length of the slide-on stub.

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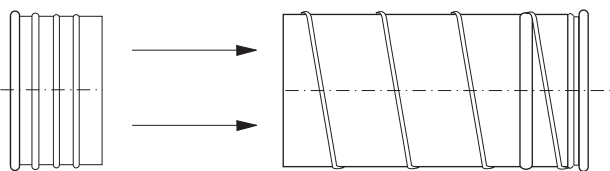
14

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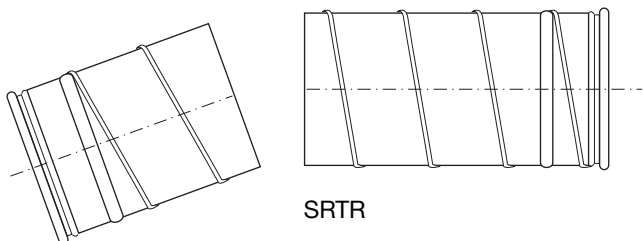


TSRTTR

SRTR

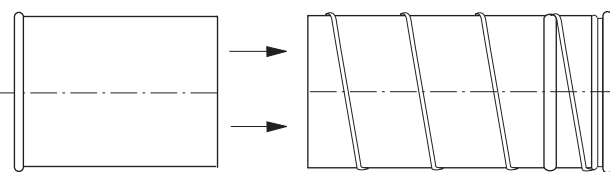
Install slide-on stub TSRTTR (please refer to page 480).

### Adaption with flexible length



SRTR

Shorten the duct to the desired length. Also consider the installation length of the slide-on stub.



TLTR 1/TLSR

SRTR

### Install telescopic duct

For Ø80–200 use TLTR-1 (page 484)

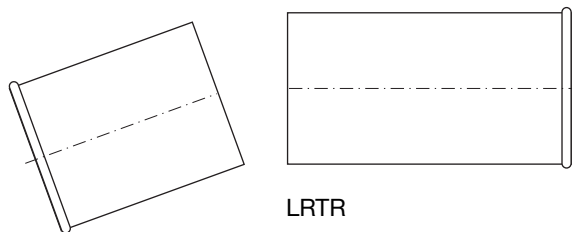
For Ø224–500 use TLSR (page 484)

### Remember to

Turn the duct so that the joint does not point towards the direction of the air flow.

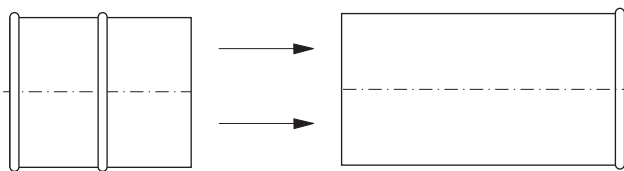
## Lengthways swaged duct LRTR

### Adaption with fixed length



LRTR

Shorten the duct to the desired length. Also consider the installation length of the slide-on stub.

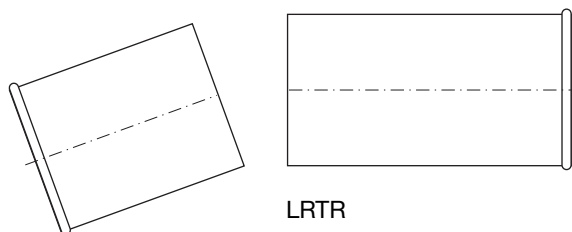


PTR

LRTR

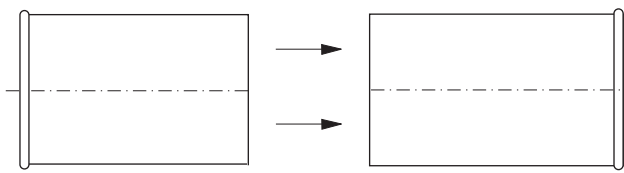
Install slide-on stub PTR (please refer to page 483).

### Adaption with flexible length



LRTR

Shorten the duct to the desired length. Also consider the installation length of the slide-on stub.



TLTR 1

LRTR

### Install telescopic duct

Use TLTR-1 (page 484)

### Remember to

Turn the duct so that the joint does not point towards the direction of the air flow.



# Bend

# BTR 90°

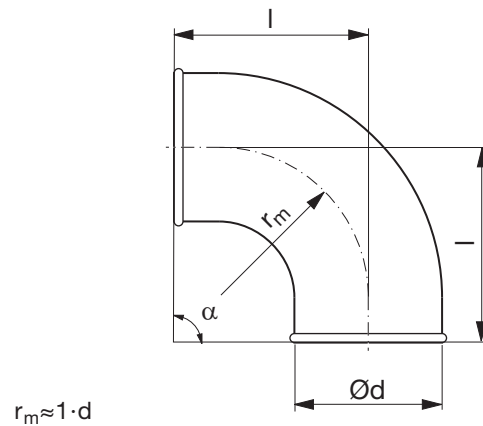


## Description

Pressed and seam welded bend.

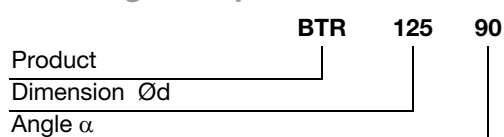
Some dimensions are made with a swaged-on beaded end.

## Dimensions



| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l<br>mm | m<br>kg |
|-----------|---------|----------------------|---------|---------|
| 80        | 0,5     | 100                  | 135     | 0,31    |
| 100       | 0,5     | 100                  | 130     | 0,30    |
| 125       | 0,5     | 125                  | 155     | 0,50    |
| 140       | 0,7     | 135                  | 165     | 0,70    |
| 150       | 0,7     | 150                  | 180     | 0,80    |
| 160       | 0,6     | 160                  | 190     | 0,77    |
| 180       | 0,7     | 180                  | 205     | 1,00    |
| 200       | 0,7     | 200                  | 252     | 1,20    |
| 224       | 0,7     | 225                  | 277     | 1,37    |
| 250       | 0,7     | 250                  | 302     | 1,71    |

## Ordering example





# Bend

# BTR 60°

- 1
- 2
- 3
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- 10
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- 17
- 18

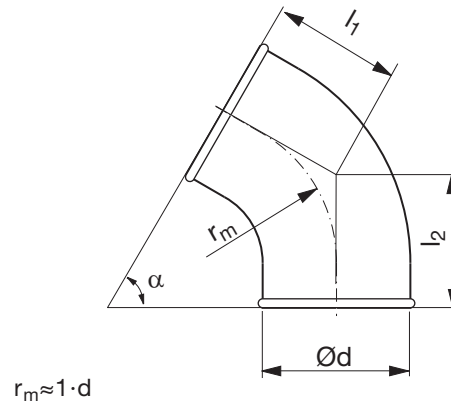


## Description

Pressed and seam welded bend.

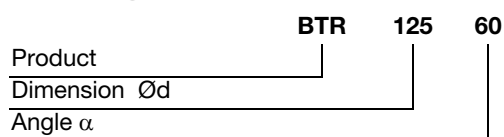
Some dimensions are made with a swaged-on beaded end.

## Dimensions



| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l <sub>1</sub><br>mm | l <sub>2</sub><br>mm | m<br>kg |
|-----------|---------|----------------------|----------------------|----------------------|---------|
| 80        | 0,5     | 100                  | 88                   | 114                  | 0,20    |
| 100       | 0,5     | 100                  | 88                   | 88                   | 0,20    |
| 125       | 0,6     | 125                  | 102                  | 102                  | 0,25    |
| 140 *     | 0,7     | 135                  | 108                  | 134                  | 0,50    |
| 150 *     | 0,7     | 150                  | 117                  | 143                  | 0,51    |
| 160 *     | 0,6     | 160                  | 122                  | 148                  | 0,51    |
| 180 *     | 0,7     | 180                  | 129                  | 156                  | 0,80    |
| 200       | 0,7     | 200                  | 167                  | 167                  | 0,86    |
| 224       | 0,7     | 225                  | 182                  | 182                  | 1,03    |
| 250       | 0,7     | 250                  | 196                  | 196                  | 1,20    |

## Ordering example





# Bend

# BTR 45°

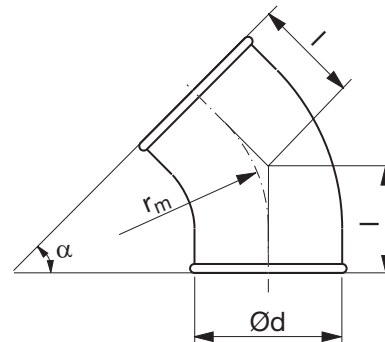


## Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

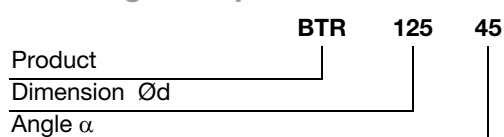
## Dimensions



$$r_m \approx 1 \cdot d$$

| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l<br>mm | m<br>kg |
|-----------|---------|----------------------|---------|---------|
| 80        | 0,5     | 100                  | 71      | 0,20    |
| 100       | 0,5     | 100                  | 71      | 0,30    |
| 125       | 0,5     | 125                  | 82      | 0,30    |
| 140       | 0,7     | 135                  | 86      | 0,40    |
| 150       | 0,7     | 150                  | 92      | 0,43    |
| 160       | 0,6     | 160                  | 96      | 0,43    |
| 180       | 0,7     | 180                  | 110     | 0,68    |
| 200       | 0,6     | 200                  | 135     | 0,80    |
| 224       | 0,7     | 225                  | 145     | 0,86    |
| 250       | 0,7     | 250                  | 156     | 0,86    |

## Ordering example



- 1
- 2
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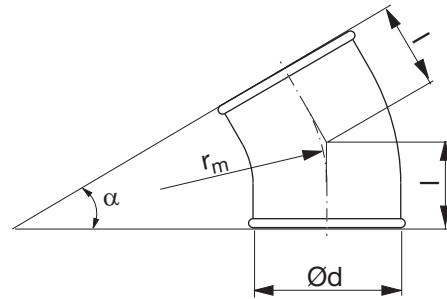


# Bend

# BTR 30°



## Dimensions



$$r_m \approx 1 \cdot d$$

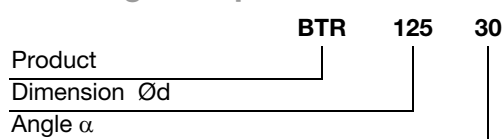
## Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l <sub>1</sub><br>mm | l <sub>2</sub><br>mm | m<br>kg |
|-----------|---------|----------------------|----------------------|----------------------|---------|
| 80        | 0,5     | 100                  | 57                   | 57                   | 0,20    |
| 100       | 0,5     | 100                  | 57                   | 57                   | 0,20    |
| 125       | 0,6     | 125                  | 63                   | 63                   | 0,25    |
| 140       | 0,7     | 140                  | 68                   | 68                   | 0,40    |
| 150       | 0,7     | 150                  | 70                   | 70                   | 0,34    |
| 160       | 0,7     | 160                  | 73                   | 73                   | 0,50    |
| 180       | 0,7     | 180                  | 73                   | 73                   | 0,60    |
| 200       | 0,7     | 200                  | 106                  | 106                  | 0,80    |
| 224       | 0,7     | 225                  | 112                  | 112                  | 0,77    |
| 250       | 0,7     | 250                  | 119                  | 119                  | 1,10    |

## Ordering example





# Bend

# BTR 15°

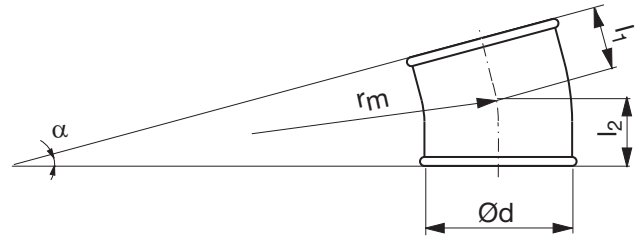


## Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

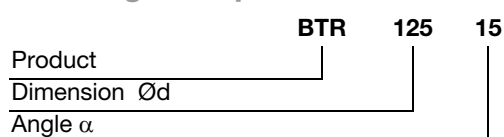
## Dimensions



$$r_m \approx 1 \cdot d$$

| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l <sub>1</sub><br>mm | l <sub>2</sub><br>mm | m<br>kg |
|-----------|---------|----------------------|----------------------|----------------------|---------|
| 80        | 0,5     | 100                  | 43                   | 69                   | 0,10    |
| 100       | 0,5     | 100                  | 43                   | 43                   | 0,20    |
| 125       | 0,5     | 125                  | 46                   | 46                   | 0,14    |
| 140       | 0,7     | 140                  | 74                   | 74                   | 0,30    |
| 150       | 0,6     | 150                  | 76                   | 76                   | 0,26    |
| 160       | 0,5     | 160                  | 51                   | 51                   | 0,14    |
| 180       | 0,7     | 180                  | 76                   | 76                   | 0,40    |
| 200       | 0,7     | 200                  | 78                   | 78                   | 0,60    |
| 224       | 0,7     | 225                  | 81                   | 81                   | 0,60    |

## Ordering example



- 1
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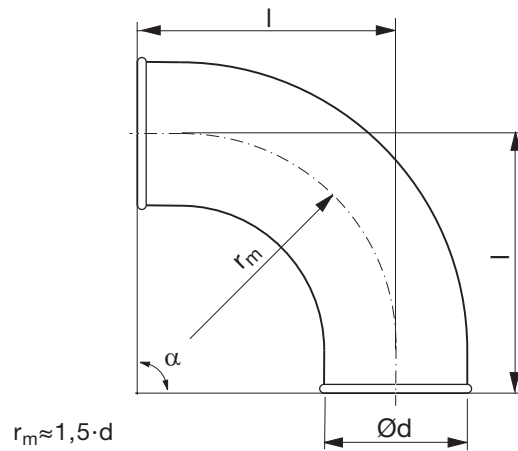


# Bend

# BSTR 90°



## Dimensions



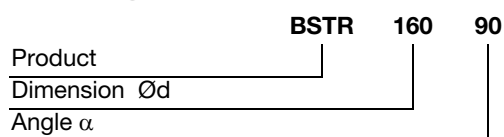
## Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l<br>mm | m<br>kg |
|-----------|---------|----------------------|---------|---------|
| 100       | 0,6     | 150                  | 180     | 0,50    |
| 125       | 0,7     | 190                  | 220     | 0,80    |
| 150       | 0,7     | 225                  | 255     | 1,10    |
| 160       | 0,7     | 240                  | 270     | 1,20    |
| 180       | 0,7     | 270                  | 295     | 1,60    |
| 200       | 0,6     | 300                  | 352     | 1,63    |

## Ordering example





# Bend

# BSTR 60°

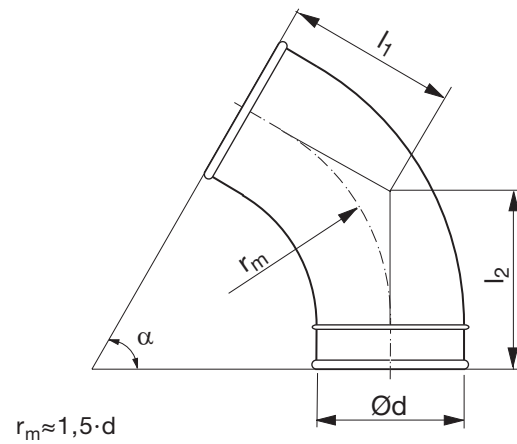


## Description

Pressed and seam welded bend.

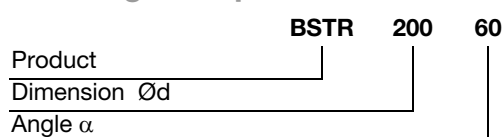
Some dimensions are made with a swaged-on beaded end.

## Dimensions



| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l <sub>1</sub><br>mm | l <sub>2</sub><br>mm | m<br>kg |
|-----------|---------|----------------------|----------------------|----------------------|---------|
| 100       | 0,6     | 150                  | 117                  | 143                  | 0,40    |
| 125       | 0,7     | 190                  | 140                  | 166                  | 0,60    |
| 150       | 0,7     | 225                  | 160                  | 186                  | 0,70    |
| 160       | 0,7     | 240                  | 169                  | 195                  | 0,80    |
| 180       | 0,7     | 270                  | 181                  | 208                  | 1,20    |
| 200       | 0,7     | 300                  | 225                  | 225                  | 1,13    |

## Ordering example



- 1
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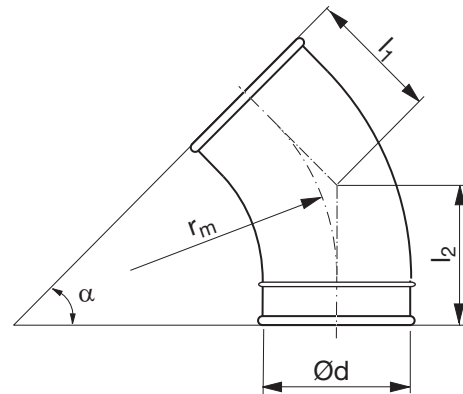


# Bend

# BSTR 45°



## Dimensions



$$r_m \approx 1,5 \cdot d$$

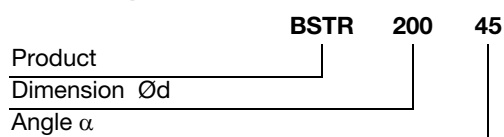
## Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l <sub>1</sub><br>mm | l <sub>2</sub><br>mm | m<br>kg |
|-----------|---------|----------------------|----------------------|----------------------|---------|
| 100       | 0,6     | 150                  | 92                   | 118                  | 0,30    |
| 125       | 0,7     | 190                  | 109                  | 135                  | 0,40    |
| 150       | 0,7     | 225                  | 123                  | 149                  | 0,50    |
| 160       | 0,7     | 240                  | 129                  | 155                  | 0,60    |
| 180       | 0,7     | 270                  | 137                  | 164                  | 0,90    |
| 200       | 0,6     | 300                  | 176                  | 176                  | 0,88    |

## Ordering example





# Bend

# BSTR 30°

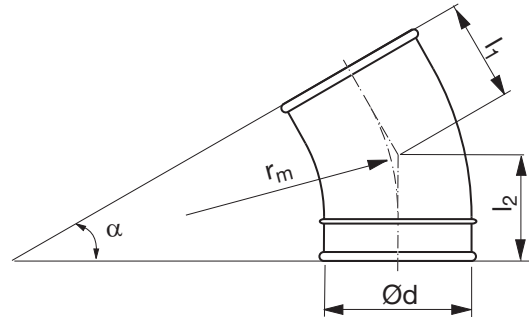


## Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

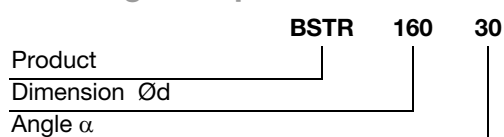
## Dimensions



$$r_m \approx 1,5 \cdot d$$

| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l <sub>1</sub><br>mm | l <sub>2</sub><br>mm | m<br>kg |
|-----------|---------|----------------------|----------------------|----------------------|---------|
| 100       | 0,6     | 150                  | 70                   | 96                   | 0,30    |
| 125       | 0,7     | 190                  | 81                   | 107                  | 0,30    |
| 150       | 0,7     | 225                  | 90                   | 116                  | 0,50    |
| 160       | 0,7     | 240                  | 94                   | 120                  | 0,50    |
| 180       | 0,7     | 270                  | 97                   | 124                  | 0,70    |
| 200       | 0,7     | 300                  | 132                  | 132                  | 0,79    |

## Ordering example



- 1
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# Bend

# BSTR 15°

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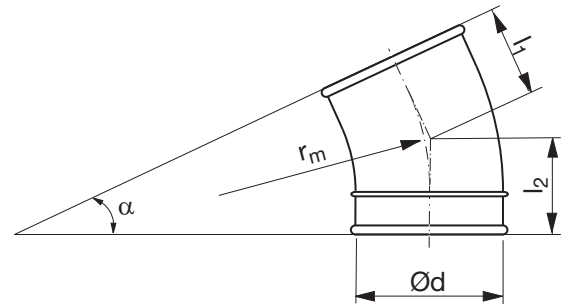


## Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

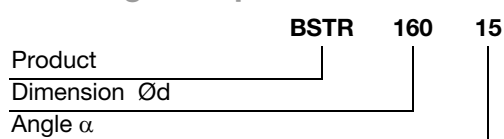
## Dimensions



$$r_m \approx 1,5 \cdot d$$

| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l <sub>1</sub><br>mm | l <sub>2</sub><br>mm | m<br>kg |
|-----------|---------|----------------------|----------------------|----------------------|---------|
| 100       | 0,6     | 150                  | 50                   | 76                   | 0,20    |
| 125       | 0,7     | 190                  | 55                   | 81                   | 0,40    |
| 150       | 0,7     | 225                  | 60                   | 86                   | 0,40    |
| 160       | 0,7     | 240                  | 62                   | 88                   | 0,40    |
| 180       | 0,7     | 270                  | 61                   | 88                   | 0,50    |
| 200       | 0,7     | 300                  | 91                   | 91                   | 0,62    |

## Ordering example





# Bend

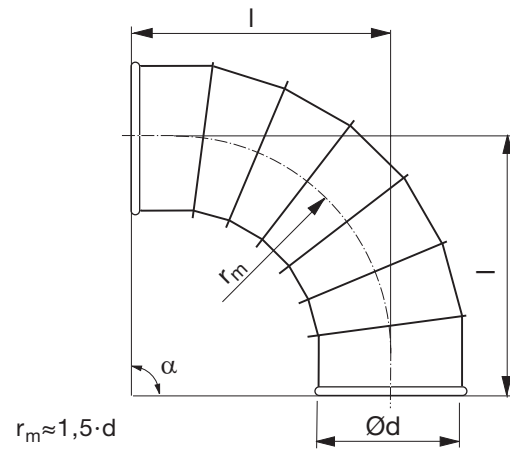
# BSFTR 90°



## Description

Segmented and swaged bend.

## Dimensions



| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l<br>mm | m<br>kg |
|-----------|---------|----------------------|---------|---------|
| 200       | 0,7     | 300                  | 387     | 3,40    |
| 224       | 0,7     | 336                  | 423     | 4,20    |
| 250       | 0,7     | 375                  | 462     | 4,90    |
| 300       | 0,7     | 450                  | 531     | 6,40    |
| 315       | 0,7     | 472                  | 553     | 7,10    |
| 350       | 0,7     | 525                  | 606     | 9,00    |
| 400       | 0,9     | 600                  | 681     | 13,1    |
| 450       | 0,9     | 675                  | 756     | 16,2    |
| 500       | 0,9     | 750                  | 831     | 19,5    |
| 560 *     | 0,9     | 840                  | 875     | 29,3    |
| 600 *     | 0,9     | 900                  | 935     | 32,7    |
| 630 *     | 0,9     | 945                  | 980     | 37,3    |
| 650 *     | 0,9     | 975                  | 1010    | 41,4    |
| 710 *     | 0,9     | 1065                 | 1100    | 47,0    |
| 750 *     | 0,9     | 1125                 | 1160    | 51,1    |
| 800 *     | 0,9     | 1200                 | 1235    | 54,5    |
| 900 *     | 0,9     | 1350                 | 1385    | 74,8    |

\* Supplied with flange FL

## Ordering example

|              |       |     |    |
|--------------|-------|-----|----|
| Product      | BSFTR | 250 | 90 |
| Dimension Ød |       |     |    |
| Angle α      |       |     |    |

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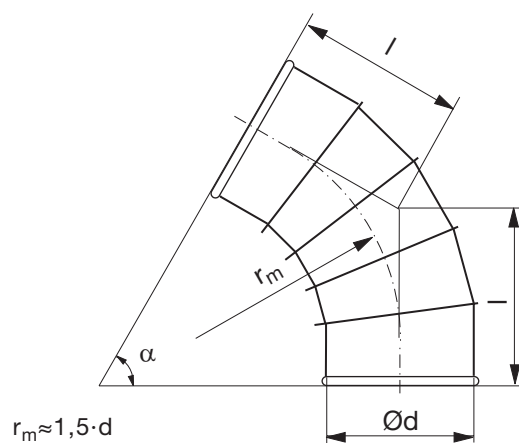


# Bend

# BSFTR 60°



## Dimensions



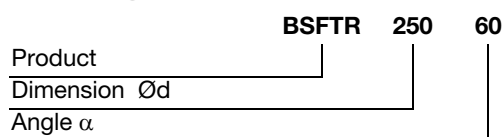
## Description

Segmented and swaged bend.

| Ød<br>nom | t<br>mm | rm<br>mm | l<br>mm | m<br>kg |
|-----------|---------|----------|---------|---------|
| 200       | 0,7     | 300      | 260     | 2,30    |
| 224       | 0,7     | 336      | 281     | 2,70    |
| 250       | 0,7     | 375      | 304     | 3,10    |
| 300       | 0,7     | 450      | 341     | 4,20    |
| 315       | 0,7     | 472      | 354     | 4,60    |
| 350       | 0,7     | 525      | 384     | 5,60    |
| 400       | 0,9     | 600      | 427     | 8,10    |
| 450       | 0,9     | 675      | 471     | 10,1    |
| 500       | 0,9     | 750      | 514     | 12,1    |
| 560 *     | 0,9     | 840      | 520     | 20,8    |
| 600 *     | 0,9     | 900      | 555     | 23,5    |
| 630 *     | 0,9     | 945      | 581     | 24,6    |
| 650 *     | 0,9     | 975      | 598     | 27,2    |
| 710 *     | 0,9     | 1065     | 650     | 36,4    |
| 750 *     | 0,9     | 1125     | 685     | 40,4    |
| 800 *     | 0,9     | 1200     | 728     | 42,3    |
| 900 *     | 0,9     | 1350     | 814     | 45,1    |

\* Supplied with flange FL

## Ordering example





# Bend

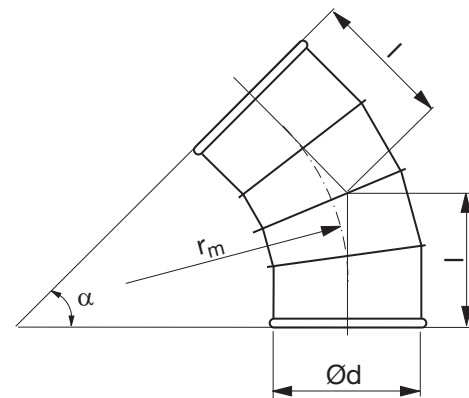
# BSFTR 45°



## Description

Segmented and swaged bend.

## Dimensions

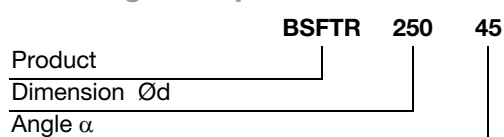


$$r_m \approx 1,5 \cdot d$$

| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l<br>mm | m<br>kg |
|-----------|---------|----------------------|---------|---------|
| 200       | 0,7     | 300                  | 211     | 1,90    |
| 224       | 0,7     | 336                  | 226     | 2,20    |
| 250       | 0,7     | 375                  | 242     | 2,50    |
| 300       | 0,7     | 450                  | 267     | 3,40    |
| 315       | 0,7     | 472                  | 277     | 3,70    |
| 350       | 0,7     | 525                  | 298     | 4,50    |
| 400       | 0,9     | 600                  | 330     | 6,50    |
| 450       | 0,9     | 675                  | 361     | 7,90    |
| 500       | 0,9     | 750                  | 392     | 9,40    |
| 560 *     | 0,9     | 840                  | 383     | 16,7    |
| 600 *     | 0,9     | 900                  | 408     | 18,5    |
| 630 *     | 0,9     | 945                  | 426     | 20,1    |
| 650 *     | 0,9     | 975                  | 439     | 22,3    |
| 710 *     | 0,9     | 1065                 | 476     | 26,4    |
| 750 *     | 0,9     | 1125                 | 501     | 28,6    |
| 800 *     | 0,9     | 1200                 | 532     | 31,8    |
| 900 *     | 0,9     | 1350                 | 594     | 34,9    |

\* Supplied with flange FL

## Ordering example





# Bend

# BSFTR 30°

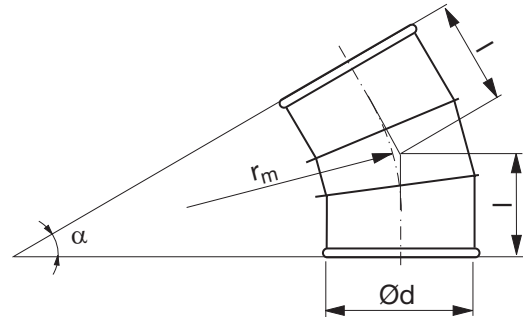
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## Description

Segmented and swaged bend.

## Dimensions

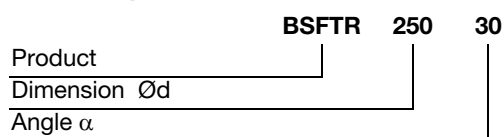


$$r_m \approx 1,5 \cdot d$$

| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l<br>mm | m<br>kg |
|-----------|---------|----------------------|---------|---------|
| 200       | 0,7     | 300                  | 167     | 1,50    |
| 224       | 0,7     | 336                  | 177     | 1,70    |
| 250       | 0,7     | 375                  | 187     | 1,90    |
| 300       | 0,7     | 450                  | 202     | 2,50    |
| 315       | 0,7     | 472                  | 208     | 2,80    |
| 350       | 0,7     | 525                  | 222     | 3,40    |
| 400       | 0,9     | 600                  | 242     | 4,90    |
| 450       | 0,9     | 675                  | 262     | 5,80    |
| 500       | 0,9     | 750                  | 282     | 6,80    |
| 560 *     | 0,9     | 840                  | 260     | 12,7    |
| 600 *     | 0,9     | 900                  | 276     | 14,5    |
| 630 *     | 0,9     | 945                  | 288     | 15,7    |
| 650 *     | 0,9     | 975                  | 296     | 18,4    |
| 710 *     | 0,9     | 1065                 | 320     | 20,2    |
| 750 *     | 0,9     | 1125                 | 336     | 21,5    |
| 800 *     | 0,9     | 1200                 | 357     | 24,9    |
| 900 *     | 0,9     | 1350                 | 397     | 29,6    |

\* Supplied with flange FL

## Ordering example





# Bend

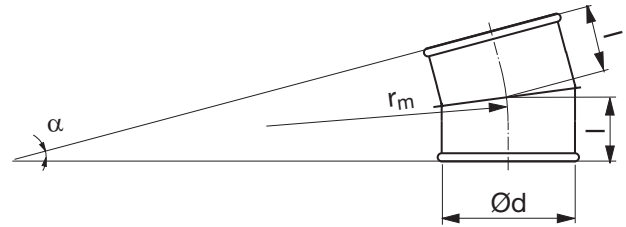
# BSFTR 15°



## Description

Segmented and swaged bend.

## Dimensions



$$r_m \approx 1,5 \cdot d$$

| Ød<br>nom | t<br>mm | r <sub>m</sub><br>mm | l<br>mm | m<br>kg |
|-----------|---------|----------------------|---------|---------|
| 200       | 0,7     | 300                  | 126     | 1,10    |
| 224       | 0,7     | 336                  | 131     | 1,30    |
| 250       | 0,7     | 375                  | 136     | 1,50    |
| 300       | 0,7     | 450                  | 140     | 2,00    |
| 315       | 0,7     | 472                  | 143     | 2,40    |
| 350       | 0,7     | 525                  | 150     | 2,90    |
| 400       | 0,9     | 600                  | 160     | 4,50    |
| 450       | 0,9     | 675                  | 170     | 5,40    |
| 500       | 0,9     | 750                  | 180     | 6,20    |
| 560 *     | 0,9     | 840                  | 146     | 11,8    |
| 600 *     | 0,9     | 900                  | 153     | 13,4    |
| 630 *     | 0,9     | 945                  | 159     | 15,6    |
| 650 *     | 0,9     | 975                  | 163     | 16,4    |
| 710 *     | 0,9     | 1065                 | 175     | 18,3    |
| 750 *     | 0,9     | 1125                 | 183     | 19,6    |
| 800 *     | 0,9     | 1200                 | 193     | 22,4    |
| 900 *     | 0,9     | 1350                 | 213     | 26,3    |

\* Supplied with flange FL

## Ordering example

|              |       |     |    |
|--------------|-------|-----|----|
| Product      | BSFTR | 250 | 15 |
| Dimension Ød |       |     |    |
| Angle α      |       |     |    |

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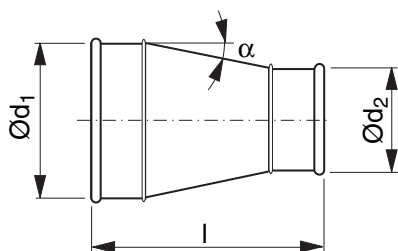
# Reducer

# RCLTR



## Description

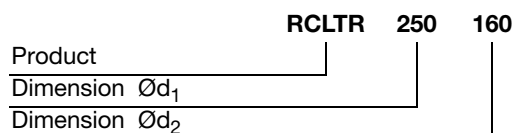
Long, concentric reducer with about 18° angle.



## Dimensions

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | t<br>mm | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|---------|
| 100                    | 80                     | 0,7     | 162     | 0,30    |
| 125                    | 80                     | 0,7     | 196     | 0,40    |
| 125                    | 100                    | 0,7     | 168     | 0,40    |
| 140                    | 80                     | 0,7     | 216     | 0,60    |
| 140                    | 100                    | 0,7     | 189     | 0,40    |
| 140                    | 125                    | 0,7     | 155     | 0,40    |
| 150                    | 80                     | 0,7     | 230     | 0,60    |
| 150                    | 100                    | 0,7     | 203     | 0,60    |
| 150                    | 125                    | 0,7     | 168     | 0,40    |
| 150                    | 140                    | 0,7     | 148     | 0,40    |
| 160                    | 80                     | 0,7     | 244     | 0,70    |
| 160                    | 100                    | 0,7     | 216     | 0,60    |
| 160                    | 125                    | 0,7     | 182     | 0,50    |
| 160                    | 140                    | 0,7     | 161     | 0,60    |
| 160                    | 150                    | 0,7     | 148     | 0,40    |
| 180                    | 100                    | 0,7     | 239     | 0,60    |
| 180                    | 125                    | 0,7     | 205     | 0,60    |
| 180                    | 140                    | 0,7     | 184     | 0,60    |
| 180                    | 150                    | 0,7     | 170     | 0,60    |
| 180                    | 160                    | 0,7     | 157     | 0,50    |
| 200                    | 125                    | 0,7     | 232     | 0,80    |
| 200                    | 140                    | 0,7     | 211     | 0,70    |
| 200                    | 150                    | 0,7     | 198     | 0,70    |
| 200                    | 160                    | 0,7     | 184     | 0,60    |
| 200                    | 180                    | 0,7     | 152     | 0,50    |
| 224                    | 140                    | 0,7     | 244     | 1,00    |
| 224                    | 150                    | 0,7     | 231     | 1,00    |
| 224                    | 160                    | 0,7     | 217     | 0,80    |
| 224                    | 180                    | 0,7     | 184     | 0,80    |
| 224                    | 200                    | 0,7     | 157     | 0,70    |
| 250                    | 140                    | 0,7     | 280     | 1,30    |
| 250                    | 150                    | 0,7     | 266     | 1,30    |
| 250                    | 160                    | 0,7     | 253     | 1,10    |
| 250                    | 180                    | 0,7     | 220     | 1,00    |
| 250                    | 200                    | 0,7     | 193     | 1,00    |
| 250                    | 224                    | 0,7     | 160     | 1,00    |
| 300                    | 150                    | 0,7     | 332     | 1,70    |
| 300                    | 160                    | 0,7     | 318     | 1,70    |
| 300                    | 180                    | 0,7     | 286     | 1,70    |
| 300                    | 200                    | 0,7     | 258     | 1,50    |
| 300                    | 250                    | 0,7     | 190     | 1,40    |
| 315                    | 160                    | 0,7     | 339     | 1,60    |
| 315                    | 180                    | 0,7     | 307     | 1,60    |
| 315                    | 200                    | 0,7     | 279     | 1,50    |
| 315                    | 224                    | 0,7     | 246     | 1,40    |

## Ordering example





## Reducer

## RCLTR

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | t<br>mm | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|---------|
| 315                    | 250                    | 0,7     | 210     | 1,40    |
| 315                    | 300                    | 0,7     | 139     | 1,30    |
| 350                    | 180                    | 0,7     | 361     | 2,00    |
| 350                    | 200                    | 0,7     | 334     | 2,00    |
| 350                    | 224                    | 0,7     | 301     | 2,10    |
| 350                    | 250                    | 0,7     | 265     | 1,90    |
| 350                    | 300                    | 0,7     | 194     | 1,70    |
| 350                    | 315                    | 0,7     | 173     | 1,40    |
| 400                    | 180                    | 0,7     | 428     | 2,80    |
| 400                    | 200                    | 0,7     | 401     | 2,80    |
| 400                    | 224                    | 0,7     | 368     | 3,00    |
| 400                    | 250                    | 0,7     | 332     | 2,60    |
| 400                    | 300                    | 0,7     | 260     | 2,70    |
| 400                    | 315                    | 0,7     | 240     | 2,30    |
| 400                    | 350                    | 0,7     | 185     | 2,00    |
| 450                    | 200                    | 0,7     | 469     | 3,50    |
| 450                    | 224                    | 0,7     | 437     | 3,80    |
| 450                    | 250                    | 0,7     | 401     | 3,30    |
| 450                    | 300                    | 0,7     | 329     | 3,40    |
| 450                    | 315                    | 0,7     | 309     | 2,90    |
| 450                    | 350                    | 0,7     | 254     | 2,60    |
| 450                    | 400                    | 0,9     | 197     | 2,80    |
| 500                    | 224                    | 0,7     | 505     | 4,30    |
| 500                    | 250                    | 0,7     | 469     | 4,00    |
| 500                    | 300                    | 0,7     | 398     | 4,00    |
| 500                    | 315                    | 0,7     | 377     | 3,80    |
| 500                    | 350                    | 0,7     | 322     | 3,40    |
| 500                    | 400                    | 0,9     | 265     | 3,60    |
| 500                    | 450                    | 0,9     | 197     | 3,20    |
| 560 *                  | 250                    | 0,7     | 578     | 8,20    |
| 560 *                  | 300                    | 0,9     | 506     | 8,00    |
| 560 *                  | 315                    | 0,7     | 485     | 7,80    |
| 560 *                  | 350                    | 0,7     | 431     | 7,60    |
| 560 *                  | 400                    | 0,9     | 374     | 7,40    |
| 560 *                  | 450                    | 0,9     | 305     | 7,00    |
| 560 *                  | 500                    | 0,9     | 236     | 6,50    |
| 600 *                  | 300                    | 0,9     | 561     | 8,60    |
| 600 *                  | 315                    | 0,7     | 541     | 8,60    |
| 600 *                  | 350                    | 0,7     | 486     | 8,20    |
| 600 *                  | 400                    | 0,9     | 429     | 8,20    |
| 600 *                  | 450                    | 0,9     | 360     | 7,70    |
| 600 *                  | 500                    | 0,9     | 291     | 7,20    |
| 600 *                  | 560                    | 0,9     | 235     | 6,40    |
| 630 *                  | 315                    | 0,7     | 582     | 8,60    |
| 630 *                  | 350                    | 0,7     | 527     | 8,00    |
| 630 *                  | 400                    | 0,9     | 470     | 7,90    |
| 630 *                  | 450                    | 0,9     | 401     | 7,40    |
| 630 *                  | 500                    | 0,9     | 333     | 7,00    |

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | t<br>mm | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|---------|
| 630 *                  | 560 *                  | 0,9     | 276     | 9,30    |
| 630 *                  | 600                    | 0,9     | 221     | 8,80    |
| 650 *                  | 350                    | 0,9     | 547     | 8,40    |
| 650 *                  | 400                    | 0,9     | 490     | 8,30    |
| 650 *                  | 450                    | 0,9     | 421     | 7,80    |
| 650 *                  | 500                    | 0,9     | 353     | 7,40    |
| 650 *                  | 560 *                  | 0,9     | 296     | 9,70    |
| 650 *                  | 600 *                  | 0,9     | 241     | 9,20    |
| 650 *                  | 630 *                  | 0,9     | 221     | 9,00    |
| 710 *                  | 400                    | 0,9     | 605     | 9,60    |
| 710 *                  | 450                    | 0,9     | 536     | 9,20    |
| 710 *                  | 500                    | 0,9     | 467     | 8,70    |
| 710 *                  | 560 *                  | 0,9     | 411     | 11,1    |
| 710 *                  | 600 *                  | 0,9     | 356     | 10,6    |
| 710 *                  | 630 *                  | 0,9     | 315     | 10,2    |
| 750 *                  | 450                    | 0,9     | 566     | 9,60    |
| 750 *                  | 500                    | 0,9     | 497     | 9,10    |
| 750 *                  | 560 *                  | 0,9     | 441     | 11,5    |
| 750 *                  | 600 *                  | 0,9     | 386     | 11,0    |
| 750 *                  | 630 *                  | 0,9     | 345     | 10,6    |
| 750 *                  | 650 *                  | 0,9     | 325     | 10,4    |
| 750 *                  | 710 *                  | 0,9     | 290     | 10,0    |
| 800 *                  | 500                    | 0,9     | 591     | 11,0    |
| 800 *                  | 560 *                  | 0,9     | 535     | 13,4    |
| 800 *                  | 600 *                  | 0,9     | 480     | 12,9    |
| 800 *                  | 630 *                  | 0,9     | 439     | 12,5    |
| 800 *                  | 650 *                  | 0,9     | 419     | 12,1    |
| 800 *                  | 710 *                  | 0,9     | 354     | 11,6    |
| 800 *                  | 750 *                  | 0,9     | 325     | 11,2    |
| 900 *                  | 560 *                  | 0,9     | 697     | 17,7    |
| 900 *                  | 600 *                  | 0,9     | 642     | 17,0    |
| 900 *                  | 630 *                  | 0,9     | 601     | 16,5    |
| 900 *                  | 650 *                  | 0,9     | 570     | 16,1    |
| 900 *                  | 710 *                  | 0,9     | 516     | 15,3    |
| 900 *                  | 750 *                  | 0,9     | 450     | 14,9    |
| 900 *                  | 800 *                  | 0,9     | 392     | 13,8    |

\* Supplied with flange FL

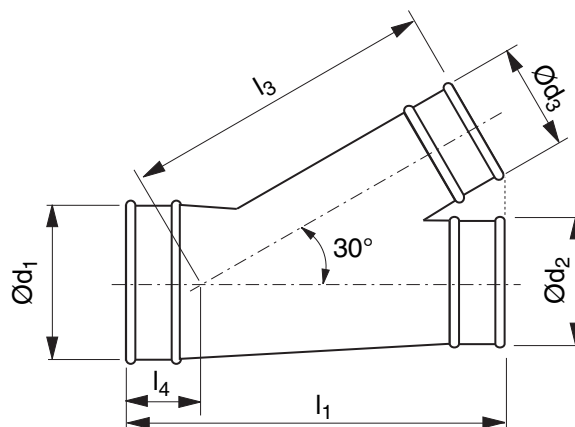


# T-piece

# TVTR 30°



## Dimensions



## Description

T-piece.

**NB**

To save space, the adjacent table only contains a limited selection from our range – the T-pieces where all dimensions  $\text{Ø}d_1$ ,  $\text{Ø}d_2$  and  $\text{Ø}d_3$  are equal in size. Other dimensions are available to special order.

In all combinations, the installation length  $l_1$  is only governed by the branch diameter  $\text{Ø}d_3$ . For example, all T-pieces with  $\text{Ø}d_3 = 200$  have installation length  $l_1 = 589$  mm.

**NB**

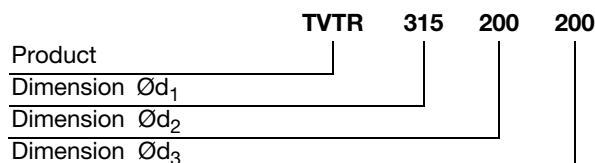
To save space, the adjacent table only contains a limited selection from our range the T-pieces where all dimensions  $d_1$ ,  $d_2$  and  $d_3$  are equal in size. Other dimensions are available to special order.

In all combinations, the installation length  $l_1$  is only governed by the branch diameter  $d_3$ . For example, all T-pieces with  $d_3 = 200$  have installation length  $l_1 = 589$  mm.

| $\text{Ø}d_1$<br>nom | $\text{Ø}d_2$<br>nom | $\text{Ø}d_3$<br>nom | t<br>mm | $l_1$<br>mm | $l_3$<br>mm | $l_4$<br>mm | m<br>kg |
|----------------------|----------------------|----------------------|---------|-------------|-------------|-------------|---------|
| 80                   | 80                   | 80                   | 0,7     | 358         | 263         | 109         | 0,90    |
| 100                  | 100                  | 100                  | 0,7     | 398         | 301         | 112         | 1,20    |
| 125                  | 125                  | 125                  | 0,7     | 448         | 347         | 116         | 1,60    |
| 140                  | 140                  | 140                  | 0,7     | 478         | 375         | 118         | 1,80    |
| 150                  | 150                  | 150                  | 0,7     | 498         | 394         | 119         | 2,00    |
| 160                  | 160                  | 160                  | 0,7     | 518         | 413         | 120         | 2,30    |
| 180                  | 180                  | 180                  | 0,7     | 549         | 445         | 119         | 2,80    |
| 200                  | 200                  | 200                  | 0,7     | 589         | 482         | 121         | 3,40    |
| 224                  | 224                  | 224                  | 0,7     | 637         | 527         | 124         | 4,20    |
| 250                  | 250                  | 250                  | 0,7     | 689         | 576         | 128         | 4,90    |
| 300                  | 300                  | 300                  | 0,7     | 777         | 662         | 129         | 7,00    |
| 315                  | 315                  | 315                  | 0,7     | 807         | 690         | 131         | 7,30    |
| 350                  | 350                  | 350                  | 0,7     | 960         | 755         | 177         | 9,00    |
| 400                  | 400                  | 400                  | 0,9     | 1060        | 848         | 184         | 14,0    |
| 450                  | 450                  | 450                  | 0,9     | 1160        | 842         | 190         | 16,9    |
| 500                  | 500                  | 500                  | 0,9     | 1260        | 1035        | 197         | 20,1    |
| 560 *                | 560 *                | 560 *                | 0,9     | 1520        | 1245        | 275         | 26,0    |
| 600 *                | 600 *                | 600 *                | 0,9     | 1600        | 1320        | 280         | 29,0    |
| 630 *                | 630 *                | 630 *                | 0,9     | 1660        | 1376        | 284         | 31,0    |
| 650 *                | 650 *                | 650 *                | 0,9     | 1700        | 1413        | 287         | 34,0    |
| 710 *                | 710 *                | 710 *                | 0,9     | 1820        | 1525        | 295         | 41,0    |
| 750 *                | 750 *                | 750 *                | 0,9     | 1900        | 1600        | 301         | 45,0    |
| 800 *                | 800 *                | 800 *                | 0,9     | 2000        | 1693        | 307         | 51,0    |
| 900 *                | 900 *                | 900 *                | 0,9     | 2200        | 1879        | 321         | 64,0    |

\* Supplied with flange FL

## Ordering example





# X-piece

# XVTR 30°



## Description

X-piece.

**NB**

To save space, the adjacent table only contains a limited selection from our range – the X-pieces where all dimensions  $\text{Ø}d_1$ ,  $\text{Ø}d_2$  and  $\text{Ø}d_3/\text{Ø}d_4$  are equal in size. Other dimensions are available to special order.

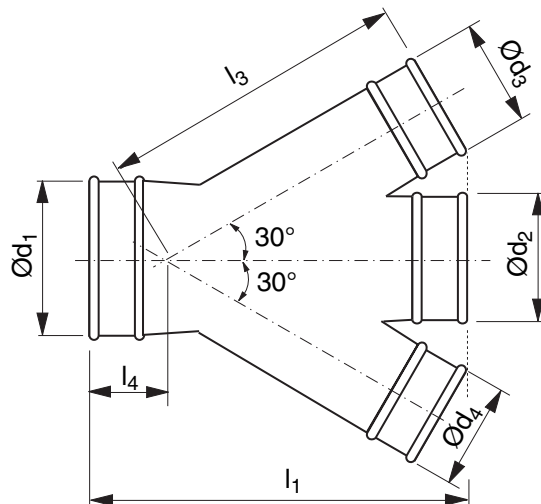
In all combinations, the installation length  $l_1$  is only governed by the larger branch diameter  $\text{Ø}d_3/\text{Ø}d_4$ . For example, all X-pieces with  $\text{Ø}d_3 = 160$  and  $\text{Ø}d_4 = 200$  have installation length  $l_1 = 589$  mm.

**NB**

To save space, the adjacent table only contains a limited selection from our range the X-pieces where all dimensions  $d_1$ ,  $d_2$  and  $d_3/d_4$  are equal in size. Other dimensions are available to special order.

In all combinations, the installation length  $l_1$  is only governed by the larger branch diameter  $d_3/d_4$ . For example, all X-pieces with  $d_3 = 160$  and  $d_4 = 200$  have installation length  $l_1 = 589$  mm.

## Dimensions



| $\text{Ø}d_1$<br>nom | $\text{Ø}d_2$<br>nom | $\text{Ø}d_3$<br>$\text{Ø}d_4$<br>nom | t<br>mm | $l_1$<br>mm | $l_3$<br>mm | $l_4$<br>mm | m<br>kg |
|----------------------|----------------------|---------------------------------------|---------|-------------|-------------|-------------|---------|
| 80                   | 80                   | 80                                    | 0,7     | 358         | 263         | 109         | 1,10    |
| 100                  | 100                  | 100                                   | 0,7     | 398         | 301         | 112         | 1,40    |
| 125                  | 125                  | 125                                   | 0,7     | 448         | 347         | 116         | 1,80    |
| 140                  | 140                  | 140                                   | 0,7     | 478         | 375         | 118         | 2,10    |
| 150                  | 150                  | 150                                   | 0,7     | 498         | 394         | 119         | 2,30    |
| 160                  | 160                  | 160                                   | 0,7     | 518         | 413         | 120         | 2,60    |
| 180                  | 180                  | 180                                   | 0,7     | 549         | 445         | 119         | 3,20    |
| 200                  | 200                  | 200                                   | 0,7     | 589         | 482         | 121         | 4,00    |
| 224                  | 224                  | 224                                   | 0,7     | 637         | 527         | 124         | 4,90    |
| 250                  | 250                  | 250                                   | 0,7     | 689         | 576         | 128         | 5,80    |
| 300                  | 300                  | 300                                   | 0,7     | 777         | 662         | 129         | 8,80    |
| 315                  | 315                  | 315                                   | 0,7     | 807         | 690         | 131         | 9,30    |
| 350                  | 350                  | 350                                   | 0,7     | 960         | 755         | 177         | 11,2    |
| 400                  | 400                  | 400                                   | 0,9     | 1060        | 848         | 184         | 18,8    |
| 450                  | 450                  | 450                                   | 0,9     | 1160        | 842         | 190         | 22,2    |
| 500                  | 500                  | 500                                   | 0,9     | 1260        | 1035        | 197         | 26,8    |
| 560 *                | 560 *                | 560 *                                 | 0,9     | 1520        | 1245        | 275         | 34,0    |
| 600 *                | 600 *                | 600 *                                 | 0,9     | 1600        | 1320        | 280         | 39,0    |
| 630 *                | 630 *                | 630 *                                 | 0,9     | 1660        | 1376        | 284         | 41,0    |
| 650 *                | 650 *                | 650 *                                 | 0,9     | 1700        | 1413        | 295         | 46,0    |
| 710 *                | 710 *                | 710 *                                 | 0,9     | 1820        | 1525        | 295         | 54,0    |
| 750 *                | 750 *                | 750 *                                 | 0,9     | 1900        | 1600        | 301         | 60,0    |
| 800 *                | 800 *                | 800 *                                 | 0,9     | 2000        | 1693        | 307         | 68,0    |
| 900 *                | 900 *                | 900 *                                 | 0,9     | 2200        | 1879        | 321         | 85,0    |

\* Supplied with flange FL

## Ordering example

|                         |             |            |            |            |            |
|-------------------------|-------------|------------|------------|------------|------------|
|                         | <b>XVTR</b> | <b>400</b> | <b>200</b> | <b>160</b> | <b>160</b> |
| Product                 |             |            |            |            |            |
| Dimension $\text{Ø}d_1$ |             |            |            |            |            |
| Dimension $\text{Ø}d_2$ |             |            |            |            |            |
| Dimension $\text{Ø}d_3$ |             |            |            |            |            |
| Dimension $\text{Ø}d_4$ |             |            |            |            |            |

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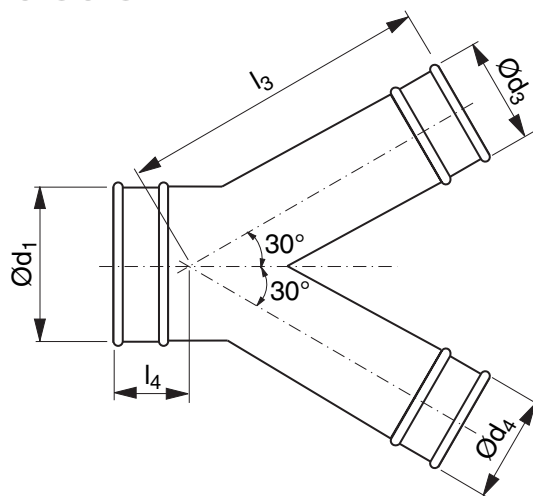


# Y-piece

# YVTR 30°



## Dimensions



## Description

Y-piece.

**NB**

To save space, the adjacent table only contains a limited selection from our range – the Y-pieces where all dimensions  $\text{Ø}d_1$ ,  $\text{Ø}d_3$  and  $\text{Ø}d_4$  are equal in size. Other dimensions are available to special order.

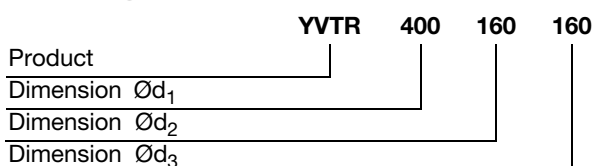
**NB**

To save space, the adjacent table only contains a limited selection from our range the Y-pieces where all dimensions  $d_1$ ,  $d_3$  and  $d_4$  are equal in size. Other dimensions are available to special order.

| $\text{Ø}d_1$<br>nom | $\text{Ø}d_3$<br>$\text{Ø}d_4$<br>nom | t<br>mm | $l_3$<br>mm | $l_4$<br>mm | m<br>kg |
|----------------------|---------------------------------------|---------|-------------|-------------|---------|
| 80                   | 80                                    | 0,7     | 191         | 65          | 0,70    |
| 100                  | 100                                   | 0,7     | 213         | 67          | 0,80    |
| 125                  | 125                                   | 0,7     | 242         | 71          | 0,90    |
| 140                  | 140                                   | 0,7     | 259         | 73          | 1,10    |
| 150                  | 150                                   | 0,7     | 270         | 74          | 1,20    |
| 160                  | 160                                   | 0,7     | 281         | 75          | 1,30    |
| 180                  | 180                                   | 0,7     | 304         | 73          | 1,60    |
| 200                  | 200                                   | 0,7     | 327         | 76          | 2,00    |
| 224                  | 224                                   | 0,7     | 354         | 79          | 2,50    |
| 250                  | 250                                   | 0,7     | 383         | 82          | 2,90    |
| 300                  | 300                                   | 0,7     | 440         | 82          | 4,40    |
| 315                  | 315                                   | 0,7     | 457         | 84          | 4,70    |
| 350                  | 350                                   | 0,7     | 497         | 89          | 5,40    |
| 400                  | 400                                   | 0,9     | 554         | 96          | 9,00    |
| 450                  | 450                                   | 0,9     | 610         | 102         | 10,8    |
| 500                  | 500                                   | 0,9     | 667         | 109         | 13,1    |
| 560*                 | 560*                                  | 0,9     | 735         | 155         | 17,0    |
| 600*                 | 600*                                  | 0,9     | 780         | 160         | 19,5    |
| 630*                 | 630*                                  | 0,9     | 814         | 164         | 20,5    |
| 650*                 | 650*                                  | 0,9     | 837         | 167         | 23,0    |
| 710*                 | 710*                                  | 0,9     | 905         | 195         | 27,0    |
| 750*                 | 750*                                  | 0,9     | 951         | 201         | 30,0    |
| 800*                 | 800*                                  | 0,9     | 1007        | 207         | 38,0    |
| 900*                 | 900*                                  | 0,9     | 1121        | 221         | 47,0    |

\* Supplied with flange FL

## Ordering example



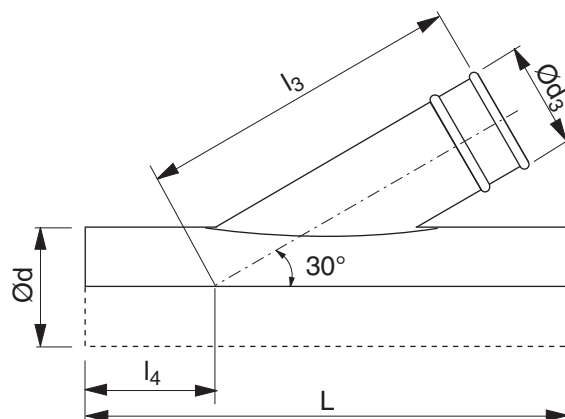


# Saddle

# PSVTR 30°



## Dimensions



## Description

Saddle.

The saddle is fixed with two sealing clamps MFK.

This product should not be installed with screws or blind rivets when used in chip extraction installations.

### NB

To save space, the adjacent table only contains a limited selection from our range – the saddles where all dimensions Ød and Ød<sub>3</sub> are equal in size. Other dimensions are available to special order.

### NB

To save space, the adjacent table only contains a limited selection from our range the saddles where all dimensions d and d<sub>3</sub> are equal in size. Other dimensions are available to special order.

| Ød<br>nom | Ød <sub>3</sub><br>nom | t<br>mm | L<br>mm | l <sub>3</sub><br>mm | l <sub>4</sub><br>mm | m<br>kg |
|-----------|------------------------|---------|---------|----------------------|----------------------|---------|
| 80        | 80                     | 0,7     | 410     | 221                  | 136                  | 0,50    |
| 100       | 100                    | 0,7     | 450     | 263                  | 138                  | 0,60    |
| 125       | 125                    | 0,7     | 500     | 317                  | 142                  | 0,80    |
| 140       | 140                    | 0,7     | 530     | 349                  | 144                  | 0,90    |
| 150       | 150                    | 0,7     | 550     | 370                  | 145                  | 1,00    |
| 160       | 160                    | 0,7     | 570     | 391                  | 146                  | 1,20    |
| 180       | 180                    | 0,7     | 610     | 434                  | 149                  | 1,50    |
| 200       | 200                    | 0,7     | 650     | 477                  | 152                  | 1,70    |
| 224       | 224                    | 0,7     | 700     | 528                  | 156                  | 2,10    |
| 250       | 250                    | 0,7     | 750     | 584                  | 159                  | 2,40    |
| 300       | 300                    | 0,7     | 850     | 690                  | 165                  | 3,10    |
| 315       | 315                    | 0,7     | 880     | 722                  | 167                  | 3,60    |
| 350       | 350                    | 0,7     | 950     | 797                  | 172                  | 5,60    |
| 400       | 400                    | 0,9     | 1050    | 904                  | 179                  | 6,50    |
| 450       | 450                    | 0,9     | 1150    | 1010                 | 185                  | 8,20    |
| 500       | 500                    | 0,9     | 1250    | 1117                 | 192                  | 9,80    |
| 560       | 560 *                  | 0,9     | 1370    | 1245                 | 200                  | 11,2    |
| 600       | 600 *                  | 0,9     | 1450    | 1330                 | 205                  | 13,8    |
| 630       | 630 *                  | 0,9     | 1510    | 1394                 | 209                  | 14,0    |
| 650       | 650 *                  | 0,9     | 1550    | 1437                 | 212                  | 16,0    |
| 710       | 710 *                  | 0,9     | 1670    | 1565                 | 220                  | 18,0    |
| 750       | 750 *                  | 0,9     | 1750    | 1651                 | 225                  | 21,0    |
| 800       | 800 *                  | 0,9     | 1850    | 1757                 | 232                  | 24,0    |
| 900       | 900 *                  | 0,9     | 2050    | 1971                 | 245                  | 28,0    |

\* Supplied with flange FL

## Ordering example

|                           |       |     |     |
|---------------------------|-------|-----|-----|
|                           | PSVTR | 400 | 160 |
| Product                   |       |     |     |
| Dimension Ød              |       |     |     |
| Dimension Ød <sub>3</sub> |       |     |     |



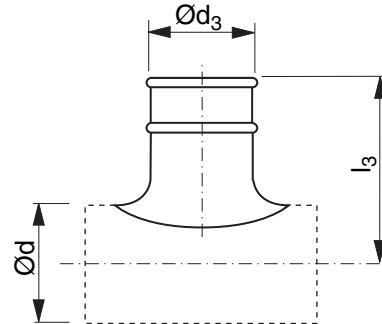


# Collar saddle

PSTR



## Dimensions

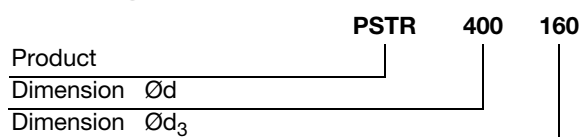


## Description

Collar saddle.

| Ød<br>nom | Ød <sub>3</sub><br>mm | t<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|-----------------------|---------|----------------------|---------|
| 80        | 80                    | 0,6     | 143                  | 0,20    |
| 100       | 80                    | 0,6     | 156                  | 0,20    |
| 100       | 100                   | 0,6     | 131                  | 0,30    |
| 125       | 80                    | 0,6     | 166                  | 0,20    |
| 125       | 100                   | 0,6     | 144                  | 0,30    |
| 125       | 125                   | 0,6     | 149                  | 0,40    |
| 140       | 80                    | 0,6     | 173                  | 0,20    |
| 140       | 100                   | 0,6     | 176                  | 0,40    |
| 140       | 125                   | 0,6     | 121                  | 0,30    |
| 140       | 140                   | 0,6     | 181                  | 0,50    |
| 150       | 80                    | 0,6     | 178                  | 0,20    |
| 150       | 100                   | 0,6     | 181                  | 0,40    |
| 150       | 125                   | 0,6     | 186                  | 0,50    |
| 150       | 140                   | 0,6     | 186                  | 0,50    |
| 150       | 150                   | 0,6     | 186                  | 0,50    |
| 160       | 80                    | 0,6     | 183                  | 0,20    |
| 160       | 100                   | 0,6     | 161                  | 0,30    |
| 160       | 125                   | 0,6     | 166                  | 0,40    |
| 160       | 140                   | 0,6     | 191                  | 0,50    |
| 160       | 150                   | 0,6     | 191                  | 0,50    |
| 160       | 160                   | 0,6     | 171                  | 0,50    |
| 180       | 80                    | 0,6     | 193                  | 0,20    |
| 180       | 100                   | 0,6     | 196                  | 0,40    |
| 180       | 125                   | 0,6     | 201                  | 0,50    |
| 180       | 140                   | 0,6     | 201                  | 0,50    |
| 180       | 150                   | 0,6     | 201                  | 0,50    |
| 180       | 160                   | 0,6     | 206                  | 0,60    |
| 180       | 180                   | 0,6     | 202                  | 0,90    |
| 200       | 80                    | 0,6     | 203                  | 0,20    |
| 200       | 100                   | 0,6     | 181                  | 0,30    |
| 200       | 125                   | 0,6     | 181                  | 0,40    |
| 200       | 140                   | 0,6     | 211                  | 0,50    |
| 200       | 150                   | 0,6     | 211                  | 0,50    |

## Ordering example





## Collar saddle

## PSTR

| Ød<br>nom | Ød <sub>3</sub><br>mm | t<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|-----------------------|---------|----------------------|---------|
| 200       | 160                   | 0,6     | 191                  | 0,50    |
| 200       | 180                   | 0,6     | 212                  | 0,90    |
| 200       | 200                   | 0,6     | 212                  | 1,00    |
| 224       | 80                    | 0,6     | 215                  | 0,20    |
| 224       | 100                   | 0,6     | 218                  | 0,40    |
| 224       | 125                   | 0,6     | 223                  | 0,50    |
| 224       | 140                   | 0,6     | 223                  | 0,50    |
| 224       | 150                   | 0,6     | 223                  | 0,50    |
| 224       | 160                   | 0,6     | 228                  | 0,60    |
| 224       | 180                   | 0,6     | 224                  | 0,80    |
| 224       | 200                   | 0,6     | 224                  | 0,80    |
| 224       | 224                   | 0,6     | 224                  | 1,00    |
| 250       | 80                    | 0,6     | 228                  | 0,30    |
| 250       | 100                   | 0,6     | 206                  | 0,40    |
| 250       | 125                   | 0,6     | 211                  | 0,40    |
| 250       | 140                   | 0,6     | 236                  | 0,50    |
| 250       | 150                   | 0,6     | 236                  | 0,50    |
| 250       | 160                   | 0,6     | 241                  | 0,60    |
| 250       | 180                   | 0,6     | 237                  | 0,90    |
| 250       | 200                   | 0,6     | 237                  | 0,90    |
| 250       | 224                   | 0,6     | 237                  | 1,20    |
| 250       | 250                   | 0,6     | 257                  | 1,30    |
| 300       | 80                    | 0,6     | 201                  | 0,20    |
| 300       | 100                   | 0,6     | 201                  | 0,20    |
| 300       | 125                   | 0,6     | 201                  | 0,30    |
| 300       | 140                   | 0,6     | 201                  | 0,40    |
| 300       | 150                   | 0,6     | 201                  | 0,40    |
| 300       | 160                   | 0,6     | 201                  | 0,40    |
| 300       | 180                   | 0,6     | 197                  | 0,60    |
| 300       | 200                   | 0,6     | 197                  | 0,60    |
| 300       | 224                   | 0,6     | 197                  | 0,70    |
| 300       | 250                   | 0,6     | 197                  | 0,80    |
| 315       | 80                    | 0,6     | 261                  | 0,30    |
| 315       | 100                   | 0,6     | 264                  | 0,40    |
| 315       | 125                   | 0,6     | 244                  | 0,40    |
| 315       | 140                   | 0,6     | 269                  | 0,50    |
| 315       | 150                   | 0,6     | 269                  | 0,50    |
| 315       | 160                   | 0,6     | 273                  | 0,50    |
| 315       | 180                   | 0,6     | 273                  | 0,90    |
| 315       | 200                   | 0,6     | 269                  | 0,90    |
| 315       | 224                   | 0,6     | 269                  | 0,90    |
| 315       | 250                   | 0,6     | 289                  | 1,10    |
| 315       | 300                   | 0,6     | 259                  | 1,50    |
| 315       | 315                   | 0,6     | 283                  | 1,90    |
| 350       | 100                   | 0,6     | 226                  | 0,30    |
| 350       | 125                   | 0,6     | 226                  | 0,30    |
| 350       | 140                   | 0,6     | 226                  | 0,40    |
| 350       | 150                   | 0,6     | 226                  | 0,40    |

| Ød<br>nom | Ød <sub>3</sub><br>mm | t<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|-----------------------|---------|----------------------|---------|
| 350       | 160                   | 0,6     | 226                  | 0,40    |
| 350       | 180                   | 0,6     | 222                  | 0,60    |
| 350       | 200                   | 0,6     | 222                  | 0,70    |
| 350       | 224                   | 0,6     | 222                  | 0,70    |
| 350       | 250                   | 0,6     | 222                  | 0,80    |
| 350       | 300                   | 0,6     | 216                  | 0,90    |
| 350       | 315                   | 0,6     | 216                  | 1,10    |
| 350       | 350                   | 0,6     | 216                  | 1,60    |
| 400       | 125                   | 0,6     | 311                  | 0,40    |
| 400       | 140                   | 0,6     | 251                  | 0,30    |
| 400       | 150                   | 0,6     | 311                  | 0,40    |
| 400       | 160                   | 0,6     | 316                  | 0,50    |
| 400       | 180                   | 0,6     | 247                  | 0,40    |
| 400       | 200                   | 0,6     | 312                  | 0,90    |
| 400       | 224                   | 0,6     | 312                  | 0,90    |
| 400       | 250                   | 0,6     | 332                  | 1,10    |
| 400       | 300                   | 0,6     | 301                  | 1,10    |
| 400       | 315                   | 0,6     | 326                  | 1,60    |
| 400       | 350                   | 0,6     | 326                  | 1,90    |
| 400       | 400                   | 0,7     | 321                  | 2,40    |
| 450       | 100                   | 0,6     | 331                  | 0,40    |
| 450       | 125                   | 0,6     | 336                  | 0,50    |
| 450       | 140                   | 0,6     | 276                  | 0,40    |
| 450       | 150                   | 0,6     | 336                  | 0,40    |
| 450       | 160                   | 0,6     | 341                  | 0,50    |
| 450       | 180                   | 0,6     | 272                  | 0,40    |
| 450       | 200                   | 0,6     | 337                  | 0,90    |
| 450       | 224                   | 0,6     | 337                  | 0,90    |
| 450       | 250                   | 0,6     | 357                  | 1,10    |
| 450       | 300                   | 0,6     | 266                  | 1,00    |
| 450       | 315                   | 0,6     | 351                  | 1,50    |
| 450       | 400                   | 0,7     | 371                  | 2,30    |
| 450       | 450                   | 0,7     | 266                  | 1,40    |
| 500       | 100                   | 0,6     | 356                  | 0,40    |
| 500       | 125                   | 0,6     | 361                  | 0,50    |
| 500       | 140                   | 0,6     | 301                  | 0,30    |
| 500       | 150                   | 0,6     | 361                  | 0,40    |
| 500       | 160                   | 0,6     | 366                  | 0,50    |
| 500       | 180                   | 0,6     | 297                  | 0,50    |
| 500       | 200                   | 0,6     | 362                  | 0,90    |
| 500       | 224                   | 0,6     | 322                  | 0,70    |
| 500       | 250                   | 0,6     | 382                  | 1,10    |
| 500       | 300                   | 0,6     | 291                  | 0,90    |
| 500       | 315                   | 0,6     | 376                  | 1,50    |
| 500       | 350                   | 0,7     | 291                  | 1,70    |
| 500       | 400                   | 0,7     | 396                  | 2,30    |
| 500       | 450                   | 0,7     | 291                  | 1,50    |
| 500       | 500                   | 0,7     | 291                  | 1,70    |

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## Collar saddle

PSTR

| Ød<br>nom | Ød <sub>3</sub><br>mm | t<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|-----------------------|---------|----------------------|---------|
| 560       | 250                   | 0,7     | 412                  | 1,50    |
| 560       | 300                   | 0,7     | 321                  | 1,30    |
| 560       | 315                   | 0,7     | 406                  | 1,90    |
| 560       | 350                   | 0,7     | 381                  | 2,00    |
| 560       | 400                   | 0,9     | 426                  | 3,10    |
| 560       | 450                   | 0,9     | 321                  | 2,70    |
| 560       | 500                   | 0,9     | 321                  | 3,10    |
| 560       | 560 *                 | 0,9     | 321                  | 5,70    |
| 600       | 300                   | 0,7     | 341                  | 1,40    |
| 600       | 315                   | 0,7     | 426                  | 1,90    |
| 600       | 350                   | 0,7     | 341                  | 1,70    |
| 600       | 400                   | 0,9     | 446                  | 3,10    |
| 600       | 450                   | 0,9     | 341                  | 2,70    |
| 600       | 500                   | 0,9     | 341                  | 3,30    |
| 600       | 560 *                 | 0,9     | 341                  | 5,80    |
| 600       | 600 *                 | 0,9     | 341                  | 6,30    |
| 630       | 315                   | 0,7     | 441                  | 2,10    |
| 630       | 350                   | 0,7     | 356                  | 1,80    |
| 630       | 400                   | 0,9     | 461                  | 3,30    |
| 630       | 450                   | 0,9     | 356                  | 2,80    |
| 630       | 500                   | 0,9     | 356                  | 3,50    |
| 630       | 560 *                 | 0,9     | 356                  | 5,90    |
| 630       | 600 *                 | 0,9     | 356                  | 6,40    |
| 630       | 630 *                 | 0,9     | 356                  | 6,80    |
| 650       | 350                   | 0,7     | 366                  | 1,90    |
| 650       | 400                   | 0,9     | 366                  | 2,60    |
| 650       | 450                   | 0,9     | 366                  | 2,90    |
| 650       | 500                   | 0,9     | 366                  | 3,60    |
| 650       | 560 *                 | 0,9     | 366                  | 6,00    |
| 650       | 600 *                 | 0,9     | 366                  | 6,50    |
| 650       | 630 *                 | 0,9     | 366                  | 6,90    |
| 650       | 650 *                 | 0,9     | 366                  | 7,20    |
| 710       | 400                   | 0,9     | 396                  | 3,00    |
| 710       | 450                   | 0,9     | 396                  | 3,10    |
| 710       | 500                   | 0,9     | 396                  | 3,80    |
| 710       | 560 *                 | 0,9     | 396                  | 6,10    |
| 710       | 600 *                 | 0,9     | 396                  | 6,70    |
| 710       | 630 *                 | 0,9     | 396                  | 7,10    |
| 710       | 650 *                 | 0,9     | 396                  | 7,40    |
| 710       | 710 *                 | 0,9     | 396                  | 8,50    |
| 750       | 450                   | 0,9     | 416                  | 3,20    |
| 750       | 500                   | 0,9     | 416                  | 3,80    |
| 750       | 560 *                 | 0,9     | 416                  | 6,20    |
| 750       | 600 *                 | 0,9     | 416                  | 6,70    |
| 750       | 630 *                 | 0,9     | 416                  | 7,10    |
| 750       | 650 *                 | 0,9     | 416                  | 7,40    |
| 750       | 710 *                 | 0,9     | 416                  | 8,60    |
| 750       | 750 *                 | 0,9     | 416                  | 9,00    |

| Ød<br>nom | Ød <sub>3</sub><br>mm | t<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|-----------|-----------------------|---------|----------------------|---------|
| 800       | 500                   | 0,9     | 441                  | 3,80    |
| 800       | 560 *                 | 0,9     | 441                  | 6,30    |
| 800       | 630 *                 | 0,9     | 441                  | 7,30    |
| 800       | 650 *                 | 0,9     | 441                  | 7,70    |
| 800       | 710 *                 | 0,9     | 441                  | 8,70    |
| 800       | 750 *                 | 0,9     | 441                  | 9,20    |
| 800       | 800 *                 | 0,9     | 441                  | 10,1    |
| 900       | 560 *                 | 0,9     | 491                  | 6,60    |
| 900       | 600 *                 | 0,9     | 491                  | 7,20    |
| 900       | 630 *                 | 0,9     | 491                  | 7,60    |
| 900       | 650 *                 | 0,9     | 491                  | 8,00    |
| 900       | 710 *                 | 0,9     | 491                  | 9,10    |
| 900       | 750 *                 | 0,9     | 491                  | 9,70    |
| 900       | 800 *                 | 0,9     | 491                  | 10,6    |
| 900       | 900 *                 | 0,9     | 491                  | 12,2    |

\* Supplied with flange FL



# Take-off

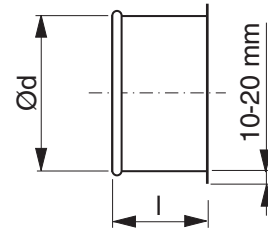
# ILTR



## Description

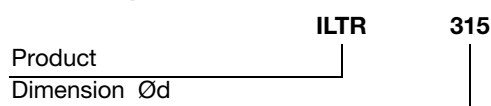
Take-off.

## Dimensions



| Ød<br>nom | t<br>mm | l<br>mm | m<br>kg |
|-----------|---------|---------|---------|
| 80        | 0,7     | 50      | 0,10    |
| 100       | 0,7     | 50      | 0,10    |
| 125       | 0,7     | 50      | 0,20    |
| 140       | 0,7     | 50      | 0,20    |
| 150       | 0,7     | 50      | 0,20    |
| 160       | 0,7     | 50      | 0,20    |
| 180       | 0,7     | 45      | 0,30    |
| 200       | 0,7     | 45      | 0,30    |
| 224       | 0,7     | 45      | 0,30    |
| 250       | 0,7     | 45      | 0,40    |
| 300       | 0,7     | 40      | 0,40    |
| 315       | 0,7     | 40      | 0,50    |
| 350       | 0,7     | 40      | 0,50    |
| 400       | 0,9     | 40      | 0,70    |
| 450       | 0,9     | 40      | 0,80    |
| 500       | 0,9     | 40      | 0,90    |

## Ordering example



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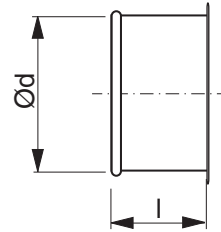


# End cover

EPTR



## Dimensions



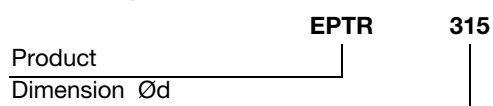
### Description

End cover.

| Ød<br>nom | t<br>mm | l<br>mm | m<br>kg |
|-----------|---------|---------|---------|
| 80        | 0,7     | 56      | 0,30    |
| 100       | 0,7     | 56      | 0,40    |
| 125       | 0,7     | 56      | 0,40    |
| 140       | 0,7     | 56      | 0,40    |
| 150       | 0,7     | 56      | 0,50    |
| 160       | 0,7     | 56      | 0,60    |
| 180       | 0,7     | 52      | 0,60    |
| 200       | 0,7     | 52      | 0,80    |
| 224       | 0,7     | 52      | 0,80    |
| 250       | 0,7     | 52      | 0,80    |
| 300       | 0,9     | 46      | 0,90    |
| 315       | 0,9     | 46      | 1,00    |
| 350       | 0,9     | 46      | 1,00    |
| 400       | 0,9     | 46      | 1,40    |
| 450       | 0,9     | 46      | 1,60    |
| 500       | 0,9     | 46      | 1,80    |
| 560 *     | 0,9     | 70      | 5,40    |
| 600 *     | 0,9     | 70      | 6,10    |
| 630 *     | 0,9     | 70      | 6,30    |
| 650 *     | 0,9     | 70      | 6,70    |
| 710 *     | 0,9     | 90      | 7,80    |
| 750 *     | 0,9     | 90      | 8,30    |
| 800 *     | 0,9     | 90      | 9,00    |
| 900 *     | 0,9     | 90      | 10,7    |

\* Supplied with flange FL

### Ordering example





# Transition piece

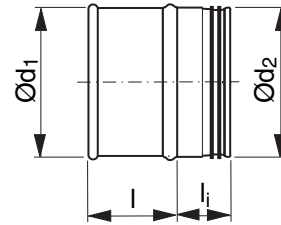
# OUTR



## Description

Coupling between Transfer and Safe systems.

## Dimensions



| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | t<br>mm | l<br>mm | l <sub>i</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|----------------------|---------|
| 80                     | 80                     | 0,7     | 40      | 40                   | 0,15    |
| 100                    | 100                    | 0,7     | 40      | 40                   | 0,15    |
| 125                    | 125                    | 0,7     | 40      | 40                   | 0,20    |
| 140                    | 140                    | 0,7     | 40      | 40                   | 0,20    |
| 150                    | 150                    | 0,7     | 40      | 40                   | 0,30    |
| 160                    | 160                    | 0,7     | 40      | 40                   | 0,30    |
| 180                    | 180                    | 0,7     | 40      | 40                   | 0,30    |
| 200                    | 200                    | 0,7     | 40      | 40                   | 0,30    |
| 224                    | 224                    | 0,7     | 40      | 40                   | 0,40    |
| 250                    | 250                    | 0,7     | 60      | 60                   | 0,40    |
| 300                    | 300                    | 0,7     | 46      | 60                   | 0,70    |
| 315                    | 315                    | 0,7     | 46      | 60                   | 0,50    |
| 350                    | 350                    | 0,9     | 46      | 60                   | 0,80    |
| 400                    | 400                    | 0,9     | 46      | 80                   | 1,20    |
| 450                    | 450                    | 0,9     | 46      | 80                   | 1,40    |
| 500                    | 500                    | 0,9     | 46      | 80                   | 1,60    |
| 560                    | 560                    | 0,9     | 80      | 80                   | 4,6     |
| 600                    | 600                    | 0,9     | 80      | 80                   | 4,9     |
| 630                    | 630                    | 0,9     | 80      | 80                   | 5,1     |
| 650                    | 650                    | 0,9     | 80      | 80                   | 5,4     |
| 710                    | 710                    | 0,9     | 100     | 100                  | 6,1     |
| 750                    | 750                    | 0,9     | 100     | 100                  | 6,8     |
| 800                    | 800                    | 0,9     | 100     | 100                  | 7,5     |
| 900                    | 900                    | 0,9     | 125     | 125                  | 8,5     |

## Ordering example

|              |      |     |
|--------------|------|-----|
| Product      | OUTR | 315 |
| Dimension Ød |      |     |

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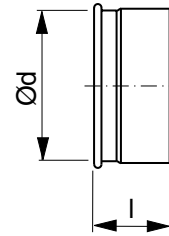


# Transition piece

# MFTR



## Dimensions



## Description

Coupling with female end between Transfer and Safe systems.

| Ød<br>nom | t<br>mm | l<br>mm | m<br>kg |
|-----------|---------|---------|---------|
| 80        | 0,7     | 62      | 0,10    |
| 100       | 0,7     | 62      | 0,10    |
| 125       | 0,7     | 62      | 0,20    |
| 140       | 0,7     | 62      | 0,20    |
| 150       | 0,7     | 62      | 0,20    |
| 160       | 0,7     | 62      | 0,20    |
| 180       | 0,7     | 58      | 0,20    |
| 200       | 0,7     | 58      | 0,20    |
| 224       | 0,7     | 58      | 0,30    |
| 250       | 0,7     | 79      | 0,30    |
| 300       | 0,9     | 106     | 0,70    |
| 315       | 0,9     | 73      | 0,30    |
| 350       | 0,7     | 115     | 0,9     |
| 400       | 0,9     | 126     | 1,20    |
| 450       | 0,9     | 126     | 1,40    |
| 500       | 0,9     | 126     | 1,60    |

## Ordering example

Product **MFTR** **315**  
 Dimension Ød

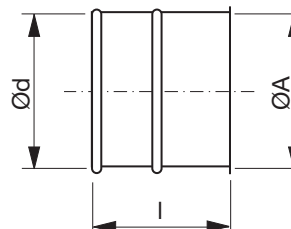


# Transition piece

OTR



## Dimensions



### Description

Coupling between Transfer and other joining system.

As standard the length is 100 mm. If a specific length is desired it can be stated when order. The length depends on dimensions and joining system. Minimum length is 50 mm.

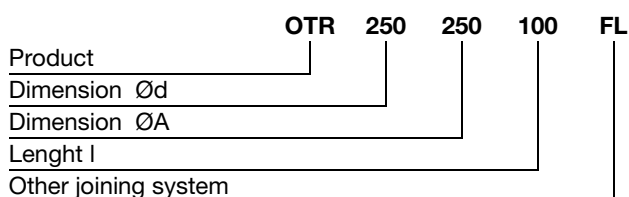
Ød : dimension for Transfer

ØA : dimension for other system

At order state the type of the other joining system.

| Ød<br>nom | t<br>mm |
|-----------|---------|
| 80        | 0,7     |
| 100       | 0,7     |
| 125       | 0,7     |
| 140       | 0,7     |
| 150       | 0,7     |
| 160       | 0,7     |
| 180       | 0,7     |
| 200       | 0,7     |
| 224       | 0,7     |
| 250       | 0,7     |
| 300       | 0,9     |
| 315       | 0,9     |
| 350       | 0,9     |
| 400       | 0,9     |
| 450       | 0,9     |
| 500       | 0,9     |

### Ordering example



- 1
- 2
- 3
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# Transition piece

# LORTR



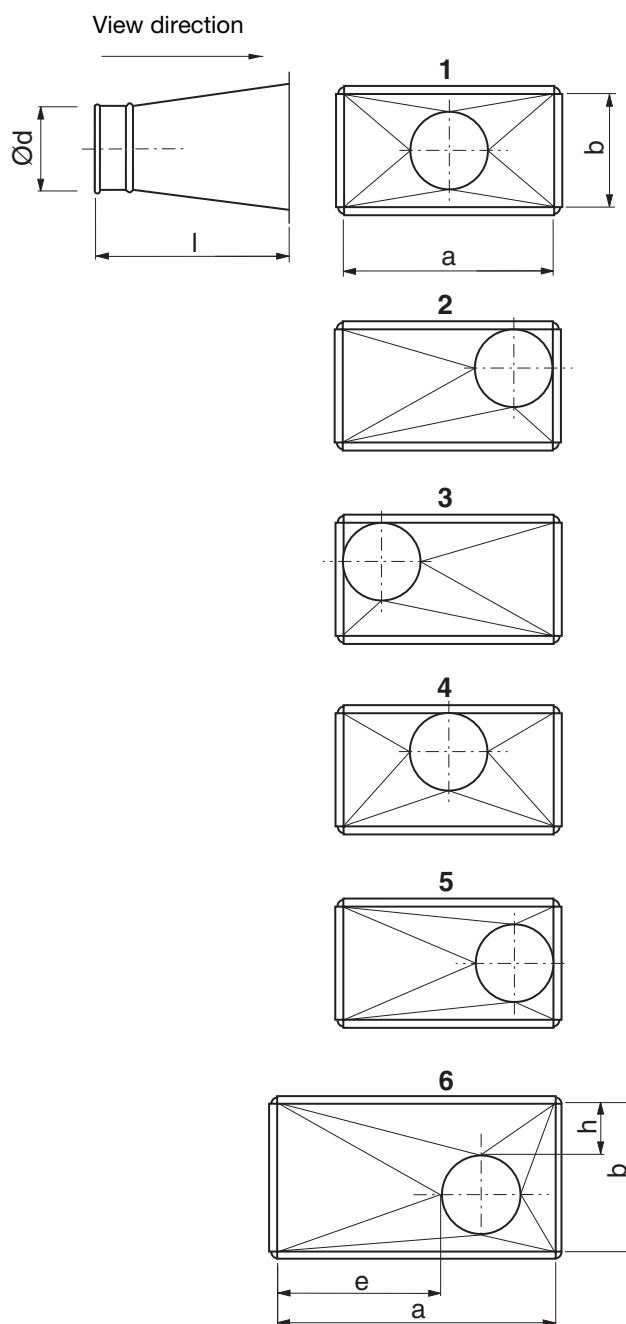
## Description

Coupling between Transfer and rectangular connection.

The measures e and h only need to be specified for alternative 6. A negative value for e, for example, means that e is outside side a.

The measures e and h only need to be specified for alternative 6. A negative value for e, for example, means that e is outside side a.

## Dimensions



## Ordering example

|  |       |     |     |     |   |
|--|-------|-----|-----|-----|---|
| Product  | LORTR | 500 | 300 | 160 | 1 |
| Largest side   | a     |     |     |     |   |
| Smallest side  | b     |     |     |     |   |
| Diameter in mm   | Ød    |     |     |     |   |
| The alt. displacement are seen from the circular end 1-6 |       |     |     |     |   |

| a, b<br>Largest side<br>mm | l<br>mm |
|----------------------------|---------|
| 100 – 350                  | 300     |
| 351 – 750                  | 450     |
| 751 – 1200                 | 600     |



# Extraction hood

SH

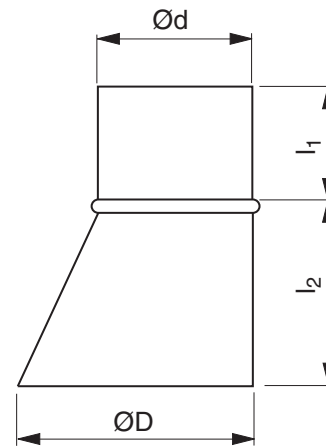


## Description

Extraction hood for all types of extraction.

Available in two standard sizes with various accessories such as a damper, net and magnet.

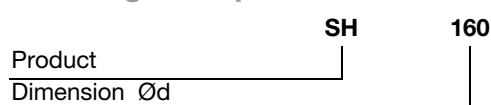
## Dimensions



| Ød<br>nom | ØD<br>nom | l <sub>1</sub><br>mm | l <sub>2</sub><br>mm | m<br>kg |
|-----------|-----------|----------------------|----------------------|---------|
| 80        | 160       | 80                   | 95                   | 0,31    |
| 160 *     | 315       | 120                  | 155                  | 1,00    |

\* Supplied with handle

## Ordering example



- 1
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# Extraction hood

# SHTR

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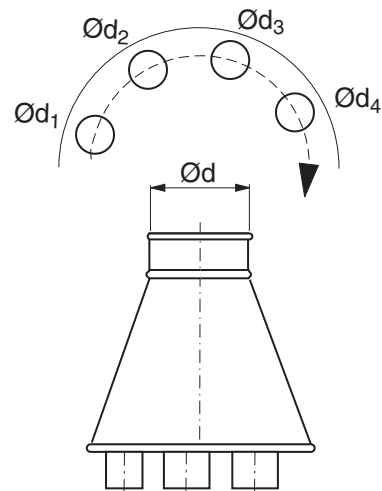


## Description

Extraction hood.

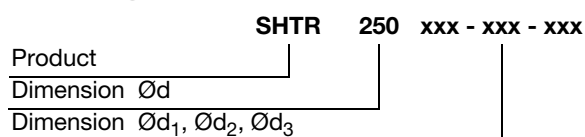
To order, specify  $\varnothing d$  and dimensions for stubs  $\varnothing d_1$ ,  $\varnothing d_2$ ,  $\varnothing d_3$  etc. and the sequence they should be located on the pitch circle.

## Dimensions



| $\varnothing d$<br>nom | t<br>mm |
|------------------------|---------|
| 80                     | 0,7     |
| 100                    | 0,7     |
| 125                    | 0,7     |
| 140                    | 0,7     |
| 150                    | 0,7     |
| 160                    | 0,7     |
| 180                    | 0,7     |
| 200                    | 0,7     |
| 224                    | 0,7     |
| 250                    | 0,7     |
| 300                    | 0,7     |
| 315                    | 0,7     |
| 350                    | 0,7     |
| 400                    | 0,9     |
| 450                    | 0,9     |
| 500                    | 0,9     |

## Ordering example





# Extraction hood

# SPTR

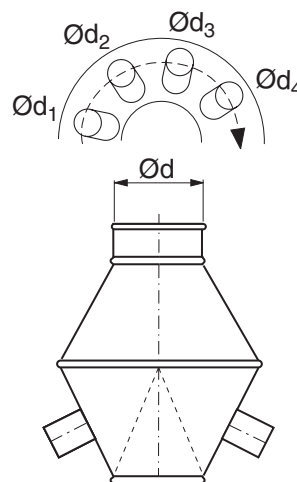


## Description

Extraction hood.

To order, specify  $\varnothing d$  and dimensions for stubs  $\varnothing d_1$ ,  $\varnothing d_2$ ,  $\varnothing d_3$  etc. and the sequence they should be located on the pitch circle.

## Dimensions



| $\varnothing d$<br>nom | t<br>mm |
|------------------------|---------|
| 80                     | 0,7     |
| 100                    | 0,7     |
| 125                    | 0,7     |
| 140                    | 0,7     |
| 150                    | 0,7     |
| 160                    | 0,7     |
| 180                    | 0,7     |
| 200                    | 0,7     |
| 224                    | 0,7     |
| 250                    | 0,7     |
| 300                    | 0,7     |
| 315                    | 0,7     |
| 350                    | 0,7     |
| 400                    | 0,9     |
| 450                    | 0,9     |
| 500                    | 0,9     |

## Ordering example

|   |      |     |                 |
|---|------|-----|-----------------|
| Product   | SPTR | 315 | xxx - xxx - xxx |
| Dimension $\varnothing d$                                     |      |     |                 |
| Dimension $\varnothing d_1, \varnothing d_2, \varnothing d_3$ |      |     |                 |

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# Waste extractor

# GSTR

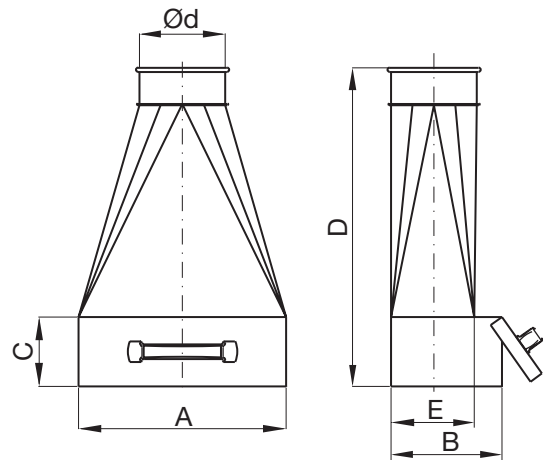
- 1
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- 15
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- 17
- 18



## Description

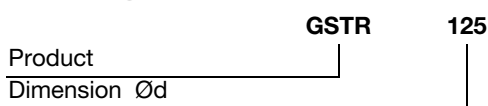
Used for extraction of chips etc. Is to be placed up to a wall.

## Dimensions



| Ød<br>nom | A<br>mm | B<br>mm | C<br>mm | D<br>mm | E<br>mm |
|-----------|---------|---------|---------|---------|---------|
| 100       | 300     | 165     | 100     | 460     | 120     |
| 125       | 300     | 165     | 100     | 460     | 120     |
| 160       | 300     | 165     | 100     | 460     | 120     |

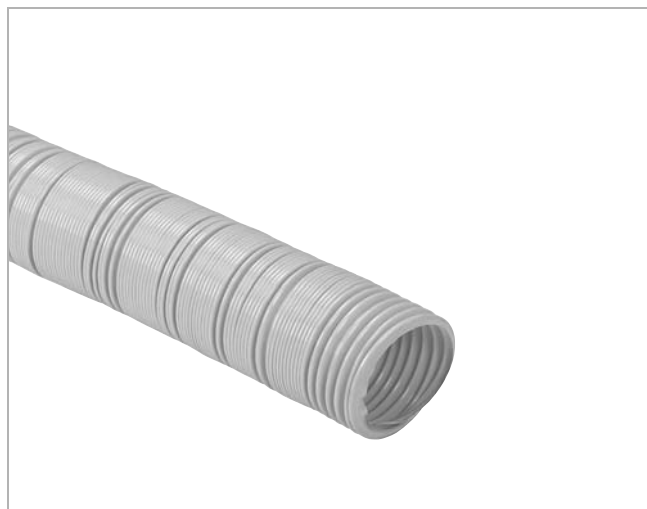
## Ordering example





# Flexible hose

# THTR



## Description

Light, flexible hose built on a bright steel spiral. Transparent with a light bluish tone.

Material polyester – polyurethane  
 Temperature range -40 to +100 °C

Fits standard fitting dimensions.

## Dimensions



| Ød<br>mm | Min.<br>bending<br>radius<br>mm | Max. per-<br>missible<br>negative<br>pressure<br>kPa | l<br>mm | m <sub>l</sub><br>kg/m |
|----------|---------------------------------|--|---------|------------------------|
| 80       | 80                              | 14,5   | 6000    | 0,50                   |
| 100      | 100                             | 12,0   | 6000    | 0,60                   |
| 125      | 125                             | 10,0   | 6000    | 0,70                   |
| 140      | 140                             | 8,0  | 6000    | 0,80                   |
| 150      | 150                             | 7,8  | 6000    | 0,90                   |
| 160      | 160                             | 7,5  | 6000    | 0,90                   |
| 180      | 180                             | 6,5  | 6000    | 1,00                   |
| 200      | 200                             | 6,2  | 6000    | 1,10                   |
| 250      | 250                             | 5,0  | 6000    | 1,40                   |

## Ordering example

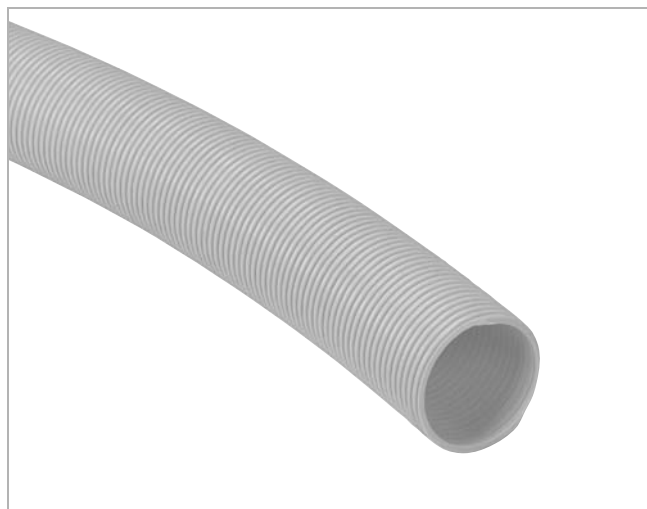


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- 9
- 10**
- 11
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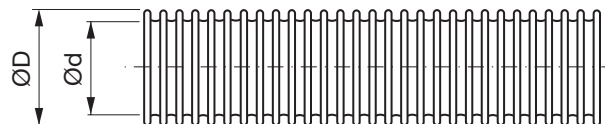


# Flexible hose

# THVTR



## Dimensions



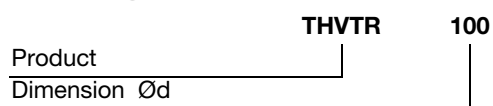
## Description

Flexible hose, non-spiral, profiled wall construction, extruded ethylene-vinyl-acetate. The design means that the hose has an almost completely smooth interior under high vacuum, with consequent low pressure drop. This is because the open ridges on the inside of the hose are compressed at negative pressure.

Colour blue  
 Temperature range -45 to +65 °C

| Ød<br>mm | ØD<br>mm | Min.<br>bending<br>radius<br>mm | Max. per-<br>missible<br>negative<br>pressure<br>kPa | l<br>mm | m <sub>l</sub><br>kg/m |
|----------|----------|---------------------------------|--|---------|------------------------|
| 25       | 31       | 66                              | 50   | 30000   | 0,20                   |
| 32       | 41       | 82                              | 50   | 30000   | 0,30                   |
| 38       | 48       | 93                              | 50   | 30000   | 0,40                   |
| 45       | 56       | 111                             | 50   | 30000   | 0,50                   |
| 50       | 61       | 122                             | 50   | 30000   | 0,60                   |
| 63       | 76       | 160                             | 50   | 30000   | 0,80                   |
| 76       | 91       | 188                             | 50   | 15000   | 1,10                   |
| 100      | 115      | 252                             | 50   | 15000   | 1,50                   |

## Ordering example





# Transition piece

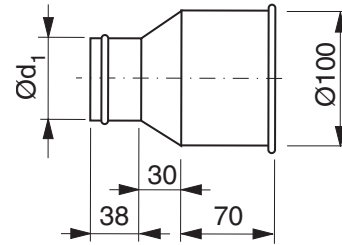
# OTRTH



## Description

Coupling between Transfer and flexible hose THVTR.

## Dimensions



| Ød <sub>1</sub><br>nom | m<br>kg |
|------------------------|---------|
| 25                     | 0,19    |
| 32                     | 0,20    |
| 38                     | 0,20    |
| 45                     | 0,20    |
| 50                     | 0,21    |
| 63                     | 0,21    |
| 76                     | 0,22    |

Dim 80–250 use TSRTR page 480.

## Ordering example

|                           |       |    |
|---------------------------|-------|----|
| Product                   | OTRTH | 50 |
| Dimension Ød <sub>1</sub> |       |    |

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# Clip

SB

- 1
- 2
- 3
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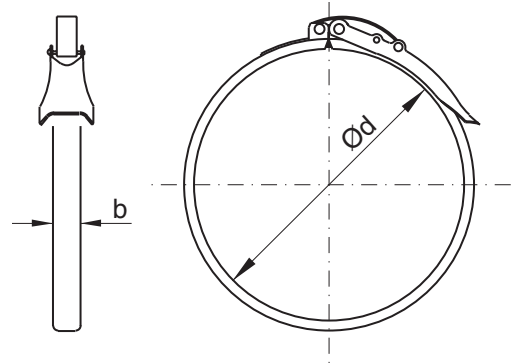


## Description

The clip is provided with a rubber gasket. The clip handles can be secured against inadvertent opening by means of a lock pin.

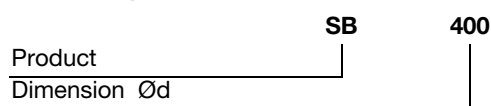
Temperature range -30 to +75 °C continuous  
-40 to +85 °C intermittent

## Dimensions



| Ød<br>nom | b<br>mm | m<br>kg |
|-----------|---------|---------|
| 80        | 14      | 0,10    |
| 100       | 14      | 0,10    |
| 125       | 14      | 0,10    |
| 140       | 14      | 0,10    |
| 150       | 14      | 0,10    |
| 160       | 14      | 0,10    |
| 180       | 19      | 0,20    |
| 200       | 19      | 0,30    |
| 224       | 19      | 0,30    |
| 250       | 19      | 0,30    |
| 300       | 25      | 0,40    |
| 315       | 25      | 0,50    |
| 350       | 25      | 0,60    |
| 400       | 25      | 0,60    |
| 450       | 25      | 0,70    |
| 500       | 25      | 0,80    |

## Ordering example



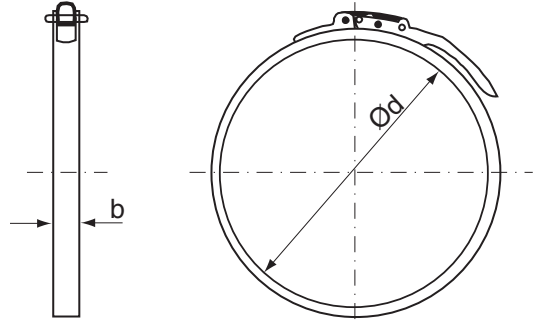


# Clip

# SB-1



## Dimensions



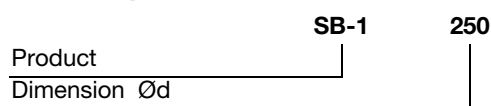
### Description

Provided with a rubber gasket of EPDM rubber and a thread spring. The clip handle can be secured against inadvertent opening by means of a lock pin.

Temperature range -30 to +75 °C continuous  
 -40 to +85 °C intermittent

| Ød<br>nom | b<br>mm | m<br>kg |
|-----------|---------|---------|
| 80        | 14      | 0,10    |
| 100       | 14      | 0,10    |
| 125       | 14      | 0,10    |
| 140       | 14      | 0,10    |
| 150       | 14      | 0,10    |
| 160       | 14      | 0,10    |
| 180       | 19      | 0,20    |
| 200       | 19      | 0,30    |
| 224       | 19      | 0,30    |
| 250       | 19      | 0,30    |
| 300       | 25      | 0,40    |
| 315       | 25      | 0,50    |
| 350       | 25      | 0,60    |
| 400       | 25      | 0,60    |
| 450       | 25      | 0,70    |
| 500       | 25      | 0,80    |

### Ordering example



- 1
- 2
- 3
- 4
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# Clip

# SB-2

- 1
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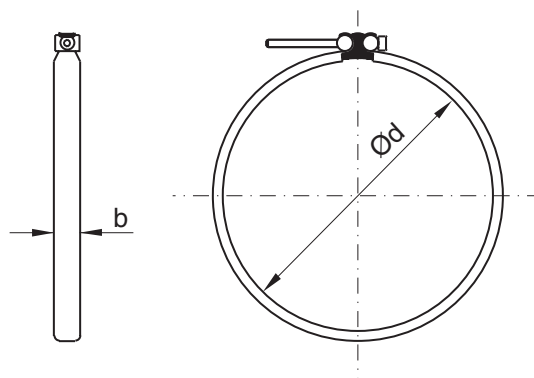


## Description

The clip is provided with a rubber gasket. The clip is tensioned by means of a hexagonal socket cap screw. Suitable for tightening with a screw tightener.

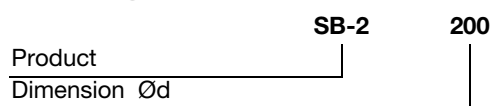
Temperature range -30 to +75 °C continuous  
 -40 to +85 °C intermittent

## Dimensions



| Ød<br>nom | b<br>mm | Key size<br>mm | m<br>kg |
|-----------|---------|----------------|---------|
| 80        | 14      | 3              | 0,10    |
| 100       | 14      | 3              | 0,10    |
| 125       | 14      | 3              | 0,10    |
| 140       | 14      | 3              | 0,10    |
| 150       | 14      | 3              | 0,10    |
| 160       | 14      | 3              | 0,10    |
| 180       | 19      | 3              | 0,20    |
| 200       | 19      | 3              | 0,30    |
| 224       | 19      | 3              | 0,30    |
| 250       | 19      | 3              | 0,30    |
| 300       | 25      | 5              | 0,40    |
| 315       | 25      | 5              | 0,50    |
| 350       | 25      | 5              | 0,60    |
| 400       | 25      | 5              | 0,60    |
| 450       | 25      | 5              | 0,70    |
| 500       | 25      | 5              | 0,80    |

## Ordering example





# Sealing clamp

MFK

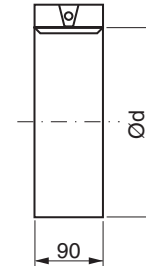


## Description

The inside of the sealing clamp is clad with longlife resistant EPDM rubber.

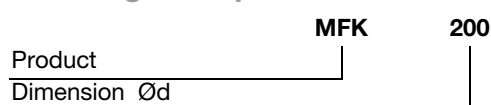
Used for sealing joints on slide-on stub PTR and saddle PSVTR.

## Dimensions



| Ød<br>nom | m<br>kg |
|-----------|---------|
| 80        | 0,30    |
| 100       | 0,30    |
| 125       | 0,40    |
| 140       | 0,40    |
| 150       | 0,50    |
| 160       | 0,50    |
| 180       | 0,50    |
| 200       | 0,50    |
| 224       | 0,60    |
| 250       | 0,60    |
| 300       | 0,60    |
| 315       | 0,70    |
| 350       | 0,70    |
| 400       | 0,80    |
| 450       | 1,10    |
| 500       | 1,20    |

## Ordering example



- 1
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# Rectangular
















|                                    |           |
|------------------------------------|-----------|
| Lindab                             | 1         |
| General information and theory     | 2         |
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| 10 |  |                 |
| 11 | <b>Rect-to-round transition</b>   | LORU ..... 540  |
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# Content – Rectangular

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# General

1 Some products might differ slightly from country to country. Please contact your local Lindab store for correct information.

2 Rectangular consists of rectangular ducts, fittings and silencers with dimensions in accordance with SS-EN 1505 when not otherwise specified. The duct system fulfils tightness class C and pressure class 2 according to EN 1507:2006. All fittings and ducts are made of hot-dip galvanized steel sheet Z 275. If higher corrosion protection is needed, alu-zinc or stainless steel can be used.

3 A joining profile is mounted at the end of every fitting and duct. A common slide profile LS-3 or bolt clamps and a seal moulding, RJSM is needed to join components. So pre-cut mouldings and an adequate length of seal moulding are supplied in each delivery. Seals are made from temperature resistant polythene. Recommended temperature range is -70 to +80°C.

4 Support distances of ducts and components must never exceed 2400 mm for any dimension. Nor may there be more than one joint between two supports. The support must be located max. 500 mm from a joint.

5 Non-standard ducts and duct components can be tendered on request. Please enclose a dimensioned sketch if possible.

## 6 Tightness

Ducts and fittings fulfil tightness class C. This only applies on condition that the products are installed in accordance with the installation instruction.

7 Please refer to page 39–40 for more information about sealing classes and official requirements.

## 8 Strength

Standard ducts and duct components can withstand positive of 1000 Pa and negative pressures of -750 Pa.

9 The ducts are manufactured to fulfil the requirements of EN 1507:2006. This means that when the duct is submitted to the maximum pressure of relevant pressure class than

- 10 • the duct slide doesn't bulge or cave more than the smallest value of 3% of its width or 30 mm
- 11 • the joint between two products doesn't bulge or cave more than 1/250-part of the longest side width.

12 Larger ducts and fittings are reinforced by hat-shaped profiles and rods.

## Dimensions and weights

The "I"-measures given in the tables are the overall installation dimensions of products. The following tolerances apply, depending on duct or fitting dimensions.

a and b are the internal duct or fitting dimensions.

### Tolerances for dimensions a and b

when  $a + b \leq 1200$ : +0 mm

when  $a + b > 1200$ :  $\begin{matrix} -4 \\ -6 \end{matrix}$  mm

Tolerances for "I"-measures  $\pm 5$  mm

### Hydraulic diameter $d_h$

The diameter of a circular duct which gives the same pressure drop at the same air velocity as in the rectangular duct.

$$d_h = \frac{4 \cdot A_c}{O} = \frac{2 \cdot a \cdot b}{a + b}$$

### Equivalent diameter $d_e$

The diameter of a circular duct which gives the same pressure drop at the same air flow as in the rectangular duct.

### Insulated ducts

Insulated ducts can be made in the following designs:

- Internally condensation and heat insulated with Lindtec®
- Internally insulated, clad with solid sheet metal
- Internally insulated, clad with perforated sheet metal
- Internal fire protection insulation 50 and 100 mm



# General

## Technical data for standard sizes

### Cross-sectional area, $A_c$ [m<sup>2</sup>]

| b \ a | 200  | 250  | 300  | 400  | 500  | 600  | 800  | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 100   | 0,02 | 0,03 | 0,03 | 0,04 |      |      |      |      |      |      |      |      |      |
| 150   | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 |      |      |      |      |      |      |      |
| 200   | 0,04 | 0,05 | 0,06 | 0,08 | 0,10 | 0,12 | 0,16 |      |      |      |      |      |      |
| 250   |      | 0,06 | 0,08 | 0,10 | 0,13 | 0,15 | 0,20 | 0,25 |      |      |      |      |      |
| 300   |      |      | 0,09 | 0,12 | 0,15 | 0,18 | 0,24 | 0,30 | 0,36 |      |      |      |      |
| 400   |      |      |      | 0,16 | 0,20 | 0,24 | 0,32 | 0,40 | 0,48 | 0,56 | 0,64 |      |      |
| 500   |      |      |      |      | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 | 0,70 | 0,80 | 0,90 | 1,00 |
| 600   |      |      |      |      |      | 0,36 | 0,48 | 0,60 | 0,72 | 0,84 | 0,96 | 1,08 | 1,20 |
| 800   |      |      |      |      |      |      | 0,64 | 0,80 | 0,96 | 1,12 | 1,28 | 1,44 | 1,60 |
| 1000  |      |      |      |      |      |      |      | 1,00 | 1,20 | 1,40 | 1,60 | 1,80 | 2,00 |
| 1200  |      |      |      |      |      |      |      |      | 1,44 | 1,68 | 1,92 | 2,16 | 2,40 |

$$A_c = a \times b$$

### Circumference, $O$ [m]

| b \ a | 200 | 250 | 300 | 400 | 500 | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
|-------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| 100   | 0,6 | 0,7 | 0,8 | 1,0 |     |     |     |      |      |      |      |      |      |
| 150   | 0,7 | 0,8 | 0,9 | 1,1 | 1,3 | 1,5 |     |      |      |      |      |      |      |
| 200   | 0,8 | 0,9 | 1,0 | 1,2 | 1,4 | 1,6 | 2,0 |      |      |      |      |      |      |
| 250   |     | 1,0 | 1,1 | 1,3 | 1,5 | 1,7 | 2,1 | 2,5  |      |      |      |      |      |
| 300   |     |     | 1,2 | 1,4 | 1,6 | 1,8 | 2,2 | 2,6  | 3,0  |      |      |      |      |
| 400   |     |     |     | 1,6 | 1,8 | 2,0 | 2,4 | 2,8  | 3,2  | 3,6  | 4,0  |      |      |
| 500   |     |     |     |     | 2,0 | 2,2 | 2,6 | 3,0  | 3,4  | 3,8  | 4,2  | 4,6  | 5,0  |
| 600   |     |     |     |     |     | 2,4 | 2,8 | 3,2  | 3,6  | 4,0  | 4,4  | 4,8  | 5,2  |
| 800   |     |     |     |     |     |     | 3,2 | 3,6  | 4,0  | 4,4  | 4,8  | 5,2  | 5,6  |
| 1000  |     |     |     |     |     |     |     | 4,0  | 4,4  | 4,8  | 5,2  | 5,6  | 6,0  |
| 1200  |     |     |     |     |     |     |     |      | 4,8  | 5,2  | 5,6  | 6,0  | 6,4  |

$$O = 2 \times (a + b)$$

### Hydraulic diameter, $d_h$ [mm]

| b \ a | 200 | 250 | 300 | 400 | 500 | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
|-------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| 100   | 133 | 143 | 150 | 160 |     |     |     |      |      |      |      |      |      |
| 150   | 171 | 188 | 200 | 218 | 231 | 240 |     |      |      |      |      |      |      |
| 200   | 200 | 222 | 240 | 267 | 286 | 300 | 320 |      |      |      |      |      |      |
| 250   |     | 250 | 273 | 308 | 333 | 353 | 381 | 400  |      |      |      |      |      |
| 300   |     |     | 300 | 343 | 375 | 400 | 436 | 462  | 480  |      |      |      |      |
| 400   |     |     |     | 400 | 444 | 480 | 533 | 571  | 600  | 622  | 640  |      |      |
| 500   |     |     |     |     | 500 | 545 | 615 | 667  | 706  | 737  | 762  | 783  | 800  |
| 600   |     |     |     |     |     | 600 | 686 | 750  | 800  | 840  | 873  | 900  | 923  |
| 800   |     |     |     |     |     |     | 800 | 889  | 960  | 1018 | 1067 | 1108 | 1143 |
| 1000  |     |     |     |     |     |     |     | 1000 | 1091 | 1167 | 1231 | 1286 | 1333 |
| 1200  |     |     |     |     |     |     |     |      | 1200 | 1292 | 1371 | 1440 | 1500 |

$$d_h = 4 \times A_c / O = 2 \times a \times b / (a + b)$$



# General

## Equivalent diameter, $d_e$ [mm]

| b \ a | 200 | 250 | 300 | 400 | 500 | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
|-------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| 100   | 152 | 169 | 183 | 207 |     |     |     |      |      |      |      |      |      |
| 150   | 189 | 210 | 229 | 260 | 287 | 310 |     |      |      |      |      |      |      |
| 200   | 219 | 244 | 267 | 305 | 337 | 366 | 414 |      |      |      |      |      |      |
| 250   |     | 274 | 299 | 344 | 381 | 414 | 470 | 518  |      |      |      |      |      |
| 300   |     |     | 328 | 378 | 421 | 458 | 521 | 575  | 621  |      |      |      |      |
| 400   |     |     |     | 438 | 489 | 534 | 610 | 675  | 732  | 783  | 829  |      |      |
| 500   |     |     |     |     | 547 | 599 | 688 | 763  | 829  | 888  | 941  | 991  | 1036 |
| 600   |     |     |     |     |     | 657 | 757 | 842  | 916  | 982  | 1043 | 1098 | 1150 |
| 800   |     |     |     |     |     |     | 876 | 978  | 1068 | 1148 | 1221 | 1289 | 1351 |
| 1000  |     |     |     |     |     |     |     | 1095 | 1199 | 1292 | 1376 | 1454 | 1527 |
| 1200  |     |     |     |     |     |     |     |      | 1314 | 1419 | 1514 | 1602 | 1684 |

$$d_e = 2 \times b \times (\pi^{2-n} \times (1 + a/b)^{1+n} / (a/b)^3)^{1/(n-5)}$$

where  $n = 1 / (1,05 \times \log(\text{Re}) - 0,45)$

where  $\text{Re} = v_m \times d_h / \nu$

where  $v_m = 5 \text{ m/s}$

and  $\nu = 0,000\,000\,101\,312 \times t + 0,010\,013\,001\,375\,72$

where  $t = 20^\circ\text{C}$

## Specific weight, $m_l$ [kg/m]

| b \ a | 200 | 250 | 300 | 400 | 500 | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
|-------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| 100   | 5   | 6   | 6   | 8   |     |     |     |      |      |      |      |      |      |
| 150   | 6   | 6   | 7   | 9   | 10  | 12  |     |      |      |      |      |      |      |
| 200   | 6   | 7   | 8   | 10  | 11  | 13  | 16  |      |      |      |      |      |      |
| 250   |     | 8   | 9   | 10  | 12  | 14  | 17  | 21   |      |      |      |      |      |
| 300   |     |     | 10  | 11  | 13  | 14  | 17  | 22   | 25   |      |      |      |      |
| 400   |     |     |     | 13  | 14  | 16  | 19  | 23   | 27   | 31   | 44   |      |      |
| 500   |     |     |     |     | 16  | 17  | 21  | 25   | 28   | 33   | 46   | 50   | 55   |
| 600   |     |     |     |     |     | 19  | 22  | 27   | 30   | 34   | 48   | 53   | 57   |
| 800   |     |     |     |     |     |     | 25  | 30   | 33   | 37   | 53   | 57   | 62   |
| 1000  |     |     |     |     |     |     |     | 34   | 38   | 42   | 58   | 62   | 67   |
| 1200  |     |     |     |     |     |     |     |      | 41   | 45   | 62   | 67   | 72   |



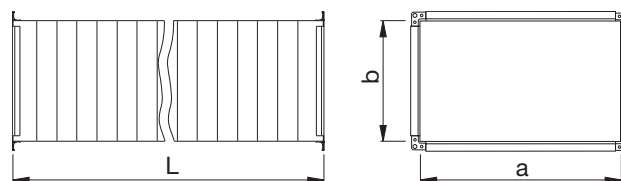


# Duct

# LKR



## Dimensions



### Description

Straight duct, stiffened with transverse trapezoid corrugations, which reduces the risk of noise generation. Larger dimensions have stiffening profiles and/or internal rods. Installation height of these profiles is 23 mm.

When  $a$  or  $b \leq 1200$ , standard lengths are 2400 or 1250 mm. If  $a$  or  $b > 1200$ , standard length is 1250 mm. Other lengths can be ordered.

Ducts are normally supplied with a strong joining profile RJFP 20 or RJFP 30 at each end, but can also be supplied as a flexible piece, where the joining profile on one end is not fixed. Also available with an end cover fixed by joining profiles.

### Ordering example

|   | LKR | 500 | 300 | 1 | 1 |
|---|-----|-----|-----|---|---|
| Product                                     |     |     |     |   |   |
| Largest side                                | a   |     |     |   |   |
| Smallest side                               | b   |     |     |   |   |
| L = 2400 mm*                                | 1   |     |     |   |   |
| L = 1250 mm                                 | 2   |     |     |   |   |
| L < 2400 mm                                 | L   |     |     |   |   |
| RJFP-joint at both ends                     |     | 1   |     |   |   |
| RJFP-joint at one end                       |     |     |     |   |   |
| Loose joint included.                       |     | 2   |     |   |   |
| RJFP-joint at one end                       |     |     |     |   |   |
| End cover on joining profiles at other end. |     |     | 3   |   |   |
| End cover on joining profiles at both ends. |     |     |     | 4 |   |
| RJFP-joint at one end                       |     |     |     |   |   |
| No loose joint included.                    |     |     |     | 5 |   |

\* Applies when  $a$  or  $b \leq 200$  mm.

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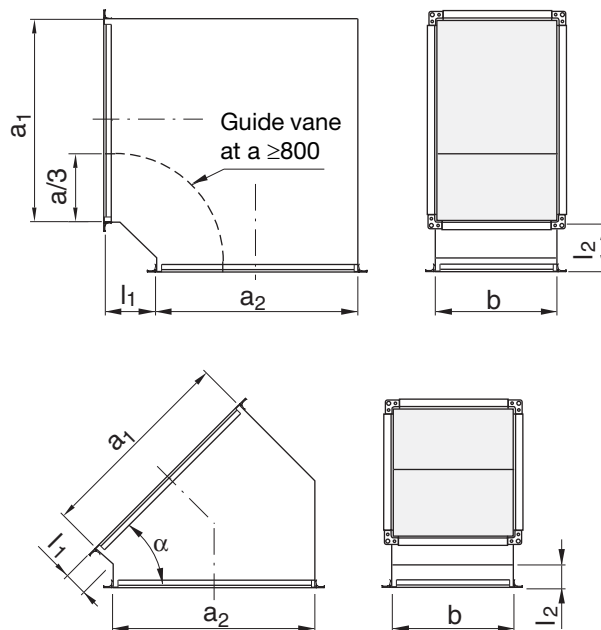


# Bend

LBR



## Dimensions



## Description

Bend with sharp outer corner, stiffened with trapezoid corrugation.

The bend is delivered with 90° or 45° angles and joining profile RJFP at both ends. Other leg lengths and angles can also be ordered.

Standard design  $l_1 = l_2 = 125$  mm.

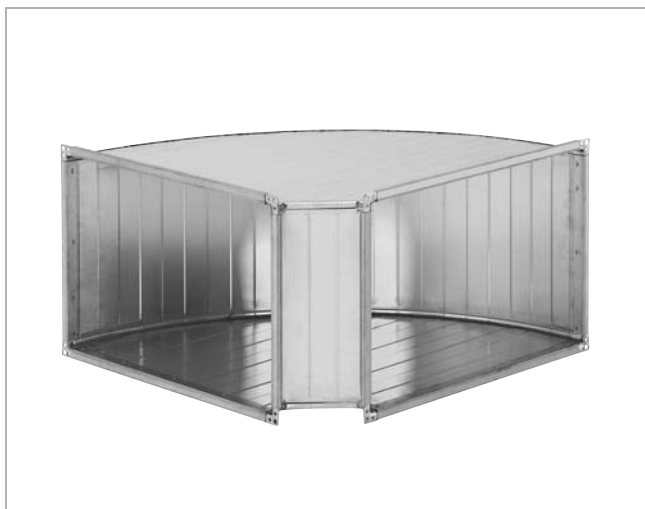
## Ordering example

|             | LBR      | 500 | 300 | 500 | 1 | 1 | 1 |
|-------------|----------|-----|-----|-----|---|---|---|
| Product     |          |     |     |     |   |   |   |
| Form side   | $a_1$    |     |     |     |   |   |   |
| Curved side | $b$      |     |     |     |   |   |   |
| Form side   | $a_2$    |     |     |     |   |   |   |
| 90°         | 1        |     |     |     |   |   |   |
| 45°         | 2        |     |     |     |   |   |   |
| Angle       | $\alpha$ |     |     |     |   |   |   |
| 125 mm      | 1        |     |     |     |   |   |   |
| Leg length  | $l_1$    |     |     |     |   |   |   |
| 125 mm      | 1        |     |     |     |   |   |   |
| Leg length  | $l_2$    |     |     |     |   |   |   |



# Bend

# LBXR



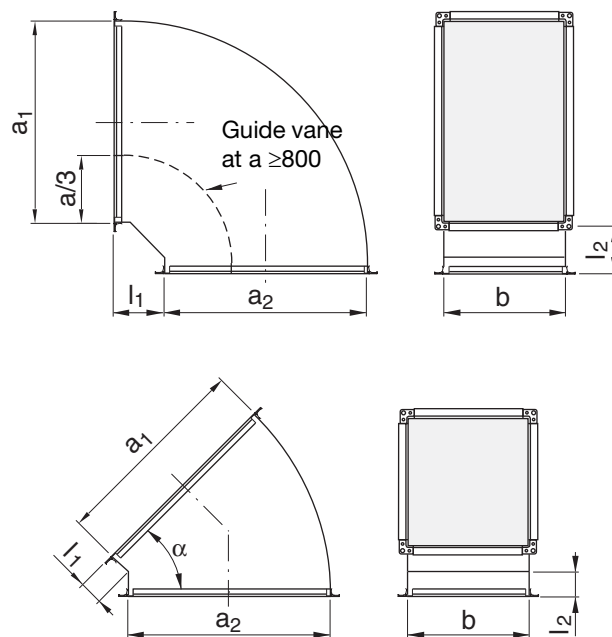
## Description

Bend with rounded outer corner, stiffened with trapezoid corrugations.

The bend is delivered with 90° or 45° angles and joining profiles type RJFP at both ends. Other leg lengths and angles can also be ordered.

Standard design  $l_1 = l_2 = 125$  mm.

## Dimensions



## Ordering example

|             | LBXR     | 500 | 300 | 500 | 1 | 1 | 1 |
|-------------|----------|-----|-----|-----|---|---|---|
| Product     |          |     |     |     |   |   |   |
| Form side   | $a_1$    |     |     |     |   |   |   |
| Curved side | $b$      |     |     |     |   |   |   |
| Form side   | $a_2$    |     |     |     |   |   |   |
| 90°         | 1        |     |     |     |   |   |   |
| 45°         | 2        |     |     |     |   |   |   |
| Angle       | $\alpha$ |     |     |     |   |   |   |
| 125 mm      | 1        |     |     |     |   |   |   |
| Leg length  | $l_1$    |     |     |     |   |   |   |
| 125 mm      | 1        |     |     |     |   |   |   |
| Leg length  | $l_2$    |     |     |     |   |   |   |

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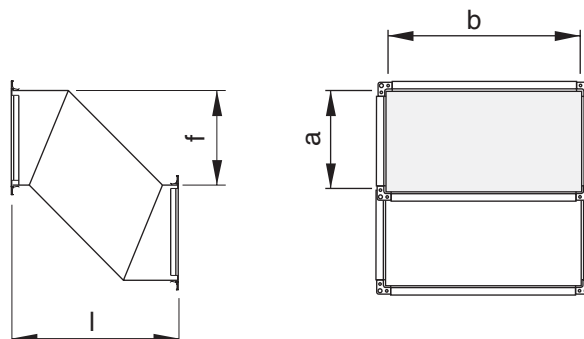


# S-bend

# LBSR



## Dimensions



### Description

Used for deflections of the duct system, for example where ducts cross.

Has a joining profile type RJFP at both ends, and is stiffened by trapezoid corrugations.

A special relationship is needed between the a-dimension, fall f and length l for the LBSR to retain its cross-sectional area and not restrict the air flow. For this reason, standard lengths and standard drops have been prepared.

| a<br>mm | l<br>std<br>mm | f<br>std<br>mm |
|---------|----------------|----------------|
| 100     | 400            | 300            |
| 150     | 400            | 300            |
| 200     | 400            | 300            |
| 250     | 400            | 300            |
| 300     | 500            | 300            |
| 350     | 500            | 300            |
| 400     | 600            | 400            |
| 450     | 600            | 400            |
| 500     | 600            | 400            |
| 600     | 700            | 400            |
| 700     | 800            | 500            |
| 800     | 900            | 500            |
| 900     | 1000           | 500            |
| 1000    | 1100           | 500            |
| 1100    | 1200           | 500            |
| 1200    | 1300           | 500            |
| 1300    | 1400           | 500            |
| 1400    | 1500           | 500            |
| 1500    | 1600           | 500            |
| 1600    | 1700           | 500            |
| 1800    | 1900           | 500            |
| 2000    | 2100           | 500            |

### Ordering example

|             |      |     |     |     |     |
|-------------|------|-----|-----|-----|-----|
| Product     | LBSR | 300 | 600 | 300 | 400 |
| Form side   | a    |     |     |     |     |
| Curved side | b    |     |     |     |     |
| Fall        | f    |     |     |     |     |
| Length      | l    |     |     |     |     |



# Taper

# LDR



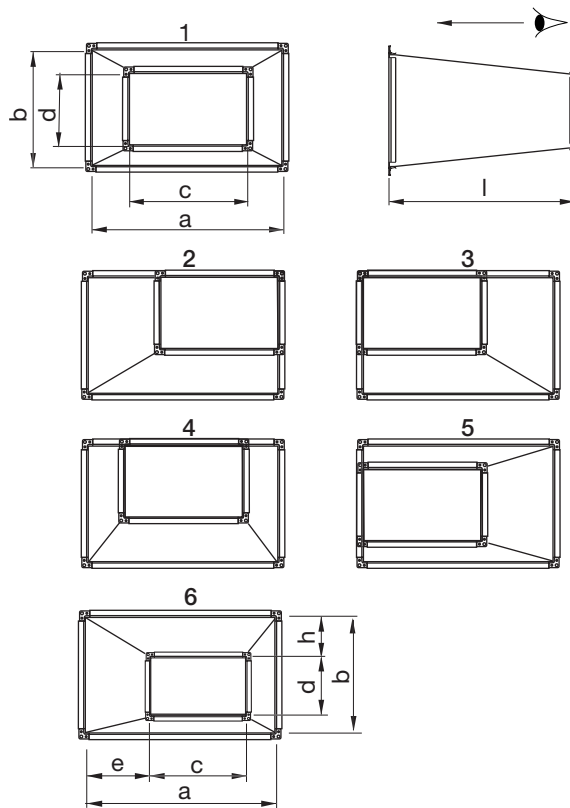
## Description

The taper is used as transition between different duct dimensions. The larger dimensions are available with offsets as in the coded sketches.

Dimension changes have a joining profile type RJFP at both ends, and are stiffened by trapezoid corrugations.

Measures e and h only need to be given for alternative 6. Negative values for e, for example, mean that e is outside side a.

## Dimensions



## Ordering example

|   |     |     |     |     |       |   |     |       |                          |
|---|-----|-----|-----|-----|-------|---|-----|-------|--------------------------|
|   | LDR | 500 | 300 | 300 | 200   | 1 | 450 | ..... | .....                    |
| Product   |     |     |     |     |       |   |     |       |                          |
| Large end   | a   |     |     |     |       |   |     |       |                          |
| Large end   | b   |     |     |     |       |   |     |       |                          |
| Small end   | c   |     |     |     |       |   |     |       |                          |
| Small end   | d   |     |     |     |       |   |     |       |                          |
| The alternative displacements are seen from the cxd end |     |     |     |     | 1 - 6 |   |     |       |                          |
| Length  | l   |     |     |     |       |   |     |       |                          |
| Displacement  | h   |     |     |     |       |   |     |       | (Only at alternative 6.) |
| Displacement  | e   |     |     |     |       |   |     |       | (Only at alternative 6.) |

| a mm | l std mm |
|------|----------|
| 100  | 300      |
| 150  | 300      |
| 200  | 300      |
| 250  | 300      |
| 300  | 300      |
| 350  | 300      |
| 400  | 450      |
| 450  | 450      |
| 500  | 450      |
| 600  | 450      |
| 700  | 450      |
| 800  | 600      |
| 900  | 600      |
| 1000 | 600      |
| 1100 | 600      |
| 1200 | 600      |
| 1300 | 600      |
| 1400 | 600      |
| 1500 | 600      |
| 1600 | 600      |
| 1800 | 600      |
| 2000 | 600      |

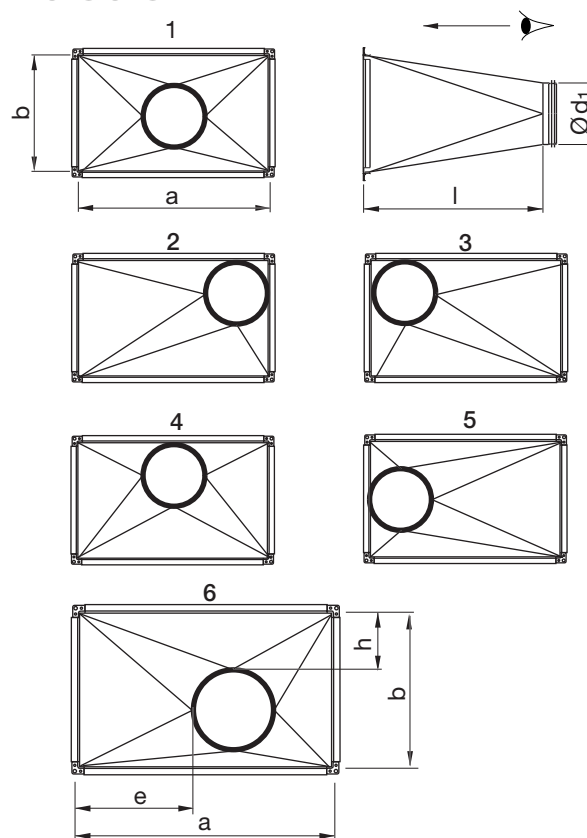


# Rect-to-round transition

# LORU



## Dimensions



## Description

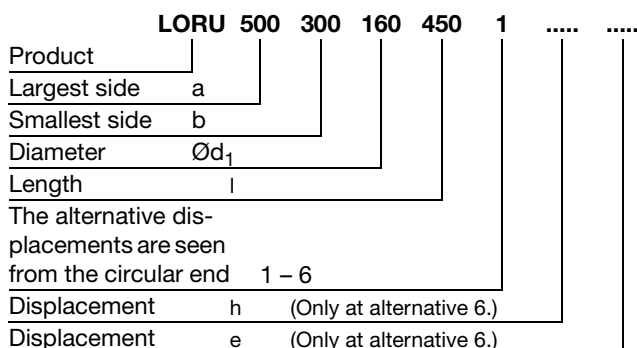
Rect-to-round transition are used between rectangular and circular ducts. The rectangular connection has joining profiles type RJFP and the circular connection has Safe seal.

The rectangular connection is available with offsets as in the coded sketches.

Measures e and h only need to be given for alternative 6. Negative values for e, for example, mean that e is outside side a.

| a mm | l std mm |
|------|----------|
| 100  | 300      |
| 150  | 300      |
| 200  | 300      |
| 250  | 300      |
| 300  | 300      |
| 350  | 300      |
| 400  | 450      |
| 450  | 450      |
| 500  | 450      |
| 600  | 450      |
| 700  | 450      |
| 800  | 600      |
| 900  | 600      |
| 1000 | 600      |
| 1100 | 600      |
| 1200 | 600      |
| 1300 | 600      |
| 1400 | 600      |
| 1500 | 600      |
| 1600 | 600      |
| 1800 | 600      |
| 2000 | 600      |

## Ordering example





# Collar

LTR

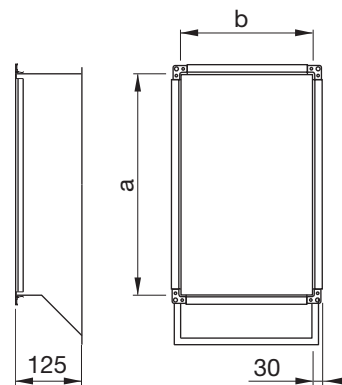


## Description

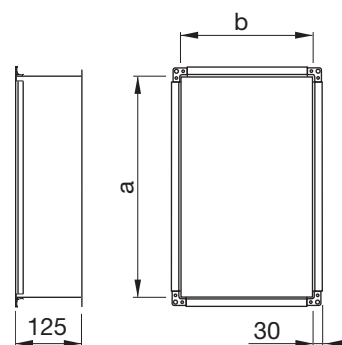
The collar is used for connection to rectangular duct. The smaller joint end is provided with joining profiles type RJFP. The larger one has an edge, for fixing with blind rivets or self-tapping screws, but can also be given a folding tab to facilitate assembly.

## Dimensions

Sloping design: FAS



Straight design: RAK



## Ordering example

|                          |          |     |     |     |     |     |   |
|--------------------------|----------|-----|-----|-----|-----|-----|---|
| Product                  |          | LTR | 500 | 300 | 125 | FAS | v |
| Form side                | a        |     |     |     |     |     |   |
| Curved side              | b        |     |     |     |     |     |   |
| Length                   |          |     |     |     |     |     |   |
| Design                   | sloping  | FAS |     |     |     |     |   |
|                          | straight | RAK |     |     |     |     |   |
| Option                   |          |     |     |     |     |     |   |
| Fixing with folding tabs |          |     |     |     |     |     |   |

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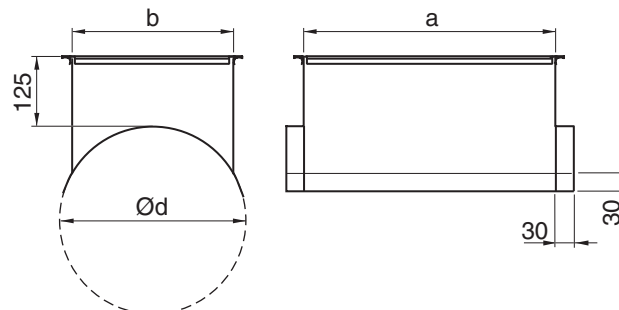
# Collar on circular duct

LTRSR

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- 12
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- 17
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## Dimensions



### Description

The collar is used for connection to circular duct. The rectangular end is provided with joining profiles type RJFP. The rounded end has an edge, for fixing with blind rivets or self-tapping screws.

Other lengths can also be supplied.

### Ordering example

|          | LTRSR | 600 | 300 | 400 | 125 |
|----------|-------|-----|-----|-----|-----|
| Product  |       |     |     |     |     |
| Side     | a     |     |     |     |     |
| Side     | b     |     |     |     |     |
| Diameter | Ød    |     |     |     |     |
| Length   |       |     |     |     |     |





# T-piece

# LTROR



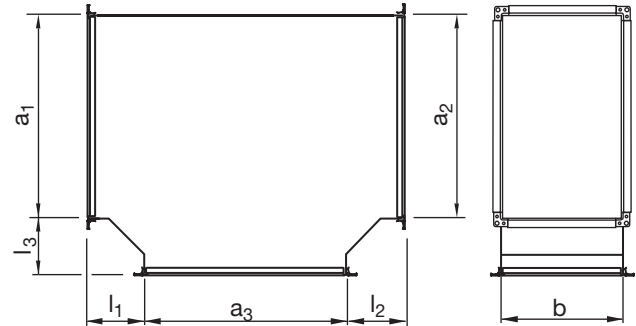
## Description

A T-piece which is provided with joining profiles type RJFP and is stiffened with trapezoid corrugations.

Standard design  $l_1 = l_2 = l_3 = 125$  mm.

Other leg lengths can also be supplied.

## Dimensions



## Ordering example

|            | LTROR | 600 | 600 | 800 | 400 | 1 | 1 | 1 |
|------------|-------|-----|-----|-----|-----|---|---|---|
| Product    |       |     |     |     |     |   |   |   |
| Side       | $a_1$ |     |     |     |     |   |   |   |
| Side       | $a_2$ |     |     |     |     |   |   |   |
| Side       | $a_3$ |     |     |     |     |   |   |   |
| Side       | b     |     |     |     |     |   |   |   |
| 125 mm     | 1     |     |     |     |     |   |   |   |
| Leg length | $l_1$ |     |     |     |     |   |   |   |
| 125 mm     | 1     |     |     |     |     |   |   |   |
| Leg length | $l_2$ |     |     |     |     |   |   |   |
| 125 mm     | 1     |     |     |     |     |   |   |   |
| Leg length | $l_3$ |     |     |     |     |   |   |   |

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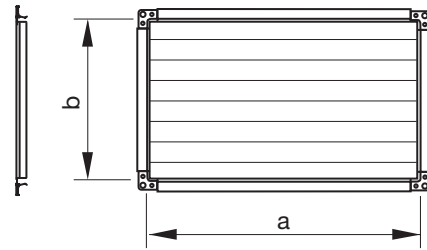
# End cover

# LEPR

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## Dimensions



### Description

Used as end cover in duct.

The edges are equipped with joining profiles type RJFP.

The end cover is stiffened with trapezoid corrugations.

### Ordering example

|               |      |     |     |
|---------------|------|-----|-----|
| Product       | LEPR | 500 | 300 |
| Largest side  | a    |     |     |
| Smallest side | b    |     |     |



# Rectangular joint system

The joint system is strong, airtight and easy to install.

- Flange profiles
- Corners
- Flange profile fasteners
- Corner fasteners
- Seal moulding



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## Flange profiles

RJFP Rectangular Joint Flange Profil comes in three sizes, different sheet steel thicknesses, with and without sealant.



## Dimensions

| Code | Dim | Length | Material | Type | Thickness |
|------|-----|--------|----------|------|-----------|
| RJFP | 20  | 5000   | GALV     |      | 0,7       |
| RJFP | 20  | 5000   | GALV     | SEAL | 0,7       |
| RJFP | 20  | 5000   | GALV     |      | 0,8       |
| RJFP | 20  | 5000   | GALV     | SEAL | 0,8       |
| RJFP | 30  | 5000   | GALV     |      | 0,8       |
| RJFP | 30  | 5000   | GALV     | SEAL | 0,8       |
| RJFP | 30  | 5000   | GALV     |      | 0,9       |
| RJFP | 30  | 5000   | GALV     | SEAL | 0,9       |
| RJFP | 40  | 5700   | GALV     |      | 1,13      |
| RJFP | 40  | 5700   | GALV     |      | 1,2       |

## Ordering example

|           |             |           |             |             |            |
|-----------|-------------|-----------|-------------|-------------|------------|
|           | <b>RJFP</b> | <b>20</b> | <b>5000</b> | <b>GALV</b> | <b>0,7</b> |
| Product   |             |           |             |             |            |
| Dimension |             |           |             |             |            |
| Length    |             |           |             |             |            |
| Material  |             |           |             |             |            |
| Thickness |             |           |             |             |            |

### RJFP 20



### RJFP 30



### RJFP 40





# Rectangular joint system

## Corners

1

### RJCL 20

The corner is constructed to fit the flange profile RJFP 20.



2

3

4

5

Length 63 is to be used when the side of the duct is very small. Up to 100 mm.

6



7

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Length 73 is to be used in all normal cases where the 20 profile is used.

10

11



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14

Length 95 is to be used as a compromise when the side of the duct is large but the bigger profile RJFP 30 is too high.

15

### Ordering example

|           |             |           |           |             |          |
|-----------|-------------|-----------|-----------|-------------|----------|
|           | <b>RJCL</b> | <b>20</b> | <b>63</b> | <b>GALV</b> | <b>3</b> |
| Product   |             |           |           |             |          |
| Dimension |             |           |           |             |          |
| Length    |             |           |           |             |          |
| Material  |             |           |           |             |          |
| Thickness |             |           |           |             |          |

17

18

### RJCL 30

The corner is constructed to fit the flange profile RJFP 30.



### RJCL 40

The corner is constructed to fit the flange profile RJFP 40



### Dimensions

| Code | Dim | Length | Material | Thickness |
|------|-----|--------|----------|-----------|
| RJCL | 20  | 63     | GALV     | 3         |
| RJCL | 20  | 73     | GALV     | 3         |
| RJCL | 20  | 95     | GALV     | 3         |
| RJCL | 30  | 103    | GALV     | 3         |
| RJCL | 40  | 123    | GALV     | 4         |



# Rectangular joint system

## Flange profile fasteners

### RJBC

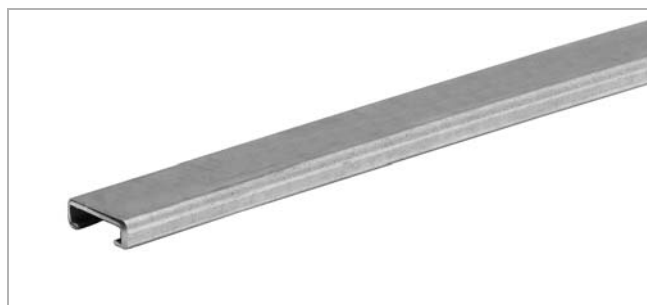
Rectangular Joint Bolt Clamp



The clamp is easy to use where there is sufficient space to fasten the clamp.

### RJSP

Rectangular Joint Slide Profile



The slide profile does not demand space above the profile, but there has to be space at the side of the duct.

## Dimensions

| Code | Dim | Length | Material | Thickness |
|------|-----|--------|----------|-----------|
| RJBC |     |        | GALV     |           |
| RJSP |     | 5000   | GALV     |           |
| RJB  | 8   | 25     | GALV     |           |
| RJB  | 10  | 25     | GALV     |           |
| RJN  | 8   |        | GALV     |           |
| RJN  | 10  |        | GALV     |           |
| RJSM | 9   | 10000  | PE       | 4         |
| RJSM | 12  | 10000  | PE       | 4         |

## Ordering example

|          |             |             |
|----------|-------------|-------------|
|          | <b>RJBC</b> | <b>GALV</b> |
| Product  |             |             |
| Material |             |             |

## Corner fasteners

The M8 bolt and nut is to be used with all the RJCL 20 corners. The M10 bolt and nut is to be used with RJCL 30 and 40 corners.

### RJB

Rectangular Joint Bolt



### RJN

Rectangular Joint Nut



## Seal moulding

### RJSM

Rectangular Joint Seal Moulding



The 9 mm seal moulding is to be used with RJFP 20 profile.

The 12 mm seal moulding is to be used with RJFP 30 and 40 profiles.

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# Rectangular duct stiffeners

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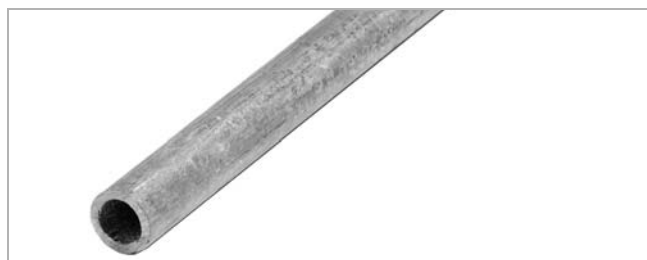
The rod is round and together with the crosses and the rod fasteners it will decrease the bulging and caving of the duct.

- Rod
- Rod fasteners
- Rod crosses



## Rod

**RDR**  
Rectangular Duct Rod



## Rod fasteners

**RDRB**  
Rectangular Duct Rod Bolt



**RDRW**  
Rectangular Duct Rod Washer



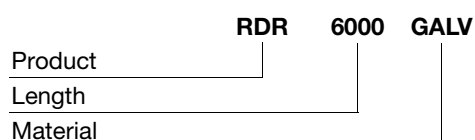
**RDRD**  
Rectangular Duct Rod Dowel



## Dimensions

| Code | Dim | Length | Material |
|------|-----|--------|----------|
| RDR  |     | 6000   | GALV     |
| RDRB | 6   | 40     | GALV     |
| RDRW |     |        | GALV     |
| RDRD | 6   |        |          |

## Ordering example



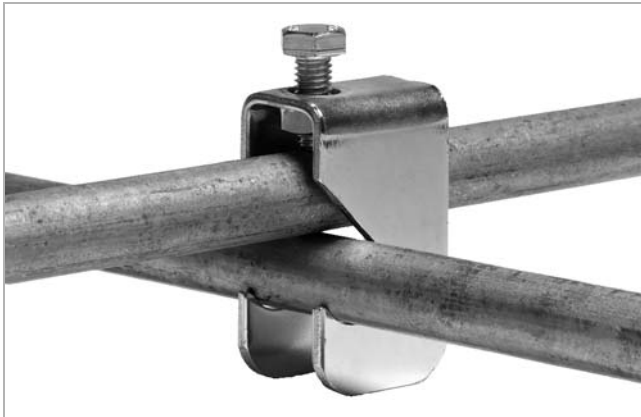


# Rectangular duct stiffeners

## Rod crosses

### **RDRC**

Rectangular Duct Rod Cross



The metal cross is used for large ducts.



The plastic cross is used for small ducts.

## Dimensions

| Code | Material |
|------|----------|
| RDRC | GALV     |
| RDRC | PE       |

## Ordering example

|          |             |             |
|----------|-------------|-------------|
|          | <b>RDRC</b> | <b>GALV</b> |
| Product  |             |             |
| Material |             |             |

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# RDVF

1

The vane fasteners are easy to mount and gives a stable and airtight construction.

- Vane fasteners

2

## Vane fasteners

Rectangular Duct Vane Fastener

3

## RDVF

4



5

6

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8

## Dimensions

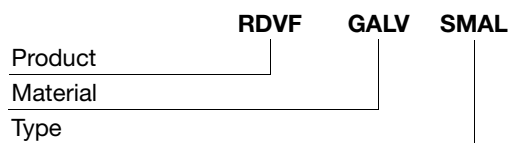
| Code | Material | Type |
|------|----------|------|
| RDVF | GALV     | SMAL |
| RDVF | GALV     | LARG |

9

10

11

## Ordering example



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The small Vane Fastener is used for sheet steel thickness 0,5–0,9 mm.



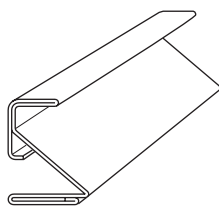
The large Vane Fastener is used for sheet steel thickness 0,9–1,25 mm.





# Joining parts

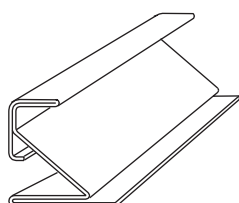
## Description



### Joining profile LS 1

Joining profile designed to be fixed to the duct by embossing with a special pincers. It is sealed to the duct by special factory-applied seam putty. Profile height is app. 20 mm. Normally supplied in 5 m lengths.

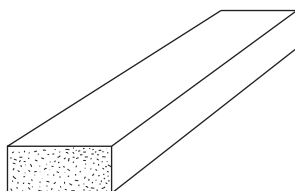
Specific weight: 0,40 kg/m



### Joining profile LS 11

Joining profile designed to be spot welded to the duct. It is sealed to the duct by special factory-applied seam putty. Profile height is app. 20 mm. Normally supplied in 5 m lengths.

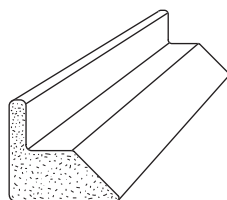
Specific weight: 0,47 kg/m



### Seal moulding LS 21

The seal moulding is intended to be installed in each joining profile.

Made from polythene foam. Supplied in 10 m coils.



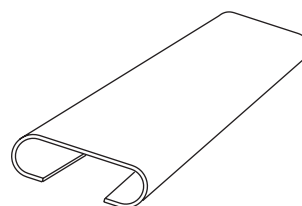
### Seal moulding LS 31

The seal moulding is intended to be installed in each joining profile.

Made from polythene foam.

**Included as standard with all orders.**

Supplied in 250 m in cartons.

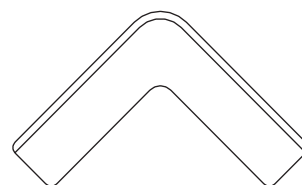


### Slide profile LS 3

Used to join two ducts or fittings which both have joining profiles.

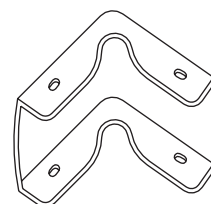
Normally supplied in 5 m lengths.

Specific weight: 0,20 kg/m



### Inner corner LS 4

Used to keep the seal moulding in place and give the ventilation duct stiffness and stability.



### Outer corner LS 5

Used outside the slide profile to protect the seal moulding and stiffen the joint. Gives a neat finish.

### Other joining methods

If you do not want to fix ducts or duct components together with slide mouldings, as described above, we can meet your needs. You must then specify the particular method of joining you want, in plain language. For example: blind rivet edge 25 mm, flat bar flange to a particular standard, or equivalent.

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| 18        |



# Flexible ducting



|                                    |           |
|------------------------------------|-----------|
| Lindab                             | 1         |
| General information and theory     | 2         |
| Safe                               | 3         |
| Silencers                          | 4         |
| Dampers & Measure units            | 5         |
| Fire dampers & Smoke evacuation    | 6         |
| Air valves                         | 7         |
| Roof hoods                         | 8         |
| Other circular products            | 9         |
| Transfer                           | 10        |
| Rectangular                        | 11        |
| <b>Flexible ducting</b>            | <b>12</b> |
| Isol                               | 13        |
| Access doors                       | 14        |
| Smart tools                        | 15        |
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## Uninsulated ducts

### Flexible duct



|            |     |
|------------|-----|
| KF.....    | 558 |
| FD.....    | 559 |
| FBLD.....  | 562 |
| FLD.....   | 563 |
| FMD.....   | 564 |
| FBLDD..... | 565 |
| FLDD.....  | 566 |

### Semiflexible duct



|          |     |
|----------|-----|
| FDO..... | 560 |
| FD.....  | 561 |
| FDD..... | 567 |

### Semiflexible connector



|             |     |
|-------------|-----|
| DRASUT..... | 568 |
|-------------|-----|

## Insulated ducts

### Flexible ducts



|            |     |
|------------|-----|
| FIBLD..... | 569 |
| FILD.....  | 570 |
| FIMD.....  | 571 |
| FIHD.....  | 572 |
| FDI.....   | 574 |
| FDFI.....  | 575 |

### Semiflexible duct



|           |     |
|-----------|-----|
| FIDD..... | 573 |
|-----------|-----|

## Silencers

### Flexible ducts



|             |     |
|-------------|-----|
| AKUCOM..... | 576 |
|-------------|-----|



|             |     |
|-------------|-----|
| FMDSL.....  | 577 |
| FHDSL.....  | 578 |
| FLDFSL..... | 579 |

### Semiflexible double duct



|             |     |
|-------------|-----|
| FDDGSL..... | 580 |
| FDDGSL..... | 581 |

## Flexible duct clamp



|          |     |
|----------|-----|
| MDC..... | 582 |
|----------|-----|

## Flexible duct band



|          |     |
|----------|-----|
| FDB..... | 583 |
|----------|-----|

## Flexible duct band lock



|           |     |
|-----------|-----|
| FDBL..... | 583 |
|-----------|-----|



# Flexible ducts and semiflexible ducts

## Linings and materials

|                   | Flexible     |                       |                  |                      | Semiflexible |            |            |                        | Denomination interpretation          |                                |                   |
|-------------------|--------------|-----------------------|------------------|----------------------|--------------|------------|------------|------------------------|--------------------------------------|--------------------------------|-------------------|
|                   | Denomination | Inner wall            | Insulation       | Outer wall           | Denomination | Inner wall | Insulation | Outer wall             |                                      |                                |                   |
| Uninsulated ducts | KF           | PVC                   |                  |                      |              |            |            |                        | Flexible Duct                        |                                |                   |
|                   | FD           | PVC                   |                  |                      |              |            |            |                        | Flexible Duct                        |                                |                   |
|                   |              |                       |                  |                      |              |            |            |                        | FDO                                  | AL                             | Flexible Duct One |
|                   |              |                       |                  |                      |              |            |            |                        | FD                                   | GALV                           | Flexible Duct     |
|                   | FBLD         | AP budget light       |                  |                      |              |            |            |                        | Flexible Budget Light Duct           |                                |                   |
|                   | FLD          | AP light              |                  |                      |              |            |            |                        | Flexible Light Duct                  |                                |                   |
|                   | FMD          | AP medium             |                  |                      |              |            |            |                        | Flexible Medium Duct                 |                                |                   |
|                   | FBLDD        | AP budget light + PVC |                  |                      |              |            |            |                        | Flexible Budget Light Double Duct    |                                |                   |
|                   | FLDD         | AP+PVC                |                  |                      |              |            |            |                        | Flexible Light Double Duct           |                                |                   |
|                   |              | FDD                   | AL+AL            | Flexible Double Duct |              |            |            |                        |                                      |                                |                   |
| Connector         |              |                       |                  |                      | DRASUT       | AL         |            |                        |                                      |                                |                   |
| Insulated ducts   | FIBLD        | AP budget light       | Glass wool 25 mm | AP or PMP            |              |            |            |                        | Flexible Insulated Budget Light Duct |                                |                   |
|                   | FILD         | AP light              | Glass wool 25 mm | AP                   |              |            |            |                        | Flexible Insulated Light Duct        |                                |                   |
|                   | FIMD         | AP medium             | Glass wool 25 mm | MP                   |              |            |            |                        | Flexible Insulated Medium Duct       |                                |                   |
|                   | FIHD         | AP heavy              | Glass wool 25 mm | AP                   |              |            |            |                        | Flexible Insulated Heavy Duct        |                                |                   |
|                   |              |                       |                  |                      |              | FIDD       | AL+AL      | Glass wool 25 or 50 mm | AL+AL                                | Flexible Insulated Double Duct |                   |
|                   | FDI          |                       | Glass wool 25 mm | AP                   |              |            |            |                        | Flexible Duct Insulation             |                                |                   |
|                   | FDFI         | PE                    | Glass wool 25 mm | AP                   |              |            |            |                        | Flexible Duct Foil Insulation        |                                |                   |

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# Flexible ducts and semiflexible ducts

|                  | Flexible     |            |                    |            | Semiflexible |            |                  |            | Denomination interpretation          |                                   |
|------------------|--------------|------------|--------------------|------------|--------------|------------|------------------|------------|--------------------------------------|-----------------------------------|
|                  | Denomination | Inner wall | Insulation         | Outer wall | Denomination | Inner wall | Insulation       | Outer wall |                                      |                                   |
| <b>Silencers</b> | AKUCOM       | AL         | Mineral wool 25 mm | PE         |              |            |                  |            |                                      |                                   |
|                  | FMDSL        | AP medium  | Glass wool 25 mm   | AP or MP   |              |            |                  |            |                                      | Flexible Medium Duct Silencer     |
|                  | FHDSL        | AP heavy   | Glass wool 25 mm   | AP         |              |            |                  |            |                                      | Flexible Heavy Duct Silencer      |
|                  | FLDFSL       | AP light   | Glass wool 25 mm   | AP or PMP  |              |            |                  |            |                                      | Flexible Light Duct Foil Silencer |
|                  |              |            |                    |            | FDDGSL       | AL+AL      | Glass wool 25 mm | AL+AL      | Flexible Double Duct Gables Silencer |                                   |
|                  |              |            |                    |            | FDDGSL       | AL+AL      | Glass wool 50 mm | AL+AL      | Flexible Double Duct Gables Silencer |                                   |

**Materials**

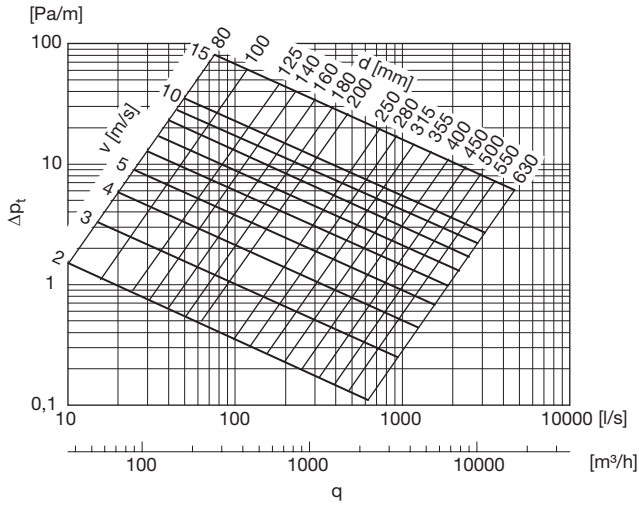
- AL = Aluminium
- AP = Aluminium-polyester
- GALV = Galvanized steel
- MP = Metalized Polyester
- PE = Polyester
- PVC = Polyvinyl Chloride



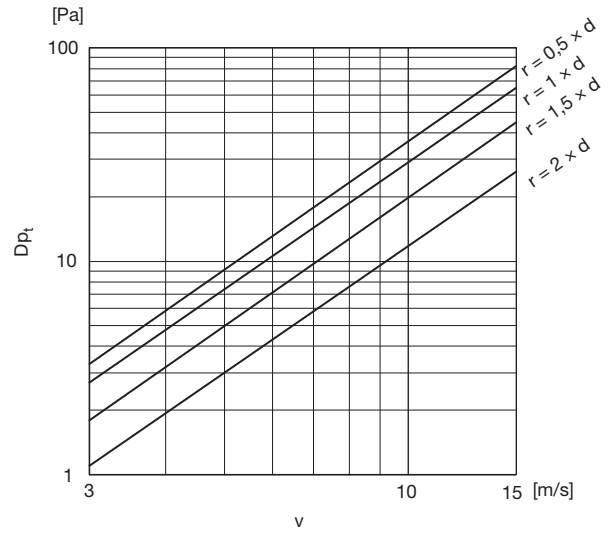
# Flexible ducts and semiflexible ducts

## Technical data

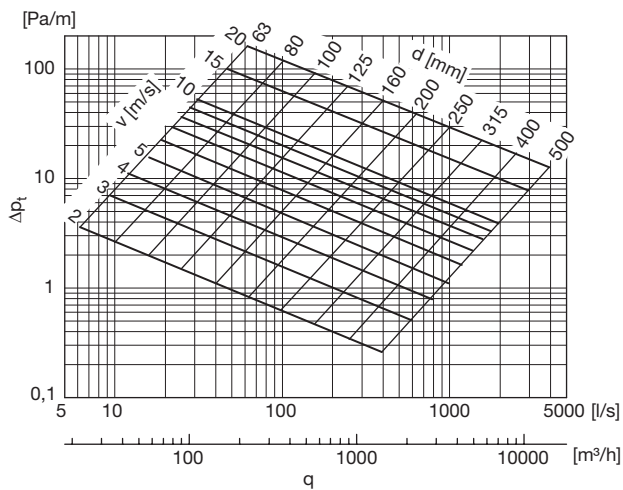
### Flexible ducts



### Flexible ducts 90° bends



### Semiflexible ducts

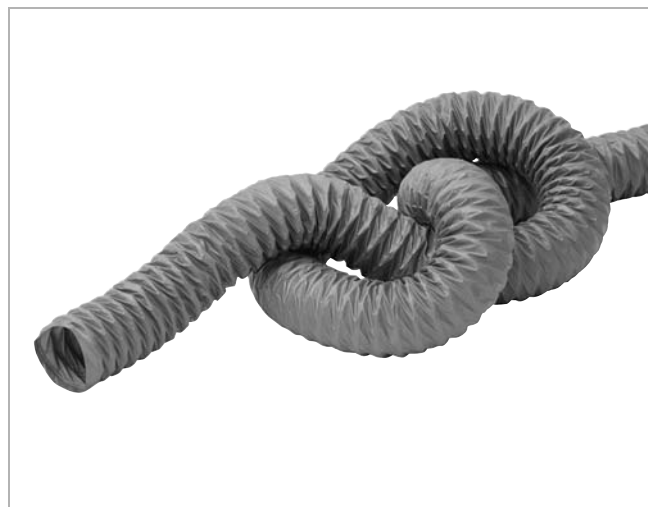


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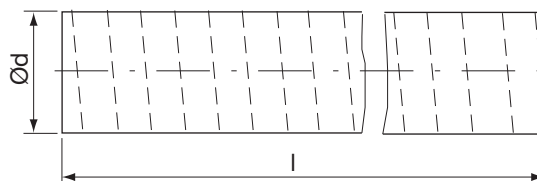


# Flexible duct

KF



## Dimensions



### Description

Single-layer duct wall reinforced with a spiral wire. Due to the materials used in its construction KF is able to withstand repeated flexing without damage or kinking.

### Applications

Suitable for high, medium and low pressure applications. Also suitable for air conditioning and fume extraction systems.

### Advantages

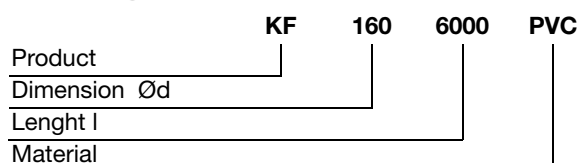
- Easy assembly
- Very small storage and transport volume
- Tested for fire resistance
- Manufactured from puncture and tear resistant materials. Withstands repeated flexing without damage

### Technical data

|                             |  |
|-----------------------------|--|
| Duct material .....         | PVC coated glassfibre fabric                                     |
| Colour .....                | Grey   |
| Minimum bending radius..... | 0,5×d  |
| Maximum air velocity .....  | 25 m/s   |
| Temperature range .....     | -20 to +70 °C  |
| Working pressure .....      | -125 to +3000 Pa   |
| Fire type approval .....    | Meets class E according to EN 13501-1 and French class M1 (CSTB) |

| Ød<br>nom | O<br>$\pi d$<br>m | A<br>$\pi d^2/4$<br>m <sup>2</sup> | l<br>mm |
|-----------|-------------------|------------------------------------|---------|
| 80        | 0,251             | 0,005                              | 6000    |
| 100       | 0,314             | 0,008                              | 6000    |
| 125       | 0,393             | 0,012                              | 6000    |
| 150       | 0,471             | 0,018                              | 6000    |
| 160       | 0,503             | 0,020                              | 6000    |
| 180       | 0,565             | 0,025                              | 6000    |
| 200       | 0,628             | 0,031                              | 6000    |
| 224       | 0,704             | 0,039                              | 6000    |
| 250       | 0,785             | 0,049                              | 6000    |
| 280       | 0,880             | 0,062                              | 6000    |
| 300       | 0,942             | 0,071                              | 6000    |
| 315       | 0,990             | 0,078                              | 6000    |
| 350       | 1,10              | 0,096                              | 6000    |
| 400       | 1,26              | 0,126                              | 6000    |
| 450       | 1,41              | 0,159                              | 6000    |
| 500       | 1,57              | 0,196                              | 6000    |
| 560       | 1,76              | 0,246                              | 6000    |
| 600       | 1,88              | 0,292                              | 6000    |

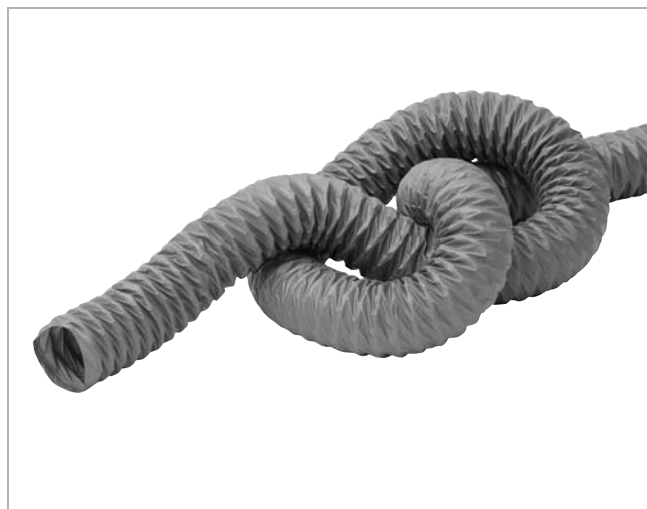
### Ordering example





# Flexible duct

FD



## Description

Single-layer duct wall reinforced with a spiral wire. Due to the materials used in its construction FD is able to withstand repeated flexing without damage or kinking.

## Applications

Suitable for high, medium and low pressure applications. Also suitable for air conditioning and fume extraction systems.

## Classifications

EU - EN 13180 Dia. Class B, Tightness Class C, Sag < 15°, Crushing Strength 13–35 kg compressed, 2–5 kg uncompressed.

## Advantages

- Easy assembly
- Very small storage and transport volume
- Tested for fire resistance
- Manufactured from puncture and tear resistant materials. Withstands repeated flexing without damage

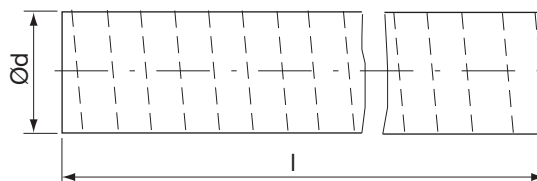
## Technical data

|                             |                        |
|-----------------------------|------------------------|
| Duct material.....          | PVC coated glass cloth |
| Colour.....                 | Grey                   |
| Minimum bending radius..... | 1,0xd                  |
| Maximum air velocity .....  | 30 m/s                 |
| Temperature range .....     | -10 to +80 °C          |
| Working pressure .....      | from -125 to +3000 Pa  |
| Standard length.....        | 10 m                   |

## Ordering example

|              |           |            |              |            |
|--------------|-----------|------------|--------------|------------|
|              | <b>FD</b> | <b>160</b> | <b>10000</b> | <b>PVC</b> |
| Product      |           |            |              |            |
| Dimension Ød |           |            |              |            |
| Length l     |           |            |              |            |
| Material     |           |            |              |            |

## Dimensions



| Ød<br>nom | O<br>$\pi d$<br>m | A<br>$\pi d^2/4$<br>m <sup>2</sup> | Max.<br>pressure<br>Pa |
|-----------|-------------------|------------------------------------|------------------------|
| 82        | 0,258             | 0,005                              | +3000                  |
| 102       | 0,320             | 0,008                              | +3000                  |
| 127       | 0,157             | 0,013                              | +3000                  |
| 133       | 0,198             | 0,014                              | +3000                  |
| 152       | 0,478             | 0,018                              | +3000                  |
| 160       | 0,503             | 0,020                              | +3000                  |
| 180       | 0,565             | 0,025                              | +3000                  |
| 203       | 0,638             | 0,032                              | +3000                  |
| 229       | 0,719             | 0,041                              | +3000                  |
| 254       | 0,798             | 0,051                              | +3000                  |
| 305       | 0,958             | 0,073                              | +3000                  |
| 315       | 0,990             | 0,078                              | +3000                  |
| 356       | 1,12              | 0,100                              | +3000                  |
| 406       | 1,28              | 0,129                              | +3000                  |
| 457       | 1,44              | 0,164                              | +3000                  |
| 508       | 1,60              | 0,203                              | +3000                  |
| 560       | 1,76              | 0,246                              | +3000                  |
| 610       | 1,92              | 0,292                              | +3000                  |





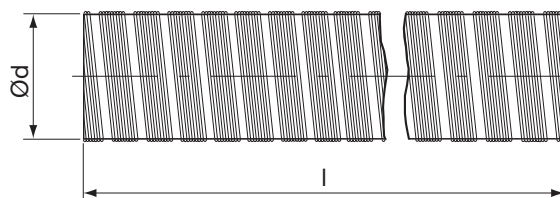


# Semiflexible duct

FDO



## Dimensions



### Description

Single-layer duct wall.

### Advantages

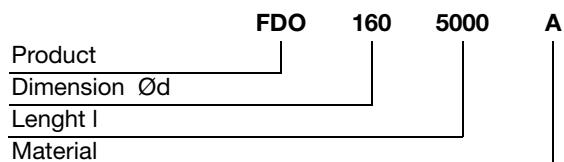
- Small storage and transport volume.
- No toxic gases are emitted in case of fire.
- Tested on fire resistance.

### Technical data

|                             |  |
|-----------------------------|--|
| Duct material.....          | Aluminium  |
| Minimum bending radius..... | 1×d  |
| Maximum temperature.....    | +200 °C  |
| Fire resistance.....        | Not flammable in accordance with DIN 4102 class A1 |
| Standard length.....        | 5 m also available in 3 m                          |

| Ød<br>nom | O<br>πd<br>m | A<br>πd <sup>2</sup> /4<br>m <sup>2</sup> | l<br>mm | m<br>kg |
|-----------|--------------|---|---------|---------|
| 80        | 0,251        | 0,005                                     | 5000    | 0,67    |
| 100       | 0,314        | 0,008                                     | 5000    | 0,83    |
| 125       | 0,393        | 0,012                                     | 5000    | 1,04    |
| 140       | 0,440        | 0,015                                     | 5000    | 1,17    |
| 150       | 0,471        | 0,018                                     | 5000    | 1,25    |
| 160       | 0,503        | 0,020                                     | 5000    | 1,33    |
| 180       | 0,565        | 0,025                                     | 5000    | 1,79    |
| 200       | 0,628        | 0,031                                     | 5000    | 1,99    |
| 224       | 0,704        | 0,039                                     | 5000    | 2,23    |
| 250       | 0,785        | 0,049                                     | 5000    | 2,49    |
| 280       | 0,880        | 0,062                                     | 5000    | 2,79    |
| 300       | 0,942        | 0,071                                     | 5000    | 2,99    |
| 315       | 0,990        | 0,078                                     | 5000    | 3,14    |
| 355       | 1,12         | 0,099                                     | 5000    | 3,54    |
| 400       | 1,26         | 0,126                                     | 5000    | 3,99    |

### Ordering example





# Semiflexible duct

FD



## Description

Single-layer duct wall

Can also be used where a flexible duct of aluminium is not sufficient to meet fire regulations. Ø 80 and 100 mm are usually used in this field of application.

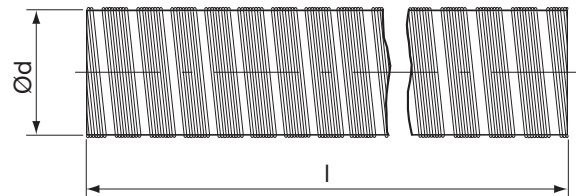
## Advantages

- Small storage and transport volume.
- No toxic gases are emitted in case of fire.
- Tested on fire resistance.

## Technical data

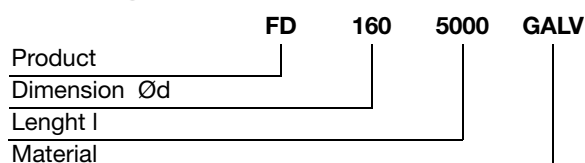
|                             |  |
|-----------------------------|--|
| Duct material .....         | Galvanized steel sheet (GALV)                      |
| Minimum bending radius..... | 1×d  |
| Maximum temperature.....    | +350 °C  |
| Fire resistance .....       | Not flammable in accordance with DIN 4102 class A1 |

## Dimensions



| Ød<br>nom | O<br>πd<br>m | A<br>πd <sup>2</sup> /4<br>m <sup>2</sup> | l<br>mm | Max.<br>pressure<br>Pa |
|-----------|--------------|---|---------|------------------------|
| 80        | 0,251        | 0,005                                     | 5000    | +10 000                |
| 100       | 0,314        | 0,008                                     | 5000    | +10 000                |
| 125       | 0,393        | 0,012                                     | 5000    | +8000                  |
| 140       | 0,471        | 0,018                                     | 5000    | +8000                  |
| 150       | 0,471        | 0,018                                     | 5000    | +7000                  |
| 160       | 0,503        | 0,020                                     | 5000    | +7000                  |
| 180       | 0,565        | 0,025                                     | 5000    | +7000                  |
| 200       | 0,628        | 0,031                                     | 5000    | +7000                  |
| 224       | 0,704        | 0,039                                     | 5000    | +5000                  |
| 250       | 0,785        | 0,049                                     | 5000    | +5000                  |

## Ordering example



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18

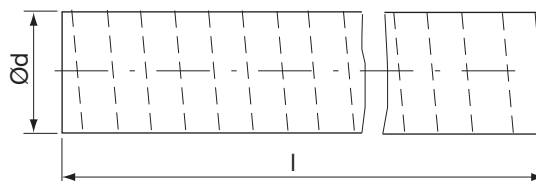


# Flexible budget light duct

# FBLD



## Dimensions



### Description

Multi-layer duct wall reinforced with a spiral wire. The duct wall is thinner than FMD and FHD, which means lower durability to temperature and pressure.

### Applications

Used in ventilation, air conditioning, and air handling systems where a low-cost, non-rated flexible duct is suitable.

### Classifications

EU - EN 13180 Dia. Class B, Tightness Class C, Sag < 15°, Crushing Strength 13–35 kg compressed, 2–5 kg uncompressed.

### Advantages

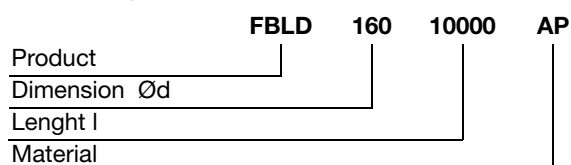
- Easy assembly
- Very small storage and transport volume
- Manufactured from puncture and tear resistant materials. Withstands repeated flexing without damage

### Technical data

|                             |                            |
|-----------------------------|----------------------------|
| Duct material .....         | Aluminium-polyester (AP)   |
| Minimum bending radius..... | 1,0×d                      |
| Maximum air velocity .....  | 20 m/s                     |
| Temperature range .....     | -30 to +82 °C              |
| Working pressure .....      | from -188 to +1500 Pa      |
| Delivery length.....        | Compressed to 0,4 or 0,8 m |
| Packing .....               | Individual box             |
| Standard length.....        | 10 m                       |

| Ød<br>nom | O<br>πd<br>m | A<br>πd <sup>2</sup> /4<br>m <sup>2</sup> | l<br>mm | Max.<br>pressure<br>Pa |
|-----------|--------------|---|---------|------------------------|
| 82        | 0,258        | 0,005                                     | 10000   | +1500                  |
| 102       | 0,320        | 0,008                                     | 10000   | +1500                  |
| 127       | 0,157        | 0,013                                     | 10000   | +1500                  |
| 133       | 0,198        | 0,014                                     | 10000   | +1500                  |
| 152       | 0,478        | 0,018                                     | 10000   | +1500                  |
| 160       | 0,503        | 0,020                                     | 10000   | +1500                  |
| 180       | 0,565        | 0,025                                     | 10000   | +1500                  |
| 203       | 0,638        | 0,032                                     | 10000   | +1500                  |
| 229       | 0,719        | 0,041                                     | 10000   | +1500                  |
| 254       | 0,798        | 0,051                                     | 10000   | +1500                  |
| 305       | 0,958        | 0,073                                     | 10000   | +1500                  |
| 315       | 0,990        | 0,078                                     | 10000   | +1500                  |
| 356       | 1,12         | 0,100                                     | 10000   | +1500                  |
| 406       | 1,28         | 0,129                                     | 10000   | +1500                  |
| 457       | 1,44         | 0,164                                     | 10000   | +1500                  |
| 508       | 1,60         | 0,203                                     | 10000   | +1500                  |
| 560       | 1,76         | 0,246                                     | 10000   | +1500                  |
| 610       | 1,92         | 0,292                                     | 10000   | +1500                  |

### Ordering example





# Flexible light duct

FLD



## Description

Multi-layer duct wall reinforced with a spiral wire. The duct wall is thinner than FMD and FHD, which means lower durability to temperature and pressure.

## Applications

Used in ventilation, air conditioning, and air handling systems where high mechanical strength, temperature, and fire resistance is required.

## Classifications

**EU** - EN 13180 Dia. Class B, Tightness Class C, Sag < 15°, Crushing Strength 13–35 kg compressed, 2–5 kg uncompressed.

**French** - M1, Report No. LNE N° C050541-CEMATE/17

**Dutch** - NEN 6065 Class 1, NEN 6066 DL;h;max < 0.03m-1, Report No. 2005-CVB-R0445

**Italy** - Class 1, Report No. CSI/0235/06/RF

**UK** - BS 476 Parts 5, 6, 7 & 20, Report No. WARRES 140343, 140150, 140147, & 141454

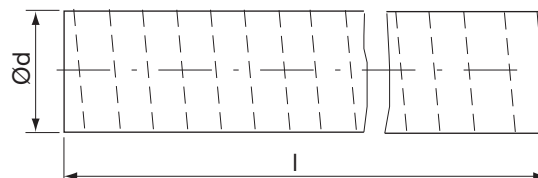
## Advantages

- Easy assembly
- Very small storage and transport volume
- Manufactured from puncture and tear resistant materials. Withstands repeated flexing without damage
- Tested on fire resistance

## Ordering example

|              |     |     |       |    |
|--------------|-----|-----|-------|----|
|              | FLD | 160 | 10000 | AP |
| Product      |     |     |       |    |
| Dimension Ød |     |     |       |    |
| Length l     |     |     |       |    |
| Material     |     |     |       |    |

## Dimensions



| Ød<br>nom | O<br>$\pi d$<br>m | A<br>$\pi d^2/4$<br>m <sup>2</sup> | l<br>mm | Max.<br>pressure<br>Pa |
|-----------|-------------------|------------------------------------|---------|------------------------|
| 65        | 0,204             | 0,003                              | 10000   | +2500                  |
| 76        | 0,239             | 0,005                              | 10000   | +2500                  |
| 82        | 0,258             | 0,005                              | 10000   | +2500                  |
| 90        | 0,238             | 0,006                              | 10000   | +2500                  |
| 102       | 0,320             | 0,008                              | 10000   | +2500                  |
| 112       | 0,352             | 0,010                              | 10000   | +2500                  |
| 127       | 0,157             | 0,013                              | 10000   | +2500                  |
| 133       | 0,198             | 0,014                              | 10000   | +2500                  |
| 140       | 0,440             | 0,015                              | 10000   | +2500                  |
| 152       | 0,478             | 0,018                              | 10000   | +2500                  |
| 160       | 0,503             | 0,020                              | 10000   | +2500                  |
| 180       | 0,565             | 0,025                              | 10000   | +2500                  |
| 203       | 0,638             | 0,032                              | 10000   | +2500                  |
| 229       | 0,719             | 0,041                              | 10000   | +2500                  |
| 254       | 0,798             | 0,051                              | 10000   | +2500                  |
| 280       | 0,880             | 0,062                              | 10000   | +2500                  |
| 305       | 0,958             | 0,073                              | 10000   | +2500                  |
| 315       | 0,990             | 0,078                              | 10000   | +2500                  |
| 356       | 1,12              | 0,100                              | 10000   | +2500                  |
| 380       | 1,19              | 0,113                              | 10000   | +2500                  |
| 406       | 1,28              | 0,129                              | 10000   | +2500                  |
| 457       | 1,44              | 0,164                              | 10000   | +2500                  |
| 508       | 1,60              | 0,203                              | 10000   | +2500                  |
| 560       | 1,76              | 0,246                              | 10000   | +2500                  |
| 610       | 1,92              | 0,292                              | 10000   | +2500                  |

## Technical data

|                              |                            |
|------------------------------|----------------------------|
| Duct material .....          | Aluminium-polyester (AP)   |
| Minimum bending radius ..... | 1,0×d                      |
| Maximum air velocity .....   | 30 m/s                     |
| Temperature range .....      | -30 to +140 °C             |
| Working pressure .....       | from -188 to +2500 Pa      |
| Delivery length .....        | Compressed to 0,4 or 0,8 m |
| Packing .....                | Individual box             |
| Standard length .....        | 10 m                       |



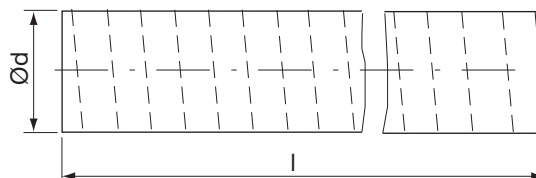


# Flexible medium duct

# FMD



## Dimensions



### Description

Multi-layer duct wall reinforced with a spiral wire. The duct wall is thicker than for FLD and FBLD, which means higher durability to temperature and pressure.

### Applications

Used in ventilation, air conditioning, and air handling systems where high mechanical strength, temperature, and fire resistance is required.

### Classifications

**EU** - EN 13180 Dia. Class B, Tightness Class C, Sag < 15°, Crushing Strength 13–35 kg compressed, 2–5 kg uncompressed.

**EU** - B/s1/d0, Report No. MA 39-VFA2004-075.01

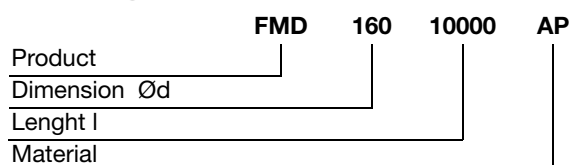
**French** - M0, Report No. LNE N° F080237-CEMATE/2

### Advantages

- Easy assembly
- Very small storage and transport volume
- Manufactured from puncture and tear resistant materials. Withstands repeated flexing without damage
- Tested on fire resistance

| Ød<br>nom | O<br>$\pi d$<br>m | A<br>$\pi d^2/4$<br>m <sup>2</sup> | l<br>mm | Max.<br>pressure<br>Pa |
|-----------|-------------------|------------------------------------|---------|------------------------|
| 65        | 0,204             | 0,003                              | 10000   | +3000                  |
| 76        | 0,239             | 0,005                              | 10000   | +3000                  |
| 82        | 0,258             | 0,005                              | 10000   | +3000                  |
| 90        | 0,238             | 0,006                              | 10000   | +3000                  |
| 102       | 0,320             | 0,008                              | 10000   | +3000                  |
| 112       | 0,352             | 0,010                              | 10000   | +3000                  |
| 127       | 0,157             | 0,013                              | 10000   | +3000                  |
| 133       | 0,198             | 0,014                              | 10000   | +3000                  |
| 140       | 0,440             | 0,015                              | 10000   | +3000                  |
| 152       | 0,478             | 0,018                              | 10000   | +3000                  |
| 160       | 0,503             | 0,020                              | 10000   | +3000                  |
| 180       | 0,565             | 0,025                              | 10000   | +3000                  |
| 203       | 0,638             | 0,032                              | 10000   | +3000                  |
| 229       | 0,719             | 0,041                              | 10000   | +3000                  |
| 254       | 0,798             | 0,051                              | 10000   | +3000                  |
| 280       | 0,880             | 0,062                              | 10000   | +3000                  |
| 305       | 0,958             | 0,073                              | 10000   | +3000                  |
| 315       | 0,990             | 0,078                              | 10000   | +3000                  |
| 356       | 1,12              | 0,100                              | 10000   | +3000                  |
| 380       | 1,19              | 0,113                              | 10000   | +3000                  |
| 406       | 1,28              | 0,129                              | 10000   | +3000                  |
| 457       | 1,44              | 0,164                              | 10000   | +3000                  |
| 508       | 1,60              | 0,203                              | 10000   | +3000                  |
| 560       | 1,76              | 0,246                              | 10000   | +3000                  |
| 610       | 1,92              | 0,292                              | 10000   | +3000                  |

### Ordering example



### Technical data

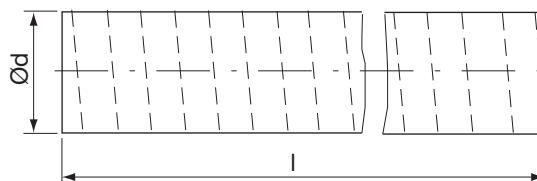
|                              |                            |
|------------------------------|----------------------------|
| Duct material .....          | Aluminium-polyester (AP)   |
| Minimum bending radius ..... | 1,0xd                      |
| Maximum air velocity .....   | 30 m/s                     |
| Temperature range .....      | -30 to +200 °C             |
| Working pressure .....       | from -188 to +2500 Pa      |
| Delivery length .....        | Compressed to 0,4 or 0,8 m |
| Standard length .....        | 10 m                       |



# Flexible budget light double duct FBLDD



## Dimensions



### Description

Multi-layer duct wall reinforced with a spiral wire.

### Applications

Used in ventilation, air conditioning, and air handling systems where a low-cost, non-rated flexible duct is suitable.

### Classifications

EU - EN 13180 Dia. Class B, Tightness Class C, Sag < 10°, Crushing Strength 13–35 kg compressed, 2–5 kg uncompressed

### Advantages

- Easy assembly
- Very small storage and transport volume
- Manufactured from puncture and tear resistant materials. Withstands repeated flexing without damage
- Combination of mechanical strength and high temperature

### Technical data

|                             |                                     |
|-----------------------------|-------------------------------------|
| Duct materials .....        | Aluminium-polyester (AP) + PVC (PV) |
| Minimum bending radius..... | 1,0xd                               |
| Maximum air velocity .....  | 20 m/s                              |
| Temperature range .....     | -30 to +140 °C                      |
| Working pressure .....      | from -188 to +1500 Pa               |
| Standard length.....        | 10 m                                |
| Delivery length.....        | Compressed to 0,4 or 0,8 m          |
| Packing .....               | Individual box                      |

| Ød<br>nom | O<br>πd<br>m | A<br>πd <sup>2</sup> /4<br>m <sup>2</sup> | l<br>mm | Max.<br>pressure<br>Pa |
|-----------|--------------|---|---------|------------------------|
| 102       | 0,320        | 0,008                                     | 10000   | +1500                  |
| 127       | 0,157        | 0,013                                     | 10000   | +1500                  |
| 133       | 0,198        | 0,014                                     | 10000   | +1500                  |
| 152       | 0,478        | 0,018                                     | 10000   | +1500                  |
| 160       | 0,503        | 0,020                                     | 10000   | +1500                  |
| 180       | 0,565        | 0,025                                     | 10000   | +1500                  |
| 203       | 0,638        | 0,032                                     | 10000   | +1500                  |
| 229       | 0,719        | 0,041                                     | 10000   | +1500                  |
| 254       | 0,798        | 0,051                                     | 10000   | +1500                  |
| 305       | 0,958        | 0,073                                     | 10000   | +1500                  |
| 315       | 0,990        | 0,078                                     | 10000   | +1500                  |
| 356       | 1,12         | 0,100                                     | 10000   | +1500                  |
| 406       | 1,28         | 0,129                                     | 10000   | +1500                  |
| 457       | 1,44         | 0,164                                     | 10000   | +1500                  |
| 508       | 1,60         | 0,203                                     | 10000   | +1500                  |

### Ordering example

|              |              |            |              |           |           |
|--------------|--------------|------------|--------------|-----------|-----------|
|              | <b>FBLDD</b> | <b>160</b> | <b>10000</b> | <b>AP</b> | <b>PV</b> |
| Product      |              |            |              |           |           |
| Dimension Ød |              |            |              |           |           |
| Length l     |              |            |              |           |           |
| Material     |              |            |              |           |           |
| Type         |              |            |              |           |           |



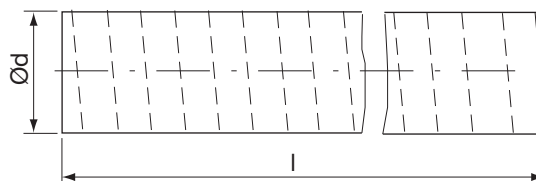


# Flexible light double duct

# FLDD



## Dimensions



### Description

Multi-layer duct wall reinforced with a spiral wire. The duct is covered with a mechanical resistant chlorinated Polyethylene (CPE) layer.

### Classifications

**EU** - EN 13180 Dia. Class B, Tightness Class C, Sag < 10°, Crushing Strength 13–35 kg compressed, 2–5 kg uncompressed

**French** - M1, Report No. CSTB N° RA07-0373

**Italy** - Class 1, Report No. CSI/0233/06/RF

**UK** - BS 476 Parts 5, 6, & 20, Report No. WARRES 145962, 145902, & 146123

### Advantages

- Easy assembly
- Very small storage and transport volume
- Manufactured from puncture and tear resistant materials. Withstands repeated flexing without damage
- Combination of mechanical strength and high temperature

### Technical data

|                         |   |
|-------------------------|---|
| Duct materials .....    | Aluminium-polyester (AP) + PVC (PV)       |
| Temperature range ..... | 30 to +140 °C                             |
| Maximum air.....        | 30 m/s                                    |
| Delivery length.....    | Compressed to 0,8 m                       |
| Standard length.....    | 10 m. Available in 6 or 1,5 m on request. |

Available in black or grey.

### Ordering example

|              |             |            |              |             |             |
|--------------|-------------|------------|--------------|-------------|-------------|
|              | <b>FLDD</b> | <b>160</b> | <b>10000</b> | <b>APPV</b> | <b>BLAC</b> |
| Product      |             |            |              |             |             |
| Dimension Ød |             |            |              |             |             |
| Length l     |             |            |              |             |             |
| Material     |             |            |              |             |             |
| Type         |             |            |              |             |             |

| Ød<br>nom | O<br>$\pi d$<br>m | A<br>$\pi d^2/4$<br>m <sup>2</sup> | Max.<br>pressure<br>Pa |
|-----------|-------------------|------------------------------------|------------------------|
| 102       | 0,320             | 0,008                              | +3000                  |
| 108       | 0,339             | 0,009                              | +3000                  |
| 127       | 0,157             | 0,013                              | +3000                  |
| 133       | 0,198             | 0,014                              | +3000                  |
| 152       | 0,478             | 0,018                              | +3000                  |
| 160       | 0,503             | 0,020                              | +3000                  |
| 180       | 0,565             | 0,025                              | +3000                  |
| 203       | 0,638             | 0,032                              | +3000                  |
| 229       | 0,719             | 0,041                              | +3000                  |
| 254       | 0,798             | 0,051                              | +3000                  |
| 305       | 0,958             | 0,073                              | +3000                  |
| 315       | 0,99              | 0,078                              | +3000                  |
| 356       | 1,12              | 0,100                              | +3000                  |
| 406       | 1,28              | 0,129                              | +3000                  |
| 457       | 1,44              | 0,164                              | +3000                  |
| 508       | 1,60              | 0,203                              | +3000                  |



# Semiflexible double duct

# FDD



## Description

Double-layer duct wall.

## Applications

Suitable for mechanical air supply systems and air conditioning systems

## Advantages

- Small storage and transport volume.

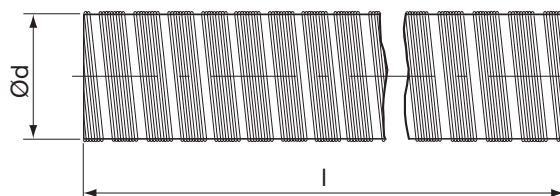
## Technical data

|                             |  |
|-----------------------------|--|
| Duct material .....         | Aluminium + aluminium (AL)                         |
| Minimum bending radius..... | 1×d  |
| Maximum temperature .....   | +200 °C  |
| Fire resistance .....       | Not flammable in accordance with DIN 4102 class A1 |

### Delivery length:

|                      |                             |
|----------------------|-----------------------------|
| Ø 50–315 .....       | Compressed to 1,2 m         |
| Ø 355–500 .....      | Not compressed (i.e. 5 m)   |
| Standard length..... | 5 m. Also available in 10 m |

## Dimensions



| Ød<br>nom | O<br>$\pi d$<br>m | A<br>$\pi d^2/4$<br>m <sup>2</sup> | l<br>mm | Max.<br>pressure<br>Pa |
|-----------|-------------------|------------------------------------|---------|------------------------|
| 50        | 0,157             | 0,002                              | 5000    | ±3150                  |
| 63        | 0,198             | 0,003                              | 5000    | ±3150                  |
| 71        | 0,223             | 0,004                              | 5000    | ±3150                  |
| 75        | 0,236             | 0,004                              | 5000    | ±3150                  |
| 80        | 0,251             | 0,005                              | 5000    | ±3150                  |
| 100       | 0,314             | 0,008                              | 5000    | ±3150                  |
| 125       | 0,393             | 0,012                              | 5000    | ±3150                  |
| 140       | 0,440             | 0,015                              | 5000    | ±3150                  |
| 150       | 0,471             | 0,018                              | 5000    | ±2500                  |
| 160       | 0,503             | 0,020                              | 5000    | ±2500                  |
| 180       | 0,565             | 0,025                              | 5000    | ±2500                  |
| 200       | 0,628             | 0,031                              | 5000    | ±2500                  |
| 224       | 0,704             | 0,039                              | 5000    | ±2500                  |
| 250       | 0,785             | 0,049                              | 5000    | ±2000                  |
| 280       | 0,880             | 0,062                              | 5000    | ±2000                  |
| 300       | 0,942             | 0,071                              | 5000    | ±2000                  |
| 315       | 0,990             | 0,078                              | 5000    | ±2000                  |
| 355       | 1,12              | 0,099                              | 5000    | -                      |
| 400       | 1,26              | 0,126                              | 5000    | -                      |
| 450       | 1,41              | 0,159                              | 5000    | -                      |
| 500       | 1,57              | 0,196                              | 5000    | -                      |

## Ordering example

|              |            |            |             |           |             |
|--------------|------------|------------|-------------|-----------|-------------|
|              | <b>FDD</b> | <b>160</b> | <b>5000</b> | <b>AA</b> | <b>DOUB</b> |
| Product      |            |            |             |           |             |
| Dimension Ød |            |            |             |           |             |
| Length l     |            |            |             |           |             |
| Material     |            |            |             |           |             |
| Type         |            |            |             |           |             |





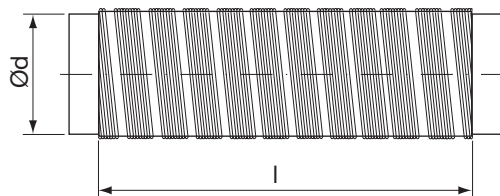


# Semiflexible connector

# DRASUT



## Dimensions



### Description

Single wall of flexible and folded duct.  
Available in three lengths 500, 1000 and 1500 mm.  
 $r_i$  denominates minimum inner radius.

### Applications

Suitable for mechanical air supply systems and air conditioning systems

### Advantages

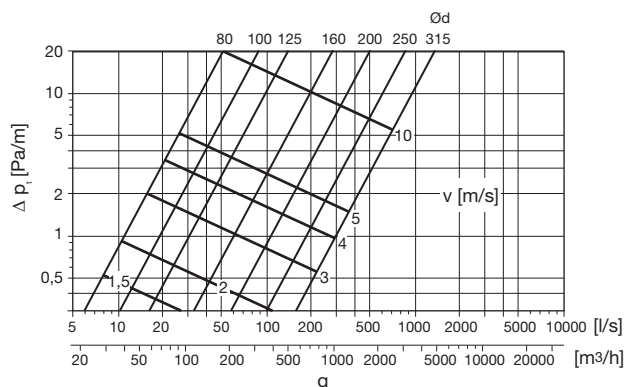
- Saves installation time and material
- Small storage and transport volume.
- The ends are equipped with female connectors for simple mounting and tighter connection.
- The ends are also available with male connectors.

### Technical data

|                       |  |
|-----------------------|--|
| Duct material .....   | Aluminium  |
| Maximum temperature.. | 200 °C   |
| Delivery length.....  | 0,5 m compressed to 0,25 m<br>1,0 m compressed to 0,35 m<br>1,5 m compressed to 0,55 m |

| Ød<br>nom | l<br>mm | l<br>mm | l<br>mm | $r_i$<br>mm |
|-----------|---------|---------|---------|-------------|
| 80        | 500     | 1000    | 1500    | 48          |
| 100       | 500     | 1000    | 1500    | 60          |
| 125       | 500     | 1000    | 1500    | 75          |
| 160       | 500     | 1000    | 1500    | 96          |
| 200       | 500     | 1000    | 1500    | 160         |
| 250       | 500     | 1000    | 1500    | 200         |
| 315       | 500     | 1000    | 1500    | 250         |

### Specific pressure drop, straight duct



### Ordering example

|              |               |            |            |
|--------------|---------------|------------|------------|
|              | <b>DRASUT</b> | <b>125</b> | <b>500</b> |
| Product      |               |            |            |
| Dimension Ød |               |            |            |
| Length       |               |            |            |



# Flexible insulated budget light duct FIBLD



## Description

Multi-layer inner duct wall reinforced with a spiral wire. The inner duct wall is covered with a fibre glass insulation. The insulation is covered with an outer jacket.

The insulation reduces the heat gain or loss resulting from a temperature difference between the air flowing in the duct and the surrounding air.

The outer jacket acts as a vapour barrier to prevent condensation to enter into the insulation. condensation can occur on the outside of a duct carrying air at lower temperatures than the surrounding air.

## Applications

Used in ventilation, air conditioning, and air handling systems where high mechanical strength, temperature, and fire resistance is required.

## Classifications

**EU** - EN 13180 Dia. Class B, Tightness Class C, Sag < 4°, Crushing Strength 13–35 kg compressed, 2–5 kg uncompressed

**French** - M1, Report No. CSTB RA06-0042

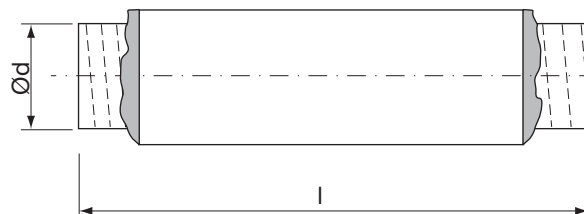
## Advantages

- Easy assembly
- Very small storage and transport volume
- Manufactured from puncture and tear resistant materials. Withstands repeated flexing without damage
- Tested on fire resistance

## Ordering example

|              |              |            |              |           |                  |
|--------------|--------------|------------|--------------|-----------|------------------|
|              | <b>FIBLD</b> | <b>160</b> | <b>10000</b> | <b>AP</b> | <b>AP/MP/PMP</b> |
| Product      |              |            |              |           |                  |
| Dimension Ød |              |            |              |           |                  |
| Length l     |              |            |              |           |                  |
| Material     |              |            |              |           |                  |
| Type         |              |            |              |           |                  |

## Dimensions



| Ød<br>nom | O<br>$\pi d$<br>m | A<br>$\pi d^2/4$<br>m <sup>2</sup> | l<br>mm | Max.<br>pressure<br>Pa |
|-----------|-------------------|------------------------------------|---------|------------------------|
| 82        | 0,258             | 0,005                              | 10000   | +1500                  |
| 102       | 0,320             | 0,008                              | 10000   | +1500                  |
| 127       | 0,157             | 0,013                              | 10000   | +1500                  |
| 133       | 0,198             | 0,014                              | 10000   | +1500                  |
| 152       | 0,478             | 0,018                              | 10000   | +1500                  |
| 160       | 0,503             | 0,020                              | 10000   | +1500                  |
| 180       | 0,565             | 0,025                              | 10000   | +1500                  |
| 203       | 0,638             | 0,032                              | 10000   | +1500                  |
| 229       | 0,719             | 0,041                              | 10000   | +1500                  |
| 254       | 0,798             | 0,051                              | 10000   | +1500                  |
| 305       | 0,958             | 0,073                              | 10000   | +1500                  |
| 315       | 0,990             | 0,078                              | 10000   | +1500                  |
| 356       | 1,12              | 0,100                              | 10000   | +1500                  |
| 406       | 1,28              | 0,129                              | 10000   | +1500                  |
| 457       | 1,44              | 0,164                              | 10000   | +1500                  |
| 508       | 1,60              | 0,203                              | 10000   | +1500                  |
| 560       | 1,76              | 0,246                              | 10000   | +1500                  |

## Technical data

Duct materials:

|                           |  |
|---------------------------|--|
| inner wall (core) .....   | Aluminium-polyester (AP)   |
| insulation .....          | Glass wool 25 mm   |
| outer wall (jacket) ..... | Aluminium-polyester (AP),<br>Micron Polyester (MP) or<br>Metalized Polyester (PMP) |

Temperature range:

|           |                |
|-----------|----------------|
| AP .....  | -30 to +140 °C |
| MP .....  | -30 to +140 °C |
| PMP ..... | -30 to +140 °C |

Maximum air velocity .....

20 m/s

Delivery length .....

Compressed to 1 m

Standard length .....

10 m.

Packing .....

Individual box



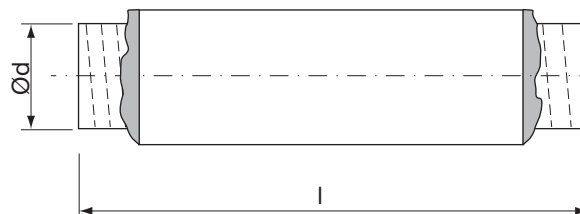


# Flexible insulated light duct

# FILD



## Dimensions



### Description

Multi-layer inner duct wall reinforced with a spiral wire. The inner duct wall is covered with a fibre glass insulation. The insulation is covered with an outer jacket.

The insulation reduces the heat gain or loss resulting from a temperature difference between the air flowing in the duct and the surrounding air.

The outer jacket acts as a vapour barrier to prevent condensation to enter into the insulation. condensation can occur on the outside of a duct carrying air at lower temperatures than the surrounding air.

### Applications

Used in ventilation, air conditioning, and air handling systems where high mechanical strength, temperature, and fire resistance is required.

### Classifications

**EU** - EN 13180 Dia. Class B, Tightness Class C, Sag < 4°, Crushing Strength 13–35 kg compressed, 2–5 kg uncompressed

**French** - M1, Report No. CSTB RA06-0042

### Advantages

- Easy assembly
- Very small storage and transport volume
- Manufactured from puncture and tear resistant materials. Withstands repeated flexing without damage

### Ordering example

|              |      |     |       |    |    |
|--------------|------|-----|-------|----|----|
| Product      | FILD | 160 | 10000 | AP | AP |
| Dimension Ød |      |     |       |    |    |
| Length l     |      |     |       |    |    |
| Material     |      |     |       |    |    |
| Type         |      |     |       |    |    |

| Ød<br>nom | O<br>$\pi d$<br>m | A<br>$\pi d^2/4$<br>m <sup>2</sup> | l<br>mm | Max.<br>pressure<br>Pa |
|-----------|-------------------|------------------------------------|---------|------------------------|
| 76        | 0,239             | 0,005                              | 10000   | +2500                  |
| 82        | 0,258             | 0,005                              | 10000   | +2500                  |
| 90        | 0,238             | 0,006                              | 10000   | +2500                  |
| 102       | 0,320             | 0,008                              | 10000   | +2500                  |
| 112       | 0,352             | 0,010                              | 10000   | +2500                  |
| 127       | 0,157             | 0,013                              | 10000   | +2500                  |
| 133       | 0,198             | 0,014                              | 10000   | +2500                  |
| 140       | 0,440             | 0,015                              | 10000   | +2500                  |
| 152       | 0,478             | 0,018                              | 10000   | +2500                  |
| 160       | 0,503             | 0,020                              | 10000   | +2500                  |
| 180       | 0,565             | 0,025                              | 10000   | +2500                  |
| 203       | 0,638             | 0,032                              | 10000   | +2500                  |
| 229       | 0,719             | 0,041                              | 10000   | +2500                  |
| 254       | 0,798             | 0,051                              | 10000   | +2500                  |
| 280       | 0,880             | 0,062                              | 10000   | +2500                  |
| 305       | 0,958             | 0,073                              | 10000   | +2500                  |
| 315       | 0,990             | 0,078                              | 10000   | +2500                  |
| 356       | 1,12              | 0,100                              | 10000   | +2500                  |
| 380       | 1,19              | 0,113                              | 10000   | +2500                  |
| 406       | 1,28              | 0,129                              | 10000   | +2500                  |
| 457       | 1,44              | 0,164                              | 10000   | +2500                  |
| 508       | 1,60              | 0,203                              | 10000   | +2500                  |

### Technical data

|                            |                          |
|----------------------------|--------------------------|
| Duct materials:            |                          |
| inner wall (core) .....    | Aluminium-polyester (AP) |
| insulation .....           | Glass wool 25 mm         |
| outer wall (jacket) .....  | Aluminium-polyester (AP) |
| Temperature range.....     | -30 to +140 °C           |
| Maximum air velocity ..... | 30 m/s                   |
| Delivery length .....      | Compressed to 1 m        |
| Standard length .....      | 10 m                     |
| Packing .....              | Individual box           |



# Flexible insulated medium duct

# FIMD



## Description

Multi-layer inner duct wall reinforced with a spiral wire. The inner duct wall is covered with a fibre glass insulation. The insulation is covered with an outer jacket.

The insulation reduces the heat gain or loss resulting from a temperature difference between the air flowing in the duct and the surrounding air.

The outer jacket acts as a vapour barrier to prevent condensation to enter into the insulation. condensation can occur on the outside of a duct carrying air at lower temperatures than the surrounding air.

## Applications

Used in ventilation, air conditioning, and air handling systems where high mechanical strength, temperature, and fire resistance is required.

## Classifications

**EU** - EN 13180 Dia. Class B, Tightness Class C, Sag < 4°, Crushing Strength 13–35 kg compressed, 2–5 kg uncompressed

**French** - M0/M1, Report No. LNE N° F014932-CEMATE/12

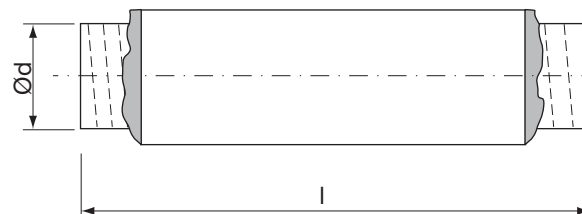
## Advantages

- Easy assembly
- Very small storage and transport volume
- Manufactured from puncture and tear resistant materials. Withstands repeated flexing without damage
- Tested on fire resistance

## Ordering example

|              |             |            |              |           |           |
|--------------|-------------|------------|--------------|-----------|-----------|
|              | <b>FIMD</b> | <b>160</b> | <b>10000</b> | <b>AP</b> | <b>MP</b> |
| Product      |             |            |              |           |           |
| Dimension Ød |             |            |              |           |           |
| Length l     |             |            |              |           |           |
| Material     |             |            |              |           |           |
| Type         |             |            |              |           |           |

## Dimensions



| Ød<br>nom | O<br>$\pi d$<br>m | A<br>$\pi d^2/4$<br>m <sup>2</sup> | l<br>mm | Max.<br>pressure<br>Pa |
|-----------|-------------------|------------------------------------|---------|------------------------|
| 82        | 0,258             | 0,005                              | 10000   | +2500                  |
| 102       | 0,320             | 0,008                              | 10000   | +2500                  |
| 127       | 0,157             | 0,013                              | 10000   | +2500                  |
| 133       | 0,198             | 0,014                              | 10000   | +2500                  |
| 152       | 0,478             | 0,018                              | 10000   | +2500                  |
| 160       | 0,503             | 0,020                              | 10000   | +2500                  |
| 180       | 0,565             | 0,025                              | 10000   | +2500                  |
| 203       | 0,638             | 0,032                              | 10000   | +2500                  |
| 229       | 0,719             | 0,041                              | 10000   | +2500                  |
| 254       | 0,798             | 0,051                              | 10000   | +2500                  |
| 305       | 0,958             | 0,073                              | 10000   | +2500                  |
| 315       | 0,990             | 0,078                              | 10000   | +2500                  |
| 356       | 1,12              | 0,100                              | 10000   | +2500                  |
| 406       | 1,28              | 0,129                              | 10000   | +2500                  |
| 457       | 1,44              | 0,164                              | 10000   | +2500                  |
| 508       | 1,60              | 0,203                              | 10000   | +2500                  |
| 560       | 1,76              | 0,246                              | 10000   | +2500                  |

## Technical data

|                            |                          |
|----------------------------|--------------------------|
| Duct materials:            |                          |
| inner wall (core) .....    | Aluminium-polyester (AP) |
| insulation .....           | Glass wool 25 mm         |
| outer wall (jacket) .....  | Micron-Polyester (MP)    |
| Temperature range          |                          |
| inner wall .....           | -30 to +200 °C           |
| outer wall .....           | -30 to +140 °C           |
| Maximum air velocity ..... | 30 m/s                   |
| Delivery length .....      | Compressed to 1 m        |
| Standard length .....      | 10 m                     |
| Packing .....              | Individual box           |



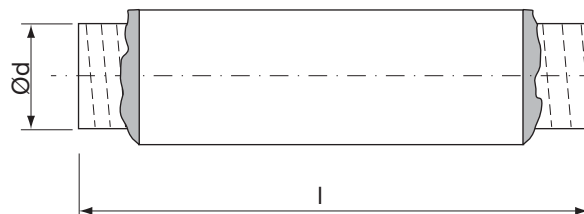


# Flexible insulated heavy duct

# FIHD



## Dimensions



| Ød<br>nom | O<br>$\pi d$<br>m | A<br>$\pi d^2/4$<br>m <sup>2</sup> | l<br>mm | Max.<br>pressure<br>Pa |
|-----------|-------------------|------------------------------------|---------|------------------------|
| 82        | 0,258             | 0,005                              | 10000   | +2500                  |
| 102       | 0,320             | 0,008                              | 10000   | +2500                  |
| 127       | 0,157             | 0,013                              | 10000   | +2500                  |
| 133       | 0,198             | 0,014                              | 10000   | +2500                  |
| 152       | 0,478             | 0,018                              | 10000   | +2500                  |
| 160       | 0,503             | 0,020                              | 10000   | +2500                  |
| 180       | 0,565             | 0,025                              | 10000   | +2500                  |
| 203       | 0,638             | 0,032                              | 10000   | +2500                  |
| 229       | 0,719             | 0,041                              | 10000   | +2500                  |
| 254       | 0,798             | 0,051                              | 10000   | +2500                  |
| 305       | 0,958             | 0,073                              | 10000   | +2500                  |
| 315       | 0,990             | 0,078                              | 10000   | +2500                  |
| 356       | 1,12              | 0,100                              | 10000   | +2500                  |
| 406       | 1,28              | 0,129                              | 10000   | +2500                  |
| 457       | 1,44              | 0,164                              | 10000   | +2500                  |
| 508       | 1,60              | 0,203                              | 10000   | +2500                  |
| 560       | 1,76              | 0,246                              | 10000   | +2500                  |

## Description

Multi-layer inner duct wall reinforced with a spiral wire. The inner duct wall is covered with a fibre glass insulation. The insulation is covered with an outer jacket.

The insulation reduces the heat gain or loss resulting from a temperature difference between the air flowing in the duct and the surrounding air.

The outer jacket acts as a vapour barrier to prevent condensation to enter into the insulation. condensation can occur on the outside of a duct carrying air at lower temperatures than the surrounding air.

## Applications

Used in ventilation, air conditioning, and air handling systems where high mechanical strength, temperature, and fire resistance is required.

## Classifications

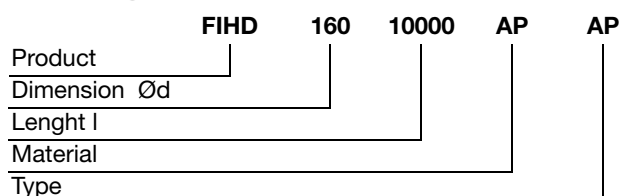
**EU** - EN 13180 Dia. Class B, Tightness Class C, Sag < 4°, Crushing Strength 13–35 kg compressed, 2–5 kg uncompressed

**French** - M0/M1, Report No. LNE N° F014932-CEMATE/12

## Advantages

- Easy assembly
- Very small storage and transport volume
- Manufactured from puncture and tear resistant materials. Withstands repeated flexing without damage
- Tested on fire resistance

## Ordering example



## Technical data

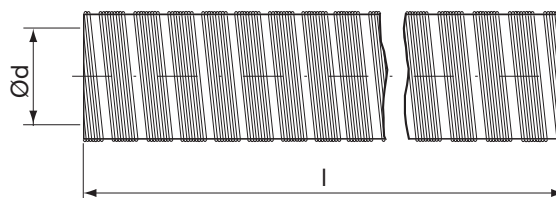
|                            |                          |
|----------------------------|--------------------------|
| Duct materials:            |                          |
| inner wall (core) .....    | Aluminium-polyester (AP) |
| insulation .....           | Glass wool 25 mm         |
| outer wall (jacket) .....  | Aluminium-polyester (AP) |
| Temperature range          |                          |
| inner wall .....           | -30 to +250 °C           |
| outer wall .....           | -30 to +140 °C           |
| Maximum air velocity ..... | 30 m/s                   |
| Delivery length .....      | Compressed to 1 m        |
| Standard length .....      | 10 m                     |
| Packing .....              | Individual box           |



# Semiflexible insulated double duct FIDD



## Dimensions



### Description

Double-layer inner duct wall. The inner duct wall is covered with a fibre glass insulation. The insulation is covered with a double-layer outer duct.

The insulation reduces the heat gain or loss resulting from a temperature difference between the air flowing in the duct and the surrounding air.

The outer duct acts as a vapour barrier to prevent condensation to enter into the insulation. Condensation can occur on the outside of a duct carrying air at lower temperatures than the surrounding air.

### Advantages

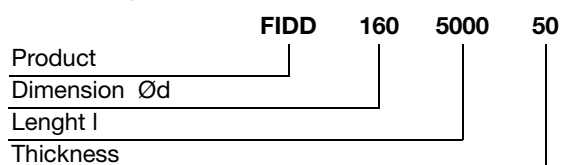
- Small storage and transport volume.

### Technical data

|                             |  |
|-----------------------------|--|
| Duct materials:             |  |
| inner wall.....             | Aluminium + aluminium (AL)                         |
| insulation.....             | Glass wool 25 or 50 mm                             |
| outer wall .....            | Aluminium + aluminium                              |
| Minimum bending radius..... | 2-3×d  |
| Fire resistance .....       | Not flammable in accordance with DIN 4102 class A1 |
| Standard length.....        | 5 m  |

| Ød<br>nom | O<br>πd<br>m | A<br>πd <sup>2</sup> /4<br>m <sup>2</sup> | l<br>mm |
|-----------|--------------|---|---------|
| 80        | 0,251        | 0,005                                     | 5000    |
| 100       | 0,314        | 0,008                                     | 5000    |
| 125       | 0,393        | 0,012                                     | 5000    |
| 140       | 0,440        | 0,015                                     | 5000    |
| 150       | 0,471        | 0,018                                     | 5000    |
| 160       | 0,503        | 0,020                                     | 5000    |
| 180       | 0,565        | 0,025                                     | 5000    |
| 200       | 0,628        | 0,031                                     | 5000    |
| 224       | 0,704        | 0,039                                     | 5000    |
| 250       | 0,785        | 0,049                                     | 5000    |
| 280       | 0,880        | 0,062                                     | 5000    |
| 300       | 0,942        | 0,071                                     | 5000    |
| 315       | 0,990        | 0,078                                     | 5000    |
| 350       | 1,12         | 0,099                                     | 5000    |
| 400       | 1,26         | 0,126                                     | 5000    |

### Ordering example



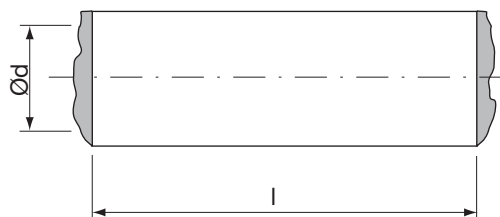


# Flexible duct insulation

FDI



## Dimensions



### Description

Fibre glass insulation. The insulation is covered with an outer jacket.

### Applications

The purpose is to insulate a rigid duct.

The insulation reduces the heat gain or loss resulting from a temperature difference between the air flowing in a duct and the surrounding air.

The outer jacket acts as a vapour barrier to prevent condensation to enter into the insulation. Condensation can occur on the outside of a duct carrying air at lower temperatures than the surrounding air.

### Advantages

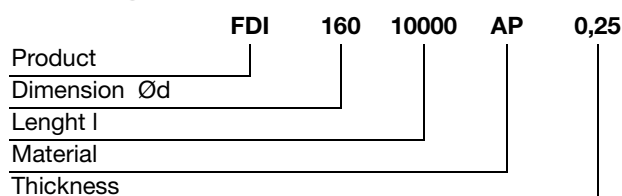
- Easy assembly, saves installation time.
- Very small storage and transport volume.
- No toxic gases are emitted in case of fire.
- Tested on fire resistance.

### Technical data

|                          |                          |
|--------------------------|--------------------------|
| Insulation materials:    |                          |
| insulation.....          | Glass wool 25 mm         |
| outer wall (jacket)..... | Aluminium-polyester (AP) |
| Temperature range .....  | -30 to +140 °C           |
| Delivery form .....      | Flattened                |
| Packing .....            | Roll                     |
| Standard length.....     | 5 or 10 m                |

| Ød<br>nom | l<br>mm |       |
|-----------|---------|-------|
| 76        | 5000    | 10000 |
| 82        | 5000    | 10000 |
| 90        | 5000    | 10000 |
| 102       | 5000    | 10000 |
| 112       | 5000    | 10000 |
| 127       | 5000    | 10000 |
| 133       | 5000    | 10000 |
| 152       | 5000    | 10000 |
| 160       | 5000    | 10000 |
| 180       | 5000    | 10000 |
| 203       | 5000    | 10000 |
| 229       | 5000    | 10000 |
| 254       | 5000    | 10000 |
| 280       | 5000    | 10000 |
| 305       | 5000    | 10000 |
| 315       | 5000    | 10000 |
| 356       | 5000    | 10000 |
| 380       | 5000    | 10000 |
| 406       | 5000    | 10000 |
| 457       | 5000    | 10000 |
| 508       | 5000    | 10000 |
| 560       | 5000    | 10000 |

### Ordering example



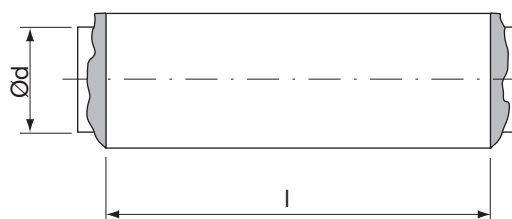


# Flexible duct insulation

# FDFI



## Dimensions



### Description

Fibre glass insulation. The insulation is covered with an inner liner and an outer jacket.

### Applications

The purpose is to insulate a rigid duct. The inner liner makes it easier to pull the insulation over the rigid duct.

The insulation reduces the heat gain or loss resulting from a temperature difference between the air flowing in a duct and the surrounding air.

The outer jacket acts as a vapour barrier to prevent condensation to enter into the insulation. condensation can occur on the outside of a duct carrying air at lower temperatures than the surrounding air.

### Advantages

- Easy assembly, saves installation time.
- Very small storage and transport volume.
- No toxic gases are emitted in case of fire.
- Tested on fire resistance.

### Technical data

Insulation materials:

|                          |                          |
|--------------------------|--------------------------|
| liner .....              | Polyethylene (PE)        |
| insulation.....          | Glass wool 25 mm         |
| outer wall (jacket)..... | Aluminium-polyester (AP) |
| Temperature range .....  | -30 to +140 °C           |
| Delivery form .....      | Flattened                |
| Packing .....            | Roll                     |
| Standard length.....     | 5 or 10 m                |

| Ød<br>nom | l<br>mm |       |
|-----------|---------|-------|
| 76        | 5000    | 10000 |
| 82        | 5000    | 10000 |
| 90        | 5000    | 10000 |
| 102       | 5000    | 10000 |
| 112       | 5000    | 10000 |
| 127       | 5000    | 10000 |
| 133       | 5000    | 10000 |
| 152       | 5000    | 10000 |
| 160       | 5000    | 10000 |
| 180       | 5000    | 10000 |
| 203       | 5000    | 10000 |
| 229       | 5000    | 10000 |
| 254       | 5000    | 10000 |
| 280       | 5000    | 10000 |
| 305       | 5000    | 10000 |
| 315       | 5000    | 10000 |
| 356       | 5000    | 10000 |
| 380       | 5000    | 10000 |
| 406       | 5000    | 10000 |
| 457       | 5000    | 10000 |
| 508       | 5000    | 10000 |
| 560       | 5000    | 10000 |

### Ordering example

|              |             |            |              |           |             |
|--------------|-------------|------------|--------------|-----------|-------------|
|              | <b>FDFI</b> | <b>160</b> | <b>10000</b> | <b>AP</b> | <b>0,25</b> |
| Product      |             |            |              |           |             |
| Dimension Ød |             |            |              |           |             |
| Length l     |             |            |              |           |             |
| Material     |             |            |              |           |             |
| Thickness    |             |            |              |           |             |

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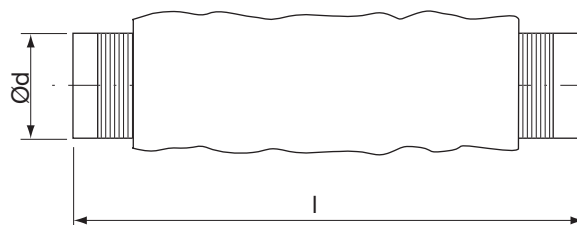


# Flexible duct silencer

# AKUCOM



## Dimensions



| Ød<br>nom | l<br>mm | Ødy<br>mm |
|-----------|---------|-----------|
| 80        | 1200    | 130       |
| 100       | 1200    | 150       |
| 125       | 1200    | 175       |
| 160       | 1200    | 210       |
| 200       | 1200    | 250       |
| 250       | 1200    | 300       |
| 315       | 1200    | 365       |

## Description

Inner duct wall of flexible, folded and perforated duct. The inner wall is covered with mineral wool insulation. The insulation is covered with an outer jacket. The insulation reduces the noise passing through the silencer. For best attenuation the silencer shall be pulled out to full length.

## Advantages

- Small storage and transport volume.
- The ends are equipped with female connectors for simple mounting and tighter connection.
- Saves installation time and material.

## Technical data

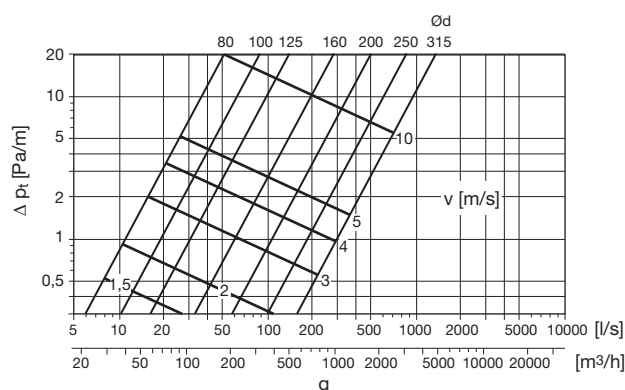
|                           |                                 |
|---------------------------|---------------------------------|
| <b>Duct material:</b>     |                                 |
| inner wall (core) .....   | Perforated aluminium            |
| insulation .....          | Mineral wool 25 mm              |
| outer wall (jacket) ..... | Gray or white polyeten (PE)     |
| Delivery length.....      | Compressed to 0,55 m            |
| Standard length.....      | 1,2 m. Also available in 600 mm |

## Sound attenuation, ΔL, [dB]

According to the GLSM method. The silencer fully extended and straight.

| Ød<br>nom | Centre frequency [Hz] |     |     |     |    |    |    |    |
|-----------|-----------------------|-----|-----|-----|----|----|----|----|
|           | 63                    | 125 | 250 | 500 | 1K | 2K | 4K | 8K |
| 80        | 28                    | 35  | 37  | 35  | 36 | 39 | 43 | 31 |
| 100       | 28                    | 35  | 37  | 32  | 33 | 41 | 32 | 17 |
| 125       | 29                    | 34  | 35  | 30  | 30 | 39 | 29 | 16 |
| 160       | 26                    | 33  | 31  | 23  | 27 | 34 | 24 | 15 |
| 200       | 21                    | 24  | 30  | 22  | 24 | 27 | 17 | 13 |
| 250       | 31                    | 26  | 25  | 18  | 23 | 24 | 13 | 12 |
| 315       | 25                    | 23  | 22  | 17  | 22 | 20 | 14 | 10 |

## Specific pressure drop, straight silencer



## Ordering example

|              |        |     |      |
|--------------|--------|-----|------|
| Product      | AKUCOM | 100 | 1200 |
| Dimension Ød |        |     |      |
| Length l     |        |     |      |



# Flexible medium duct silencer

# FMDSL



## Description

Multi-layer micro-perforated inner duct wall reinforced with a spiral wire. The inner wall is covered with a fibre glass insulation. The insulation is covered with an outer jacket. The insulation reduces the noise passing through the silencer.

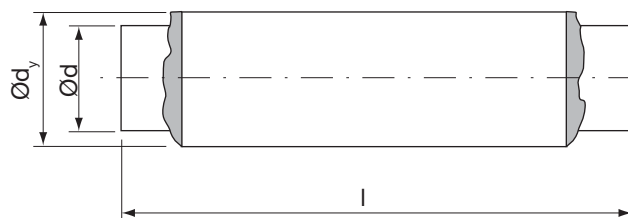
## Classifications

**EU** – EN 13180 Dia. Class B, Tightness Class C, Sag < 4°, Crushing strength 13–35 kg compressed, 2–5 kg uncompressed.

## Advantages

- Easy assembly
- Very small storage and transport volume.
- No toxic gases are emitted in case of fire.
- Tested on fire resistance.

## Dimensions



| Ød<br>nom | l<br>mm | Ødy<br>mm |
|-----------|---------|-----------|
| 76        | 10000   | 126       |
| 82        | 10000   | 132       |
| 90        | 10000   | 140       |
| 102       | 10000   | 152       |
| 112       | 10000   | 162       |
| 127       | 10000   | 177       |
| 133       | 10000   | 183       |
| 140       | 10000   | 190       |
| 152       | 10000   | 202       |
| 160       | 10000   | 210       |
| 180       | 10000   | 230       |
| 203       | 10000   | 253       |
| 229       | 10000   | 279       |
| 254       | 10000   | 304       |
| 280       | 10000   | 330       |
| 305       | 10000   | 355       |
| 315       | 10000   | 365       |
| 356       | 10000   | 406       |
| 380       | 10000   | 430       |
| 406       | 10000   | 456       |
| 457       | 10000   | 507       |
| 508       | 10000   | 558       |

## Technical data

|                           |  |
|---------------------------|--|
| Duct materials:           |  |
| inner wall (core) .....   | Micro-perforated aluminium-polyester (AP)            |
| insulation .....          | Glass wool 25 mm                                     |
| outer wall (jacket) ..... | Aluminium-polyester (AP) or metalized polyester (MP) |
| Temperature range.....    | -30 to +140 °C                                       |
| Maximum air velocity..... | 30 m/s   |
| Delivery length .....     | Compressed to 1 m                                    |
| Standard length .....     | 10 m   |
| Packing .....             | Individual box                                       |

## Ordering example

|              |       |     |       |    |       |
|--------------|-------|-----|-------|----|-------|
| Product      | FMDSL | 160 | 10000 | AP | AP/MP |
| Dimension Ød |       |     |       |    |       |
| Length l     |       |     |       |    |       |
| Material     |       |     |       |    |       |
| Type         |       |     |       |    |       |



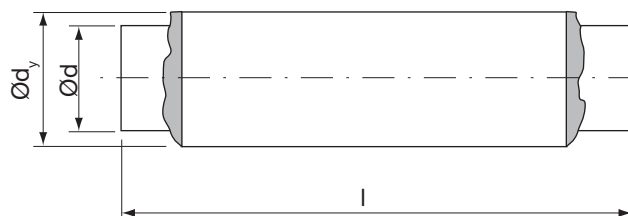


# Flexible heavy duct silencer

# FHDSL



## Dimensions



| Ød<br>nom | l<br>mm | Ødy<br>mm |
|-----------|---------|-----------|
| 82        | 10000   | 132       |
| 102       | 10000   | 152       |
| 127       | 10000   | 177       |
| 133       | 10000   | 183       |
| 152       | 10000   | 202       |
| 160       | 10000   | 210       |
| 180       | 10000   | 230       |
| 203       | 10000   | 253       |
| 229       | 10000   | 279       |
| 254       | 10000   | 304       |
| 305       | 10000   | 355       |
| 315       | 10000   | 365       |
| 356       | 10000   | 406       |
| 406       | 10000   | 456       |
| 457       | 10000   | 507       |
| 508       | 10000   | 558       |
| 560       | 10000   | 610       |

## Description

Multi-layer micro-perforated inner duct wall reinforced with a spiral wire. The inner wall is covered with a fibre glass insulation. The insulation is covered with an outer jacket. The insulation reduces the noise passing through the silencer.

## Classifications

**EU** – EN 13180 Dia. Class B, Tightness Class C, Sag < 4°, Crushing strength 13–35 kg compressed, 2–5 kg uncompressed.

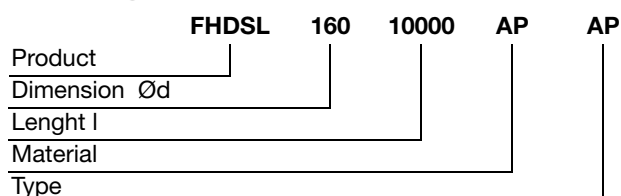
## Advantages

- Easy assembly
- Very small storage and transport volume.
- No toxic gases are emitted in case of fire.
- Tested on fire resistance.

## Technical data

|                            |   |
|----------------------------|---|
| Duct materials:            |   |
| inner wall (core) .....    | Micro-perforated aluminium-polyester (AP) |
| insulation .....           | Glass wool 25 mm                          |
| outer wall (jacket) .....  | Aluminium-polyester (AP)                  |
| Temperature range          |   |
| inner wall .....           | -30 to +250 °C                            |
| outer wall .....           | -30 to +140 °C                            |
| Maximum air velocity ..... | 30 m/s                                    |
| Delivery length .....      | Compressed to 1 m                         |
| Standard length .....      | 10 m                                      |
| Packing .....              | Individual box                            |

## Ordering example





# Flexible light duct silencer

# FLDFSL



## Description

Multi-layer micro-perforated inner duct wall reinforced with a spiral wire. The inner wall is covered with a liner. The liner is covered with a fibre glass insulation. The insulation is covered with an outer jacket. The insulation reduces the noise passing through the silencer.

## Classifications

**EU** – EN 13180 Dia. Class B, Tightness Class C, Sag < 4°, Crushing strength 13–35 kg compressed, 2–5 kg uncompressed.

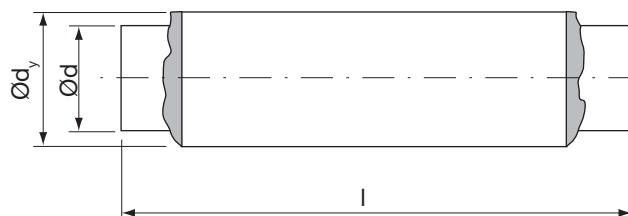
## Advantages

- Easy assembly
- Very small storage and transport volume.
- No toxic gases are emitted in case of fire.
- Tested on fire resistance.

## Ordering example

|              |        |     |       |    |       |
|--------------|--------|-----|-------|----|-------|
| Product      | FLDFSL | 160 | 10000 | AP | AP/MP |
| Dimension Ød |        |     |       |    |       |
| Length l     |        |     |       |    |       |
| Material     |        |     |       |    |       |
| Type         |        |     |       |    |       |

## Dimensions



| Ød<br>nom | l<br>mm | Ødy<br>mm |
|-----------|---------|-----------|
| 76        | 10000   | 126       |
| 82        | 10000   | 132       |
| 90        | 10000   | 140       |
| 102       | 10000   | 152       |
| 112       | 10000   | 162       |
| 127       | 10000   | 177       |
| 133       | 10000   | 183       |
| 140       | 10000   | 190       |
| 152       | 10000   | 202       |
| 160       | 10000   | 210       |
| 180       | 10000   | 230       |
| 203       | 10000   | 253       |
| 229       | 10000   | 279       |
| 254       | 10000   | 304       |
| 280       | 10000   | 330       |
| 305       | 10000   | 355       |
| 315       | 10000   | 365       |
| 356       | 10000   | 406       |
| 380       | 10000   | 430       |
| 406       | 10000   | 456       |
| 457       | 10000   | 507       |
| 508       | 10000   | 558       |

## Technical data

|                            |  |
|----------------------------|--|
| Duct materials:            |  |
| inner wall (core) .....    | Micro-perforated aluminium-polyester (AP)            |
| liner.....                 | Polyethylene (PE)                                    |
| insulation .....           | Glass wool 25 mm                                     |
| outer wall (jacket) .....  | Aluminium-polyester (AP) or metalized polyester (MP) |
| Temperature range.....     | -30 to +140 °C                                       |
| Standard length .....      | 10 m   |
| Maximum air velocity ..... | 30 m/s   |
| Delivery length .....      | Compressed to 1 m                                    |
| Packing .....              | Individual box                                       |

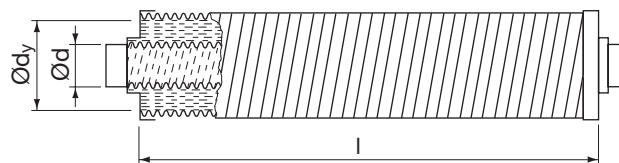




# Semiflexible double duct silencer FDDGSL



## Dimensions



## Description

Double-layer micro-perforated inner duct wall. The inner wall is covered with a fibre glass insulation. The insulation is covered with a double-layer outer duct.

The ends of the silencer are covered with aluminium gables. The duct connections fits inside ducts.

The insulation reduces the noise passing through the silencer.

## Advantages

- Small storage and transport volume.

## Technical data

Duct materials:

inner wall..... Aluminium + aluminium (AL)  
 insulation..... Glass wool 25 mm  
 outer wall ..... Aluminium + aluminium

Minimum bending radius.....

2-3xd

Maximum temperature.....

+200 °C

Fire resistance.....

Not flammable in accordance with DIN 4102 class A1

| Ød nom | l mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ødy mm |
|--------|------|--|-----|-----|-----|----|----|----|----|--------|
|        |      | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |        |
| 80     | 750  |  |     |     |     |    |    |    |    | 135    |
| 80     | 1000 | 2                                      | 6   | 10  | 20  | 38 | 58 | 33 | 28 | 135    |
| 80     | 1250 |  |     |     |     |    |    |    |    | 135    |
| 80     | 1500 |  |     |     |     |    |    |    |    | 135    |
| 80     | 2000 |  |     |     |     |    |    |    |    | 135    |
| 100    | 750  |  |     |     |     |    |    |    |    | 160    |
| 100    | 1000 | 1                                      | 5   | 8   | 18  | 35 | 58 | 33 | 27 | 160    |
| 100    | 1250 |  |     |     |     |    |    |    |    | 160    |
| 100    | 1500 |  |     |     |     |    |    |    |    | 160    |
| 100    | 2000 |  |     |     |     |    |    |    |    | 160    |
| 125    | 750  |  |     |     |     |    |    |    |    | 190    |
| 125    | 1000 | 1                                      | 5   | 8   | 18  | 35 | 58 | 33 | 27 | 190    |
| 125    | 1250 |  |     |     |     |    |    |    |    | 190    |
| 125    | 1500 |  |     |     |     |    |    |    |    | 190    |
| 125    | 2000 |  |     |     |     |    |    |    |    | 190    |
| 160    | 750  |  |     |     |     |    |    |    |    | 210    |
| 160    | 1000 | 1                                      | 2   | 4   | 10  | 23 | 43 | 18 | 14 | 210    |
| 160    | 1250 |  |     |     |     |    |    |    |    | 210    |
| 160    | 1500 |  |     |     |     |    |    |    |    | 210    |
| 160    | 2000 |  |     |     |     |    |    |    |    | 210    |
| 200    | 750  |  |     |     |     |    |    |    |    | 260    |
| 200    | 1000 | 2                                      | 2   | 4   | 9   | 20 | 27 | 13 | 11 | 260    |
| 200    | 1250 |  |     |     |     |    |    |    |    | 260    |
| 200    | 1500 |  |     |     |     |    |    |    |    | 260    |
| 200    | 2000 |  |     |     |     |    |    |    |    | 260    |
| 250    | 750  |  |     |     |     |    |    |    |    | 310    |
| 250    | 1000 | 1                                      | 2   | 4   | 9   | 18 | 19 | 9  | 9  | 310    |
| 250    | 1250 |  |     |     |     |    |    |    |    | 310    |
| 250    | 1500 |  |     |     |     |    |    |    |    | 310    |
| 250    | 2000 |  |     |     |     |    |    |    |    | 310    |
| 315    | 750  |  |     |     |     |    |    |    |    | 365    |
| 315    | 1000 | 1                                      | 2   | 3   | 5   | 11 | 13 | 7  | 8  | 365    |
| 315    | 1250 |  |     |     |     |    |    |    |    | 365    |
| 315    | 1500 |  |     |     |     |    |    |    |    | 365    |
| 315    | 2000 |  |     |     |     |    |    |    |    | 365    |

## Ordering example

|              |               |            |             |           |           |
|--------------|---------------|------------|-------------|-----------|-----------|
|              | <b>FDDGSL</b> | <b>160</b> | <b>1250</b> | <b>AA</b> | <b>25</b> |
| Product      |               |            |             |           |           |
| Dimension Ød |               |            |             |           |           |
| Length l     |               |            |             |           |           |
| Material     |               |            |             |           |           |
| Thickness    |               |            |             |           |           |



# Semiflexible double duct silencer FDDGSL



## Description

Double-layer micro-perforated inner duct wall. The inner wall is covered with a fibre glass insulation. The insulation is covered with a double-layer outer duct.

The ends of the silencer are covered with aluminium gables. The duct connections fits inside ducts.

The insulation reduces the noise passing through the silencer.

## Advantages

- Small storage and transport volume.

## Technical data

Duct materials:

inner wall..... Aluminium + aluminium (AL)  
 insulation..... Glass wool 50 mm  
 outer wall ..... Aluminium + aluminium

Minimum bending radius.....

2-3xd

Maximum temperature.....

+200 °C

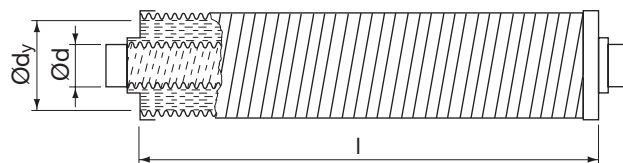
Fire resistance.....

Not flammable in accordance with DIN 4102 class A1

## Ordering example

|              |               |            |             |           |           |
|--------------|---------------|------------|-------------|-----------|-----------|
|              | <b>FDDGSL</b> | <b>160</b> | <b>1250</b> | <b>AA</b> | <b>50</b> |
| Product      |               |            |             |           |           |
| Dimension Ød |               |            |             |           |           |
| Length l     |               |            |             |           |           |
| Material     |               |            |             |           |           |
| Thickness    |               |            |             |           |           |

## Dimensions



| Ød nom | l mm | Attenuation [dB] centre frequency [Hz] |     |     |     |    |    |    |    | Ødy mm |
|--------|------|--|-----|-----|-----|----|----|----|----|--------|
|        |      | 63                                     | 125 | 250 | 500 | 1k | 2k | 4k | 8k |        |
| 80     | 750  |  |     |     |     |    |    |    |    | 190    |
| 80     | 1000 | 3                                      | 13  | 19  | 30  | 47 | 58 | 33 | 28 | 190    |
| 80     | 1250 |  |     |     |     |    |    |    |    | 190    |
| 80     | 1500 |  |     |     |     |    |    |    |    | 190    |
| 80     | 2000 |  |     |     |     |    |    |    |    | 190    |
| 100    | 750  |  |     |     |     |    |    |    |    | 210    |
| 100    | 1000 | 2                                      | 11  | 16  | 28  | 46 | 58 | 36 | 36 | 210    |
| 100    | 1250 |  |     |     |     |    |    |    |    | 210    |
| 100    | 1500 |  |     |     |     |    |    |    |    | 210    |
| 100    | 2000 |  |     |     |     |    |    |    |    | 210    |
| 125    | 750  |  |     |     |     |    |    |    |    | 235    |
| 125    | 1000 | 1                                      | 7   | 13  | 24  | 41 | 45 | 29 | 28 | 235    |
| 125    | 1250 |  |     |     |     |    |    |    |    | 235    |
| 125    | 1500 |  |     |     |     |    |    |    |    | 235    |
| 125    | 2000 |  |     |     |     |    |    |    |    | 235    |
| 160    | 750  |  |     |     |     |    |    |    |    | 260    |
| 160    | 1000 | 1                                      | 5   | 10  | 21  | 39 | 30 | 20 | 18 | 260    |
| 160    | 1250 |  |     |     |     |    |    |    |    | 260    |
| 160    | 1500 |  |     |     |     |    |    |    |    | 260    |
| 160    | 2000 |  |     |     |     |    |    |    |    | 260    |
| 200    | 750  |  |     |     |     |    |    |    |    | 310    |
| 200    | 1000 | 3                                      | 4   | 9   | 16  | 32 | 22 | 15 | 15 | 310    |
| 200    | 1250 |  |     |     |     |    |    |    |    | 310    |
| 200    | 1500 |  |     |     |     |    |    |    |    | 310    |
| 200    | 2000 |  |     |     |     |    |    |    |    | 310    |
| 250    | 750  |  |     |     |     |    |    |    |    | 365    |
| 250    | 1000 | 2                                      | 4   | 8   | 16  | 33 | 15 | 11 | 12 | 365    |
| 250    | 1250 |  |     |     |     |    |    |    |    | 365    |
| 250    | 1500 |  |     |     |     |    |    |    |    | 365    |
| 250    | 2000 |  |     |     |     |    |    |    |    | 365    |
| 315    | 750  |  |     |     |     |    |    |    |    | 410    |
| 315    | 1000 | 2                                      | 3   | 6   | 12  | 25 | 11 | 8  | 11 | 410    |
| 315    | 1250 |  |     |     |     |    |    |    |    | 410    |
| 315    | 1500 |  |     |     |     |    |    |    |    | 410    |
| 315    | 2000 |  |     |     |     |    |    |    |    | 410    |



# Flexible duct clamp

MDC

- 1
- 2
- 3
- 4
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- 7
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- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



## Description

A metal clamp for all types of flexible ducting. The clamp consists of the band FDB and the flip-up band lock FDBL.

This system allows an easy and quick application thanks to the automatic locking that forms the right diameter of the duct.

## Advantages

- Labour saving.
- The band has lifted edges to avoid damage to the ducting.

## Technical data

|                     |   |
|---------------------|---|
| Diameter range..... | Ø 60–660  |
| Band width .....    | 9 mm  |
| Band material ..... | Stainless steel (SS) UNI X 8<br>CR17 - DIN 14016 (W2) -<br>AISI 430 |

## Ordering example





# Flexible duct band/band lock FDB/FDBL



## Description

A metal band for all types of flexible ducting. The band lock FDBL fits this band.

## Advantages

- The band has lifted edges to avoid damage to the ducting.
- Just cut to adequate length to fit any diameter.

## Technical data

|                     |   |
|---------------------|---|
| Diameter range..... | Any   |
| Band width.....     | 9 mm  |
| Band material.....  | Stainless (SS) steel UNI X 8<br>CR17 - DIN 14010 (W2) -<br>AISI 430 |
| Band length.....    | 30 m  |

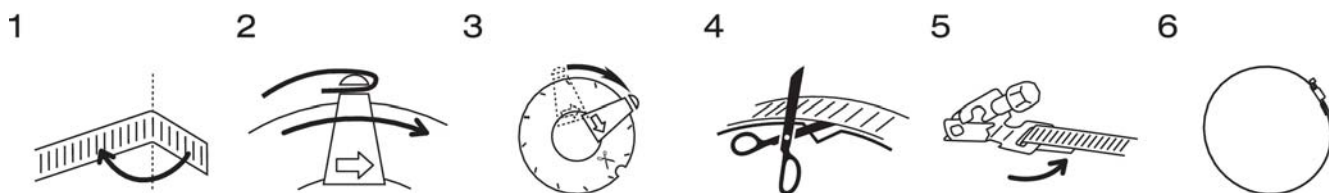


## Description

A flip-up lock for the flexible duct band FDB.

## Technical data

|                    |   |
|--------------------|---|
| Lock material..... | Stainless (SS) steel UNI X 8<br>CR17 - DIN 14010 (W2) -<br>AISI 430 |
| Packing.....       | Box of 50 pieces  |



## Ordering example

|          |            |               |           |
|----------|------------|---------------|-----------|
|          | <b>FDB</b> | <b>30 000</b> | <b>SS</b> |
| Product  | _____      |               |           |
| Length   | _____      |               |           |
| Material | _____      |               |           |

## Ordering example

|          |             |           |
|----------|-------------|-----------|
|          | <b>FDBL</b> | <b>SS</b> |
| Product  | _____       |           |
| Material | _____       |           |

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# Isol







|                                    |           |
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| Lindab                             | 1         |
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# General

Isol is the name for our pre-insulated ducts and fittings, intended for both indoor and outdoor use. The system is based on sheet steel inner and outer sheaths with rock wool insulation in between.

The nominal size Ø100–500 always refers to the inner duct diameter, irrespective of the type in question.

### Insulation

insulation thickness is 50 mm.

As special we can offer products with 25 mm glass wool insulation.

### Inner sheath

The inner sheath is made from standard units from the Safe programme. This means that adequate properties are the same as for the corresponding Safe units.

### Outer sheath

The outer sheath is supplied as standard with hot dip galvanised steel sheet Z 275. It can also be made in plastic coated galvanised steel sheet, stainless steel or alu-zink to special order.

### Joints

When installation is done outdoors, it is important to have a diffusion-proof outer sheath. For this reason, use the special sealing clamp SVK, which gives good mechanical strength and good sealing at the joints. The sealing material consists of long-life EPDM rubber.

### Duct fixing

The Isol system is normally mounted on straps, in the same way as other duct systems.

### Heat/cold

Graphs of theoretically estimated power loss in a straight duct.

### Prerequisites

Transported air  $t_1 = 20$  [°C]

Heat transfer coefficient between outer sheath and surrounding air at 10 [m/s]  $\alpha_y = 30-40$  [W/(m<sup>2</sup>·°C)]

Ambient temperature  $t_2 = -20$  to  $+20$  [°C]

### Do like this:

1. Start with the temperature difference,  $\Delta t$  [°C], between the air in the duct and the surrounding.
2. Go to the duct diameter,  $\varnothing$  [mm].
3. Find the specific power loss,  $P_l$  [W/m].
4. Continue to the air flow,  $q$  [m<sup>3</sup>/s].
5. Find the specific temperature drop,  $T_d$  [°C/m].

### Example:

1.  $\Delta t = 30$  °C and
2.  $\varnothing = 400$  mm yields
3.  $P_l = 25,5$  W/m
4.  $q = 0,1$  m<sup>3</sup>/s yields
5.  $T_d = 0,212$  °C/m

### Explanations:

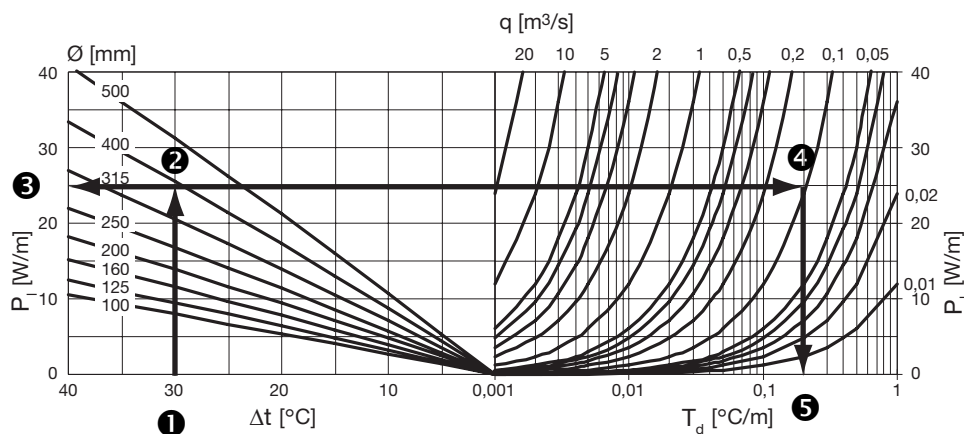
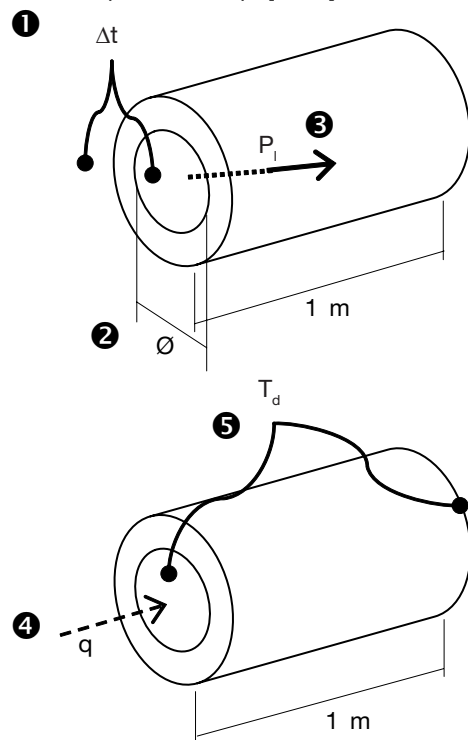
$\Delta t$  = temperature difference, [°C]

$\varnothing$  = duct diameter, [mm]

$P_l$  = specific power loss, [W/m]

$q$  = air flow, [m<sup>3</sup>/s]

$T_d$  = specific temperature drop, [°C/m]



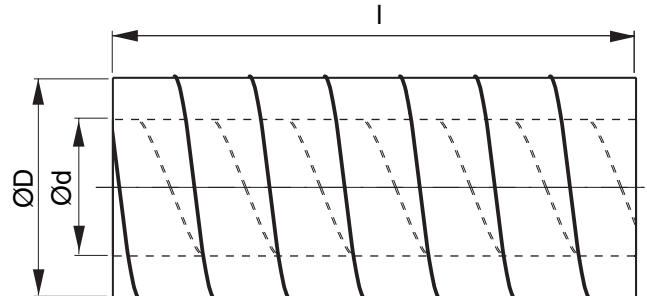


# Circular duct

SRI



## Dimensions



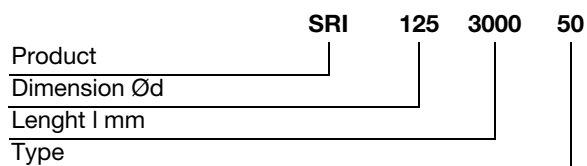
## Description

Circular duct.

| Ød<br>nom | ØD<br>mm | l<br>std<br>mm | m <sub>1</sub><br>kg/m |
|-----------|----------|----------------|------------------------|
| 100       | 200      | 3000           | 6,19                   |
| 125       | 224      | 3000           | 7,44                   |
| 160       | 260      | 3000           | 9,29                   |
| 200       | 300      | 3000           | 11,1                   |
| 250 *     | 355 *    | 3000           | 13,3                   |
| 315 *     | 415 *    | 3000           | 19,6                   |
| 400 *     | 500 *    | 3000           | 23,2                   |
| 500 *     | 600 *    | 3000           | 31,3                   |

\* With external stiffening corrugation

## Ordering example





# Bend

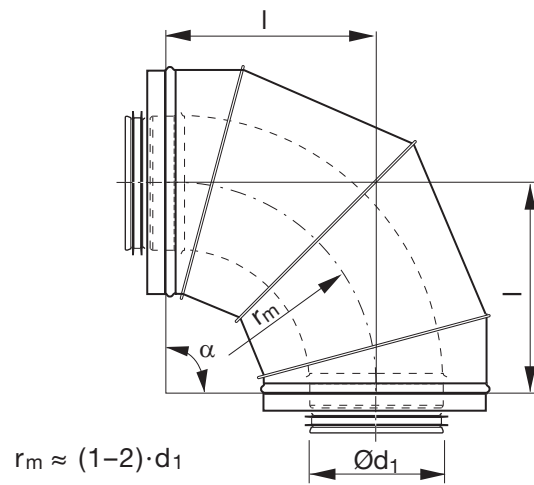
# BFUI 90°



## Description

Segmented and lockseamed bend.

## Dimensions



| $\text{Ø}d_1$<br>nom | l<br>mm | m<br>kg |
|----------------------|---------|---------|
| 100                  | 200     | 2,93    |
| 125                  | 225     | 3,44    |
| 160                  | 240     | 4,88    |
| 200                  | 300     | 6,86    |
| 250                  | 352     | 9,74    |
| 315                  | 315     | 11,6    |
| 400                  | 400     | 18,6    |
| 500                  | 500     | 26,1    |

## Ordering example

|                         |             |            |           |           |
|-------------------------|-------------|------------|-----------|-----------|
| Product                 | <b>BFUI</b> | <b>200</b> | <b>90</b> | <b>50</b> |
| Dimension $\text{Ø}d_1$ |             |            |           |           |
| Angle $\alpha$          |             |            |           |           |
| Type                    |             |            |           |           |

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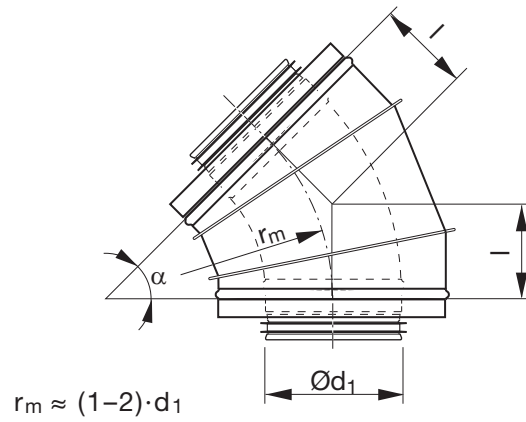


# Bend

# BFUI 45°



## Dimensions

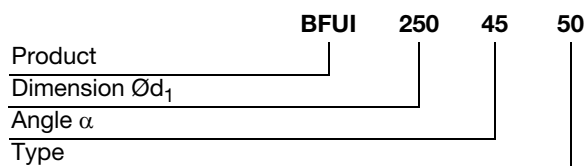


## Description

Segmented and lockseamed bend.

| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 100                    | 83      | 1,55    |
| 125                    | 79      | 1,68    |
| 160                    | 100     | 2,49    |
| 200                    | 124     | 3,34    |
| 250                    | 136     | 4,90    |
| 315                    | 145     | 5,55    |
| 400                    | 188     | 8,97    |
| 500                    | 224     | 12,9    |

## Ordering example





# Bend

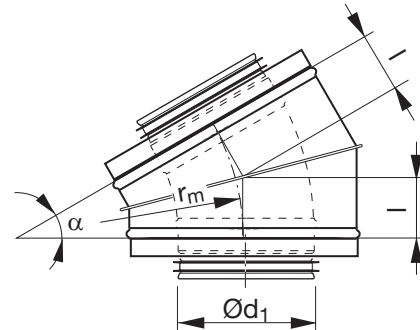
# BFUI 30°



## Description

Segmented and lockseamed bend.

## Dimensions



$$r_m \approx (0,8-2) \cdot d_1$$

| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 100                    | 54      | 1,03    |
| 125                    | 60      | 1,35    |
| 160                    | 67      | 1,95    |
| 200                    | 54      | 2,67    |
| 250                    | 69      | 3,65    |
| 315                    | 83      | 4,48    |
| 400                    | 99      | 6,90    |
| 500                    | 105     | 10,1    |

## Ordering example

|                           |      |     |    |    |
|---------------------------|------|-----|----|----|
| Product                   | BFUI | 315 | 30 | 50 |
| Dimension Ød <sub>1</sub> |      |     |    |    |
| Angle α                   |      |     |    |    |
| Type                      |      |     |    |    |

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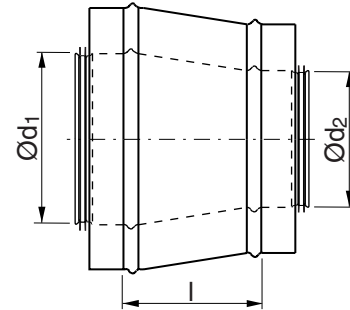


# Reducer

# RCLUI



## Dimensions



## Description

Long, hand made reducer with appr. 20° angle.

| Ød <sub>1</sub><br>nom | Ød <sub>2</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|------------------------|---------|---------|
| 125                    | 100                    | 64      | 0,87    |
| 160                    | 100                    | 112     | 1,24    |
| 160                    | 125                    | 78      | 1,11    |
| 200                    | 100                    | 167     | 1,90    |
| 200                    | 125                    | 133     | 1,66    |
| 200                    | 160                    | 85      | 1,42    |
| 250                    | 125                    | 202     | 2,82    |
| 250                    | 160                    | 154     | 2,54    |
| 250                    | 200                    | 99      | 2,24    |
| 315                    | 160                    | 243     | 3,78    |
| 315                    | 200                    | 188     | 3,43    |
| 315                    | 250                    | 119     | 3,15    |
| 400                    | 200                    | 310     | 5,87    |
| 400                    | 250                    | 241     | 6,69    |
| 400                    | 315                    | 152     | 4,77    |
| 500                    | 250                    | 378     | 9,26    |
| 500                    | 315                    | 289     | 8,06    |
| 500                    | 400                    | 177     | 6,78    |

## Ordering example

|                           |              |            |            |           |
|---------------------------|--------------|------------|------------|-----------|
|                           | <b>RCLUI</b> | <b>400</b> | <b>250</b> | <b>50</b> |
| Product                   |              |            |            |           |
| Dimension Ød <sub>1</sub> |              |            |            |           |
| Dimension Ød <sub>2</sub> |              |            |            |           |
| Type                      |              |            |            |           |





# Reducer

# RCFUI

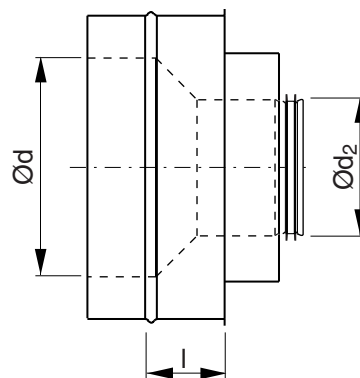


## Description

Short, concentric reducer with one female end.

$\text{Ød}$  fits over a fitting and  $\text{Ød}_2$  fits inside a duct.

## Dimensions



| $\text{Ød}$<br>nom | $\text{Ød}_2$<br>nom | l<br>mm | m<br>kg |
|--------------------|----------------------|---------|---------|
| 125                | 100                  | 82      | 0,93    |
| 160                | 100                  | 97      | 1,11    |
| 160                | 125                  | 66      | 1,04    |
| 200                | 100                  | 118     | 1,46    |
| 200                | 125                  | 106     | 1,44    |
| 200                | 160                  | 86      | 1,37    |
| 250                | 125                  | 150     | 2,23    |
| 250                | 160                  | 133     | 2,21    |
| 250                | 200                  | 112     | 2,15    |
| 315                | 160                  | 168     | 2,87    |
| 315                | 200                  | 148     | 2,81    |
| 315                | 250                  | 143     | 3,14    |
| 400                | 200                  | 203     | 4,59    |
| 400                | 250                  | 198     | 4,08    |
| 400                | 315                  | 165     | 4,81    |
| 500                | 250                  | 248     | 6,90    |
| 500                | 315                  | 215     | 6,62    |
| 500                | 400                  | 193     | 6,92    |

## Ordering example

|                         |              |            |            |           |
|-------------------------|--------------|------------|------------|-----------|
|                         | <b>RCFUI</b> | <b>250</b> | <b>160</b> | <b>50</b> |
| Product                 |              |            |            |           |
| Dimension $\text{Ød}$   |              |            |            |           |
| Dimension $\text{Ød}_2$ |              |            |            |           |
| Type                    |              |            |            |           |



# T-piece

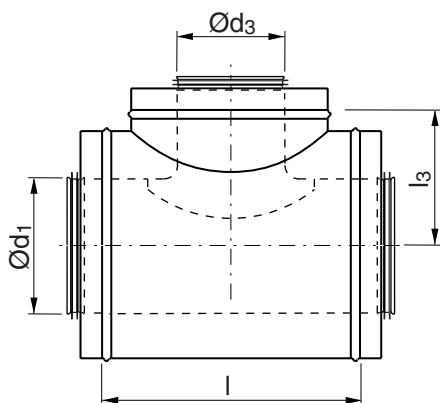
TCUI



## Description

Centric T-piece.

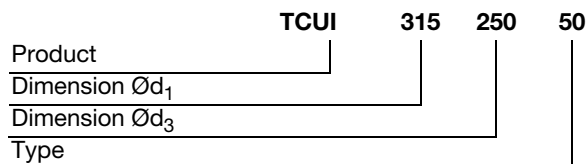
## Dimensions



## Dimensions

| Ød <sub>1</sub><br>nom | Ød <sub>3</sub><br>nom | l<br>mm | l <sub>3</sub><br>mm | m<br>kg |
|------------------------|------------------------|---------|----------------------|---------|
| 100                    | 100                    | 250     | 134                  | 2,86    |
| 125                    | 100                    | 250     | 131                  | 3,21    |
| 125                    | 125                    | 274     | 146                  | 3,49    |
| 160                    | 100                    | 250     | 149                  | 3,72    |
| 160                    | 125                    | 274     | 149                  | 4,05    |
| 160                    | 160                    | 310     | 149                  | 4,54    |
| 200                    | 100                    | 250     | 169                  | 4,30    |
| 200                    | 125                    | 274     | 169                  | 4,67    |
| 200                    | 160                    | 310     | 169                  | 5,33    |
| 200                    | 200                    | 350     | 169                  | 5,97    |
| 250                    | 100                    | 250     | 194                  | 5,60    |
| 250                    | 125                    | 274     | 194                  | 6,03    |
| 250                    | 160                    | 310     | 194                  | 6,79    |
| 250                    | 200                    | 350     | 194                  | 7,53    |
| 250                    | 250                    | 400     | 192                  | 9,16    |
| 315                    | 100                    | 250     | 227                  | 6,51    |
| 315                    | 125                    | 274     | 227                  | 7,01    |
| 315                    | 160                    | 310     | 227                  | 7,86    |
| 315                    | 200                    | 350     | 227                  | 8,58    |
| 315                    | 250                    | 400     | 222                  | 10,4    |
| 315                    | 315                    | 465     | 222                  | 12,7    |
| 400                    | 100                    | 250     | 269                  | 8,38    |
| 400                    | 125                    | 274     | 269                  | 9,00    |
| 400                    | 160                    | 310     | 269                  | 10,0    |
| 400                    | 200                    | 350     | 269                  | 11,0    |
| 400                    | 250                    | 400     | 264                  | 13,1    |
| 400                    | 315                    | 465     | 264                  | 15,9    |
| 400                    | 400                    | 550     | 269                  | 17,6    |
| 500                    | 100                    | 250     | 319                  | 11,3    |
| 500                    | 125                    | 274     | 319                  | 12,2    |
| 500                    | 160                    | 310     | 319                  | 13,4    |
| 500                    | 200                    | 350     | 319                  | 14,5    |
| 500                    | 250                    | 443     | 314                  | 18,1    |
| 500                    | 315                    | 465     | 314                  | 20,7    |
| 500                    | 400                    | 550     | 314                  | 22,5    |
| 500                    | 500                    | 650     | 349                  | 27,0    |

## Ordering example





# Take-off

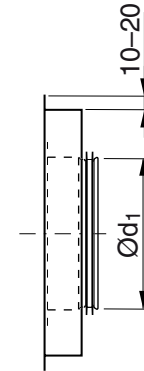
ILUI



## Description

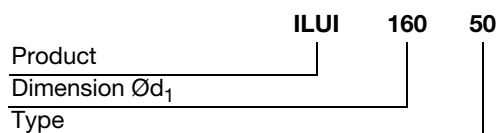
Take-off with radius 2–4 mm.

## Dimensions



| Ød <sub>1</sub><br>nom | m<br>kg |
|------------------------|---------|
| 100                    | 0,32    |
| 125                    | 0,37    |
| 160                    | 0,47    |
| 200                    | 0,58    |
| 250                    | 0,81    |
| 315                    | 1,05    |
| 400                    | 1,58    |
| 500                    | 2,04    |

## Ordering example



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# Coupling

NPUI

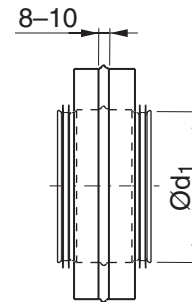
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## Description

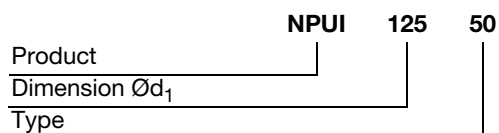
Coupling for joining of SRI ducts.

## Dimensions



| Ød <sub>1</sub><br>nom | m<br>kg |
|------------------------|---------|
| 100                    | 0,26    |
| 125                    | 0,30    |
| 160                    | 0,36    |
| 200                    | 0,50    |
| 250                    | 0,97    |
| 315                    | 1,18    |
| 400                    | 2,05    |
| 500                    | 2,72    |

## Ordering example





# Female coupling

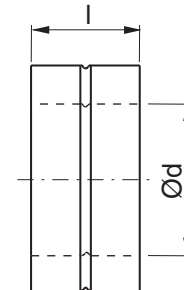
MFI



## Description

Female coupling for joining of fittings.

## Dimensions



| Ød<br>nom | l<br>mm | m<br>kg |
|-----------|---------|---------|
| 100       | 90      | 0,58    |
| 125       | 90      | 0,68    |
| 160       | 90      | 0,85    |
| 200       | 90      | 1,01    |
| 250       | 130     | 1,76    |
| 315       | 130     | 2,08    |
| 400       | 170     | 3,64    |
| 500       | 170     | 4,62    |

## Ordering example

|              |            |            |           |
|--------------|------------|------------|-----------|
|              | <b>MFI</b> | <b>100</b> | <b>50</b> |
| Product      |            |            |           |
| Dimension Ød |            |            |           |
| Type         |            |            |           |

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# End cap

ESUI

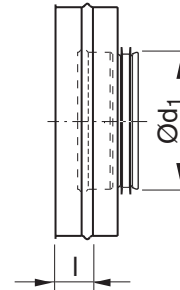
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## Description

End cap which fits inside a duct.

## Dimensions



| Ød<br>nom | l<br>mm | m<br>kg |
|-----------|---------|---------|
| 100       | 58      | 0,81    |
| 125       | 58      | 0,95    |
| 160       | 58      | 1,25    |
| 200       | 58      | 1,58    |
| 250       | 58      | 2,26    |
| 315       | 58      | 3,04    |
| 400       | 58      | 4,77    |
| 500       | 58      | 6,41    |

## Ordering example



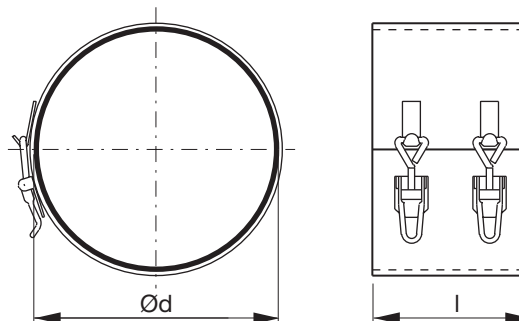


# Sealing clamp

# SVK



## Dimensions



## Description

Removable sealing clamp to be installed outside the outer sheath.

The inside of the sealing clamp is covered with a thick layer of cellular EPDM rubber.

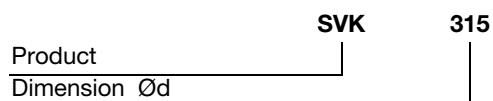
The table below specifies the sealing clamp SVK, with diameter d, which is used on each nominal diameter d<sub>1</sub>, of Isol.

| Isol<br>Ød <sub>1</sub><br>nom | Use SVK<br>Ød |
|--------------------------------|---------------|
| 100                            | 200           |
| 125                            | 224           |
| 160                            | 260           |
| 200                            | 300           |
| 250                            | 355           |
| 315                            | 415           |
| 400                            | 500           |
| 500                            | 600           |

| Ød<br>nom | l<br>mm | m<br>kg |
|-----------|---------|---------|
| 80 *      | 130     | 0,30    |
| 100 *     | 130     | 0,34    |
| 125 *     | 130     | 0,40    |
| 160       | 130     | 0,46    |
| 180       | 130     | 0,52    |
| 200       | 130     | 0,59    |
| 224       | 130     | 0,75    |
| 250 *     | 190     | 0,94    |
| 260       | 190     | 0,98    |
| 300       | 190     | 1,12    |
| 315       | 190     | 1,17    |
| 355       | 190     | 1,30    |
| 375       | 190     | 1,35    |
| 400 *     | 250     | 1,42    |
| 415       | 250     | 1,49    |
| 460       | 250     | 1,60    |
| 500       | 250     | 1,75    |
| 560       | 250     | 2,00    |
| 600       | 250     | 2,20    |

\* Only used in the Safe programme

## Ordering example



- 1
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- 13**
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# Access doors



|                                    |           |
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| Lindab                             | 1         |
| General information and theory     | 2         |
| Safe                               | 3         |
| Silencers                          | 4         |
| Dampers & Measure units            | 5         |
| Fire dampers & Smoke evacuation    | 6         |
| Air valves                         | 7         |
| Roof hoods                         | 8         |
| Other circular products            | 9         |
| Transfer                           | 10        |
| Rectangular                        | 11        |
| Flexible ducting                   | 12        |
| Isol                               | 13        |
| <b>Access doors</b>                | <b>14</b> |
| Smart tools                        | 15        |
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**Access doors**



|             |     |
|-------------|-----|
| EPFH .....  | 604 |
| ESHU .....  | 605 |
| KCU .....   | 606 |
| KCIVU ..... | 607 |
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**Uninsulated for circular ducts**



|            |     |
|------------|-----|
| IPLR ..... | 610 |
|------------|-----|

**Uninsulated for rectangular ducts**



|           |     |
|-----------|-----|
| IPF ..... | 611 |
|-----------|-----|

**Insulated for rectangular ducts**



|            |     |
|------------|-----|
| IPRD ..... | 612 |
|------------|-----|



|           |     |
|-----------|-----|
| IPL ..... | 613 |
|-----------|-----|

**Access door for rectangular ducts**



|            |     |
|------------|-----|
| LKCR ..... | 614 |
|------------|-----|

**Insulated for circular ducts**



|             |     |
|-------------|-----|
| EPFUI ..... | 615 |
|-------------|-----|



|             |     |
|-------------|-----|
| KCRUI ..... | 616 |
|-------------|-----|



# End caps and access doors

## Cleaning of duct systems

Some duct units have parts which more or less block the duct system, and thus obstruct or prevent cleaning of it. Such units are silencers with baffles, most dampers and some flow measurement units. You can choose one of the following approaches, to permit cleaning at such units:

- You can install access doors such as KCU page 606, EPFH page 604, KCRU page 608 or KC page 609 on each side of the unit.
- You can use sealing clamp SVK page 467 to make it easy to remove the unit from the system.
- You can use slide-in coupling SMFU page 164 to make it easy to remove the unit from the system.  
**NOTE!** To prevent the system from inadvertently coming apart during operation, locate the slide-in coupling **upstream** of the unit, seen from the direction of the air flow.
- You can locally switch over to Transfer to make it easy to remove the unit from the system.

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# Access door

# EPFH



## Description

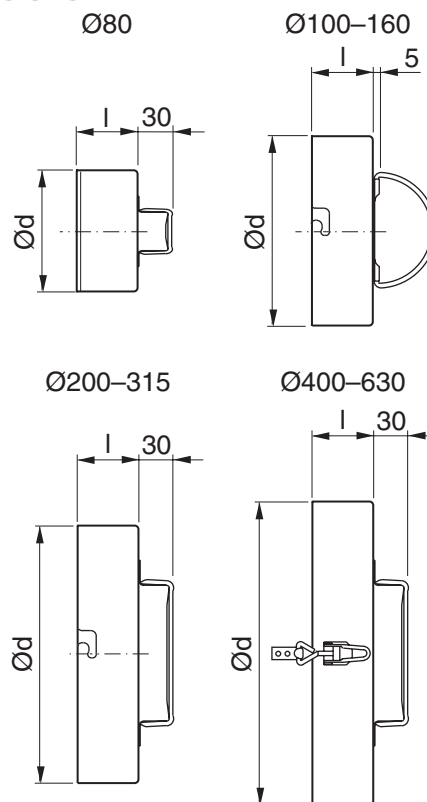
Access door, which fits outside a Safe fitting.

Some dimensions Ø80–355 have notches for bayonet locking, in order to be better fixed in ducts with positive pressure. You must then add two rivets to the fitting.

Dimensions Ø400–630 have eccentric locks in order to be better fixed in ducts with positive pressure. You must then mount the hooks of the locks in the fitting.

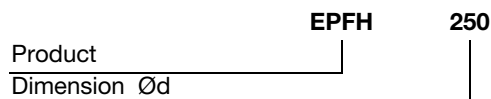
No Click function – no notches.

## Dimensions



| Ød nom | l mm | m kg | Handle        | Lock     |
|--------|------|------|---------------|----------|
| 80     | 48   | 0,09 | 1 fixed small | –        |
| 100    | 40   | 0,15 | 1 folding     | bayonet  |
| 112    | 40   | 0,16 | 1 folding     | –        |
| 125    | 40   | 0,17 | 1 folding     | bayonet  |
| 140    | 40   | 0,19 | 1 folding     | –        |
| 150    | 40   | 0,21 | 1 folding     | –        |
| 160    | 40   | 0,22 | 1 folding     | bayonet  |
| 180    | 40   | 0,24 | 1 fixed       | –        |
| 200    | 40   | 0,32 | 1 fixed       | bayonet  |
| 224    | 60   | 0,38 | 1 fixed       | –        |
| 250    | 60   | 0,55 | 2 fixed       | bayonet  |
| 280    | 60   | 0,64 | 2 fixed       | –        |
| 300    | 60   | 0,69 | 2 fixed       | –        |
| 315    | 60   | 0,74 | 2 fixed       | bayonet  |
| 355    | 60   | 0,87 | 2 fixed       | –        |
| 400    | 80   | 1,26 | 2 fixed       | eccenter |
| 450    | 80   | 1,57 | 2 fixed       | eccenter |
| 500    | 80   | 1,87 | 2 fixed       | eccenter |
| 560    | 80   | 2,18 | 2 fixed       | eccenter |
| 600    | 80   | 2,49 | 2 fixed       | eccenter |
| 630    | 80   | 2,71 | 2 fixed       | eccenter |

## Ordering example





# Access door

# ESHU



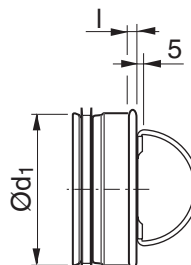
## Description

Access door, which fits inside an SR duct.

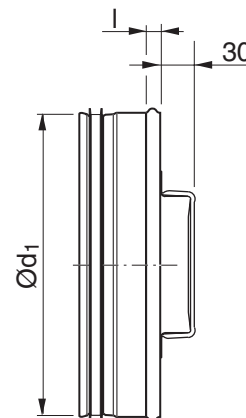
No Click function – has a closed turned-over end.

## Dimensions

Ø100–160

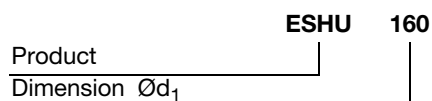


Ø200–630



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg | Handle    |
|------------------------|---------|---------|-----------|
| 100                    | 10      | 0,17    | 1 folding |
| 112                    | 4       | 0,18    | 1 folding |
| 125                    | 10      | 0,19    | 1 folding |
| 140                    | 10      | 0,24    | 1 folding |
| 150                    | 10      | 0,22    | 1 folding |
| 160                    | 10      | 0,29    | 1 folding |
| 180                    | 10      | 0,32    | 1 fixed   |
| 200                    | 10      | 0,36    | 1 fixed   |
| 224                    | 10      | 0,44    | 1 fixed   |
| 250                    | 10      | 0,58    | 2 fixed   |
| 280                    | 4       | 0,70    | 2 fixed   |
| 300                    | 10      | 0,78    | 2 fixed   |
| 315                    | 10      | 0,88    | 2 fixed   |
| 355                    | 10      | 0,99    | 2 fixed   |
| 400                    | 12      | 1,34    | 2 fixed   |
| 500                    | 12      | 1,72    | 2 fixed   |
| 630                    | 4       | 2,62    | 2 fixed   |

## Ordering example



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# Access door

KCU

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## Description

Insulated access door which fits outside a Safe fitting.

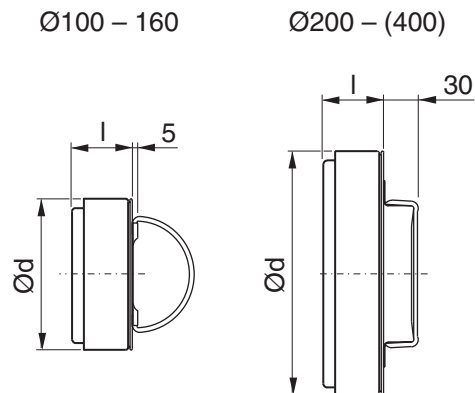
The door is held in place by spring clips against the inside of the Safe fitting. This does not apply to Ø400 which is held in place by two eccentric locks.

The door is loosened by pulling it straight outwards, and is installed in the opposite manner (but not Ø400). There are one or two handles to help in the process.

$\Delta p$  in the table gives the maximum positive pressure the access door can withstand when installed from beneath.

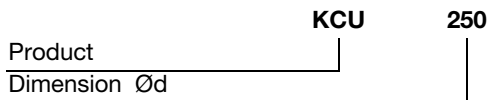
No Click function – no notches.

## Dimensions



| Ød nom | $\Delta p$ Pa | l mm | m kg | Handle    |
|--------|---------------|------|------|-----------|
| 100    | 3400          | 40   | 0,30 | 1 folding |
| 125    | 3400          | 40   | 0,40 | 1 folding |
| 160    | 3400          | 40   | 0,60 | 1 folding |
| 200    | 3400          | 40   | 0,80 | 1 fixed   |
| 250    | 3400          | 60   | 1,28 | 2 fixed   |
| 315    | 2600          | 60   | 1,81 | 2 fixed   |
| 400    | 10000         | 90   | 2,82 | 2 fixed   |

## Ordering example





# Access door

# KCIVU



## Description

Insulated access door which fits outside a Safe fitting.

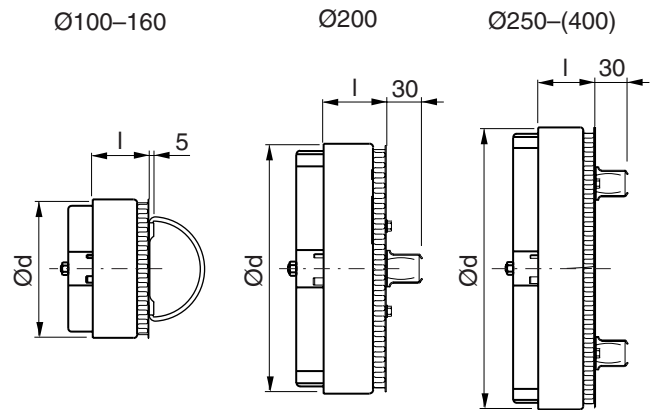
The door is held in place by spring clips against the inside of the Safe fitting. This does not apply to Ø400 which is held in place by two eccentric locks.

The door is loosened by pulling it straight outwards, and is installed in the opposite manner (but not Ø400). There are one or two handles to help in the process.

$\Delta p$  in the table gives the maximum positive pressure the access door can withstand when installed from beneath.

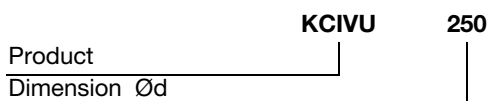
No Click function – no notches.

## Dimensions



| Ød nom | $\Delta p$ Pa | l mm | m kg | Handle    |
|--------|---------------|------|------|-----------|
| 100    | 3400          | 50   | 0,43 | 1 folding |
| 125    | 3400          | 50   | 0,62 | 1 folding |
| 160    | 3400          | 50   | 1,00 | 1 folding |
| 200    | 3400          | 50   | 1,41 | 1 fixed   |
| 250    | 3400          | 70   | 2,25 | 2 fixed   |
| 315    | 2600          | 70   | 3,30 | 2 fixed   |
| 400    | 10000         | 100  | 5,00 | 2 fixed   |

## Ordering example



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# Access door

# KCRU

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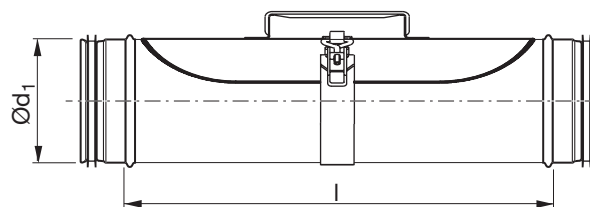
## Description

Access door which complies with the requirements for access doors in Swedish Standard SS 2645.

The door is held in place by a tension strap with adjustable eccentric lock. This offers a quick and simple opening and closing. A built-in handle also aids handling.

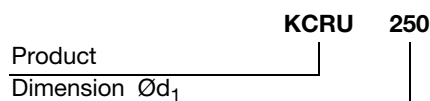
Can achieve maximum tightness class C.

## Dimensions



| Ød <sub>1</sub><br>nom | l<br>mm | m<br>kg |
|------------------------|---------|---------|
| 100                    | 480     | 1,06    |
| 125                    | 480     | 1,30    |
| 160                    | 480     | 1,80    |
| 200                    | 480     | 2,00    |
| 250                    | 480     | 2,92    |
| 315                    | 480     | 4,10    |
| 400                    | 480     | 5,51    |

## Ordering example





# Access door

KC



## Description

Intended for use with fittings which do not have a Safe gasket. The door is retained by spring clips which press against the inside of the fitting. It is released by pulling it straight out, and installed by pressing it in. There are one or two handles to help. The gasket is made from EPDM rubber.

$\Delta p$  in the table specifies the maximum positive pressure the access door can withstand without coming loose, when installed from below.

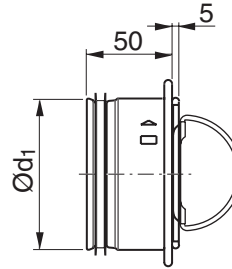
Can manage up to tightness class C.

The corresponding Safe component (of different design) is designated KCU and only fits inside Safe components.

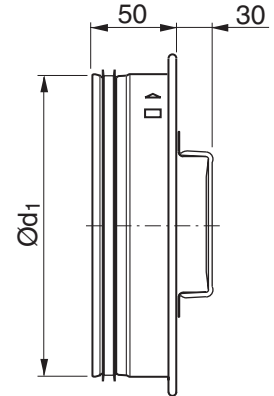
Hasn't any Click function – has a closed turned-over end.

## Dimensions

Ø100–160

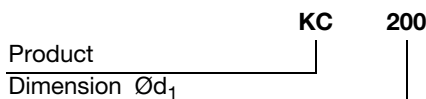


Ø200–315



| Ød nom | $\Delta p$ Pa | m kg | Handle    |
|--------|---------------|------|-----------|
| 100    | 3400          | 0,29 | 1 folding |
| 125    | 3400          | 0,38 | 1 folding |
| 160    | 3400          | 0,57 | 1 folding |
| 200    | 3000          | 0,94 | 1 fixed   |
| 250    | 2300          | 1,76 | 2 fixed   |
| 315    | 1600          | 1,86 | 2 fixed   |

## Ordering example



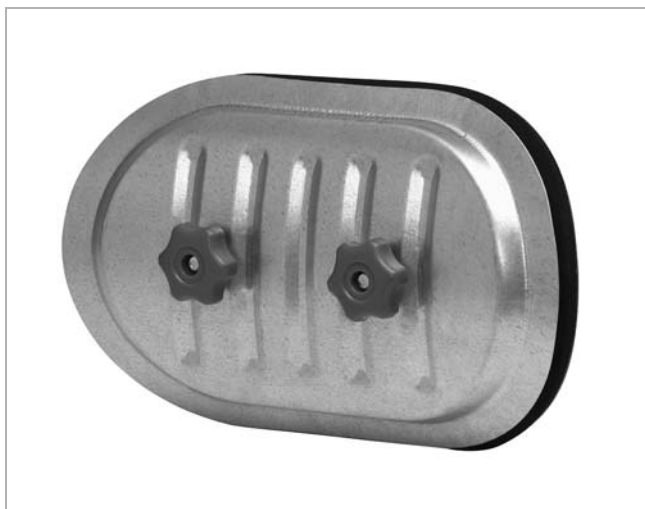
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# Access door

IPLR



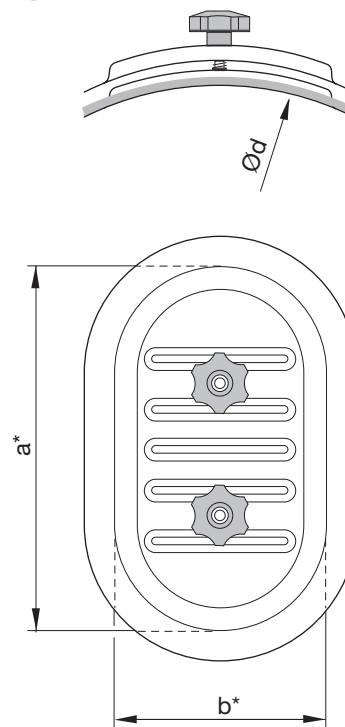
## Description

Access door, which fits on the curved side of a circular duct.

A neoprene cellular gasket seals on the duct's inside. Supplied with a self adhesive template which guides when cutting the oval aperture.

Ø 100–800 is available in stainless steel by request.

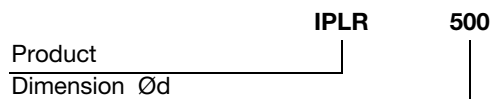
## Dimensions



| Ød<br>nom | a*<br>mm | b*<br>mm | m<br>kg |
|-----------|----------|----------|---------|
| 80        | 180      | 80       | 0,36    |
| 100       | 180      | 80       | 0,36    |
| 112       | 180      | 80       | 0,36    |
| 125       | 180      | 80       | 0,36    |
| 150       | 180      | 80       | 0,36    |
| 160       | 180      | 80       | 0,36    |
| 180       | 250      | 150      | 0,80    |
| 200       | 250      | 150      | 0,80    |
| 250       | 250      | 150      | 0,80    |
| 315       | 250      | 150      | 0,80    |
| 355       | 300      | 200      | 0,88    |
| 400       | 300      | 200      | 0,88    |
| 450       | 300      | 200      | 0,88    |
| 500       | 400      | 300      | 2,20    |
| 560       | 400      | 300      | 2,20    |
| 630       | 400      | 300      | 2,20    |
| 710       | 400      | 300      | 2,20    |
| 800       | 400      | 300      | 2,20    |
| 900       | 400      | 300      | 2,31    |
| 1000      | 500      | 400      | 2,31    |
| 1120      | 500      | 400      | 2,31    |
| 1250      | 500      | 400      | 2,31    |

\* Note! Opening dimensions.

## Ordering example





# Access door

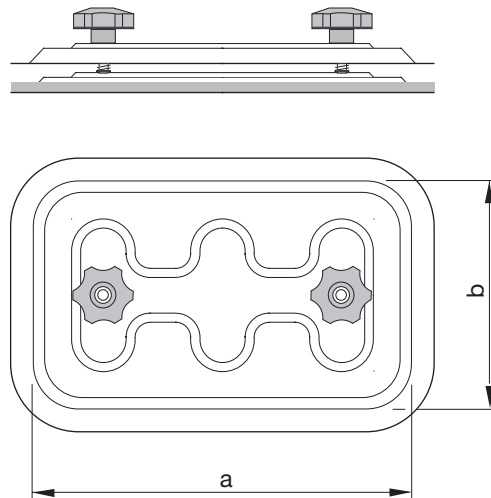
IPF



## Description

Access door, which fits on the flat side of a rectangular duct. A neoprene cellular gasket seals on the duct's inside. Supplied with a self adhesive template which guides when cutting the rectangular aperture.

## Dimensions



| a*<br>mm | b*<br>mm | m<br>kg |
|----------|----------|---------|
| 250      | 150      | 0,65    |
| 300      | 200      | 1,10    |
| 450      | 350      | 2,78    |
| 600      | 450      | 4,90    |

\* Note! Opening dimensions.

## Ordering example

|               |     |     |     |
|---------------|-----|-----|-----|
| Product       | IPF | 300 | 200 |
| Largest side  | a   |     |     |
| Smallest side | b   |     |     |

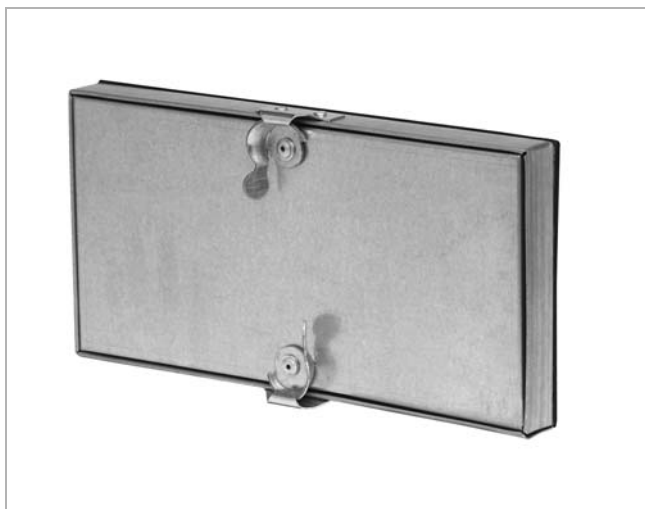
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# Access door

IPRD

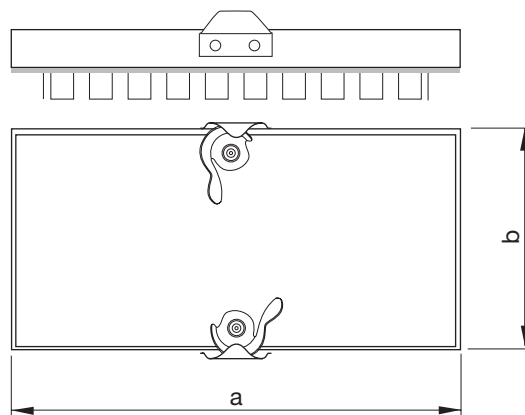
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## Description

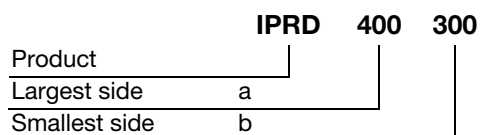
Access door, which fits on the flat side of a rectangular duct. Consists of a door and a frame. The door has a 25 mm thick high density insulation. The frame is attached to the duct wall by means of fixing tabs. Both door and frame are supplied with a neoprene cellular gasket.

## Dimensions



| a<br>mm | b<br>mm | m<br>kg |
|---------|---------|---------|
| 300     | 150     | 0,90    |
| 400     | 300     | 2,00    |
| 500     | 500     | 3,10    |

## Ordering example





# Access door

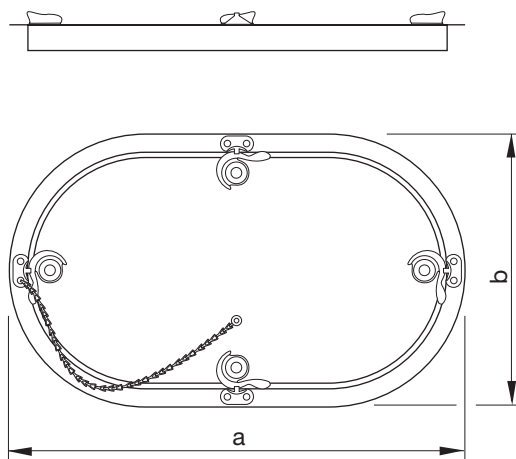
IPL



## Description

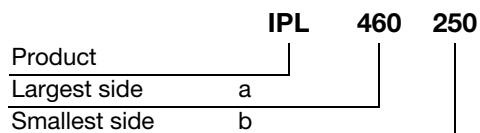
Access door, which fits on the flat side of a rectangular duct. Consists of a door and a frame. The door has a 20 mm thick high density insulation. The frame is attached to the duct wall by means of screws. A gasket as well as a retaining chain is fitted between door and frame.

## Dimensions



| a<br>mm | b<br>mm | m<br>kg |
|---------|---------|---------|
| 300     | 150     | 1,03    |
| 460     | 250     | 2,08    |
| 560     | 360     | 2,70    |
| 635     | 430     | 3,57    |

## Ordering example



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# Access door

LKCR

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## Description

The access door is also used as an inspection hatch for rectangular ducts. To the access door belongs a fixing frame, which is attached to the rectangular duct. This is normally done with blind rivets through the folded-down edge of the door frame. It can also be provided with folding tabs on request.

It is easy to remove the access door from the fixing frame by using over-centre catches. In the insulated versions, the inner side will always be in level with the innermost boundary line of the duct, irrespective of whether the duct is insulated internally or externally. The table below shows the insulation thickness of the door at different duct insulation alternatives.

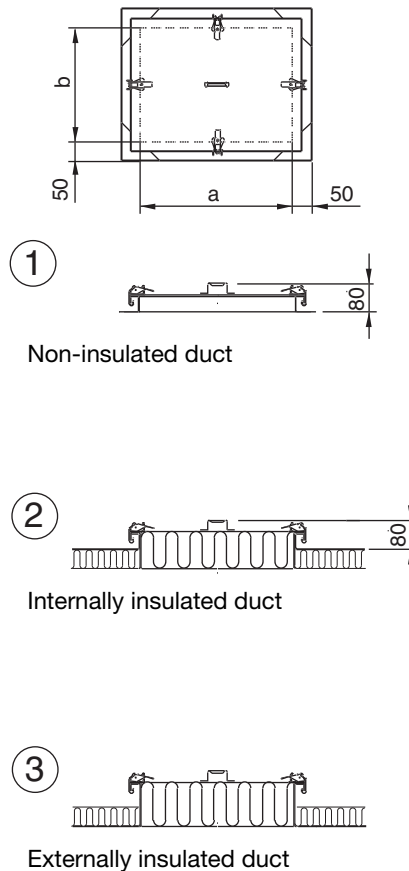
The door should not be placed closer than 50 mm from the nearest side of the rectangular duct.

**Maximum square measurement of the access door is 1170x1170 mm.**

## Ordering example

|                           | LKCR                | 500 | 300 | 250/100 | v |
|---------------------------|---------------------|-----|-----|---------|---|
| Product                   |                     |     |     |         |   |
| Largest side              | a                   |     |     |         |   |
| Smallest side             | b                   |     |     |         |   |
| Non-insulated duct        | Type 1              |     |     |         |   |
| Internally insulated duct | Type 2              |     |     |         |   |
| Externally insulated duct | Type 3              |     |     |         |   |
| Duct/cover insulation     | 30/80 mm (Type 2)   |     |     |         |   |
| Duct/cover insulation     | 50/100 mm (Type 2)  |     |     |         |   |
| Duct/cover insulation     | 70/120 mm (Type 2)  |     |     |         |   |
| Duct/cover insulation     | 100/150 mm (Type 2) |     |     |         |   |
| Duct/cover insulation     | 120/170 mm (Type 2) |     |     |         |   |
| Duct/cover insulation     | 40/60 mm (Type 3)   |     |     |         |   |
| Duct/cover insulation     | 50/80 mm (Type 3)   |     |     |         |   |
| Duct/cover insulation     | 70/100 mm (Type 3)  |     |     |         |   |
| Duct/cover insulation     | 140/160 mm (Type 3) |     |     |         |   |
| <b>Option</b>             |                     |     |     |         |   |
| Fixing with folding tabs  |                     |     |     |         |   |

## Dimensions





# Access door

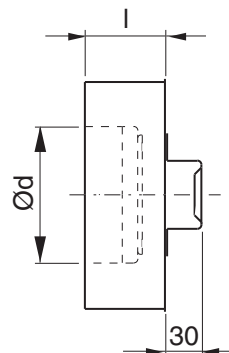
# EPFUI



## Description

End cap which fits outside a fitting.  
Belongs to the Isol programme range.

## Dimensions



| Ød nom | l mm | m kg |
|--------|------|------|
| 100    | 90   | 0,73 |
| 125    | 90   | 0,88 |
| 160    | 90   | 1,13 |
| 200    | 90   | 1,41 |
| 250    | 110  | 2,24 |
| 315    | 110  | 2,94 |
| 400    | 130  | 4,71 |
| 500    | 130  | 6,55 |

## Ordering example

|              |       |     |    |
|--------------|-------|-----|----|
| Product      | EPFUI | 400 | 50 |
| Dimension Ød |       |     |    |
| Type         |       |     |    |

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# Access door

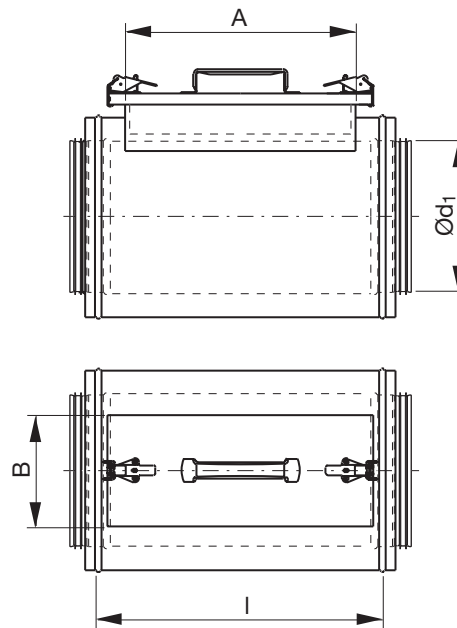
# KCRUI



## Description

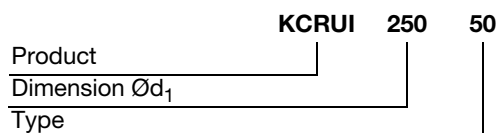
Inspection door which fits at a duct. The hatch is easy to open, with eccentric lock. Belongs to the Isol programme range.

## Dimensions



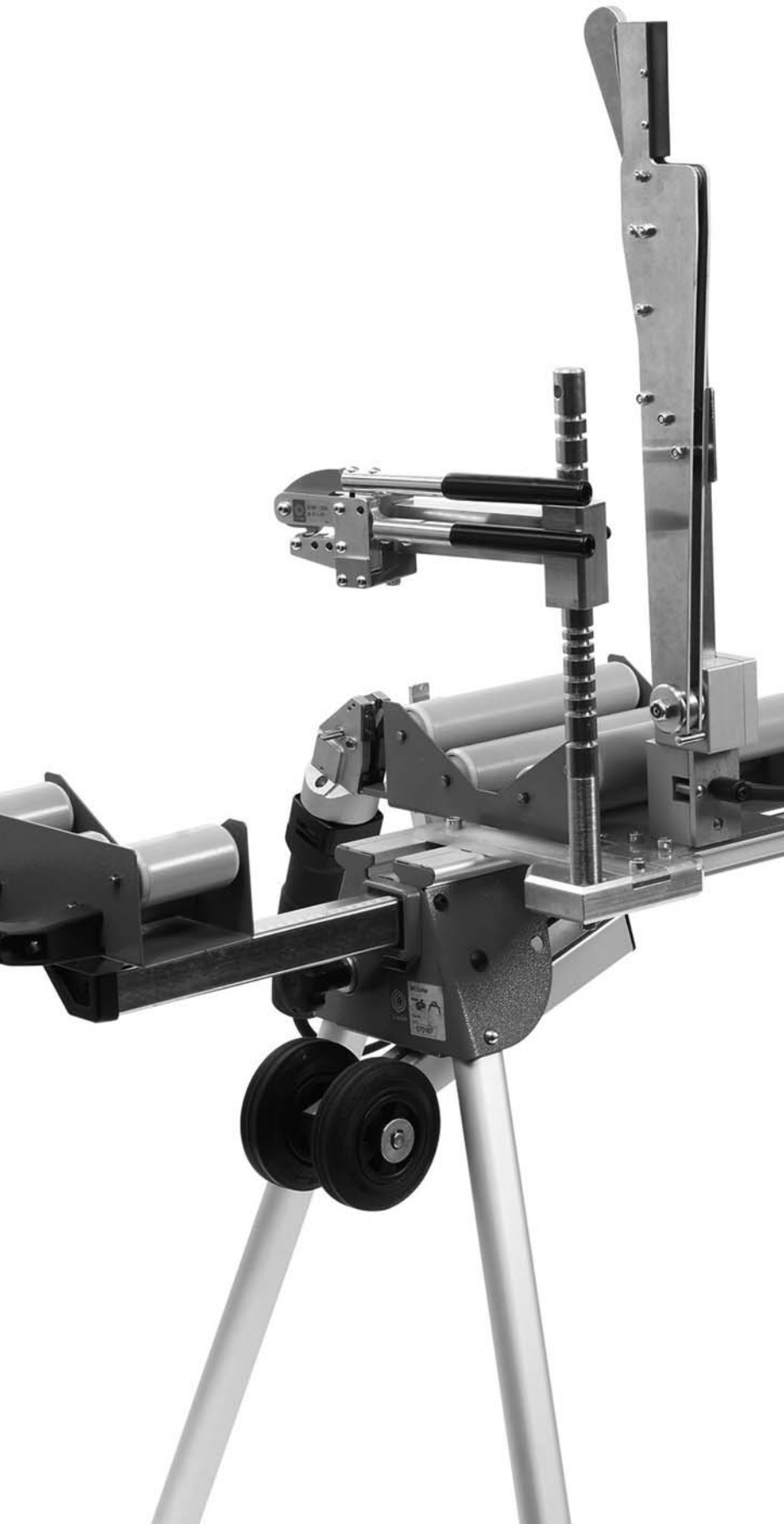
| Ød <sub>1</sub><br>nomkg | A<br>mm | B<br>mm | I<br>mm | m    |
|--------------------------|---------|---------|---------|------|
| 200                      | 300     | 100     | 360     | 5,70 |
| 250                      | 300     | 100     | 360     | 7,71 |
| 315                      | 400     | 200     | 460     | 9,38 |
| 400                      | 400     | 200     | 460     | 13,6 |
| 500                      | 400     | 200     | 460     | 15,2 |

## Ordering example





# Smart tools












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# SR Cutter

# SRCS



## Description

Working bench/platform for cutting circular ducts of diameters Ø 80–315 and lengths 200–3000 mm.

The bench is CE and TÜV approved.

The bench is equipped with:

- two wheels – to very easily move the bench to the working spot where you momentarily are,
- four foldable legs and a foldable knife arm – to fold the bench to a very compact format,
- a handle – to offer a good grip when folding and unfolding the bench,
- two scales on two telescopic arms – to set the wanted duct length,
- sixteen rollers – to rotate the duct,
- a knife – to make a designed start cutting hole for the shears,
- an arm – to guide the shears.

Spare parts are available.

## Ordering example

|         |             |             |
|---------|-------------|-------------|
|         | <b>SRCS</b> | <b>3000</b> |
| Product |             |             |
| Length  |             |             |

## Technical data

|                                       |          |
|---------------------------------------|----------|
| <i>Folded</i>                         |          |
| Length                                | 1 910 mm |
| Width                                 | 500 mm   |
| Height                                | 380 mm   |
| <i>Erected</i>                        |          |
| Length                                | 1 910 mm |
| Length (with extended telescope arms) | 4 800 mm |
| Width                                 | 730 mm   |
| Height                                | 1 270 mm |
| Working height                        | 820 mm   |
| Maximum load                          | 75 kg    |
| Weight                                | 36 kg    |

## Note

The bench is delivered without any:

- Shears – to cut the duct,
- Needle cut pliers – to cut the needle,
- Click pliers – to make the notches for the Click system,
- Click pliers kit – to support the click pliers.

These tools, if wanted, have to be ordered separately.

| In order to ... |                               |  |
|-----------------|-------------------------------|--|
| cut a duct      | cut a duct and cut the needle | cut a duct and cut the needle and make Click notches |
| you need ...    |                               |  |
| SR Cutter       | SR Cutter                     | SR Cutter  |
| +               | +                             | +  |
| Shears          | Shears                        | Shears   |
|                 | +                             | +  |
|                 | Needle cut pliers             | Needle cut pliers                                    |
|                 |                               | +  |
|                 |                               | Click pliers   |
|                 |                               | +  |
|                 |                               | Click pliers kit                                     |





# Shears

CSS

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## Technical data

|                  |            |
|------------------|------------|
| Model            | 3514-7R    |
| Power            | 500 W      |
| Stroke frequency | 2400 1/min |
| Weight           | 2,2 kg     |

## Description

Shears to cut circular ducts of sheet metal thickness up to 0,9 mm.

The shears is also suitable for general sheet metal cutting, e.g. holes for take-offs, since it is easy to detach the shears from the bench and it is equipped with jaws for radius cuts.

The cutter comes in four types adapted to the different electrical standards in different countries:

| Type | Country                  | Voltage V | Frequency Hz |
|------|--------------------------|-----------|--------------|
| EU   | Most European            | 230       | 50           |
| CH   | Switzerland              | 230       | 50           |
| UK   | United Kingdom           | 110       | 50           |
| US   | United States of America | 110       | 60           |

Spare parts are available.

## Ordering example





# Click pliers kit

# CSCPS



## Technical data

|        |        |
|--------|--------|
| Length | 440 mm |
| Weight | 4,5 kg |

## Description

Stand to support and guide the Click pliers.

The stand is designed to be used together with the SR Cutter, SRCS.

The stand has guiding grooves to suit all duct diameters. Rarely used grooves can advantageously be "filled" with special clips.

The stand can easily be unscrewed to make the folded bench still more compact.

A bagful of clips, CSCPSC, to fill unwanted grooves are delivered together with every kit order.

## Ordering example

Product **CSCPS**

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# Click pliers

CSCP

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## Description

Pliers to produce the notches for the Click joining system.

The pliers is intended to be used together with the SR Cutter, SRCS.

The pliers sits on a stand, CSCPS, which guides it to facilitate the work.

The pliers can also be used to make notches on ducts away from the bench, since the pliers is very easily detachable from the support.

The pliers comes in two sizes adapted to the different insertion lengths of different duct diameters:

| Size nom | Duct diameter mm | Duct insertion length mm |
|----------|------------------|--------------------------|
| 40       | 80-224           | 40                       |
| 60       | 250-315          | 60                       |

A special gauge tool, CSNC, to check the notch is delivered together with every pliers order.

## Technical data

*CSCP 40*  
 Length 290 mm  
 Weight 1,0 kg

*CSCP 60*  
 Length 290 mm  
 Weight 1,1 kg

## Ordering example





# Needle cut pliers

NCP



## Description

Pliers to cut away the very sharp and dangerous needle which is formed when cutting a spirally lockseamed duct.

## Advantages

- Cut off the needle without harming the duct wall.
- Sturdy construction for reliable function and longevity.
- Well designed handles make the work effortless.
- Opening spring for easier work.
- Operated by one hand.

## Technical data

|        |         |
|--------|---------|
| Length | 200 mm  |
| Weight | 0,35 kg |

## Ordering example

Product \_\_\_\_\_ NCP

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# SR roller

# SRR



## Description

SRR is a cradle for cutting of ducts with  $\varnothing$  315–1250 mm. The duct is placed on two or three cradles for simple, fast and ergonomically correct rotating at marking of cut length and at cutting.

The cradle substantially reduces the need of free floor space, and makes it easier to arrange a proper working place e.g. with simpler cord handling.

Made with lightening holes for smaller weight and easier carrying.

The rollers are available as spare part and can easily be exchanged.

Weight: 5,0 kg

## Ordering example

Product  **SRR**

## Advantages

The duct coming up a little from the floor surface leads to the following advantages:

- faster to cut the ducts,
- easier to insert fittings in the duct,
- easier to slip on flat bar flanges.

The duct being easy to rotate also leads to the following advantages:

- full access all around and better working position to screw/rivet a fitting,
- easier to cut hole for and to screw/rivet e.g. a saddle piece.

Painted ducts run much smaller risk of being scratched.

Easily damaged floors run much smaller risk of being damaged.

## Material

Manufactured of sturdy, painted steel sheet metal to be robust.



# SR carrying handle

# SRH



## Description

SRH is a carrying handle which makes it substantially easier to manually move circular ventilation ducts at the building site.

The handle fit ducts  $\varnothing$  315–1250, but it is adequate to limit its use to the sizes  $\varnothing$  400–800. You ought not to exceed the recommended maximum carrying weight of 25 kg per person.

One person at each duct end uses a handle each.

Weight: 2,0 kg

## Advantages

- Connects and disconnects in a moment.
- Provides a superior better and more secure grip compared to hold directly on to the duct.
- Can be gripped with one or two hands.
- Can be held on the shoulder to relieve the load on the arms.
- Eliminates the risk of hitting the legs to the edge of the duct and makes it possible to walk with "normal" step length.
- Gives a much better all-around-view and in particular you can see where you put your feet.

## Ordering example

Product SRH

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# Trolley

# TRO

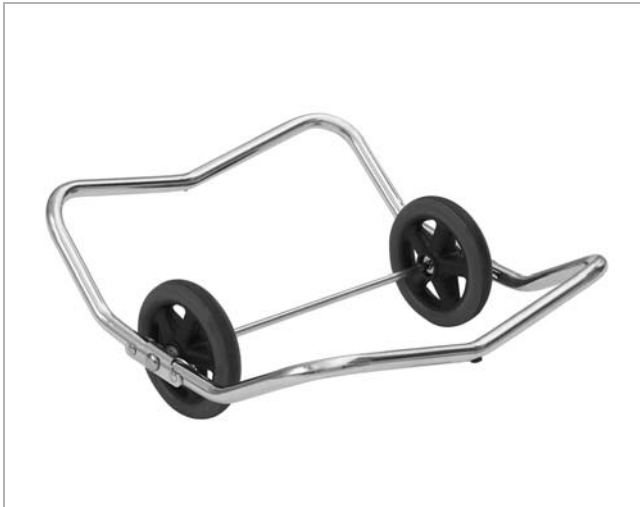
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## Description

TRO is a trolley which makes it substantially easier and more ergonomic to manually move circular ventilation ducts and other heavy products at the building site.

7

The trolley is suitable for ducts Ø 400–1250.

8

Trolley with loaded duct is easily moved by one person.  
Maximum load: circa 100 kg.

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Weight: 4,0 kg.

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## Ordering example

TRO

Product \_\_\_\_\_

18

## Advantages

- Very easy to load and unload the duct.
- Soft punctureproof tyres.
- The wheels manages passing of smaller obstacles and semi-rough surface.
- Foldable for easier storage.
- You can also use it to transport large fittings in the building place like for example silencers and bends in big diameters.
- More flexibility at the building site as you can work alone.
- Improved ergonomics and workig conditions as you reduce lifting of heavy products.



# Side bars

# TROB



## Description

TROB are side bars to the trolley TRO which makes it possible to transport many small ventilation ducts at the building site at the same haulage.

The side bars are suitable for ducts  $\varnothing$  80–500.

Trolley with bars and loaded ducts is easily run by one person.

Weight: 6,0 kg

## Advantages

- Very easy to snap the bars on and off without any need of tools.
- Equipped with a handle that gives a good manoeuvrability and a comfortable driving position.
- The handle can be adopted to fit both right- and left-handed persons.
- Removable for easier storage.

## Ordering example

Product **TROB**

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# Ring spanner

# SPANN

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## Description

SPANN is a ring spanner with ratcheting mechanism for sheet metal screws with 1/4" hexagon head.

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The spanner has a hexagon grip.

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The other end has an 8 mm fixed ring spanner with a twelve-point grip.

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## Ordering example

**SPANN**

Product \_\_\_\_\_

18

## Advantages

- Suitable in cramped spaces where there is no room for a common electric screwdriver.
- The stem is angled 15° for easier handling.



# Heavy duty knife

# KNIFE



## Description

KNIFE is a sturdy and durably sharpened knife for tough tasks e.g. hole-making in ventilation ducts e.g. at cutting with shears.

The blade is manufactured of 3 mm Japanese carbon steel and sharpened with double edge angles.

The handle and sheath are manufactured of extra impact resistant PP plastic.

## Advantages

- The sheath has a unique function to attach around a button on the clothing or to a belt so it doesn't fall off, at the same time it is easy to remove.
- Due to the thickness of the blade and the double edge angles it makes a perfect hole in the duct when cutting with a nibbler.
- More rigid compared to other knives when used to make hole in steel ducts.

## Ordering example

Product **KNIFE**

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# Markingmeasure

# TALMET

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## Description

TALMET is a combination tool for measuring and marking of lengths up to 3 m. Measures both external and internal lengths. Equipped with three steel scribing edges for marking. Locks the setting automatically and has a two-step release mechanism.

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$\pi$ -scale for direct reading of the diameter when measuring the circumference.

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## Ordering example

**TALMET**

Product \_\_\_\_\_

18

## Advantages

- No need to see the scale, i.e. measurements can be taken at hard-to-reach or dark places.
- Transfers a measure directly without any need to read the scale, nor to remember nor to set the measure.
- Can be operated with one hand only.
- Can be used as a scratch gauge.
- Can be used as a spacer or gauge block.
- Can be used as a scribe-compass.
- Easily exchangeable scale and extender.
- Small dimensions – goes into any pocket.



# Bits set

# BITS



## Description

A bit collection specially selected to suit mounting of ventilation systems.

16 bits sits in a holster of red, flexible plastic.

The holster has a smart metal clip for rapid attachment to and removal from clothes or belt.

The supplied bits are:

- Screwdriver Torx, T-20 W
- Screwdriver Torx, T-25 W
- Screwdriver Torx, T-30 W
- Screwdriver Phillips, PH 2
- Screwdriver Phillips, PH 2, 70 mm long
- Screwdriver Phillips, PH 3
- Screwdriver Robertson, R 2
- Screwdriver Robertson, R 3
- Screwdriver slotted, 1x6 mm
- Bit holder with quick lock, 1/4" – for 1/4" bit
- Magnetic socket, hexagon, 1/4" – for sheet metal screw
- Spring socket, hexagon, 8 mm – for bolt
- Spiral drill, 3,3 mm – for blind rivet 3,2 mm
- Spiral drill, 3,3 mm – for blind rivet 3,2 mm
- Spiral drill, 4,1 mm – for blind rivet 4,0 mm
- Spiral drill, 5,0 mm – for separation of Click system

## Technical data

|           |         |
|-----------|---------|
| Length    | 90 mm   |
| Width     | 60 mm   |
| Thickness | 25 mm   |
| Weight    | 0,18 kg |

## Advantages

- A variety of useful bits are always at hand.
- The bit kit fits snugly in a pocket.
- The bit kit can easily be attached to your clothes.

## Ordering example

|          | BITS | SATS |
|----------|------|------|
| Product  |      |      |
| Material |      |      |

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# Duct cover

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## Description

The duct cover protects your ducts in bad weather conditions, and keeps the ducts clean during transport and storage.

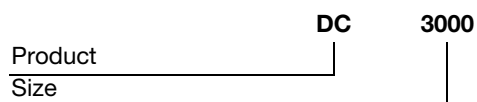
- Equipped with Velcro®-fastenings at one gable.
- Has a binding loop at each bottom corner.

## Advantages

- Protects your ducts in bad weather conditions.
- Keeps ducts clean during transport and storage.

| Size nom | Length mm | Height mm | Width mm | m kg |
|----------|-----------|-----------|----------|------|
| 3000     | 3100      | 1250      | 1100     | 2,1  |
| 5000     | 5100      | 1250      | 1100     | 4,5  |
| 6000     | 6100      | 1250      | 1100     | 5,4  |

## Ordering example





# Leakage tester

# LTEST



## Description and advantages

A complete equipment for field measuring of leakage in duct systems.

The unit automatically regulates to the chosen pressure.

All is built in - No loose meters and connection hoses.

The unit automatically calculates leakage, leakage factor and whether the chosen leakage class is achieved.

The unit automatically runs the measurement cycle according to the standards EN 12237 and EN 1507.

The fully automatized operation makes the whole measurement process considerably faster and easier.

Simple to handle, carry and store.

## Spare parts

Thermal paper for printer

Sealing-off bladder

Filter for air intake

## Storage and transportation

Aluminium trunks, 2 pcs

## Device

Main device Lindab Leakage Tester LT 510

Adapter Type 1 (in minitrunk)

Adapter Type 2 (in minitrunk)

Electric wire (length 2,4 m)

Fuses (fine-wire T10, 250 V)

Printer TD 600

Thermal paper (roll)

Batteries (type AA or LR6), 4 pcs

## Connection for leakage air

Plastic hose (Ø 50 mm, length 4 m)

Connector (Special female end cap EPF Ø 100)

## Connection for system pressure

Rubber hose (Ø 10 mm, length 10 m)

Connector (Special female end cap EPF Ø 100)

## Sealing-off equipment

Seal-off bladder (size 3), 5 pcs

Seal-off bladder (size 5), 5 pcs

Seal-off bladder (size 10), 5 pcs

Air hand pump (For bladder)

## Technical data

### Pressure measurement

|                 |  |
|-----------------|--|
| Principle       | piezo-resistive semi-conductor sensor            |
| Measuring range | -750 to +2000 Pa                                 |
| Resolution      | 1 Pa   |
| Accuracy        | ±3 Pa or ±2,5 % of reading, whichever is highest |

### Flow measurement (referred to 1013 hPa and 20 °C)

|                 |  |
|-----------------|--|
| Principle       | massflow hot film anemometer                       |
| Measuring range | 0,00 to 55,00 l/s                                  |
| Resolution      | 0,01 l/s   |
| Accuracy        | ±0,03 l/s or ±5 % of reading, whichever is highest |

### Flow range

|                |                  |
|----------------|------------------|
| No adapter     | 8,00 to 55 l/s   |
| Adapter type 1 | 3,00 to 7,99 l/s |
| Adapter type 2 | 0,00 to 2,99 l/s |

### General data

|                           |                |
|---------------------------|----------------|
| Power supply              | 230 V, 50 Hz   |
| Power consumption         | max. 9 A       |
| Working temperature range | +5 to +40 °C   |
| Storage temperature range | -20 to +50 °C  |
| Main device weight        | approx. 9,5 kg |
| Total weight              | approx. 22 kg  |

## Ordering example

Product LTEST





# Duct suspensions & Support systems



|   |           |
|---|-----------|
| Lindab  | 1         |
| General information and theory                | 2         |
| Safe  | 3         |
| Silencers                                     | 4         |
| Dampers & Measure units                       | 5         |
| Fire dampers & Smoke evacuation               | 6         |
| Air valves                                    | 7         |
| Roof hoods                                    | 8         |
| Other circular products                       | 9         |
| Transfer                                      | 10        |
| Rectangular                                   | 11        |
| Flexible ducting                              | 12        |
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**Channel nut short spring**

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**Hammer top screw**

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**Channel end cap**

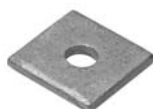
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**T joining plate**

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**Two hole 90° bracket**

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**Three hole 90° bracket**

TS12 ..... 655



**Four hole 90° bracket**

TS14 ..... 655











**Four hole 90° bracket with gusset**

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| <b>Z-fastener with vibration damper</b>   | WCZGM..... 660                |
|  |                               |
| <b>Sheet metal roof attachment without nut with rubber</b>                          | WCVG..... 660                 |
|  |                               |
| <b>Beam clamp</b>   | BCT ..... 661<br>BC ..... 661 |
|  |                               |



## Frame support system

### Square tube



SSR.....662

### T-piece



SSTP.....663

### Support foot



SSF .....663

### Adjustable foot



SSFA.....663

### Corner piece



SSH.....663

### Angle 45° int. and ext.



SSB.....664

### Angle 90°



SSB.....664

### Wall attachment



SSVA.....664

### Corner X



SSKV ..... 664

### Pipe cover, inside



SBEI..... 665

### Pipe cover, outside



SBEU ..... 665

## Grippler – hang fast system

### Fast hanging wire kit loop



FHL..... 666

### Fast hanging wire kit stud



FHS..... 667

### Fast hanging wire kit toggle



FHT..... 668

### Fast hanging plastic sleeve



FHPS ..... 668

|           |
|-----------|
| 1         |
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| <b>16</b> |
| 17        |
| 18        |



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**Fast hanging wire kit eyelet**  
 FHE .....669



**Fast hanging wire kit 90° eyelet**  
 FHE90 .....669



**Corner sadel**  
 FHCS .....670



**Wire rope cutter**  
 WRC.....670



**Wire rope twister**  
 WRT .....670



**Support systems**

**H frame**  
 HFS .....671



**Multi foot**  
 MULTIF .....672



**Anti vibration mat**  
 MFAV .....672



**Fix-it foot**  
 FIF ..... 673





# Duct suspension

## FB17, FB30, FB40, FB50

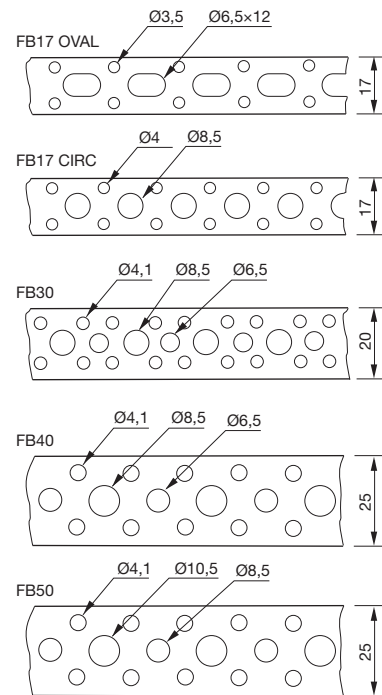
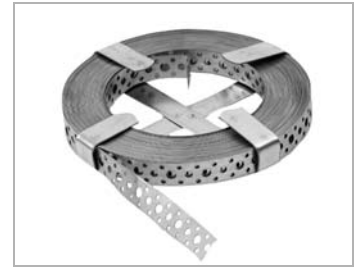
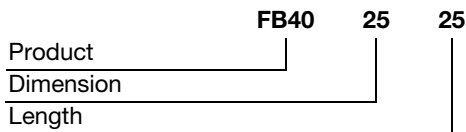
### Suspension band

Suspension bands are designed to suspend air ducts. It is easy to cut and bend and allows a quick and economical method of assembly. The perforated suspension steel band is made of galvanised steel with assorted holes, which, according to the type selected, allow fixing of threaded rods, threaded clamps, bolts, etc. The small holes can be used with rivets, screws or nails.

Surface finish: Electro zinc plated.

| Product | Dim mm | Thickness mm | Length m | Type |
|---------|--------|--------------|----------|------|
| FB17    | 17     | 0,6          | 25       | OVAL |
| FB17    | 17     | 0,6          | 25       | CIRC |
| FB30    | 20     | 0,7          | 25       |      |
| FB40    | 25     | 0,9          | 25       |      |
| FB50    | 25     | 1,25         | 25       |      |

### Ordering example

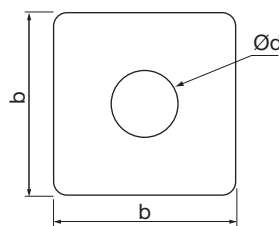


## RPW

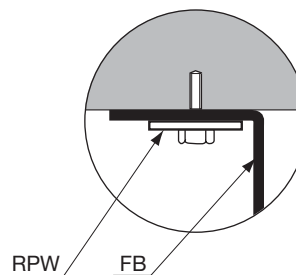
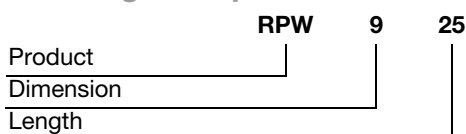
### Rectangular plain washer

Surface finish: Hot dipped galvanized.

| Dim Ød | b mm | Thickness mm |
|--------|------|--------------|
| 9      | 25   | 3            |
| 11     | 30   | 3            |



### Ordering example



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# Duct suspension

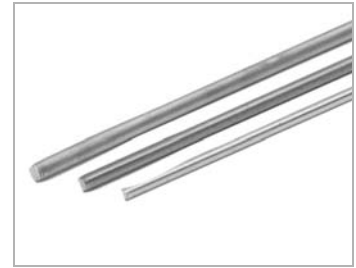
1

## OSB

### Threaded rod

Surface finish: Electro zinc plated.

| Dim | Length<br>mm |
|-----|--------------|
| M6  | 1000         |
| M6  | 2000         |
| M6  | 3000         |
| M8  | 1000         |
| M8  | 2000         |
| M8  | 3000         |
| M10 | 1000         |
| M10 | 2000         |
| M10 | 3000         |
| M12 | 1000         |
| M12 | 2000         |
| M12 | 3000         |



2

3

4

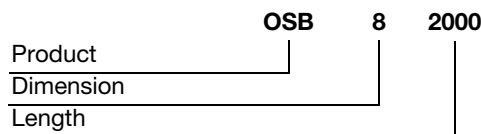
5

6

7

8

### Ordering example



9

10

## OSM

### Hexagonal studding connector

Used together with threaded rod to reduce wastage to a minimum.

Threaded in both ends with a stop in the middle.

Surface finish: Electro zinc plated.

| Dim | Length<br>mm |
|-----|--------------|
| M6  | 30           |
| M8  | 30           |
| M10 | 30           |
| M12 | 30           |



11

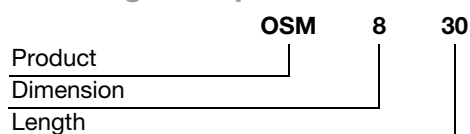
12

13

14

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### Ordering example



16

17

18





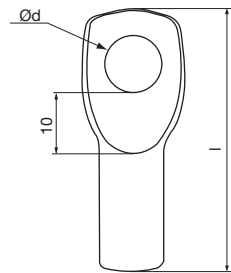
# Duct suspension

## EB

### Eye bolt

Surface finish: Electro zinc plated.

| Dim | Length<br>mm | Ød<br>mm |
|-----|--------------|----------|
| M8  | 46           | 8,5      |
| M10 | 51           | 10,5     |
| M12 | 61           | 12,5     |



### Ordering example

|           |           |          |
|-----------|-----------|----------|
|           | <b>EB</b> | <b>8</b> |
| Product   |           |          |
| Dimension |           |          |

- 1
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- 16**
- 17
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# Circular suspension

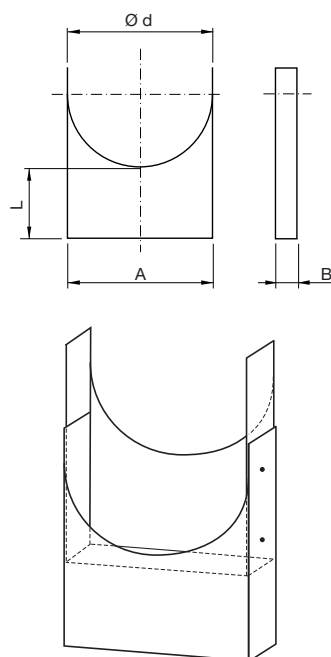
## FA

### Duct support

Used to fix ducts standing on joists.  
Is provided with fixing holes in the base.



| Ød nom | A mm | B mm | L mm |
|--------|------|------|------|
| 63     | 66   | 30   | 100  |
| 80     | 83   | 30   | 100  |
| 100    | 103  | 30   | 100  |
| 125    | 128  | 30   | 100  |
| 160    | 163  | 30   | 100  |
| 200    | 203  | 30   | 100  |
| 250    | 253  | 30   | 100  |
| 315    | 318  | 30   | 100  |
| 400    | 403  | 30   | 100  |
| 500    | 503  | 30   | 100  |
| 630    | 633  | 30   | 100  |
| 80     | 83   | 30   | 75   |
| 100    | 103  | 30   | 75   |
| 125    | 128  | 30   | 75   |
| 160    | 163  | 30   | 75   |
| 200    | 203  | 30   | 75   |
| 250    | 253  | 30   | 75   |
| 315    | 318  | 30   | 75   |
| 400    | 403  | 30   | 75   |
| 500    | 503  | 30   | 75   |
| 630    | 633  | 30   | 75   |



Varying height can be arranged by installing two duct supports, one inside the other. These can be locked with two self-tapping screws on each short side.

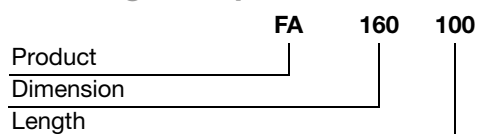
The L dimension can then vary:

for Ø 63–250 between 100 and 200 mm,

for Ø 315–630 between 100 and 250 mm.

Can also be delivered in additional sizes.

### Ordering example



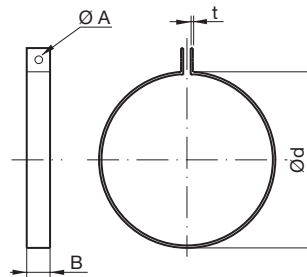


# Circular suspension

## UV25, UV30

### Suspension rings

For suspension of circular ducting. At insulated duct it is recommended that the suspension ring is mounted inside the insulation.



| Ød<br>nom | UV25    |          |         | UV30    |          |         |
|-----------|---------|----------|---------|---------|----------|---------|
|           | t<br>mm | ØA<br>mm | B<br>mm | t<br>mm | ØA<br>mm | B<br>mm |
| 63        |         |          |         |         |          |         |
| 80        |         |          |         | 1,25    | 10,5     | 30      |
| 100       | 2,00    | 9,5      | 25      | 1,25    | 10,5     | 30      |
| 125       | 2,00    | 9,5      | 25      | 1,25    | 10,5     | 30      |
| 160       | 2,00    | 9,5      | 25      | 1,50    | 10,5     | 30      |
| 200       | 2,00    | 9,5      | 25      | 1,50    | 10,5     | 30      |
| 250       | 2,00    | 9,5      | 25      | 1,50    | 10,5     | 30      |
| 315       | 2,00    | 9,5      | 25      | 1,50    | 10,5     | 30      |
| 400       | 2,00    | 9,5      | 25      | 2,00    | 10,5     | 30      |
| 500       | 2,00    | 9,5      | 25      | 2,00    | 10,5     | 30      |
| 630       | 2,00    | 9,5      | 25      | 2,00    | 10,5     | 30      |
| 710       | 2,00    | 9,5      | 25      | 3,00    | 10,5     | 30      |
| 800       | 2,00    | 9,5      | 25      | 3,00    | 10,5     | 30      |
| 1000      | 2,00    | 9,5      | 25      | 3,00    | 10,5     | 30      |
| 1250      | 2,00    | 9,5      | 25      | 3,00    | 10,5     | 30      |

Can also be delivered in additional sizes.

### Ordering example

|           |             |            |
|-----------|-------------|------------|
|           | <b>UV25</b> | <b>250</b> |
| Product   |             |            |
| Dimension |             |            |

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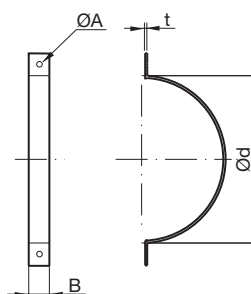
# Circular suspension

## UVH25, UVH30

### Suspension rings

For suspension of circular ducting. At insulated duct it is recommended that the suspension ring is mounted inside the insulation.

N.B. Is sold in pairs.



| Ød<br>nom | UVH25   |          |         | UVH30   |          |         |
|-----------|---------|----------|---------|---------|----------|---------|
|           | t<br>mm | ØA<br>mm | B<br>mm | t<br>mm | ØA<br>mm | B<br>mm |
| 80        | 2,00    | 9,5      | 25      | 1,25    | 10,5     | 30      |
| 100       | 2,00    | 9,5      | 25      | 1,25    | 10,5     | 30      |
| 125       | 2,00    | 9,5      | 25      | 1,25    | 10,5     | 30      |
| 160       | 2,00    | 9,5      | 25      | 1,25    | 10,5     | 30      |
| 200       | 2,00    | 9,5      | 25      | 1,25    | 10,5     | 30      |
| 250       | 2,00    | 9,5      | 25      | 1,50    | 10,5     | 30      |
| 315       | 2,00    | 9,5      | 25      | 1,50    | 10,5     | 30      |
| 400       | 2,00    | 9,5      | 25      | 2,00    | 10,5     | 30      |
| 500       | 2,00    | 9,5      | 25      | 2,00    | 10,5     | 30      |
| 630       | 2,00    | 9,5      | 25      | 2,00    | 10,5     | 30      |
| 800       | 2,00    | 9,5      | 25      | 3,00    | 10,5     | 30      |
| 1000      | 2,00    | 9,5      | 25      | 3,00    | 10,5     | 30      |
| 1250      | 2,00    | 9,5      | 25      | 3,00    | 10,5     | 30      |

Can also be delivered in additional sizes.

### Ordering example

|           |       |     |
|-----------|-------|-----|
| Product   | UVH25 | 250 |
| Dimension |       |     |



# Circular suspension

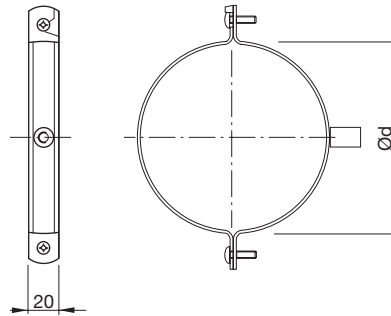
## DRSN

### Suspension ring

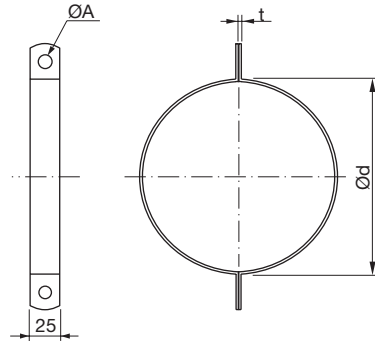
Combined nut M8/M10 up to dim 400. With slotted quick release. At insulated duct it is recommended that the suspension ring is mounted inside the insulation. N.B. Is sold in pairs.

| Ød<br>nom | t<br>mm | ØA<br>mm |
|-----------|---------|----------|
| 63        | 1,8     |          |
| 80        | 1,8     |          |
| 100       | 1,8     |          |
| 125       | 1,8     |          |
| 140       | 1,8     |          |
| 150       | 1,8     |          |
| 160       | 1,8     |          |
| 180       | 1,8     |          |
| 200       | 1,8     |          |
| 224       | 1,8     |          |
| 250       | 1,8     |          |
| 280       | 1,8     |          |
| 300       | 1,8     |          |
| 315       | 1,8     |          |
| 355       | 1,8     |          |
| 400       | 1,8     |          |
| 450       | 2,3     | 10       |
| 500       | 2,3     | 10       |
| 560       | 2,3     | 10       |
| 600       | 2,3     | 10       |
| 630       | 2,3     | 10       |
| 710       | 2,3     | 10       |
| 800       | 2,3     | 10       |
| 900       | 2,3     | 10       |
| 1000      | 2,3     | 10       |
| 1120      | 2,3     | 10       |
| 1250      | 2,3     | 10       |

Ø63-400



Ø450-1250



### Ordering example

|           |      |     |
|-----------|------|-----|
| Product   | DRSN | 250 |
| Dimension |      |     |

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# Circular suspension

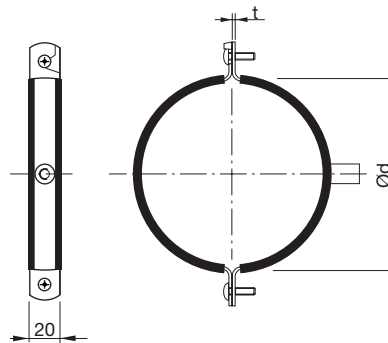
## DRSNR

### Suspension ring

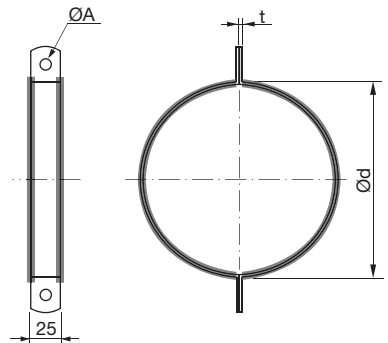
Combined nut M8/M10 up to dim 400. With slotted quick release and vibration-damping rubber. At insulated duct it is recommended that the suspension ring is mounted inside the insulation. N.B. Is sold in pairs.

| Ød<br>nom | t<br>mm | ØA<br>mm |
|-----------|---------|----------|
| 63        | 1,8     |          |
| 80        | 1,8     |          |
| 100       | 1,8     |          |
| 125       | 1,8     |          |
| 140       | 1,8     |          |
| 150       | 1,8     |          |
| 160       | 1,8     |          |
| 180       | 1,8     |          |
| 200       | 1,8     |          |
| 224       | 1,8     |          |
| 250       | 1,8     |          |
| 280       | 1,8     |          |
| 300       | 1,8     |          |
| 315       | 1,8     |          |
| 355       | 1,8     |          |
| 400       | 1,8     |          |
| 450       | 2,3     | 10       |
| 500       | 2,3     | 10       |
| 560       | 2,3     | 10       |
| 600       | 2,3     | 10       |
| 630       | 2,3     | 10       |
| 710       | 2,3     | 10       |
| 800       | 2,3     | 10       |
| 900       | 2,3     | 10       |
| 1000      | 2,3     | 10       |
| 1120      | 2,3     | 10       |
| 1250      | 2,3     | 10       |

Ø63–400



Ø450–1250



### Ordering example

|           |       |     |
|-----------|-------|-----|
| Product   | DRSNR | 250 |
| Dimension |       |     |



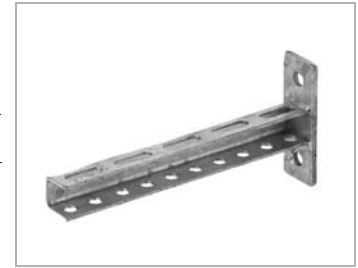
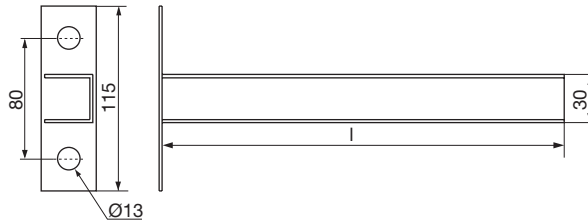
# Channels and channel brackets

## CL

### Cantilever

Material: Hot dipped galvanized.  
To be fixed of walls, floors and ceilings as an assembly profile.

| Length<br>mm |
|--------------|
| 150          |
| 200          |
| 250          |
| 300          |
| 400          |



### Ordering example

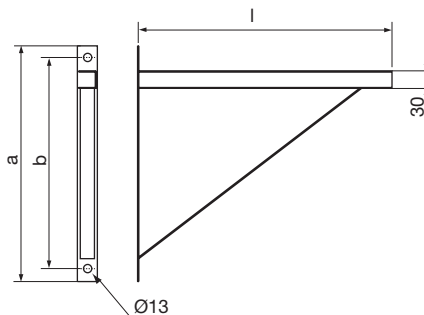


## CLS

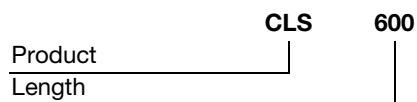
### Supported cantilever

Material: Hot dipped galvanized.  
To be fixed of walls, floors and ceilings as an assembly profile. The diagonal support bar makes it suitable for heavy loads.

| Length<br>mm | a<br>mm | b<br>mm |
|--------------|---------|---------|
| 400          | 230     | 190     |
| 500          | 230     | 190     |
| 600          | 230     | 190     |
| 800          | 400     | 360     |
| 1000         | 400     | 360     |



### Ordering example



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# Channels and channel brackets

## RPA

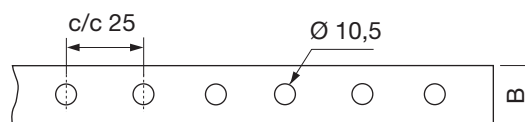
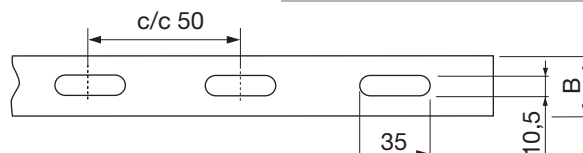
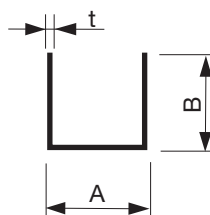
### Channel

Surface finish: Electro zinc plated.

| Dim |    | Length<br>mm | SLOT/<br>PLAI | Thickness<br>mm |
|-----|----|--------------|---------------|-----------------|
| A   | B  |              |               |                 |
| 30  | 30 | 2000         | SLOT          | 3               |
| 30  | 30 | 2000         | SLOT          | 2               |

### Ordering example

|                 |     |      |      |      |   |
|-----------------|-----|------|------|------|---|
| Product         | RPA | 3030 | 2000 | SLOT | 3 |
| Dimension A x B |     |      |      |      |   |
| Length          |     |      |      |      |   |
| Type            |     |      |      |      |   |
| Thickness       |     |      |      |      |   |



## RPC

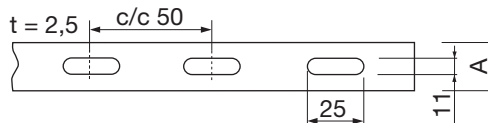
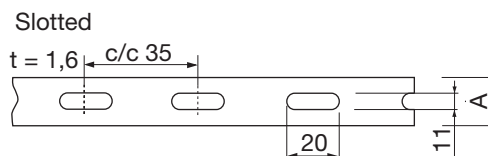
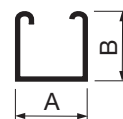
### Channel

Surface finish: Electro zinc plated.  
Available as plain or slotted.

| Dim |    | Length<br>mm | SLOT/<br>PLAI | Thickness |
|-----|----|--------------|---------------|-----------|
| A   | B  |              |               | t<br>mm   |
| 41  | 21 | 3000         | PLAI          | 1,6       |
| 41  | 21 | 3000         | PLAI          | 2,5       |
| 41  | 21 | 3000         | SLOT          | 1,6       |
| 41  | 21 | 3000         | SLOT          | 2,5       |
| 41  | 21 | 6000         | PLAI          | 1,6       |
| 41  | 21 | 6000         | PLAI          | 2,5       |
| 41  | 21 | 6000         | SLOT          | 1,6       |
| 41  | 21 | 6000         | SLOT          | 2,5       |
| 41  | 41 | 3000         | PLAI          | 1,6       |
| 41  | 41 | 3000         | PLAI          | 2,5       |
| 41  | 41 | 3000         | SLOT          | 1,6       |
| 41  | 41 | 3000         | SLOT          | 2,5       |
| 41  | 41 | 6000         | PLAI          | 1,6       |
| 41  | 41 | 6000         | PLAI          | 2,5       |
| 41  | 41 | 6000         | SLOT          | 1,6       |
| 41  | 41 | 6000         | SLOT          | 2,5       |

### Ordering example

|                 |     |      |      |      |     |
|-----------------|-----|------|------|------|-----|
| Product         | RPC | 4121 | 3000 | SLOT | 2,5 |
| Dimension A x B |     |      |      |      |     |
| Length          |     |      |      |      |     |
| Type            |     |      |      |      |     |
| Thickness       |     |      |      |      |     |







# Channels and channel brackets

## Channel slide nuts

Channel slide nuts and springs are self aligning and are specially manufactured to complement the range of RPC channels. The slide nut can be moved along the channel for ease of alignment whilst the springs tension the nut against the internal channel lips to facilitate installation. In addition to the shape of the slide nuts prevents turning inside the channel eliminating the need to grip the nut whilst inserting bolts or threaded rod.

### CN

Channel nut, without spring

| Dim |
|-----|
| 8   |
| 10  |
| 12  |



#### Ordering example



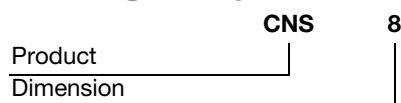
### CNS

Channel nut with spring

| Dim |
|-----|
| 8   |
| 10  |
| 12  |



#### Ordering example



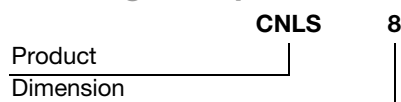
### CNLS

Channel nut long spring

| Dim |
|-----|
| 8   |
| 10  |
| 12  |



#### Ordering example



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



# Channels and channel brackets

1

## CNSS

Channel nut short spring

| Dim |
|-----|
| 8   |
| 10  |
| 12  |



2

3

### Ordering example



5

6

## HHB

Hammer head bolt

| Dim | Length mm |
|-----|-----------|
| 8   | 30        |
| 10  | 30        |
| 12  | 30        |
| 8   | 40        |
| 10  | 40        |
| 12  | 40        |

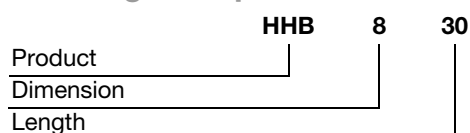


7

8

9

### Ordering example



10

11

12

## HTS

Hammer top screw

| Dim | Length mm |
|-----|-----------|
| 8   | 30        |
| 10  | 30        |
| 12  | 30        |
| 8   | 40        |
| 10  | 40        |
| 12  | 40        |



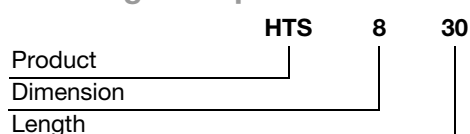
13

14

15

16

### Ordering example



17

18



# Channels and channel brackets

## CEC

Channel end cap

|                  |
|------------------|
| for channel 4141 |
| for channel 4121 |



### Ordering example

|             |            |             |
|-------------|------------|-------------|
|             | <b>CEC</b> | <b>4141</b> |
| Product     |            |             |
| For channel |            |             |

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16**
- 17
- 18



# Channel framing system

1

The Lindab channel framing system is designed to provide an effective yet economical solution to today's framing and support requirements.

The TS fittings are used together with the RPC channels.

All TS fittings are generally manufactured from 6 mm thick steel strip and hot dip galvanised to BSENISO1461:1999 unless otherwise indicated. Standard hole diameter 14 mm.

2

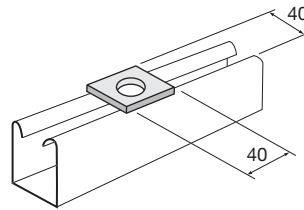
3

## TS00

### External plate

Available in 8 and 10 mm hole clearance – 5 mm thick

| Dim |
|-----|
| 8   |
| 10  |



4

5

6

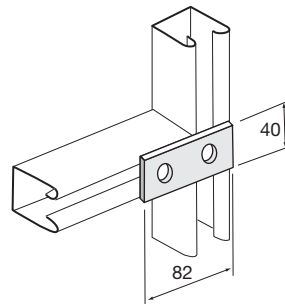
### Ordering example

|           |      |   |
|-----------|------|---|
| Product   | TS00 | 8 |
| Dimension |      |   |

8

## TS01

### Two hole joining plate



9

10

### Ordering example

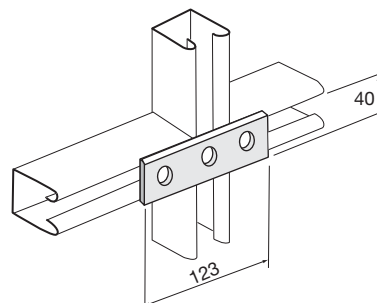
|         |      |
|---------|------|
| Product | TS01 |
|---------|------|

11

12

## TS02

### Three hole joining plate



13

14

### Ordering example

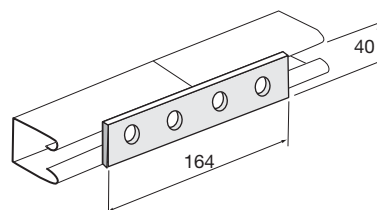
|         |      |
|---------|------|
| Product | TS02 |
|---------|------|

15

16

## TS03

### Four hole joining plate



17

18

### Ordering example

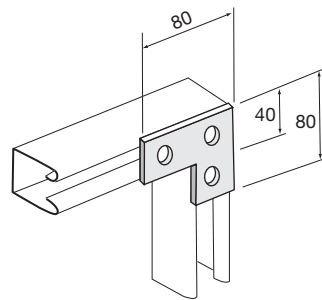
|         |      |
|---------|------|
| Product | TS03 |
|---------|------|



# Channels and channel brackets

## TS06

90° joining plate



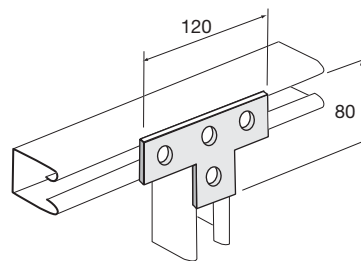
Ordering example

TS06

Product

## TS07

T joining plate



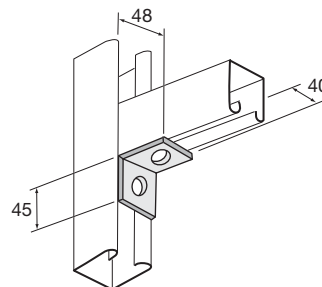
Ordering example

TS07

Product

## TS11

Two hole 90° bracket



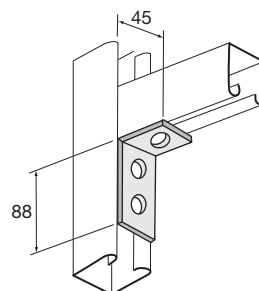
Ordering example

TS11

Product

## TS12

Three hole 90° bracket



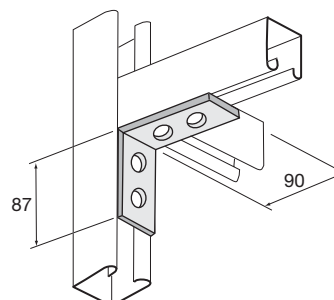
Ordering example

TS12

Product

## TS14

Four hole 90° bracket



Ordering example

TS14

Product

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

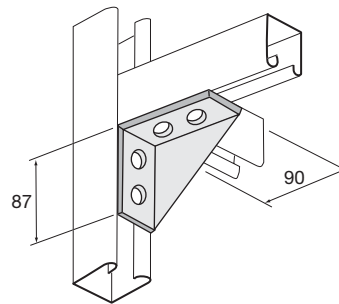


# Channels and channel brackets

1

## TS15

Four hole 90° bracket with gusset



2

### Ordering example

TS15

Product

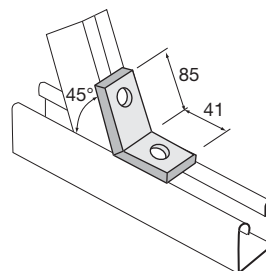
4

5

## TS29

Extern angle bracket

Angles available 45°



6

### Ordering example

TS29

Product

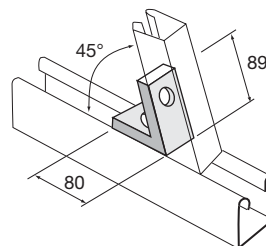
8

9

## TS31

Internal angle bracket

Angles available 45°



10

### Ordering example

TS31

Product

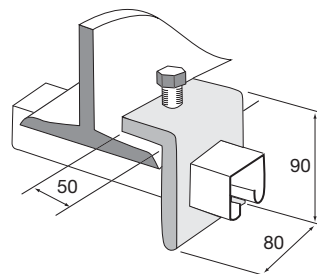
12

13

## TS45

Window bracket

Maximum loading 220 kg.



14

| Dim |
|-----|
| 41  |
| 21  |

15

16

### Ordering example

TS45

41

Product

Dimension

17

18



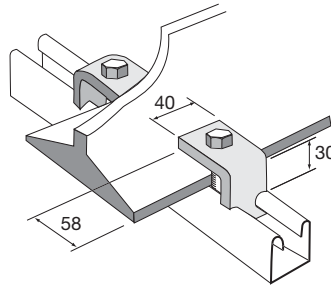
# Channels and channel brackets

## TS48

**Beam clamp**

**Ordering example**

Product TS48



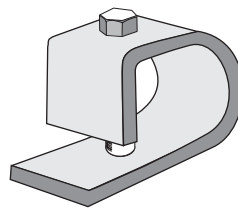
## TS91

**Purlin clips**

Mild steel zinc plated  
Clearance hole allows for M10.

**Ordering example**

Product TS91

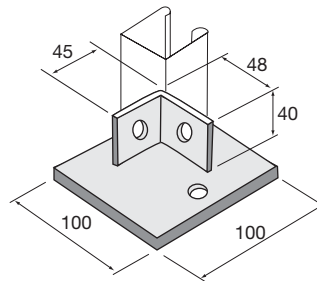


## TS38

**Two hole base plate**

**Ordering example**

Product TS38

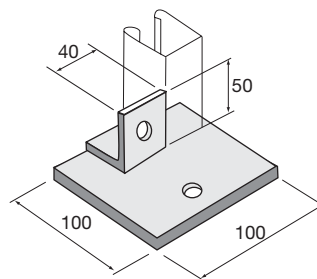


## TS39

**One hole base plate**

**Ordering example**

Product TS39



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



# Channels and channel brackets

1

## TS40

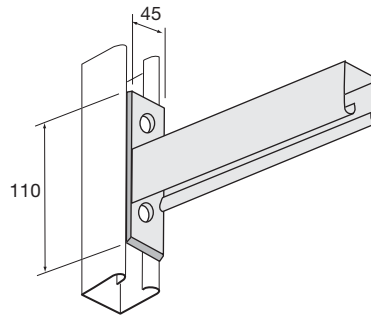
### Cantilever arms, universal

Back plate 8 mm thick.

2

| Length |
|--------|
| 450    |
| 600    |

3



4

### Ordering example

5

|         |      |     |
|---------|------|-----|
| Product | TS40 | 450 |
| Length  |      |     |

6

7

8

9

10

11

12

13

14

15

16

17

18





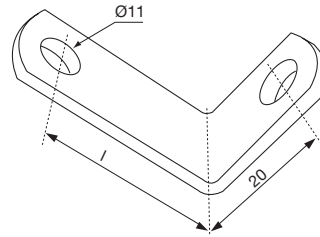
# Brackets

## WCL

### L-fastener

Surface finish: Electro zinc plated.

| Dim | Length  |                 |
|-----|---------|-----------------|
|     | l<br>mm | Thickness<br>mm |
| 25  | 35      | 4               |
| 25  | 110     | 4               |



### Ordering example

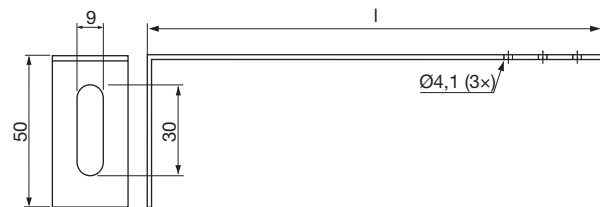
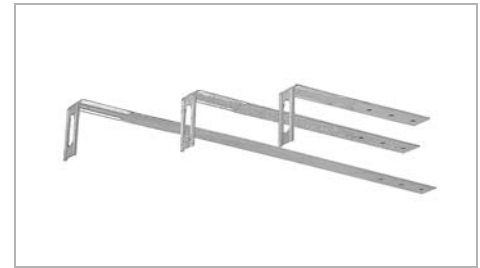
|           |     |    |    |
|-----------|-----|----|----|
| Product   | WCL | 25 | 35 |
| Dimension |     |    |    |
| Length    |     |    |    |

## WCLT

### Fastening bracket

Surface finish: Electro zinc plated.

| Dim | Length  |                 |
|-----|---------|-----------------|
|     | l<br>mm | Thickness<br>mm |
| 25  | 150     | 1,5             |
| 25  | 250     | 1,5             |
| 25  | 400     | 1,5             |



### Ordering example

|           |      |    |     |
|-----------|------|----|-----|
| Product   | WCLT | 25 | 150 |
| Dimension |      |    |     |
| Length    |      |    |     |

## WCLGM

### L-fastener with vibration damper

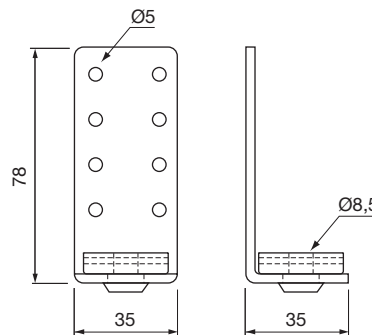
Quick fixing of rectangular ducts. Supplied with sound reduction mounting compliant with DIN 4109.

Fixing with blind rivets or self drilling screws.

Easy height adjustment by using M8 threaded rod and hex nuts.

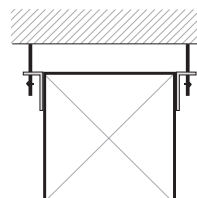
Material 35 x 2,0 mm.

Surface finish: Electro zinc plated.



### Ordering example

|         |       |
|---------|-------|
| Product | WCLGM |
|---------|-------|



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



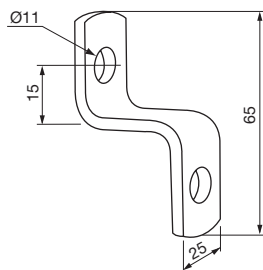
# Brackets

## WCZ

### Z-fastener

Surface finish: Electro zinc plated.

| Dim | Thickness mm |
|-----|--------------|
| 25  | 4            |



### Ordering example

|           |     |    |
|-----------|-----|----|
| Product   | WCZ | 25 |
| Dimension |     |    |

## WCZGM

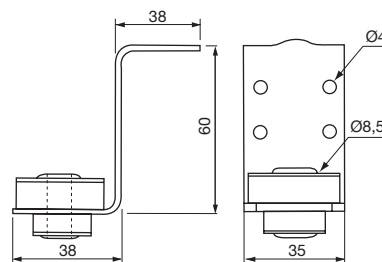
### Z-fastener with vibration damper

Quick installation of rectangular ducts. Supplied with sound reduction mounting compliant with DIN 4109.

Fixing with blind rivets or self drilling screws.

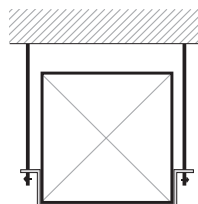
Easy height adjustment by using M8 threaded rod and hex nuts. Material 35 x 2,0 mm.

Surface finish: Electro zinc plated.



### Ordering example

|         |       |
|---------|-------|
| Product | WCZGM |
|---------|-------|



## WCVG

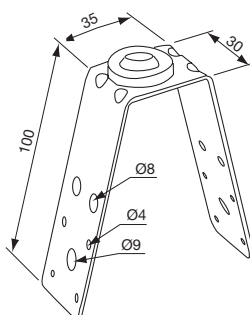
### Sheet metal roof attachment without nut with rubber

Suspension bracket designed to suspend ductwork with threaded rods of maximum 8 mm. Allows fixing against trapeze type ceilings.

Supplied with a moulded elastomeric element which prevents the transmission of vibrations.

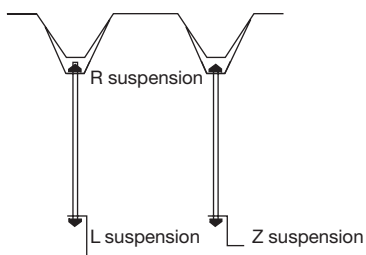
For best vibration isolation, load should not exceed 40 kg. Material: 25 x 2,5 mm.

Surface finish: Electro zinc plated.



### Ordering example

|         |      |
|---------|------|
| Product | WCVG |
|---------|------|

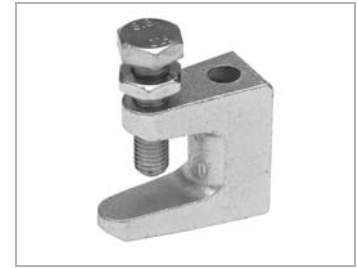
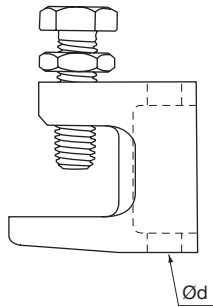




# Brackets

## Beam clamp

To fix on to beams without welding or drilling. With hexagon head screw DIN 933 8.8, threaded end with cup point according to EN ISO 4753 and locknut DIN 439. Available as threaded (BCT) or not threaded (BC). Material: Body made of malleable cast iron, zinc plated, casting tolerance acc. to DIN 1684 GTA / 17.



## BCT

Threaded rod hole.

| Dim<br>Ød |
|-----------|
| M 8       |
| M 10      |
| M 12      |

## BC

Not threaded rod hole.

| Dim<br>Ød |
|-----------|
| 8         |
| 10        |
| 12        |

## Ordering example

|           |            |          |
|-----------|------------|----------|
| Product   | <b>BCT</b> | <b>8</b> |
| Dimension |            |          |

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18



# Frame support system

1

## Stand system

Consisting of square tubes and a number of parts which are used to create a range of different structures. This stand system is made up of square tubes in accordance with DIN 2395 and materials in accordance with SIS 1312. The load diagram indicates the maximum permissible load with regard to flex sensing and does not take deflection into account. The diagram indicates the maximum permissible load for different distances between the supporting legs without exceeding the limit load in accordance with the Swedish Fatigue Design Code for Welded Structures, StBK-N1, static load. This load diagram is applicable to all horizontal tubes with their associated supports, provided that there are no lateral forces.

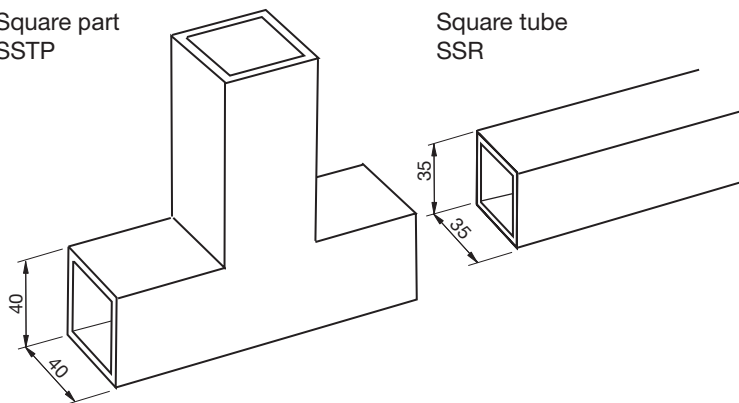
2

3

4

Square part SSTP

Square tube SSR



5

6

7

8



9

10

11

12

13

## SSR

### Square tube

Surface finish: Hot dipped galvanized.

| Dim mm | Thickness mm | Length mm |
|--------|--------------|-----------|
| 35x35  | 1,5          | 3000      |

15

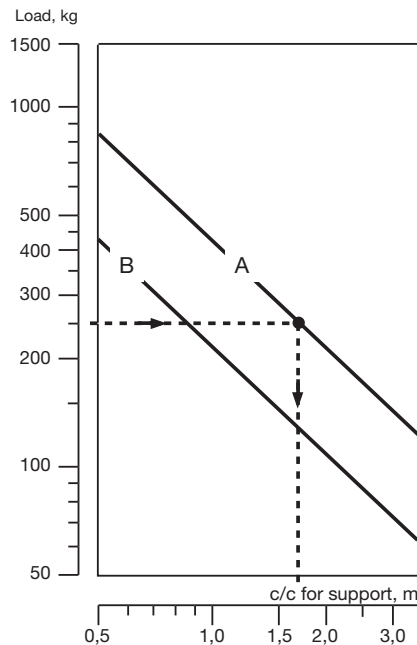
16

### Ordering example

Product SSR

17

18



A = Extended, evenly distributed static load – tubes 35 x 35 x 1,5  
 B = Centrally applied static spot load – 35 x 35 x 1,5

#### Example

Load 250 kg, distributed evenly  
 Stand tube 35 x 35 gives a max c/c between supporting legs of 1,7 m





# Frame support system

## SSTP

### T-piece

Surface finish: Electro zinc plated.

| Dim<br>mm | Thickness<br>mm |
|-----------|-----------------|
| 40x40     | 2,0             |

### Ordering example

**SSTP**

Product



## SSF

### Support foot

Surface finish: Electro zinc plated.

| Dim<br>mm | Thickness<br>mm |
|-----------|-----------------|
| 40x40     | 2,0             |

### Ordering example

**SSF**

Product



## SSFA

### Adjustable foot

Surface finish: Electro zinc plated.

| Dim<br>mm | Thickness<br>mm |
|-----------|-----------------|
| 40x40     | 2,0             |

### Ordering example

**SSFA**

Product



## SSH

### Corner piece

Surface finish: Electro zinc plated.

| Dim<br>mm | Thickness<br>mm |
|-----------|-----------------|
| 40x40     | 2,0             |

### Ordering example

**SSH**

Product



1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18



# Frame support system

1

## SSB

**Angle 45° internal and external**

Surface finish: Electro zinc plated.

| Dim mm | Dim mm | Thickness mm |
|--------|--------|--------------|
| 40x40  | 35x35  | 2,0          |

### Ordering example

Product SSB 45

Angle



2

3

4

5

6

## SSB

**Angle 90°**

Surface finish: Electro zinc plated.

| Dim mm | Thickness mm |
|--------|--------------|
| 40x40  | 2,0          |

### Ordering example

Product SSB 90

Angle



7

8

9

10

## SSVA

**Wall attachment**

Surface finish: Electro zinc plated.

| Dim mm | Thickness mm |
|--------|--------------|
| 40x40  | 2,0          |

### Ordering example

Product SSVA



11

12

13

14

15

## SSKV

**Corner X**

Surface finish: Electro zinc plated.

| Dim mm | Thickness mm |
|--------|--------------|
| 40x40  | 2,0          |

### Ordering example

Product SSKV



17

18



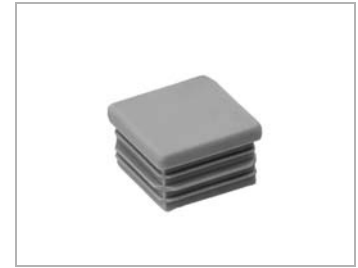
# Frame support system

## SBEI

**Pipe cover, inside**

Material: Plastic.

|                  |
|------------------|
|                  |
| for square tubes |
| for square parts |



### Ordering example

**SBEI**

Product

## SBEU

**Pipe cover, outside**

Material: Plastic.

|                  |
|------------------|
|                  |
| for square tubes |
| for square parts |



### Ordering example

**SBEU**

Product

|           |
|-----------|
| 1         |
| 2         |
| 3         |
| 4         |
| 5         |
| 6         |
| 7         |
| 8         |
| 9         |
| 10        |
| 11        |
| 12        |
| 13        |
| 14        |
| 15        |
| <b>16</b> |
| 17        |
| 18        |



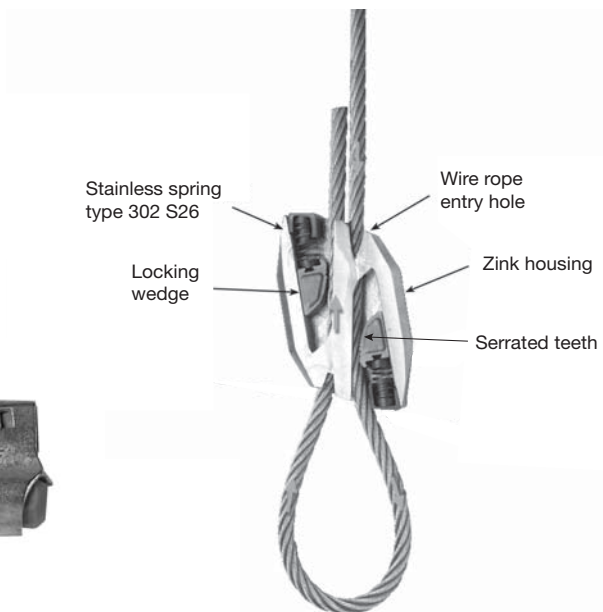
# Gripple – hang fast system

## 1 Fast hanging wire kit

Each kit comprises a Length of steel wire rope with a choice of different end fixings, a rope grip to adjust the free end, and a setting key.

2 Hangers are available as standard in 2 load related sizes. Each size is designed to carry a specific weight range and has a designated safe working load (SWL).

| Size | Working load span |
|------|-------------------|
| 2    | 11–45 kg          |
| 3    | 46–90 kg          |

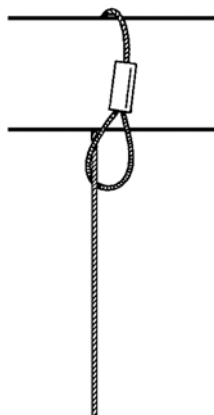


## 10 FHL

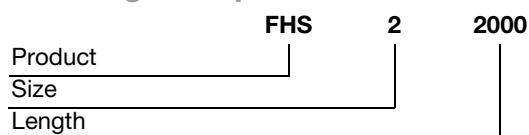
### Fast hanging wire kit loop

For looping around purlins, beams, roof trusses and other accessible building features.

| Size | Length mm |
|------|-----------|
| 2    | 1000      |
| 2    | 2000      |
| 2    | 3000      |
| 2    | 5000      |
| 2    | 10000     |
| 3    | 3000      |
| 3    | 5000      |
| 3    | 10000     |



## 16 Ordering example







# Gripple – hang fast system

## FHS

### Fast hanging wire kit stud

For anchoring into concrete ceilings, metal decking and pressed metal brackets (with nuts). Supplied with drop in anchors or nuts as required.

| Size | Length mm | Type |
|------|-----------|------|
| 2    | 1000      | M6   |
| 2    | 2000      | M6   |
| 2    | 3000      | M6   |
| 3    | 3000      | M6   |
| 3    | 5000      | M6   |
| 3    | 10000     | M6   |
| 2    | 1000      | M8   |
| 2    | 2000      | M8   |
| 2    | 3000      | M8   |
| 2    | 4000      | M8   |
| 2    | 5000      | M8   |
| 2    | 10000     | M8   |
| 3    | 3000      | M8   |
| 3    | 5000      | M8   |
| 3    | 10000     | M8   |



### Ordering example

|         |            |          |             |          |
|---------|------------|----------|-------------|----------|
|         | <b>FHS</b> | <b>2</b> | <b>2000</b> | <b>6</b> |
| Product |            |          |             |          |
| Size    |            |          |             |          |
| Length  |            |          |             |          |
| Type    |            |          |             |          |

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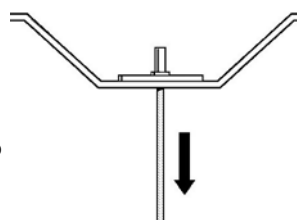
# Gripple – hang fast system

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## FHT

### Fast hanging wire kit toggle

For anchoring into profile roof cladding, light fixings, luminaries and other pre-drilled structures. Toggle end fixing is an integral part of the wire, requiring no additional accessories.



| Size | Length<br>m |
|------|-------------|
| 2    | 1000        |
| 2    | 2000        |
| 2    | 3000        |
| 2    | 4000        |
| 2    | 5000        |
| 2    | 10000       |
| 3    | 4000        |
| 3    | 5000        |
| 3    | 10000       |

### Ordering example

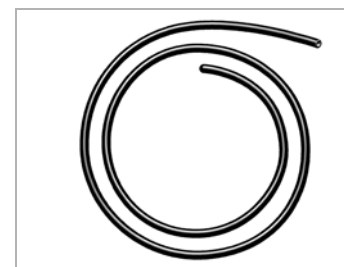
|         |     |   |      |
|---------|-----|---|------|
| Product | FHT | 2 | 2000 |
| Size    |     |   |      |
| Length  |     |   |      |

## FHPS

### Fast hanging plastic sleeve

Protective black plastic sleeve tubing to further reduce risk of condensation. Colour: Black.

| Length<br>m | Thickness<br>mm | Suits<br>size |
|-------------|-----------------|---------------|
| 25          | 2               | 2             |
| 25          | 3               | 3             |



### Ordering example

|           |      |    |   |   |
|-----------|------|----|---|---|
| Product   | FHPS | 25 | 2 | 2 |
| Length    |      |    |   |   |
| Thickness |      |    |   |   |
| Size      |      |    |   |   |



# Gripple – hang fast system

## FHE

### Fast hanging wire kit eyelet

For attachment to a variety of applications that require bolting to brackets or fixtures. Eyelet end fixing is an integral part of the wire, requiring no additional accessories.

| Size | Length mm |
|------|-----------|
| 2    | 1000      |
| 2    | 2000      |
| 2    | 3000      |
| 2    | 4000      |
| 2    | 5000      |
| 2    | 10000     |
| 3    | 3000      |
| 3    | 5000      |
| 3    | 10000     |



### Ordering example

|         |            |          |             |
|---------|------------|----------|-------------|
|         | <b>FHE</b> | <b>2</b> | <b>2000</b> |
| Product |            |          |             |
| Size    |            |          |             |
| Length  |            |          |             |

## FHE90

### Fast hanging wire kit 90° eyelet

For fixing into concrete, steel and wood using gas and power actuated tools or fixing screws. Eyelet end fixing is an integral part of the wire, requiring no additional accessories.

| Size | Length mm |
|------|-----------|
| 2    | 1000      |
| 2    | 2000      |
| 2    | 3000      |
| 2    | 4000      |
| 2    | 5000      |
| 2    | 10000     |
| 3    | 3000      |
| 3    | 5000      |
| 3    | 10000     |



### Ordering example

|         |              |          |             |
|---------|--------------|----------|-------------|
|         | <b>FHE90</b> | <b>2</b> | <b>2000</b> |
| Product |              |          |             |
| Size    |              |          |             |
| Length  |              |          |             |

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# Gripple – hang fast system

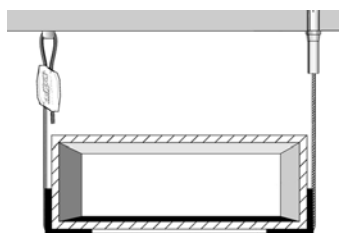
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## FHCS

### Corner Saddle

A right-angles reinforcement moulding for positioning and supporting wire ropes, sizes no 2 to no 3. Standard or magnetic version. Material: Plastic.

| Type     |
|----------|
| Standard |
| MAGN     |



### Ordering example

|         |             |             |
|---------|-------------|-------------|
|         | <b>FHCS</b> | <b>MAGN</b> |
| Product |             |             |
| Type    |             |             |

## WRC

### Wire rope cutter

A purpose-made tool for cutting wire rope. Suitable for use on the Gripple ranges sizes 2–3. Hardened jaws for durability.

### Ordering example

|         |            |
|---------|------------|
|         | <b>WRC</b> |
| Product |            |



## WRT

### Wire rope twister

For securing wires tails, and make a tidy finish. Suitable for use with sizes no. 2 and 3.

### Ordering example

|         |            |
|---------|------------|
|         | <b>WRT</b> |
| Product |            |





# H Frame Support System

# HFS

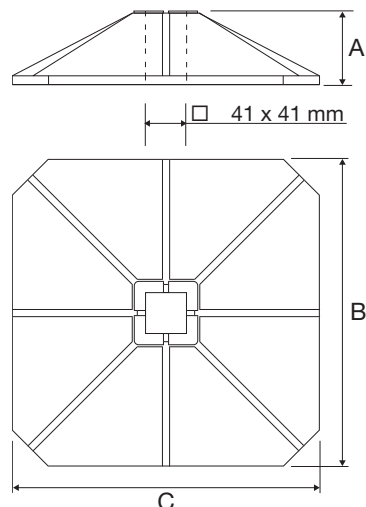


## Description

The Lindab H frame set is a quick, versatile and economical solution for supporting ductwork, pipework or cable trays. Using the inserts supplied the feet are adapted to accommodate Lindabs off the shelf 40 mm x 40 mm channel support system (not included in kit).

## Construction

The Lindab Big Foot plastic mounting feet for the modular framework system are manufactured from UV protected Nylon 6 B601L 30% Glass fibre filled. Metal components are manufactured from hot dipped galvanised steel and comply with EN10219 S235 J0H, EN10219 S275 J2H & EN10219 S355 J2H.



| Type | A mm | B mm | C mm | m kg |
|------|------|------|------|------|
| 305  | 75   | 305  | 305  | 5,0  |
| 450  | 100  | 450  | 450  | 10,0 |

## Kit Includes

- 2 x Feet
- 2 x AV mats
- 2 x Channel inserts
- 2 x L-Brackets
- 4 x M10 Bolts
- 4 x Square channel nuts

**Kit does not include channel**

## Options

Available with either 305 mm or 450 mm square feet depending on the load requirements.

## Maximum Loads

Maximum load per 305 mm<sup>2</sup> Leg Assembly – 120 kg  
 Maximum load per 450 mm<sup>2</sup> Leg Assembly – 220 kg

## Ordering example

|           |     |     |
|-----------|-----|-----|
| Product   | HFS | 305 |
| Dimension |     |     |

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# Multi Foot MULTIF



## Description

The Lindab Multi Foot is designed to be a multi-purpose ductwork, cable and pipework support. The Multi Foot is an extremely versatile and cost effective one piece support available in two sizes with optional antivibration mats. When used with Lindab's Support Channel and Threaded Rod (not included) the Multi Foot provides a complete support solution for a host of applications from cable trays to ductwork

## Designed to

- 41 × 41 mm channel
- 40 mm wide channel (horizontally)
- 12 mm threaded (vertically)

| Dim | Length mm | Width mm | Height mm | Weight kg | Max Load kg |
|-----|-----------|----------|-----------|-----------|-------------|
| 400 | 400       | 180      | 95        | 1,7       | 77          |
| 600 | 600       | 220      | 95        | 2,8       | 142         |

Max recommended load is based on each foot producing a loading of 10,0 kN/m<sup>2</sup>, if conditions allow, the maximum load per foot is 500 kg.

## Construction

The Lindab Multi Foot plastic mounting feet are manufactured from Polypropylene 20% Glass fibre filled.

## Application

Suitable for internal or external applications in temperatures between -30°C to +80°C.

## Ordering example

|           |        |     |
|-----------|--------|-----|
| Product   | MULTIF | 400 |
| Dimension |        |     |

# Anti-Vibration Mat MFAV



## Optional

Multi Foot Anti-vibration Mat 400 MFAV  
Multi Foot Anti-vibration Mat 600 MFAV

| Dim | Length mm | Weight kg |
|-----|-----------|-----------|
| 400 | 180       | 2,5       |
| 600 | 220       | 4,5       |

## Construction

The antivibration mats are manufactured from Styrene Butadiene Rubber (SBR).

## Application

Suitable for internal or external applications in temperatures between -30°C to +80°C.

## Ordering example

|           |      |     |
|-----------|------|-----|
| Product   | MFAV | 400 |
| Dimension |      |     |



# Fix-it Foot Support System

FIF



## Description

The Lindab Fix-it Foot are available in three sizes, each has a 40 mm x 20 mm aluminium channel recessed into the top face allowing fixing of the services resting across the feet.

## Construction

The Lindab Fix-it Foot is pressure moulded using a one or two part mix, utilising milled, sieved and grade Styrene Butadiene Rubber (SBR-Recycled Rubber) bound with a ratio of high quality moisturecuring Polyurethane Pre-Polymer.

| Multi Foot | Length mm | Width mm | Height mm | Weight kg | Max Load kg |
|------------|-----------|----------|-----------|-----------|-------------|
| 250        | 250       | 180      | 95        | 2,3       | 50          |
| 400        | 400       | 180      | 95        | 3,7       | 100         |
| 600        | 600       | 220      | 95        | 5,5       | 150         |

## Ordering example



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# Fastening material










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| General information and theory     | 2         |
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| Dampers & Measure units            | 5         |
| Fire dampers & Smoke evacuation    | 6         |
| Air valves                         | 7         |
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# Content – Fastening material

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| 7  | <b>Circular plain washer</b>  | CPW.....678   |
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# Fastening materials

## FRSK

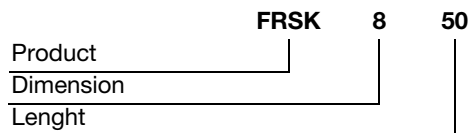
### Hex head wood screw

Surface finish: Hot galvanised.

| Dim | Lenght mm |
|-----|-----------|
| 8   | 50        |
| 8   | 65        |
| 8   | 75        |
| 10  | 50        |
| 10  | 65        |
| 10  | 75        |
| 10  | 100       |



### Ordering example



## RJB

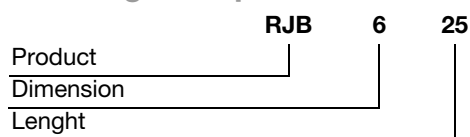
### Hex head bolt

Surface finish:electro zink plated.

| Dim | Lenght mm |
|-----|-----------|
| M6  | 25        |
| M8  | 25        |
| M8  | 35        |
| M10 | 30        |



### Ordering example



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# Fastening materials

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## RJN

### Hex nut

Surface finish:electro zink plated.

| Dim |
|-----|
| M6  |
| M8  |
| M10 |
| M12 |



### Ordering example

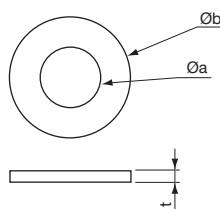
|           |     |   |
|-----------|-----|---|
| Product   | RJN | 6 |
| Dimension |     |   |

## CPW

### Circular plain washer

Surface finish:electro zink plated.

| Ø a mm | Ø b mm | t mm |
|--------|--------|------|
| 6,4    | 12     | 1,5  |
| 8      | 16     | 1,5  |
| 10     | 22     | 2    |
| 13     | 24     | 2    |
| 12     | 35     | 2    |



### Ordering example

|               |     |    |    |   |
|---------------|-----|----|----|---|
| Product       | CPW | 10 | 22 | 2 |
| Dimension Ø a |     |    |    |   |
| Dimension Ø b |     |    |    |   |
| Thickness t   |     |    |    |   |

## ANKS

### Through bolt anchor

Through bolt is designed for medium heavy and heavy fixings in concrete and natural stone.

Surface finish: electro zink plated.

| Dim | Lenght mm |
|-----|-----------|
| M8  | 50        |
| M8  | 75        |
| M10 | 80        |



### Ordering example

|           |      |   |    |
|-----------|------|---|----|
| Product   | ANKS | 8 | 75 |
| Dimension |      |   |    |
| Lenght    |      |   |    |



# Fastening materials

## DIA

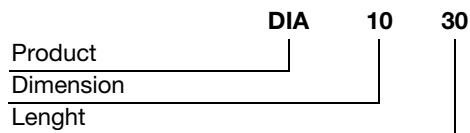
### Drop in anchor

Drop anchor is designed for medium heavy and heavy loads.  
With internal thread.  
Surface finish: electro zink plated.

| Dim | Lenght<br>mm |
|-----|--------------|
| M10 | 30           |
| M12 | 40           |
| M14 | 50           |



### Ordering example



## DYBH

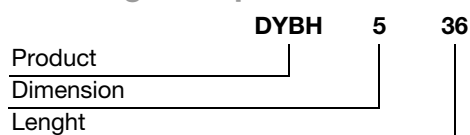
### Gypsum fastener

With screws.  
Surface finish: electro zink plated.

| Dim | Lenght<br>mm | For<br>gypsum<br>mm |
|-----|--------------|---------------------|
| M5  | 36           | 13                  |
| M5  | 64           | 26                  |



### Ordering example



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