Content

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 was founded in Sweden in 1959 and is divided into two business areas: Ventilation and Profile. Ventilation and Profile develop, produce and market ventilation- and building components in sheet metal. Worldwide the corporation has approximately 4,900 employees distributed throughout more than 100 branches in 29 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 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 experience at your disposal, when you choose Lindab as your business partner.

We help to secure a good 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.

Knowledge

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.

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.

Lindab laboratories insure 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.

Logistics

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

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

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With a selection of more than 25,000 standard components and the possiblity 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?

Product range

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.

IT solutions

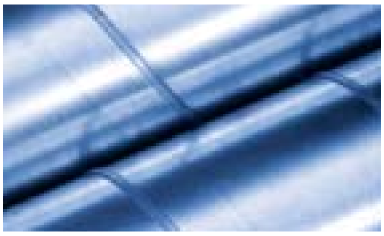
Lindab offers a large range of intelligent and rational tools and services that make your day-to-day work easier. We want to give you the opportunity to develop optimal, reliable and economical ventilation solutions in the shortest possible time.

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

Ventilation Accessories

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.



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IT solutions

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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 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 object-oriented 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 and noise, reports easily exportable to Excel.
- 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

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 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 conduct 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 Europe 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

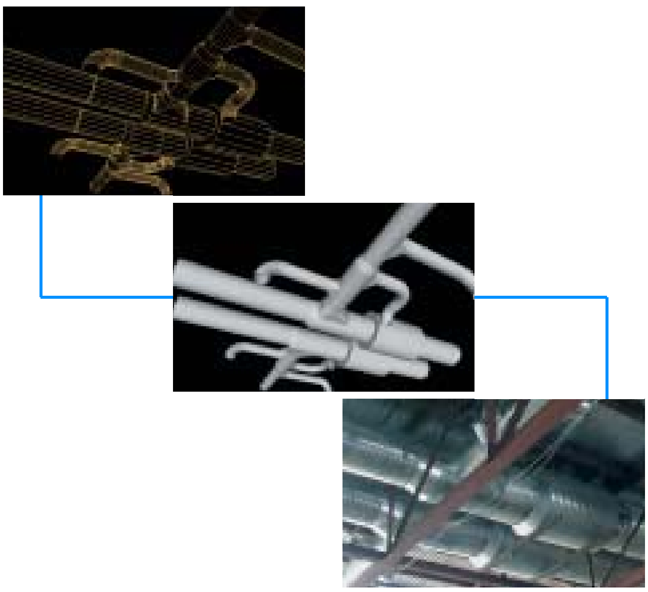
- TEKNOsim is based on many years' experience of data-based climate simulation
- the software takes into account every significant parameter affecting indoor climate
- fast, accurate calculations that minimize the risk of oversizing your climate control system
- verified by Chalmers Industriteknik, CIT,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

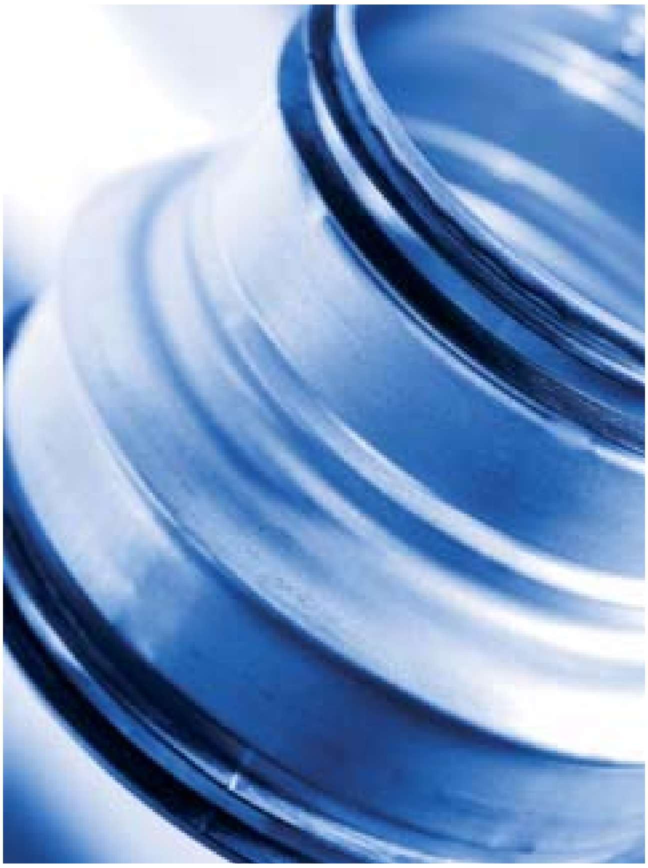
Brand neutrality

- 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 or the site of your local Lindab company. Or contact us by mail: 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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References

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Turning Torso, Malmö, Sweden

Hotel Mariott, Copenhagen, Denmark

Aluminium grilles, Metro, Copenhagen, Denmark

Bilia, Sweden

Tenpin bowling hall, Sweden

Operan, Copenhagen, Denmark

References

Ejendal arena, Leksand, Sweden

Malmö university, Sweden

National Exhibition Centre, Birmingham, UK

Brussels Airport, Belgium

Hospital, Copenhagen, Denmark

Tollcross Park Leisure Center, Glasgow, UK

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General information and theory

Dimensions

Designations and examples

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

Lengths are given in mm.

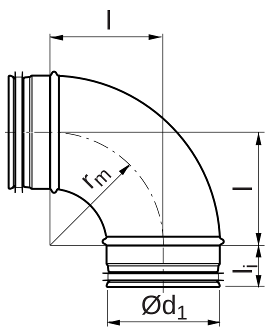
Angles are given in degrees.

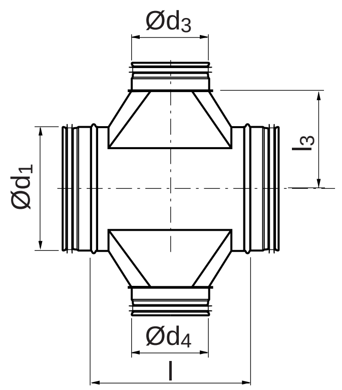
Fittings with $Ød_1$ – $Ød_4$ fit inside ducts and fittings with Ød.

Duct and female dimension .... Ød

Connector dimension .... $Ød_1$, $Ød_2$, $Ød_3$, $Ød_4$

Sheet metal thickness .... t





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

Bend radius .... r_m

Insertion length .... l_i

Eccentricity cc

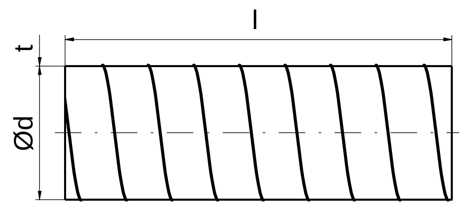
Component length L

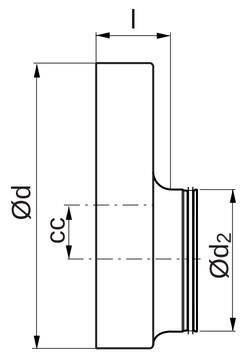
Circumference .... O

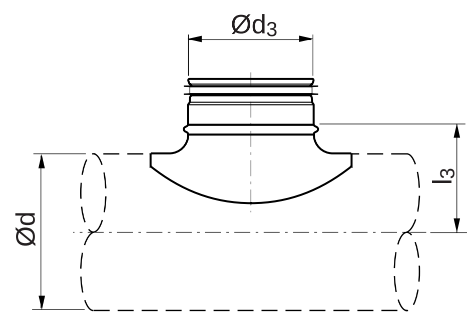
Cross-sectional area .... A_c

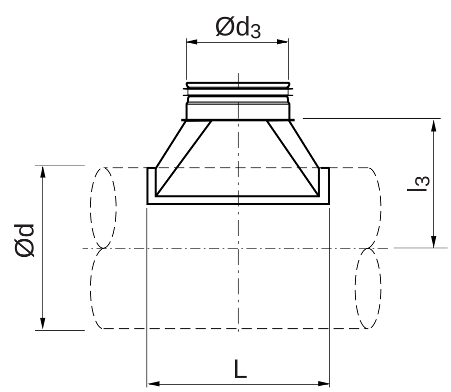
Mass .... m

Linear mass .... m_l







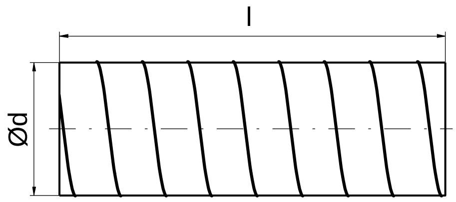


Lindab

Tolerances

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

Ducts



According to EN1506

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

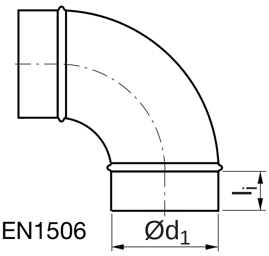
Length

l, l_1, l_3, etc	Tolerance
0–15	+0 -2
16–100	+0 -5
101–	+0 -10
L	±5

Angle

α	Tolerance
	±2°

Fittings



According to EN1506

$Ød_1, d_2, d_3, d_4$ nom	Tolerance range	l_i nom
63	**61,8 – 62,3**	**40**
80	**78,8 – 79,3**	**40**
100	**98,8 – 99,3**	**40**
112	110,8 – 111,3	40
125	**123,8 – 124,3**	**40**
140	138,7 – 139,3	40
150	148,7 – 149,3	40
160	**158,7 – 159,3**	**40**
180	178,6 – 179,3	40
200	**198,6 – 199,3**	**40**
224	222,5 – 223,3	40
250	**248,5 – 249,3**	**60**
280	278,4 – 279,3	60
300	298,4 – 299,3	60
315	**313,4 – 314,3**	**60**
355	353,3 – 354,3	60
400	**398,3 – 399,3**	**80**
450	448,2 – 449,3	80
500	**498,2 – 499,3**	**80**
560	558,1 – 559,3	80
600	598,1 – 599,3	80
630	**628,1 – 629,3**	**80**
710	708,0 – 709,3	100
800	**798,0 – 799,3**	**100**
900	897,9 – 899,3	100
1000	**997,9 – 999,3**	**120**
1120	1117,8 – 1119,3	120
1250	**1247,8 – 1249,3**	**120**
1400	1397,3 – 1398,8	150
1500	1496,9 – 1498,5	150
1600	**1596,5 – 1598,2**	**150**

Weight

±10%

Sheet metal thickness

As in sheet metal standard EN 10143:1993.

Material

Sheet metal grade

Fittings and ducts in the standard Lindab range are made from hot dip galvanized steel sheet with a yield point in tension of 200 N/mm^2, and the zinc coating shall at least comply with Z 275.

Surface treatment of class Z 275 means 275 g $zinc/m^2$, double sided. Z 275 thus specifies the total amount of zinc on both sides of a 1 m^2 sheet. The thickness can thus be calculated as follows

$$\text{Zinc thickness} = \frac{\text{zinc weight}}{\text{no. of sides} \times \text{zinc density}} =$$

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

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.

Material

- The following material is used in the standard range:
- Ducts and hand made fittings are made with material to EN 10142 – Fe PO2 G Z 275 MA–C.
- Pressed fittings are made with material to EN 10142 – Fe PO2 G Z 275 MA–C and EN 10142 – Fe PO6 G Z 275 MB–C

Other material can also be supplied, for example

- **Stainless steel** to EN 1.4436 or AISI 316 or EN 1.4301 or AISI 304. Some fittings which are normally pressed have to be hand made and swaged together.
- **Aluminium** to ISO/DIS 209-1. Some fittings which are normally pressed have to be hand made and swaged together.
- **Plastic coated products**

  Ducts are made from "Plastisol" as standard, i.e. hot dip galvanised steel sheet Z 275, with an internal and external coating,100 µm thick, of polyvinyl chloride (PVC).

  Fittings are made, as standard, from hot dip galvanised steel sheet Z 275 and then powder coated internally and externally with a mixed powder consisting of epoxy and polyester (PE) to a thickness of 80 µm.

  Ducts can also be supplied with an optional coating of epoxy + PE. This can be done either both internally and externally, or only on the inside or outside. Powder-coated ducts eliminate the risk of differing shades in colour between ducts and fittings.

  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.

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

  Powder coating can be optionally obtained in thicknesses of up to 200 µm.
- **Aluzink** with surface treatment to AZ 185 means 185 g $aluzink/m^2$ double sided. Some fittings which are normally pressed have to be fabricated and swaged together.

Materials

Temperature limits for our materials

The shadowed fields denote standard versions.

Product	Material/type	Operation – Continual – Temperature limit min °C	Operation – Continual – Temperature limit max °C	Operation – Intermittent – Temperature limit min °C	Operation – Intermittent – Temperature limit max °C
Pressed and seam welded	Galvanized steel sheet metal		200[1]		250[2]
	Aluminium sheet metal		200[3]		300
	Stainless steel sheet metal		500		700
	PVC coated sheet steel metal		80		120
	PE-/EP coated products		150		200
Swaged, spot welded and/or blind interlocked joint	Aluzink sheet metal		315		
	Mastic	-40	70		
Safe gasket and damper blade seals[4]	EPDM rubber	-30	100	-50	120
	Silicone rubber	-70	150	-90	200
Foam rubber seal	EPDM rubber	-30	100	-50	120
Foam plastic gasket	Polyester	-40	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	Etheylene vinyl acetate and polyethylene	-45	65		
Insulation	Glass wool		200		
	Rock wool		700		
Silencer	Polyester		130		180
[4] Damper blade seal at DT*U Ø80.	Silicone cell rubber	-50	200		

[1] Discoloration occurs at about 200 °C in galvanized steel. This is mostly an appearance problem and does not mean impaire corrosion protection in a normal environment.

[2] If the temperature rises to about 300 °C, the adhesion of the zinc is impaired, which means poorer corrosion protection.

[3] 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^2
For pressure, mechanical stress	pascal	Pa	1 Pa	= 1 N/m^2
For energy, work	joule	J	1 J	= 1 N · m
For power	watt	W	1 W	= 1 J/s
For electric potential, 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^3 = 1 dm^3

Some multiple prefixes

Index	**Designation**	**Des.**	**Example**	
10^{12}	tera	T	1 terajoule	1 TJ
10^{9}	giga	G	1 gigawatt	1 GW
10^{6}	mega	M	1 megavolt	1 MV
10^{3}	kilo	k	1 kilometre	1 km
10^{2}	hecto	h	1 hectogramme	1 hg
10^{1}	deca	da	1 decalumen	1 dalm
10^{-1}	deci	d	1 decimetre	1 dm
10^{-2}	centi	c	1 centimetre	1 cm
10^{-3}	milli	m	1 milligramme	1 mg
10^{-6}	micro	µ	1 micrometre	1 µm
10^{-9}	nano	n	1 nanohenry	1 nH
10^{-12}	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 pascal N/m^2	mm wc mm Aq mm H_2O	mm Hg (at 20 °C)	in wg " wg in wc	psi(g) ibf/in^2	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 inch	ft foot	yd yard	m 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^2 sq in	ft^2 sq ft	yd^2 sq yd	m^2 sq metre	ar	ha 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^3 cu in	l litre	US gal gallon	UK gal gallon	ft^3 cu ft	yd^3 cu yd	m^3 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 fpm	km/h Bz	ft/s	mile/h mph	knot 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

ft³/h cfh	l/min	m³/h	ft³/min cfm	l/s	m³/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 ounce	lb pound	kg 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, ρ

kg/m³	lb/ft³	g/cm³	lb/in³
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 newton	lbf pound-force	kp 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 joule Nm, Ws	Btu British thermal unit	kcal 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 watt Nm/s, J/s	kcal/h	hk metric horsepower	hp UK, US 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, ΔT for K; $\Delta\vartheta$ for °C

K kelvin	°F degree Fahrenheit	°C degree Celsius
1	1,80	1,00
0,556	1	0,556
1,00	1,80	1

Associated temperatures

K	°F	°C	Physical state
0,00	-460	-273	Absolute zero
255	**0,00**	-17,8	Mixture of sal ammoniac and snow
273	32,0	**0,00**	Melting point of ice
293	68,0	20,0	Standard atmospheric temperature
311	**100**	37,8	Normal temperature of human body
373	**212**	**100**	Boiling point of water

Conversion between temperatures

°C = (°F - 32) × 5/9 °C = K - 273,15

°F = °C × 9/5 + 32 K = °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
alfa	α	Α
beta	β	Β
gamma	γ	Γ
delta	δ	Δ
epsilon	ε	Ε
zeta	ζ	Ζ
eta	η	Η
teta	ϑ	Θ
jota	ι	Ι
kappa	κ	Κ
lambda	λ	Λ
my	μ	Μ

Name	Lower case	Upper case
ny	ν	Ν
ksi	ξ	Ξ
omikron	ο	Ο
pi	π	Π
ro	ρ	Ρ
sigma	σ	Σ
tau	τ	Τ
ypsilon	υ	Υ
fi	φ	Φ
ki	χ	Χ
psi	ψ	Ψ
omega	ω	Ω

Pressure

1
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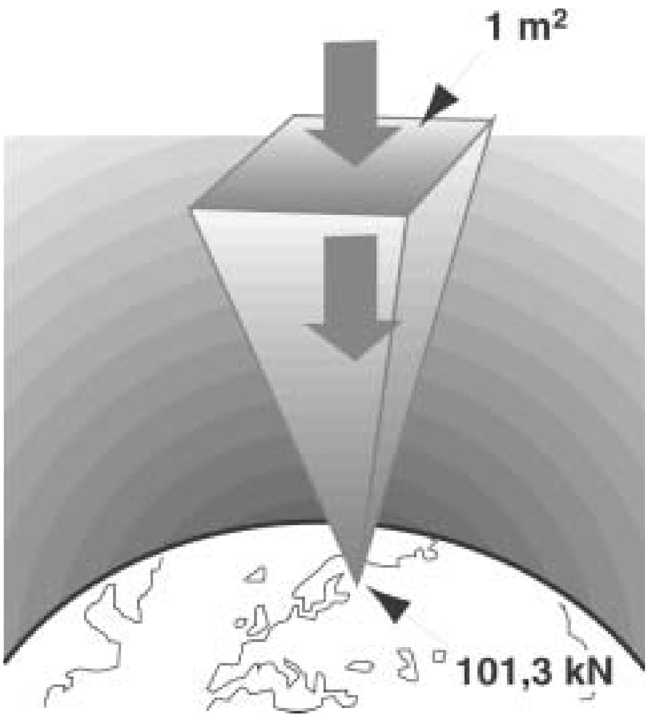
16
17
18

Total pressure = dynamic pressure + static pressure

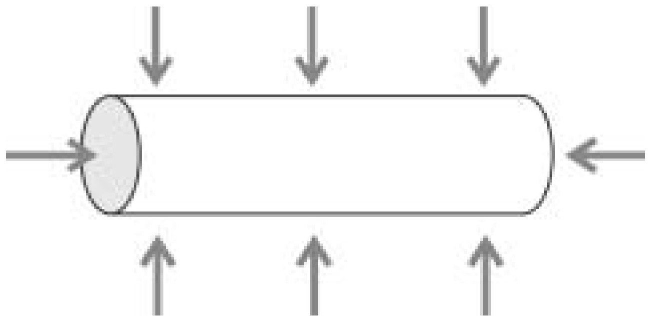
The static pressure in the atmosphere varies with the weather - high pressure or low pressure - and with the height above sea level. The standard pressure, atmospheric pressure at sea level is:

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.

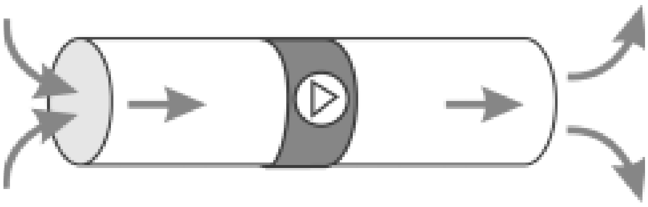
In a ventilation system, the static pressure is related to the ambient atmospheric pressure outside the duct system; the static pressure can thus be positive - higher than ambient atmospheric, or negative - lower than ambient atmospheric pressure.



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

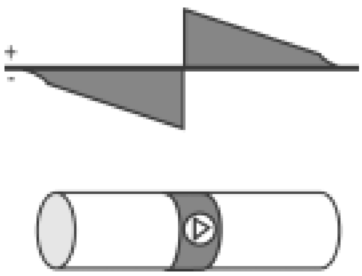
The dynamic pressure depends on

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

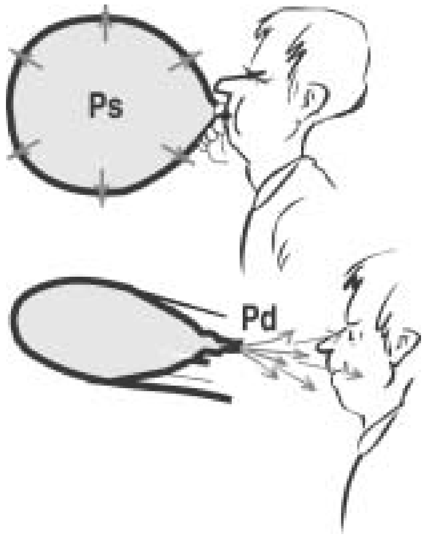
$$\frac{kg}{m^3} \cdot \left(\frac{m}{s}\right)^2 = \frac{kg}{m^3} \cdot \frac{m^2}{s^2} = \frac{kgm}{s^2} \cdot \frac{m}{m^3} = N \cdot \frac{1}{m^2} = \frac{N}{m^2} = Pa$$

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

where

Δp_f = friction loss per metre (Pa/m)

λ = 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

ρ = air density (kg/m^3)

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

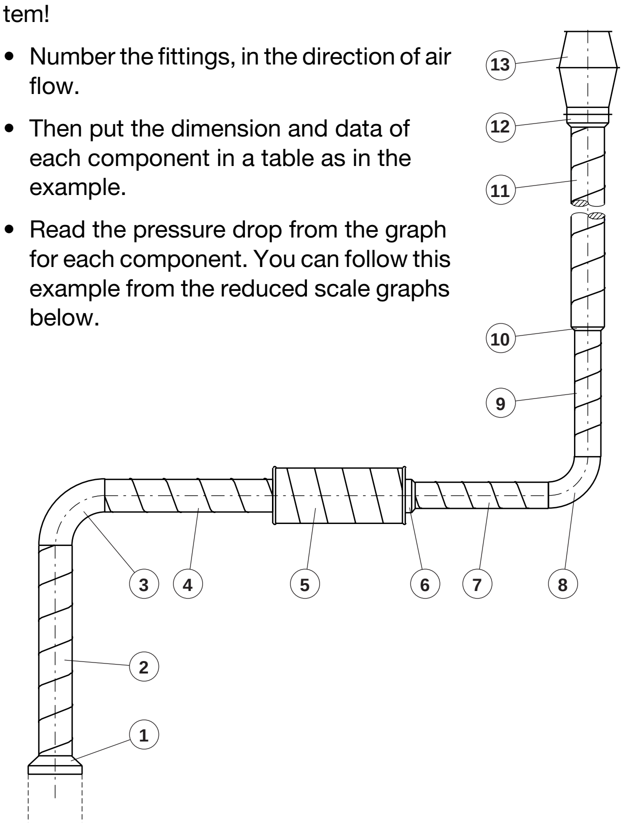
Pressure

Pressure drop calculation

Fan pressure capacity required

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

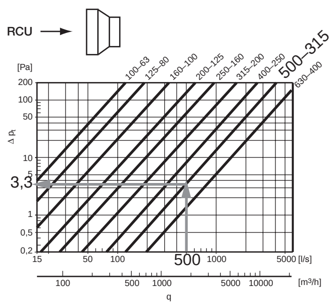
- Number the fittings, in the direction of air flow.
- Then put the dimension and data of each component in a table as in the example.
- Read the pressure drop from the graph for each component. You can follow this example from the reduced scale graphs below.



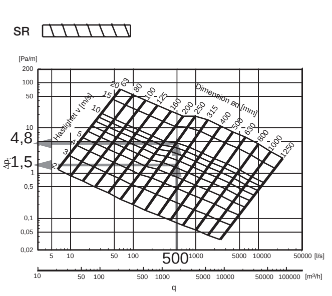
No	Flow l/s	Component Denom.	Dimension Ø mm	Length m	Pressure drop Pa/m	Pressure drop Pa
1	500	RCU	500-315	-	-	3,3
2	"	SR	315	2	1,5	3,0
3	"	BSU 90°	315	-	-	5,5
4	"	SR	315	1,6	1,5	2,4
5	"	SLCBU 100	315/1200	1,2	-	42,0
6	"	RCFU	315-250	-	-	5,0
7	"	SR	250	1,5	4,8	7,2
8	"	BSU	250	-	-	14,0
9	"	SR	250	1,2	4,8	5,8
10	"	RCU	315-250	-	-	6,0
11	"	SR	315	3,5	1,5	5,3
12	"	RCFU	400-315	-	-	2,0
13	"	HF	400	-	-	22,0
		Total pressure drop (sum of rows 1 – 13) = 123,4				

Add up the pressure drops on the far right of the table. Then select a suitable fan which gives the required flow q = 500 l/s and a total pressure rise of p_t = 125 Pa.

1



2 4 7 9 11



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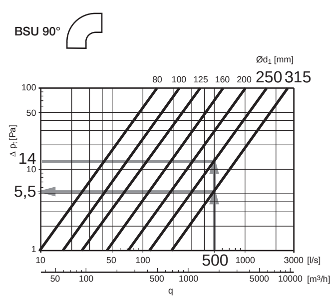

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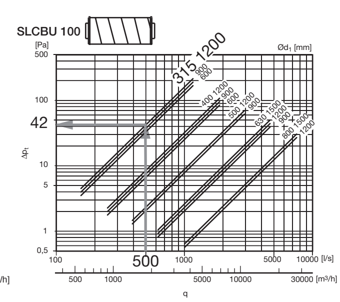

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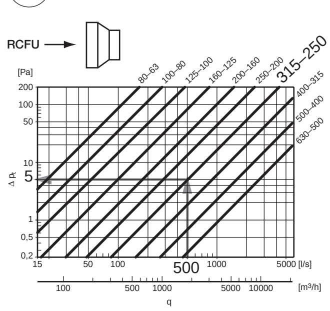
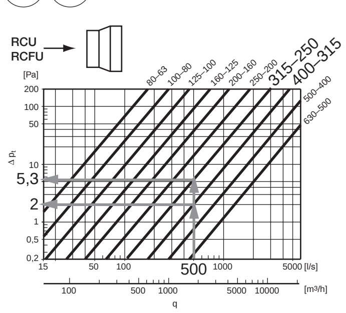
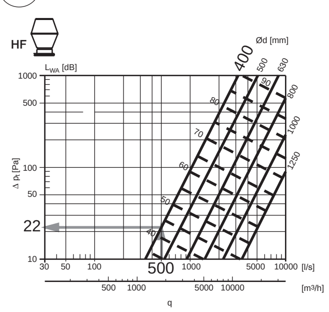


10 12



13



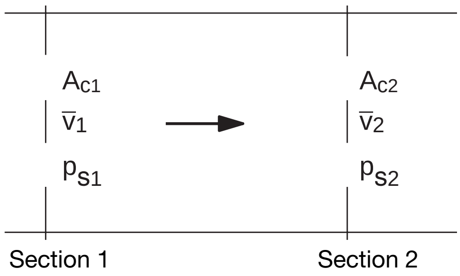
Pressure

Prerequisites

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

The total pressure drop Δp_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_h	=	hydraulic diameter	m (mm)
A_c	=	cross sectional area	m^2
p_A	=	atmospheric pressure	mbar
p_s	=	static pressure	Pa
p_d	=	dynamic pressure	Pa
p_t	=	total pressure	Pa
Δp	=	pressure drop	Pa
Δp_t	=	total pressure drop	Pa
ϑ	=	temperature	°C
$\bar{v}$	=	air velocity (average)	m/s
q	=	air flow	m^3/s
ρ	=	density	kg/m^3
α	=	angle	°
φ	=	relative humidity	%
λ	=	friction number	
R	=	coefficient of friction	Pa/m
ζ	=	resistance number	
ν	=	kinematic viscosity	m^2/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 litterature.

The graphs apply to air under standard conditions.

ν	=	$15{,}1 \cdot 10^{-6}$ m^2/s
ϑ	=	20 °C
ρ	=	1,2 kg/m^3
φ	=	65 %
p_A	=	1013,2 mbar

For air of other density (ρ_{other}) the flow ($q_{other\_density}$) is obtained from the formula

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

Sound

Ventilation does not have to be noisy!

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

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.

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

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

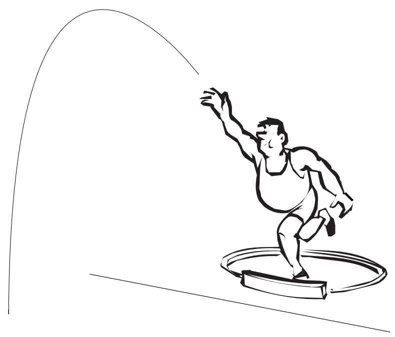
You must have some basic knowledge about how and where noise is generated, transmitted and attenuated in the system, to be table to choose the correct principle and correct components. To take a simple analogy: noise transmission consists of waves in a medium, i.e. air, which we can not see. This is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

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

Source

Waves on water

We throw a stone onto completely calm water.



Waves in air

We fire a starter´s gun.

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

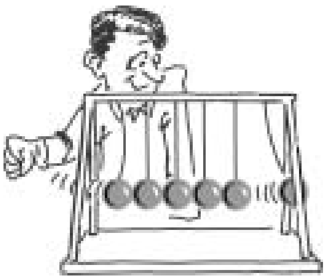
Energy transport

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.

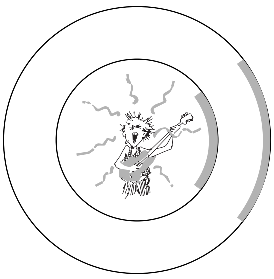
Intensity

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.



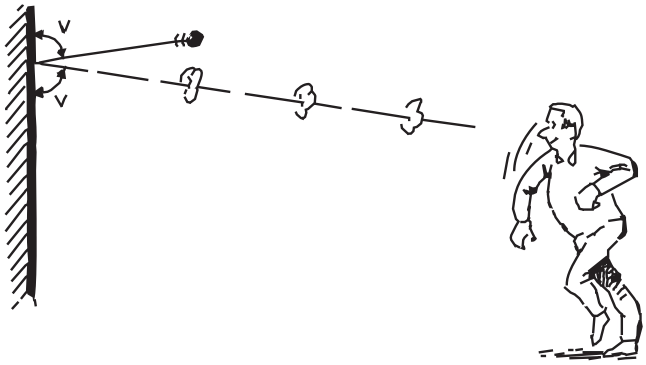
Obstruction in the way

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.

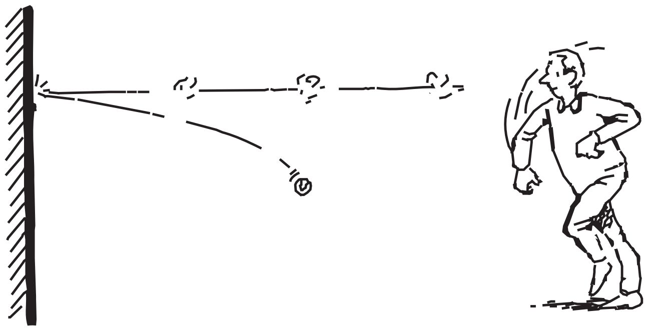
Energy loss

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.

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

Sound

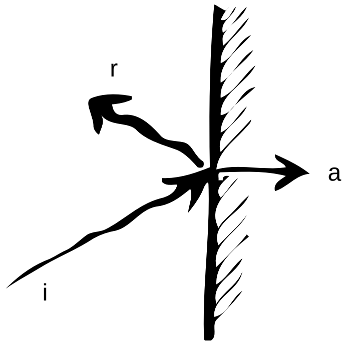
Sound can be absorbed
When sound waves meet a soft, porous wall (mineral wool etc.), the vibrating molecules penetrate the surface layer, and are then braked by friction against the material fibres.

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 α of the material.

$i = a + r$

$\alpha = \frac{a}{i}$



If nothing is absorbed, everything is reflected, then a = 0 which makes α = 0:

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

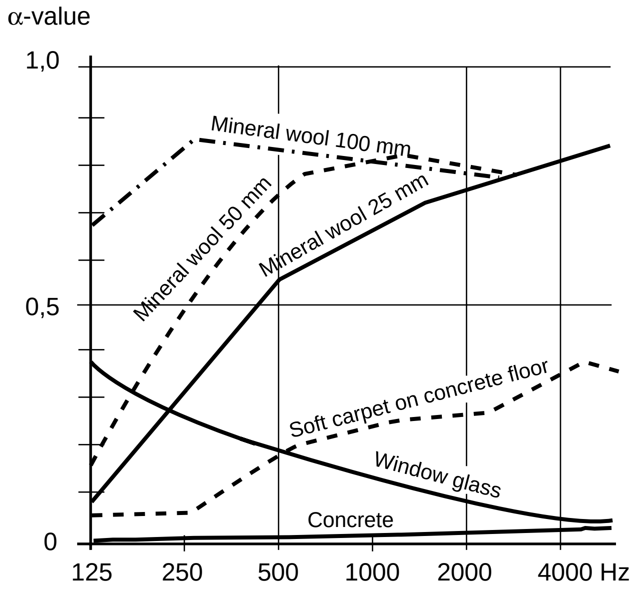
If nothing is reflected, everything is absorbed, then r = 0 which makes α = 1:

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

An open window can be said to have α = 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 α 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 α 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.

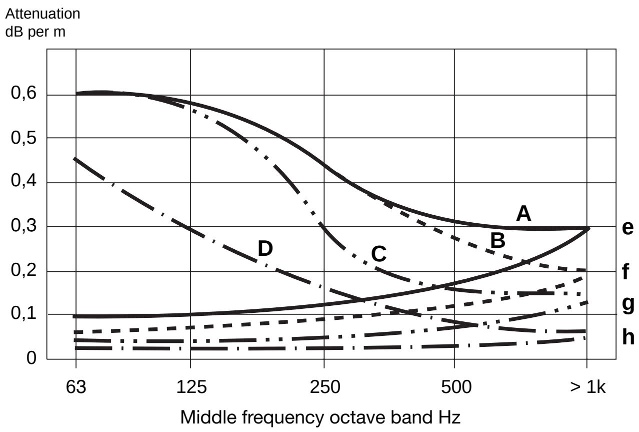
Given the same free duct area, a circular, spiral seamed duct is stiffer than a rectangular one and will thus provide less damping.

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 etal ducts (1 mm sheet metal thickness)

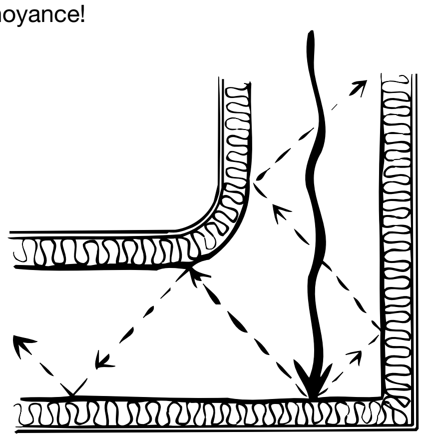


Duct dimensions			
Rectangular sheet metal ducts			
□ 75–200	200–400	400–800	800–1000
A	B	C	D
Circular sheet metal ducts			
Ø75–200	200–400	400–800	800–1600
e	f	g	h

Absorption is more effective

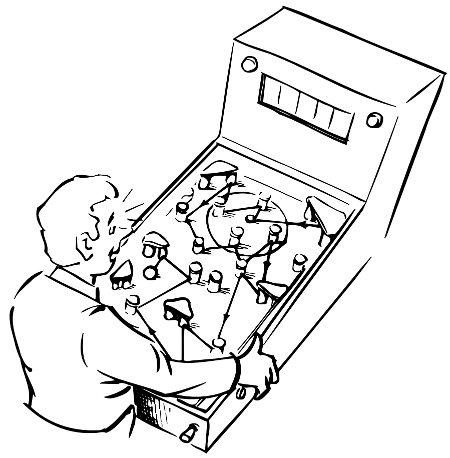
The damping becomes more effective if we put absorbent material into the duct system. The way that sound is damped was described above, part of the sound energy is absorbed by the absorption material which is hit by the sound.

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!

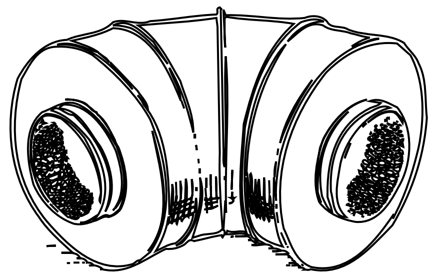


Where should you put the absorption material in the ducts?

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.



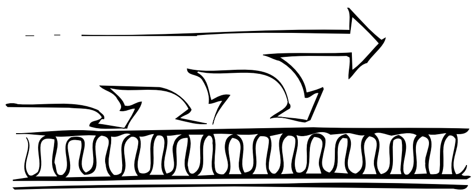
Why the curved silencer BSLCU is so effective!



Straight silencers concentrate the absorption material

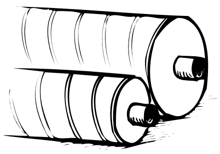
There is a complement to the description of sound waves above. When the sound waves travel along a porous surface, they will be deflected towards the duct walls. This deflection is called, “diffraction”.

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



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_1	l	Attenuation in dB for centre frequency Hz							
nom	mm	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_1	l	Attenuation in dB for centre frequency Hz							
nom	mm	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_1	l	Attenuation in dB for centre frequency Hz							
nom	mm	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_1	l	Attenuation in dB for centre frequency Hz							
nom	mm	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_1	l	Attenuation in dB for centre frequency Hz							
nom	mm	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_1	l	Attenuation in dB for centre frequency Hz							
nom	mm	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

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.

SLCU 100

Ød_1	l	Attenuation in dB for centre frequency Hz							
nom	mm	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_1	l	Attenuation in dB for centre frequency Hz							
nom	mm	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

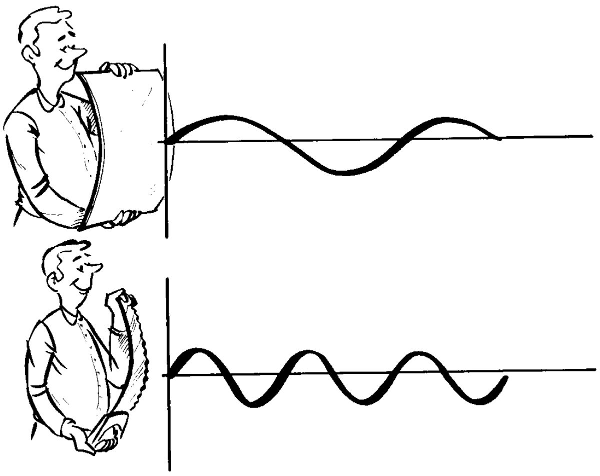
Sound

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 (λ, “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).

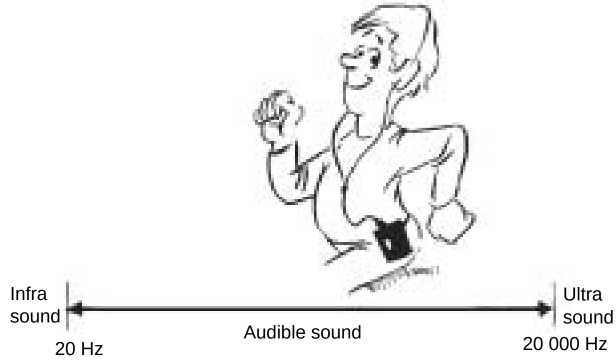
These three variables have the following relationship:

$c = f \cdot \lambda$

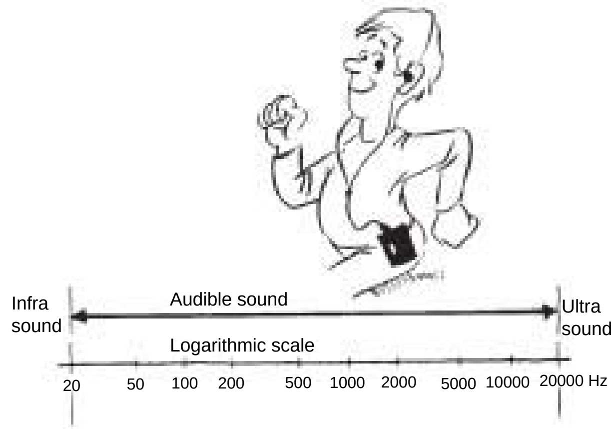
The speed of sound in air is also a function of pressure and temperature.

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

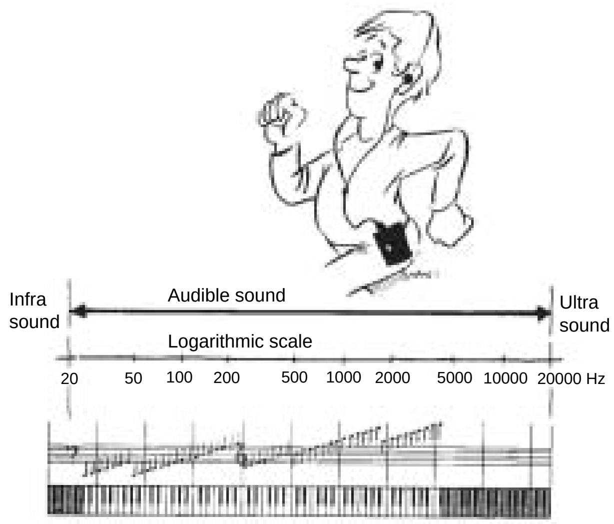
A young person with normal hearing can hear sounds at frequencies from 20-20 000 Hz, i.e. (in air) at wavelengths ranging from 17 m (at 20 Hz) to app. 17 mm (at 20 kHz).



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.

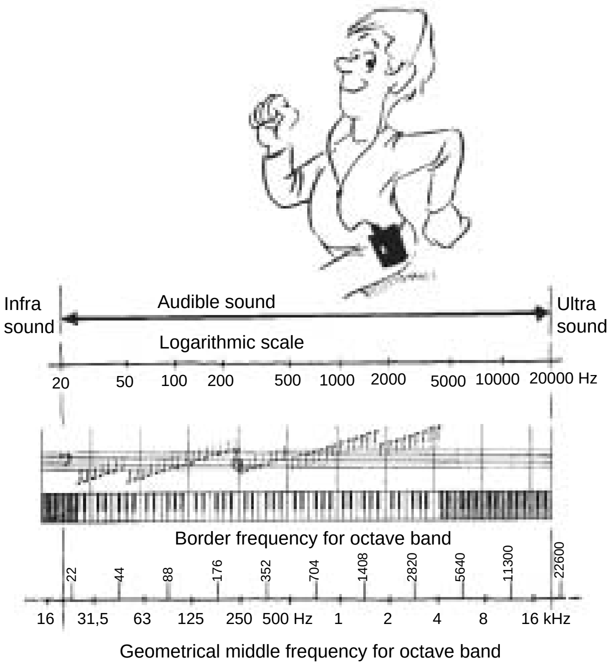


The logarithmic scale is usually sub-divided into octaves. i.e. in scales where the top note is twice the frequency of the bottom note. This has been customary in music for a long time.

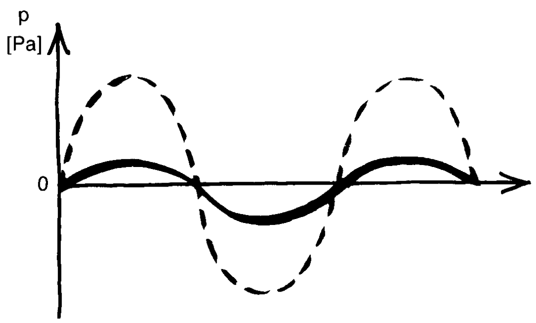


Sound

And in engineering.



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



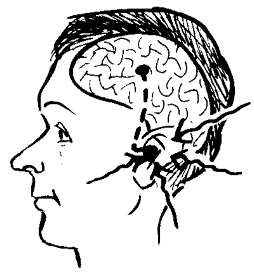
Sound pressure changes in the audible area can vary within very wide limits. Some sounds are so weak that we can not hear them. The so-called **audible limit** varies with frequency and is 20 µPa at about 1000 Hz .

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.

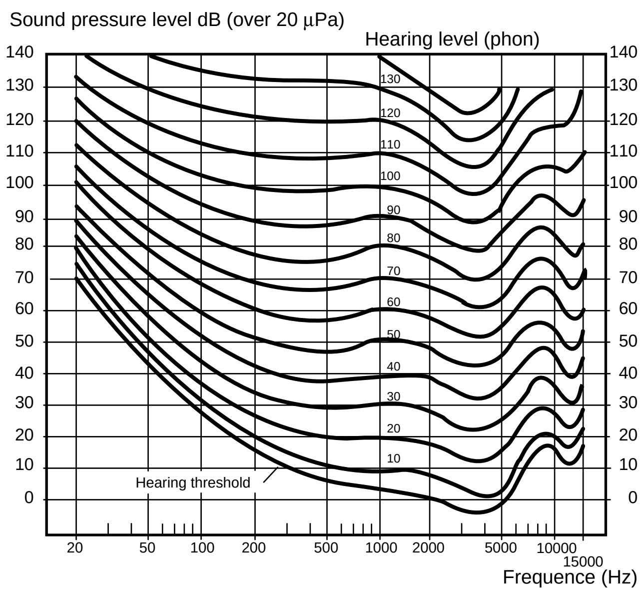
The **dB** unit, which is used in many different applications, is generally defined as: $10 \cdot \log (X/X_0)$, where X is the unit measured, i.e. the sound pressure, and X_0 is a reference level expressed in the same units. The relationship of X/X_0 is thus dimensionless. The reference level from which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

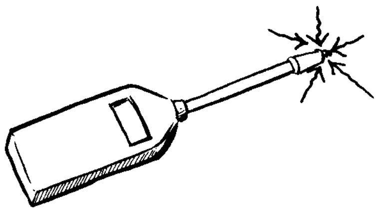


Example:

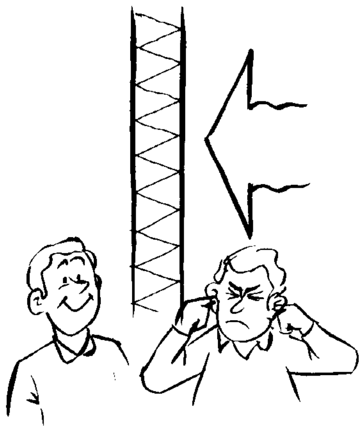
The sound pressure level 70 dB at 50 Hz is normally perceived as being as loud as 50 dB at 1000 Hz.

Sound

Sound levels

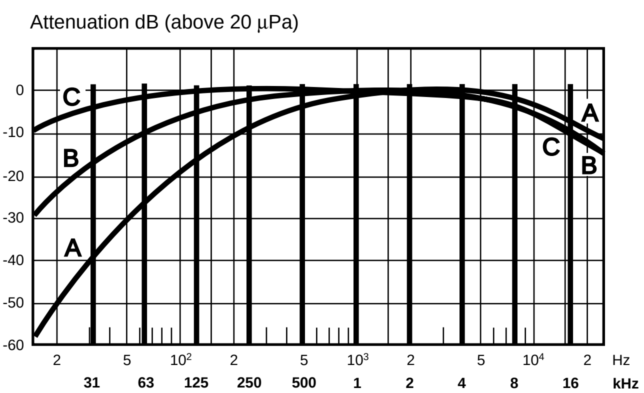


Several methods are used to compare the disturbance caused by two different sounds, and where the perception of the ear to noise has been modelled.



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)**.



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:

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

q = air flow (in m^3/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 $\mathbf{p_t}$.

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.

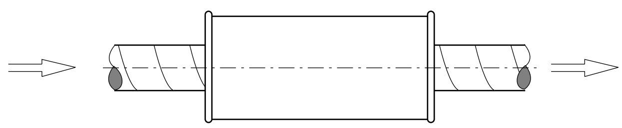
Low air speeds also cut operating costs.

- 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 an other of the possible alternatives.

SLCBU 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.
- **SLCBU 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.

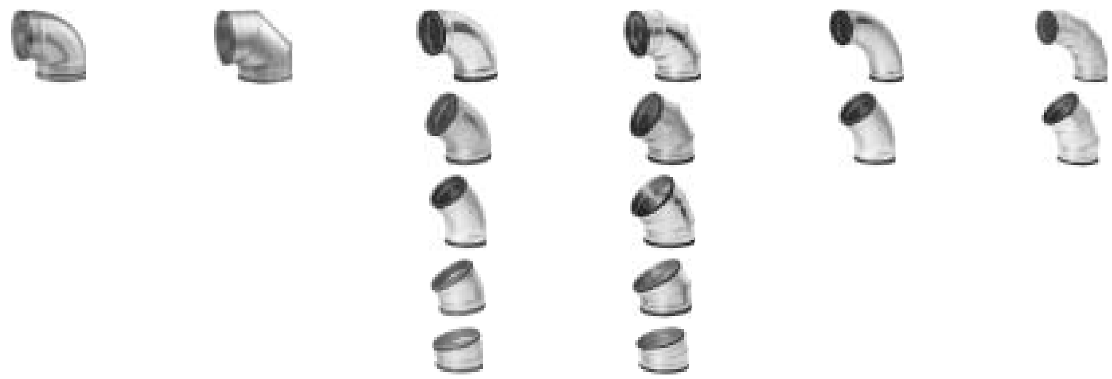
Safe

Content – Safe

Bends

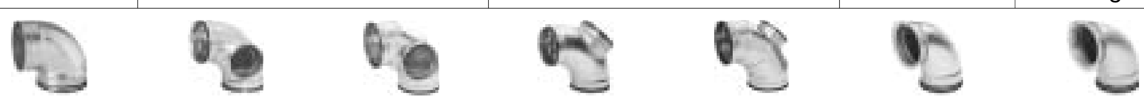
Overview bends – ordinary

	Short radius $r_m \approx 0{,}6 \bullet d_1$		Normal radius $r_m \approx 1 \bullet d_1$		Long radius $r_m \approx 1{,}5 \bullet d_1$	
$Ød_1$	Pressed and seam welded	Segmented and lockseamed	Pressed and seam welded	Segmented and lockseamed	Pressed and seam welded	Segmented and lockseamed
63						
80						
100	BKU 90°					
125			BU 90° BU 60° BU 45° BU 30° BU 15°			
160					BSU 90° BSU 45°	
200						
250						
315		BKFU 90°				
400						
500				BFU 90° BFU 60° BFU 45° BFU 30° BFU 15°		BSFU 90° BSFU 45°
630						
800						
1000						
1250						



Overview bends – others

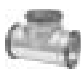
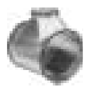
	Short radius $r_m \approx 0{,}6 \bullet d_1$	Normal radius $r_m \approx 1 \bullet d_1$					
$Ød_1$	Pressed and seam welded	Pressed and seam welded	Segmented and lock-seamed	Pressed and seam welded	Segmenterad and lock-seamed	Pressed and seam welded	Pressed and seam welded
63							
80							
100	BKMU 90°					BU GJUT	
125							BSIU GJUT
160		BKCU 90°		BBKCU 90°			
200							
250							
315							
400			BFKCU 90°		BFBKCU 90°		
	Female end	Clearing stud at side		Clearing stud at back		Female end and nail flange	Air valve socket and nail flange



T-pieces and saddle

Overview T-pieces – ordinary

<table>
<tr><th></th><th>Short installation length</th><th colspan="2">Normal installation length</th></tr>
<tr><th>Ød$_1$</th><th>Pressed and seam welded</th><th>Pressed and seam welded</th><th>Segmented and lockseamed</th></tr>
<tr><td>63</td><td></td><td rowspan="11">TCPU</td><td rowspan="13">TCU
TU</td></tr>
<tr><td>80</td><td></td></tr>
<tr><td>100</td><td rowspan="3">TCPU KORT</td></tr>
<tr><td>125</td></tr>
<tr><td>160</td></tr>
<tr><td>200</td><td></td></tr>
<tr><td>250</td><td></td></tr>
<tr><td>315</td><td></td></tr>
<tr><td>400</td><td></td></tr>
<tr><td>500</td><td></td></tr>
<tr><td>630</td><td></td></tr>
<tr><td>800</td><td></td><td></td></tr>
<tr><td>1000</td><td></td><td></td></tr>
<tr><td>1250</td><td></td><td></td></tr>
</table>

Overview saddle and T-pieces

<table>
<tr><th colspan="2">Normal installation length</th></tr>
<tr><th>Pressed and seam welded</th><th>Segmented and lockseamed</th></tr>
<tr><td rowspan="11">PSU</td><td rowspan="14">TSTCU
TSTU</td></tr>
<tr></tr><tr></tr><tr></tr><tr></tr><tr></tr><tr></tr><tr></tr><tr></tr><tr></tr><tr></tr>
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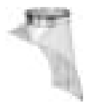
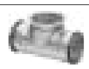
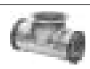
</table>

Overview T-pieces – others

<table>
<tr><th></th><th>Short installation length</th><th colspan="2">Normal installation length</th></tr>
<tr><th>Ød$_1$</th><th>Pressed and seam welded</th><th>Pressed and seam welded</th><th>Pressed and seam welded</th></tr>
<tr><td>63</td><td></td><td></td><td></td></tr>
<tr><td>80</td><td rowspan="4">TCPU GIPS</td><td rowspan="4">TCPU GJUT</td><td></td></tr>
<tr><td>100</td><td rowspan="3">TCSIU GJUT</td></tr>
<tr><td>125</td></tr>
<tr><td>160</td></tr>
<tr><td>200</td><td></td><td></td><td></td></tr>
<tr><td>250</td><td></td><td></td><td></td></tr>
<tr><td>315</td><td></td><td></td><td></td></tr>
<tr><td>400</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Female end</td><td>Female end and nail flange</td><td>Air valve socket and nail flange</td></tr>
</table>

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

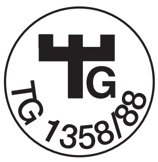
- Quick assembly.
- Factory fitted seal with no loose fittings.
- Can be twisted and adjusted with tightness unaffected.
- Installation without sealant or solvents.
- Can be used in all climates.
- Seal moulding remains tight from 5 000 Pa negative pressure to 3 000 Pa positive pressure.
  Duct resistance to collapse differs from these pressures, and is noted on page 43.
- Type approved to sealing class D.

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

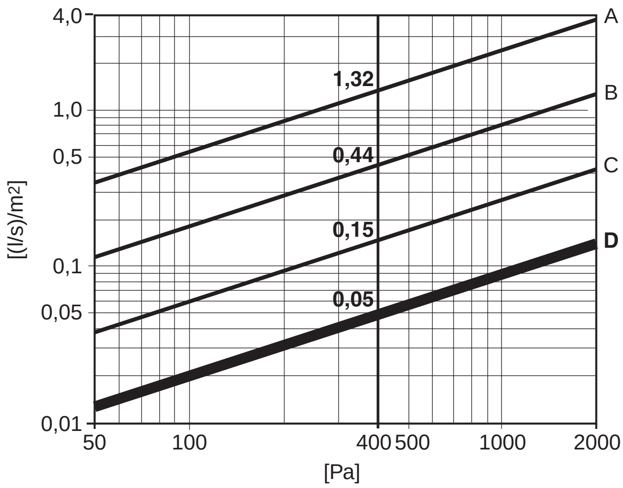
Each individual product is marked with a special label or stamped in the metal.



Tightness

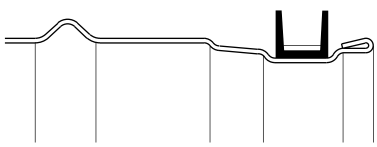
A duct system will never be “completely tight”. The system will normally have some leaks at joints between ducts and fittings. The leakage will also increase as the pressure difference between the in- and outside of the duct sides increases.

The leakage factor in (l/s)/m^2 is always specified in relation to the pressure difference in Pa. (The unit (l/s)/m^2 denotes the leakage flow in l/s in or out of the system in relation to its duct area in m^2.) 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

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.

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.

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

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.

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.

Fittings

Products under the Safe insert and fittings with Safe seals under the Silencer, 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.

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

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

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 dimentions. For further informations see page 11.

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

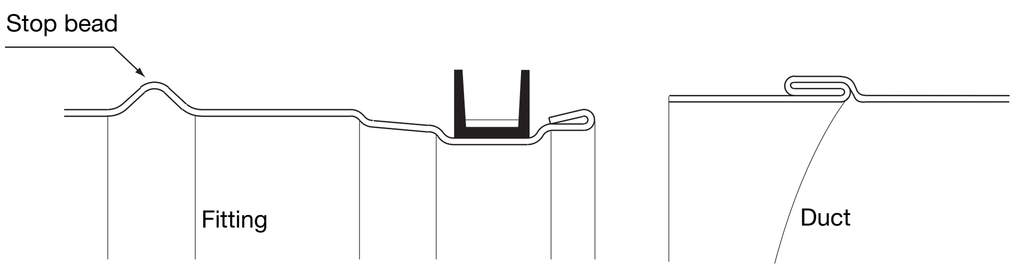
As special for installations which demand high temperature tolerance and somewhat higher oil resistance, Safe fittings can be supplied with a special silicone rubber moulding. This moulding is recognized by its blue colour.
Temperature tolerance:

-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.



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

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 useable in certain cases
1	Badly affected	Unsuitable
–	No information	

		EPDM	Silicone
A			
Acetaldehyde		4	4
Acetic acid	dilute 30%	4	3
	crystalline acetic acid	4	3
Acetic anhydride		3	2
Acetone		4	3
Acetylene		3	3
Aluminium salts (non-oxidizing)		4	4
Alun		4	4
Ammonia, liquid		4	1
Ammonia gas, cold		4	4
Ammonia gas, hot 65 °C		3	3
Ammonium hydroxide, dil. ammonia		3	3
Ammonium salts (non-oxidising)		4	3
Amyl acetate		4	1
Aniline		3	–
Aniline dyes		4	–
Animal fats		2	3
Arsenic acid		4	4
Asphalt		1	1
B			
Barium salts (non-oxidizing)		4	4
Beer		4	4
Benzene, bensol		1	1
Black liquor		1	–
Black water, waste water		4	3
Bleaching liquor, see Potassium hypochlorite			
Borax		4	3
Boric acid		4	4
Bromide, liquid		–	1
Bromic acid		4	1
Butane		1	4
Butanol, butyl alcohol		4	3
Butter oils		1	1
Butyl acetate		4	1
C			
Caustic soda, sodium hydroxide		4	2
Calcium salts (non-oxidizing)		4	3
Cellosolve, ethylene glycol		3	–
Cellosolve acetate		3	–
Chlorine gas	dry	2	–
	damp	2	–
Chlorine solutions	0,1 g/l free chlorine	4	–
	0,1-1 g/l free chlorine	4	–
	1-10 g/l free chlorine	3	–
	over 10 g/l free chlorine	2	–
Chlorine sulphonate acid		1	1
Chromic acid		2	2
CFC (e.g. Freon)		11	11
		12	31
		13	4–
		21	1–
		22	41
		31	4–
		32	4–
	112		1–
	113		11
	114		41
	115	4	–
Copper salts (non-oxidizing)			44
Citric acid		4	4
D			
Detergent		4	4
Diesel oil		1	2
Dilutin (White spirit)		1	1
Developing solutions		3	–
E			
Ethanol, ethyl alcohol		4	4
”Ether”, diethyl ether, ethyl ether		2	–
Ethyl acetate		3	2
Ethylene glycol		4	3

		EPDM	Silicone
Ethylene chloride		**1**	**–**
Ethyl glycol, cellosolve		3	–
Ethyl chloride		4	1
Ethane, ethylene		1	–
F			
Fluoric silicate		4	2
Formic acid		4	2
Formaldehyde, formalin		4	–
Freon, see CFC			
Furan, furfuran		2	–
Furfural		3	–
G			
Glucose		4	4
Glycerine, glycerol		4	4
Green liquor, white liquor		4	3
H			
Heating oil		1	2
Hydraulic oil, mineral oil based		1	3
Hydraulic oil, phosphate ester based		4	4
Hydrogen		4	4
Hydrogen peroxide 3%		4	4
	30% 20 °C	4	4
	90% 20 °C	2	4
Hydrochloric acid	dilute	4	1
	conc 37% room temp	4	1
	conc 37% 70 °C	2	1
Hydrogen sulphide	dry, room temp	4	4
	damp, room temp	4	2
	damp, hot	3	1
Hydrofluosilicic acid		4	1
Hydrofluoric acid 50%		4	1
Hydrofluoric acid, conc.		4	1
I			
Iodine		–	–
Iron salts (non-oxidizing)		4	3
L			
Lactic acid		4	4
Lead salts (non-oxidizing)		4	2
Linseed oil		3	4
Liquid manure		4	3
LPG (Propane/butane)		1	1
M			
Magnesium salts (non-oxidizing)		4	4
Manganese salts (non-oxidizing)		4	4
Mercury		4	4
Mercury salts (non-oxidizing)		4	4
Methanol, methyl alcohol, wood alcohol		4	4
Methylene chloride		1	1
Methyl chloride		2	1
Methyl ethyl ketone MEK		4	–
Methyl isobutyl ketone		3	2
Methyl isopropyl ketone		3	2
Milk		4	4
N			
Natural gas		1	4
Nickel salts (non-oxidizing)		4	4
Nitrobenzene, Nitrobenzol		2	1
Nitric acid	20% room temp.	4	–
	20% 50 °C	3	1
	40% 50 °C	3	1
	50% 50 °C	2	1
	60% room temp.	2	1
	70% room temp.	1	1
	red fuming	1	1
Nitrogen		4	4
Nitrous gases		2	2
O			
Olive oil		3	3
Oleic acid		4	–

		EPDM	Silicone
Oxalic acid		**4**	**3**
Ozone		4	4
Oxygen		4	4
P			
Palmitinic acid		3	–
Paraffin (kerosine)		1	1
Perchlorethylene		1	3
Perchloric acid		3	1
Petrol (gasoline), 65 octane		1	1
Petrol (gasoline), 100 octane		1	1
Petroleum ether		1	1
Petroleum oils	high aromatic content	1	1
	low aromatic content	1	3
Phenol		3	2
Phosphoric acid 45%		4	1
Phosphoric acid 85%		4	1
Plating solutions without chromium		4	3
Potassium hypochlorite,			
	pH 7 below 10 g/l	4	1
	over 10 g/l	3	1
Potassium hydroxide, potash		4	3
Potassium salts (non-oxidizing)		4	3
Propane, LPG		1	1
Propanol, Propyl alcohol		4	4
R			
Radioactive radiation		3	2
Rape seed oil (canola oil)		4	4
Rosin oil		1	1
S			
Salicylic acid		4	4
Sodium salts (non-oxidizing)		4	4
Sodium hydroxide, sodium hydrate		4	2
Sodium hypochlorite max 10 g/l free Cl		4	–
	over 10 g/l free Cl	3	–
Sugar solutions		4	4
Styrene		1	1
Sulphur, melted		4	4
Sulphur dioxide, dry gas		4	3
Sulphur chloride		1	–
Sulphuric acid	60% room temp.	4	1
	60% 50 °C	4	1
	60-75% 50 °C	3	1
	75-80% 50 °C	2	1
	85-96% 50 °C	1	1
	fuming, Oleum	1	1
Sulphurous acid		4	1
Sulphur trioxide, dry gas		3	2
T			
Tar		1	2
Tannic acid		4	1
Terpentine, terpenes		1	1
Toluene, toluol		1	1
Trichloretane, “thinner”		1	2
Transformer oil	mineral oil based	1	3
	chlorated hydrocarbon	1	1
V			
Vegetable oils		4	4
W			
Water	fresh	4	4
	distilled	4	4
	salt	4	4
	fresh & dist. 100 °C	4	2
White spirit (Dilutin)		1	1
Wine		4	4
X			
Xylene, xylol		1	1
Z			
Zinc salts (non-oxidizing)		4	4

Circular duct

SR

Description

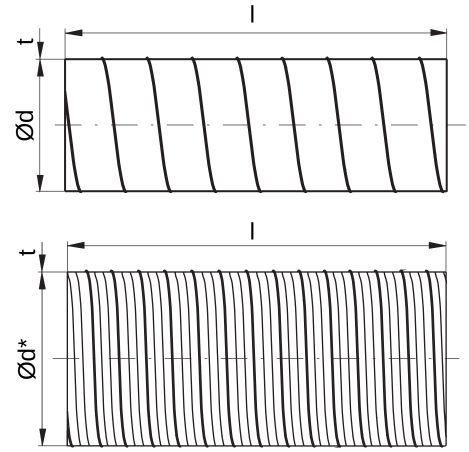
Circular duct.

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

Ordering example

	SR	200	3000
Product	SR		
Dimension Ød		200	
Lenght l			3000

Dimensions



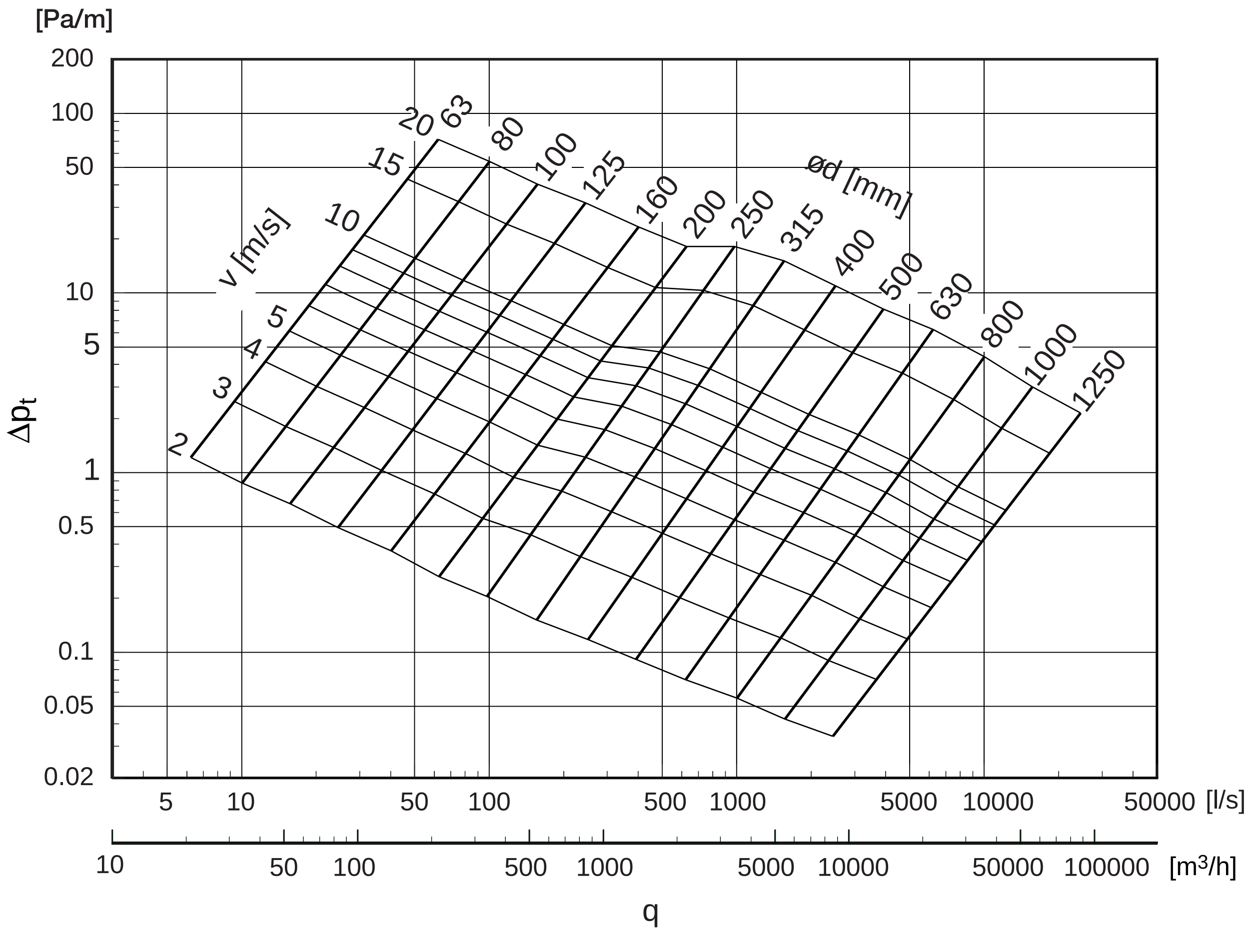
Ød std nom	O πd m	A $\pi d^2/4$ m^2	t std mm	l std mm	m_l std kg/m
63	0,198	0,003	0,5	3000	0,89
80	0,251	0,005	0,5	3000	1,01
100	0,314	0,008	0,45	3000	1,14
112	0,352	0,010	0,5	3000	1,42
125	0,393	0,012	0,45	3000	1,41
140	0,440	0,015	0,5	3000	1,76
150	0,471	0,018	0,5	3000	1,89
160	0,503	0,020	0,5	3000	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	0,6	3000	4,28
300 *	0,942	0,071	0,6	3000	4,58
315 *	0,990	0,078	0,6	3000	4,81
355 *	1,115	0,099	0,6	3000	5,41
400 *	1,257	0,126	0,6	3000	6,56
450 *	1,414	0,159	0,7	3000	9,83
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	38,4
1500 *	4,712	1,767	1,25	2400	41,1
1600 *	5,027	2,011	1,25	2400	43,8

* With outturned stiffening corrugation

Circular duct

SR

Technical data



Circular duct SR

Technical data

Special versions

We can supply ducts with the following special designs:

- In intermediate dimensions, see page 13.
- 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.

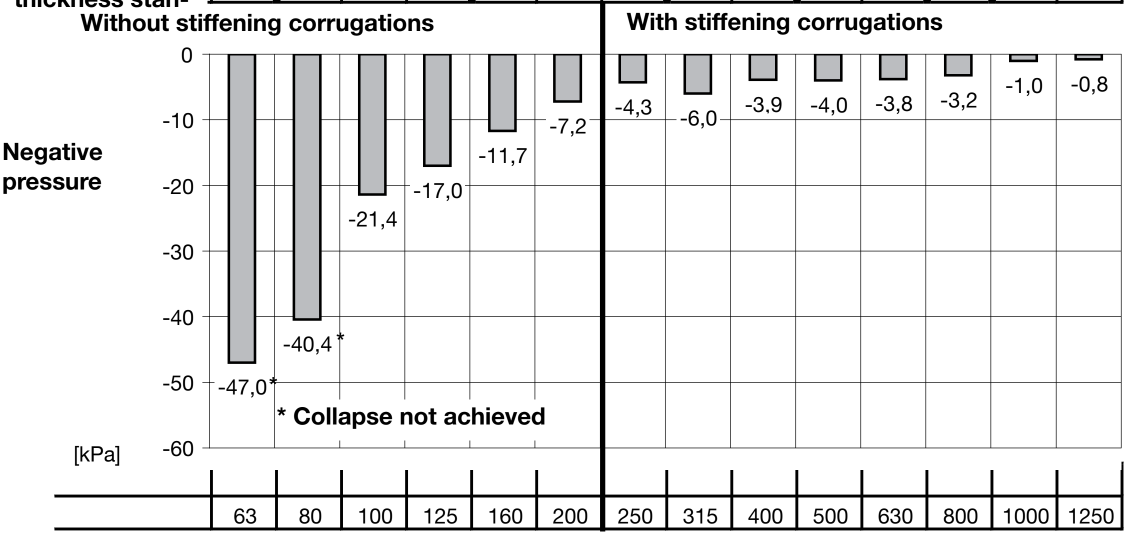
Negative pressure
In installations with high negative pressure, there is a risk that the ducts could collapse.

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 37.

Collapsing pressure for duct SR

Diameter Ø	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250
Sheet metal thickness stan-	0,5	0,45	0,45	0,45	0,5	0,5	0,5	0,6	0,6	0,7	0,7	0,8	0,9	0,9

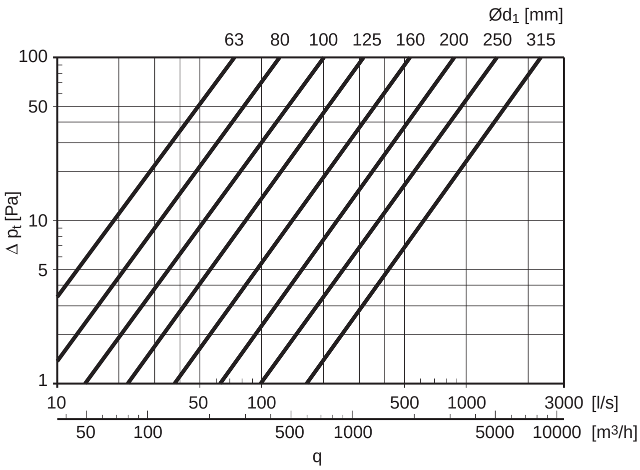


Bend

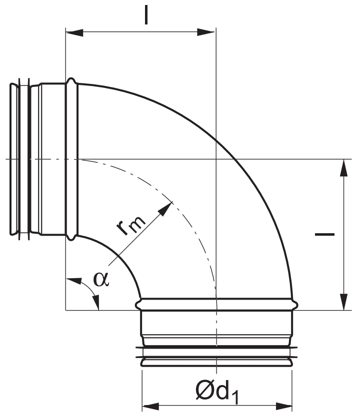
BU 90°

Description

Pressed and seam welded bend.



Dimensions



$r_m \approx 1 \cdot d_1$

Ød$_1$ 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	1,30
224	225	1,55
250	250	2,06
300	300	2,80
315	315	3,06

Ordering example

BU 100 90

Product — BU
Dimension Ød$_1$ — 100
Angle α — 90

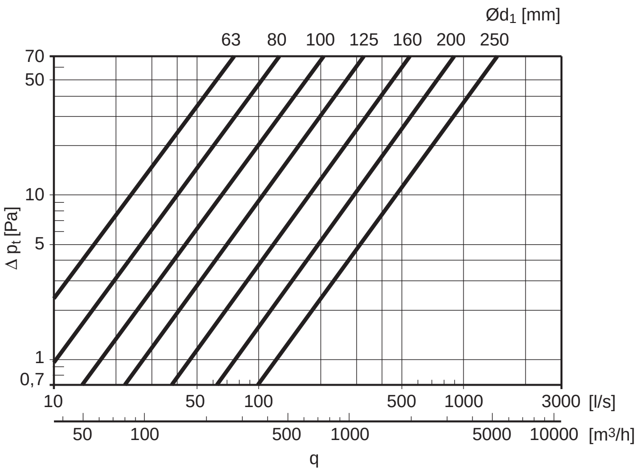
Lindab

Bend

BU 60°

Description

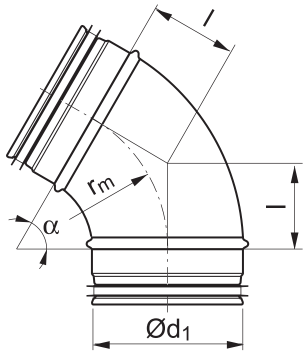
Pressed and seam welded bend.



Ordering example

	BU	125	60
Product	BU		
Dimension Ød1		125	
Angle α			60

Dimensions



$r_m \approx 1 \cdot d_1$

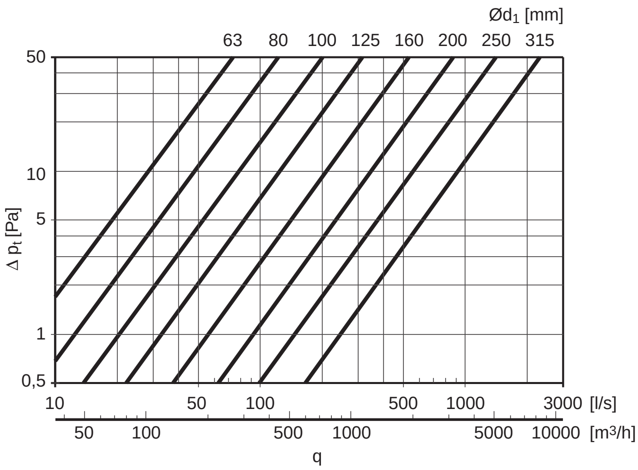
$Ød_1$ nom	l mm	m kg
63	64	0,30
80	58	0,32
100	58	0,33
112	69	0,37
125	72	0,33
140	78	0,51
150	87	0,50
160	92	0,56
180	104	0,79
200	115	0,95
224	130	1,10
250	144	1,30

Bend

BU 45°

Description

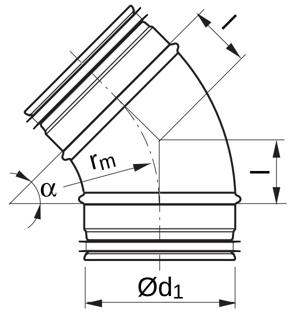
Pressed and seam welded bend.



Ordering example

	BU	125	45
Product	BU		
Dimension $Ød_1$		125	
Angle α			45

Dimensions



$r_m \approx 1 \cdot d_1$

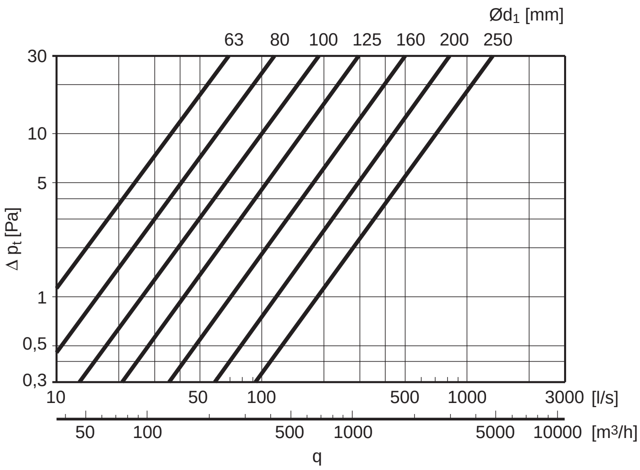
$Ød_1$ nom	l mm	m kg
63	46	0,16
80	41	0,17
100	41	0,21
112	81	0,24
125	52	0,29
140	56	0,43
150	62	0,42
160	66	0,48
180	76	0,65
200	83	0,80
224	93	0,95
250	103	1,22
315	130	1,90

Bend

BU 30°

Description

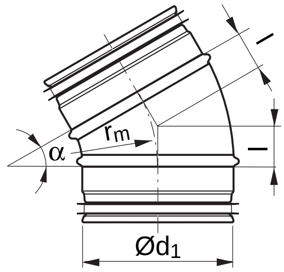
Pressed and seam welded bend.



Ordering example

	BU	125	30
Product	BU		
Dimension $Ød_1$		125	
Angle α			30

Dimensions



$r_m \approx 1 \cdot d_1$

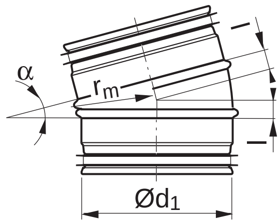
$Ød_1$ nom	l mm	m kg
63	29	0,13
80	27	0,15
100	27	0,18
112	30	0,21
125	33	0,20
140	36	0,36
150	40	0,35
160	43	0,32
180	48	0,51
200	54	0,62
224	60	0,83
250	67	1,05

Bend

BU 15°

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

Dimensions



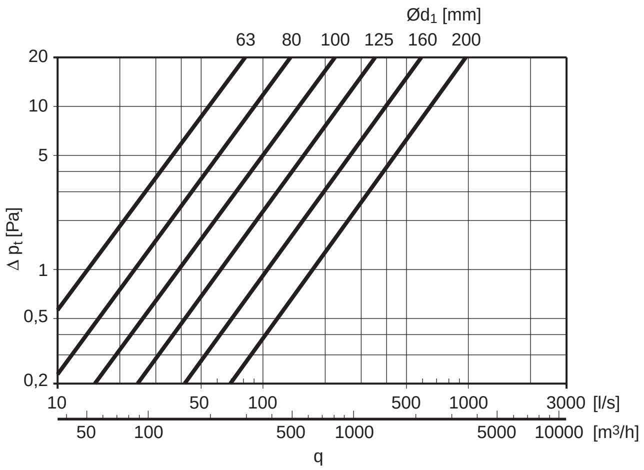
$r_m \approx 1 \cdot d_1$

$Ød_1$ 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

Description

Pressed and seam welded bend.



Ordering example

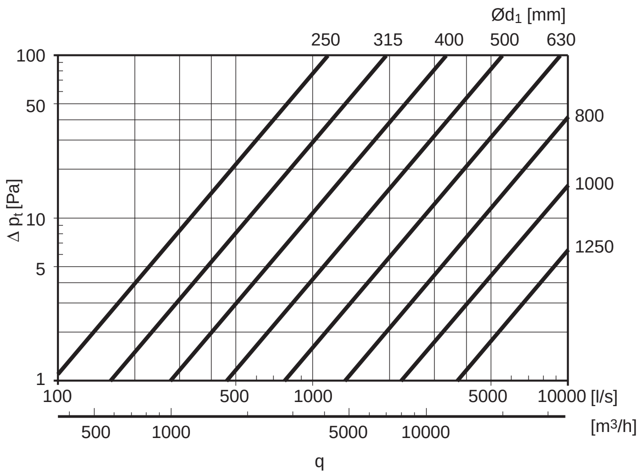
	BU	125	15
Product	BU		
Dimension $Ød_1$		125	
Angle α			15

Bend – lockseamed

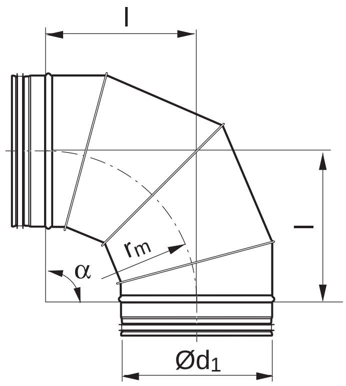
BFU 90°

Description

Segmented and lockseamed bend.



Dimensions



$r_m \approx 1 \cdot d_1$

$Ød_1$ nom	l mm	m kg
250	250	2,20
280	280	2,50
300	300	2,70
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

BFU 315 90

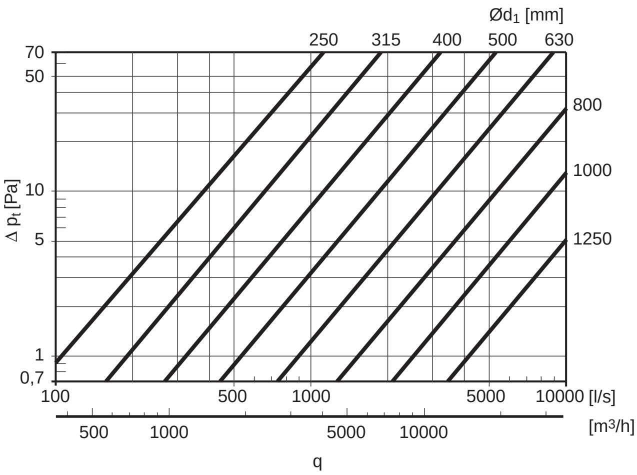
Product — BFU
Dimension $Ød_1$ — 315
Angle α — 90

Bend – lockseamed

BFU 60°

Description

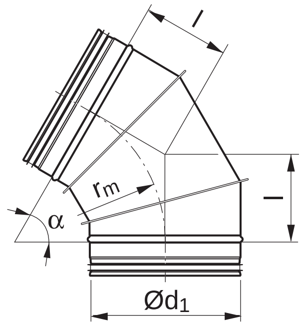
Segmented and lockseamed bend.



Ordering example

	BFU	315	60
Product	BFU		
Dimension $Ød_1$		315	
Angle α			60

Dimensions



$r_m \approx 1 \cdot d_1$

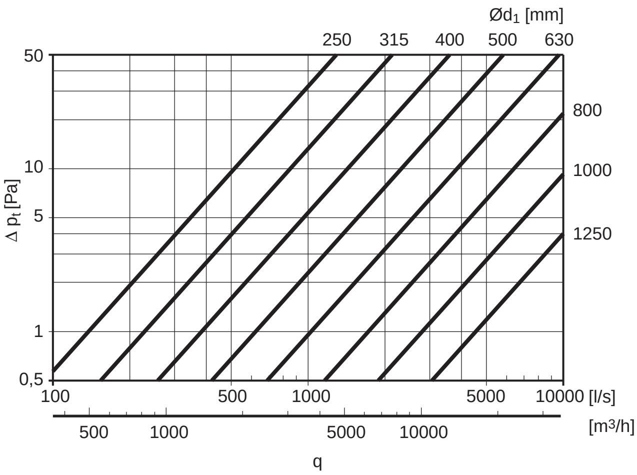
$Ød_1$ nom	l mm	m kg
250	144	1,48
280	162	1,80
300	173	2,00
315	182	2,20
355	205	2,80
400	231	3,47
450	260	4,70
500	289	6,00
560	323	7,40
600	346	8,60
630	364	9,20
710	410	11,3
800	462	14,8
900	520	19,3
1000	577	24,2
1120	647	30,1
1250	722	36,6

Bend – lockseamed

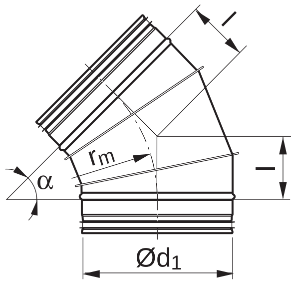
BFU 45°

Description

Segmented and lockseamed bend.



Dimensions



$r_m = 1 \cdot d_1$

$Ød_1$ 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

BFU 250 45

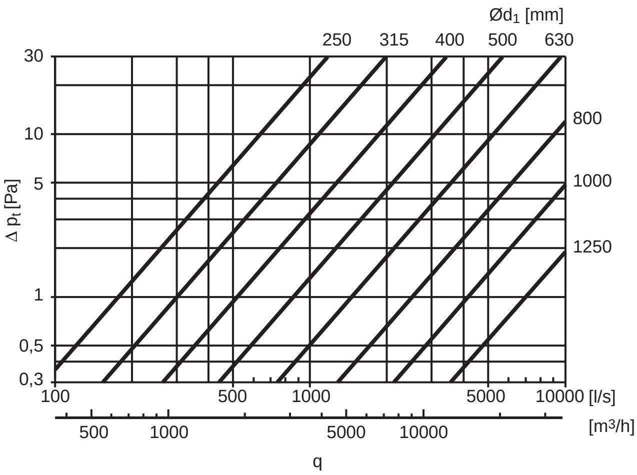
Product — BFU
Dimension $Ød_1$ — 250
Angle α — 45

Bend – lockseamed

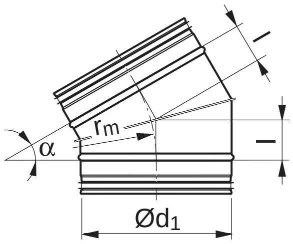
BFU 30°

Description

Segmented and lockseamed bend.



Dimensions



$r_m = 1 \cdot d_1$

$Ød_1$ nom	l mm	m 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

BFU 315 30

Product — BFU
Dimension $Ød_1$ — 315
Angle α — 30

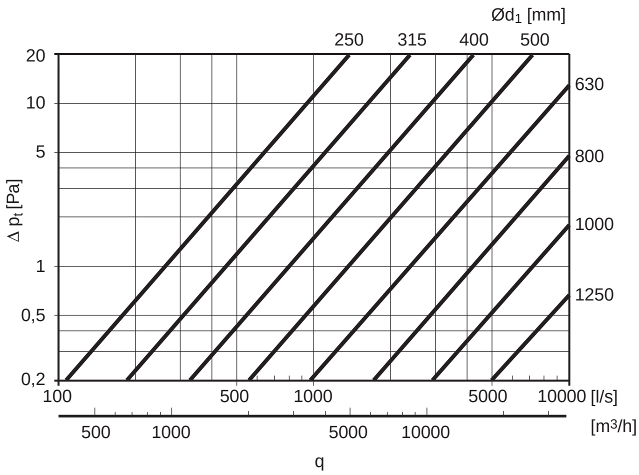
Lindab

Bend – lockseamed

BFU 15°

Description

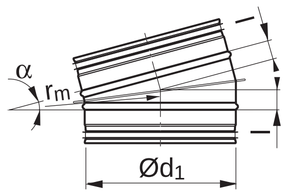
Segmented and lockseamed bend.



Ordering example

	BFU	400	15
Product	BFU		
Dimension $Ød_1$		400	
Angle α			15

Dimensions



$r_m = 1 \cdot d_1$

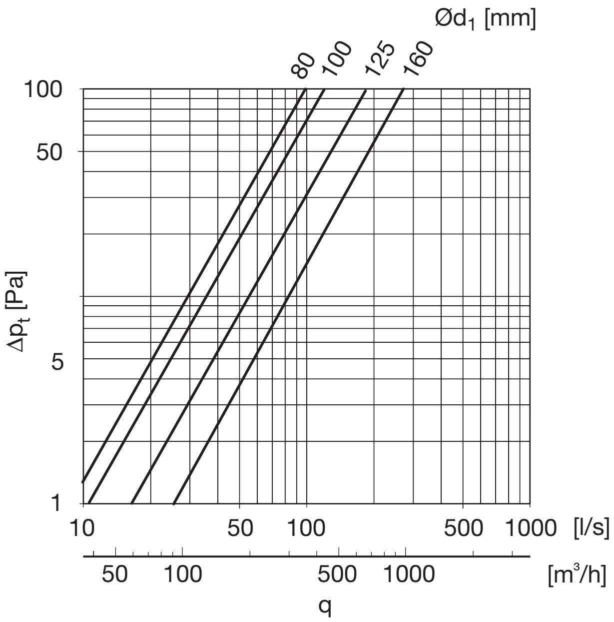
$Ød_1$ nom	l mm	m kg
250	33	0,65
280	37	0,77
300	39	0,85
315	41	0,91
355	47	1,41
400	53	1,70
450	59	2,20
500	66	2,65
560	74	3,30
600	79	3,70
630	83	4,00
710	93	5,80
800	105	7,00
900	118	8,50
1000	132	10,4
1120	147	12,5
1250	165	14,5

Bend – short

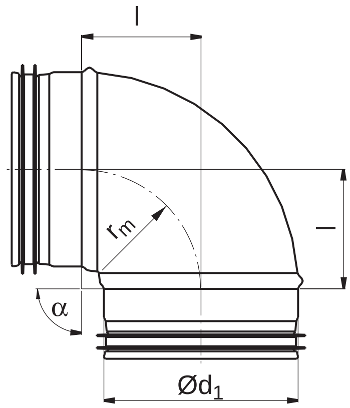
BKU90

Description

Pressed and seam welded bend with short installation length.



Dimensions



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

$Ød_1$ nom	l mm	m kg
80	80	0,14
100	62	0,22
125	79	0,31
160 *	94	0,64

* With a seam in the middle

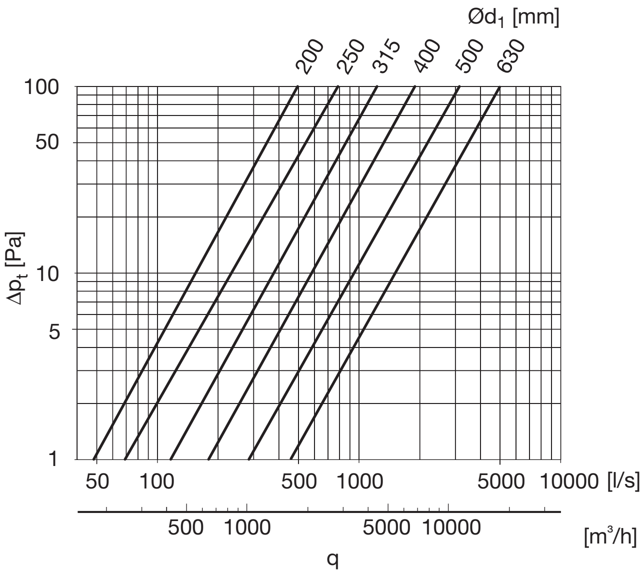
Ordering example

	BKU	100	90
Product	BKU		
Dimension $Ød_1$		100	
Angle α			90

Bend – short, lockseamed BKFU 90°

Description

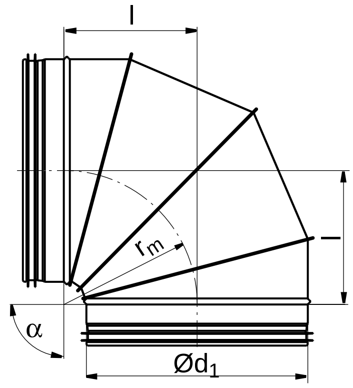
Segmented and lockseamed bend with short installation length.



Ordering example

	BKFU	250	90
Product	BKFU		
Dimension Ød1		250	
Angle α			90

Dimensions



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

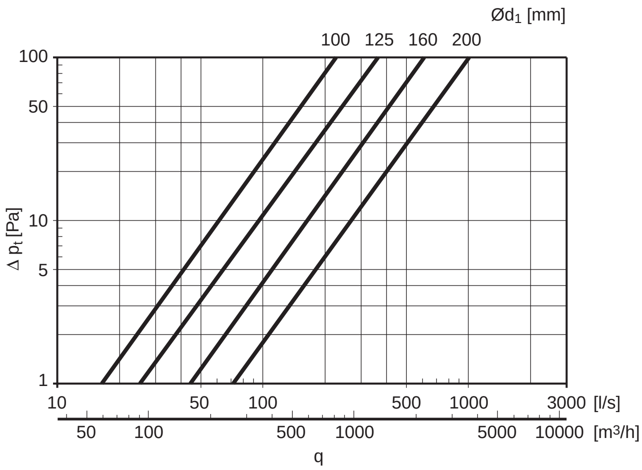
$Ød_1$ nom	l mm	m kg
200	158	1,18
250	180	1,64
315	220	2,49
400	255	3,61
500	315	6,30
630	397	9,45

Bend – long

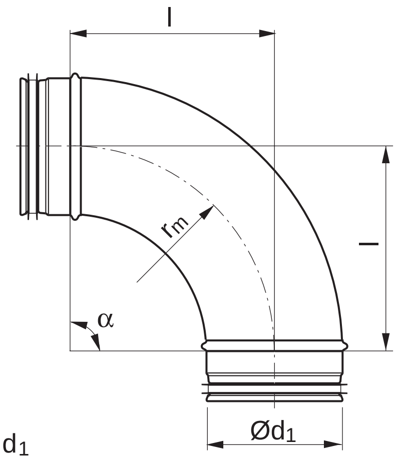
BSU 90°

Description

Pressed and seam welded bend.



Dimensions



$r_m \approx 1,5 \cdot d_1$

$Ød_1$ nom	l mm	m 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

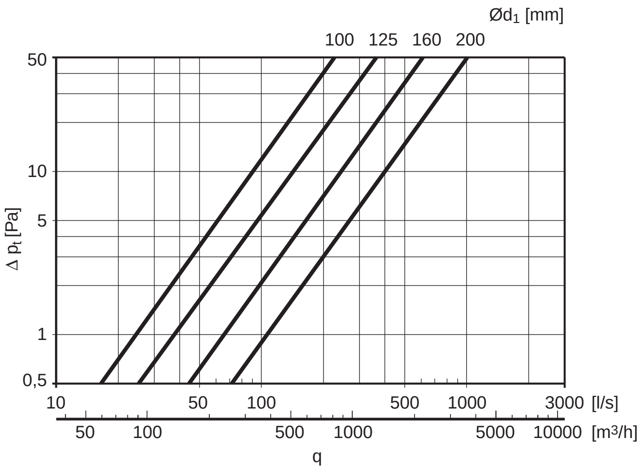
	BSU	250	90
Product	BSU		
Dimension $Ød_1$		250	
Angle α			90

Bend – long

BSU 45°

Description

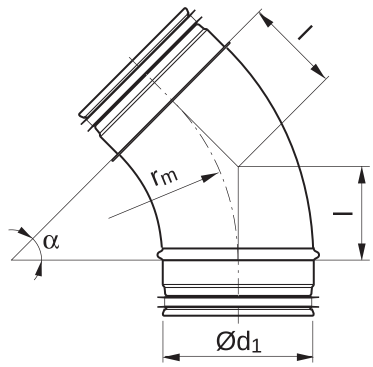
Pressed and seam welded bend.



Ordering example

	BSU	125	45
Product	BSU		
Dimension Ød1		125	
Angle α			45

Dimensions



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

Ød_1 nom	l mm	m 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

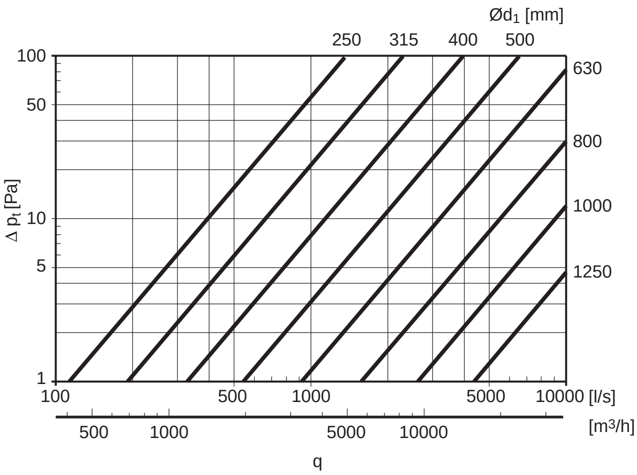
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Bend – long, lockseamed BSFU 90°

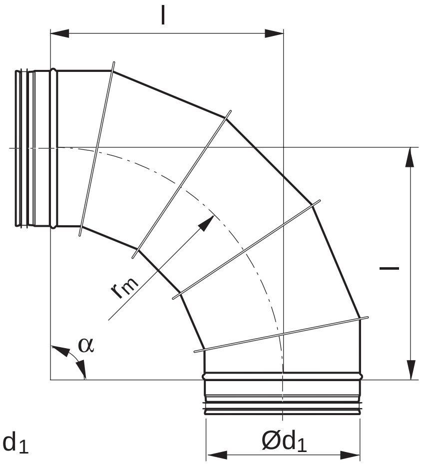
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Description

Segmented and lockseamed bend.



Dimensions



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

$Ød_1$ nom	l mm	m 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

BSFU 315 90

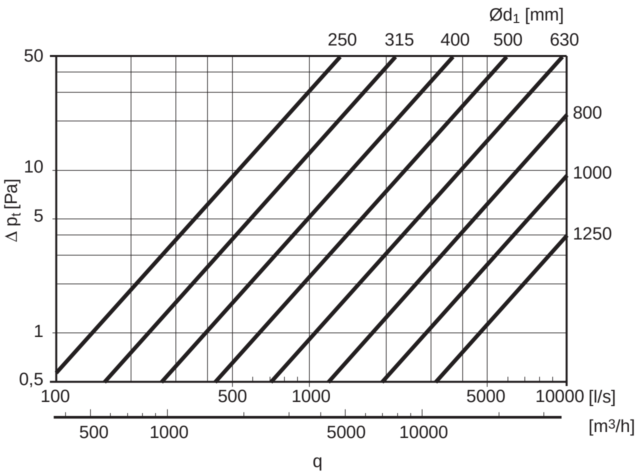
- Product: BSFU
- Dimension $Ød_1$: 315
- Angle α: 90

We reserve the right to make changes without prior notice

Bend – long, lockseamed BSFU 45°

Description

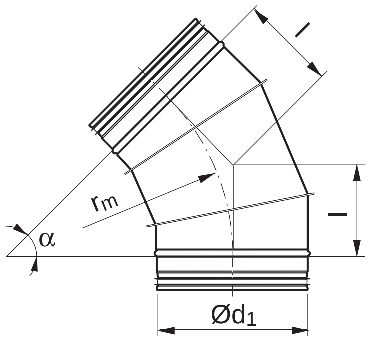
Segmented and lockseamed bend.



Ordering example

	BSFU	315	45
Product	BSFU		
Dimension $Ød_1$		315	
Angle α			45

Dimensions



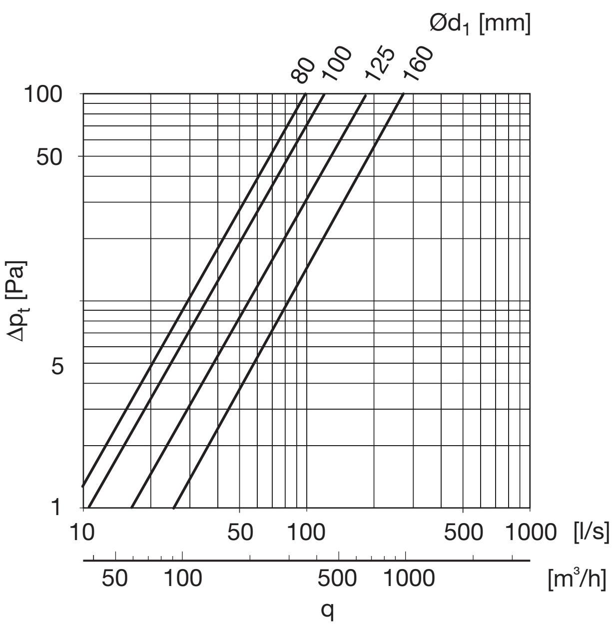
$r_m = 1{,}5 \cdot d_1$

$Ød_1$ nom	l mm	m 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

Bend – Casting-in programme BKMU 90°

Description

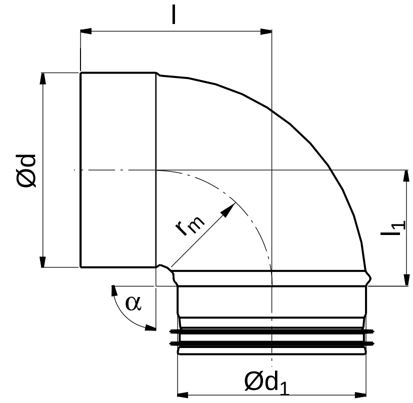
Pressed and seam welded bend with short installation length and female end.



Ordering example

	BKMU	100	90
Product	BKMU		
Dimension $Ød_1$		100	
Angle α			90

Dimensions



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

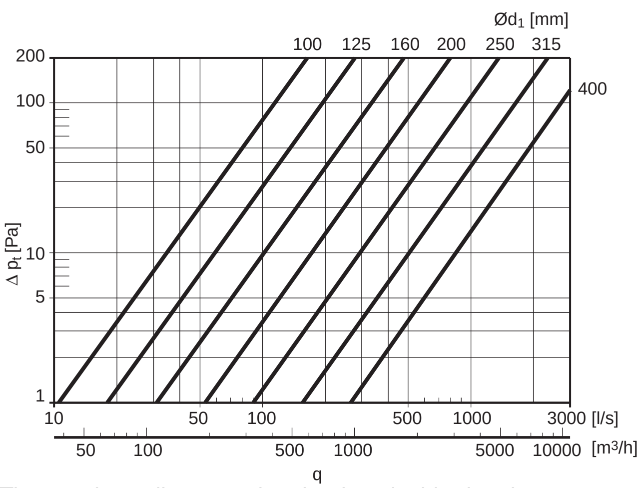
$Ød_1$ nom	$Ød$ nom	l mm	l_1 mm	m kg
80	80	123	80	0,13
100	100	105	62	0,21
125	125	120	79	0,31
160 *	160	136	94	0,63

* With a seam in the middle

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.

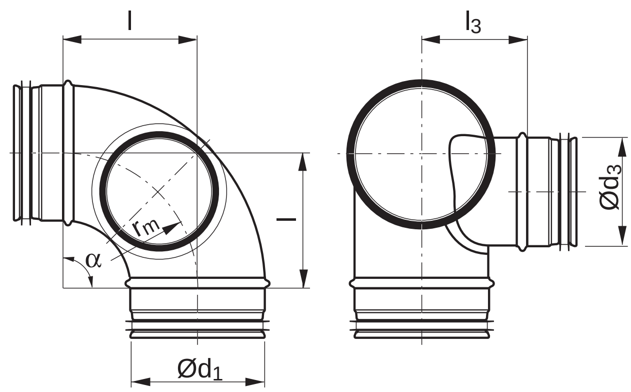


The graph applies to a cleaning bend with cleaning cap. Pressure drop is independent of take-off dimension ($Ød_3 \leq Ød_1$).

Ordering example

	BKCU	200	160
Product	BKCU		
Dimension $Ød_1$		200	
Dimension $Ød_3$			160

Dimensions

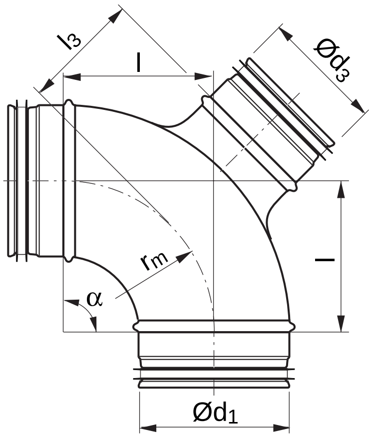


$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m kg
100	100	100	75	0,41
112	100	120	85	0,50
125	100	125	90	0,59
125	125	125	90	0,66
140	125	135	100	0,75
150	125	150	105	0,78
160	125	160	110	0,97
160	160	160	110	0,97
180	160	180	120	1,18
200	160	200	130	1,40
200	200	200	130	1,44
224	200	225	140	1,78
250	200	250	155	2,19
250	250	250	150	2,28
300	250	300	175	2,95
315	250	315	180	3,30
315	315	315	180	3,30
355 *	315	350	200	5,50
400 *	315	400	220	7,53
400 *	400	400	220	7,25

* Segmented and lockseamed. Designated BFKCU 90°

Cleaning bends BBKCU90°, BFBKCU90°

Dimensions



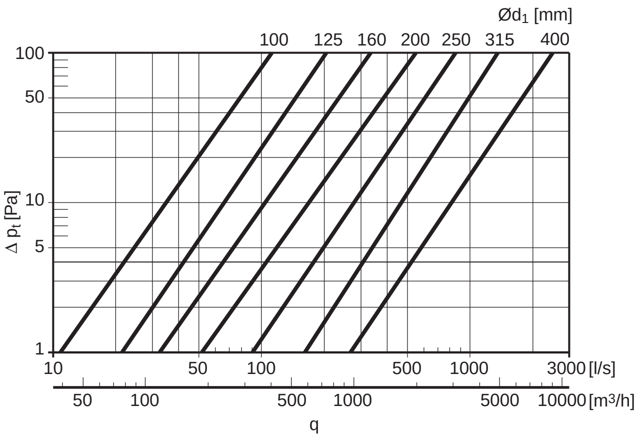
$r_m \approx 1 \cdot d_1$

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 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	1,40
200	200	200	125	1,45
224	200	225	128	1,90
250	200	250	150	2,30
250	250	250	150	2,40
300	250	300	148	3,10
315	250	315	183	3,45
315	315	315	183	3,45
355 *	315	350	180	5,60
400 *	315	400	225	7,30
400 *	400	400	225	7,00

* Segmented and lockseamed. Designated BFBKCU 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 graph applies to a cleaning bend with cleaning cap EPFH and with the same dimension of take-off and main duct ($Ød_3$=$Ød_1$).

The pressure drop is about 30% lower for cleaning cap KCU and $Ød_3$=$Ød_1$.

The pressure drop is about 30% lower for cleaning cap EPFH and one step smaller take-off dimension ($Ød_3 < Ød_1$).

The pressure drop is about 50% lower for cleaning cap KCU and one step smaller take-off dimension ($Ød_3 < Ød_1$).

Ordering example

BBKCU 200 160

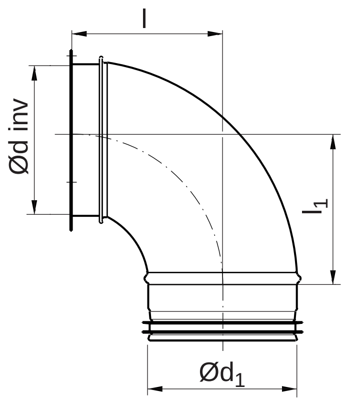
Product — BBKCU
Dimension $Ød_1$ — 200
Dimension $Ød_3$ — 160

Bend – Casting-in programme BU

Description

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

Dimensions



$Ød_1$ nom	Ød nom	l mm	l_1 mm	m kg
80	80	80	90	0,24
100	100	100	100	0,32
125	125	125	120	0,42
160	160	160	150	0,57

Ordering example

BU 100 90 GJUT

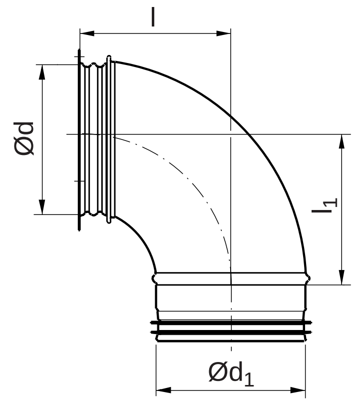
- Product – BU
- Dimension $Ød_1$ – 100
- Angle α – 90
- Specification – GJUT

Bend – Casting-in programme BSIU

Description

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

Dimensions



$Ød_1$ nom	Ød nom	l mm	l_1 mm	m kg
100	92	92	100	0,30
125	117	122	125	0,41
160	152	157	160	0,51

Ordering example

BSIU 100 90 GJUT

Product — BSIU
Dimension $Ød_1$ — 100
Angle α — 90
Specification — GJUT

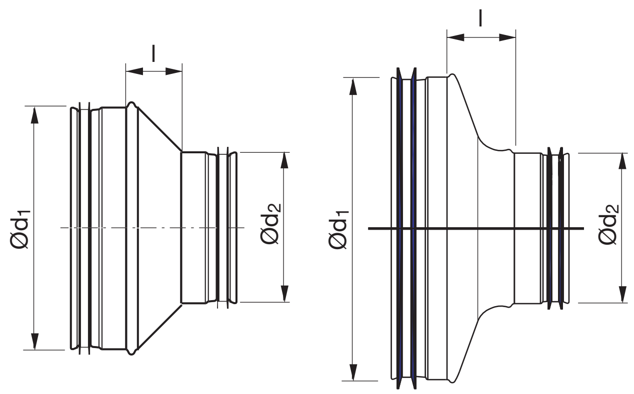
Reducer RCU

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 67.

Dimensions



Ordering example

	RCU	315	250
Product	RCU		
Dimension $Ød_1$		315	
Dimension $Ød_2$			250

Dimensions

$Ød_1$ nom	$Ød_2$ nom	l mm	m kg
80	63	18	0,12
100	63	27	0,16
100 *	80	26	0,18
125 *	80	38	0,16
125 *	100	27	0,21
150	100	36	0,17
150 *	125	31	0,15
160	80	52	0,30
160 *	100	46	0,17
160 *	125	35	0,22
160	150	20	0,25
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	23	0,34
224	150	48	0,53
224	160	44	0,53
224	180	32	0,47
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	0,73
300	250	34	0,71
315	160	91	0,86
315	200	74	0,83
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

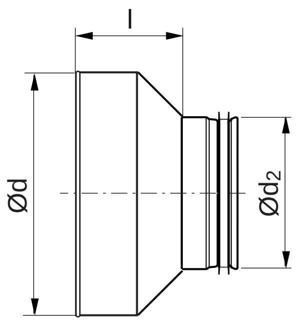
RCFU

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 67.

Dimensions



Ordering example

	RCFU	315	250
Product	RCFU		
Dimension Ød		315	
Dimension $Ød_2$			250

Dimensions

Ød nom	$Ød_2$ nom	l mm	m kg
80	63	57	0,11
100	63	66	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	57	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

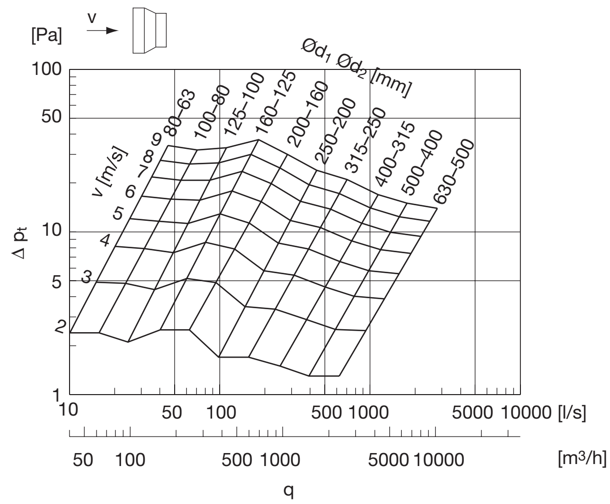
* With turned-over edge
** Hand made
1 With stream-lined transition

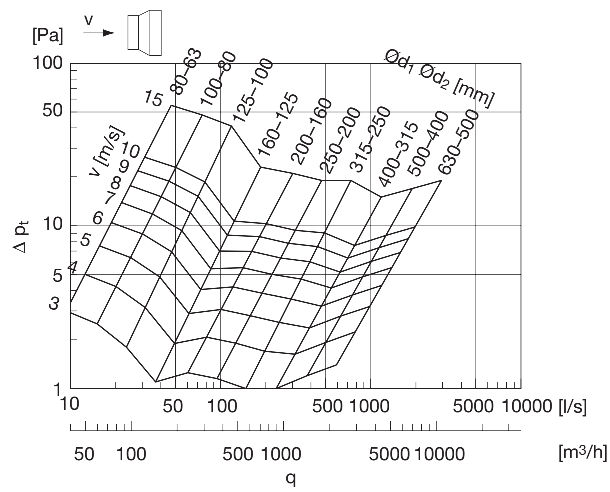
Reducers

RCU, RCFU

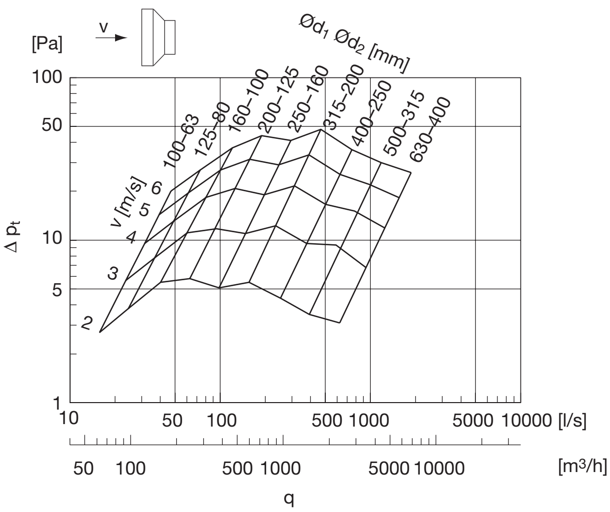
Technical data

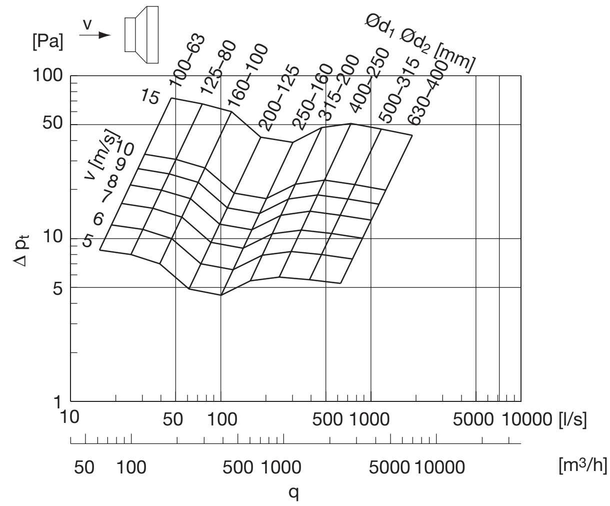
1 dimension step



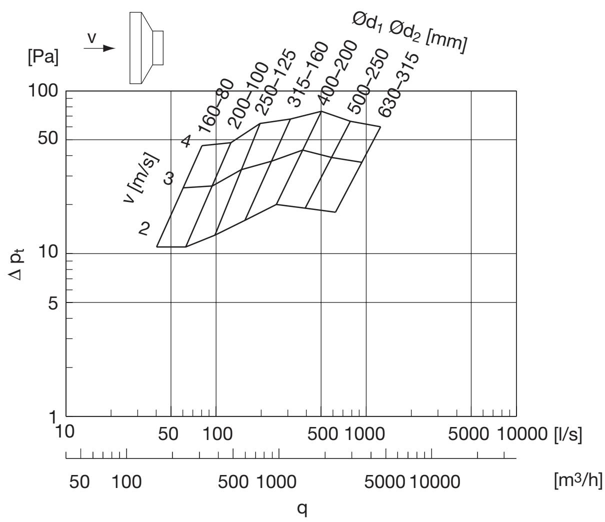


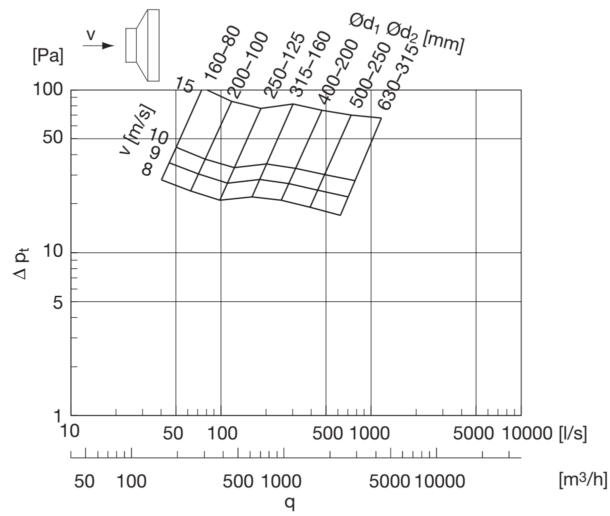
2 dimension steps





3 dimension steps





Reducer

RU

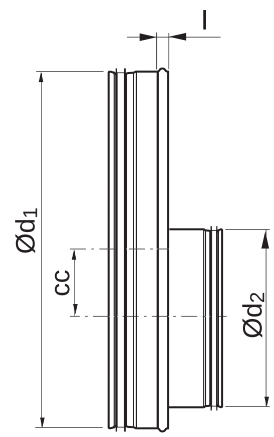
Description

Short, eccentric reducer to achieve extremely short installation length.

Ordering example

	RU	400	315
Product	RU		
Dimension $Ød_1$		400	
Dimension $Ød_2$			315

Dimensions



$Ød_1$ nom	$Ød_2$ nom	cc mm	l mm	m kg
400	200	75	12	1,42
400	224	63	12	1,48
400	250	50	12	1,54
400	280	35	12	1,53
400	300	25	12	1,52
400	315	18	12	1,51
400	355	10	12	1,13
450	250	75	4	1,76
450	280	60	4	1,75
450	300	50	4	1,74
450	315	43	4	1,73
450	355	23	4	1,64
450	400	15	4	1,31
500	250	100	12	1,98
500	280	85	12	1,97
500	300	75	12	1,96
500	315	68	12	1,95
500	355	48	12	1,87
500	400	25	12	1,92
500	450	15	12	1,46
560	315	98	4	2,29
560	355	78	4	2,21
560	400	55	4	2,26
560	450	30	4	1,80
560	500	20	4	1,70
600	315	118	4	2,63
600	355	98	4	2,54
600	400	75	4	2,60
600	450	50	4	2,14
600	500	25	4	2,56
600	560	10	4	1,87
630	315	133	4	2,85
630	355	113	4	2,77

Reducer

RU

$Ød_1$ nom	$Ød_2$ nom	cc mm	l mm	m kg
630	400	90	4	2,82
630	450	65	4	2,36
630	500	40	4	2,78
630	560	25	4	2,09
630	600	5	4	1,90
710	400	130	4	3,43
710	450	105	4	2,97
710	500	80	4	3,39
710	560	50	4	2,70
710	600	30	4	2,51
710	630	15	4	2,48
800	400	175	4	4,06
800	450	150	4	3,60
800	500	125	4	4,02
800	560	95	4	3,33
800	600	75	4	3,14
800	630	60	4	3,75
800	710	20	4	3,06
900	500	175	4	5,30
900	560	145	4	4,58
900	600	125	4	4,36
900	630	110	4	4,95
900	710	70	4	4,20
900	800	25	4	4,01
1000	500	225	4	6,52
1000	560	195	4	5,80
1000	600	175	4	5,58
1000	630	160	4	6,17
1000	710	120	4	5,42
1000	800	75	4	5,23
1000	900	25	4	4,94
1120	630	222	4	7,59
1120	710	182	4	6,48
1120	800	137	4	6,64
1120	900	87	4	6,36
1120	1000	37	4	5,46
1250	630	287	4	9,69
1250	710	247	4	8,94
1250	800	202	4	8,74
1250	900	152	4	8,46
1250	1000	102	4	7,56
1250	1120	42	4	7,53

Reducer

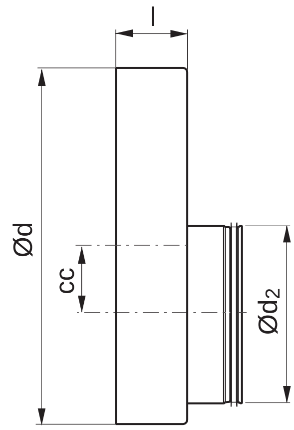
RFU

Description

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

Ød fits outside another fitting.

Dimensions



$Ød_1$ nom	$Ød_2$ nom	cc mm	l mm	m kg
400	200	75	80	1,33
400	224	63	80	1,39
400	250	50	80	1,44
400	280	35	80	1,43
400	300	25	80	1,43
400	315	18	80	1,42
400	355	10	80	0,99
450	250	75	80	1,76
450	280	60	80	1,75
450	300	50	80	1,74
450	315	43	80	1,73
450	355	23	80	1,69
450	400	15	80	1,31
500	250	100	80	2,09
500	280	85	80	2,08
500	300	75	80	2,07
500	315	68	80	2,06
500	355	48	80	1,98
500	400	25	80	2,03
500	450	15	80	1,57
560	315	98	80	2,39
560	355	78	80	2,32
560	400	55	80	2,36
560	450	30	80	1,90
560	500	20	80	1,80
600	315	118	80	2,62
600	355	98	80	2,54
600	400	75	80	2,59
600	450	50	80	2,53
600	500	25	80	2,54
600	560	10	80	1,86
630	315	133	80	2,79
630	355	113	80	2,71

Ordering example

RFU 630 315

Product — RFU
Dimension Ød — 630
Dimension $Ød_2$ — 315

Lindab

Reducer

RFU

$Ød_1$ nom	$Ød_2$ nom	cc mm	l mm	m kg
630	400	90	80	2,76
630	450	65	80	2,30
630	500	40	80	2,72
630	560	25	80	2,03
630	600	5	80	1,84
710	400	130	100	3,72
710	450	105	100	2,76
710	500	80	100	3,18
710	560	50	100	2,49
710	600	30	100	2,30
710	630	15	100	2,44
800	400	175	100	3,76
800	450	150	100	3,30
800	500	125	100	3,72
800	560	95	100	3,03
800	600	75	100	2,84
800	630	60	100	3,44
800	710	20	100	2,76
900	500	175	100	6,14
900	560	145	100	5,42
900	600	125	100	5,20
900	630	110	100	5,74
900	710	70	100	5,04
900	800	25	100	4,84
1000	500	225	100	7,34
1000	560	195	100	6,42
1000	600	175	100	6,40
1000	630	160	100	6,99
1000	710	120	100	6,24
1000	800	75	100	6,04
1000	900	25	100	5,76
1120	630	222	120	9,09
1120	710	182	120	8,34
1120	800	137	120	8,14
1120	900	87	120	7,86
1120	1000	37	120	6,96
1250	630	287	120	11,0
1250	710	247	120	10,3
1250	800	202	120	10,0
1250	900	152	120	9,76
1250	1000	102	120	8,86
1250	1120	42	120	8,83

* With turned-over edge

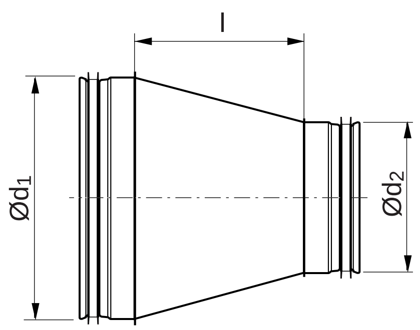
Reducer

RCLU

Description

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

Dimensions



$Ød_1$ nom	$Ød_2$ nom	l mm	m 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

Ordering example

RCLU 200 100

Product — RCLU
Dimension $Ød_1$ — 200
Dimension $Ød_2$ — 100

$Ød_1$ nom	$Ød_2$ nom	l mm	m kg
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
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

Reducer

RCLU

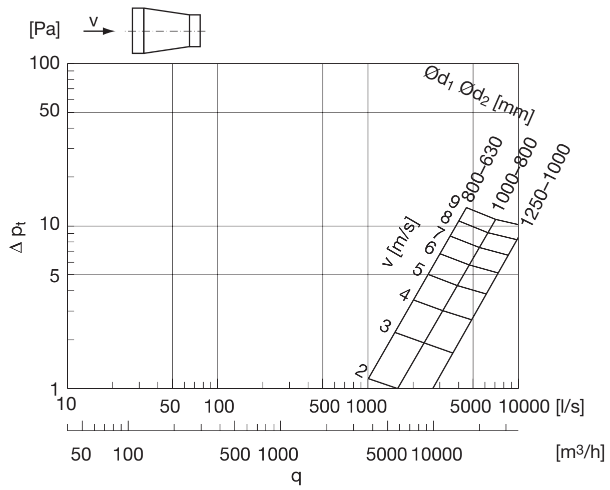
Ød$_1$ nom	Ød$_2$ nom	l mm	m kg
355	300	106	1,30
400	160	365	2,44
400	180	337	2,38
400	224	277	2,23
400	280	200	2,01
400	300	172	1,90
400	355	97	1,55
450	200	378	2,99
450	224	346	2,90
450	250	310	2,85
450	280	269	2,70
450	300	241	2,59
450	315	221	2,50
450	355	166	2,24
450	400	109	2,64
500	200	447	3,66
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
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

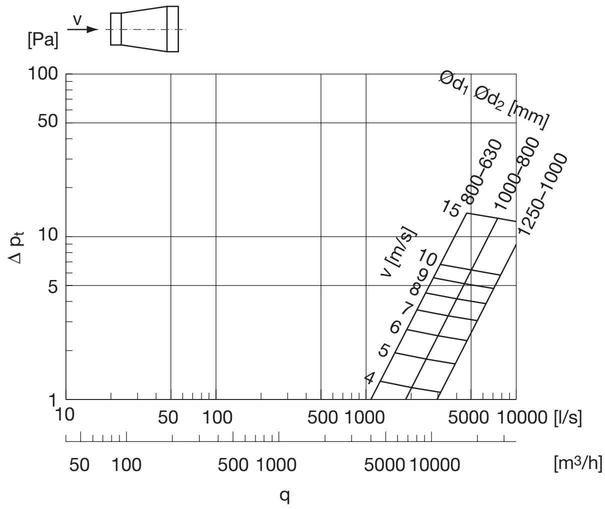
Ød$_1$ nom	Ød$_2$ nom	l mm	m kg
710	500	333	6,12
710	560	251	5,57
710	600	196	5,10
710	630	155	4,72
800	400	594	8,81
800	450	526	8,49
800	500	457	8,02
800	560	375	7,46
800	600	320	6,99
800	630	279	6,62
800	710	174	6,21
900	450	663	10,8
900	500	594	10,3
900	560	512	9,78
900	600	457	9,31
900	630	416	8,94
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
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

Reducer RCLU

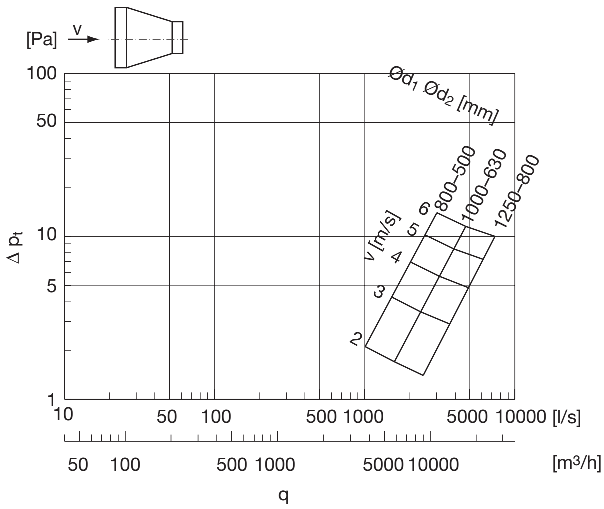
Technical data

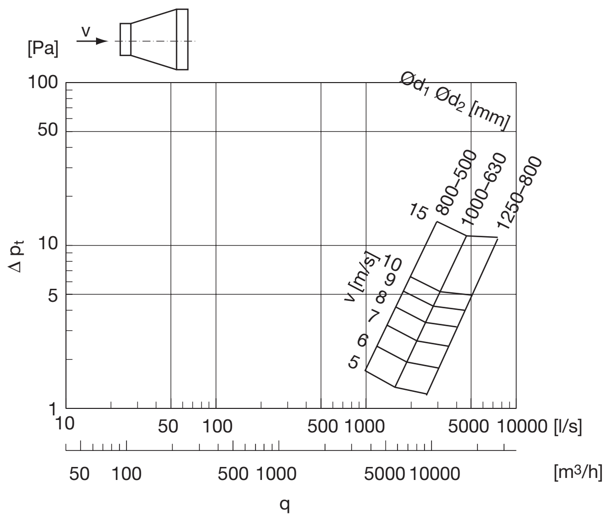
1 dimension step



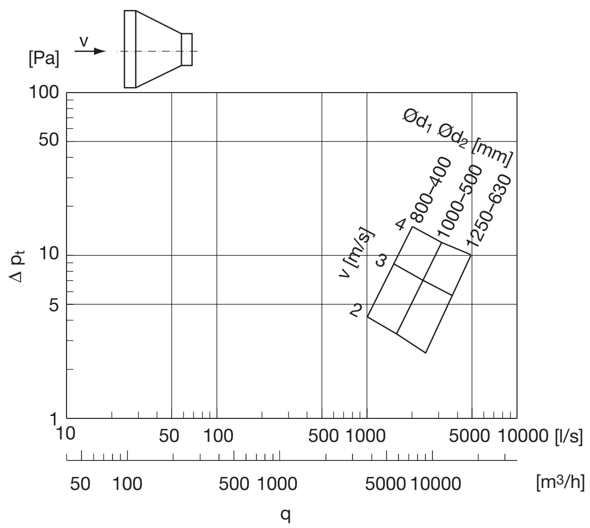


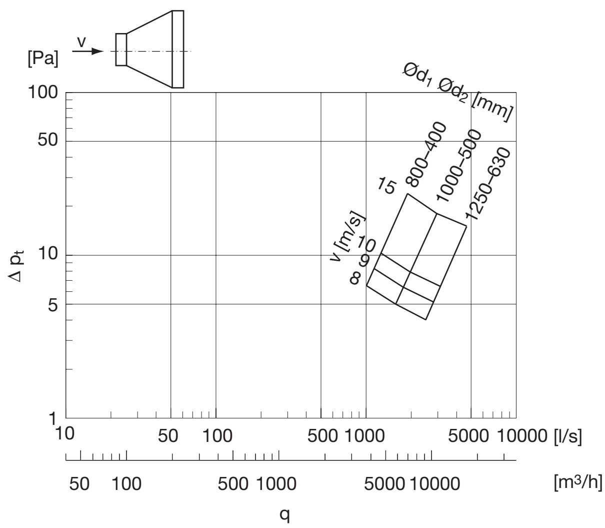
2 dimension steps





3 dimension steps





Reducer

RLU

Description

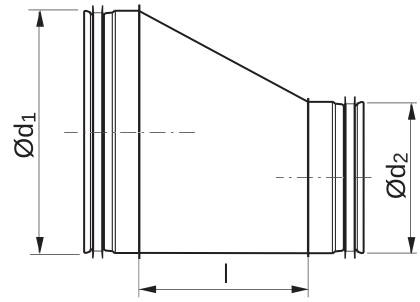
Long, tangential, hand made reducer with approx. 35° angle.

Dimensions are otherwise adapted to DIN 24147 section 4.

Ordering example

	RLU	200	160
Product	RLU		
Dimension $Ød_1$		200	
Dimension $Ød_2$			160

Dimensions



$Ød_1$ nom	$Ød_2$ nom	l mm	m 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

Reducer RLU

$Ød_1$ nom	$Ød_2$ nom	l mm	m 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

$Ød_1$ nom	$Ød_2$ nom	l mm	m 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

Reducer RLU

$Ød_1$ nom	$Ød_2$ nom	l mm	m 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

$Ød_1$ nom	$Ød_2$ nom	l mm	m 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.

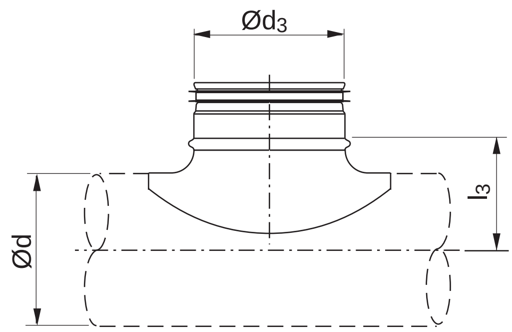
Pressure drop, see graphs on page 84.

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

Ordering example

	PSU	125	100
Product	PSU		
Dimension Ød		125	
Dimension Ød_3			100

Dimensions



Ød nom	Ød_3 nom	l_3 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

Saddle

PSU

Ød nom	Ød3 nom	l3 mm	m 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 nom	Ød3 nom	l3 mm	m 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 nom	Ød$_3$ nom	l$_3$ mm	m 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 nom	Ød$_3$ nom	l$_3$ mm	m 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

* Hand made

T-piece

TCPU

Description

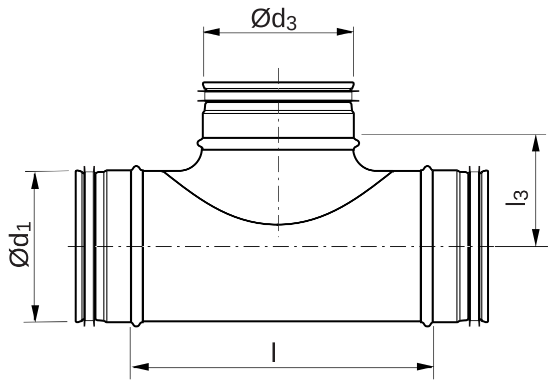
T-piece built with PSU saddle or a fully pressed top section.

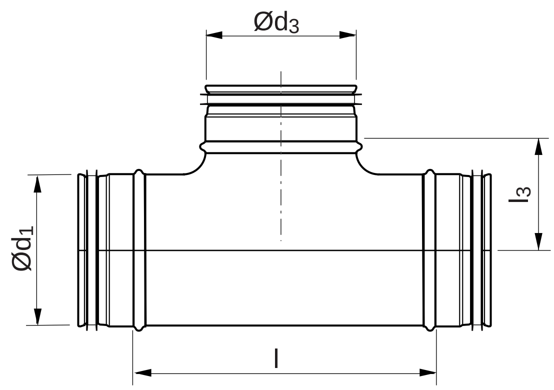
Pressure drop, see graphs on page 84.

Ordering example

	TCPU	250	160
Product	TCPU		
Dimension $Ød_1$		250	
Dimension $Ød_3$			160

Dimensions





$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m 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

T-piece

TCPU

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m 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

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m 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

T-piece

TCPU

Ød$_1$ nom	Ød$_3$ nom	l mm	l$_3$ mm	m 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

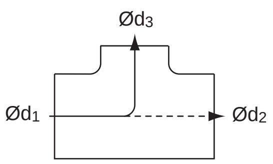
Ød$_1$ nom	Ød$_3$ nom	l mm	l$_3$ mm	m kg
600	315	415	325	6,46
600	355 *	470	300	6,98
600	400	510	325	7,43
600	450 *	550	300	7,84
600	500 *	552	300	7,91
600	560 *	610	300	8,76
600	600 *	650	300	10,8
630	100	175	330	4,03
630	125	225	335	4,41
630	160	266	340	4,99
630	200	300	340	5,35
630	250	350	340	6,00
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

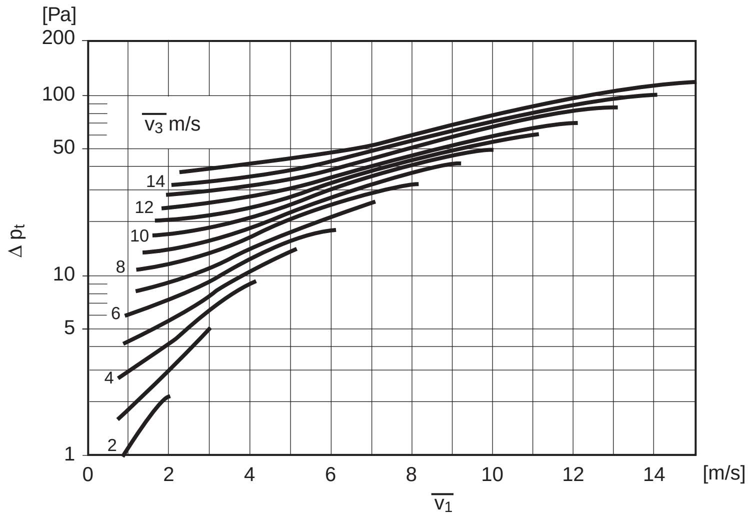
* Built with PSU saddle, without radius

T-piece and saddle TCPU, PSU

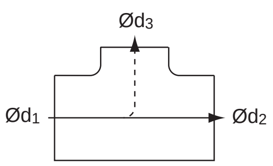
Supply air

Diverging flow

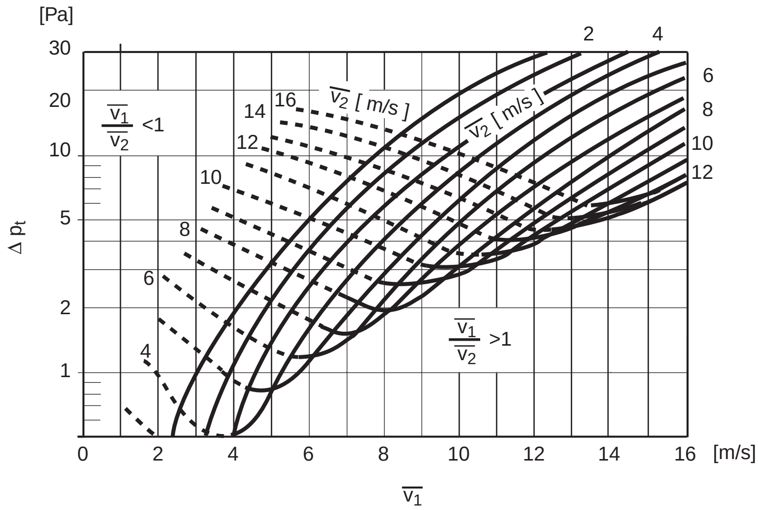




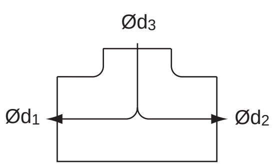
Diverging flow

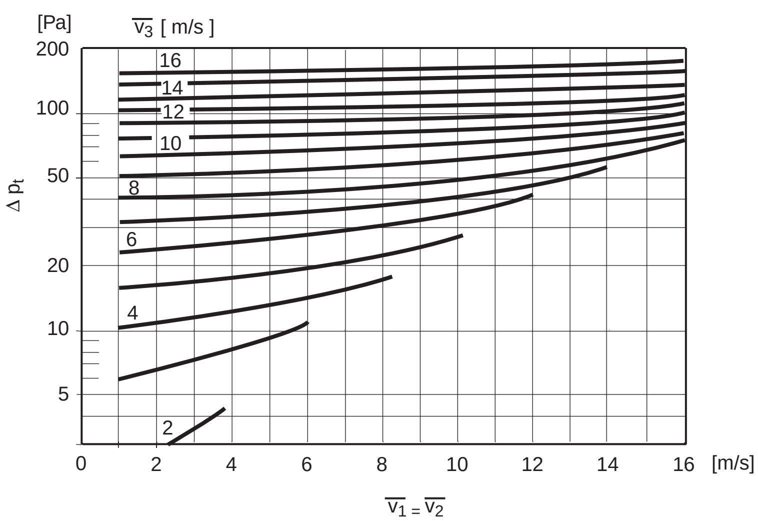


The diagram is also applicable to reduction in $Ød_2$.



Diverging flow

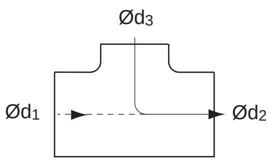


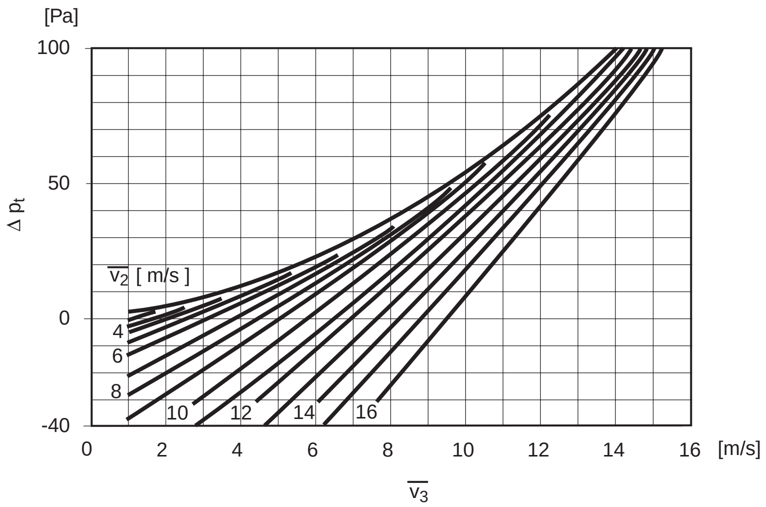


T-piece and saddle TCPU, PSU

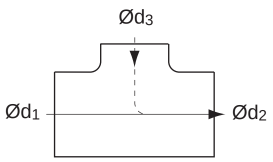
Exhaust air

Converging flow

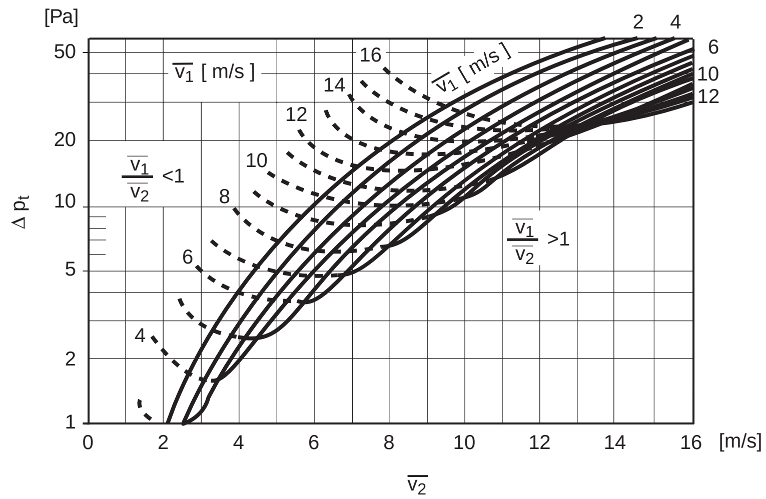




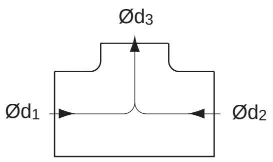
Converging flow

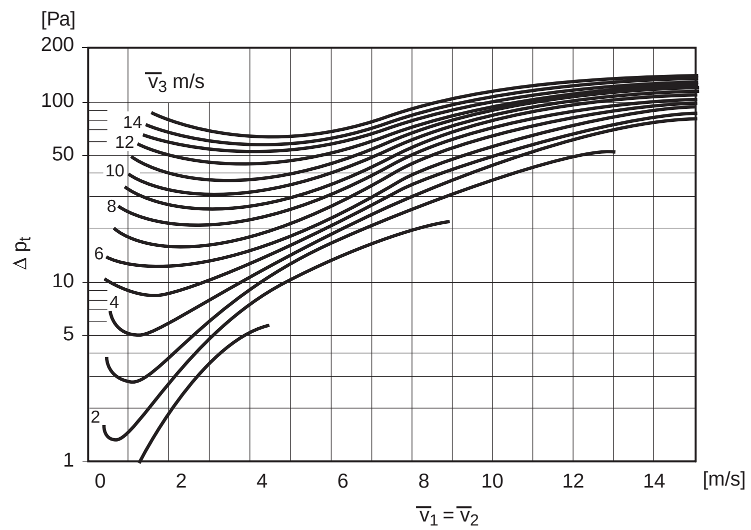


The diagram is also applicable to reduction in Ød$_1$.



Converging flow





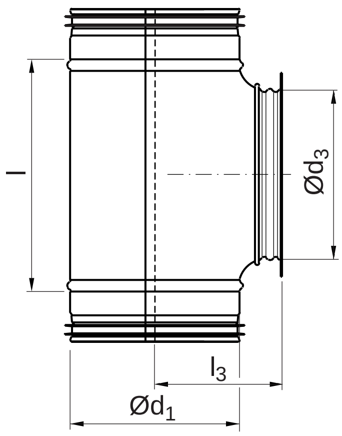
T-piece – Casting-in programme TCSIU

Description

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

Fits air valve KGEB etc.

Dimensions



Ød1 nom	Ød3 nom	l mm	l3 mm	m kg
100	92	130	90	0,31
125	92	130	105	0,52
125	117	165	105	0,67
160	152	229	132	1,02

Ordering example

TCSIU 100 100 GJUT

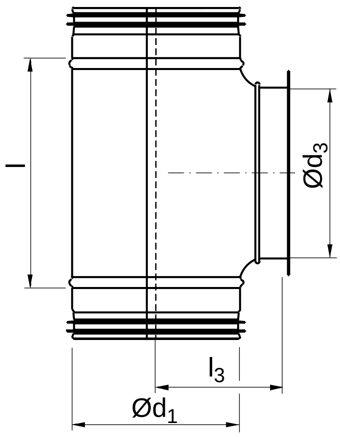
- Product
- Dimension Ød1
- Branch Ød3
- Specification

T-piece – Casting-in programme TCPU

Description

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

Dimensions



Ød1 nom	Ød3 nom	l mm	l3 mm	m kg
80 *	80	140	80	0,38
100	100	130	90	0,30
125	100	130	100	0,49
125	125	165	100	0,59
160	160	229	117	0,90

* Made with saddle PS

Ordering example

TCPU 100 100 GJUT

- Product
- Dimension Ød1
- Branch Ød3
- Specification

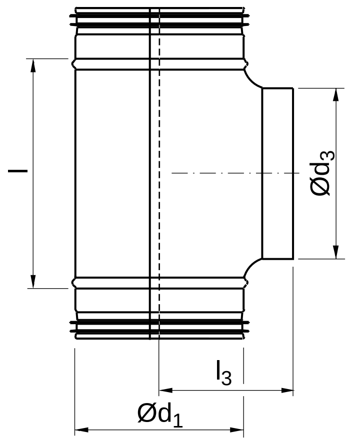
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

T-piece – Casting-in programme TCPU

Description

Short branch with female end.

Dimensions



Ød1 nom	Ød3 nom	l mm	l3 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

TCPU 100 100 GIPS

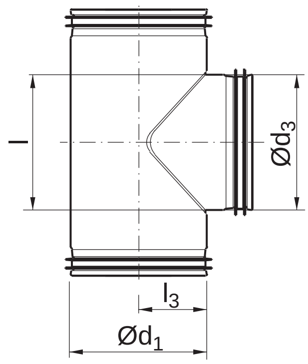
Product
Dimension $Ød_1$
Branch $Ød_3$
Specification

T-piece – Casting-in programme TCPU

Description

Short branch and short installation lengths.

Dimensions



Ød1 nom	Ød3 nom	l mm	l3 mm	m kg
100	100	100	50	0,35
125	125	125	63	0,50
160	160	160	80	0,66

Ordering example

TCPU 100 100 KORT

- Product
- Dimension Ød1
- Branch Ød3
- Specification

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

T-piece

TCU

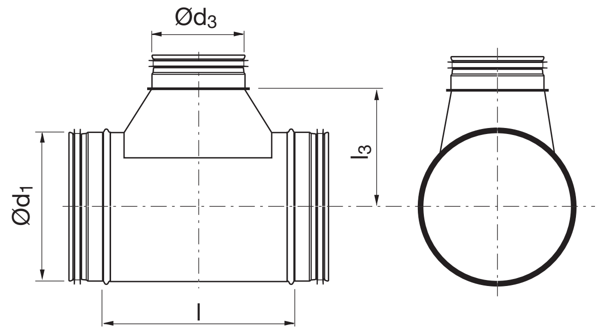
Description

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

Ordering example

	TCU	400	500
Product	TCU		
Dimension $Ød_1$		400	
Dimension $Ød_3$			500

Dimensions



$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m 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	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
160	112	225	125	0,76

T-piece

TCU

Ød1 nom	Ød3 nom	l mm	l3 mm	m 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

Ød1 nom	Ød3 nom	l mm	l3 mm	m 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

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m 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

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m 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

T-piece

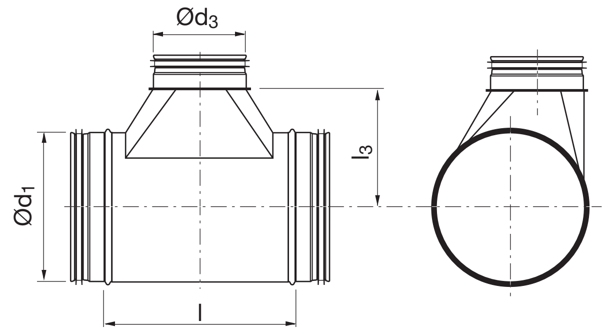
TCU

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m 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

Dimensions



Ød$_1$ nom	Ød$_3$ nom	l mm	l$_3$ mm	m 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

Description

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

Ordering example

TU 400 250

Product — TU
Dimension Ød$_1$ — 400
Dimension Ød$_3$ — 250

Lindab

T-piece

TU

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m 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	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
180	224	360	155	1,41

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m kg
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
250	315	460	200	2,55

T-piece

TU

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m kg
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
315	280	435	235	2,85

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m kg
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
450	160	290	275	2,73

T-piece

TU

Ød1 nom	Ød3 nom	l mm	l3 mm	m kg
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
560	630	800	370	10,3

Ød1 nom	Ød3 nom	l mm	l3 mm	m kg
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
710	710	940	445	14,1

T-piece

TU

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m kg
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
1000	1120	1370	590	37,4

$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m kg
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

X-piece

XCU

Description

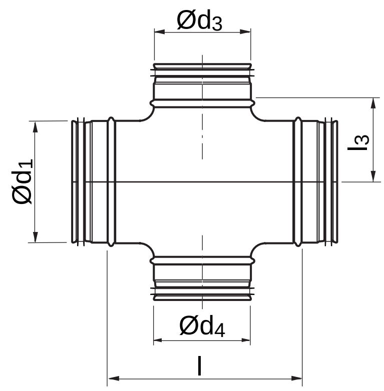
Centric –

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

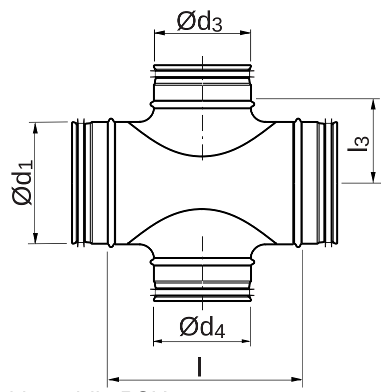
Ordering example

	XCU	400	250
Product	XCU		
Dimension $Ød_1$		400	
Dimension $Ød_3$, $Ød_4$			250

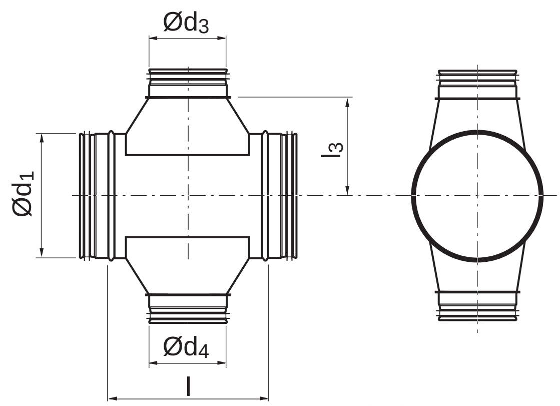
Dimensions



Centric – fully pressed



* Centric – with saddle PSU



** Centric – with hand made T-piece TSTCU

$Ød_1$ nom	$Ød_3/Ød_4$ nom	l mm	l_3 mm	m 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

X-piece

XCU

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

$Ød_1$ nom	$Ød_3/Ød_4$ nom	l mm	l_3 mm	m kg
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
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

$Ød_1$ nom	$Ød_3/Ød_4$ nom	l mm	l_3 mm	m kg
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
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

X-piece

XCU

Ød1 nom	Ød3/Ød4 nom	l mm	l3 mm	m kg
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
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

Ød1 nom	Ød3/Ød4 nom	l mm	l3 mm	m kg
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
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

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

X-piece

XCU

Ød$_1$ nom	Ød$_3$/Ød$_4$ nom	l mm	l$_3$ mm	m kg
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
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

Ød$_1$ nom	Ød$_3$/Ød$_4$ nom	l mm	l$_3$ mm	m kg
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
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

* Centric – with saddle PSU
** Centric – with hand made T-piece TSTCU

X-piece

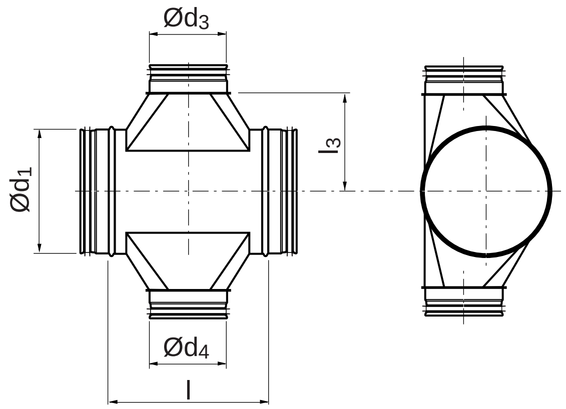
XU

Description

Tangential –

- with hand made T-piece TSTU

Dimensions



Ød1 nom	Ød3/Ød4 nom	l mm	l3 mm	m 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

	XU	315	250
Product			
Dimension $Ød_1$			
Dimension $Ød_3$, $Ød_4$			

X-piece

XU

Ød1 nom	Ød3/Ød4 nom	l mm	l3 mm	m 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

Ød1 nom	Ød3/Ød4 nom	l mm	l3 mm	m 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

$Ød_1$ nom	$Ød_3/Ød_4$ nom	l mm	l_3 mm	m 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

$Ød_1$ nom	$Ød_3/Ød_4$ nom	l mm	l_3 mm	m 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

X-piece

XU

$Ød_1$ nom	$Ød_3/Ød_4$ nom	l mm	l_3 mm	m 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

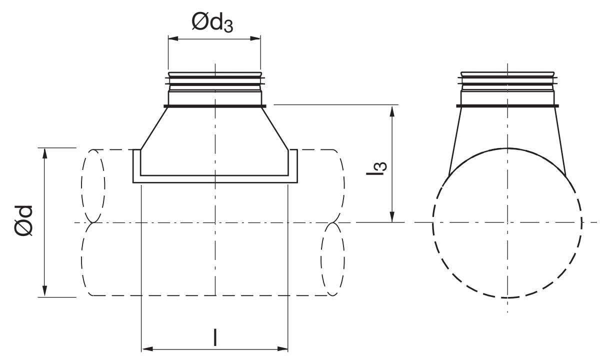
T-piece

TSTCU

Description

Hand made centric T-piece.

Dimensions



Ød nom	Ød$_3$ nom	l mm	l$_3$ 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

	TSTCU	400	500
Product	✓		
Dimension Ød		✓	
Dimension Ød$_3$			✓

T-piece

TSTCU

Ød nom	Ød$_3$ nom	l mm	l$_3$ 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
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

T-piece

TSTCU

Ød nom	Ød$_3$ nom	l mm	l$_3$ mm	m 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 nom	Ød$_3$ nom	l mm	l$_3$ mm	m 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 nom	Ød$_3$ nom	l mm	l$_3$ mm	m 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

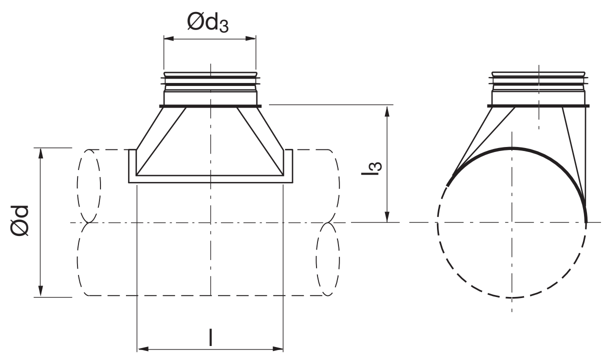
T-piece

TSTU

Description

Hand made tangential T-piece.

Dimensions



Ød nom	Ød3 nom	l mm	l3 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

	TSTU	400	500
Product	TSTU		
Dimension Ød		400	
Dimension Ød3			500

T-piece

TSTU

Ød nom	Ød$_3$ nom	l mm	l$_3$ 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$_3$ nom	l mm	l$_3$ 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

T-piece

TSTU

Ød nom	Ød$_3$ nom	l mm	l$_3$ mm	m 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 nom	Ød$_3$ nom	l mm	l$_3$ mm	m 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 nom	Ød$_3$ nom	l mm	l$_3$ mm	m 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 nom	Ød$_3$ nom	l mm	l$_3$ mm	m 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

T-piece

TSTU

Ød nom	Ød$_3$ nom	l mm	l$_3$ mm	m 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 nom	Ød$_3$ nom	l mm	l$_3$ mm	m 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

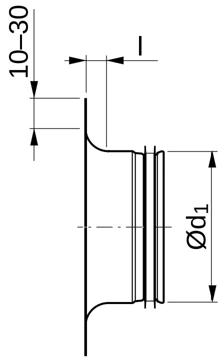
Take-off

ILRU

Description

Take-off with radius.

Dimensions



Ød1 nom	l mm	m 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

ILRU 250

Product — ILRU
Dimension $Ød_1$ — 250

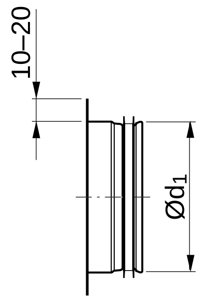
Take-off

ILU

Description

Take-off without radius.

Dimensions



Ød1 nom	m kg
63	0,06
80	0,08
100	0,07
112	0,10
125	0,11
140	0,15
150	0,15
160	0,16
180	0,19
200	0,21
224	0,36
250	0,36
280	0,30
300	0,36
315	0,54
355	0,41
400	0,58
450	0,71
500	0,83
560	0,96
600	0,99
630	1,13
710	1,58
800	2,11
900	2,70
1000	3,23
1120	4,10
1250	4,55

Ordering example

ILU 250

Product — ILU
Dimension $Ød_1$ — 250

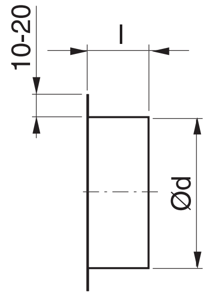
Take-off

ILF

Description

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

Dimensions



Ød nom	l mm	m 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

	ILF	200
Product	✓	
Dimension Ød		✓

Take-off with mesh

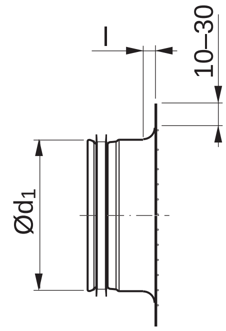
ILRNU

Description

To terminate an inlet duct.

With radius. Mesh size 10 × 10 mm

Dimensions



$Ød_1$ nom	l mm	m 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

ILRNU 200

Product

Dimension $Ød_1$

Take-off with mesh

ESNU

Description

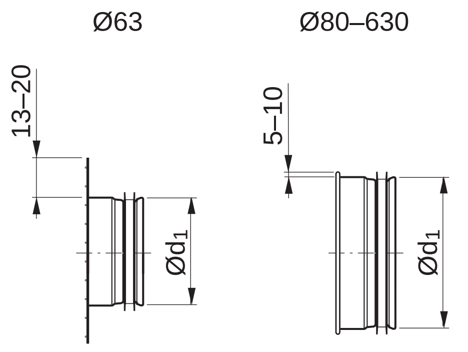
To terminate an inlet duct.

Mesh size 10 × 10 mm.

Ordering example

	ESNU	200
Product	ESNU	
Dimension Ød1		200

Dimensions



Ød1 nom	m kg
63	0,06
80	0,09
100	0,10
112	0,12
125	0,13
140	0,17
150	0,16
160	0,17
180	0,21
200	0,25
224	0,31
250	0,38
280	0,37
300	0,51
315	0,57
355	0,54
400	0,75
450	0,92
500	1,09
560	1,26
600	1,34
630	1,55

Take-off with mesh

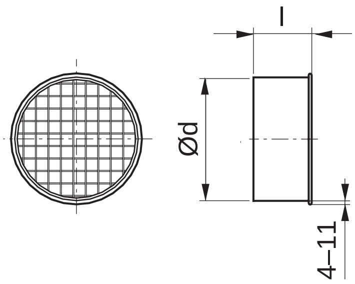
EPNF

Description

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

Mesh size 10 × 10 mm.

Dimensions



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	0,19
224	48	0,22
250	68	0,34
280	68	0,38
300	68	0,42
315	68	0,44
355	68	0,50
400	93	0,69
450	93	0,81
500	93	0,92
560	93	1,07
600	93	1,16
630	93	1,23

Ordering example

EPNF **250**

Product — EPNF

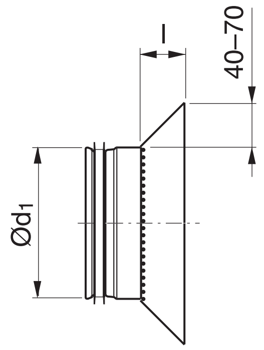
Dimension Ød — 250

Take-off with mesh and cone ILKNU 50

Description

To terminate an inlet duct. Mesh size 10 × 10 mm.

Dimensions



Ød$_1$ nom	l mm	m 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

ILKNU 200 50

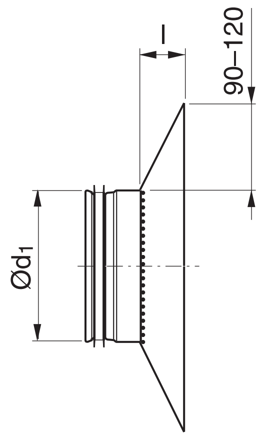
Product — ILKNU
Dimension Ød$_1$ — 200
Cone heigh, nominal — 50

Take-off with mesh and cone ILKNU 100

Description

To terminate an inlet duct. Mesh size 10 × 10 mm.

Dimensions



Ød1 nom	l mm	m 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

ILKNU 200 100

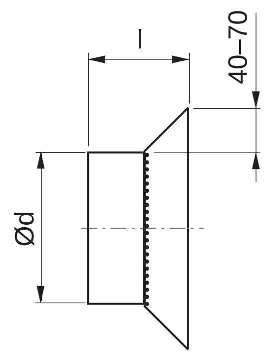
Product — ILKNU
Dimension $Ød_1$ — 200
Cone heigh, nominal — 100

Take-off with mesh and cone ILKNF 50

Description

To terminate an inlet duct. With female end – fits outside a Safe fitting. Mesh size 10 × 10 mm.

Dimensions



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

ILKNF 200 50

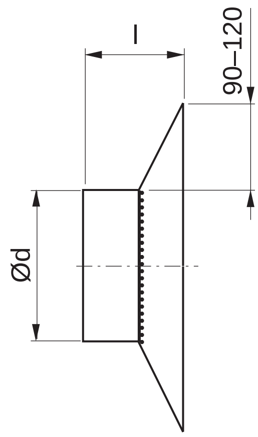
Product – ILKNF
Dimension Ød – 200
Cone heigh, nominal – 50

Take-off with mesh and cone ILKNF 100

Description

To terminate an inlet duct. With female end – fits outside a Safe fitting. Mesh size 10 × 10 mm.

Dimensions



Ød nom	l mm	m 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

ILKNF 200 100

Product — ILKNF
Dimension Ød — 200
Cone heigh, nominal — 100

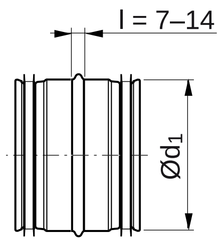
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Coupling NPU

Description

Coupling connector for joining circular ducts.

Dimensions



$Ød_1$ nom	m 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

NPU 200

Product — NPU
Dimension $Ød_1$ — 200

Lindab

Expanding coupling NPEU

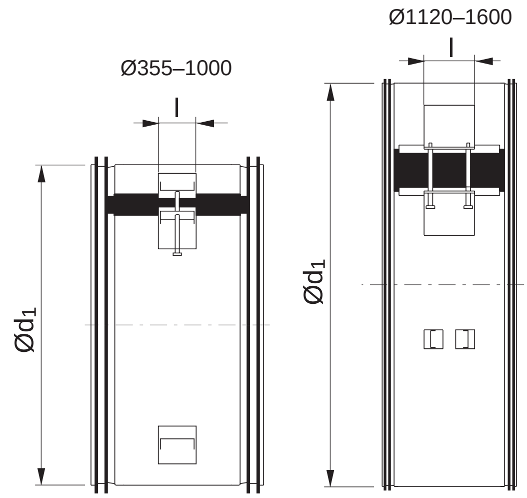
Description

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.

Ordering example

	NPEU	500
Product	┘	
Dimension $Ød_1$		┘

Dimensions



$Ød_1$ nom	l mm	m 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

Slide-in coupling SKNPU

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18

Description

Slide-in coupling intended for greater flexibility when joining SR ducts.

Other applications could be:

- To eliminate the accurate cutting of ducts which the ordinary NPU connector requires in some cases.
- To add a piece of duct to a system to replace a damaged piece of duct.

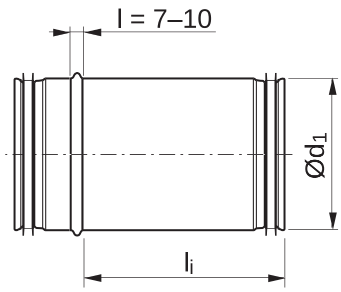
Ordering example

SKNPU 250

Product

Dimension $Ød_1$

Dimensions



$Ød_1$ nom	l_i mm	m kg
80	133	0,18
100	133	0,22
112	133	0,24
125	133	0,28
140	133	0,31
150	133	0,33
160	133	0,36
180	133	0,40
200	133	0,56
224	133	0,62
250	172	0,90
280	172	1,00
300	172	1,10
315	172	1,16
355	172	1,30
400	170	2,07
450	170	2,33
500	170	2,60

Slide-in coupling

SNPU

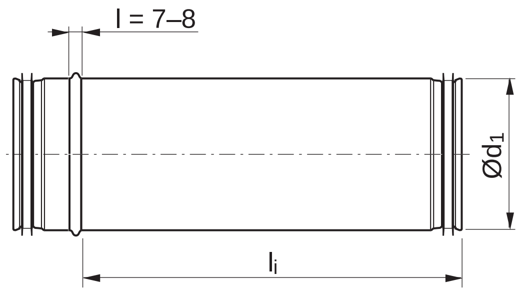
Description

Slide-in coupling intended for greater flexibility when joining SR ducts.

Other applications could be:

- To eliminate the accurate cutting of ducts which the ordinary NPU connector requires in some cases.
- To add a piece of duct to a system to replace a damaged piece of duct.

Dimensions



$Ød_1$ nom	l_i mm	m kg
100	395	0,51
112	395	0,55
125	395	0,65
140	395	0,72
150	395	0,76
160	395	0,83
180	395	0,93
200	395	1,28
224	395	1,41
250	395	1,66
280	395	1,85
300	395	2,01
315	395	2,12

Ordering example

	SNPU	160
Product		
Dimension $Ød_1$		

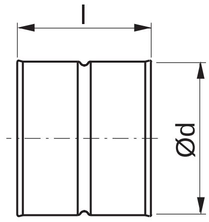
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Female coupling MF

Description

Female coupling for joining fittings.

Dimensions



Ød nom	l mm	m kg
63 *	95	0,06
80 *	95	0,08
100 *	95	0,10
112	95	0,11
125 *	95	0,13
140	95	0,17
150 *	95	0,18
160 *	95	0,20
180	95	0,22
200 *	95	0,25
224	95	0,27
250 *	140	0,42
280	130	0,50
300	130	0,51
315 *	140	0,54
355	130	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	210	1,96
800	210	2,24
900	210	4,00
1000	250	5,09
1120	250	5,90
1250	250	6,52

* With turned-over edge

Ordering example

	MF	200
Product	MF	
Dimension Ød		200

Slide-in female coupling SKMF

Description

Slide-in female coupling, intended to add fittings to an existing system.

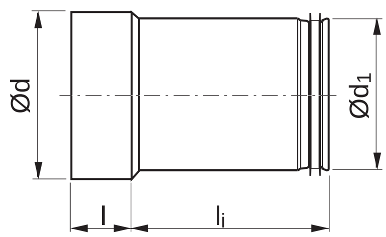
Other applications could be:

- To extend the distance between a T-piece and a cleaning cover, to get it outside any insulation.
- To take up the often varying distance between the stub on an air supply terminal and the duct junction.
- To facilitate the access when inspecting and cleaning the duct system.

Ordering example

	SKMF	250
Product	SKMF	
Dimension $Ød_1$		250

Dimensions



$Ød_1$ nom	l mm	l_i mm	m kg
80	40	130	0,16
100	40	130	0,20
112	40	130	0,23
125	40	130	0,25
140	40	130	0,28
150	40	130	0,30
160	40	130	0,32
180	40	130	0,36
200	40	130	0,50
224	40	130	0,56
250	60	185	0,88
280	60	185	0,99
300	60	185	1,07
315 *	60	185	1,12
355 *	60	185	1,27
400 *	80	240	2,67
450 **	80	242	3,04
500 **	80	242	3,37

* With stiffening bead
** Design with lockseam

Slide-in female coupling SMFU

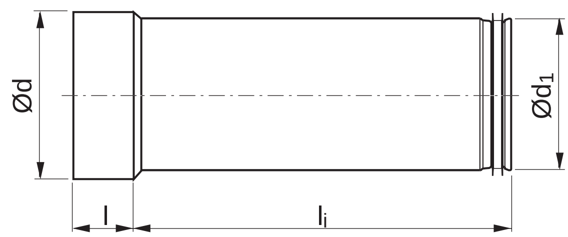
Description

Slide-in female coupling, intended to add fittings to an existing system.

Other applications could be:

- To extend the distance between a T-piece and a cleaning cover, to get it outside any insulation.
- To take up the often varying distance between the stub on an air supply terminal and the duct junction.
- To facilitate the access when inspecting and cleaning the duct system.

Dimensions



$Ød_1$ nom	l mm	l_i mm	m kg
100	40	405	0,51
112	40	405	0,59
125	40	405	0,64
140	40	405	0,71
150	40	405	0,76
160	40	405	0,81
180	40	405	0,92
200	40	405	1,26
224	40	405	1,41
250	60	405	1,64
280	60	405	1,84
300	60	405	1,98
315 *	60	405	2,07

* With stiffening bead

Ordering example

	SMFU	200
Product	↑	
Dimension $Ød_1$		↑

Lindab

End caps and cleaning covers

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 cleaning covers such as KCU page 138, EPFH page 136, KCRU page 140 or KC page 266 on each side of the unit.
- You can use sealing clamp SVK page 264 to make it easy to remove the unit from the system.
- You can use slide-in coupling SKMF page 131 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.

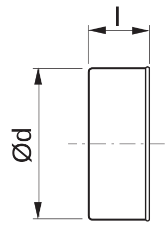
End cap

EPF

Description

End cap, which fits outside a Safe fitting.

Dimensions



Ød nom	l mm	m 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

	EPF	250
Product	↑	
Dimension Ød		↑

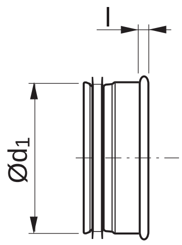
End cap

ESU

Description

End cap, which fits inside SR duct.

Dimensions



$Ød_1$ nom	l mm	m 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

ESU **160**

Product

Dimension $Ød_1$

Cleaning cover

EPFH

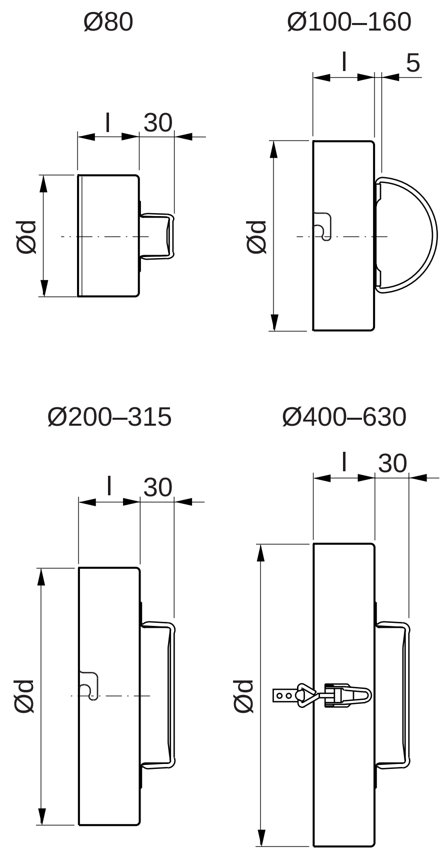
Description

Cleaning cover, which fits outside a Safe fitting.

Dimensions Ø100–315 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.

Dimensions



Ød nom	l mm	m kg	Handle	Locking
80	48	0,09	1 fixed small	–
100	40	0,15	1 folding	bayonet
112	40	0,16	1 folding	bayonet
125	40	0,17	1 folding	bayonet
140	40	0,19	1 folding	bayonet
150	40	0,21	1 folding	bayonet
160	40	0,22	1 folding	bayonet
180	40	0,24	1 fixed	bayonet
200	40	0,32	1 fixed	bayonet
224	60	0,38	1 fixed	bayonet
250	60	0,55	2 fixed	bayonet
280	60	0,64	2 fixed	bayonet
300	60	0,69	2 fixed	bayonet
315	60	0,74	2 fixed	bayonet
355	60	0,87	2 fixed	bayonet
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

EPFH **250**

Product

Dimension Ød

Lindab

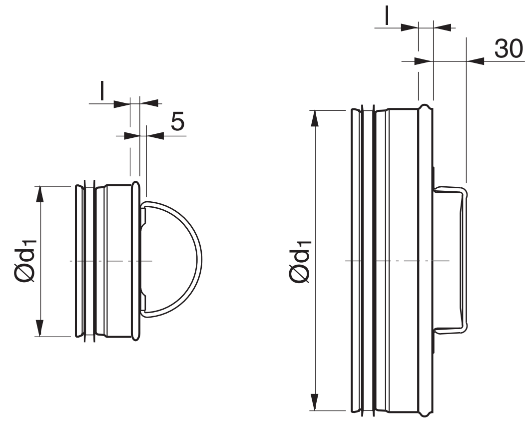
Cleaning cover

ESHU

Description

Cleaning cover, which fits inside an SR duct.

Dimensions



Ød$_1$ nom	l mm	m 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

ESHU 160

Product — ESHU
Dimension Ød$_1$ — 160

Cleaning cover

KCU

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Description

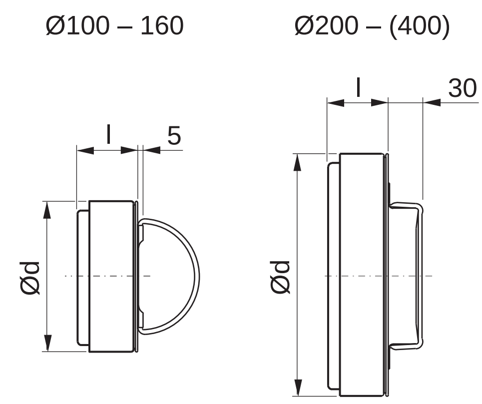
Cleaning cover which fits outside a Safe fitting.

The cover 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 cover 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.

Δp in the table gives the maximum positive pressure the cleaning cover can withstand when installed from beneath.

Dimensions



Ød nom	Δp 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

	KCU	250
Product	KCU	
Dimension Ød		250

Lindab

Cleaning cover

KCIVU

Description

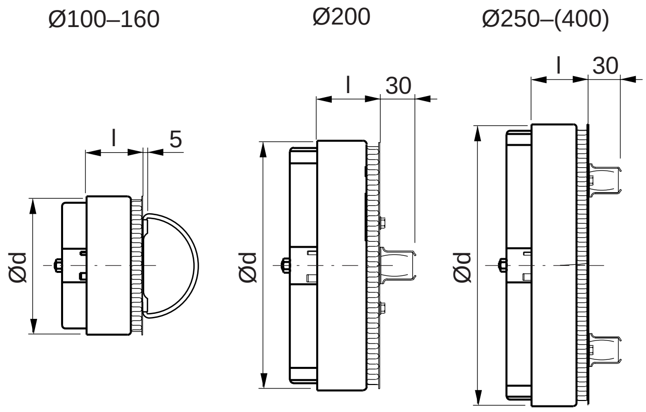
Cleaning cover which fits outside a Safe fitting.

The cover 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 cover 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.

Δp in the table gives the maximum positive pressure the cleaning cover can withstand when installed from beneath.

Dimensions



Ød nom	Δp 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

	KCIVU	250
Product	KCIVU	
Dimension Ød		250

Cleaning cover

KCRU

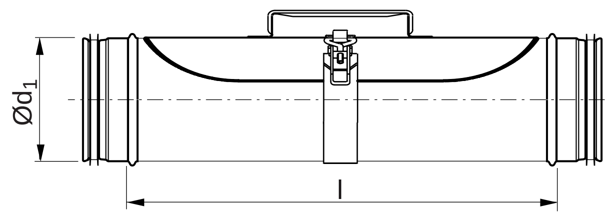
Description

Cleaning cover which complies with the requirements for cleaning covers in Swedish Standard SS 2645.

The hatch 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



$Ød_1$ nom	l mm	m 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

KCRU 250

Product — KCRU
Dimension $Ød_1$ — 250

Silencer

Content – Silencer

Circular straight

Circular straight low-built

Circular curved

Exhaust air terminal device

Overwiev silencers – circular connection

<table>
<tr><th></th><th colspan="6">Straight</th><th colspan="2">Curved</th><th colspan="2">Straight</th></tr>
<tr><th></th><th colspan="4">Circular outer sheet casing</th><th colspan="2">Rectangular outer sheet casing</th><th colspan="2">Circular outer sheet casing</th><th colspan="2">Circular outer sheet casing</th></tr>
<tr><td>Ød₁</td><td colspan="3"></td><td>Baffle</td><td></td><td>Baffle</td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td>63</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>80</td><td rowspan="8">SLCU 50</td><td rowspan="11">SLU
SLCU 100
SLGU 100</td><td rowspan="6">SLGU 150</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>100</td><td></td><td rowspan="7">LRCA</td><td></td><td></td><td></td><td rowspan="7">SLKNU 50</td><td rowspan="7">SLKNU 100</td></tr>
<tr><td>125</td><td></td><td></td><td rowspan="5">BSLCU 50</td><td rowspan="9">BSLCU 100</td></tr>
<tr><td>160</td><td></td><td></td></tr>
<tr><td>200</td><td></td><td></td></tr>
<tr><td>250</td><td></td><td></td></tr>
<tr><td>315</td><td></td><td rowspan="5">SLBU
SLCBU 100
SLBGU 100</td><td rowspan="5">LRBCB</td></tr>
<tr><td>400</td><td></td><td></td></tr>
<tr><td>500</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>630</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>800</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>1000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>1250</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td colspan="4"></td><td colspan="2">Low built</td><td colspan="2"></td><td colspan="2">Cone and net</td></tr>
</table>

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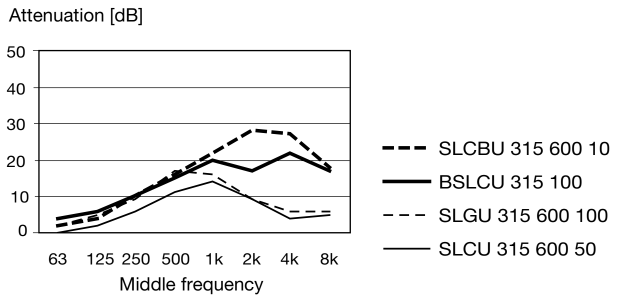
General

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 28.

Method of measurement

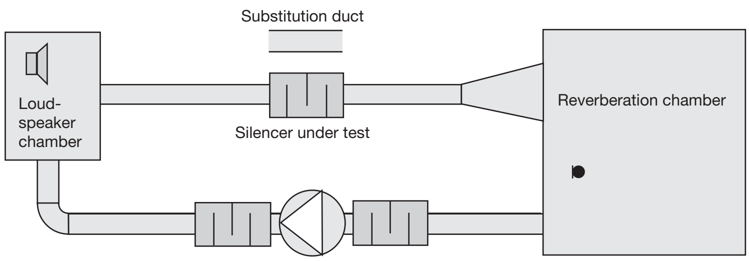
The silencers are tested in accordance with ISO 7235 ”Acoustics - Measurement procedures for ducted silencers - Insertion loss, flow noise and total pressure loss”.

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 rectangular ones consist in principle of an outer sheet casing and baffles.
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 and in the rectangular silencers.
The tear of fibre is prevented since all exposed surfaces are lined. The connections of the circular types are supplied with a Safe-gasket. The rectangular have guide joins.

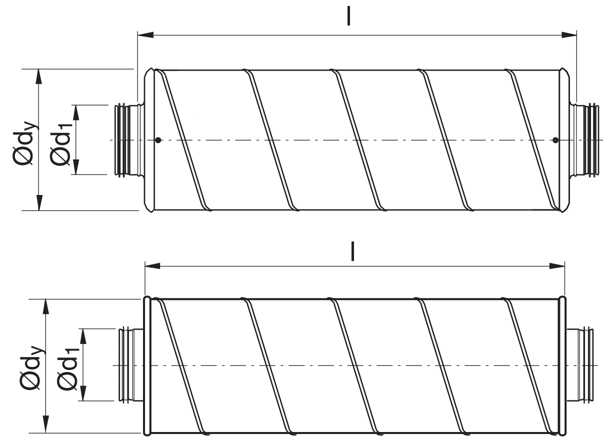
Cleaning of duct systems

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 133.



Circular straight silencer SLU

Dimensions



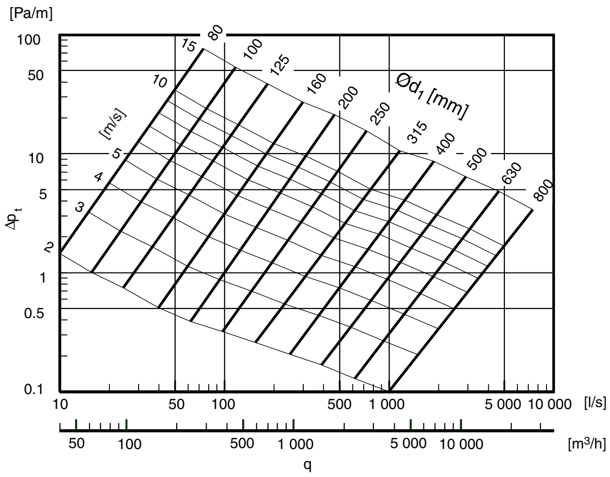
Ød1 nom	Length nom	Attenuation [dB] centre frequency [Hz] 63	125	250	500	1k	2k	4k	8k	Ødy mm	l mm	m kg
80	300	1	5	8	15	25	25	21	15	180	300	2,00
80	600	2	8	14	28	49	50	47	24	180	600	3,00
80	900	3	10	21	40	50	50	50	34	180	900	5,00
80	1200	4	13	27	50	50	50	50	43	180	1200	7,00
100	300	1	5	7	15	25	25	21	13	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	315	300	4,00
200	600	1	3	8	15	28	19	12	8	315	600	7,00
200	900	2	4	11	21	37	28	16	10	315	900	10,0
200	1200	2	5	14	27	46	36	21	13	315	1200	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

Description

Insulation thickness 50 mm.

Technical data



Ordering example

	SLU	125	600	50
Product	SLU			
Dimension Ød1		125		
Length l			600	
Insulation thickness				50

Circular straight silencer SLCU 50

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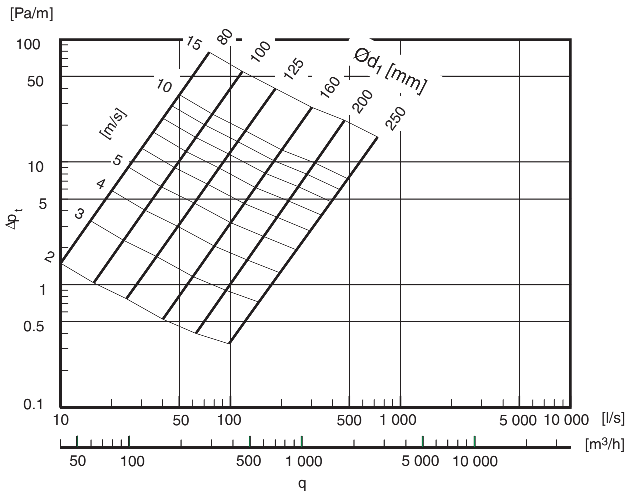
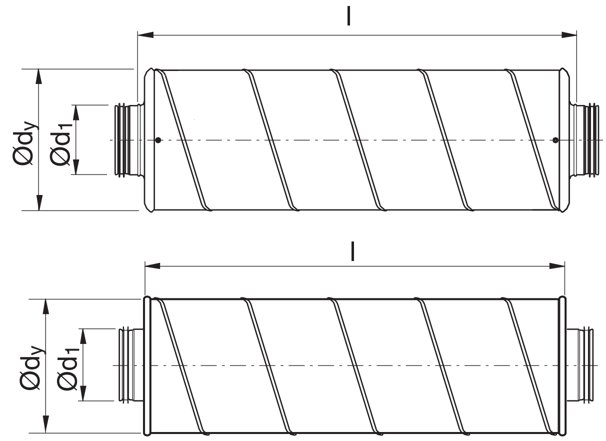
Description

Insulation thickness 50 mm.

Technical data



Dimensions



$Ød_1$ nom	Length nom	Attenuation [dB] centre frequency [Hz] 63	125	250	500	1k	2k	4k	8k	$Ød_y$ mm	l mm	m kg
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	300	4,11
200	600	2	3	7	16	21	23	9	8	325	600	6,90
200	900	2	4	8	24	32	34	13	10	325	900	9,74
200	1200	3	5	10	31	43	45	18	13	325	1200	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	465	600	11,8
315	900	1	3	7	16	22	12	6	7	465	900	16,3
315	1200	1	3	8	22	30	16	7	9	465	1200	21,1
400 *	600	0	3	4	6	8	4	4	4	508	600	18,9
400 *	900	1	3	5	10	13	7	5	6	508	900	24,3
400 *	1200	1	4	7	14	19	10	7	8	508	1200	26,7

* Supplied with two loose couplings

Ordering example

SLCU 125 600 50

- Product (SLCU)
- Dimension $Ød_1$ (125)
- Length, nominal (600)
- Insulation thickness (50)

Lindab

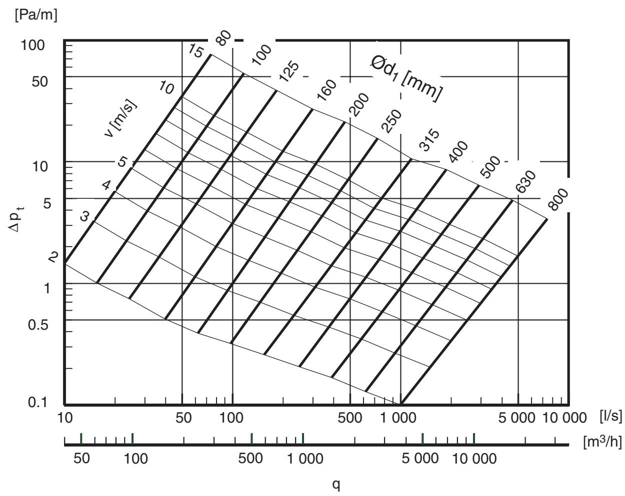
Circular straight silencer SLCU 100

Description

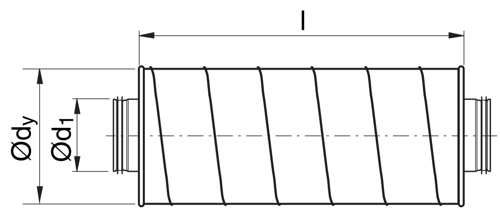
Insulation thickness 100 mm.

Good attenuation in 125 and 250 Hz bands.

Technical data



Dimensions



Ød1 nom	l mm	Attenuation [dB] centre frequency [Hz] Hz 63	125	250	500	1k	2k	4k	8k	Ødy mm	m kg
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	14,7
315	900	2	6	12	14	19	15	7	8	510	19,8
315	1200	2	8	16	18	26	21	9	10	510	25,8
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

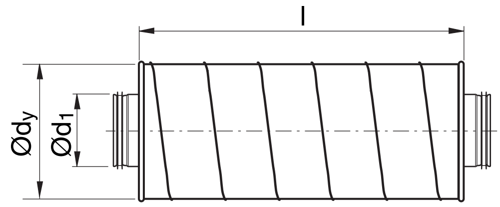
Ordering example

SLCU 200 600 100

Product – SLCU
Dimension Ød1 – 200
Length l – 600
Insulation thickness – 100

Circular straight silencer SLGU 100

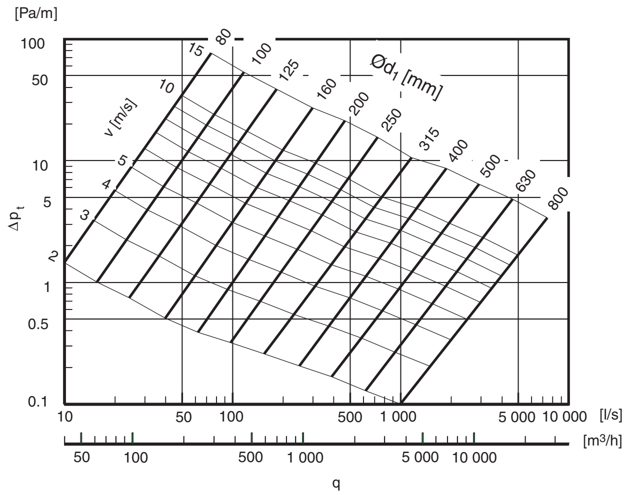
Dimensions



Description

Insulation thickness 100 mm.

Technical data



Ød$_1$ nom	l mm	63	125	250	500	1k	2k	4k	8k	Ød$_y$ mm	m kg
		Attenuation [dB] centre frequency [Hz] Hz									
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	14,1
315	900	3	6	14	23	24	13	8	8	510	20,5
315	1200	4	8	18	29	32	17	10	11	510	26,8
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

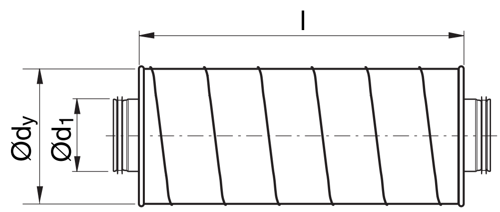
SLGU 250 900 100

- Product: SLGU
- Dimension Ød$_1$: 250
- Length l: 900
- Insulation thickness: 100

Circular straight silencer with baffle

SLGU 150

Dimensions



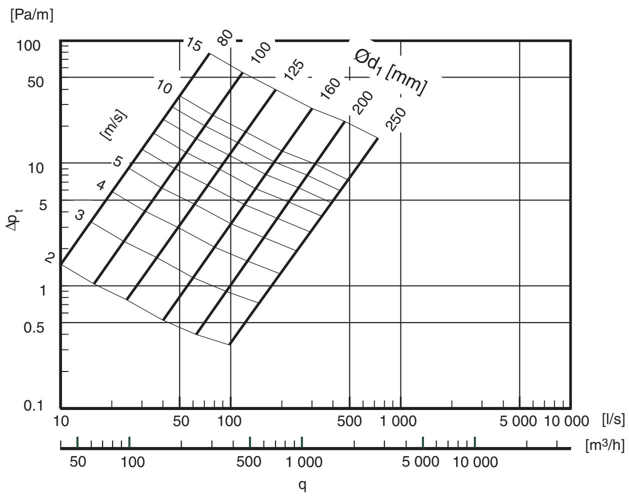
Ød1 nom	l mm	Attenuation [dB] centre frequency [Hz] Hz 63	125	250	500	1k	2k	4k	8k	Ødy mm	m kg
80	900	15	30	41	50	50	50	50	34	410	13,6
100	900	10	26	36	48	50	50	48	26	410	14,1
125	900	8	20	31	45	49	49	36	19	465	15,9
125	1200	13	30	38	48	50	50	45	24	465	20,9
160	900	6	15	25	38	48	45	23	14	465	16,7
160	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

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



Ordering example

	SLGU	160	900	150
Product	SLGU			
Dimension Ød1		160		
Length l			900	
Insulation thickness				150

Circular straight silencer SLBU

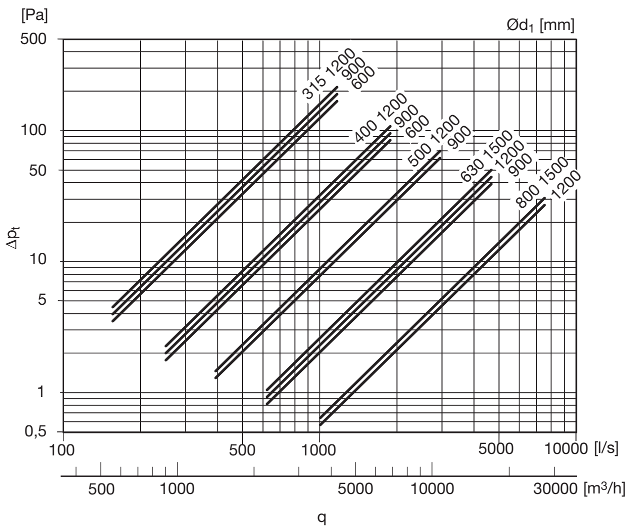
Description

Insulation thickness 100 mm.

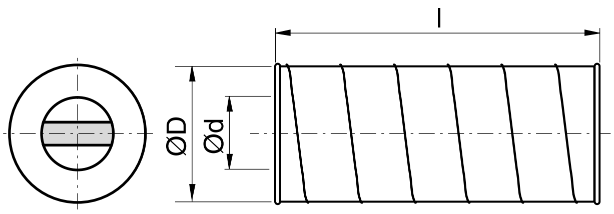
Provided with a 100 mm thick baffle. This gives very good attenuation across the entire range.

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

Technical data



Dimensions



$Ød_1$ nom	l nom	63	125	250	500	1k	2k	4k	8k	$Ød_y$ mm	m kg
		Attenuation [dB] centre frequency [Hz]									
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

SLBU 400 900 100

Product
Dimension $Ød_1$
Length l
Insulation thickness

We reserve the right to make changes without prior notice

Lindab

Circular straight silencer with baffle

SLCBU 100

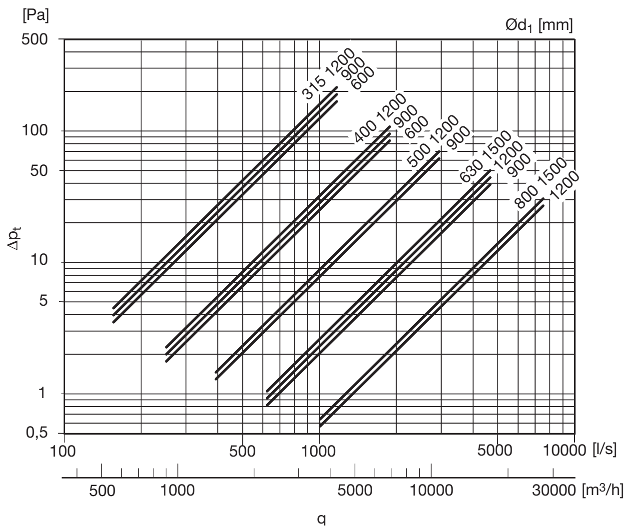
Description

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.

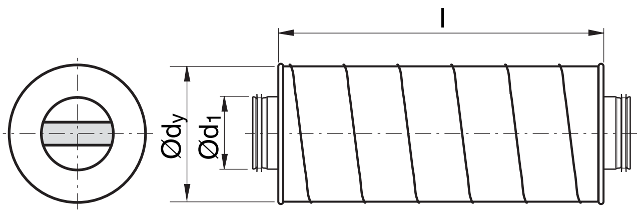
Technical data



Ordering example

SLCBU	400	900	100
Product	Dimension $Ød_1$	Length l	Insulation thickness

Dimensions



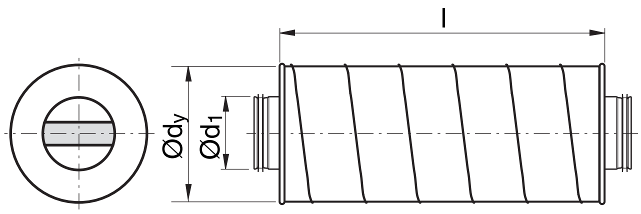
$Ød_1$ nom	l mm	Attenuation [dB] centre frequency [Hz] Hz 63	125	250	500	1k	2k	4k	8k	$Ød_y$ mm	m kg
315	600	4	6	10	16	22	28	27	18	510	16,7
315	900	5	7	16	23	30	38	32	22	510	22,6
315	1200	7	9	23	30	38	47	37	25	510	29,3
400 *	600	4	5	7	9	13	16	15	13	625	22,5
400 *	900	5	7	12	16	22	26	20	16	625	32,7
400 *	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

Circular straight silencer with baffle

SLBGU 100

Dimensions



Ød1 nom	l mm	Attenuation [dB] centre frequency [Hz] Hz 63	125	250	500	1k	2k	4k	8k	Ødy mm	m kg
315	900	6	9	20	34	39	44	34	22	510	23,0
315	1200	7	12	27	39	50	50	45	27	510	30,3
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

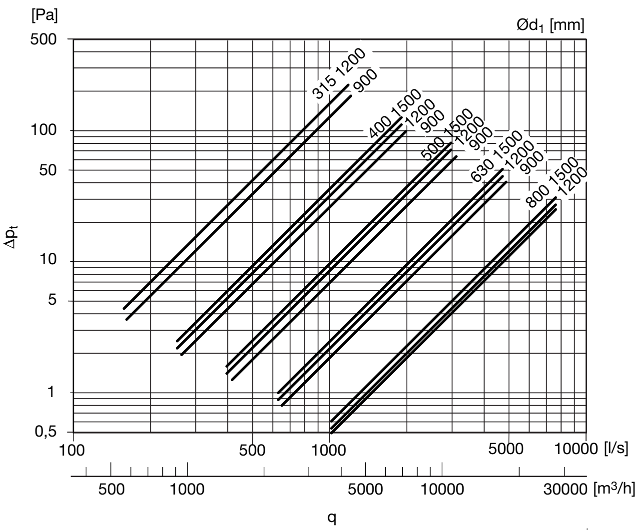
Description

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



Ordering example

	SLBGU	400	1200	100
Product	SLBGU			
Dimension Ød1		400		
Length l			1200	
Insulation thickness				100

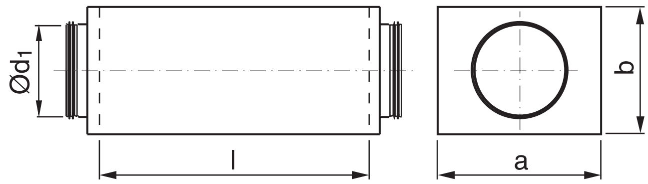
We reserve the right to make changes without prior notice

Lindab

Circular straight low-built silencer

LRCA

Dimensions



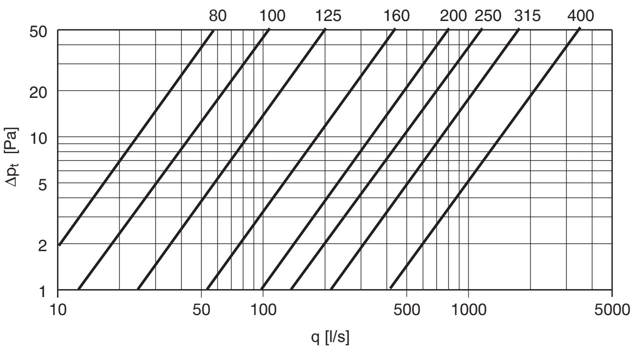
Description

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

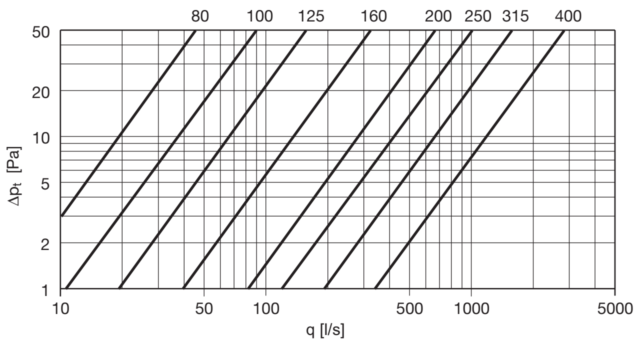
Ød1 nom	l mm	a mm	b mm	Attenuation in dB for centre frequency Hz 63	125	250	500	1k	2k	4k	8k	m kg
100	500	210	158	8	12	12	23	44	45	30	18	3,17
100	1000	210	158	17	18	25	41	50	50	50	32	5,55
125	500	239	181	8	9	11	21	36	36	23	14	3,85
125	1000	239	181	17	14	21	38	50	50	45	23	6,89
160	500	275	218	6	7	10	18	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

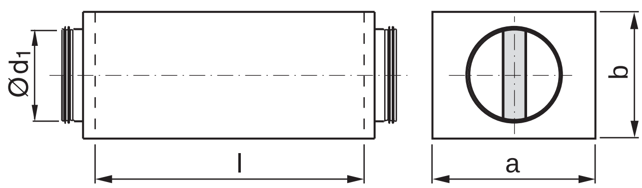
LRCA 125 1000

Product – LRCA
Dimension $Ød_1$ – 125
Lenght l – 1000

Circular straight low-built silencer with baffle

LRBCB

Dimensions



Ød1 nom	l mm	a mm	b mm	63	125	250	500	1k	2k	4k	8k	m kg
				Attenuation in dB for centre frequency Hz								
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

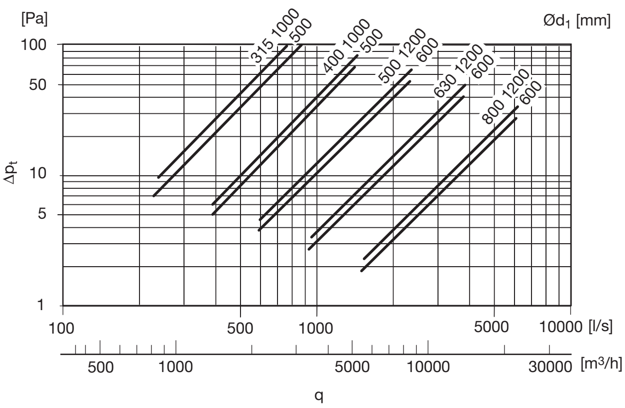
Description

Baffle silencer with low installation height.

Inner pipe of perfoated 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



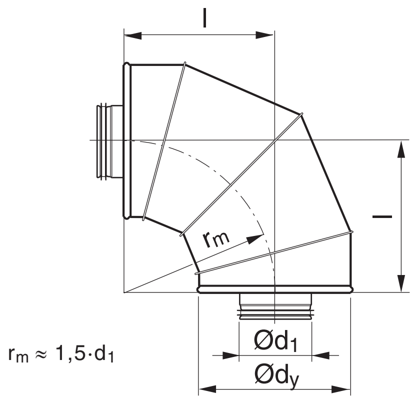
Ordering example

	LRBCB	500	1200
Product	LRBCB		
Dimension $Ød_1$		500	
Lenght l			1200

Lindab

Circular curved silencer BSLCU 50

Dimensions



$Ød_1$ nom	l mm	Attenuation [dB] centre frequency [Hz] Hz 63	125	250	500	1k	2k	4k	8k	$Ød_y$ mm	m kg
125	200	3	2	6	14	22	33	26	22	235	3,32
160	240	1	2	6	14	23	29	25	21	270	4,00
200	305	0	2	5	15	29	24	24	20	310	5,64
250	370	1	2	6	17	31	22	27	20	365	9,74
315	370	1	2	7	19	20	17	20	16	465	14,2

Description

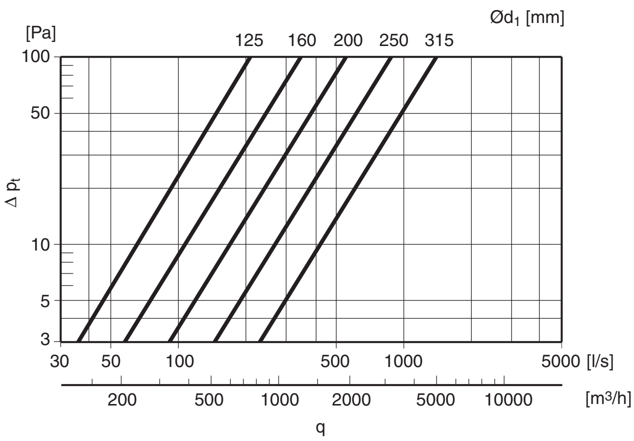
Lack of space is a frequent problem in air treatment installations. This means that it is often difficult to find enough straight lengths to install a straight silencer.

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.

Technical data



Ordering example

	BSLCU	200	50
Product	BSLCU		
Dimension $Ød_1$		200	
Insulation thickness			50

Circular curved silencer BSLCU 100

Description

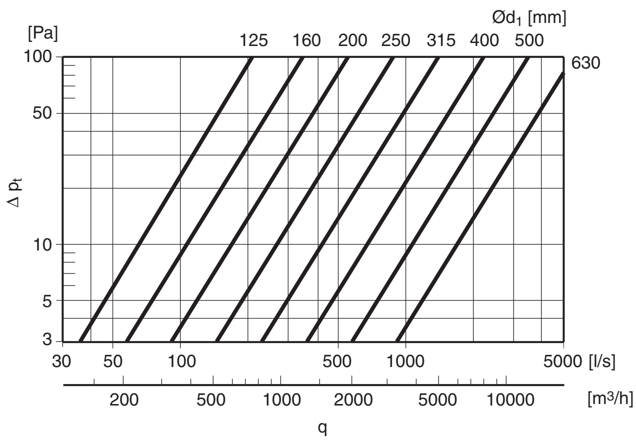
Lack of space is a frequent problem in air treatment installations. This means that it is often difficult to find enough straight lengths to install a straight silencer.

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.

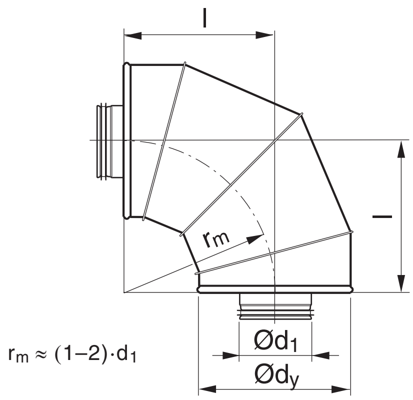
Technical data



Ordering example

	BSLCU	200	100
Product	BSLCU		
Dimension $Ød_1$		200	
Insulation thickness			100

Dimensions



$Ød_1$ nom	l mm	Attenuation [dB] centre frequency [Hz] Hz 63	125	250	500	1k	2k	4k	8k	$Ød_y$ mm	m kg
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

Exhaust air terminal device SLKNU 50

Description

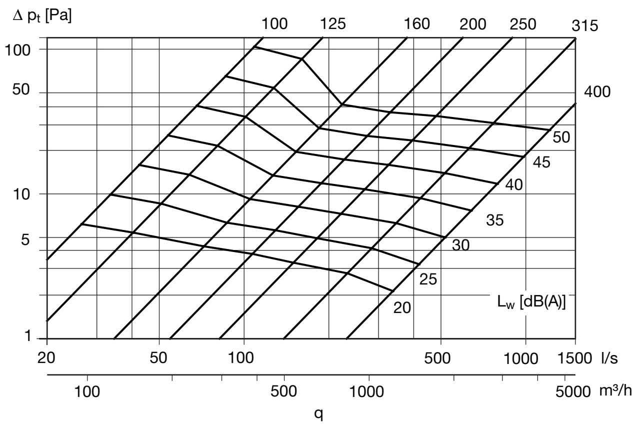
SLKNU is an exhaust air terminal device consisting of a silencer with 50 mm insulation and conical inlet with net.

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

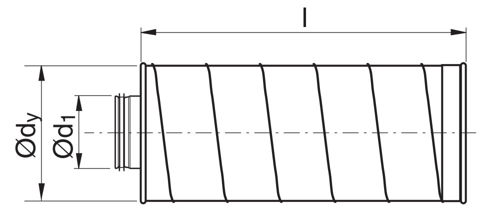
Air flow q [l/s] and [m³/h], total pressure Δ_{pt} [Pa] and sound pressure level L_W [dB(A)] is read in the graph.



Ordering example

	SLKNU	125	600	50
Product	SLKNU			
Dimension $Ød_1$		125		
Length, nominal			600	
Insulation thickness				50

Dimensions



Self attenuation ΔL

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

$Ød_1$ nom	Length nom	Attenuation [dB] centre frequency [Hz] Hz 63	125	250	500	1k	2k	4k	8k	$Ød_y$ mm	l mm	m kg
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	379	4,03
200	600	2	3	7	16	21	23	9	8	325	679	6,82
200	900	2	4	8	24	32	34	13	10	325	979	9,66
200	1200	3	5	10	31	43	45	18	13	325	1279	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	465	701	11,4
315	900	1	3	7	16	22	12	6	7	465	1001	16,0
315	1200	1	3	8	22	30	16	7	9	465	1301	21,0
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 two loose couplings

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

$Ød_1$ 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

Description

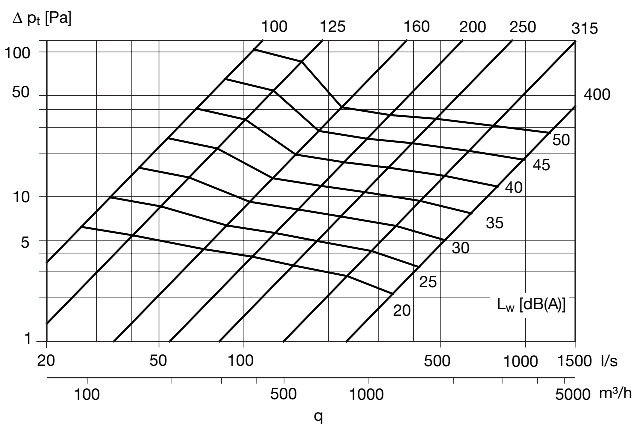
SLKNU is an exhaust air terminal device consisting of a silencer with 100 mm insulation and conical inlet with net.

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

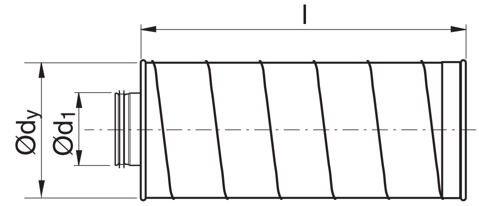
Air flow q [l/s] and [m³/h], total pressure Δp_t [Pa] and sound pressure level L_W [dB(A)] is read in the graph.



Ordering example

	SLKNU	200	600	100
Product	SLKNU			
Dimension $Ød_1$		200		
Length, nominal			600	
Insulation thickness				100

Dimensions



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

$Ød_1$ nom	Length nom	63	125	250	500	1k	2k	4k	8k	$Ød_y$ mm	l mm	m kg
		Attenuation [dB] centre frequency [Hz] Hz										
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 two loose couplings

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

$Ød_1$ mm	63	125	250	500	1k	2k	4k	8k
	Correction, k_{ok}, in dB at middle frequency Hz							
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

Dampers and Measure units

Content – Dampers and Measure units

We reserve the right to make changes without prior notice

Lindab

Content – Dampers

Tightness classes

Tightness class				
0	1	2	3	4
To regulate		To shut-off		
DRU DIRU DIRBU DIRVU DSU Ø63–315 PSDRU TDRU TASU DAU DA2EU DAVU	DSU Ø400–1000 TDSU	TATU TATBU		
			DTPU Ø400–630	DTU Ø400–630 DTHU Ø400–630 DTBU Ø400–630 DTBCU Ø400–630
			DTPU Ø80–315	DTU Ø80–315 DTHU Ø80–315 DTBU Ø80–315 DTBCU Ø80–315

Summary, motorized dampers

This is the standard range. Other combinations of dampers and motors can be ordered

Motor	Forward Return	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
	Regula- ting	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
	Denomina- tion	LM 24A (-F) LM 230A (-F)	NM 24A (-F) NM 230A (-F)	SM 24A SM 230A	TF 24 TF 230	LF 24 LF 230	AF 24 AF 230	LM 24A -SR	NM 24A -SR	SM 24A -SR	AK 31 P	AK 41 P	AK 42 P
Original damper		Motorized damper											
DTU		DTBU Ø80–315	DTBU Ø400–500	DTBU Ø630	DTBCU Ø80–200	DTBCU Ø250–315	DTBCU Ø400–630				DTPU Ø80–200	DTPU Ø250–315	DTPU Ø400–630
TATU			TATBU Ø100–400										
DAU		DA2EU Ø80–315						DAVU Ø80–315					
DIRU			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 with KOMHY and long spindle
Belimo LM	LÖMOK + VREDF 15 60	– (Motor fits directly)
Belimo NM	LÖMOK + VREDF 15 100 or KOMHY + VREDF 15 60	– (Motor fits directly)
Belimo SM	KOMHY + VREDF 15 60	– (Motor fits directly)
Belimo TF	LÖMOK + VREDF 15 100 or KOMHY + VREDF 15 100	– (Motor fits directly)
Belimo LF	KOMHY + VREDF 15 100	– (Motor fits directly)
Belimo AF	KOMHY + VREDF 15 100	– (Motor fits directly)
Sauter AK 31 P	KOMHY + VREDF 15 100 + MSATS AK 31 P	MSATS AK 31 P
Sauter AK 41 P	KOMHY + VREDF 15 100 + MSATS AK 41 P	MSATS AK 41 P
Sauter AK 42 P	Special shelf + VREDF 15 100 + MSATS AK 42 P	Motor does **not** 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.

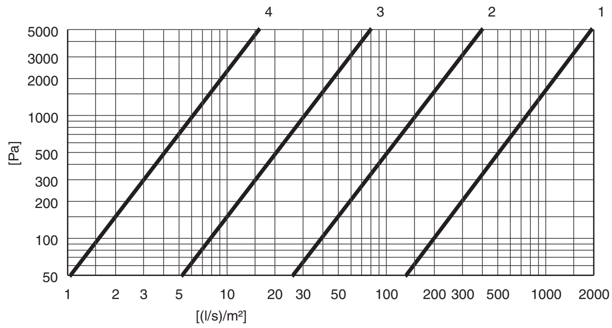
Shut-off dampers are used to save energy, to prevent the spread of poisonous gas etc. These dampers often have rubber seals on the damper blade. The damper can either be designed as a straight piece of ducting, or as a T-piece to switch the air flow from one duct to another. The blade is normally either 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 throu 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.
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.

Tightness past the closed damper blade



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.

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 133.

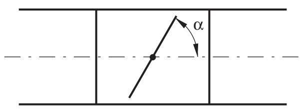
Regulating damper DRU

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.

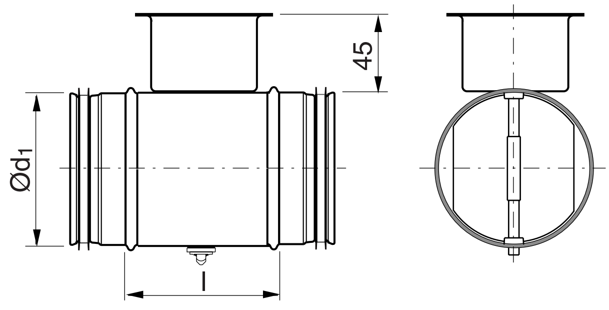
Setting angle α
α = 0° = open blade, α = 90° = closed blade



The cup at Ø 80–630 can be complemented with the special insulation cup IK at insulation thicker than 50 mm.

Property	Ø 80–315	Ø 400	Ø 500	Ø 630	Ø 800	Ø 1000
The blade is set via a knob in a protective cup.	×	×	×	×		
The setting of the blade is read against an embossed scale at the rim of the cup.	×	×	×	×		
The blad is locked with two screws, type Pozidriv (PZD2).	×	×	×	×		
The blade has reinforced locking with a sturdy wing nut.					×	×
The blade is reinforced.			×	×		
The blade is additionally reinforced.					×	×
With sturdy handle.		×	×	×		
With additionally reinforced handle.					×	×
With reinforced stop beads.			×	×		
The axle is reinforced.					×	×
The damper can be delivered prepared for motor.	×	×	×	×		
The damper can be delivered with motor.	×	×	×	×	×	×

Dimensions



$Ød_1$ nom	l mm	m kg	Sealing class past 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

Reinforced blade

Ordering example

DRU 125

Product — DRU
Dimension $Ød_1$ — 125

We reserve the right to make changes without prior notice

Lindab

Regulating damper DRU

Technical data

Pressure drop graphs with noise data for dimensioning

The solid curves show the pressure drop, Δpt, over the damper as a function of flow q, and setting angle α.
The dashed curves give the A-weighted sound power data, L_{WA}, in dB to the duct.

Example

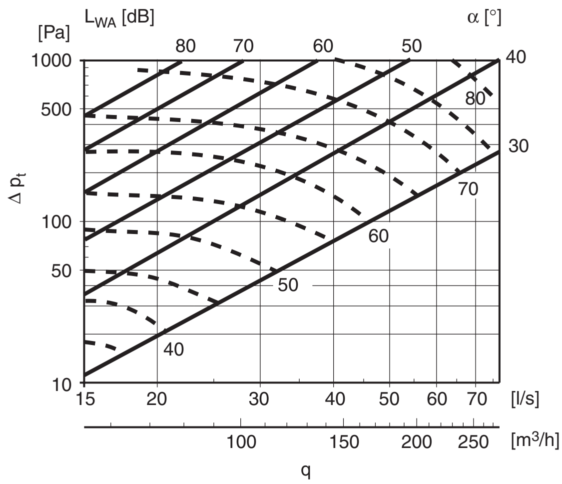
Given

Dimension Ø100
Flow 60 l/s
Pressure drop 200 Pa

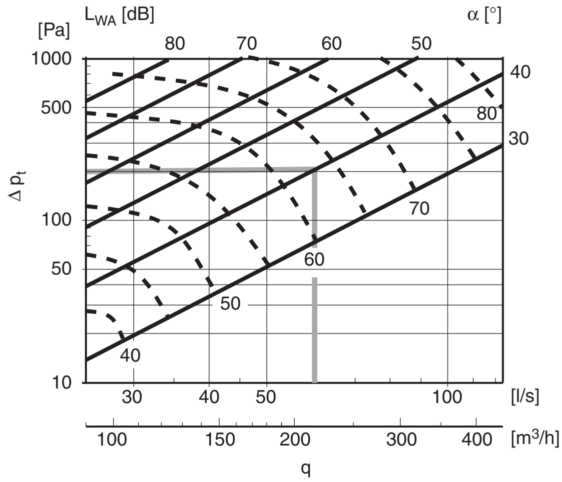
Obtained from graph

Setting angle 40°
Sound power level 63 dB (A)

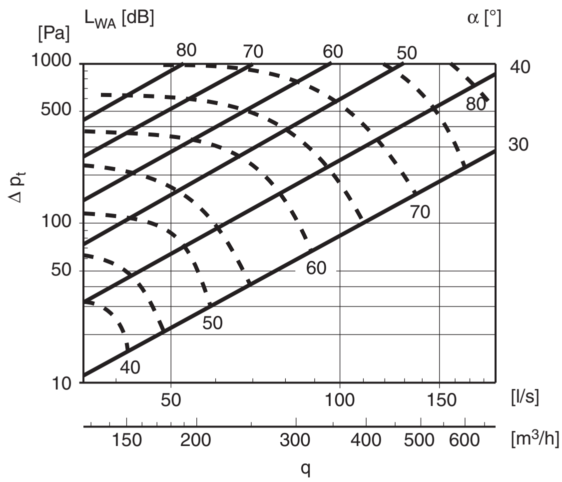
Ø80



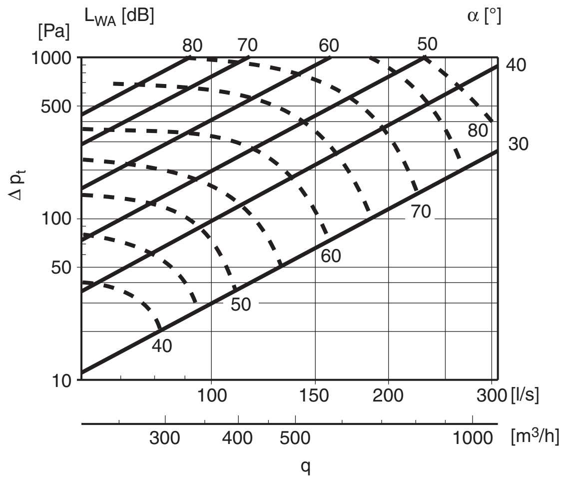
Ø100



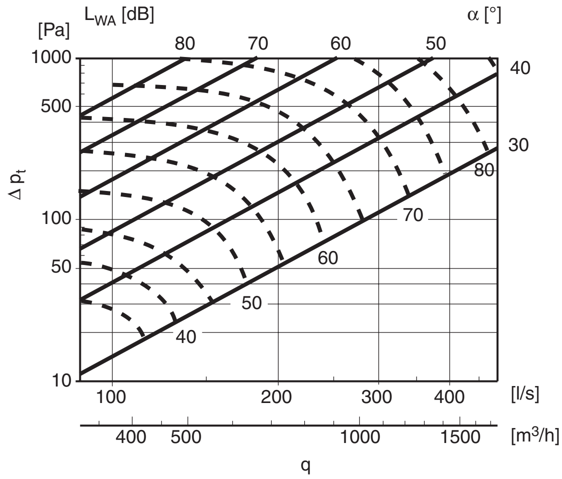
Ø125



Ø160

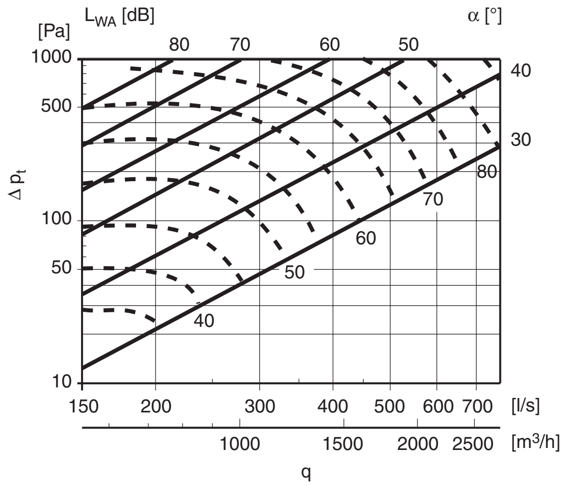


Ø200

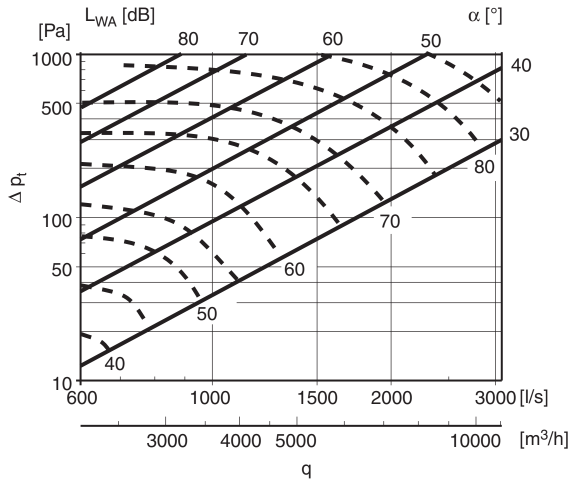


Regulating damper DRU

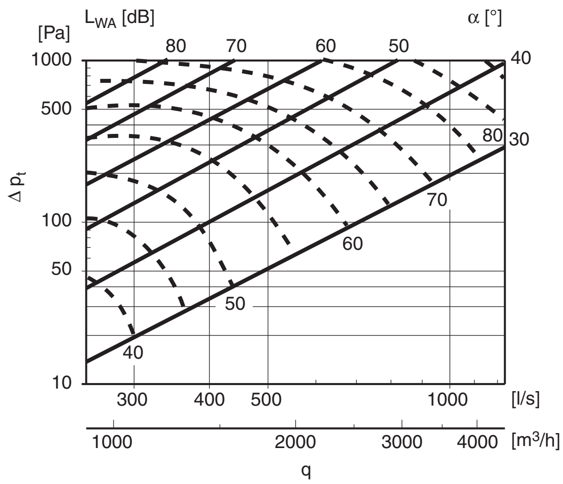
Ø250



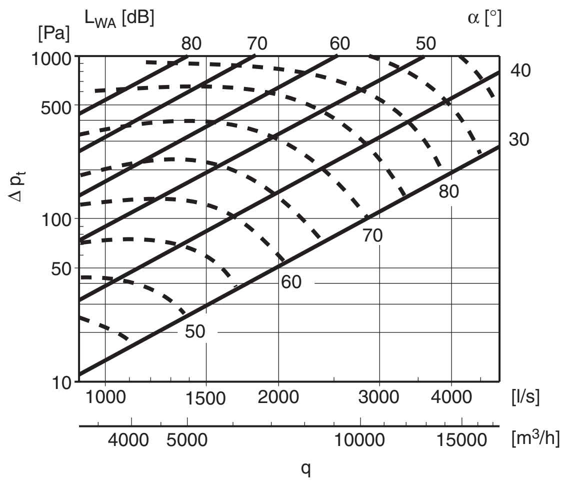
Ø500



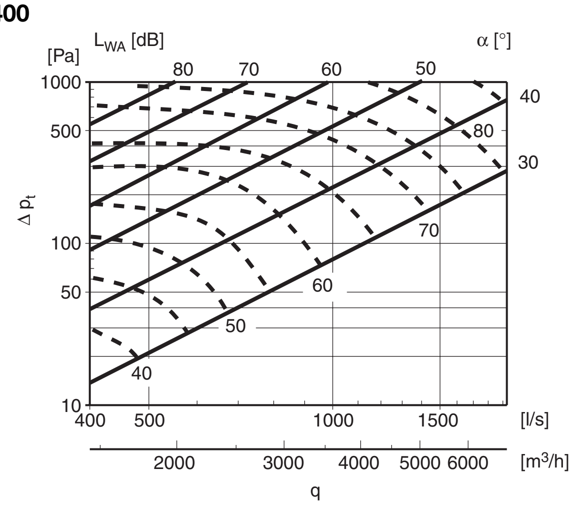
Ø315



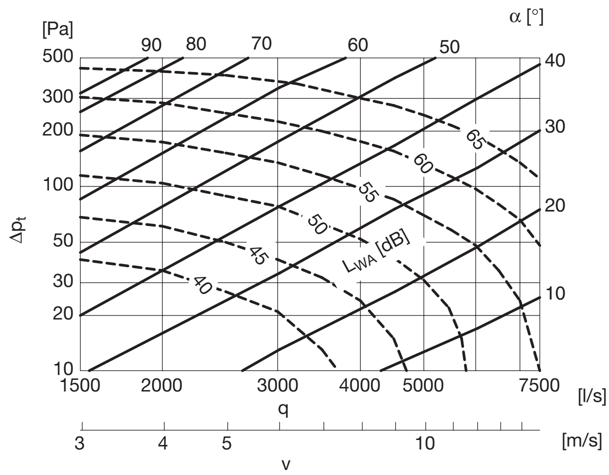
Ø630



Ø400

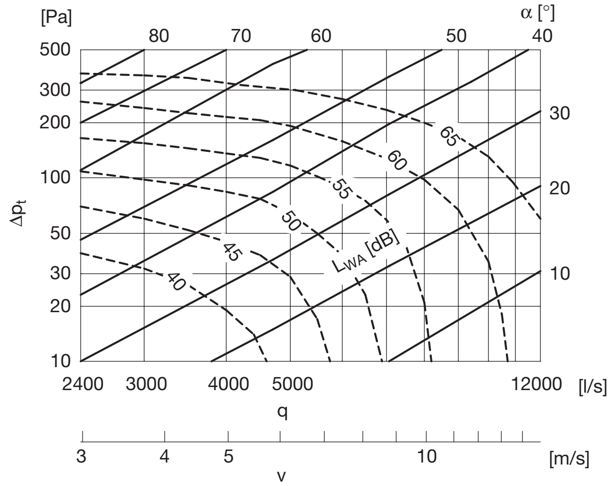


Ø800



Regulating damper DRU

Ø1000



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18

Regulating damper DRU

Sound data for DRU

Sound power level L_W, [dB] to duct in the octave bands 1–8, 63–8000 Hz, as a function of dimension, flow and pressure drop.

The methods ISO 5135 and ISO 3741 have been used to measure these sound values, as recommended by the Swedish National Testing and Research Institute.

dim $Ød_1$	Pressure drop [Pa]	Velocity app. 3 [m/s]								Velocity app. 6 [m/s]								Velocity app. 9 [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 15 [l/s]								Flow 30 [l/s]								Flow 45 [l/s]							
	500	65	65	65	65	59	55	49	46	67	67	67	67	60	57	50	47	70	70	70	70	63	60	53	49
	300	63	63	60	60	54	48	42	36	66	66	63	63	56	50	44	38	70	70	67	67	60	54	47	40
	200	63	63	60	54	51	43	34	29	65	65	62	56	53	44	35	30	70	70	67	60	57	48	38	32
	100	55	60	53	48	43	30	23	15	59	65	57	51	46	32	24	16	66	72	63	57	51	36	27	18
	50	56	54	47	43	36	25	16	9	59	59	52	47	40	27	17	10	-	-	-	-	-	-	-	-
100		Flow 25 [l/s]								Flow 50 [l/s]								Flow 75 [l/s]							
	500	67	64	64	57	54	48	48	48	72	68	68	62	59	52	52	52	78	75	75	67	64	57	57	57
	300	62	61	60	54	51	45	42	42	68	68	68	59	56	50	47	47	75	74	73	65	61	54	51	51
	200	58	58	58	50	48	40	37	37	65	65	64	57	54	45	42	42	74	73	73	64	59	50	47	46
	100	58	55	53	46	41	34	26	24	68	66	62	54	48	40	31	29	79	75	71	62	56	46	36	33
	50	55	53	48	42	35	26	22	18	69	67	60	53	44	33	28	22	-	-	-	-	-	-	-	-
125		Flow 40 [l/s]								Flow 80 [l/s]								Flow 120 [l/s]							
	500	71	68	65	59	56	50	50	47	76	73	70	63	60	53	53	50	83	79	76	68	65	58	58	54
	300	66	66	60	55	52	46	43	40	73	73	67	60	57	51	48	44	79	79	72	66	62	55	52	48
	200	65	62	57	51	46	41	38	38	74	71	65	59	53	47	43	43	82	78	71	65	58	51	48	48
	100	64	59	53	47	39	34	29	27	77	70	63	55	47	40	35	32	84	78	70	61	51	45	39	35
	50	63	54	50	41	36	27	25	20	80	68	60	51	43	34	32	26	-	-	-	-	-	-	-	-
160		Flow 60 [l/s]								Flow 120 [l/s]								Flow 180 [l/s]							
	500	68	67	64	59	55	53	52	51	72	71	68	62	59	55	54	53	78	77	74	67	63	60	59	58
	300	63	62	59	55	52	49	46	45	67	66	64	58	55	52	49	48	75	75	71	65	61	58	54	54
	200	61	58	56	50	48	42	40	40	68	65	62	56	53	47	44	44	76	73	69	63	59	53	50	50
	100	59	54	50	45	40	35	33	31	70	64	60	53	48	42	39	38	77	73	69	61	54	48	45	44
	50	54	50	46	37	33	29	25	25	69	64	58	48	42	37	32	32	-	-	-	-	-	-	-	-
200		Flow 100 [l/s]								Flow 200 [l/s]								Flow 300 [l/s]							
	500	70	64	61	55	52	52	55	55	75	68	65	59	55	55	59	59	83	76	72	65	61	61	65	65
	300	67	62	56	50	48	45	48	48	74	68	62	55	52	51	53	52	84	78	71	64	61	57	60	60
	200	62	57	55	47	44	42	42	42	71	65	62	53	50	48	47	47	83	76	71	62	58	55	54	54
	100	57	52	48	41	39	36	34	34	69	64	58	50	47	44	42	42	83	76	69	59	56	53	50	50
	50	51	45	41	36	32	32	28	28	63	56	51	44	39	39	34	34	-	-	-	-	-	-	-	-
250		Flow 150 [l/s]								Flow 300 [l/s]								Flow 450 [l/s]							
	500	69	66	59	53	50	54	53	52	71	67	61	56	53	56	55	54	78	75	68	61	58	61	60	59
	300	63	61	55	50	47	46	48	47	66	63	57	51	48	47	51	48	75	72	65	59	55	55	59	55
	200	59	57	52	46	44	41	44	44	63	60	55	49	46	44	46	46	72	69	63	57	55	54	54	53
	100	56	52	45	41	38	36	34	31	63	57	51	45	43	40	38	35	75	69	60	56	52	49	45	42
	50	52	48	40	38	34	30	28	24	61	56	47	45	40	38	33	28	-	-	-	-	-	-	-	-
315		Flow 250 [l/s]								Flow 500 [l/s]								Flow 750 [l/s]							
	500	68	65	59	53	50	50	53	50	74	71	65	58	55	55	58	55	82	78	71	64	60	60	54	60
	300	62	59	54	49	46	45	49	43	69	66	60	54	51	51	53	48	78	74	68	61	57	57	61	54
	200	60	55	50	45	43	40	43	40	70	64	58	52	49	48	49	46	79	72	66	59	58	57	56	52
	100	54	52	45	41	38	36	36	31	66	63	55	50	47	46	44	39	76	72	64	57	54	52	50	44
	50	49	49	43	38	34	32	30	24	64	64	56	49	45	42	40	32	-	-	-	-	-	-	-	-
400		Flow 400 [l/s]								Flow 800 [l/s]								Flow 1200 [l/s]							
	500	79	73	67	62	57	60	59	58	82	75	68	65	59	62	61	60	88	81	74	70	62	66	65	64
	300	72	66	60	54	51	51	51	51	77	70	64	58	56	55	54	54	84	77	70	63	62	61	60	60
	200	67	62	56	50	48	48	48	45	74	68	62	56	53	52	52	49	82	75	68	61	60	59	58	54
	100	61	56	49	44	42	39	39	34	72	66	58	53	49	47	46	40	83	76	67	60	58	55	53	47
	50	57	52	44	39	37	35	34	26	72	67	56	50	47	44	44	33	-	-	-	-	-	-	-	-
500		Flow 600 [l/s]								Flow 1200 [l/s]								Flow 1800 [l/s]							
	500	84	77	70	64	63	62	61	60	85	78	71	65	64	63	62	61	91	84	76	68	67	68	68	67
	300	77	70	64	58	54	54	58	58	80	74	67	60	57	57	60	60	88	80	73	66	62	62	66	66
	200	71	65	59	53	50	50	50	47	77	70	64	58	56	55	54	51	85	78	72	65	63	61	60	57
	100	63	58	53	47	46	44	42	37	72	66	60	55	53	51	49	43	82	75	70	63	60	57	55	50
	50	59	52	47	44	42	38	38	31	71	63	57	54	51	46	46	37	-	-	-	-	-	-	-	-
630		Flow 1000 [l/s]								Flow 2000 [l/s]								Flow 3000 [l/s]							
	500	88	80	73	69	66	64	63	62	90	83	75	71	68	67	65	64	96	88	80	76	72	72	70	68
	300	82	75	69	65	62	61	58	55	84	77	70	67	63	62	61	56	92	84	77	73	69	68	68	61
	200	78	72	65	62	59	55	55	49	80	74	67	64	60	57	57	50	89	82	75	71	67	63	63	56
	100	71	66	59	54	50	46	45	40	78	71	66	59	56	49	47	44	90	82	76	68	63	58	55	50
	50	66	58	53	48	43	40	39	30	77	68	62	57	51	45	48	36	-	-	-	-	-	-	-	-
800		Flow 1500 [l/s]								Flow 3000 [l/s]								Flow 4500 [l/s]							
	500	–	–	–	–	–	–	–	–	72	65	62	63	62	62	61	56	78	70	66	66	65	64	63	58
	300	62	55	51	52	53	54	51	43	69	62	58	59	57	56	55	49	75	67	62	62	60	59	57	51
	200	58	52	49	49	50	49	45	37	67	60	56	55	53	52	49	43	72	64	60	59	57	55	52	46
	100	55	48	45	44	44	40	35	29	63	55	51	49	47	44	40	34	68	59	55	53	51	48	44	37
	50	52	44	40	38	35	31	26	20	60	50	46	44	41	37	33	25	66	55	51	48	45	42	37	30
	25	48	40	36	32	29	23	19	10	58	45	42	39	35	30	25	17	64	51	48	44	40	37	31	24
1000		Flow 2400 [l/s]								Flow 4700 [l/s]								Flow 7100 [l/s]							
	500	–	–	–	–	–	–	–	–	77	70	66	67	64	64	63	57	81	74	69	69	67	65	64	58
	300	66	59	55	56	55	56	53	45	74	66	61	60	58	57	56	48	79	71	65	64	61	59	58	51
	200	64	56	53	52	52	51	48	38	72	64	58	56	54	52	50	42	76	69	63	60	57	55	53	45
	100	60	52	46	45	44	41	37	28	67	58	53	49	47	44	40	32	72	64	58	55	52	49	47	39
	50	56	47	40	39	36	31	27	15	62	54	48	44	41	37	33	25	68	60	54	52	48	45	43	36
	25	53	41	36	36	30	23	16	8	58	50	44	40	37	33	28	25	65	57	51	50	45	43	41	34

Regulating damper

DRU

dim Ød_1	Pressure drop [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	83	73	69	69	68	66	65	60	–	–	–	–	–	–	–	–
	300	79	70	65	65	63	61	59	54	83	73	68	67	66	64	62	57
	200	77	67	63	62	60	58	55	49	80	70	66	65	63	61	58	52
	100	73	63	59	57	55	52	48	42	77	67	62	60	57	55	51	45
	50	71	60	55	52	49	47	41	35	76	65	61	58	54	52	47	40
	25	71	59	54	51	48	44	39	32	76	65	60	57	54	50	45	38
1000		Flow 9400 [l/s]								Flow 11800 [l/s]							
	500	85	77	71	71	68	67	65	60	–	–	–	–	–	–	–	–
	300	82	74	68	66	64	62	60	54	–	–	–	–	–	–	–	–
	200	80	71	65	64	61	58	57	50	–	–	–	–	–	–	–	–
	100	76	67	61	59	56	54	52	46	–	–	–	–	–	–	–	–
	50	73	65	58	57	54	51	50	45	–	–	–	–	–	–	–	–
	25	72	64	58	57	53	51	49	44	–	–	–	–	–	–	–	–

Damper with flow meter

DIRU

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.

A special mounting, measuring, balancing and maintenance instruction exists for this product.

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.

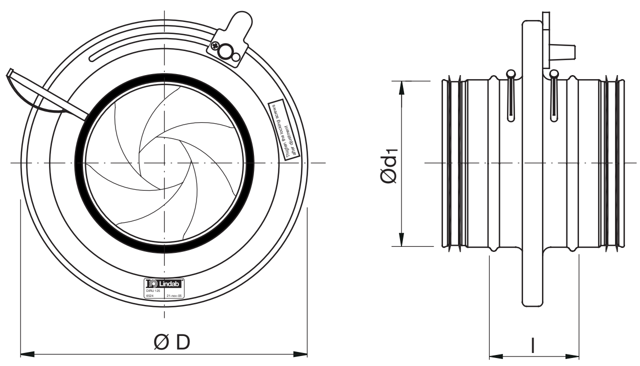
Cleaning
By fully open the damper, one get access to the duct. Do not forget to readjust the damper after cleaning.

Ordering example

DIRU 160

Product
Dimension $Ød_1$

Dimensions

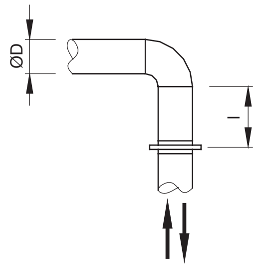
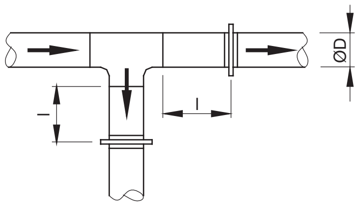
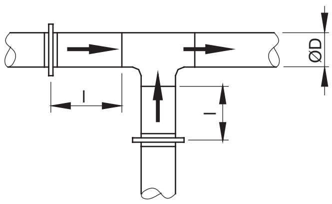
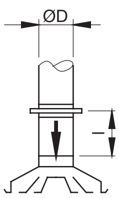


$Ød_1$ nom	ØD mm	l mm	m kg
100	163	54	0,80
125	210	63	1,20
150	230	53	1,40
160	230	60	1,40
200	285	62	2,00
250	333	62	2,60
300	406	65	3,00
315	406	63	3,40
400	560	70	6,90
500	644	60	7,90
630	811	60	11,9

Damper with flow meter

DIRU

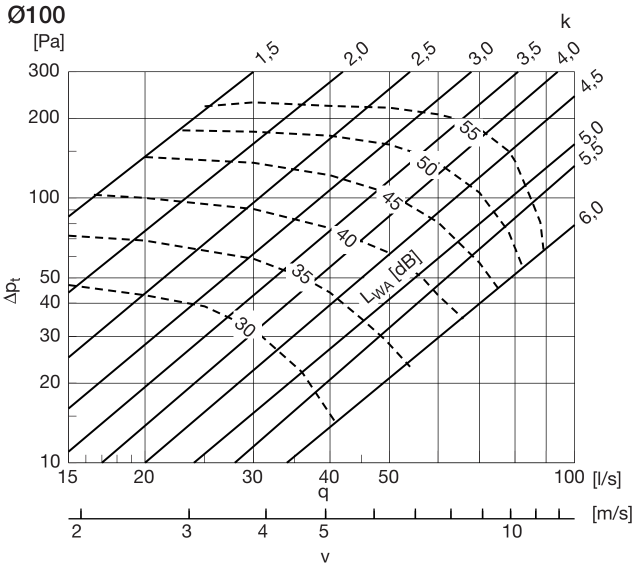
Technical data for DIRU, DIRBU and DIRVU

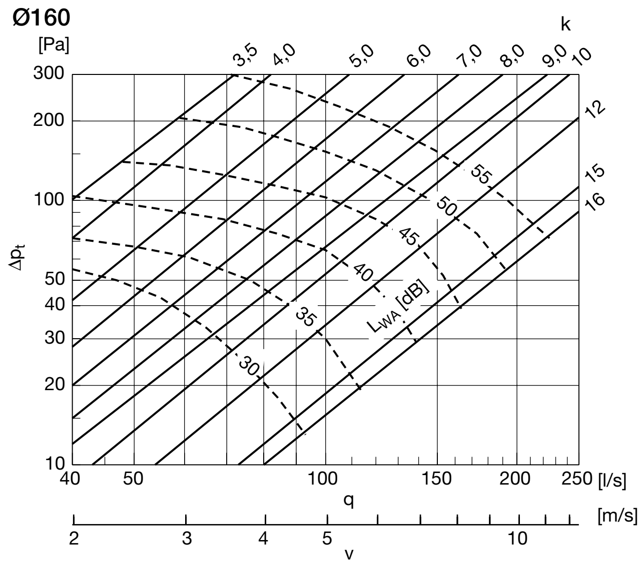
l = straigh distance before and after dis-turbances	Method error ± 7%
	l ≥ 1 D
	l ≥ 1 D
	l ≥ 3 D
	l ≥ 3 D

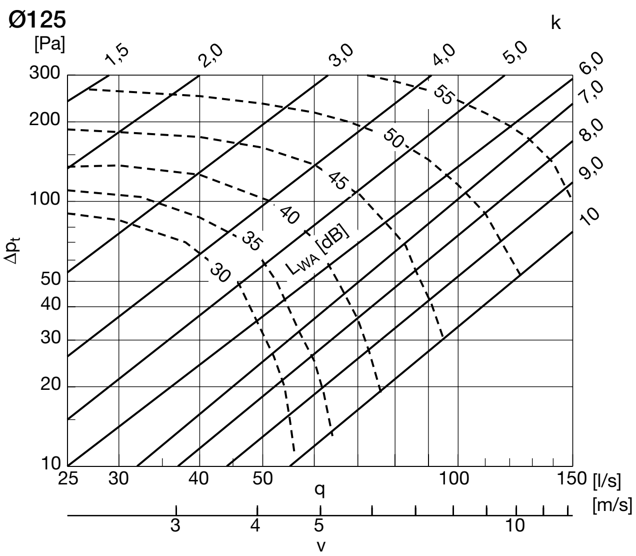
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

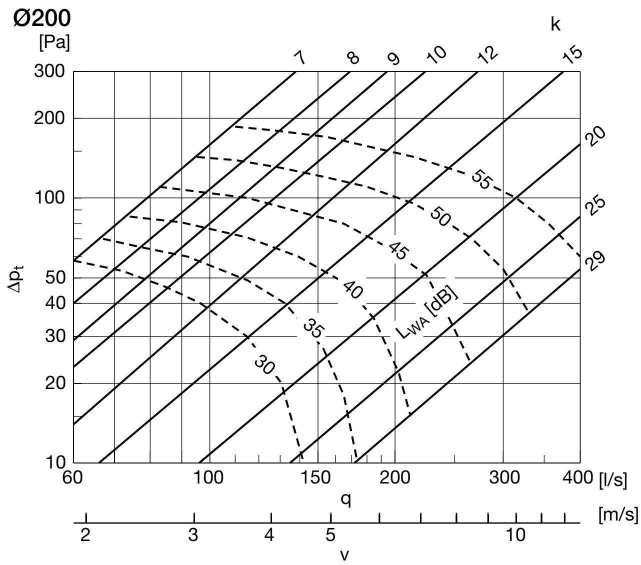
Damper with flow meter DIRU, DIRBU, DIRVU

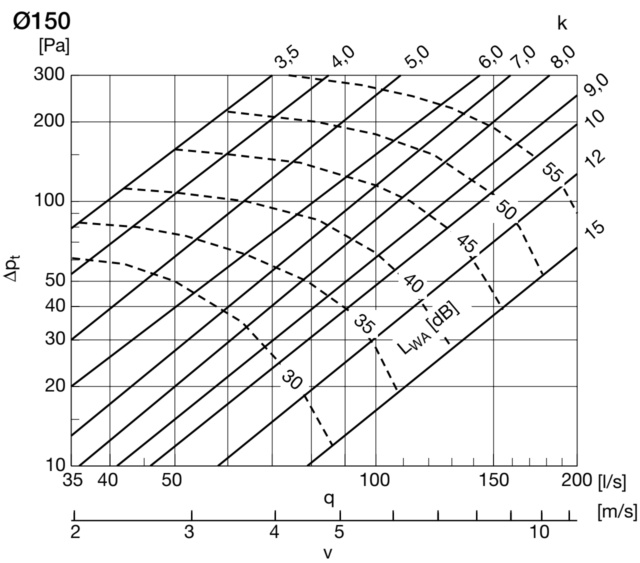
Pressure drop graph with noise data for dimensioning

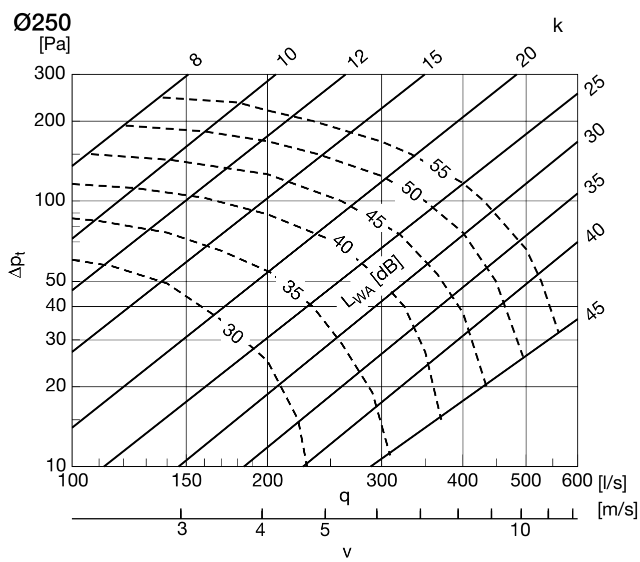






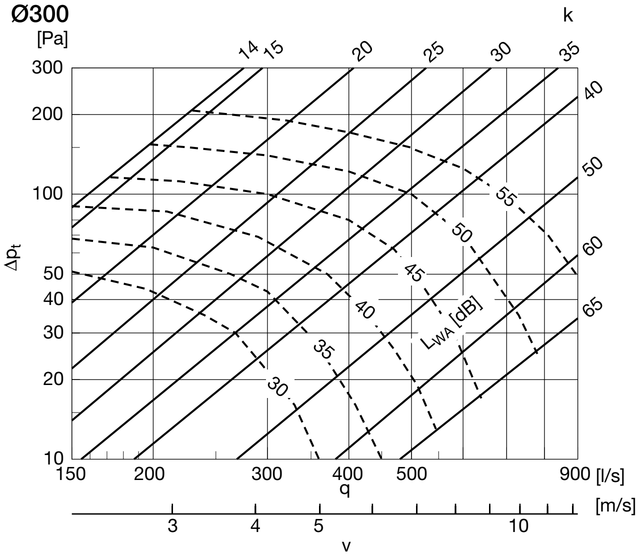




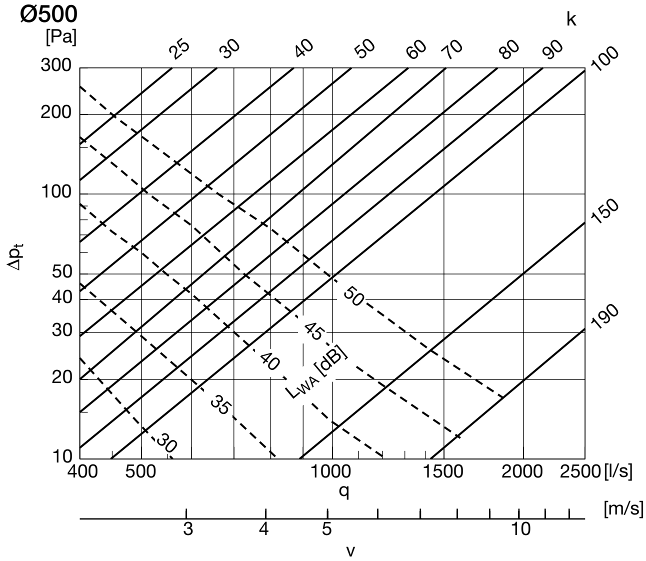


Damper with flow meter DIRU, DIRBU, DIRVU

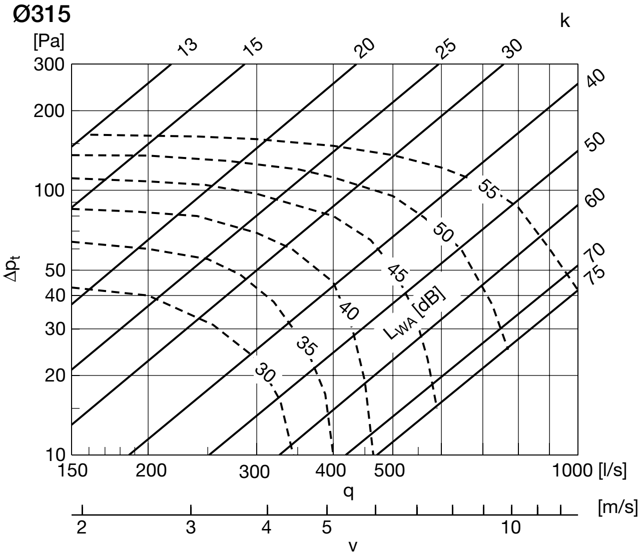
Ø300



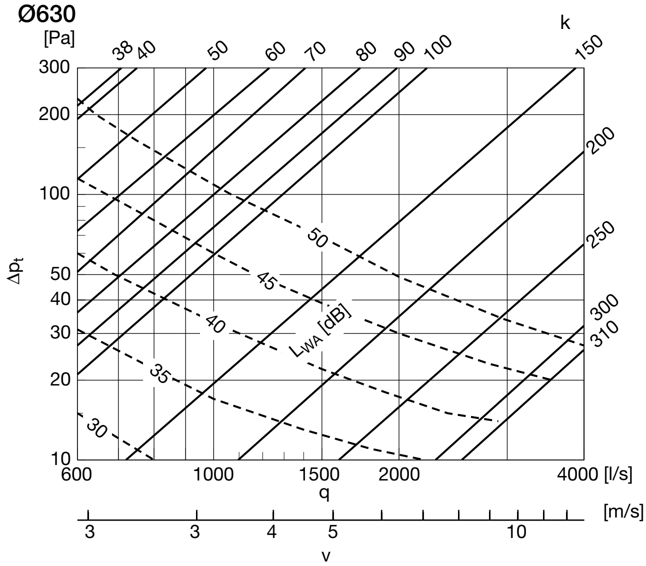
Ø500



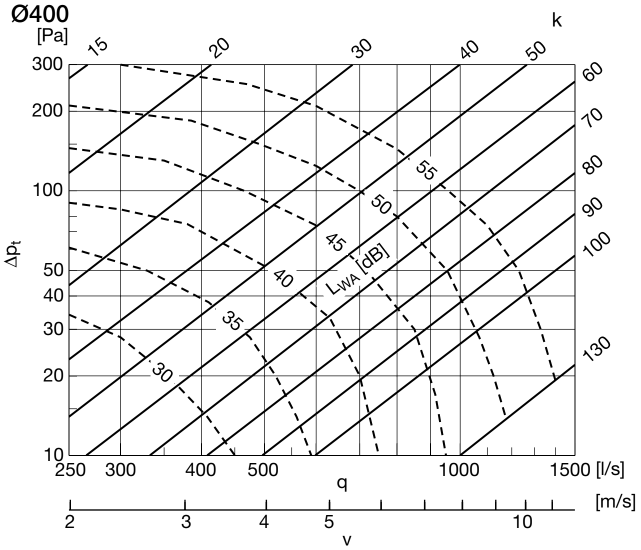
Ø315



Ø630



Ø400



Damper with flow meter DIRU, DIRBU, DIRVU

Sound data for DRU

Sound power level L_W, [dB] to duct in the octave bands 1–8, 63–8000 Hz, as a function of dimension, flow and pressure drop.

Velocity app. 2[m/s] – Centre frequency [Hz]

dim $Ød_1$	Pressure drop [Pa]	63	125	250	500	1k	2k	4k	8k
100		Flow 15 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	–	–	–	–	–	–	–	–
	50	64	57	44	34	25	16	7	3
	20	–	–	–	–	–	–	–	–
125		Flow 25 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	73	68	57	46	36	27	19	16
	100	60	55	44	33	23	14	6	3
	50	–	–	–	–	–	–	–	–
	20	–	–	–	–	–	–	–	–
150		Flow 35 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	–	–	–	–	–	–	–	–
	50	–	–	–	–	–	–	–	–
	20	–	–	–	–	–	–	–	–
160		Flow 40 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	67	58	48	38	30	22	13	10
	50	–	–	–	–	–	–	–	–
	20	–	–	–	–	–	–	–	–
200		Flow 65 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	–	–	–	–	–	–	–	–
	50	–	–	–	–	–	–	–	–
	20	–	–	–	–	–	–	–	–
250		Flow 100 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	58	48	38	36	26	21	14	11
	50	–	–	–	–	–	–	–	–
	20	–	–	–	–	–	–	–	–
300		Flow 150[l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	57	49	40	38	31	26	17	16
	50	46	38	29	27	20	15	6	5
	20	–	–	–	–	–	–	–	–
315		Flow 160 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	58	51	42	40	34	29	20	20
	50	47	40	31	29	23	18	9	9
	20	–	–	–	–	–	–	–	–
400		Flow 250 [l/s]							
	300	67	60	52	51	45	41	35	33
	200	63	56	48	47	41	37	31	29
	100	55	48	40	39	33	29	23	21
	50	46	39	31	30	24	20	14	12
	20	–	–	–	–	–	–	–	–
500		Flow 400 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	70	60	51	45	37	31	22	17
	100	63	53	44	38	30	24	15	10
	50	58	48	39	33	25	19	10	5
	20	51	41	32	26	18	12	3	0
630		Flow 620 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	69	59	52	47	42	39	36	30
	100	64	54	47	42	37	34	31	25
	50	58	48	41	36	31	28	25	19
	20	52	42	35	30	25	27	19	13

Velocity app. 3[m/s] – Centre frequency [Hz]

dim $Ød_1$	Pressure drop [Pa]	63	125	250	500	1k	2k	4k	8k
100		Flow 25 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	85	78	65	55	46	37	28	–
	100	74	67	54	44	35	26	17	–
	50	66	59	46	36	27	18	9	5
	20	–	–	–	–	–	–	–	–
125		Flow 35 [l/s]							
	300	79	74	63	52	42	33	25	22
	200	73	68	57	46	36	27	19	16
	100	62	57	46	35	25	16	8	5
	50	–	–	–	–	–	–	–	–
	20	–	–	–	–	–	–	–	–
150		Flow 55 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	74	68	56	46	38	30	21	18
	100	65	59	47	37	29	21	12	9
	50	57	51	39	29	21	13	4	1
	20	–	–	–	–	–	–	–	–
160		Flow 60 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	77	68	58	48	40	32	23	20
	100	69	60	50	40	32	24	15	12
	50	60	51	41	31	23	15	6	3
	20	–	–	–	–	–	–	–	–
200		Flow 95 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	69	59	50	41	33	27	20	16
	50	58	48	39	30	22	16	9	5
	20	–	–	–	–	–	–	–	–
250		Flow 150 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	71	61	51	49	39	34	27	24
	100	60	50	40	38	28	23	16	13
	50	51	41	31	29	19	14	7	4
	20	–	–	–	–	–	–	–	–
300		Flow 210[l/s]							
	300	–	–	–	–	–	–	–	–
	200	70	62	53	51	44	39	30	29
	100	59	51	42	40	33	28	19	18
	50	49	41	32	30	23	18	9	8
	20	–	–	–	–	–	–	–	–
315		Flow 230 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	59	52	43	41	35	30	21	21
	50	48	41	32	30	24	19	10	10
	20	–	–	–	–	–	–	–	–
400		Flow 380 [l/s]							
	300	69	62	54	53	47	43	37	35
	200	64	57	49	48	42	38	32	30
	100	56	49	41	40	34	30	24	22
	50	50	43	35	34	28	24	18	16
	20	44	37	29	28	22	18	12	10
500		Flow 590 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	69	59	50	44	36	30	21	16
	50	63	53	44	38	30	24	15	10
	20	57	47	38	32	24	18	9	4
630		Flow 940 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	67	57	50	45	40	37	34	28
	50	62	52	45	40	35	32	29	23
	20	55	45	38	33	28	25	22	6

Velocity app. 6[m/s] – Centre frequency [Hz]

dim $Ød_1$	Pressure drop [Pa]	63	125	250	500	1k	2k	4k	8k
100		Flow 45 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	86	79	68	56	47	38	29	–
	100	77	70	57	47	38	29	20	–
	50	70	63	50	40	31	22	13	9
	20	66	59	46	36	27	18	9	–
125		Flow 75 [l/s]							
	300	82	77	66	55	45	36	28	25
	200	78	73	62	51	41	32	24	21
	100	72	67	56	45	35	26	18	15
	50	70	65	54	43	33	24	16	13
	20	67	62	51	40	30	21	13	10
150		Flow 110 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	78	72	60	50	42	34	25	22
	100	71	65	53	43	35	27	18	15
	50	66	60	48	38	30	22	13	10
	20	62	56	44	34	26	18	9	6
160		Flow 120 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	82	73	63	53	45	37	28	25
	100	74	65	55	45	37	29	20	17
	50	68	59	49	39	31	23	14	11
	20	63	54	44	34	26	18	9	6
200		Flow 190 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	75	65	56	47	39	33	26	22
	50	68	58	49	40	32	26	19	15
	20	63	53	44	35	27	21	14	10
250		Flow 290 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	67	57	47	45	35	30	23	20
	50	59	49	39	37	27	22	15	12
	20	55	45	35	33	23	18	11	8
300		Flow 420[l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	64	56	47	45	38	33	24	23
	50	58	50	41	39	32	27	18	17
	20	53	45	36	34	27	22	13	12
315		Flow 470 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	65	58	49	47	41	36	27	27
	50	59	52	43	41	35	30	21	21
	20	56	49	40	38	32	27	18	18
400		Flow 750 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	65	58	50	49	43	39	33	31
	50	59	52	44	43	37	33	27	25
	20	55	48	40	39	33	29	23	21
500		Flow 1180 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	–	–	–	–	–	–	–	–
	50	–	–	–	–	–	–	–	–
	20	67	57	48	42	34	28	19	14
630		Flow 1870 [l/s]							
	300	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–
	100	–	–	–	–	–	–	–	–
	50	69	59	52	47	42	39	36	30
	20	60	50	43	38	33	30	27	21

Damper with flow meter

DIRU, DIRBU, DIRVU

dim Ød$_1$	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
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	77	70	57	47	38	29	20	16	–	–	–	–	–	–	–	–
	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
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	75	70	59	48	38	29	21	18	–	–	–	–	–	–	–	–
	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
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	73	67	55	45	37	29	20	17	–	–	–	–	–	–	–	–
	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
160		Flow 180 [l/s]								Flow 240 [l/s]							
	300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	100	81	72	62	52	44	36	27	24	–	–	–	–	–	–	–	–
	50	75	66	56	46	38	30	21	18	–	–	–	–	–	–	–	–
	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
200		Flow 280 [l/s]								Flow 380 [l/s]							
	300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	100	79	69	60	51	43	37	30	26	–	–	–	–	–	–	–	–
	50	73	63	54	45	37	31	24	20	78	68	59	50	42	36	29	25
	20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
250		Flow 440 [l/s]								Flow 590 [l/s]							
	300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	100	76	66	56	54	44	39	32	29	–	–	–	–	–	–	–	–
	50	70	60	50	48	38	33	26	23	–	–	–	–	–	–	–	–
	20	65	55	45	43	33	28	21	18	–	–	–	–	–	–	–	–
300		Flow 640 [l/s]								Flow 850[l/s]							
	300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	100	70	62	53	51	44	39	30	29	–	–	–	–	–	–	–	–
	50	66	58	49	47	40	35	26	25	70	62	53	51	44	39	30	29
	20	62	54	45	43	36	31	22	21	–	–	–	–	–	–	–	–
315		Flow 700 [l/s]								Flow 940 [l/s]							
	300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	100	70	63	54	52	46	41	32	32	–	–	–	–	–	–	–	–
	50	66	59	50	48	42	37	28	28	70	63	54	52	46	41	32	32
	20	63	56	47	45	39	34	25	25	–	–	–	–	–	–	–	–
400		Flow 1130 [l/s]								Flow 1500 [l/s]							
	300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	100	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	50	66	59	51	50	44	40	34	32	–	–	–	–	–	–	–	–
	20	63	56	48	47	41	37	31	29	–	–	–	–	–	–	–	–
500		Flow 1770 [l/s]								Flow 2360 [l/s]							
	300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	100	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	50	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	20	73	63	54	48	40	34	25	20	–	–	–	–	–	–	–	–
630		Flow 2810 [l/s]								Flow 3740 [l/s]							
	300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	200	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	100	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	50	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	20	63	53	46	41	36	33	30	24	64	54	47	42	37	34	31	25

Shut-off damper DSU

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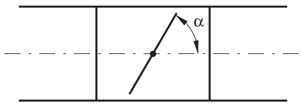
Description

Has a turning, circular blade. The blade is stepless ad-justable 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 occations be used for regulation.

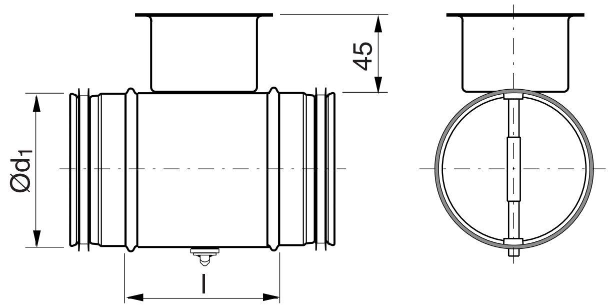
Setting angle α
α = 0° = open blade, α = 90° = closed blade



The cup at Ø 80–630 can be complemented with the special insulation cup IK at insulation thicker than 50 mm.

Property	**Ø 80–315**	**Ø 400**	**Ø 500**	**Ø 630**	**Ø 800**	**Ø 1000**
The blade is set via a knob in a protective cup.	×	×	×	×		
The setting of the blade is read against an embossed scale at the rim of the cup.	×	×	×	×		
The blad is locked with two screws, type Pozidriv (PZD2).	×	×	×	×		
The blade has reinforced locking with a sturdy wing nut.					×	×
The blade is reinforced.		×	×	×		
The blade is additionally reinforced.					×	×
With sturdy handle.		×	×	×		
With additionally reinforced handle.					×	×
With reinforced stop beads.			×	×		
The axle is reinforced.					×	×
The damper can be delivered prepared for motor.	×	×	×	×		
The damper can be delivered with motor.	×	×	×	×	×	×

Dimensions



$Ød_1$ nom	**l mm**	**m kg**	**Sealing class past 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

Reinforced blade

Ordering example

DSU 160

Product
Dimension $Ød_1$

Shut-off damper DSU

Technical data

Pressure drop graphs with noise data for dimensioning

The solid curves show the pressure drop, Δp_t, over the damper as a function of flow q, and setting angle α.

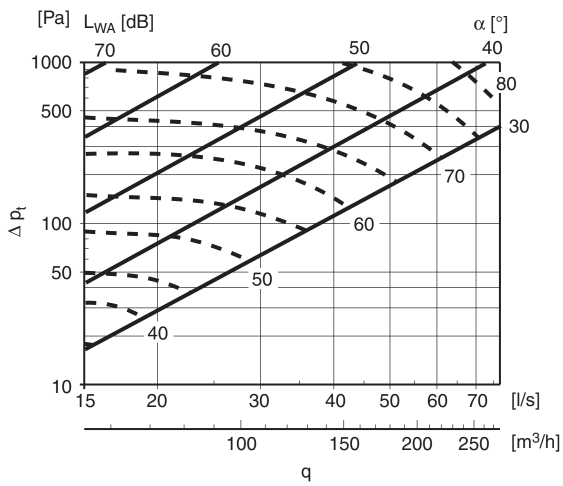
The dashed curves give the A-weighted sound power data, L_{WA}, in dB to the duct.

Example

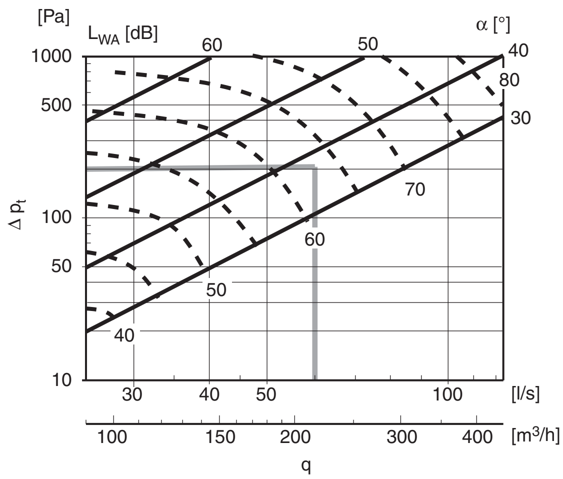
Given Dimension Ø100
Flow 60 l/s
Pressure drop 200 Pa

Obtained from graph
Setting angle 40°
Sound power level 63 dB (A)

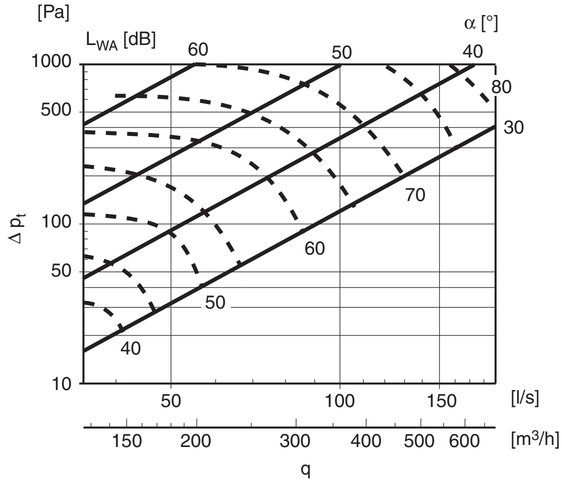
Ø80



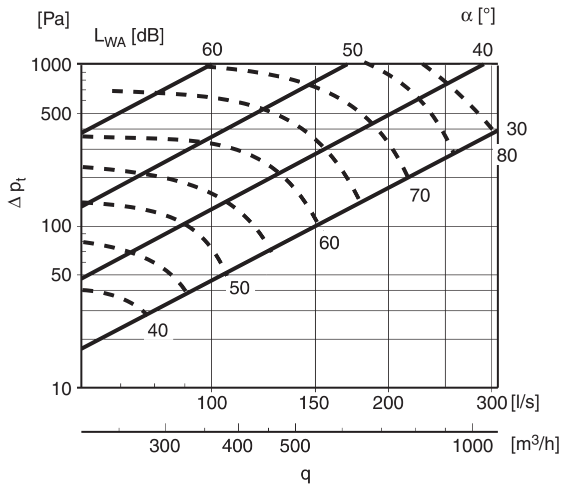
Ø100



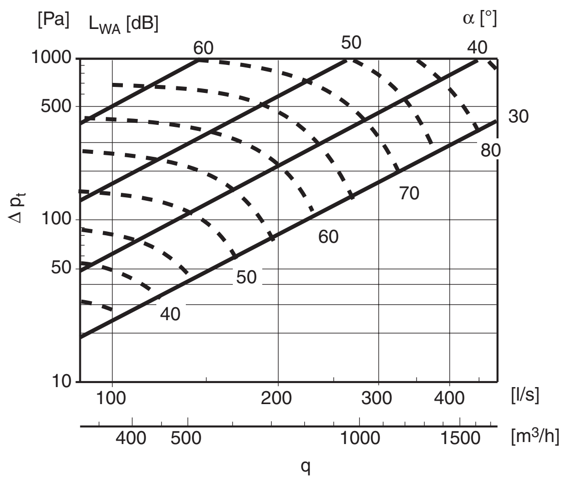
Ø125



Ø160

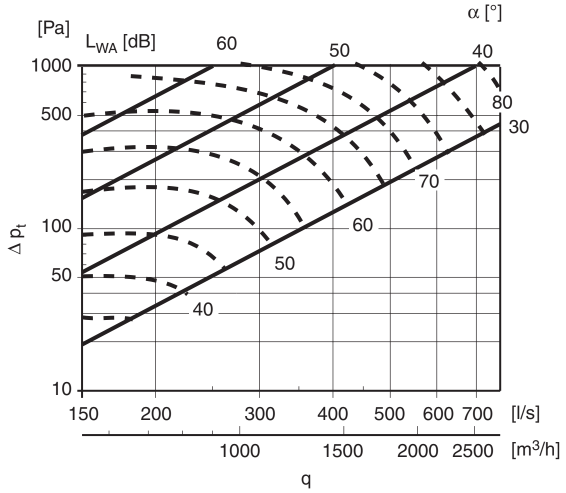


Ø200

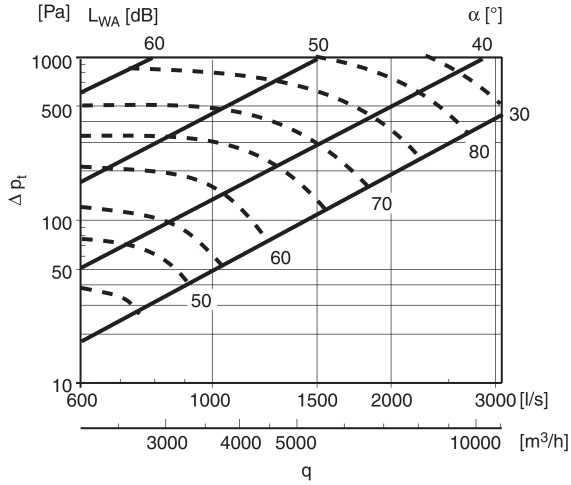


Shut-off damper DSU

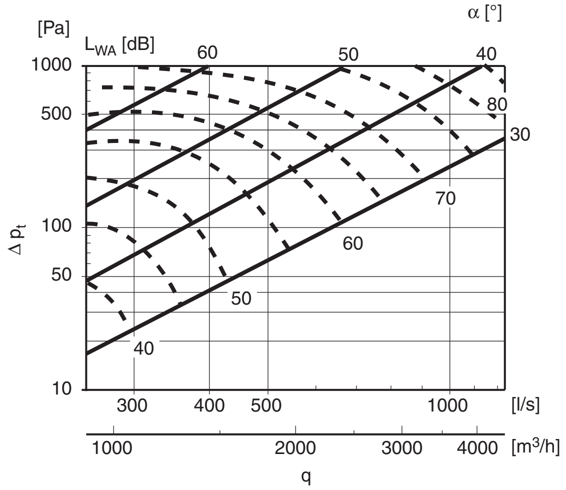
Ø250



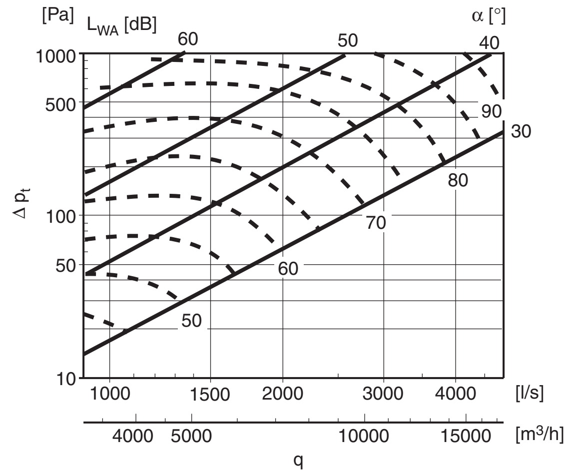
Ø500



Ø315



Ø630



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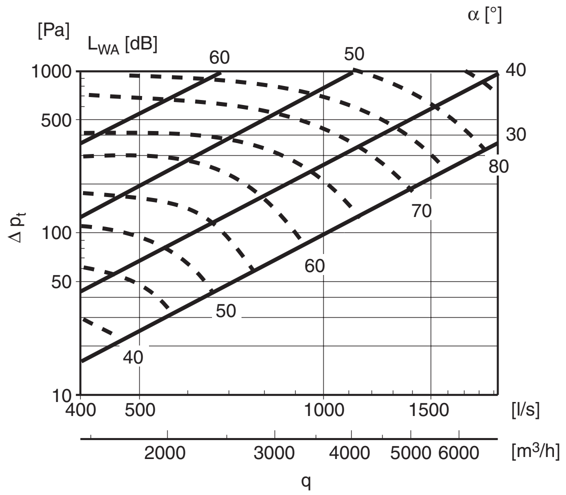

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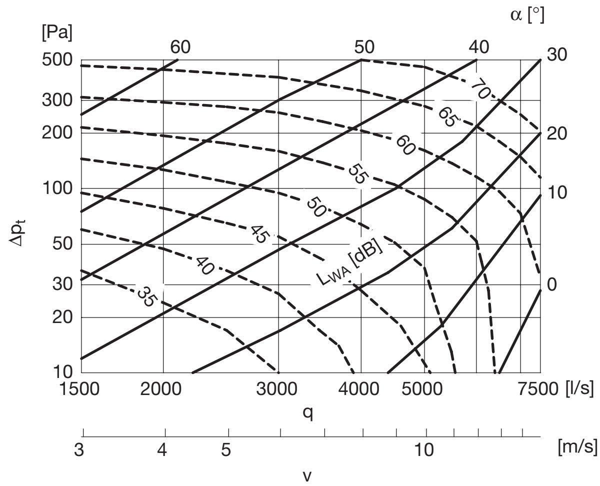
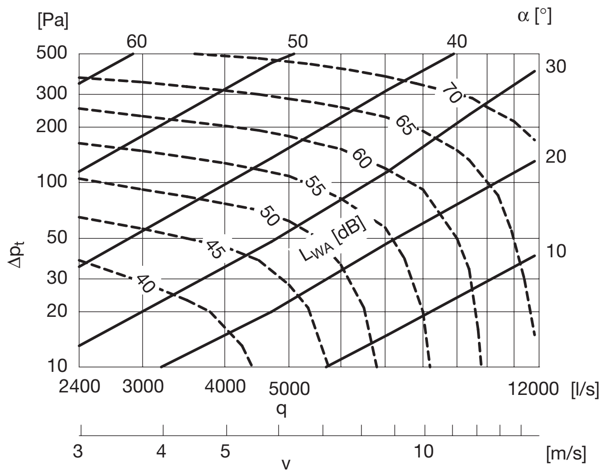


Lindab

Shut-off damper

DSU

Ø1000



Shut-off damper DSU

Sound data for DRU

Sound power level L_W, [dB] to duct in the octave bands 1–8, 63–8000 Hz, as a function of dimension, flow and pressure drop.

The methods ISO 5135 and ISO 3741 have been used to measure these sound values, as recommended by the Swedish National Testing and Research Institute.

dim Ød1	Pressure drop [Pa]	Velocity app. 3 [m/s]								Velocity app. 6 [m/s]								Velocity app. 9 [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 15 [l/s]								Flow 30 [l/s]								Flow 45 [l/s]							
	500	65	65	65	65	59	55	49	46	67	67	67	67	60	57	50	47	70	70	70	70	63	60	53	49
	300	63	63	60	60	54	48	42	36	66	66	63	63	56	50	44	38	70	70	67	67	60	54	47	40
	200	63	63	60	54	51	43	34	29	65	65	62	56	53	44	35	30	70	70	67	60	57	48	38	32
	100	55	60	53	48	43	30	23	15	59	65	57	51	46	32	24	16	66	72	63	57	51	36	27	18
	50	56	54	47	43	36	25	16	9	59	59	52	47	40	27	17	10	-	-	-	-	-	-	-	-
100		Flow 25 [l/s]								Flow 50 [l/s]								Flow 75 [l/s]							
	500	67	64	64	57	54	48	48	48	72	68	68	62	59	52	52	52	78	75	75	67	64	57	57	57
	300	62	61	60	54	51	45	42	42	68	68	68	59	56	50	47	47	75	74	73	65	61	54	51	51
	200	58	58	58	50	48	40	37	37	65	65	64	57	54	45	42	42	74	73	73	64	59	50	47	46
	100	58	55	53	46	41	34	26	24	68	66	62	54	48	40	31	29	79	75	71	62	56	46	36	33
	50	55	53	48	42	35	26	22	18	69	67	60	53	44	33	28	22	-	-	-	-	-	-	-	-
125		Flow 40 [l/s]								Flow 80 [l/s]								Flow 120 [l/s]							
	500	71	68	65	59	56	50	50	47	76	73	70	63	60	53	53	50	83	79	76	68	65	58	58	54
	300	66	66	60	55	52	46	43	40	73	73	67	60	57	51	48	44	79	79	72	66	62	55	52	48
	200	65	62	57	51	46	41	38	38	74	71	65	59	53	47	43	43	82	78	71	65	58	51	48	48
	100	64	59	53	47	39	34	29	27	77	70	63	55	47	40	35	32	84	78	70	61	51	45	39	35
	50	63	54	50	41	36	27	25	20	80	68	60	51	43	34	32	26	-	-	-	-	-	-	-	-
160		Flow 60 [l/s]								Flow 120 [l/s]								Flow 180 [l/s]							
	500	68	67	64	59	55	53	52	51	72	71	68	62	59	55	54	53	78	77	74	67	63	60	59	58
	300	63	62	59	55	52	49	46	45	67	66	64	58	55	52	49	48	75	75	71	65	61	58	54	54
	200	61	58	56	50	48	42	40	40	68	65	62	56	53	47	44	44	76	73	69	63	59	53	50	50
	100	59	54	50	45	40	35	33	31	70	64	60	53	48	42	39	38	77	73	69	61	54	48	45	44
	50	54	50	46	37	33	29	25	25	69	64	58	48	42	37	32	32	-	-	-	-	-	-	-	-
200		Flow 100 [l/s]								Flow 200 [l/s]								Flow 300 [l/s]							
	500	70	64	61	55	52	52	55	55	75	68	65	59	55	55	59	59	83	76	72	65	61	61	65	65
	300	67	62	56	50	48	45	48	48	74	68	62	55	52	51	53	52	84	78	71	64	61	57	60	60
	200	62	57	55	47	44	42	42	42	71	65	62	53	50	48	47	47	83	76	71	62	58	55	54	54
	100	57	52	48	41	39	36	34	34	69	64	58	50	47	44	42	42	83	76	69	59	56	53	50	50
	50	51	45	41	36	32	32	28	28	63	56	51	44	39	39	34	34	-	-	-	-	-	-	-	-
250		Flow 150 [l/s]								Flow 300 [l/s]								Flow 450 [l/s]							
	500	69	66	59	53	50	54	53	52	71	67	61	56	53	56	55	54	78	75	68	61	58	61	60	59
	300	63	61	55	50	47	46	48	47	66	63	57	51	48	47	51	48	75	72	65	59	55	55	59	55
	200	59	57	52	46	44	41	44	44	63	60	55	49	46	44	46	46	72	69	63	57	55	54	54	53
	100	56	52	45	41	38	36	34	31	63	57	51	45	43	40	38	35	75	69	60	56	52	49	45	42
	50	52	48	40	38	34	30	28	24	61	56	47	45	40	38	33	28	-	-	-	-	-	-	-	-
315		Flow 250 [l/s]								Flow 500 [l/s]								Flow 750 [l/s]							
	500	68	65	59	53	50	50	53	50	74	71	65	58	55	55	58	55	82	78	71	64	60	60	54	60
	300	62	59	54	49	46	45	49	43	69	66	60	54	51	51	53	48	78	74	68	61	57	57	61	54
	200	60	55	50	45	43	40	43	40	70	64	58	52	49	48	49	46	79	72	66	59	58	57	56	52
	100	54	52	45	41	38	36	36	31	66	63	55	50	47	46	44	39	76	72	64	57	54	52	50	44
	50	49	49	43	38	34	32	30	24	64	64	56	49	45	42	40	32	-	-	-	-	-	-	-	-
400		Flow 400 [l/s]								Flow 800 [l/s]								Flow 1200 [l/s]							
	500	79	73	67	62	57	60	59	58	82	75	68	65	59	62	61	60	88	81	74	70	62	66	65	64
	300	72	66	60	54	51	51	51	51	77	70	64	58	56	55	54	54	84	77	70	63	62	61	60	60
	200	67	62	56	50	48	48	48	45	74	68	62	56	53	52	52	49	82	75	68	61	60	59	58	54
	100	61	56	49	44	42	39	39	34	72	66	58	53	49	47	46	40	83	76	67	60	58	55	53	47
	50	57	52	44	39	37	35	34	26	72	67	56	50	47	44	44	33	-	-	-	-	-	-	-	-
500		Flow 600 [l/s]								Flow 1200 [l/s]								Flow 1800 [l/s]							
	500	84	77	70	64	63	62	61	60	85	78	71	65	64	63	62	61	91	84	76	68	67	68	68	67
	300	77	70	64	58	54	54	58	58	80	74	67	60	57	57	60	60	88	80	73	66	62	62	66	66
	200	71	65	59	53	50	50	50	47	77	70	64	58	56	55	54	51	85	78	72	65	63	61	60	57
	100	63	58	53	47	46	44	42	37	72	66	60	55	53	51	49	43	82	75	70	63	60	57	55	50
	50	59	52	47	44	42	38	38	31	71	63	57	54	51	46	46	37	-	-	-	-	-	-	-	-
630		Flow 1000 [l/s]								Flow 2000 [l/s]								Flow 3000 [l/s]							
	500	88	80	73	69	66	64	63	62	90	83	75	71	68	67	65	64	96	88	80	76	72	72	70	68
	300	82	75	69	65	62	61	58	55	84	77	70	67	63	62	61	56	92	84	77	73	69	68	68	61
	200	78	72	65	62	59	55	55	49	80	74	67	64	60	57	57	50	89	82	75	71	67	63	63	56
	100	71	66	59	54	50	46	45	40	78	71	66	59	56	49	47	44	90	82	76	68	63	58	55	50
	50	66	58	53	48	43	40	39	30	77	68	62	57	51	45	48	36	-	-	-	-	-	-	-	-
800		Flow 1500 [l/s]								Flow 3000 [l/s]								Flow 4500 [l/s]							
	500	–	–	–	–	–	–	–	–	72	65	62	63	62	62	61	56	78	70	66	66	65	64	63	58
	300	62	55	51	52	53	54	51	43	69	62	58	59	57	56	55	49	75	67	62	62	60	59	57	51
	200	58	52	49	49	50	49	45	37	67	60	56	55	53	52	49	43	72	64	60	59	57	55	52	46
	100	55	48	45	44	44	40	35	29	63	55	51	49	47	44	40	34	68	59	55	53	51	48	44	37
	50	52	44	40	38	35	31	26	20	60	50	46	44	41	37	33	25	66	55	51	48	45	42	37	30
	25	48	40	36	32	29	23	19	10	58	45	42	39	35	30	25	17	64	51	48	44	40	37	31	24
1000		Flow 2400 [l/s]								Flow 4700 [l/s]								Flow 7100 [l/s]							
	500	–	–	–	–	–	–	–	–	77	70	66	67	64	64	63	57	81	74	69	69	67	65	64	58
	300	66	59	55	56	55	56	53	45	74	66	61	60	58	57	56	48	79	71	65	64	61	59	58	51
	200	64	56	53	52	52	51	48	38	72	64	58	56	54	52	50	42	76	69	63	60	57	55	53	45
	100	60	52	46	45	44	41	37	28	67	58	53	49	47	44	40	32	72	64	58	55	52	49	47	39
	50	56	47	40	39	36	31	27	15	62	54	48	44	41	37	33	25	68	60	54	52	48	45	43	36
	25	53	41	36	36	30	23	16	8	58	50	44	40	37	33	28	20	65	57	51	50	45	43	41	34

Shut-off damper

DSU

dim $Ød_1$	Pressure drop [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	83	73	69	69	68	66	65	60	–	–	–	–	–	–	–	–
	300	79	70	65	65	63	61	59	54	83	73	68	67	66	64	62	57
	200	77	67	63	62	60	58	55	49	80	70	66	65	63	61	58	52
	100	73	63	59	57	55	52	48	42	77	67	62	60	57	55	51	45
	50	71	60	55	52	49	47	41	35	76	65	61	58	54	52	47	40
	25	71	59	54	51	48	44	39	32	76	65	60	57	54	50	45	38
1000		Flow 9400 [l/s]								Flow 11800 [l/s]							
	500	85	77	71	71	68	67	65	60	–	–	–	–	–	–	–	–
	300	82	74	68	66	64	62	60	54	–	–	–	–	–	–	–	–
	200	80	71	65	64	61	58	57	50	–	–	–	–	–	–	–	–
	100	76	67	61	59	56	54	52	46	–	–	–	–	–	–	–	–
	50	73	65	58	57	54	51	50	45	–	–	–	–	–	–	–	–
	25	72	64	58	57	53	51	49	44	–	–	–	–	–	–	–	–

Shut-off damper DTU

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.

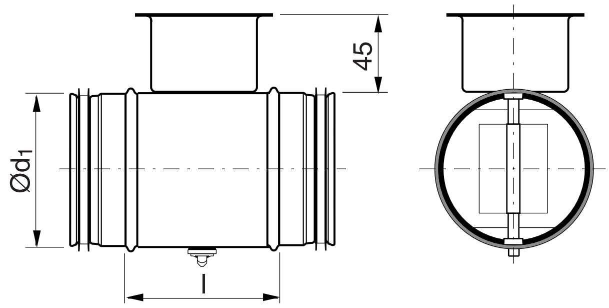
The damper can be used for regulating at rare occations.

Property	Ø 80–315	Ø 400	Ø 500	Ø 630
The blade is set via a knob in a protective cup.	×	×	×	×
The setting of the blade is read against an embossed scale at the rim of the cup.	×	×	×	×
The blad is locked with two screws, type Pozidriv (PZD2).	×	×	×	×
The blade is reinforced.			×	×
With sturdy handle.		×	×	×
With reinforced stop beads.			×	×
The damper can be delivered prepared for motor.	×	×	×	×
The damper can be delivered with motor.	×	×	×	×

Motorizing

We can supply pre-installed motors/actuators of the On/Off type for damper DTU. Electric motors are available with or without spring return. Pneumatic motors are only available with spring return.

The torque needed for the motorizing is given in the adjacent table. The torque specified is the maximum value for a non-pressurized damper.



$Ød_1$ nom	l mm	Nm	m kg	Sealing class past closed blade
80	100	1,0	0,30	4
100	100	1,0	0,38	4
112	100	1,0	0,48	4
125	100	1,0	0,53	4
140	100	1,0	0,60	4
150	100	1,0	0,63	4
160	100	1,0	0,74	4
180	100	1,0	0,82	4
200	100	1,0	1,04	4
224	100	1,5	1,27	4
250	100	1,5	1,52	4
280	100	2,0	1,77	4
300	100	2,0	1,98	4
315	100	2,0	2,14	4
355	100	4,0	2,44	4
400	100	6,0	3,65	4
450	100	7,0	4,84	4
500	115	8,0	6,07	4
560	115	9,0	7,47	4
600	115	10,0	8,11	4
630	115	10,0	8,80	4

Reinforced blade

Ordering example

DTU 200

Product (DTU)

Dimension $Ød_1$ (200)

Shut-off damper DTU

Technical data

Pressure drop graphs with noise data for dimensioning

The solid curves show the pressure drop, Δp_t, over the damper as a function of flow q, and setting angle α.

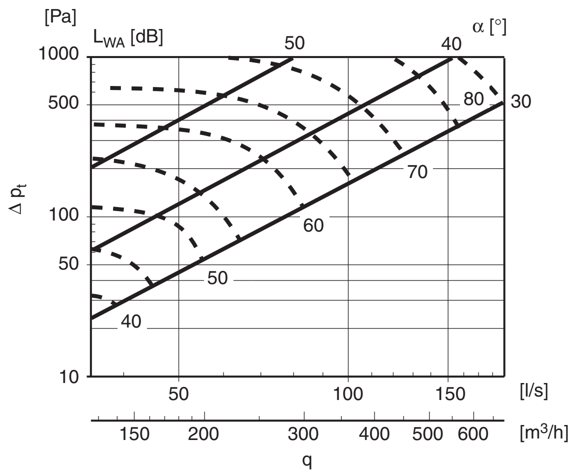
The dashed curves give the A-weighted sound power data, L_{WA}, in dB to the duct.

Example

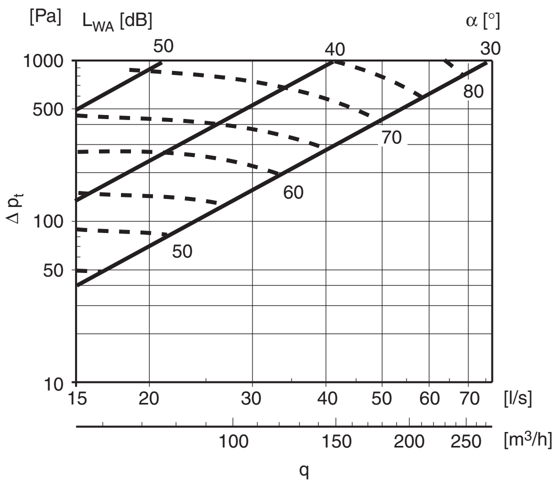
Given Dimension Ø100
Flow 60 l/s
Pressure drop 200 Pa

Obtained from graph
Setting angle 40°
Sound power level 63 dB (A)

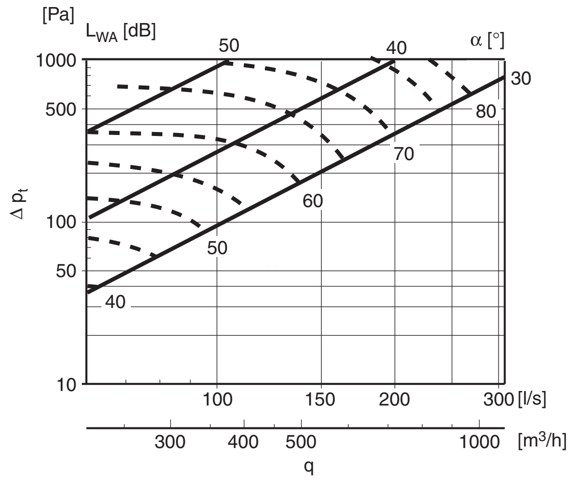
Ø125



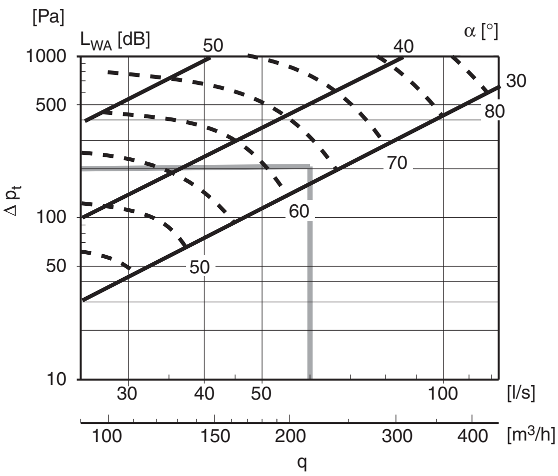
Ø80



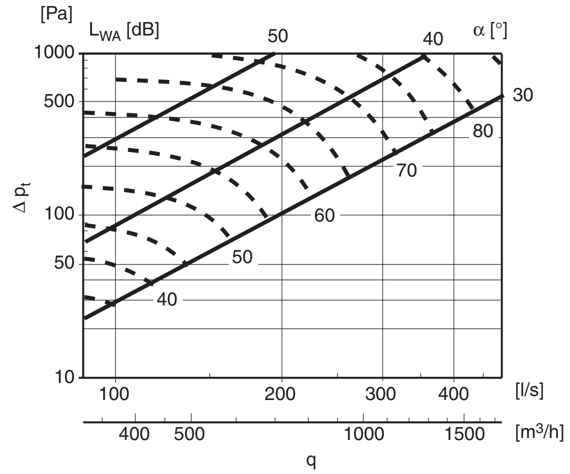
Ø160



Ø100



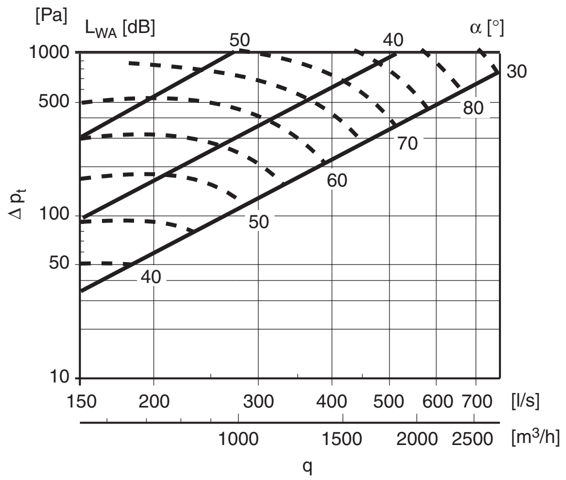
Ø200



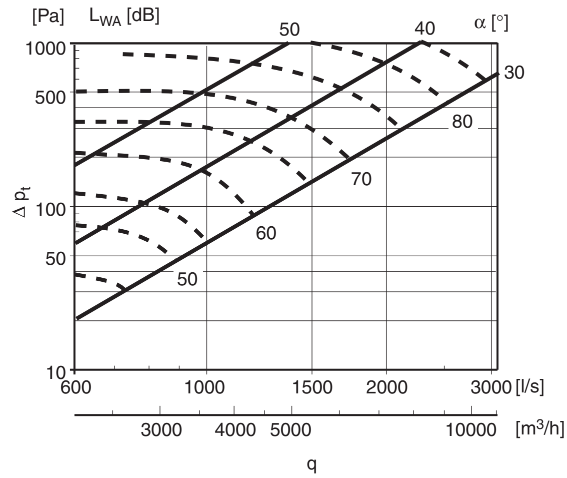
Shut-off damper

DTU

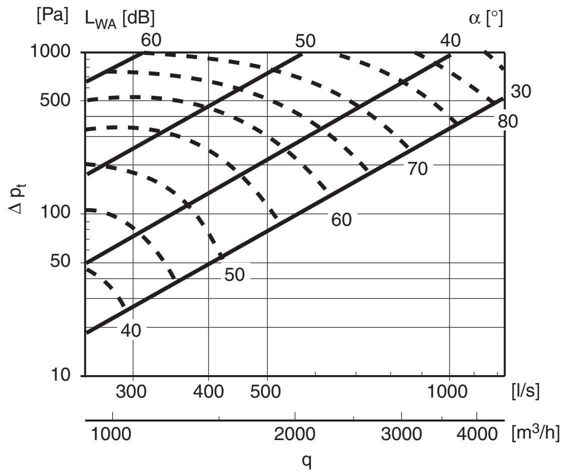
Ø250



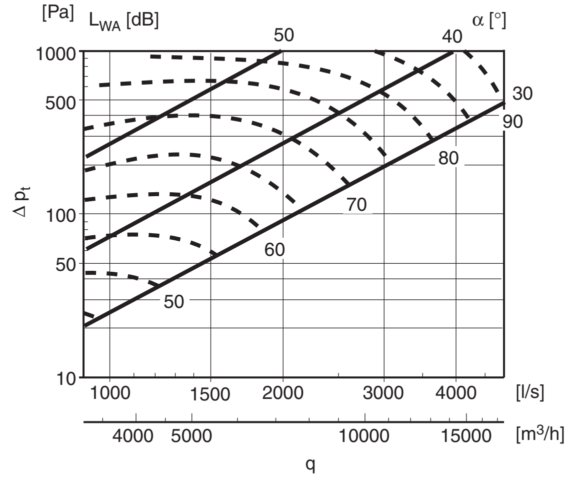
Ø500



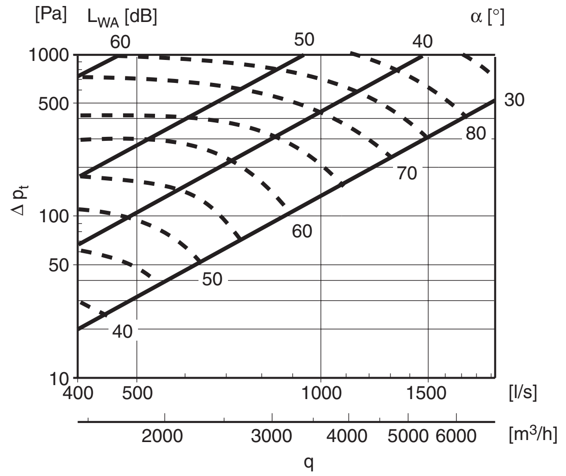
Ø315



Ø630



Ø400



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Shut-off damper DTU

Sound data for DRU

Sound power level L_W, [dB] to duct in the octave bands 1–8, 63–8000 Hz, as a function of dimension, flow and pressure drop.

The methods ISO 5135 and ISO 3741 have been used to measure these sound values, as recommended by the Swedish National Testing and Research Institute.

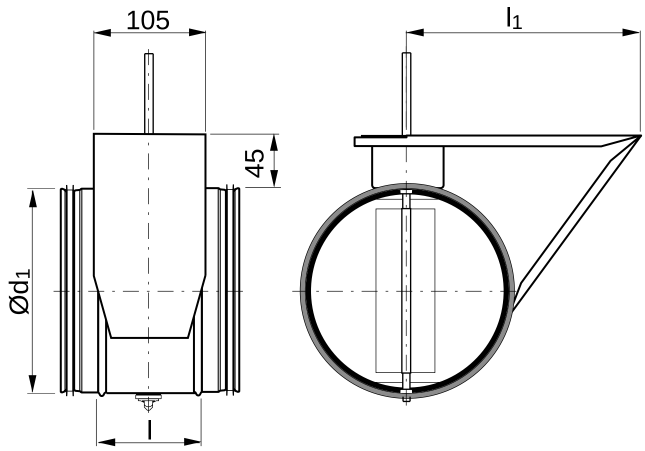
dim Ød$_1$	Pressure drop [Pa]	Velocity app. 3 [m/s]								Velocity app. 6 [m/s]								Velocity app. 9 [m/s]							
		Centre frequency [Hz]								Centre frequency [Hz]								Centre frequency [Hz]							
		63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
80		Flow 15 [l/s]								Flow 30 [l/s]								Flow 45 [l/s]							
	500	65	65	65	65	59	55	49	46	67	67	67	67	60	57	50	47	70	70	70	70	63	60	53	49
	300	63	63	60	60	54	48	42	36	66	66	63	63	56	50	44	38	70	70	67	67	60	54	47	40
	200	63	63	60	54	51	43	34	29	65	65	62	56	53	44	35	30	70	70	67	60	57	48	38	32
	100	55	60	53	48	43	30	23	15	59	65	57	51	46	32	24	16	66	72	63	57	51	36	27	18
	50	56	54	47	43	36	25	16	9	59	59	52	47	40	27	17	10	-	-	-	-	-	-	-	-
100		Flow 25 [l/s]								Flow 50 [l/s]								Flow 75 [l/s]							
	500	67	64	64	57	54	48	48	48	72	68	68	62	59	52	52	52	78	75	75	67	64	57	57	57
	300	62	61	60	54	51	45	42	42	68	68	68	59	56	50	47	47	75	74	73	65	61	54	51	51
	200	58	58	58	50	48	40	37	37	65	65	64	57	54	45	42	42	74	73	73	64	59	50	47	46
	100	58	55	53	46	41	34	26	24	68	66	62	54	48	40	31	29	79	75	71	62	56	46	36	33
	50	55	53	48	42	35	26	22	18	69	67	60	53	44	33	28	22	-	-	-	-	-	-	-	-
125		Flow 40 [l/s]								Flow 80 [l/s]								Flow 120 [l/s]							
	500	71	68	65	59	56	50	50	47	76	73	70	63	60	53	53	50	83	79	76	68	65	58	58	54
	300	66	66	60	55	52	46	43	40	73	73	67	60	57	51	48	44	79	79	72	66	62	55	52	48
	200	65	62	57	51	46	41	38	38	74	71	65	59	53	47	43	43	82	78	71	65	58	51	48	48
	100	64	59	53	47	39	34	29	27	77	70	63	55	47	40	35	32	84	78	70	61	51	45	39	35
	50	63	54	50	41	36	27	25	20	80	68	60	51	43	34	32	26	-	-	-	-	-	-	-	-
160		Flow 60 [l/s]								Flow 120 [l/s]								Flow 180 [l/s]							
	500	68	67	64	59	55	53	52	51	72	71	68	62	59	55	54	53	78	77	74	67	63	60	59	58
	300	63	62	59	55	52	49	46	45	67	66	64	58	55	52	49	48	75	75	71	65	61	58	54	54
	200	61	58	56	50	48	42	40	40	68	65	62	56	53	47	44	44	76	73	69	63	59	53	50	50
	100	59	54	50	45	40	35	33	31	70	64	60	53	48	42	39	38	77	73	69	61	54	48	45	44
	50	54	50	46	37	33	29	25	25	69	64	58	48	42	37	32	32	-	-	-	-	-	-	-	-
200		Flow 100 [l/s]								Flow 200 [l/s]								Flow 300 [l/s]							
	500	70	64	61	55	52	52	55	55	75	68	65	59	55	55	59	59	83	76	72	65	61	61	65	65
	300	67	62	56	50	48	45	48	48	74	68	62	55	52	51	53	52	84	78	71	64	61	57	60	60
	200	62	57	55	47	44	42	42	42	71	65	62	53	50	48	47	47	83	76	71	62	58	55	54	54
	100	57	52	48	41	39	36	34	34	69	64	58	50	47	44	42	42	83	76	69	59	56	53	50	50
	50	51	45	41	36	32	32	28	28	63	56	51	44	39	39	34	34	-	-	-	-	-	-	-	-
250		Flow 150 [l/s]								Flow 300 [l/s]								Flow 450 [l/s]							
	500	69	66	59	53	50	54	53	52	71	67	61	56	53	56	55	54	78	75	68	61	58	61	60	59
	300	63	61	55	50	47	46	48	47	66	63	57	51	48	47	51	48	75	72	65	59	55	55	59	55
	200	59	57	52	46	44	41	44	44	63	60	55	49	46	44	46	46	72	69	63	57	55	54	54	53
	100	56	52	45	41	38	36	34	31	63	57	51	45	43	40	38	35	75	69	60	56	52	49	45	42
	50	52	48	40	38	34	30	28	24	61	56	47	45	40	38	33	28	-	-	-	-	-	-	-	-
315		Flow 250 [l/s]								Flow 500 [l/s]								Flow 750 [l/s]							
	500	68	65	59	53	50	50	53	50	74	71	65	58	55	55	58	55	82	78	71	64	60	60	54	60
	300	62	59	54	49	46	45	49	43	69	66	60	54	51	51	54	48	78	74	68	61	57	57	61	54
	200	60	55	50	45	43	40	43	40	70	64	58	52	49	48	49	46	79	72	66	59	58	57	56	52
	100	54	52	45	41	38	36	36	31	66	63	55	50	47	46	44	39	76	72	64	57	54	52	50	44
	50	49	49	43	38	34	32	30	24	64	64	56	49	45	42	40	32	-	-	-	-	-	-	-	-
400		Flow 400 [l/s]								Flow 800 [l/s]								Flow 1200 [l/s]							
	500	79	73	67	62	57	60	59	58	82	75	68	65	59	62	61	60	88	81	74	70	62	66	65	64
	300	72	66	60	54	51	51	51	51	77	70	64	58	56	55	54	54	84	77	70	63	62	61	60	60
	200	67	62	56	50	48	48	48	45	74	68	62	56	53	52	52	49	82	75	68	61	60	59	58	54
	100	61	56	49	44	42	39	39	34	72	66	58	53	49	47	46	40	83	76	67	60	58	55	53	47
	50	57	52	44	39	37	35	34	26	72	67	56	50	47	44	44	33	-	-	-	-	-	-	-	-
500		Flow 600 [l/s]								Flow 1200 [l/s]								Flow 1800 [l/s]							
	500	84	77	70	64	63	62	61	60	85	78	71	65	64	63	62	61	91	84	76	68	67	68	68	67
	300	77	70	64	58	54	54	58	58	80	74	67	60	57	57	60	60	88	80	73	66	62	62	66	66
	200	71	65	59	53	50	50	50	47	77	70	64	58	56	55	54	51	85	78	72	65	63	61	60	57
	100	63	58	53	47	46	44	42	37	72	66	60	55	53	51	49	43	82	75	70	63	60	57	55	50
	50	59	52	47	44	42	38	38	31	71	63	57	54	51	46	46	37	-	-	-	-	-	-	-	-
630		Flow 1000 [l/s]								Flow 2000 [l/s]								Flow 3000 [l/s]							
	500	88	80	73	69	66	64	63	62	90	83	75	71	68	67	65	64	96	88	80	76	72	72	70	68
	300	82	75	69	65	62	61	58	55	84	77	70	67	63	62	61	56	92	84	77	73	69	68	68	61
	200	78	72	65	62	59	55	55	49	80	74	67	64	60	57	57	50	89	82	75	71	67	63	63	56
	100	71	66	59	54	50	46	45	40	78	71	66	59	56	49	47	44	90	82	76	68	63	58	55	50
	50	66	58	53	48	43	40	39	30	77	68	62	57	51	45	48	36	-	-	-	-	-	-	-	-

Shut-off damper DTU

dim $Ød_1$	Pressure drop [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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Shut-off damper with motor shelf DTHU

Dimensions



Ød1 nom	l mm	l1 mm	M Nm	m kg	Sealing class past closed blade
80	100	230	1,0	0,67	4
100	100	230	1,0	0,75	4
112	100	230	1,0	0,85	4
125	100	230	1,0	0,90	4
140	100	230	1,0	0,97	4
150	100	230	1,0	1,00	4
160	100	230	1,0	1,11	4
180	100	230	1,0	1,19	4
200	100	230	1,0	1,41	4
224	100	230	1,5	1,64	4
250	100	230	1,5	1,89	4
280	100	230	2,0	2,14	4
300	100	230	2,0	2,33	4
315	100	230	2,0	2,51	4
355	100	230	4,0	2,81	4
400	100	230	6,0	4,02	4
450	100	230	7,0	5,21	4
500	115	230	8,0	6,44	4
560	115	230	9,0	7,84	4
600	115	230	10,0	8,48	4
630	115	315	10,0	9,17	4

Description

Shut-off damper with motor shelf KOMHY
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.

Motorizing
The motor shelf 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.

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

DTHU 200

Product — DTHU
Dimension Ød1 — 200

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

Damper with flow meter DIRBU

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. A special mounting, measuring, balancing and maintenance instruction exists for this product.

Cleaning
By fully open the damper, one get access to the duct. Do not forget to readjust the damper after cleaning.

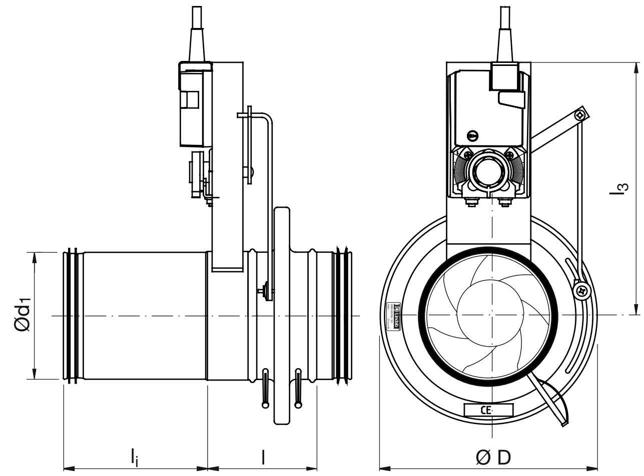
Installation
Consider required straight distance after or before disturbance, as mentioned on page * and on the card attached to the measurement nozzles, to obtain accurate flow measurement.

Ordering example

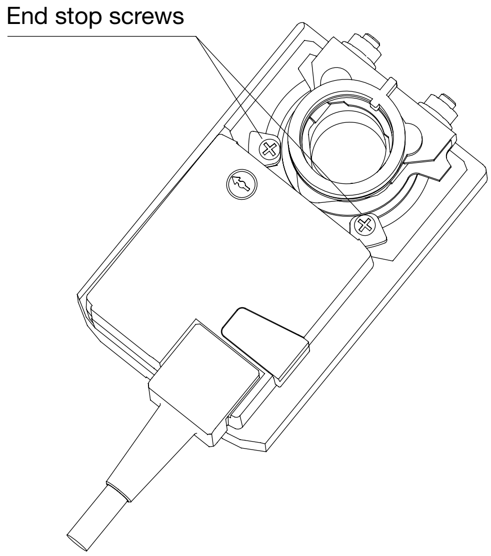
DIRBU 160 24 NM

- Product: DIRBU
- Dimension $Ød_1$: 160
- Voltage: 24
- Motor type: NM

Dimensions



$Ød_1$ nom	ØD nom	l mm	l_i mm	l_3 mm	m 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



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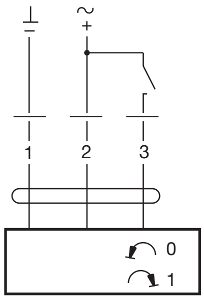
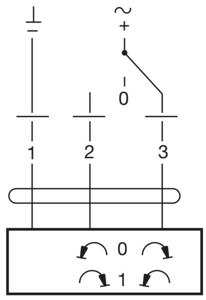
Damper with flow meter

DIRBU

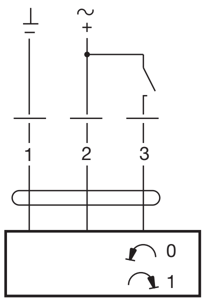
Technical data for the motors

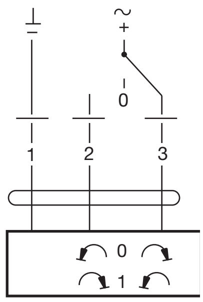
	NM 24 A-F	NM 230 A-F
Dimension	Ø100–200	Ø100–200
Power supply	AC 19,2–28,8 V, 50/60 Hz DC 19,2–28,8 V	AC 85–265 V, 50/60 Hz
Power consumption	1,5 W	2,5 W
For wire sizing	3,5 VA	6 VA
Connection	Cable 1 m, 3×0,75 mm^2	Cable 1 m, 3×0,75 mm^2
Operating angle	Max. 95°, adjustable 0–100%	Max. 95°, adjustable 0–100%
Torque at rated voltage	Min. 10 Nm	Min. 10 Nm
Direction of rotation	Switch selectable 0 ↶ or 1 ↷	Switch selectable 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





	SM 24 A	SM 230 A
Dimension	Ø250–315	Ø250–315
Power supply	AC 19,2–28,8 V, 50/60 Hz 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, 3×0,75 mm^2	Kabel 1 m, 3×0,75 mm^2
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 0 ↶ or 1 ↷	Switch selectable 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

Description

The motor-driven damper DIRVU with flow meter is suitable for systems where it should possible to vary the air flow. Examples of such systems are conference rooms and public areas. It fulfils 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.

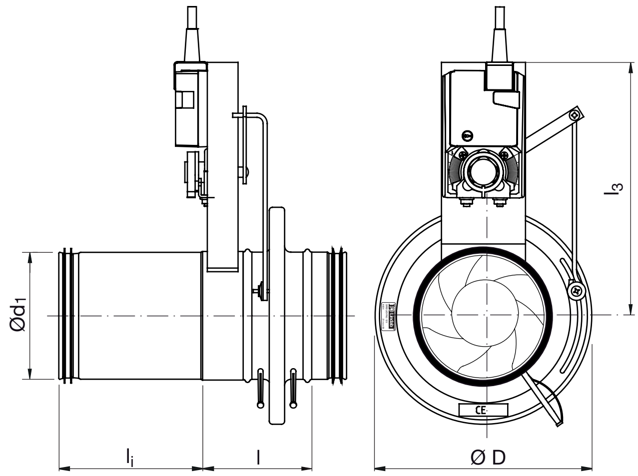
Cleaning
By fully open the damper, one get access to the duct. Do not forget to readjust the damper after cleaning.

Installation
Consider required straight distance after or before disturbance, as mentioned on page * and on the card attached to the measurement nozzles, to obtain accurate flow measurement.

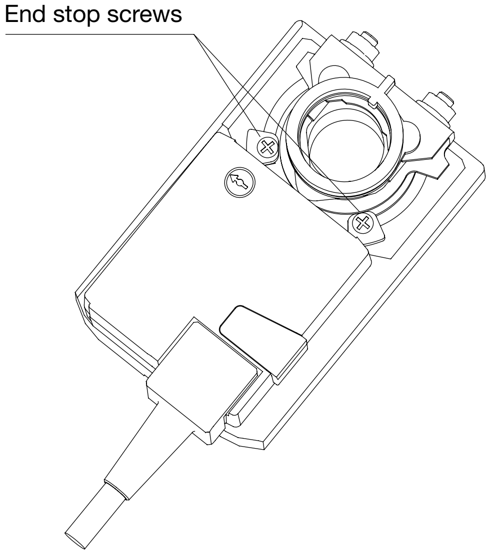
Ordering example

	DIRVU	160	24	NM
Product	DIRVU			
Dimension $Ød_1$		160		
Voltage			24	
Motor type				NM

Dimensions



$Ød_1$ nom	ØD nom	l mm	l_i mm	l_3 mm	m 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

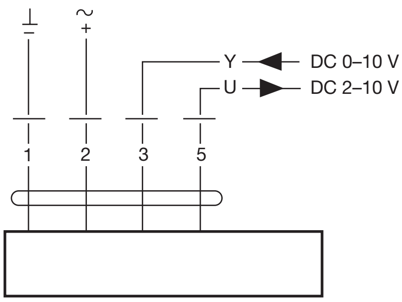


Damper with flow meter

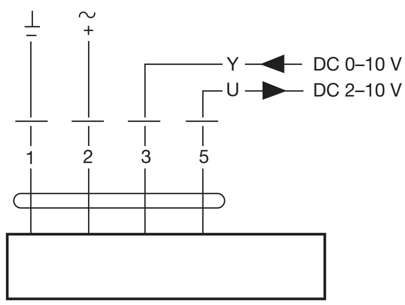
DIRVU

Technical data for the motors

	NM 24 A-SR
Dimension	Ø100–200
Power supply	AC 24 V, 50/60 Hz DC 24 V
Power consumption	2 W
For wire sizing	4 VA
Connection	Cable 1 m, 4×0,75 mm²
Operating angle	Max. 95°, adjustable 0–100%
Torque at rated voltage	Min. 10 Nm
Direction of rotation	Switch selectable 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



	SM 24 A-SR
Dimension	Ø100–200
Power supply	AC 24 V, 50/60 Hz DC 24 V
Power consumption	2 W
For wire sizing	4 VA
Connection	Kabel 1 m, 4×0,75 mm²
Operating angle	Max. 95°, justerbar 0–100%
Torque at rated voltage	Min. 20 Nm
Direction of rotation	Switch selectable 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.

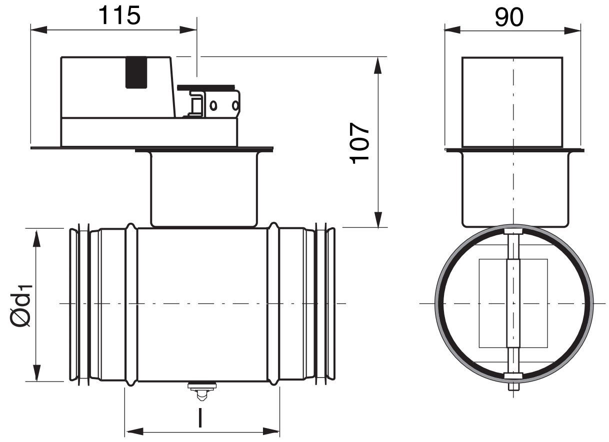
The spindle and motor can be disconnected from each other via a release button on the motor housing.

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.

Dimensions



Ød1 nom	l mm	m kg	Sealing class past 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

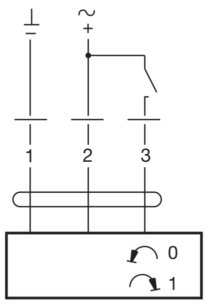
Ordering example

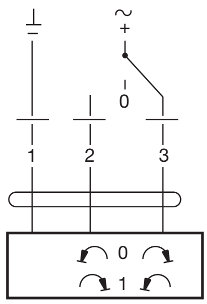
DTBU 125 24 LMF

Product – DTBU
Dimension Ød1 – 125
Voltage – 24
Motor type – LMF

Technical data for the motors

	LM 24 A-F	LM 230 A-F
Power supply	AC 19,2–28,8 V, 50/60 Hz 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, 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. 5 Nm	Min. 5 Nm
Direction of rotation	Switch selectable 0 or 1	Switch selectable 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

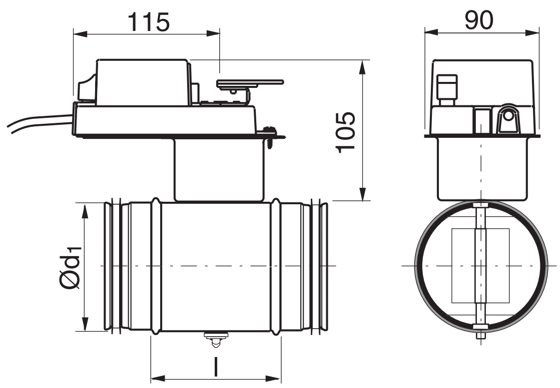




We reserve the right to make changes without prior notice

Motorized shut-off damper DTBU

Dimensions



$Ød_1$ 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.

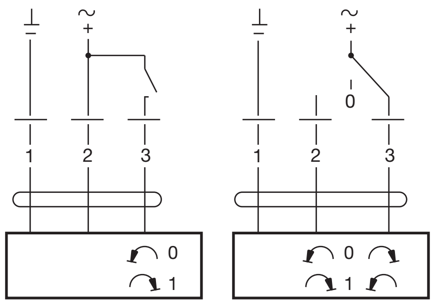
The motor is installed at a distance from the damper, which makes it easy to insulate the ventilation duct.

Ordering example

	DTBU	400	24	NM
Product	DTBU			
Dimension $Ød_1$		400		
Voltage			24	
Motor type				NM

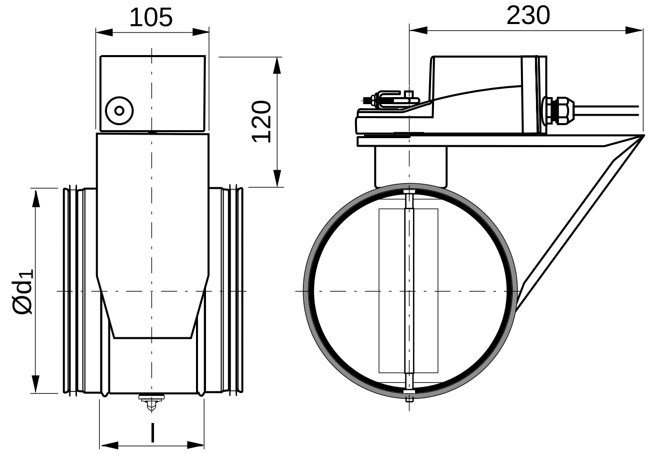
Technical data for the motors

	NM 24 A-F	NM 230 A-F
Power supply	AC 19,2–28,8 V, 50/60 Hz 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^2	Cable 1 m, 3×0,75 mm^2
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 0 or 1	Switch selectable 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



$Ød_1$ nom	l mm	m kg	Sealing class past 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.

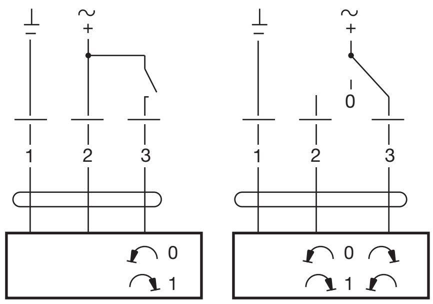
Ordering example

DTBU 630 24 SM

- Product: DTBU
- Dimension $Ød_1$: 630
- Voltage: 24
- Motor type: SM

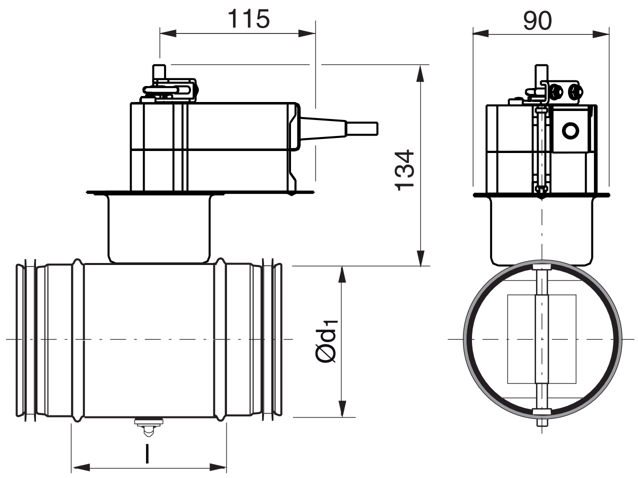
Technical data for the motors

	SM 24 A	SM 230 A
Power supply	AC 19,2–28,8 V, 50/60 Hz 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^2	Cable 1 m, 3x0,75 mm^2
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 0 or 1	Switch selectable 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 DTBCU

Dimensions



$Ød_1$ 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

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.

Ordering example

	DTBCU	200	24	TF
Product	DTBCU			
Dimension $Ød_1$		200		
Voltage			24	
Motor type				TF

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

Motorized shut-off damper DTBCU

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.

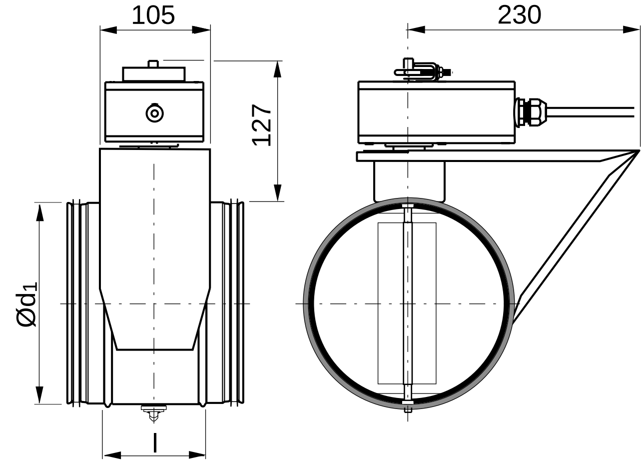
In outdoor installation, the motor should be protected from direct UV radiation.

The motor is installed at a distance from the damper, which makes it easy to insulate the ventilation duct.

Ordering example

	DTBCU	250	24	LF
Product	DTBCU			
Dimension $Ød_1$		250		
Voltage			24	
Motor type				LF

Dimensions



$Ød_1$ nom	l mm	24 V m kg	230 V m kg	Sealing class past closed blade
250	100	3,29	3,44	4
315	100	3,91	4,06	4

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.

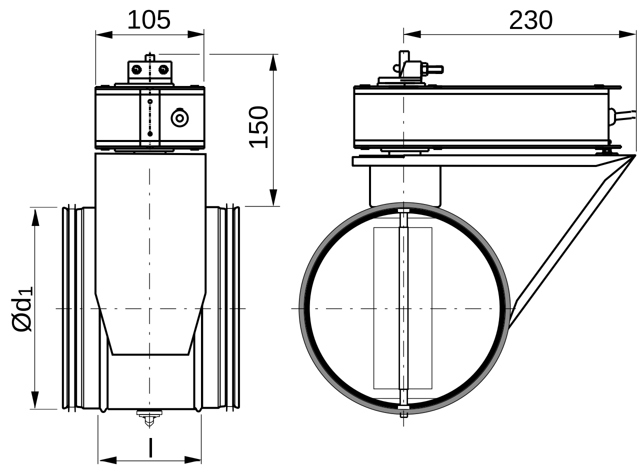
In outdoor installation, the motor should be protected from direct UV radiation.

The motor is installed at a distance from the damper, which makes it easy to insulate the ventilation duct.

Ordering example

	DTBCU	400	24	AF
Product				
Dimension $Ød_1$				
Voltage				
Motor type				

Dimensions

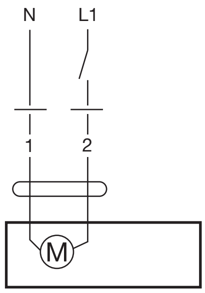


$Ød_1$ nom	l mm	24 V m kg	230 V m kg	Sealing class past closed blade
400	100	7,02	7,32	4
500	115	9,44	9,74	4
630	115	11,2	11,5	4

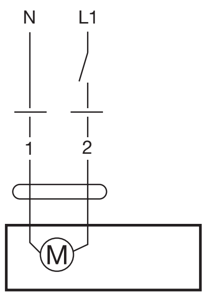
Motorized shut-off damper DTBCU

Technical data for the motors

	TF 24	TF 230
Voltage range	2AC 19,2–28,8 V, 50/60 Hz 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^2	Cable 1 m, 2×0,75 mm^2
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

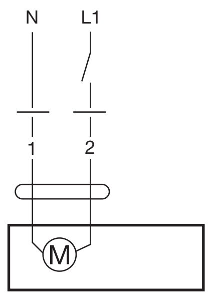


	LF 24	LF 230
Voltage range	2AC 19,2–28,8 V, 50/60 Hz DC 21,6–28,8 V	AC 198–264 V, 50/60 Hz
Power consumption		
– during opening	5 W	5 W
– stand-by	2,5 W	3 W
For wire sizing	7 VA	7 VA
Connection	Cable 1 m, 2×0,75 mm^2	Cable 1 m, 2×0,75 mm^2
Operating angle, adjustable	Mech. limited to 95°	Mech. limited 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

	AF 24	AF 230
Voltage rang	AC 19,2–28,8 V, 50/60 Hz 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^2	Cable 1 m, 2×0,75 mm^2
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 left-hand installation L/R	Optional through right or 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



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

Motorized shut-off damper DTPU

Description

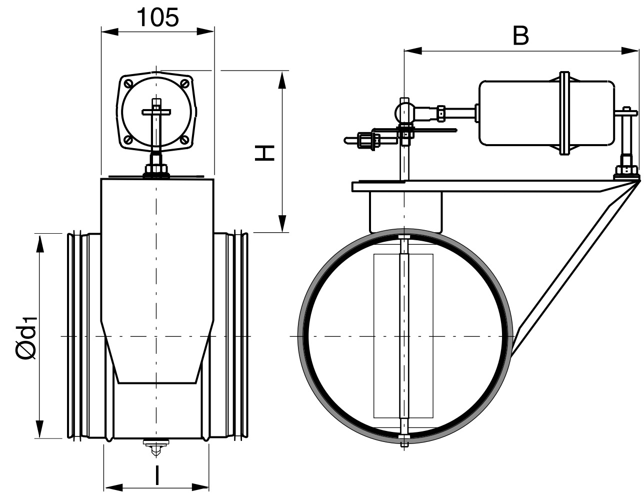
Shut-off damper with pneumatic actuator
Consists of a DTU damper with a pneumatic actuator installed. The actuator consists of a glass-reinforced polyamide housing with an internal rolling diaphragm to which the spindle is fixed.

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.

Ordering example

	DTPU	200	AK31
Product	DTPU		
Dimension $Ød_1$		200	
Motor type			AK31

Dimensions



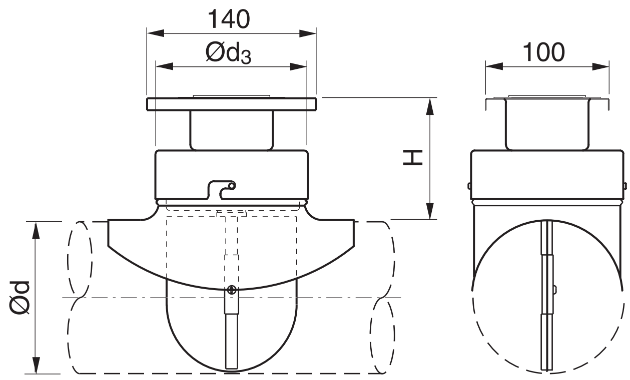
$Ød_1$ nom	l mm	H mm	B mm	m kg	Sealing class past closed blade
80	100	144	230	1,07	3
100	100	144	230	1,15	3
125	100	144	230	1,30	3
160	100	144	230	1,51	3
200	100	144	230	1,81	3
250	100	160	230	2,39	3
315	100	160	230	3,01	3
400	100	195	325	5,42	3
500	115	195	325	7,84	3
630	115	195	325	10,60	3

Technical data for the motors

	AK 31 P	**AK 41 P**	**AK 42 P**
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_n	0,5 l_n	1,7 l_n
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
Running time 0 – 90 °			
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$_3$ 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 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.

Ordering example

	PSDRU	160
Product	✓	
Dimension Ød		✓

Cleaning regulating damper TDRU

Description

Cleaning regulating damper
Consists of a KCU cleaning cover with a blade 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.

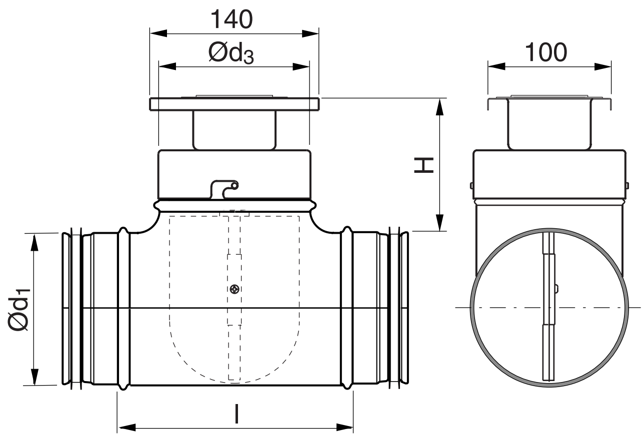
Since it is easy to remove the cleaning cover together with the blade, it is easy to inspect and clean the ventilation system. The original pressure balance in the system is not affected since the blade and cleaning cover retain their mutual positions which they were given during balancing.

Ordering example

TDRU 160

Product — TDRU
Dimension $Ød_1$ — 160

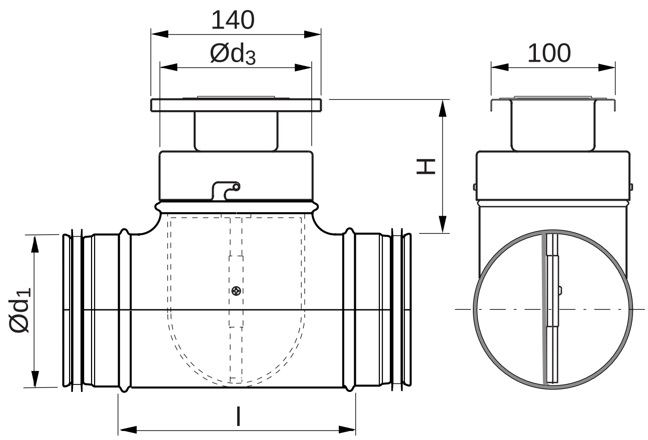
Dimensions



$Ød_1$ nom	$Ød_3$ nom	l mm	H mm	m kg	Sealing class past closed 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

Cleaning shut-off damper TDSU

Dimensions



$Ød_1$ nom	$Ød_3$ nom	l mm	H mm	m kg	Sealing class past closed 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

Description

Cleaning shut-off damper
Consists of a KCU cleaning cover with a blade 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.

Ordering example

TDSU 160

Product — TDSU
Dimension $Ød_1$ — 160

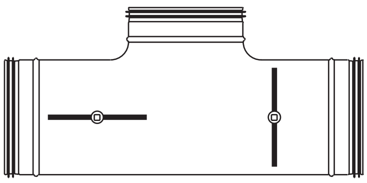
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

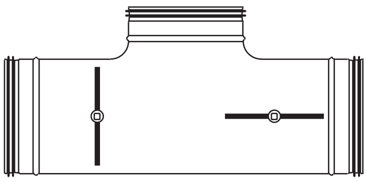
Alternating shut-off damper TASU

Description

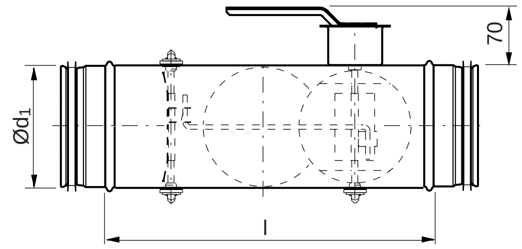
Alternating shut-off damper
Consists of an extended T-piece and two linked DSU dampers.

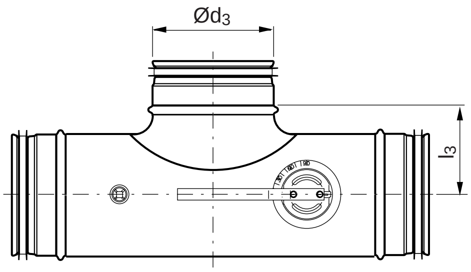
Can be used for "by pass" ducts. It thereby replaces two conventional dampers + two couplings + one T-piece and is 20–30% shorter.





Dimensions





$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 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

Ordering example

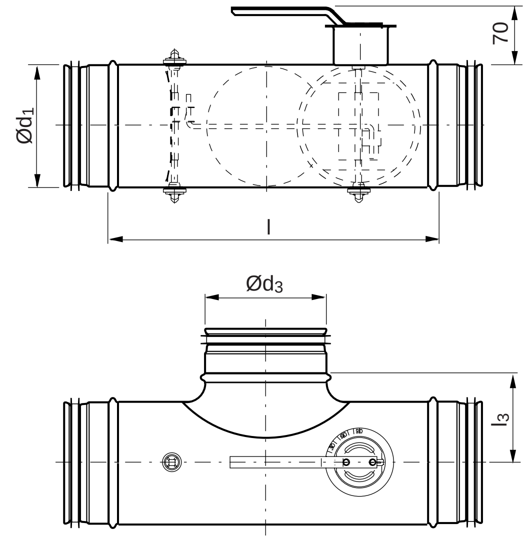
TASU 160 160

Product — TASU
Dimension $Ød_1$ — 160
Dimension $Ød_3$ — 160

Lindab

Alternating shut-off damper TATU

Dimensions

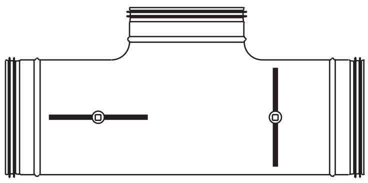


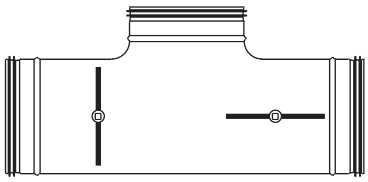
Ød1 nom	Ød3 nom	l mm	l3 mm	m kg	Sealing class past closed blade
100	100	280	65	1,20	2
125	125	345	83	1,60	2
160	160	385	105	2,20	2
200	200	425	125	3,15	2
250	250	520	150	4,50	2
315	315	585	182	6,60	2
400	400	645	225	9,80	2

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.





Ordering example

	TATU	160	160
Product	TATU		
Dimension Ød1		160	
Dimension Ød3			160

Motorized alternating shut-off damper

TATBU

Description

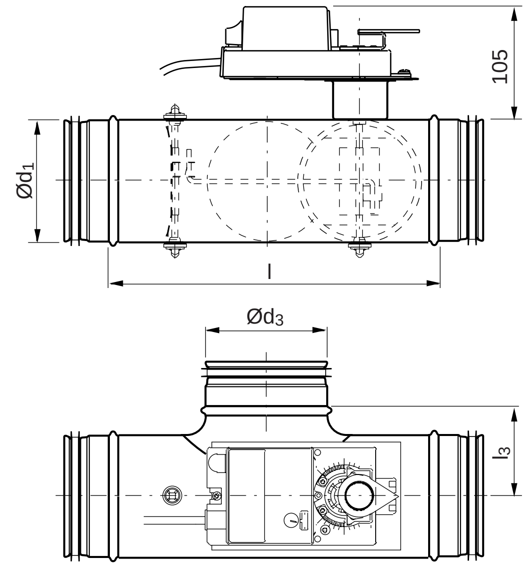
Alternating shut-off damper with electric motor – NM 24 A-F or NM 230 A-F
Consists of an extended T-piece with two linked DTU dampers and a 24 or 230 V electric motor installed.

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.

Ordering example

	TATBU	400	24	NMF
Product	TATBU			
Dimension $Ød_1$		400		
Voltage			24	
Motor type				NMF

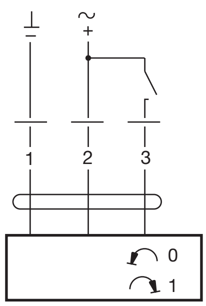
Dimensions

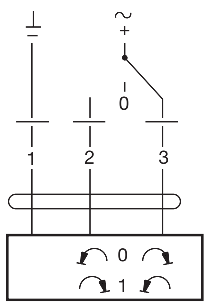


$Ød_1$ nom	$Ød_3$ nom	l mm	l_3 mm	m kg	Sealing class past closed blade
100	100	280	65	2,00	2
125	125	345	83	2,40	2
160	160	385	105	3,00	2
200	200	425	125	3,90	2
250	250	520	150	5,20	2
315	315	585	182	7,40	2
400	400	645	225	10,6	2

Technical data for the motors

	NM 24 A-F	NM 230 A-F
Power supply	AC 19,2–28,8 V, 50/60 Hz 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 mm²	Cable 1 m, 3×0,75 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 0 or 1	Switch selectable 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



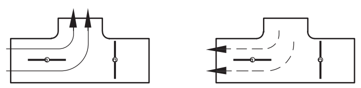


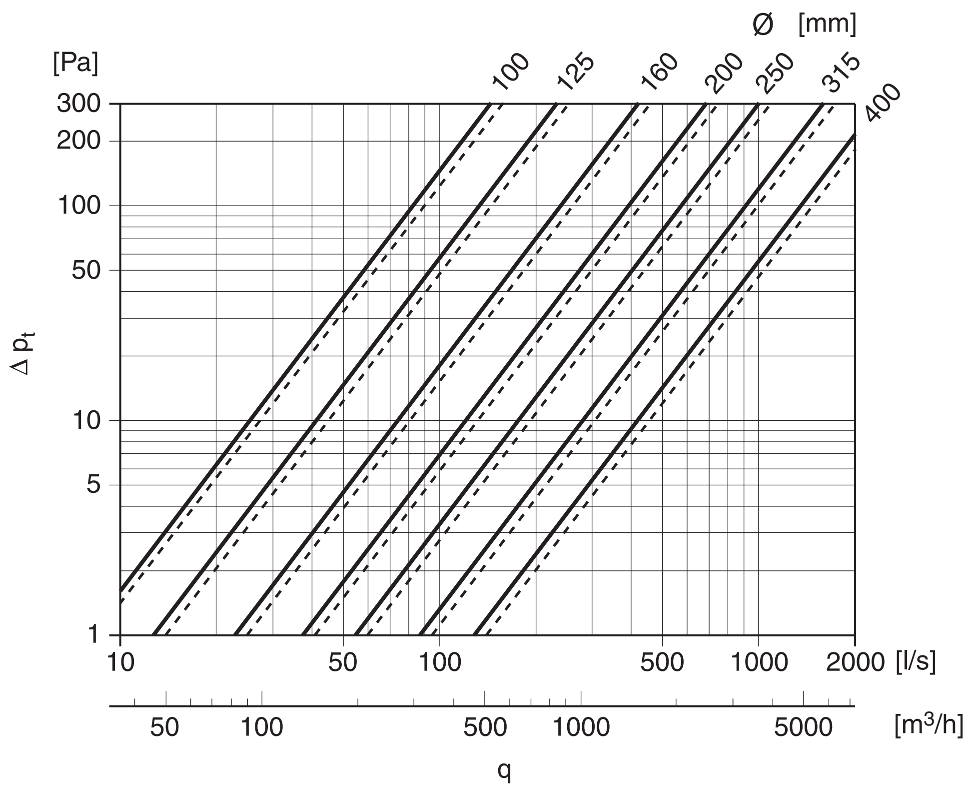
Motorized alternating shut-off dampers

TASU, TATU, TATBU

Technical data

The dashed pressure drop curves refer to the flow direction in the right picture.





Constant-/ variable flow damper DAU, DA2EU, DAVU

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 m³/h)
- Pressure range 50–1000 Pa (over the unit)
- Independent of mounting direction
- Handles 50 mm duct insulation
- Available preinsulated

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 exists:

- 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.

The units can be ordered with an external insulation and an outer sheet metal shell for lower sound radiation to the surroundings, see pages 314–315.

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, aspecially 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.

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 deverge 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 209. Constant flow damper combined with shut off damper can with advantage be used in groups at installations where you want:

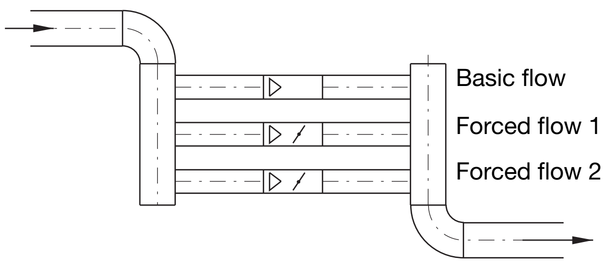
- two flows, that lies too far away from each other for a two flow unit to handle

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 posssible: 80, 180, 230 and 330 l/s.



Constant-/ variable flow damper

DAU, DA2EU, DAVU

Technical data

Pressure and flow ranges and sound to duct
The graphs show A-weighted sound power level, L_{WA} [dB], to duct. These curvs are intended for brief comparision. For more accurate calculation, please use the tables on pages *–*.

Example

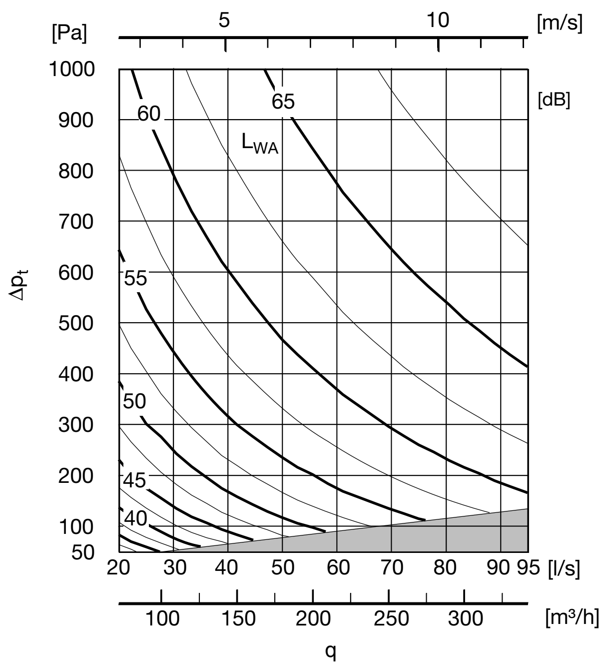
Given: Diameter 125 mm
Flow 70 l/s
Pressure drop 200 Pa

The graph gives:
A-weighted sound power level approx. 57 dB

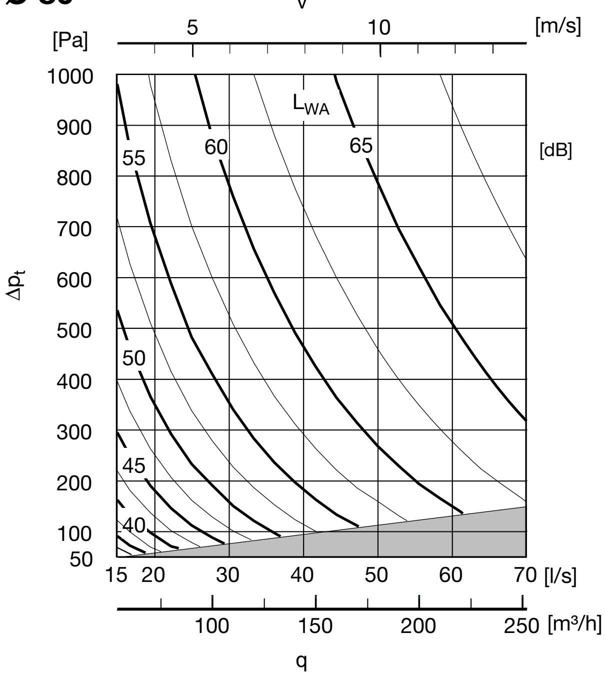
The table gives:
Sound power level as below

Centre fre-quency [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

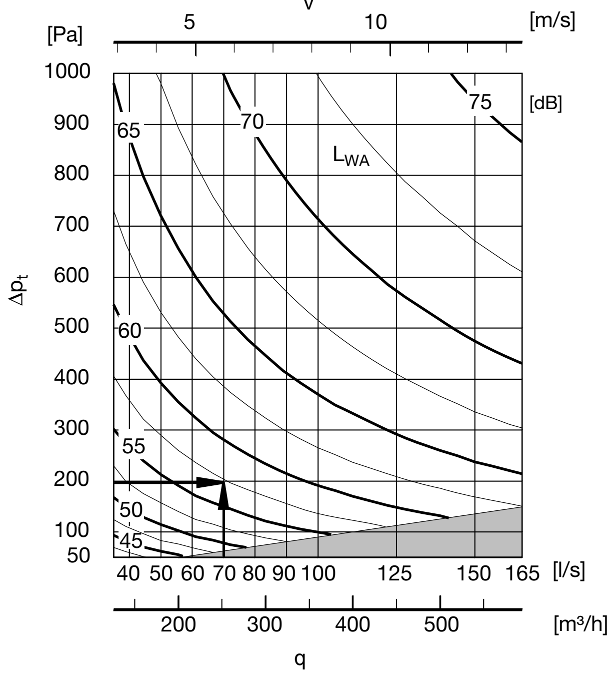
Ø 100



Ø 80



Ø 125



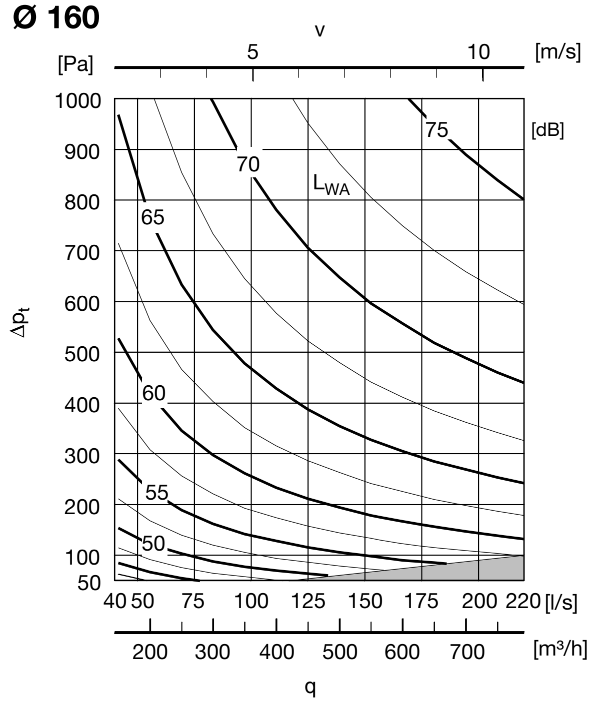
Constant-/ variable flow damper

DAU, DA2EU, DAVU

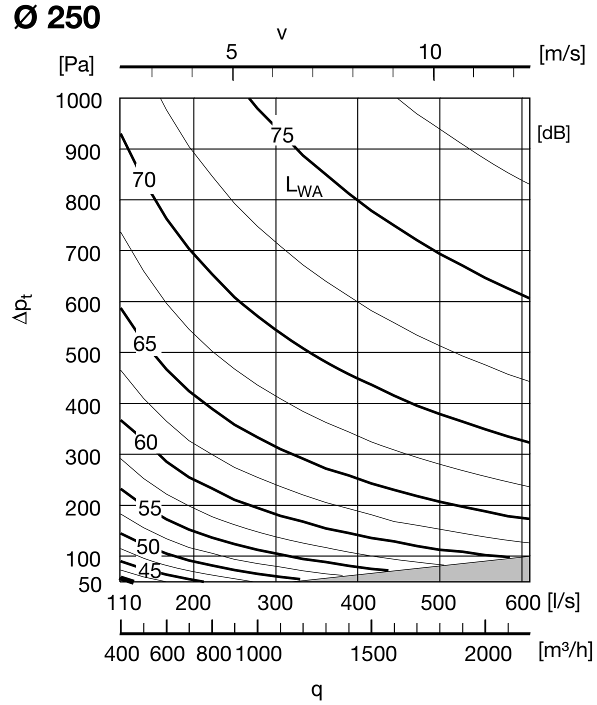
Technical data

Pressure and flow ranges and sound to duct

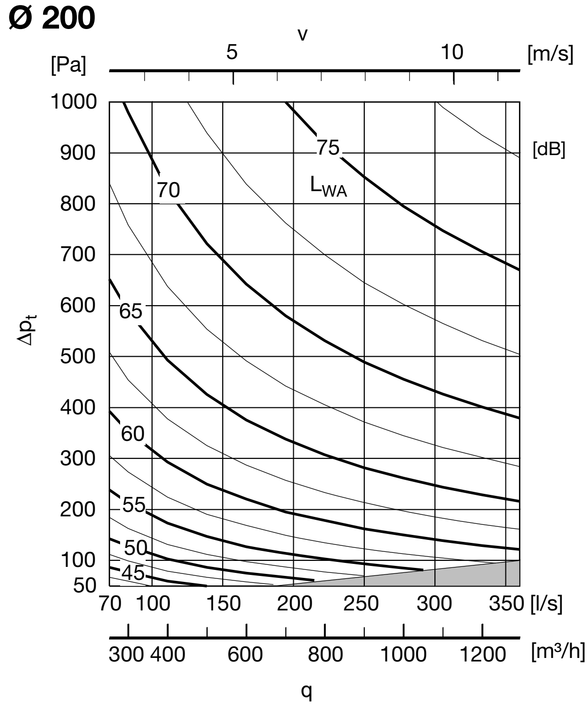
Ø 160



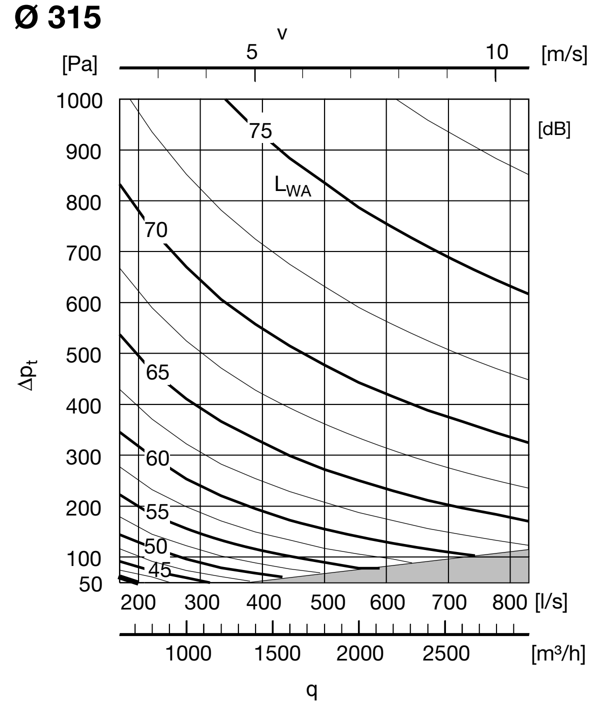
Ø 250



Ø 200



Ø 315



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.

$Ød_1$	Pressure drop [Pa]	Velocity app. 2,5 [m/s]								Velocity app. 6 [m/s]							
		Centre frequency [Hz] [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

Ød1	Pressure drop [Pa]	Velocity app. 9 [m/s]								Velocity app. 12 [m/s]							
		Centre frequency [Hz] [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:

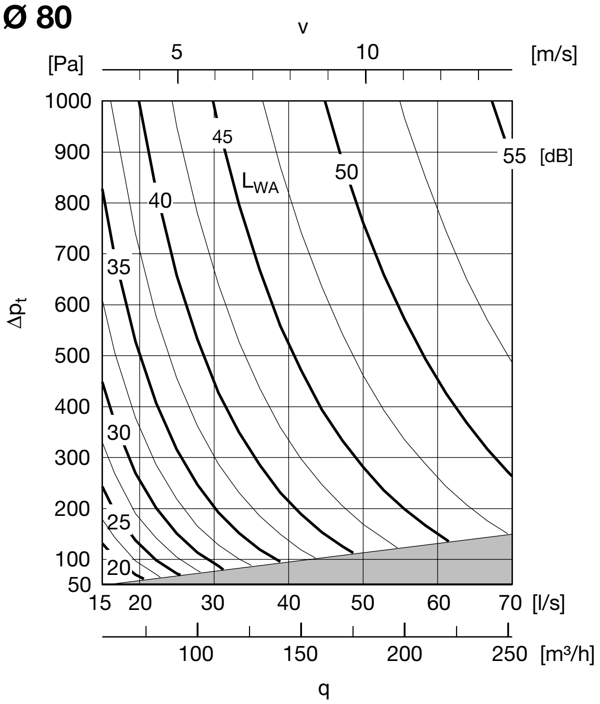
A-weighted sound power level approx. 40 dB

The A-weighted sound **pressure** level in the mittle of the room becomes approx. 8 dB lower than these graph values.

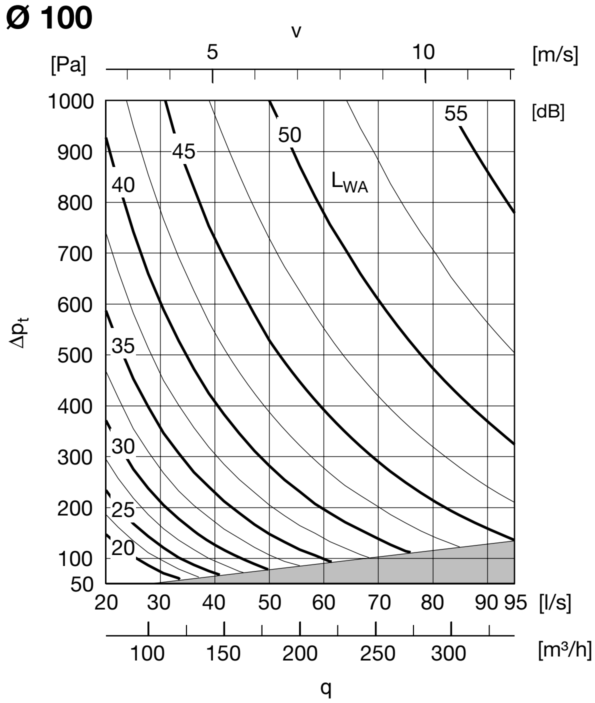
With insulation shell around the unit the sound **pressure** level in the mittle of the room becomes appox. 26 dB lower than the graph values on condition that also the connected ducts are attenuated (insulated) to the same extent.

Still lower sound **pressure** level can be achieved with additional constructional sound attension measures (false ceiling, high room attenuation).

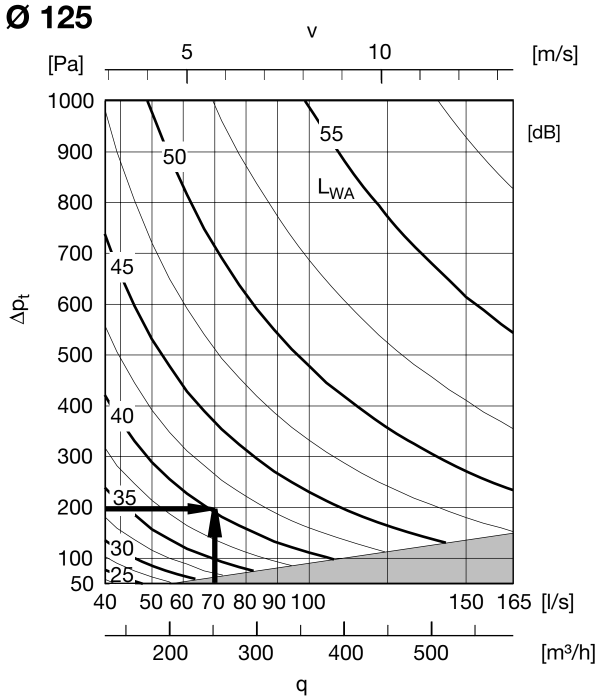
Ø 80



Ø 100



Ø 125

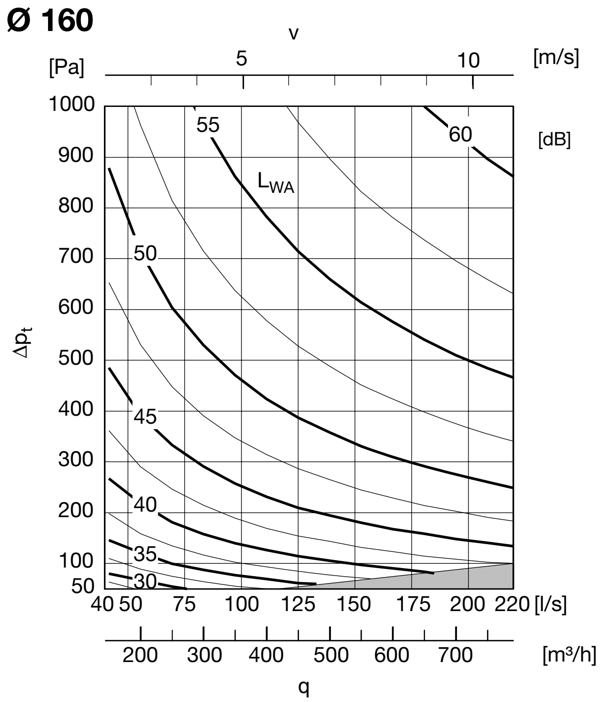


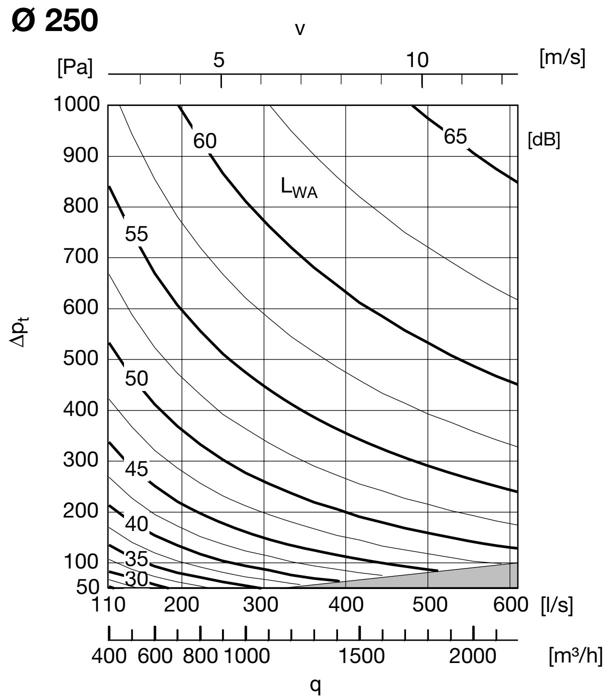
Constant-/ variable flow damper

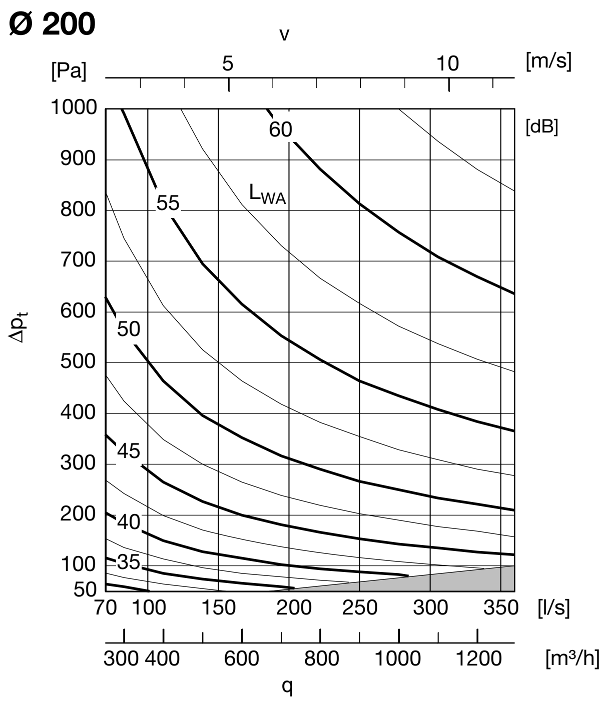
DAU, DA2EU, DAVU

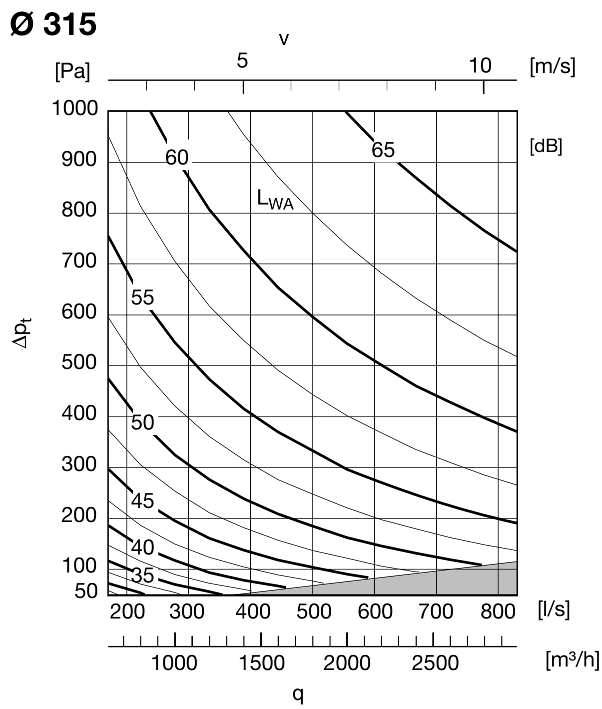
Technical data

Pressure and flow ranges and sound to the surroundings









Constant-/variable flow damper DAU

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.

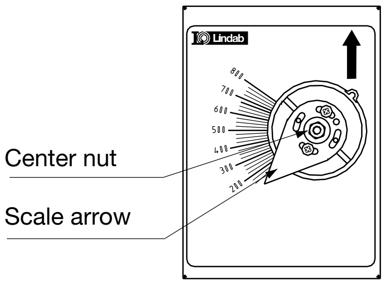
The unit compensates for e.g. connection and disconnection of system parts, clogging of filters and ducts, thermal lift forces, wind effects, window opening etc.

A special mounting, measuring, balancing and maintenance instruction exists for this product.

Technical data

Flow setting

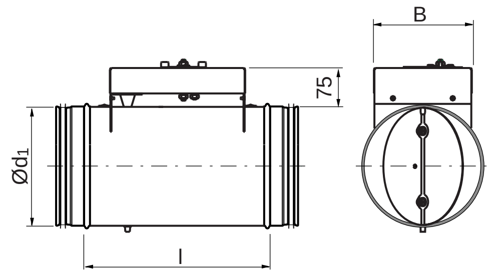
The flow is set by loosing the central nut and via the knob turning the scale arrow so it points at the wanted flow on the scale. Then the locking nut is tightened.



Ordering example

	DAU	125
Product	DAU	
Dimension $Ød_1$		125

Dimensions

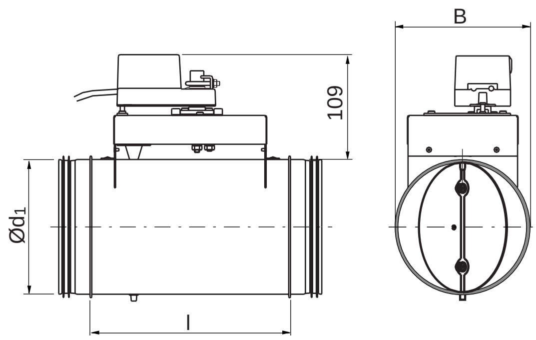


$Ød_1$ nom	l mm	B mm	m kg	Tightness class across closed blade
80	240	132	1,35	0
100	240	132	1,40	0
125	240	135	1,65	0
160	240	170	1,85	0
200	268	210	2,26	0
250	290	260	3,35	0
315	332	325	4,75	0

Constant-/variable flow damper DA2EU

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

Dimensions



$Ød_1$ nom	l mm	B mm	m kg	Tightness class across closed blade
80	240	132	1,95	0
100	240	132	2,00	0
125	240	135	2,25	0
160	240	170	2,45	0
200	268	210	2,86	0
250	290	260	3,95	0
315	332	325	5,35	0

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. A special mounting, measuring, balancing and maintenance instruction exists for this product.

Ordering example

DA2EU 125 24 LM

- Product — DA2EU
- Dimension $Ød_1$ — 125
- Voltage — 24
- Motor type — LM

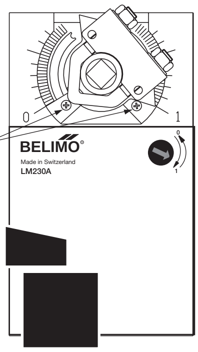
Technical data

Flow setting

The two flows are set by moving the end stoppers screws.

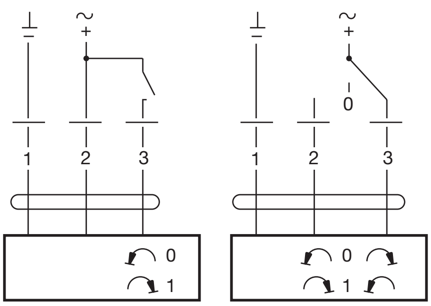
At delivery the screws are set at largest possible distance.

End stop screws



Technical data for the motors

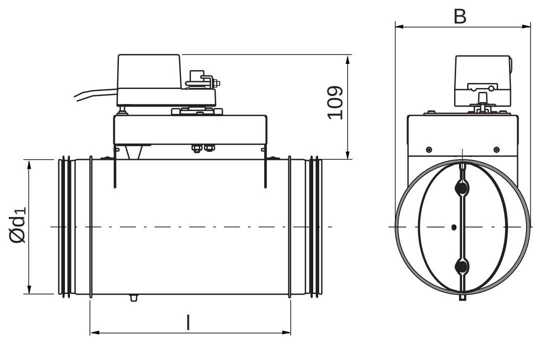
	LM 24 A	LM 230 A
Power supply	AC 19,2–28,8 V, 50/60 Hz DC 19,2–28,8 V	AC 65–265 V, 50/60 Hz
Power consumption	1 W	1,5 W
For wire sizing	2 VA	4 VA
Connection	Cable 1 m, 3×0,75 mm^2	Cable 1 m, 3×0,75 mm^2
Operating angle	Max. 95°, adjustable 0–100%	Max. 95°, adjustable 0–100%
Torque at rated voltage	Min. 5 Nm	Min. 5 Nm
Direction of rotation	Switch selectable 0 ↶ or 1 ↷	Switch selectable 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



Lindab

Constant-/variable flow damper DAVU

Dimensions



Ød1 nom	l mm	B mm	m kg	Tightness class across closed blade
80	240	132	1,95	0
100	240	132	2,00	0
125	240	135	2,25	0
160	240	170	2,45	0
200	268	210	2,86	0
250	290	260	3,95	0
315	332	325	5,35	0

Description

Constant flow damper with electric motor for continuous setting of one flow

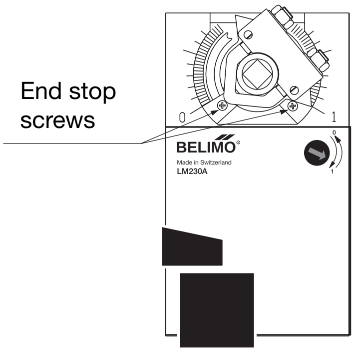
DAVU is a constant flow damper, which facilitates balancing of ventilation systems and gives correct flow from the start. The unit compensates for e.g. connection and disconnection of system parts, clogging of filters and ducts, thermal lift forces, wind effects, window opening etc. The motor shall be 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.

Technical data

Flow setting

The two flows are set by moving the end stoppers screws.

At delivery the screws are set at largest possible distance.

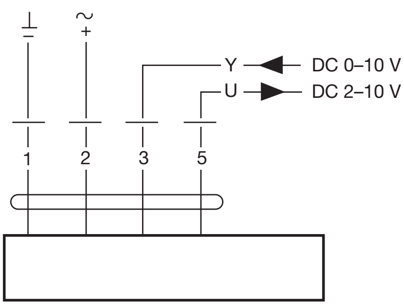


Ordering example

	DAVU	125	24	LMSR
Product	DAVU			
Dimension Ød1		125		
Voltage			24	
Motor type				LMSR

Technical data for the motors

	LM 24 A-SR
Power supply	AC 19,2–28,8 V, 50/60 Hz DC 19,2–28,8 V
Power consumption	1 W
For wire sizing	2 VA
Connection	Cable 1 m, 4×0,75 mm²
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



Sliding damper – manual SKHTR

Description

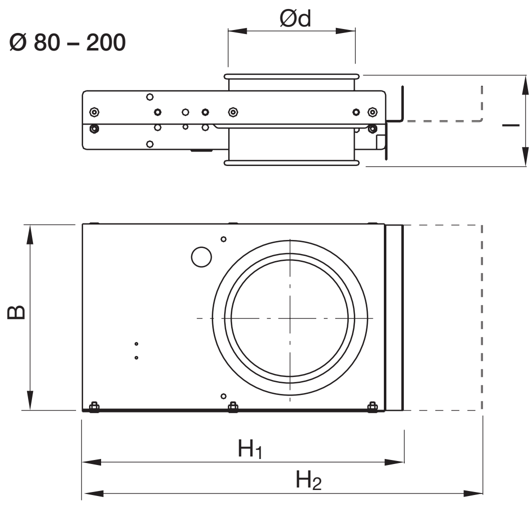
Manual shut-off sliding damper with transfer joint
The damper meets the requirements for tightness class 4.

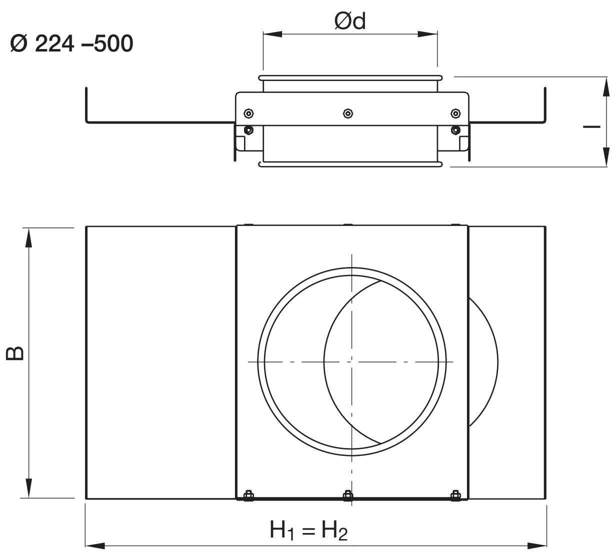
The damper meets the requirements for tightness class C only in fully closed or fully opened position.

Ordering example

	SKHTR	200
Product	SKHTR	
Dimension Ød		200

Dimensions





Ød nom	H_1 mm	H_2 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	585	345	165	10,2
250 *	585	585	370	165	12,2
300 *	730	730	420	165	18,1
315 *	730	730	435	165	19,0
350 *	800	800	470	165	22,5
400 *	905	905	520	165	26,1

* Has through blade

Sliding damper – pneumatic SKPTR

Description

Pneumatic shut-off sliding damper with transfer joint
The damper meets the requirements for tightness class 4.

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.

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

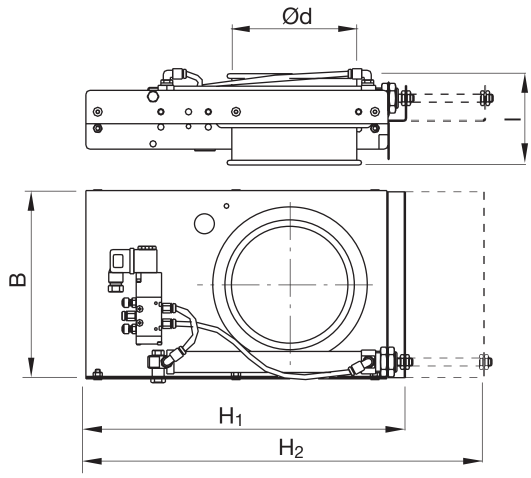
Power pressure	max 7 bar
Ambient temperature	max +50 °C
Power supply, standard	220 V~
, special	24 V~ or 24 V-
Power tolerance	±10 %
Power requirements	appr. 5 W
Protection class	IP 65
Insulation class	B
Air connection	Quick release for Ø 6 mm hose

Ordering example

SKPTR 200

Product — SKPTR
Dimension Ød — 200

Dimensions



Ød nom	H_1 mm	H_2 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

Damper with flow meter FMDRU

Description

Applications
The flow meter is suitable both for setting up and for continous flow measurement. It is intended for permanent installation and must therefore be specified at the design stage.

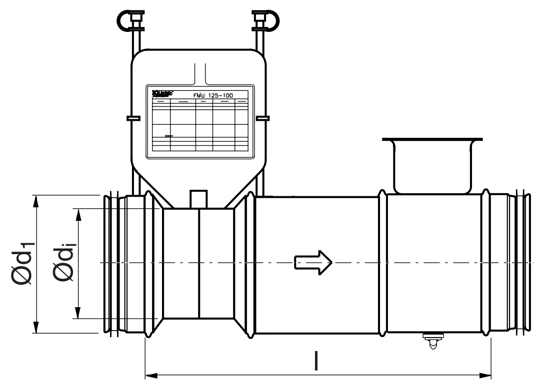
Design
The flow meter consists of two reducers joined together, with measurement nozzles. Each nozzle has a removable plastic plug which prevents dirt from entering. It also eliminates air leakage when measurement is not done.

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 * to facilitate cleaning.

Dimensions



Ød1 nom	Ødi nom	l mm	m 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.

Ordering example

FMDRU 160 125

Product
Dimension $Ød_1$
Dimension $Ød_i$

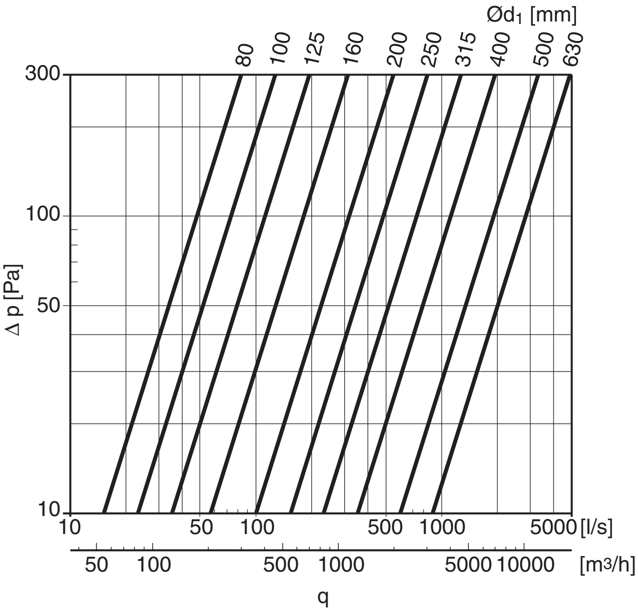
Lindab

Damper with flow meter FMDRU

Technical data

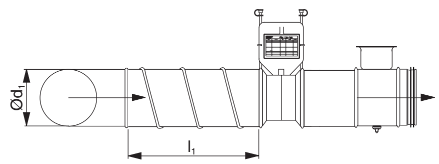
Sound
Sound generation has been measured at the Swedish National Testing and Research Institute in an reverberation room, in accordance with ISO 5135 and ISO 3741.

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, Dp, 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 =straigh distance before meter	Method error m_2	
Type of disturbance	5%	10%
A 90° bend 	$2 \cdot d_1$	$1 \cdot d_1$
l_2 = straigh distance after meter	$1 \cdot d_1$	$1 \cdot d_1$

Damper with flow meter FMDRU

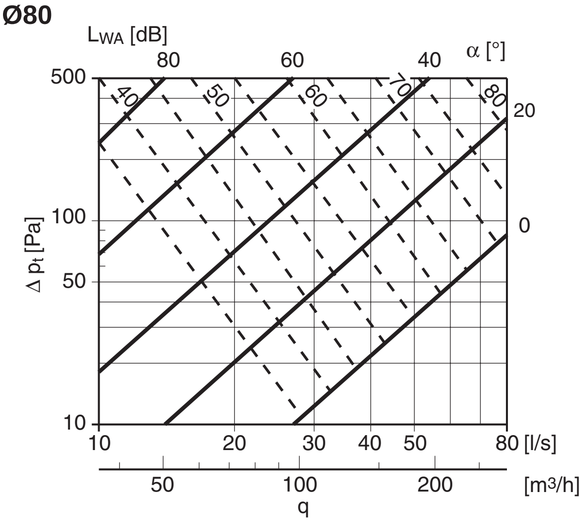
Pressure drop graphs with sound data for dimensioning

The solid lines show the pressure drop, Δp_t, across the unit as a function of flow, q.

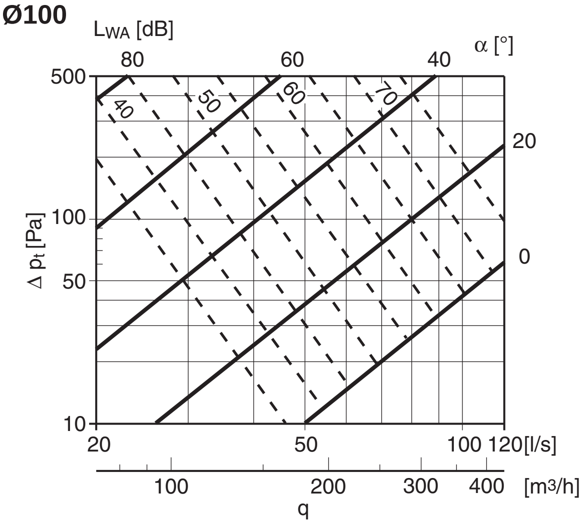
The dashed lines give the A-weighted sound power data, L_{WA}, in dB to the duct.

Flow data for balancing differs from these graphs.

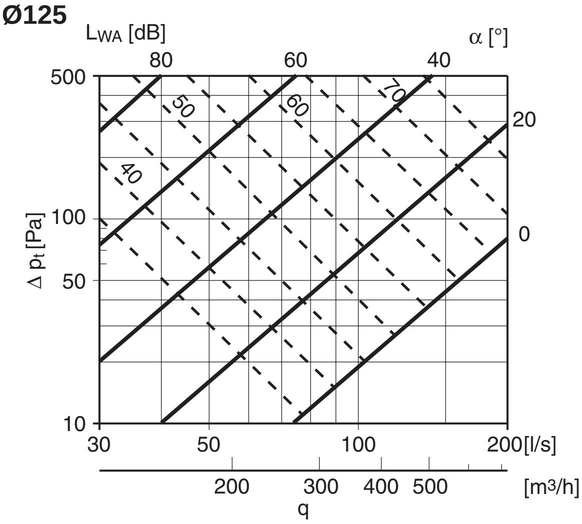
Ø80



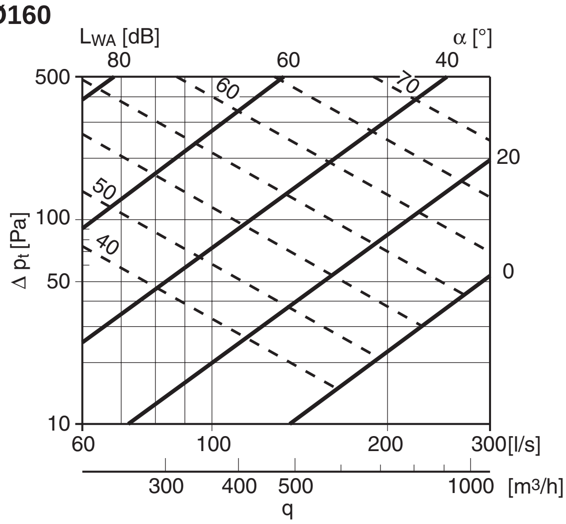
Ø100



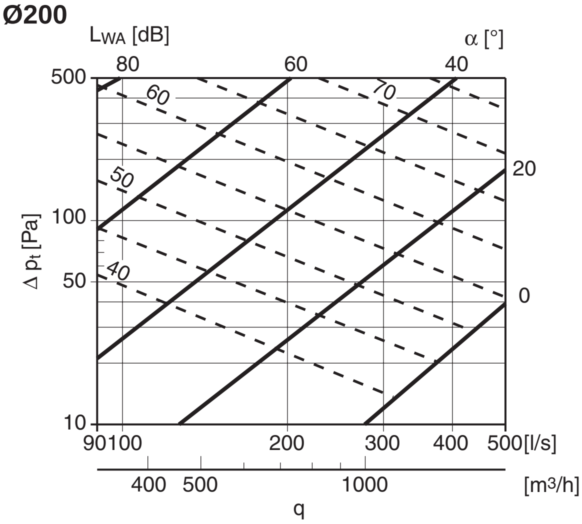
Ø125



Ø160

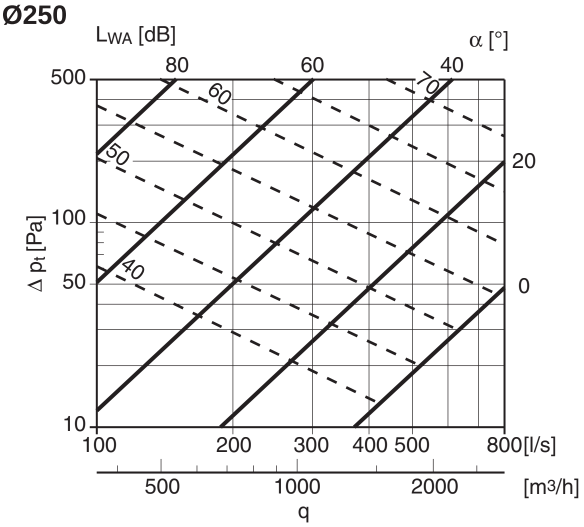


Ø200

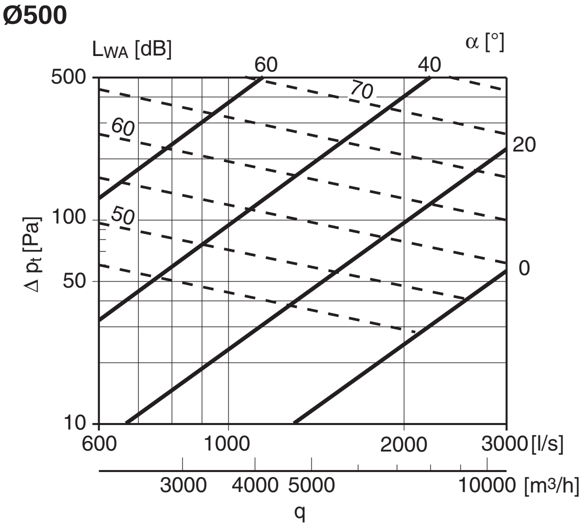


Damper with flow meter FMDRU

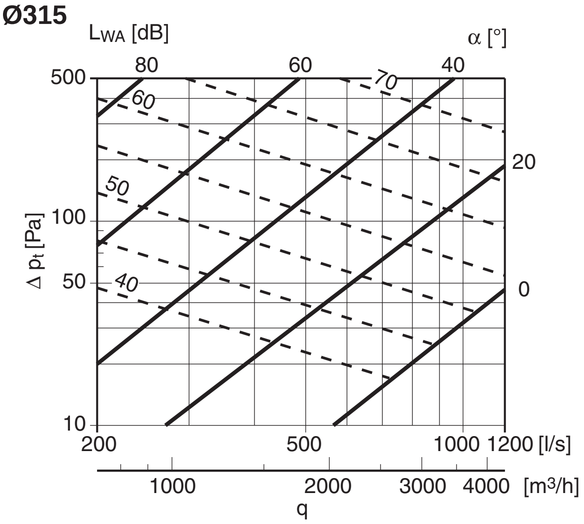
Ø250



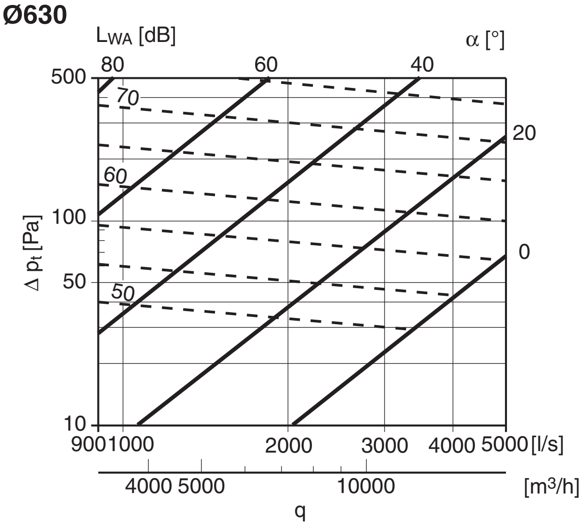
Ø500



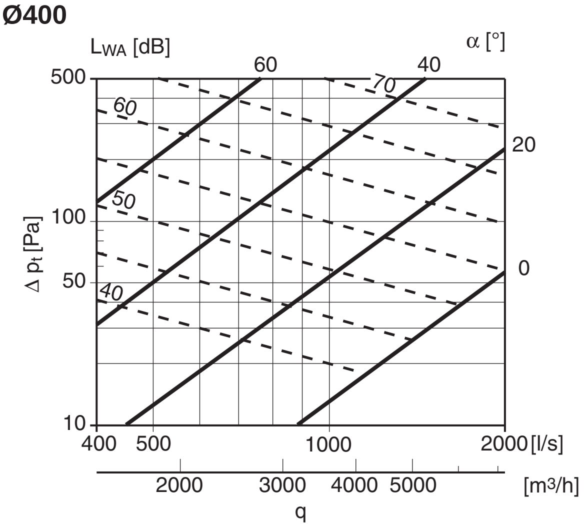
Ø315



Ø630



Ø400



Damper with flow meter FMDRU

Sound generation

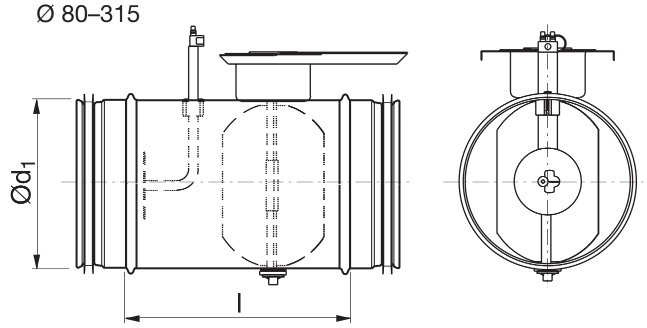
dim $Ød_1$	Pressure drop [Pa]	Velocity app. 5 [m/s]								Velocity app. 10 [m/s]								Velocity app. 15 [m/s]							
		Centre frequency [Hz]								Centre frequency [Hz]								Centre frequency [Hz]							
		63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
80		Flow 25 [l/s]								Flow 50 [l/s]								Flow 75 [l/s]							
	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
400		Flow 600 [l/s]								Flow 1200 [l/s]								Flow 1800 [l/s]							
	500	78	71	66	61	58	59	59	55	83	78	72	67	65	64	65	62	88	82	76	71	68	67	68	64
	300	73	67	61	57	54	54	53	48	77	73	67	62	60	59	59	56	84	78	71	66	64	62	63	58
	200	69	63	58	54	51	50	48	43	73	69	63	58	56	54	54	51	80	74	67	63	60	58	59	53
	100	63	56	51	48	45	43	39	34	65	62	56	52	50	47	46	42	74	68	60	56	54	50	52	45
	50	56	50	45	43	40	36	31	25	58	55	49	45	43	39	38	34	68	62	54	50	48	43	45	37
500		Flow 1000 [l/s]								Flow 2000 [l/s]								Flow 3000 [l/s]							
	500	81	75	69	64	61	63	63	59	87	81	73	68	67	66	67	64	91	84	76	71	69	68	72	66
	300	76	70	64	60	57	57	57	51	82	75	67	63	62	60	61	58	86	79	70	66	64	62	64	59
	200	73	66	61	57	54	52	51	45	78	71	63	59	57	55	56	53	82	74	66	62	59	57	59	54
	100	66	59	53	51	48	45	42	35	71	64	55	53	51	47	47	44	75	62	58	55	52	52	51	45
	50	60	53	47	45	42	37	33	26	65	56	48	46	44	38	39	35	69	60	51	49	45	40	43	36
630		Flow 1500 [l/s]								Flow 3000 [l/s]								Flow 4500 [l/s]							
	500	88	81	74	68	66	67	67	62	91	84	75	70	70	69	70	66	93	86	77	71	71	70	76	67
	300	82	75	68	63	61	60	60	54	85	78	69	65	65	62	63	59	87	80	71	65	65	63	66	60
	200	78	71	64	59	57	55	54	47	80	73	64	61	60	57	58	53	82	75	66	60	60	57	60	54
	100	70	63	56	53	51	46	43	36	72	65	56	54	53	48	48	43	73	67	58	52	51	48	51	44
	50	63	56	49	46	44	38	33	25	64	57	48	47	46	39	39	33	65	59	50	44	43	38	42	34

Damper with flow meter

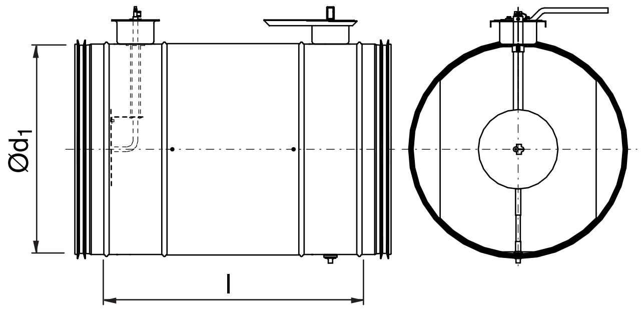
FMDU

Dimensions

Ø 80–315



Ø 400–630



$Ød_1$ nom	l mm	m 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 continous flow measurement. It is intended for permanent installation and must therefore be specified at the design stage.

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 page * to facilitate cleaning.

Advantages
- Short installation length.
- Suitable for use with insulation.

Ordering example

	FMDU	200
Product		
Dimension $Ød_1$		

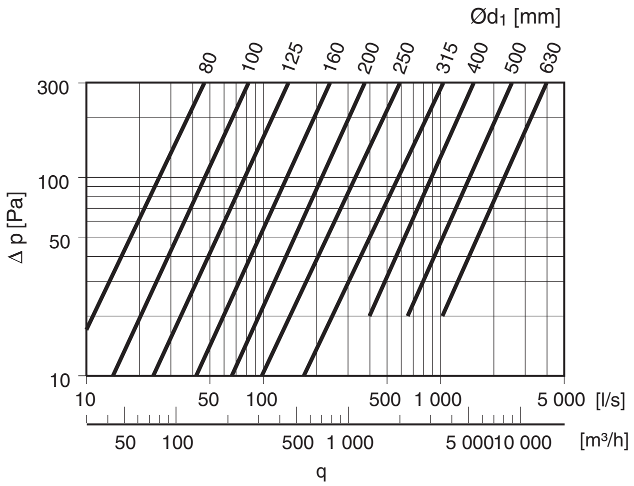
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

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.

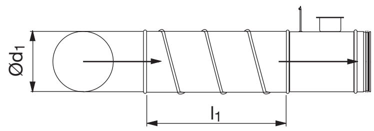
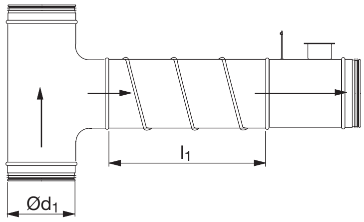


Measurement function

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.

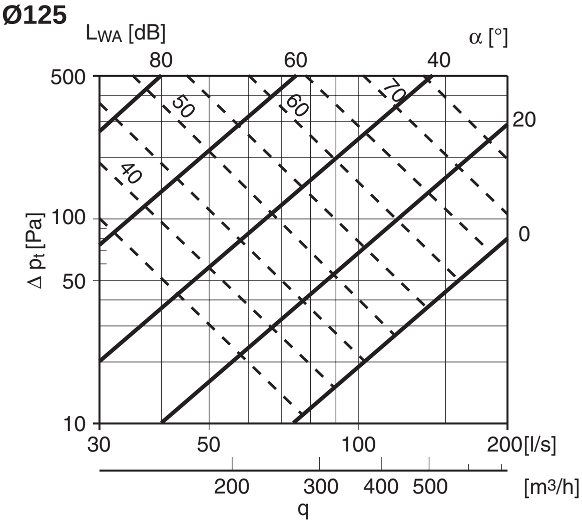
l_1 =straigh distance before meter	Method error m_2	
Type of disturbance	5%	10%
A 90° bend 	$6 \cdot d_1$	$0 \cdot d_1$
A branch 	$6 \cdot d_1$	$4 \cdot d_1$
l_2 = straigh distance after meter	$1 \cdot d_1$	$1 \cdot d_1$

Damper with flow meter FMDU

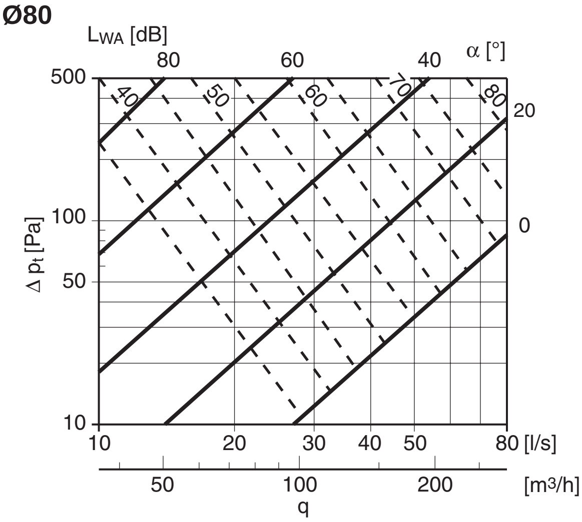
Pressure drop graphs with sound data for dimensioning

The solid lines show the pressure drop, Δp_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.

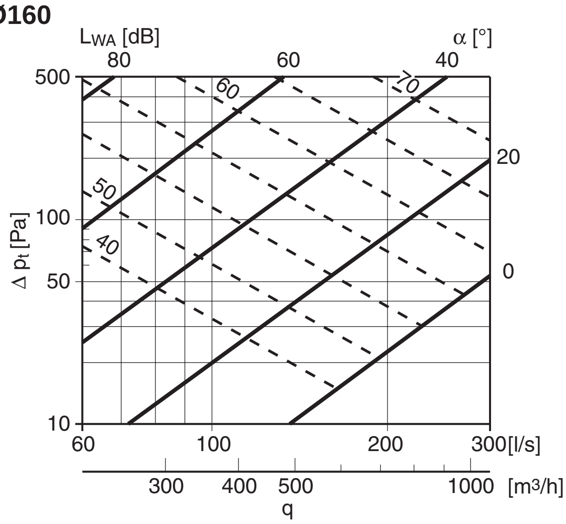
Ø125



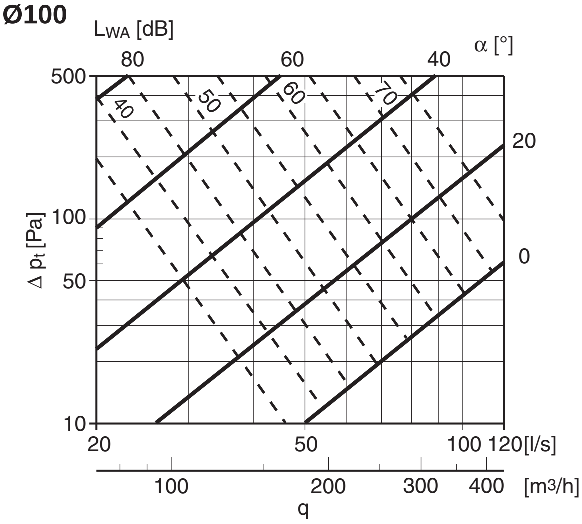
Ø80



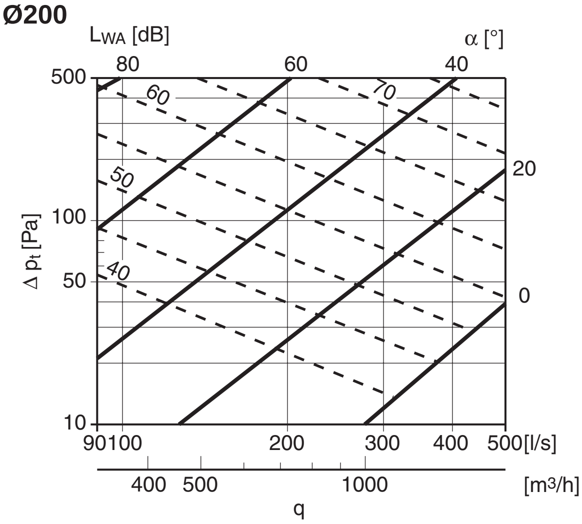
Ø160



Ø100

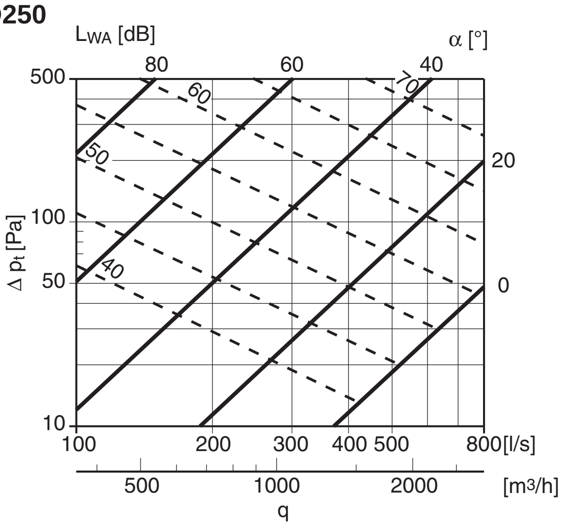


Ø200

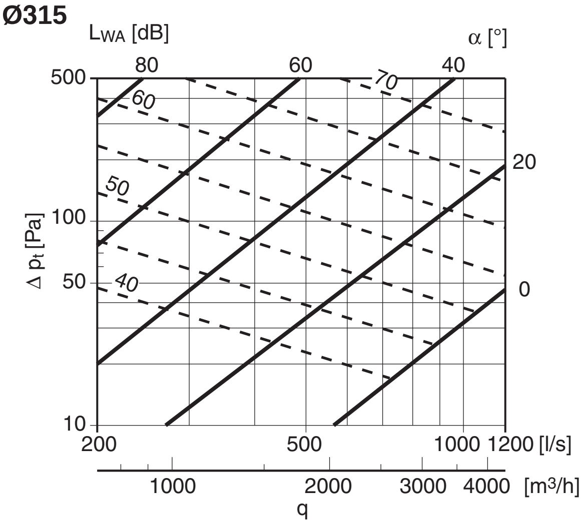


Damper with flow meter FMDU

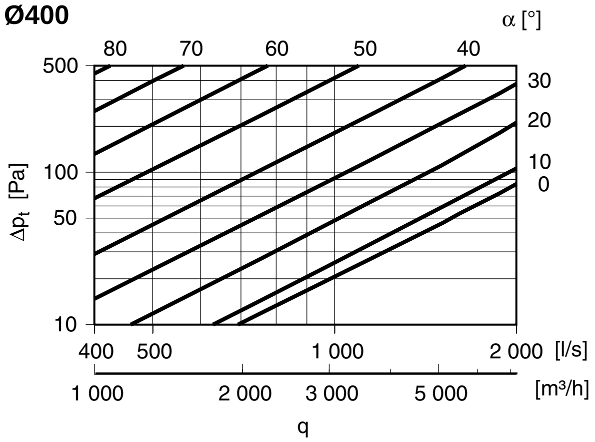
Ø250



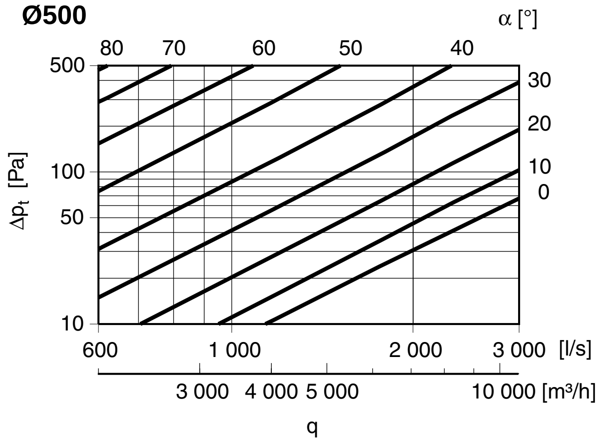
Ø315



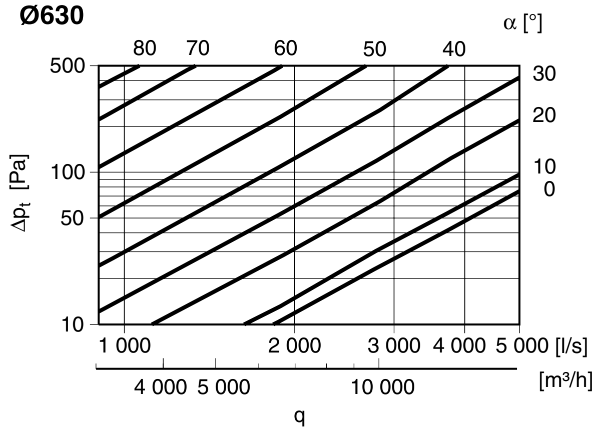
Ø400



Ø500



Ø630



Damper with flow meter FMDU

Sound generation

Velocity app. 5 [m/s] – Centre frequency [Hz]

dim Ød1	Pressure drop [Pa]	63	125	250	500	1k	2k	4k	8k
80		Flow 25 [l/s]							
	500	64	65	62	59	57	56	52	51
	300	61	62	58	55	52	50	45	43
	200	59	60	56	51	47	46	40	38
	100	56	56	51	45	40	38	30	28
	50	52	52	47	40	33	30	21	18
100		Flow 40 [l/s]							
	500	64	63	62	58	56	55	53	54
	300	61	60	58	54	51	50	46	46
	200	59	58	55	51	47	46	40	40
	100	56	54	51	45	40	40	31	30
	50	52	50	46	39	34	33	22	20
125		Flow 60 [l/s]							
	500	66	64	62	59	56	56	54	53
	300	63	61	58	55	51	51	47	45
	200	61	59	56	51	47	47	42	40
	100	57	55	51	46	41	40	33	30
	50	53	51	46	40	35	32	25	21
160		Flow 100 [l/s]							
	500	66	63	61	57	54	54	53	52
	300	63	60	57	53	50	49	47	45
	200	61	58	55	50	47	45	42	40
	100	58	54	50	45	41	38	34	31
	50	55	51	45	39	36	31	26	23
200		Flow 150 [l/s]							
	500	71	68	65	61	58	58	57	55
	300	67	64	60	57	53	53	50	47
	200	65	61	57	53	49	49	45	42
	100	60	56	52	48	43	41	36	32
	50	55	52	46	42	37	34	28	23
250		Flow 250 [l/s]							
	500	69	66	64	61	57	59	58	56
	300	66	63	60	58	53	54	53	49
	200	64	60	57	55	49	50	49	44
	100	60	56	52	50	43	44	41	34
	50	56	51	47	45	37	37	34	25
315		Flow 400 [l/s]							
	500	76	71	67	62	60	60	60	57
	300	72	67	62	58	55	55	54	49
	200	69	64	59	55	51	50	48	44
	100	63	58	53	49	45	43	39	34
	50	58	52	47	43	39	36	30	24

Velocity app. 10 [m/s] – Centre frequency [Hz]

dim Ød1	Pressure drop [Pa]	63	125	250	500	1k	2k	4k	8k
80		Flow 50 [l/s]							
	500	68	76	76	70	64	61	59	56
	300	65	75	75	67	61	57	53	49
	200	63	75	74	64	58	53	48	44
	100	59	74	72	59	52	47	40	35
	50	56	73	71	54	47	41	32	26
100		Flow 80 [l/s]							
	500	67	76	76	69	63	60	61	61
	300	65	76	76	65	59	55	56	56
	200	62	75	75	62	55	51	52	53
	100	59	75	75	57	49	44	46	46
	50	55	75	74	52	43	37	39	40
125		Flow 120 [l/s]							
	500	72	76	75	68	63	60	61	59
	300	69	75	73	65	59	56	55	53
	200	67	74	71	62	56	52	50	49
	100	64	72	69	57	50	45	43	41
	50	60	71	66	51	44	38	36	34
160		Flow 200 [l/s]							
	500	77	78	73	67	63	59	59	58
	300	75	77	70	63	59	54	54	53
	200	74	75	68	60	56	50	49	48
	100	71	73	64	55	51	43	42	41
	50	69	71	60	50	46	36	34	33
200		Flow 300 [l/s]							
	500	75	77	70	63	60	54	54	53
	300	74	75	68	60	56	50	49	48
	200	71	73	68	61	56	53	52	50
	100	66	69	64	55	50	46	45	42
	50	62	66	60	50	44	38	37	34
250		Flow 500 [l/s]							
	500	79	76	72	67	62	61	64	63
	300	77	73	68	63	57	56	59	58
	200	75	70	65	60	53	52	54	53
	100	72	65	59	54	47	45	47	46
	50	69	61	54	49	40	38	39	38
315		Flow 800 [l/s]							
	500	82	79	74	68	66	64	65	63
	300	78	75	69	64	61	58	49	57
	200	74	72	66	60	57	54	54	51
	100	69	66	60	54	51	46	46	43
	50	63	61	54	48	44	38	38	34

Velocity app. 15 [m/s] – Centre frequency [Hz]

dim Ød1	Pressure drop [Pa]	63	125	250	500	1k	2k	4k	8k
80		Flow 75 [l/s]							
	500	71	80	80	73	67	63	61	58
	300	68	79	77	68	63	58	55	52
	200	67	78	75	64	59	54	51	47
	100	63	76	71	58	53	48	42	38
	50	Pressure drop exceeds 50 [Pa]							
100		Flow 120 [l/s]							
	500	70	81	82	70	66	64	64	64
	300	68	81	80	65	62	60	60	59
	200	65	81	79	61	58	57	56	55
	100	62	81	78	54	52	51	50	49
	50	Pressure drop exceeds 50 [Pa]							
125		Flow 180 [l/s]							
	500	75	81	79	71	66	63	63	61
	300	73	79	76	67	62	59	58	56
	200	71	78	74	63	58	55	53	51
	100	67	76	70	57	52	49	46	43
	50	Pressure drop exceeds 50 [Pa]							
160		Flow 300 [l/s]							
	500	80	81	76	71	66	62	61	59
	300	78	79	72	67	62	57	55	53
	200	76	77	69	64	58	53	50	48
	100	74	74	63	59	53	46	42	39
	50	71	71	58	54	47	39	34	31
200		Flow 450 [l/s]							
	500	80	82	78	71	67	65	66	63
	300	77	79	74	67	63	60	60	57
	200	74	77	71	63	58	56	55	52
	100	70	71	66	57	52	50	48	44
	50	65	69	51	50	46	41	40	35
250		Flow 750 [l/s]							
	500	83	81	76	72	65	64	67	66
	300	81	77	72	68	60	59	61	60
	200	78	74	69	65	56	55	57	55
	100	75	69	63	60	50	48	50	47
	50	71	64	58	55	43	41	42	39
315		Flow 1200 [l/s]							
	500	86	83	77	71	68	66	69	64
	300	82	79	72	66	63	61	62	58
	200	78	75	69	62	59	56	57	53
	100	73	67	62	56	52	51	49	44
	50	67	64	56	49	45	41	41	36

Flow meter

FMU

Description

Applications
The meter is suitable both for setting up and for continous flow measurement. It is intended for permanent installation and must therefore be specified at the design stage.

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.

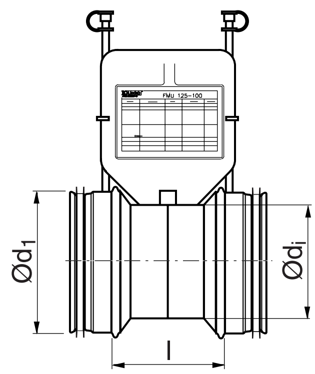
The unit permits insulation of up to 100 mm thickness to be installed without concealing the measurement nozzles or label plate. The plate can be rotated for best legibility, irrespective of the way the fitting is installed and can easily be removed, to be located away from the unit.

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

	FMU	160	125
Product	FMU		
Dimension $Ød_1$		160	
Dimension $Ød_i$			125

Dimensions



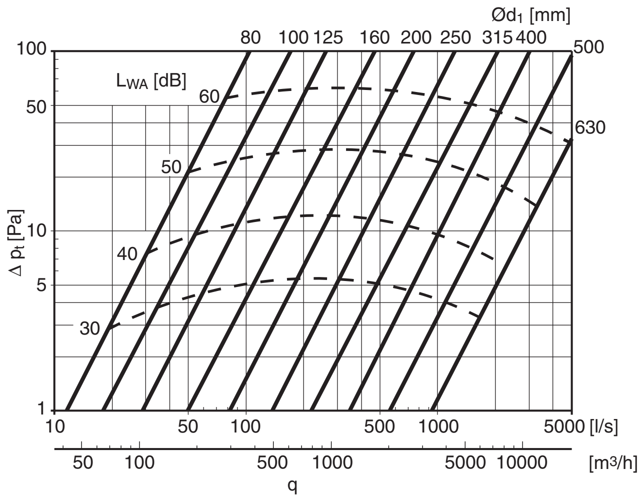
$Ød_1$ nom	$Ød_i$ nom	l mm	m kg
80	63	110	0,33
100	80	120	0,42
125	100	111	0,48
160	125	123	0,62
200	160	129	0,83
250	200	131	1,15
315	250	195	1,81
400	315	206	2,60
500	400	275	3,92
630	500	355	6,38

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

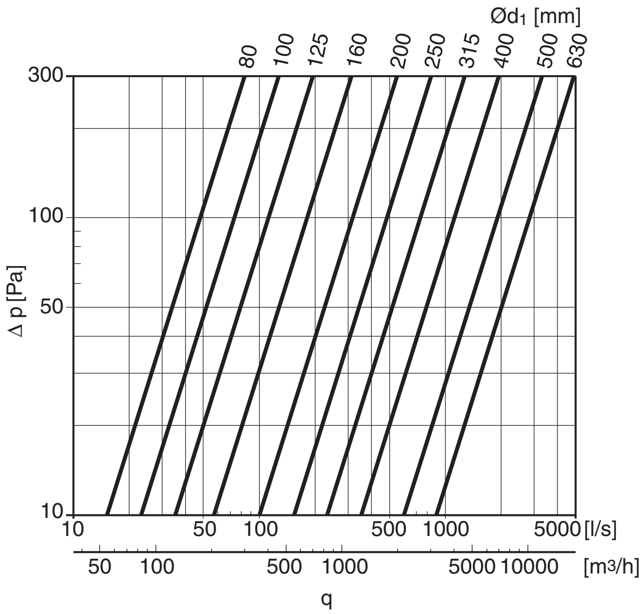
Technical data

Pressure drop graph with sound data for dimensioning
The solid lines give the pressure drop, Δp, 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.



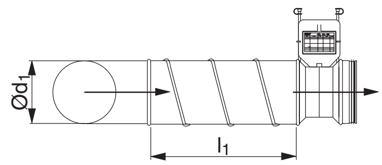
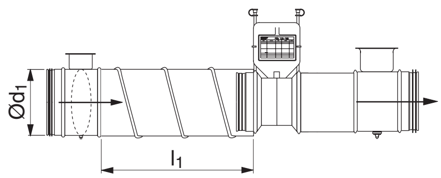
Sound
Sound generation has been measured at the Swedish National Testing and Research Institute in reverberation room, in accordance with ISO 5135 and ISO 3741.

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, Δp, 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 =straigh distance before meter	Method error m_2	
Type of disturbance	5%	10%
A 90° bend 	$2 \cdot d_1$	$1 \cdot d_1$
A rotary damper (45°). Shaft in line with measurement nozzles 	$4 \cdot d_1$	$3 \cdot d_1$
l_2 = straigh distance after meter	$1 \cdot d_1$	$1 \cdot d_1$

Flow meter FMU

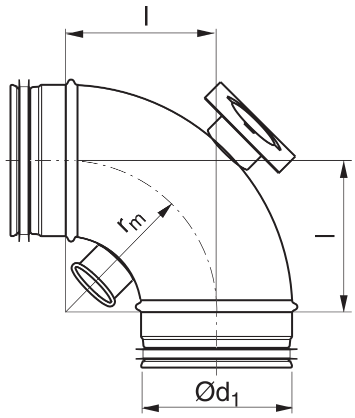
Sound generation

dim $Ød_1$	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

Measuring bend

MBU

Dimensions



$r_m \approx 1 \cdot d_1$

$Ød_1$ nom	l mm	m kg
100	100	0,40
112	120	0,51
125	125	0,60
140	135	0,82
150	150	0,80
160	160	1,02
180	175	1,20
200	200	1,40
224	225	1,73
250	250	2,00
280	275	2,71
300	300	3,02
315	315	3,20

Description

Applications
The measuring bend is suitable both for balancing and for continous 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.

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

	MBU	315	90
Product	✓		
Dimension $Ød_1$		✓	
Angle α			✓

Measuring bend

MBFU

Description

Applications

The measuring bend is suitable both for balancing and for continous 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.

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

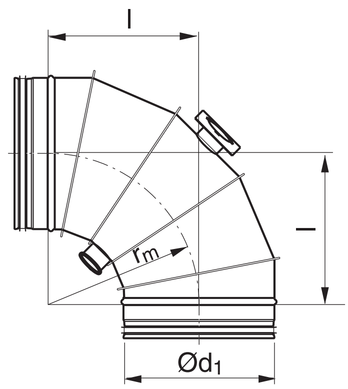
MBFU 500 90

Product — MBFU

Dimension $Ød_1$ — 500

Angle α — 90

Dimensions



$r_m \approx 0{,}9 \cdot d_1$

$Ød_1$ nom	l mm	m kg
355	328	3,93
400	360	5,82
450	413	7,18
500	454	8,38
560	506	10,3
600	540	11,9
630	566	13,1

Advantages

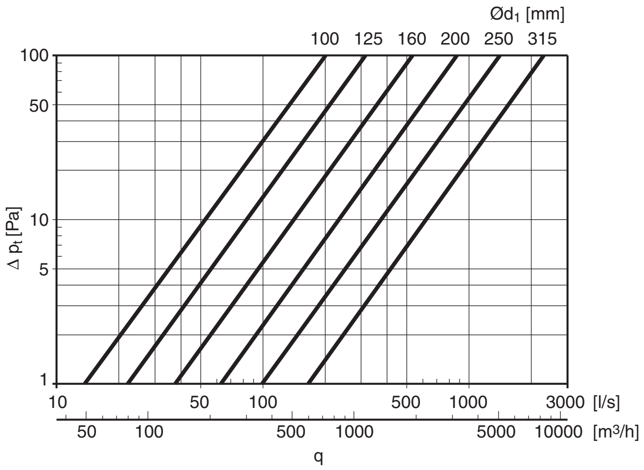
- Has a double function – both as a bend and as a meter.
- Does not increase pressure drop, compared with a standard Safe bend.
- Does not cause any noise, due to projecting components in the duct.
- Does not obstruct duct cleaning.

Measuring bends

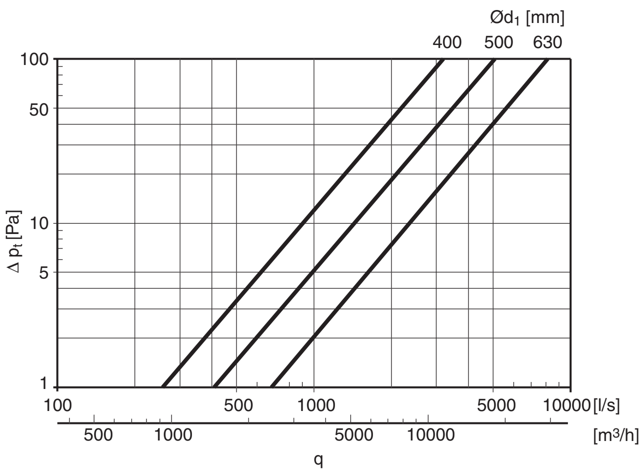
MBU, MBFU

Technical data

Pressure drop graph for dimensioning of MBU

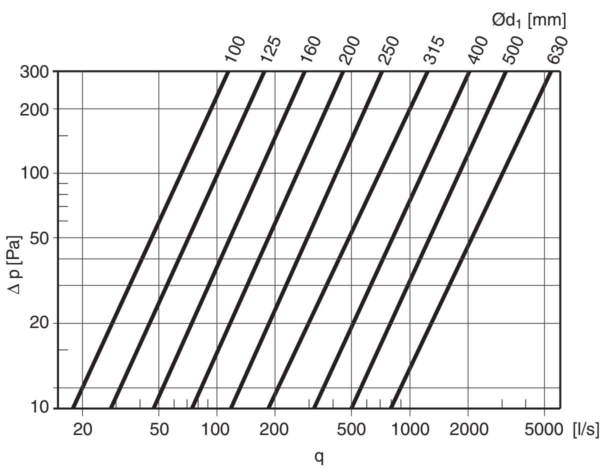


Pressure drop graph for dimensioning of MBFU



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

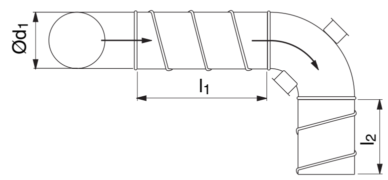
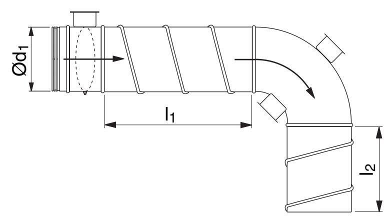


Measurement function

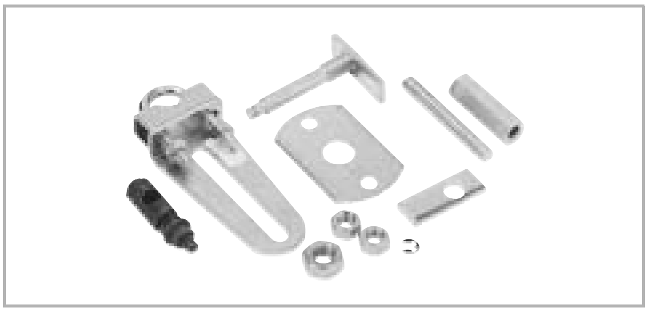
By measuring the pressure difference, Δp, between the inner and outer bend radii, you can derive the flow in the duct by means of the equation on the units plate.

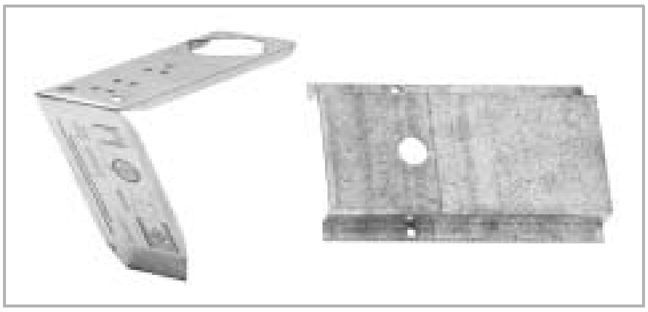
Measurement accuracy

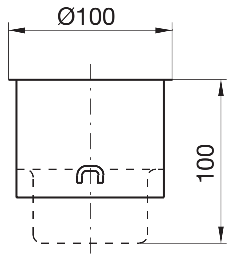
If the velocity profile is asymmetric, the measurement values can differ from the ideal values. For this reason, the measuring bend should never be located right up to any flow disturbance. The method error, as shown in the table below will differ, depending on the distance to the flow disturbance.

l_1 = straight distance before measuring bends. Type of disturbance	Method error m_2	
	5%	10%
A 90° bend 	8,5·d_1	4,5·d_1
A rotary damper (45°). Shaft in line with the measurement nozzles 	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.

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.

Roof hoods

Content – Roof hoods

Roof hoods

Roof transitions

Roof hoods

Choice

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.

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.

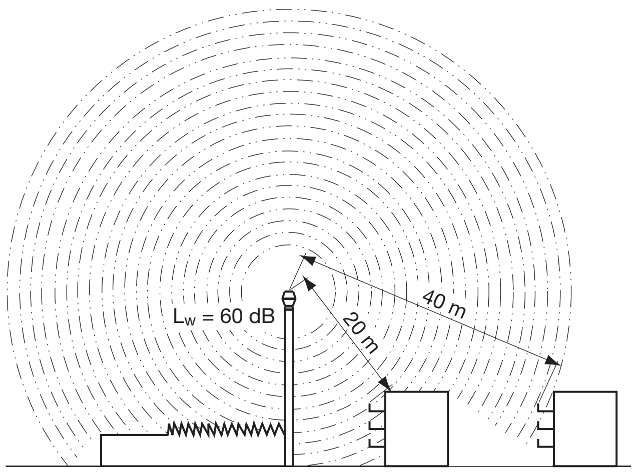
Galvanised sheet metal, aluzink sheet AZ185, stainless steel sheet 2343, and painted as detailed below.

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	

$$L_p = L_W - 10 \cdot \log\left(\frac{4 \cdot \pi \cdot r^2}{Q}\right)$$

$$L_p = 60 - 10 \cdot \log\left(\frac{4 \cdot \pi \cdot 20^2}{1}\right) = 23 \text{ dB}$$

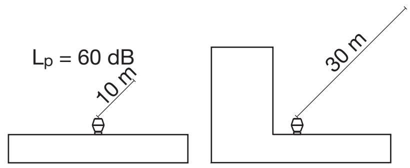
$$L_p = 60 - 10 \cdot \log\left(\frac{4 \cdot \pi \cdot 40^2}{1}\right) = 17 \text{ dB}$$

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. Can also be supplied with a pest-proof mesh.

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

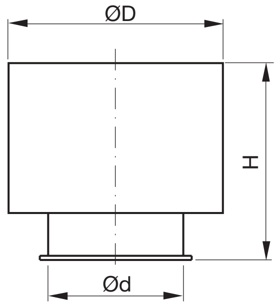
	H	315	1
Product	H		
Dimension Ød		315	
Connection options			1
Sleeve (standard 100 – 315)	1		
Flange (standard 400 – 1250)	2		
Transition piece to roof through connection	3–15		

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.

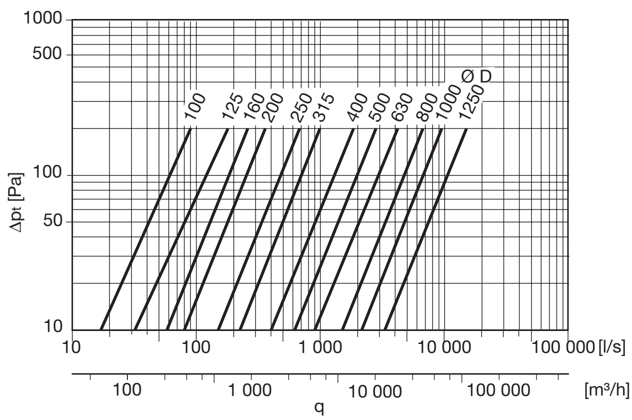
Standard colours, see page 239.

Dimensions



Ød nom	ØD mm	H mm	Free area m²	m kg	Roof through connection TGR 50 mm Size	Roof through connection TGR 100 mm Size
100	160	185	0,008	0,70	3	3
125	200	210	0,012	1,00	3	4
160	250	235	0,020	1,30	3	4
200	315	305	0,031	2,20	3	4
250	400	355	0,049	3,60	4	5
315	500	450	0,078	5,30	5	6
400	700	500	0,126	16,0	5	6
500	900	600	0,196	27,8	6	7
630	1100	750	0,312	41,9	8	9
800	1400	950	0,503	74,0	9	10
1000	1700	1150	0,785	107	11	12
1250	2100	1500	1,230	246	14	15

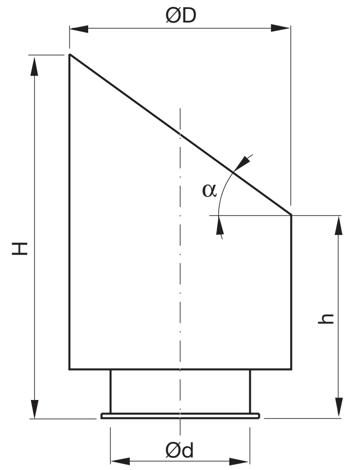
Technical data



Roof hood

HV

Dimensions



Ød nom	ØD mm	h mm	H mm	α °	Free area m²	m kg	Roof through connection TGR Size 50 mm	100 mm
100	**160**	**185**	**345**	45	0,008	0,77	3	3
125	200	210	410	45	0,012	1,10	3	4
160	250	235	460	42	0,020	1,43	3	4
200	315	305	560	39	0,031	2,42	3	4
250	400	355	657	37	0,049	3,96	4	5
315	500	450	814	36	0,078	5,83	5	6
400	700	500	973	34	0,126	16,8	5	6
500	900	600	1184	33	0,196	29,2	6	7
630	1100	750	1438	32	0,312	44,0	8	9
800	1400	950	1791	31	0,503	75,5	9	10
1000	1700	1150	2172	31	0,785	109	11	12
1250	2100	1500	2712	30	1,230	251	14	15

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. Can also be supplied with a pest-proof mesh.

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.

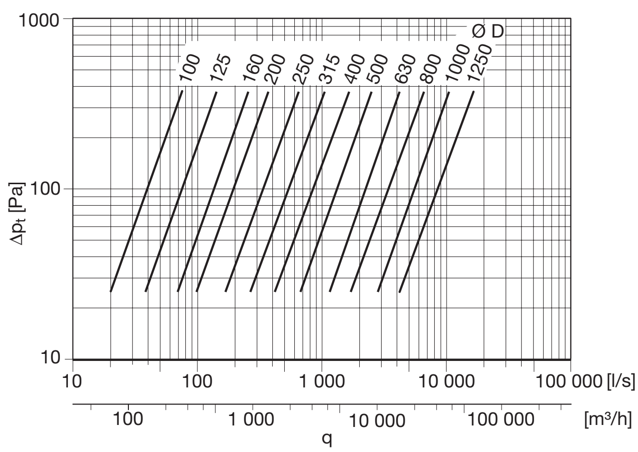
HV is available with different angles in order to be in harmony with the architectural design of the building.

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.

Technical data



Ordering example

	HV	315	1
Product	HV		
Dimension Ød		315	
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 239.

We reserve the right to make changes without prior notice

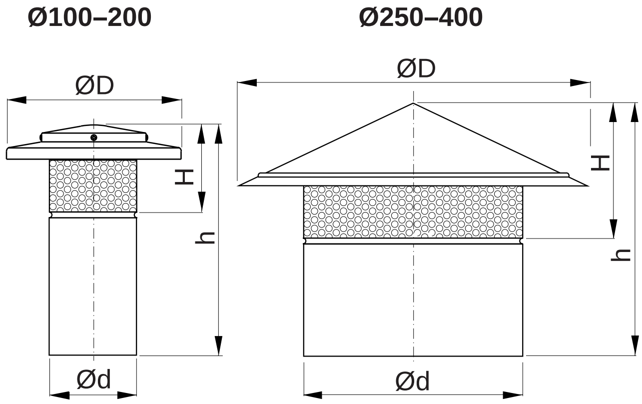
Roof hood HU

Description

For air exit above roof.

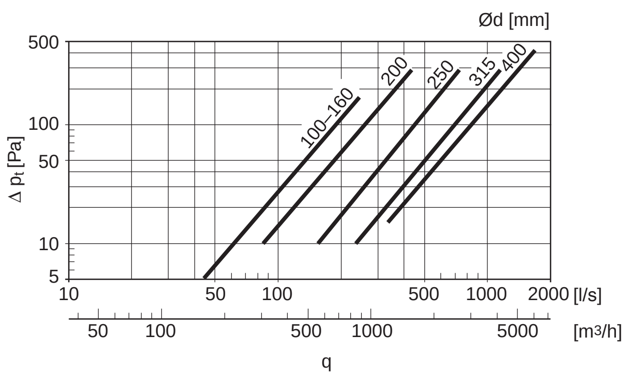
Provided with a female connection which fits outside a ventilation duct.

Dimensions



Ød nom	ØD mm	H mm	h mm	m kg	Roof through connection TGR 50 mm Size	Roof through connection TGR 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

	HU	160
Product	HU	
Dimension Ød		160

Roof hood

HN

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

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.

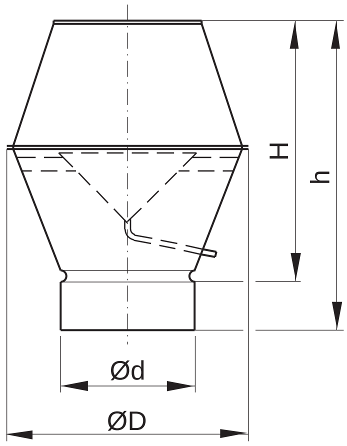
The hood has a female connection, which fits outside a ventilation duct. The hood can be ordered with other connections, however.

As special delivery the hood can be supplied with three anchoring wire-loops.

Ordering example

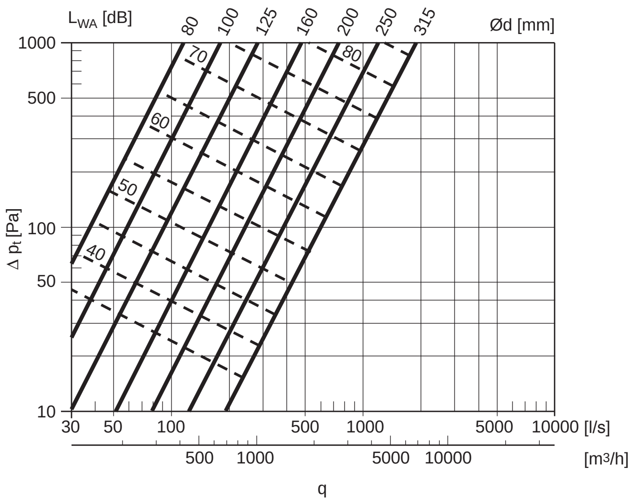
	HN	315
Product	✓	
Dimension Ød		✓

Dimensions



Ød nom	ØD mm	H mm	h mm	m kg	Roof through connection TGR 50 mm Size	Roof through connection TGR 100 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



Lindab

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.

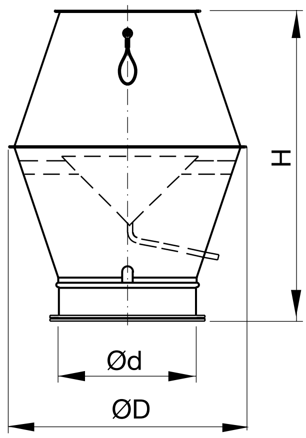
To avoid damage to the net in the opening the hood is supplied with transport protection. This must be removed before the hood is taken into service.

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

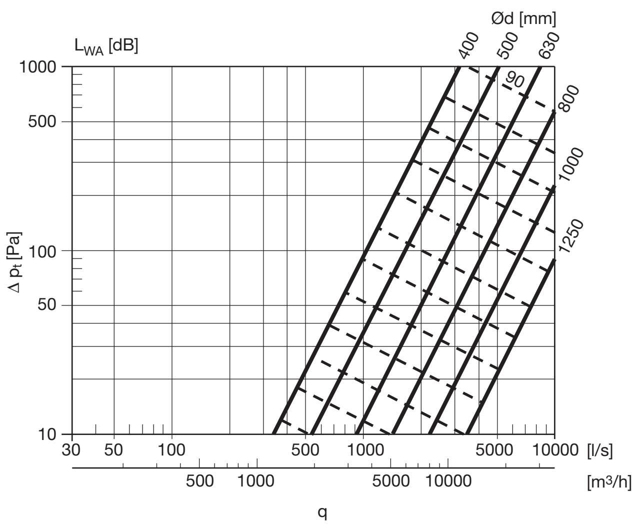
	HF	630
Product		
Dimension Ød		

Dimensions



Ød nom	ØD mm	H mm	m kg	Roof through connection TGR Size 50 mm	Roof through connection TGR Size 100 mm
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

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 Ød or ØD.

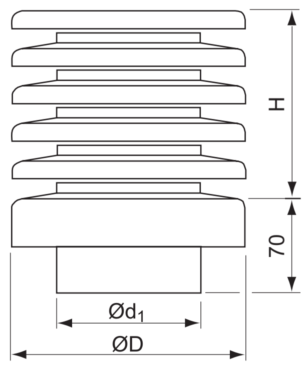
When connecting to the roof through connection TGR, the special transition piece TGR-VHL must be used (see page 254).

Ordering example

	VHL	125	200
Product	VHL		
Dimension Ød		125	
Dimension ØD			200

Standard colours, see page 239.

Dimensions

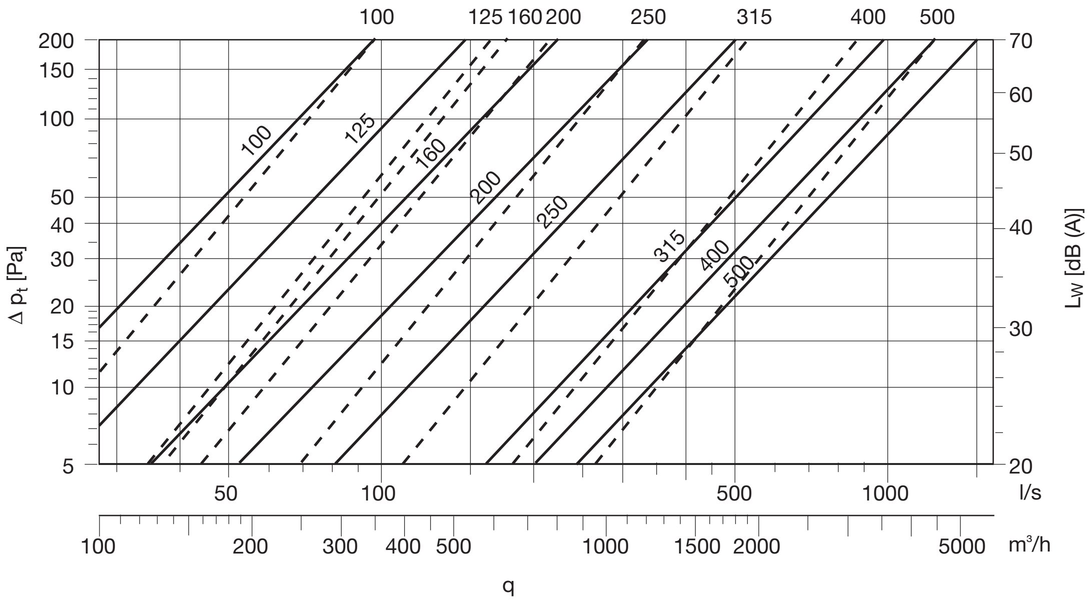


Ød nom	ØD mm	H mm	Free area m²	m kg	Roof through connection TGR Size 50 mm	Roof through connection TGR Size 100 mm
100	160	110	0,019	1,00	3	3
125	200	145	0,033	1,50	3	4
160	250	180	0,055	2,00	3	4
200	315	250	0,100	2,90	3	4
250	315	250	0,125	3,20	4	5
315	400	290	0,182	6,40	5	6
400	500	370	0,306	10,1	5	6
500	630	410	0,441	15,9	6	7

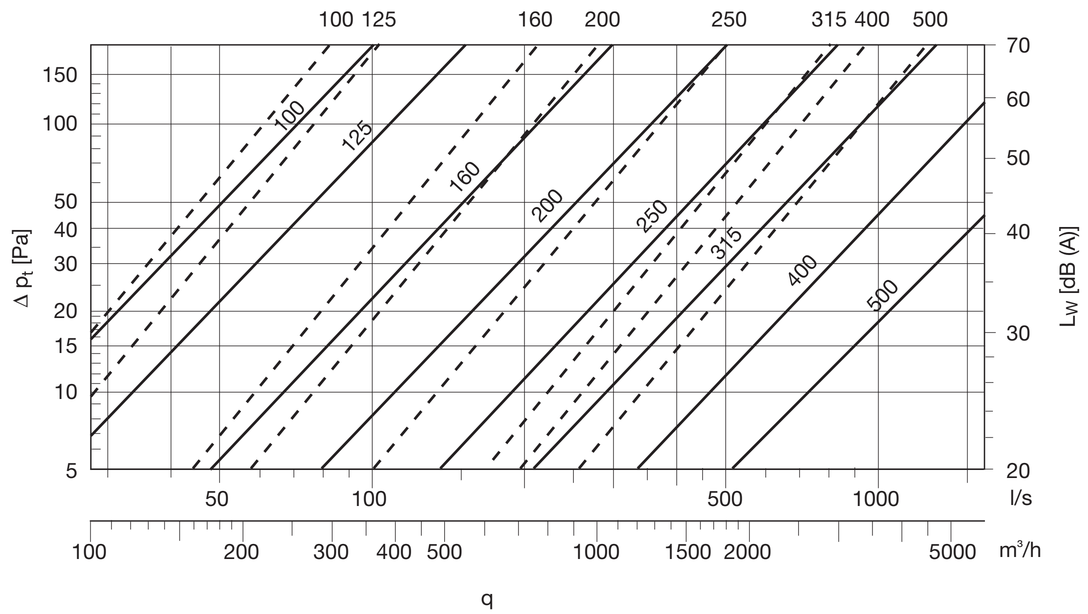
Roof hood VHL

Technical data

Outdoor air



Extract air



Roof hood

HRR

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.

Can also be supplied with a pest-proof mesh.

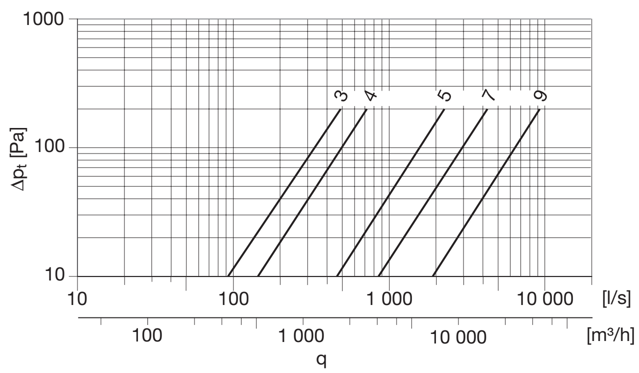
HRR is manufactured as standard from galvanised steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless, acid-resistant steel 2343 or painted.

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.

Dimensions

Size	A mm	B mm	H mm	Free area m²	m kg	Roof through connection TGR 50 mm Size	Roof through connection TGR 100 mm Size
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

Technical data



Ordering example

	HRR	4
Product	HRR	
Size		4

Specify separately if the hood is to be supplied with a pest-proof mesh from the factory.

Standard colours, see page 239.

Lindab

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.

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.

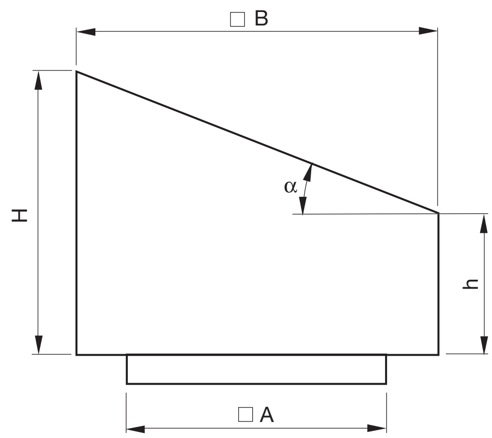
Ordering example

	HVR	4
Product	HVR	
Size		4

Specify separately if the hood is to be supplied with a pest-proof mesh from the factory and if a special angle is required.

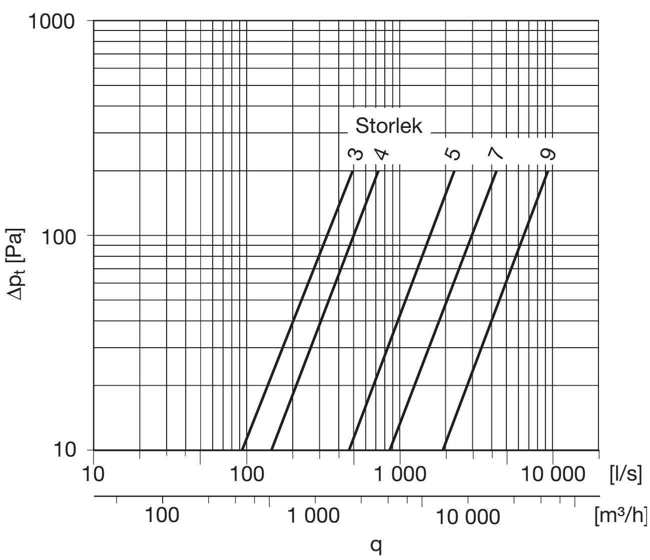
Standard colours, see page 239.

Dimensions



Size	A mm	B mm	h mm	H mm	α °	Free area m²	m kg	Roof through connection TGR 50 mm Size	Roof through connection TGR 100 mm Size
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

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.

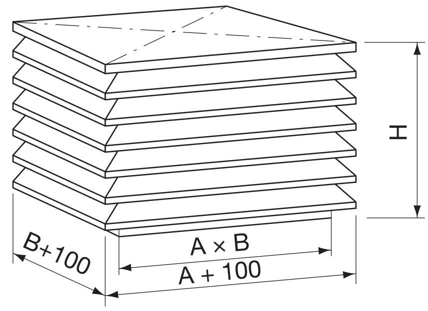
When connecting to the roof through connection TGR, the special transition piece TGR-LHR must be used. (see page 254).

Ordering example

	LHR	300	300
Product	LHR		
A		300	
B			300

Standard colours, see page 239.

Dimensions



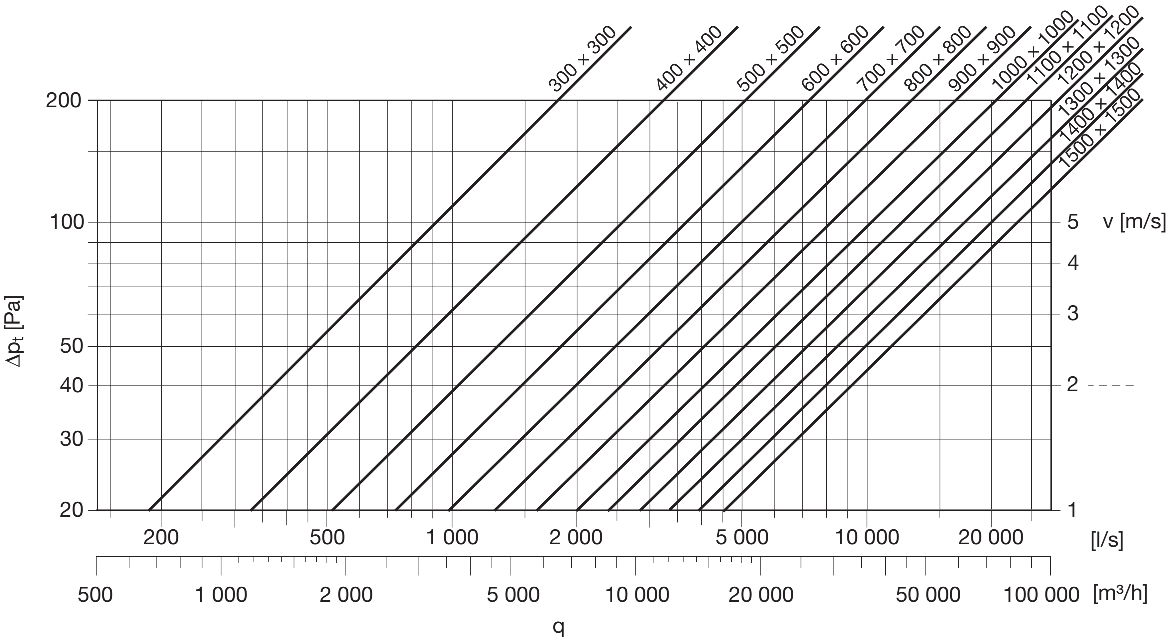
A × B = Duct dimensions

A mm	B mm	H mm	Number of ribs	Free area m²	m kg	Roof through connection TGR 50 mm Size	Roof through connection TGR 100 mm Size
300	300	370	5	0,216	5,40	4	5
400	400	430	6	0,384	8,70	5	6
500	500	490	7	0,600	12,6	6	7
600	600	490	7	0,720	15,1	7	8
700	700	550	8	1,008	20,2	8	9
800	800	610	9	1,344	25,9	9	10
900	900	670	10	1,728	32,4	10	11
1000	1000	730	11	2,160	47,4	11	12
1100	1100	790	12	2,640	56,9	12	13
1200	1200	790	12	2,880	62,1	13	14
1300	1300	850	13	3,432	72,1	14	15
1400	1400	910	14	4,032	84,5	15	16
1500	1500	970	15	4,680	97,0	16	–

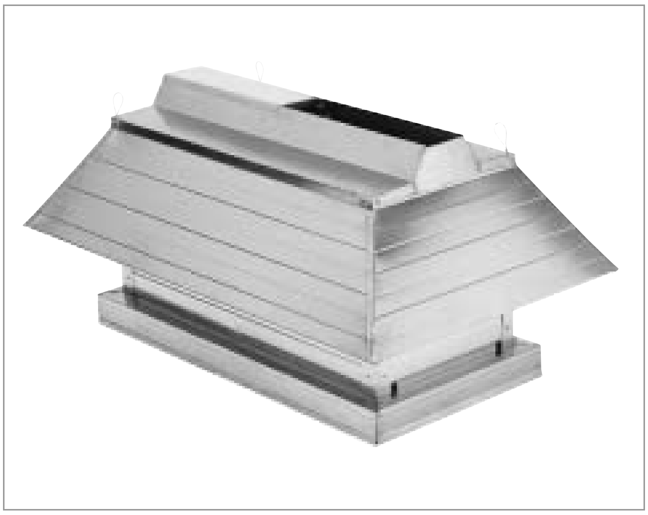
Roof hood LHR

Technical data

Outdoor air/extract air



Roof hood HKOMR



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

HKOMR 3

Product — HKOMR
Size — 3

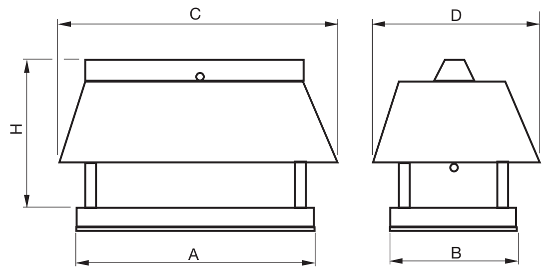
Alternatives that should be specified separately if required:

With pest-proof mesh on the extract section

With adapted connection hose for guiding directly into the duct.

Standard colours, see page 239.

Dimensions



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

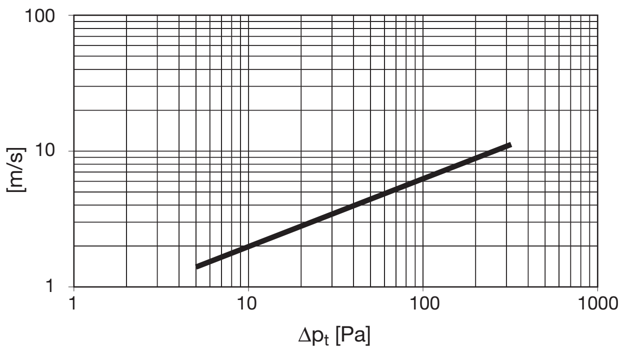
Size	Free area out-door air m²	Free area extract air m²	m kg
2	0,140	0,031	16,7
3	0,204	0,061	23,1
4	0,294	0,101	36,6
5	0,504	0,165	50,3
6	0,768	0,260	65,9
8	1,168	0,425	102
10	1,967	0,630	148
12	2,646	1,062	244
14	3,825	1,341	320

Lindab

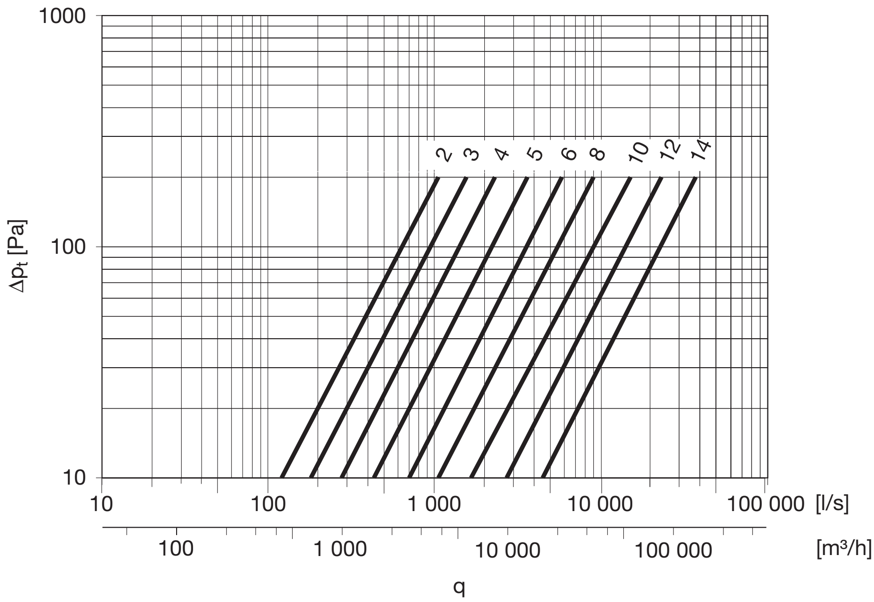
Roof hood HKOMR

Technical data

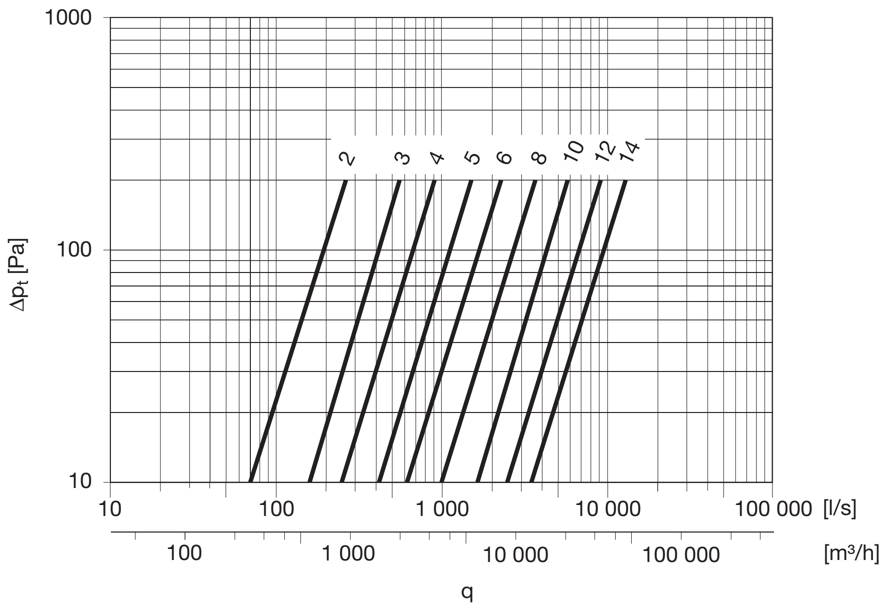
Expelling velocity extract air



Outdoor air



Extract air



Roof transition TGR

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 root 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.

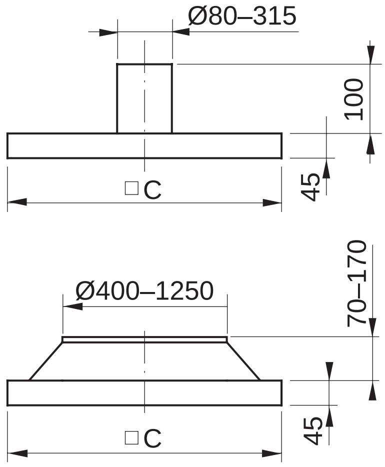
TGR is manufactured as standard from galvanized steel sheet Z275, but is also available in aluminium zinc AZ 185, stainless, acid-resistant steel 2343 or painted.

The duct connection is supplied with LS joint for guiding.

Dimensions

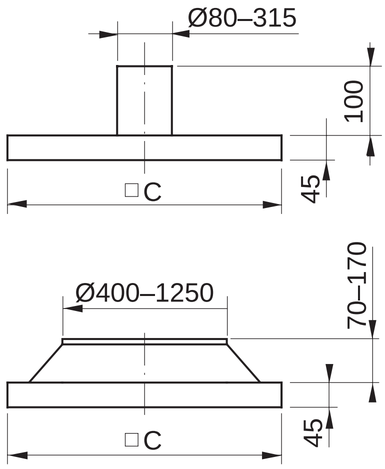
TGR-ÖA

– Upper connection



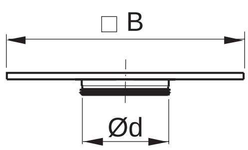
The C-measure of the upper connection (TGR-ÖA) shall fit the A-measure of the roof transition (TGR).

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	A mm	B mm 50 mm insul.	B mm 100 mm insul.	C mm	Weight kg 50 mm insul.	Weight kg 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
Stainless steel 2343	5
Stainless steel perf. 2343	6
No internal cladding (Only applicable at condensation insulation)	7

External material

Zink plated steel	1
Aluzink sheet metal AZ 185	2
Stainless steel 2343	3

Accessories

Upper connection TGR-ÖA 3 125 1

Product

Size

Hood dimension

Material

Zink plated steel	1
Aluzink sheet metal AZ 185	2
Stainless steel 2343	3

Lower connection TGR-NA 3 125 1 50

Product

Size

Connection Measure

Material

Zink plated steel	1
Aluzink sheet metal AZ 185	2
Stainless steel 2343	3

Insulation thickness

Upper connection only for roof hood VHL

TGR-VHL – 3 – 125

Product

Size

Hood dimension

Upper connection only for roof hood LHR

TGR-LHR – 5 – 400 – 400

Product

Size

A mm

B mm

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 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 LS joints for guiding.

Ordering example

TGKOMR 3 1 2 1

Product	TGKOMR
Size	3

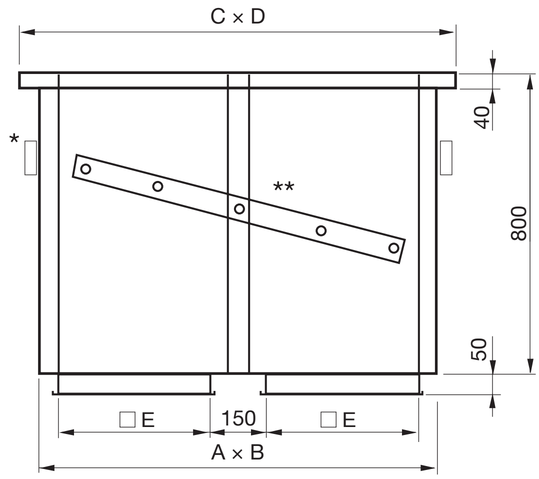
Type of insulation	
Fire protection 50 mm	1
Condensation 50 mm	2

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
Stainless steel 2343	5
Stainless steel perf. 2343	6
No internal cladding (Only applicable at condensation insulation)	7

External material	
Zink plated steel	1
Aluzink sheet metal AZ 185	2
Stainless steel 2343	3

Standard colours see page 239.

Dimensions

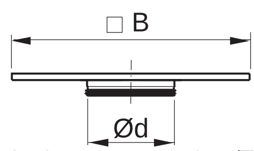


Size	A mm	B mm	C mm	D mm	E mm	m kg
2	650	300	740	390	200	32,5
3	850	400	940	490	300	43,5
4	1050	500	1140	590	400	54,3
5	1250	600	1340	690	500	72,4
6	1450	700	1540	790	600	84,5
8	1850	900	1940	990	800	113
10	2250	1100	2340	1190	1000	138
12	2650	1300	2740	1390	1200	190
14	3050	1500	3140	1590	1400	251

Hole punching dimensions = (A + 20) × (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

Lower connection TGKOMR-NA 3 125 1

Product	TGKOMR-NA
Size	3
Connection Measure	125

Material	
Zink plated steel	1
Aluzink sheet metal AZ 185	2
Stainless steel 2343	3

Lindab

Other circular products

Content – Other circular products

We reserve the right to make changes without prior notice

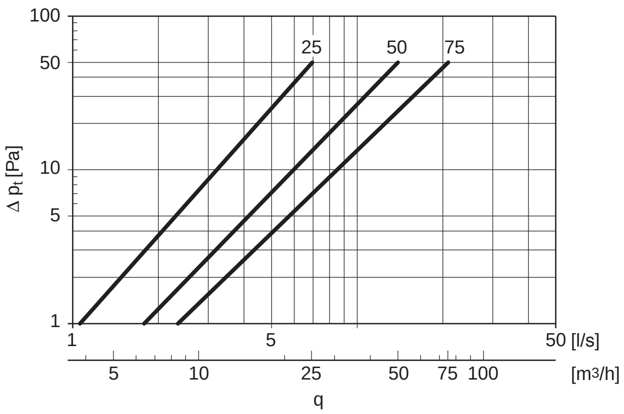
Lindab

Air entry nozzle

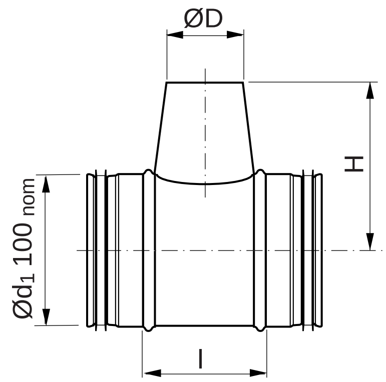
IMSKU

Description

Used for ducting in bomb shelters, and is dimensioned for the air volumes specified by the Civil Defence Board regulations.



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_{max} m³/h	Maximum no. of persons
25	25	10
50	50	20
75	75	30

Ordering example

IMSKU 75

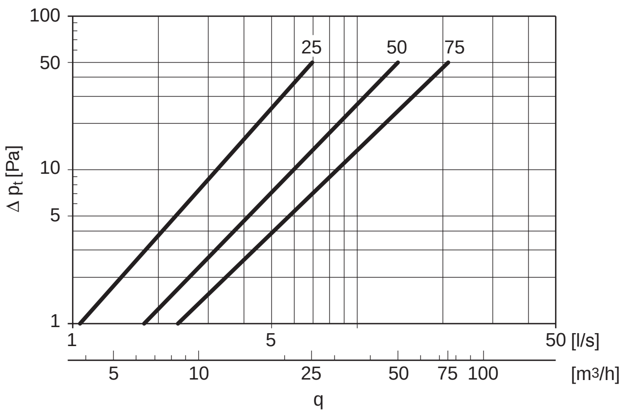
Product — IMSKU
Size — 75

Jet for air entry nozzle

DY

Description

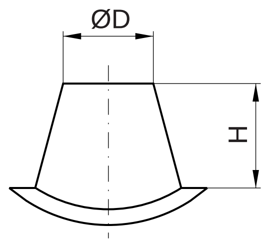
Used for ducting in bomb shelters, and is dimensioned for the air volumes specified by the Civil Defence Board regulations.



Ordering example

	DY	75
Product	DY	
Size		75

Dimensions



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_{max} m³/h	Maximum no. of persons
25	25	10
50	50	20
75	75	30

Plenum or distribution chamber SLRU

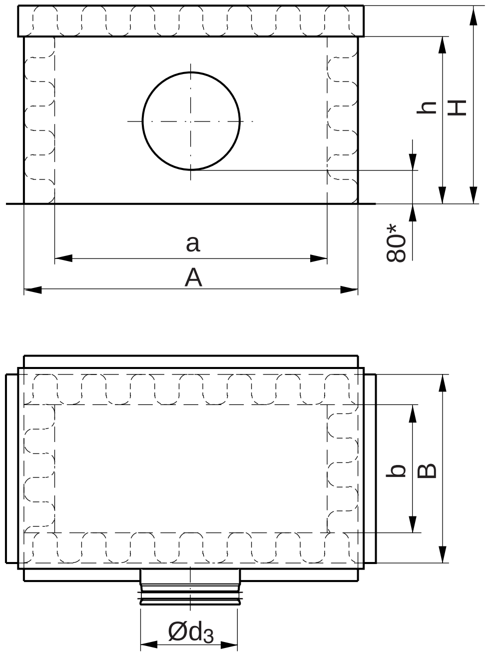
Description

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.

Dimensions



a* mm	b* mm	h* mm	Ød3 nom	Insulation thickness 50 mm A* mm	B* mm	H* mm	m kg	100 mm A* mm	B* mm	H* mm	m kg	Maximum no. of connected ducts Ødnom 63	80	100	125	160	200
210	210	300	160	310	310	355	7,23	410	410	405	14,3	1	1	1	1	1	1
450	210	300	160	550	310	355	10,6	650	410	405	19,9	3	3	3	2	2	2
600	210	300	200	700	310	355	12,8	800	410	405	23,7	4	4	4	4	3	2
800	210	300	200	900	310	355	15,7	1000	410	405	28,5	5	5	5	5	4	3
1000	210	300	200	1100	310	355	18,5	1200	410	405	33,1	7	7	6	6	5	4
1200	210	300	200	1300	310	355	21,4	1400	410	405	37,8	8	8	8	8	6	5

* Tolerance ±5 mm

Other dimensions can be made to special order.

Ordering example

	SLRU	50	600
Product	SLRU		
Insulation thickness		50	
Measure a			600

Casting-in frame

RAM

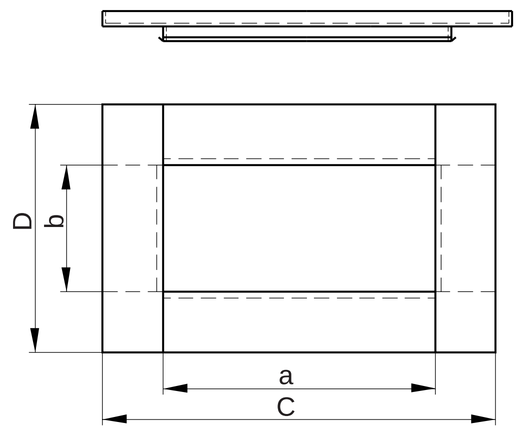
Description

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



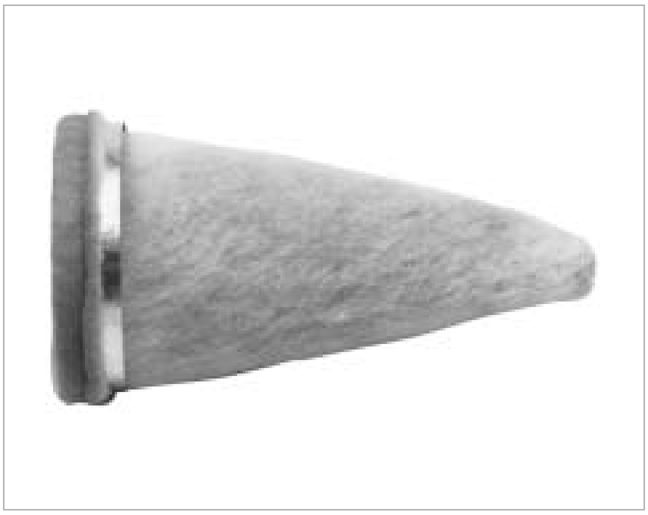
a mm	b mm	Insulation thickness 50 mm C mm	D mm	m kg	Insulation thickness 100 mm C mm	D mm	m kg
210	210	410	410	1,80	510	510	2,96
450	210	650	410	2,35	750	510	3,69
600	210	800	410	2,65	900	510	4,14
800	210	1000	410	3,16	1100	510	4,75
1000	210	1200	410	3,62	1300	510	5,35
1200	210	1400	410	4,08	1500	510	5,96

Ordering example

	RAM	600	50
Product	RAM		
Dimension a		600	
Insulation thickness			50

Duct filter

STR



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.

$\Delta p_{t\ dim} = 1{,}5 \cdot \Delta p_{t\ clean}$

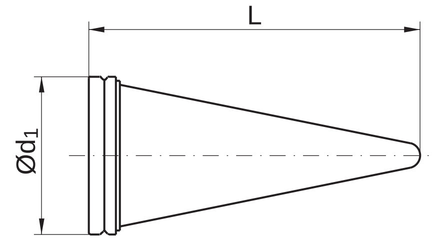
Max temperature = 120 °C
Highest recommended air speed in the duct.

Filter class	v_{max} (m/s)
G4	10
F5	4,5

Ordering example

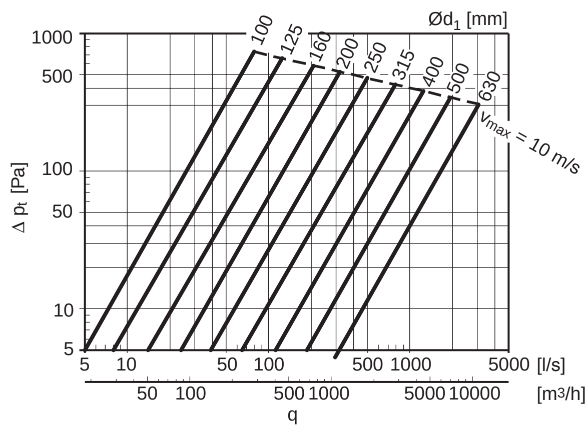
	STR	200	G4
Product	STR		
Dimension $Ød_1$		200	
Filter class			G4

Dimensions

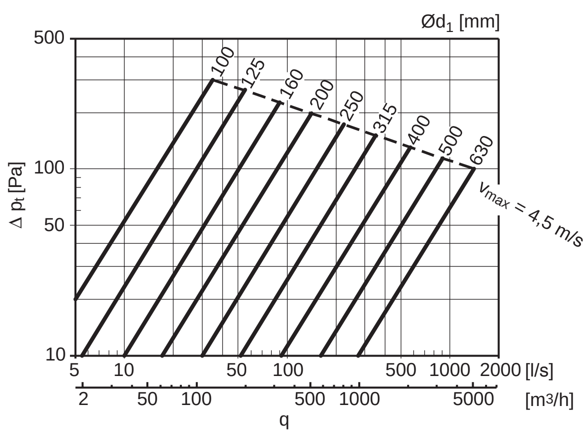


$Ød_1$ nom	L mm	tolerance mm	area m^2	m kg
100	220	± 20	0,04	0,04
125	260	± 20	0,05	0,08
160	340	± 20	0,09	0,12
200	420	± 25	0,14	0,16
250	540	± 30	0,22	0,23
315	670	± 30	0,34	0,36
400	860	± 35	0,55	0,59
500	1100	± 50	0,89	0,72
630	1350	± 50	1,37	0,91

Filter class G4



Filter class F5



Sealing clamp SVK

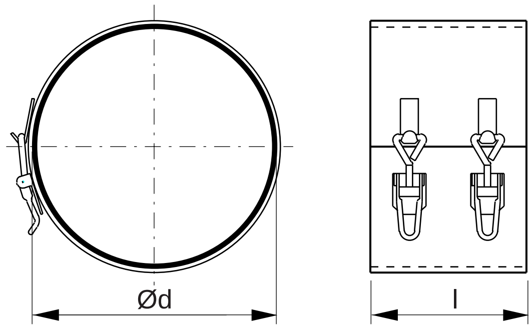
Description

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.

Dimensions



Ød nom	l mm	m 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

SVK 100

Product — SVK
Dimension Ød — 100

Lindab

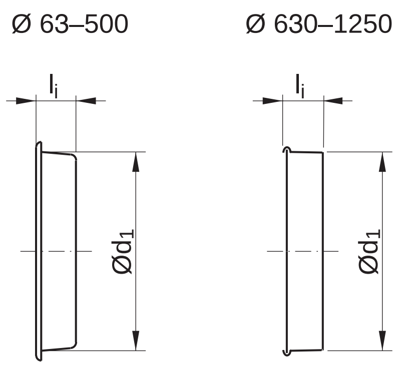
End cap

EP

Description

Fits inside a duct.

Dimensions



$Ød_1$ nom	l_i mm	m 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

EP 160

Product — EP
Dimension $Ød_1$ — 160

Cleaning cover

KC

Description

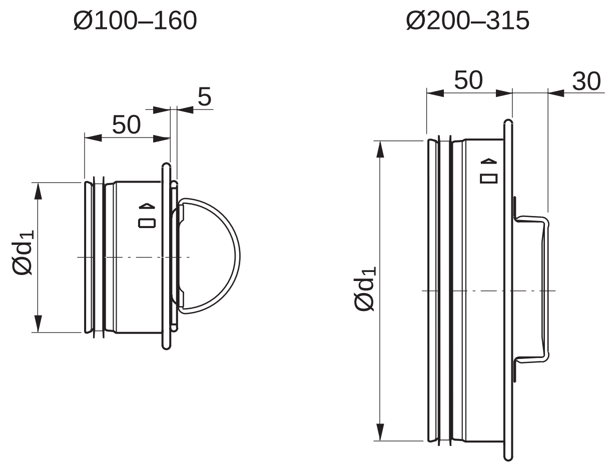
Intended for use with fittings which do not have a Safe gasket. The cover is retained by spring clips which press against the inside of the fitting. It is released by pulling it straight out, and installed by pressing it in. There are one or two handles to help.
The gasket is made from EPDM rubber.

Δp in the table specifies the maximum positive pressure the cleaning cover 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. Please refer to page 138.

Dimensions



Ød nom	Δp 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

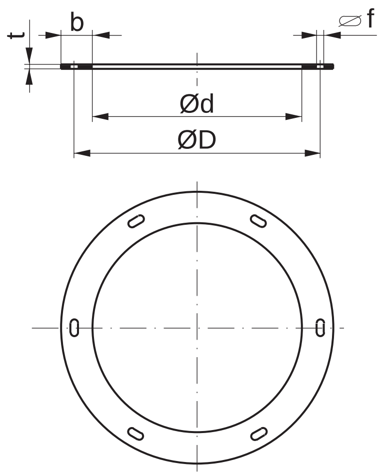
Ordering example

	KC	200
Product	KC	
Dimension $Ød_1$		200

Flat bar flange

FL

Dimensions



Description

Heavy flange made from flat bar which then is hot dip galvanised. 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.

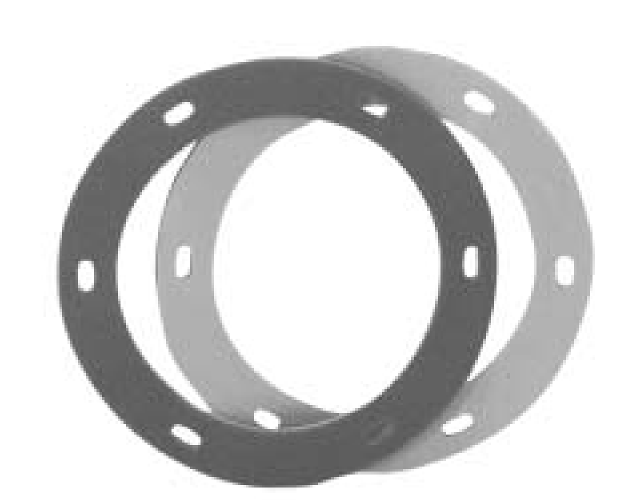
Ordering example

	FL	200
Product	FL	
Dimension $ØD_1$		200

Dimensions

<table>
<tr><th colspan="3">Ød</th><th colspan="2">ØD</th><th rowspan="2">f
mm</th><th colspan="3">Bolts to DIN 601</th><th rowspan="2">b × t
mm</th><th rowspan="2">m
kg</th></tr>
<tr><th>nom
mm</th><th>real
mm</th><th>tolerance
mm</th><th>real
mm</th><th>tolerance
mm</th><th>quantity
pcs</th><th>dim</th><th>L
mm</th></tr>
<tr><td>80</td><td>82,5</td><td rowspan="4">+1,0
-0,0</td><td>108</td><td rowspan="11">±1,0</td><td rowspan="11">7,0 × 16</td><td rowspan="4">4</td><td rowspan="11">M6</td><td rowspan="4">16</td><td rowspan="4">25 × 3</td><td>0,18</td></tr>
<tr><td>100</td><td>102</td><td>129</td><td>0,22</td></tr>
<tr><td>112</td><td>114</td><td>141</td><td>0,25</td></tr>
<tr><td>125</td><td>127</td><td>155</td><td>0,30</td></tr>
<tr><td>140</td><td>142</td><td rowspan="14">+1,5
-0,0</td><td>176</td><td rowspan="7">6</td><td rowspan="21">20</td><td rowspan="7">30 × 4</td><td>0,49</td></tr>
<tr><td>150</td><td>152</td><td>184</td><td>0,52</td></tr>
<tr><td>160</td><td>162</td><td>194</td><td>0,55</td></tr>
<tr><td>180</td><td>182</td><td>213</td><td>0,60</td></tr>
<tr><td>200</td><td>203</td><td>235</td><td>0,70</td></tr>
<tr><td>224</td><td>227</td><td>259</td><td>0,74</td></tr>
<tr><td>250</td><td>253</td><td>286</td><td>0,81</td></tr>
<tr><td>280</td><td>283</td><td>322</td><td rowspan="18">±1,5</td><td rowspan="7">9,5 × 20</td><td rowspan="4">8</td><td rowspan="7">M8</td><td rowspan="7">35 × 5</td><td>1,31</td></tr>
<tr><td>300</td><td>303</td><td>341</td><td>1,40</td></tr>
<tr><td>315</td><td>318</td><td>356</td><td>1,47</td></tr>
<tr><td>355</td><td>358</td><td>395</td><td>1,63</td></tr>
<tr><td>400</td><td>404</td><td>438</td><td rowspan="3">12</td><td>1,80</td></tr>
<tr><td>450</td><td>454</td><td>487</td><td>2,02</td></tr>
<tr><td>500</td><td>504</td><td>541</td><td>2,35</td></tr>
<tr><td>560</td><td>564</td><td rowspan="11">+2,0
-0,0</td><td>605</td><td rowspan="11">11,5 × 24</td><td rowspan="4">16</td><td rowspan="11">M10</td><td rowspan="7">40 × 5</td><td>2,81</td></tr>
<tr><td>600</td><td>604</td><td>644</td><td>3,00</td></tr>
<tr><td>630</td><td>634</td><td>674</td><td>3,15</td></tr>
<tr><td>710</td><td>714</td><td>751</td><td>3,54</td></tr>
<tr><td>800</td><td>804</td><td>837</td><td rowspan="6">24</td><td>3,90</td></tr>
<tr><td>900</td><td>904</td><td>934</td><td>4,39</td></tr>
<tr><td>1000</td><td>1005</td><td>1043</td><td>4,89</td></tr>
<tr><td>1120</td><td>1125</td><td>1174</td><td rowspan="4">25</td><td rowspan="4">50 × 6</td><td>8,36</td></tr>
<tr><td>1250</td><td>1255</td><td>1311</td><td>9,32</td></tr>
<tr><td>1400</td><td>1407</td><td>1465</td><td>10,4</td></tr>
<tr><td>1600</td><td>1607</td><td>1637</td><td>32</td><td>11,8</td></tr>
</table>

Gasket for flat bar flange FLPACK



Description

Used to seal joints between flat bar flanges FL. Made from cross-linked polythene with closed cells and tape on one side.

Recommended operation temperature is -60°C to +80°C.

The gasket is placed on the mating face of each flange, or between flange edges on ducts, please refer to the assembly instruction.

Dimensions up to dim Ø1250, as FL page 267.

Properties

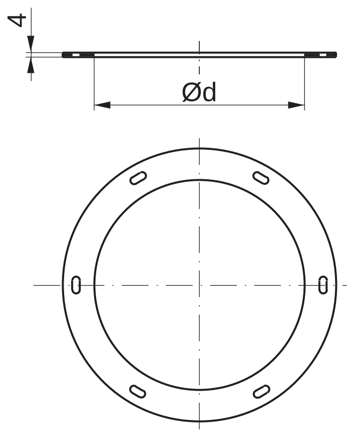
Resistant to
- ageing .... excellent
- ozone .... very good
- uv radiation .... limited
- oils and petrochemicals .... excellent
- aliphatic oils .... excellent
- aromatic solvents .... very good
- ketones .... very good
- chlorated solvents .... very good
- dilute acids .... excellent
- detergent .... excellent

Grades:
excellent – very good – good – limited – poor

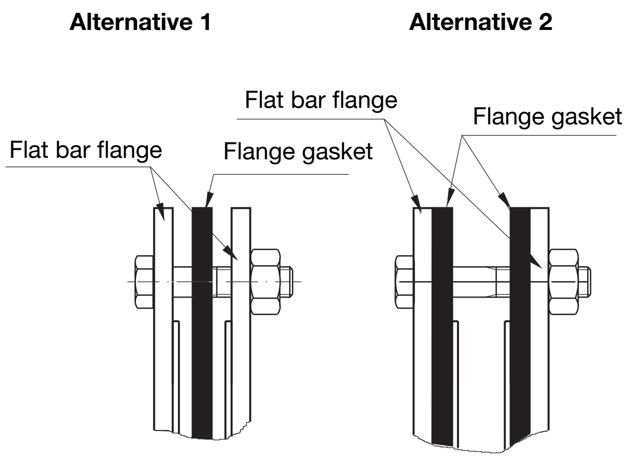
Ordering example

	FLPACK	200
Product	FLPACK	
Dimension Ød		200

Dimensions



Assembly instruction

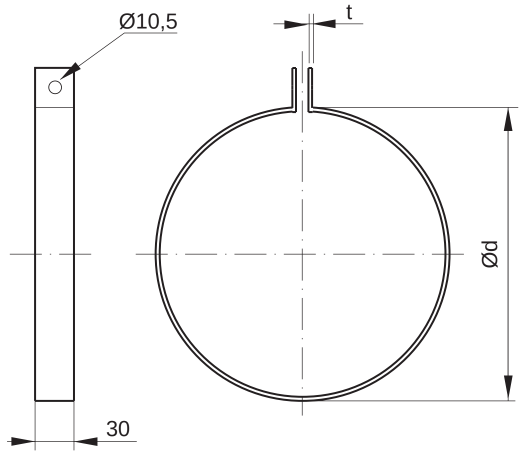


Suspension clamp UV

Description

At insulated duct it is recommended that the suspension clamp is mounted inside the insulation.

Dimensions



Ød nom	t mm	m kg
63	1,25	0,09
80	1,25	0,11
100	1,25	0,13
125	1,25	0,16
160	1,25	0,20
200	1,25	0,24
250	1,25	0,30
315	1,25	0,36
400	1,25	0,47
500	1,25	0,58
630	1,25	0,73
800	1,25	0,92
1000	1,25	1,15
1250	1,25	1,43

Ordering example

UV **200**

Product — UV
Dimension Ød — 200

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

Suspension clamp

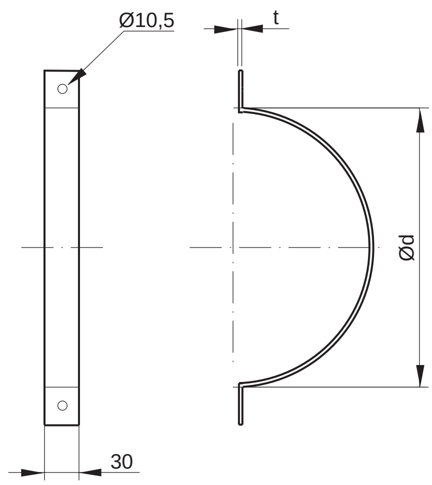
UVH

Description

At insulated duct it is recommended that the suspension clamp is mounted inside the insulation.

N.B. Is sold in pairs.

Dimensions



Ød nom	t mm	m kg
80	2,00	0,07
100	2,00	0,08
125	2,00	0,10
160	2,00	0,12
200	2,00	0,14
250	2,00	0,17
315	2,00	0,21
400	2,00	0,27
500	2,00	0,33
630	2,00	0,41
800	2,00	0,51
1000	2,00	0,64
1250	2,00	0,79

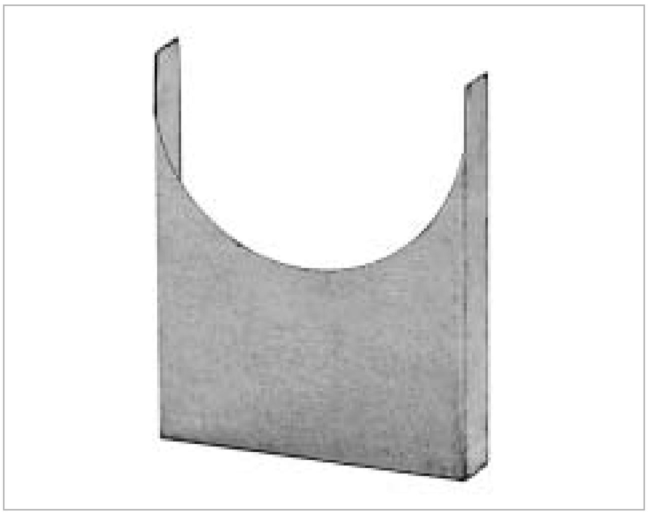
Ordering example

UVH **200**

Product

Dimension Ød

Duct support FA



Description

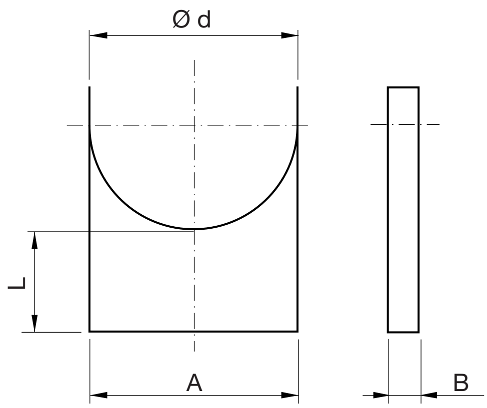
Used to fix ducts standing on joists.

Is provided with fixing holes in the base.

Ordering example

	FA	250
Product	FA	
Dimension Ød		250

Dimensions

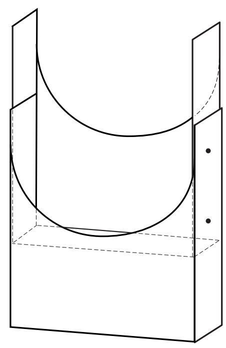


Ød nom	A mm	B mm	L mm	m kg
63	66	30	100	0,09
80	83	30	100	0,11
100	103	30	100	0,13
125	128	30	100	0,15
160	163	30	100	0,19
200	203	30	100	0,29
250	253	30	100	0,36
315	318	30	100	0,46
400	403	30	100	0,59
500	503	30	100	0,76
630	633	30	100	1,02

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.



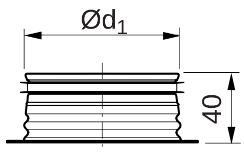
Casting-in programme – Air valve socket RAM

Description

With nail flange.

Fits air valve KGEB etc.

Dimensions



$Ød_1$ nom	m kg
100	0,09
125	0,11
160	0,16

Ordering example

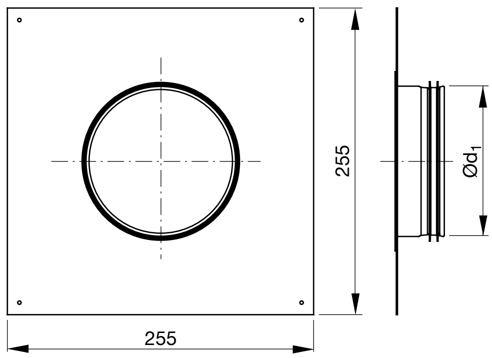
RAM 100 GJUT

Product — RAM
Dimension $Ød_1$ — 100
Specification — GJUT

Casting-in programme – Wall stub

TVILU

Dimensions



Ød1 nom	m kg
100	0,29
125	0,31
160	0,32

Description

With Safe connection.

Ordering example

	TVILU	100
Product	↑	
Dimension Ød1		↑

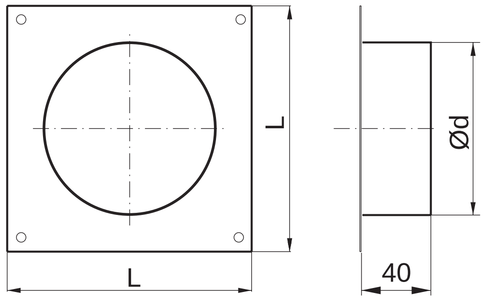
Casting-inprogramme – Wall stub

TVIL

Description

With female end.

Dimensions



Ød nom	L mm	m kg
100	150	0,15
125	180	0,20

Ordering example

	TVIL	100
Product	✓	
Dimension Ød		✓

Lindab

Transfer

Content – Transfer

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

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 267.

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 differens 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.

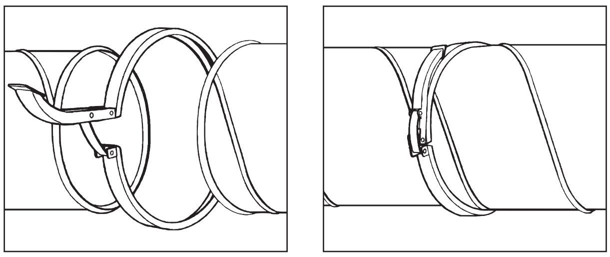
Please contact Lindab if you need other applications or to transport other materials, and if there are special operation circumstances.

Mountings
The types of mountings and their distances shall be choosen 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.

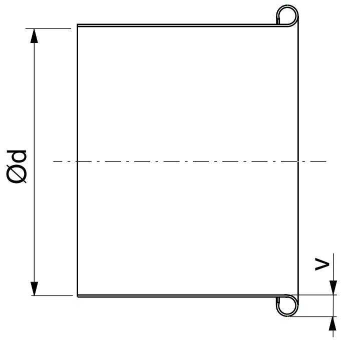
Advantages of the Transfer system

- 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.



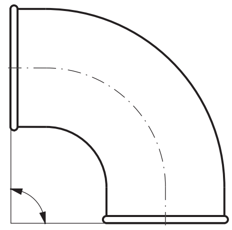
General

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



$\alpha \pm 1°$

Lindab

Spiral swaged duct

SRTR

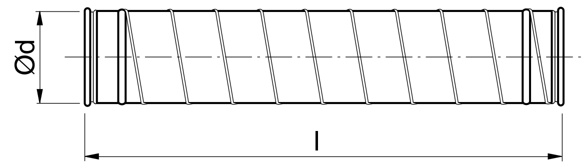
Description

Circular spiral swaged duct with projecting seam.

The duct has end stubs swaged on, with Transfer beads at each end.

Please refer to page 41 for technical data about ducts.

Dimensions



Ød nom	t std mm	500 mm	1000 mm	1500 mm	2000 mm	3000 mm	6000 mm
		Weight for standard lengths, kg					
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

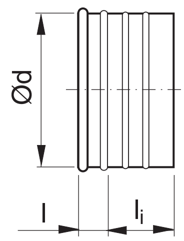
Ordering example

	SRTR	200	3000
Product	SRTR		
Dimension Ød		200	
Lenght l			3000

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 285.

Is also used as transition piece OTRTH between Transfer and flexible hose THVTR. See page 321.

Ød nom	t mm	l mm	l_i mm	m 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

	TSRTR	200
Product	TSRTR	
Dimension Ød		200

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.

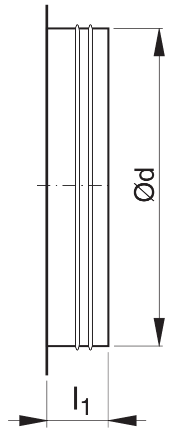
To finish off, the edge of the stub is swaged to both remove the sharp edge of the transition, and to fix the slide-on stub.

Please refer to the shortening instruction on page 285.

Ordering example

	ILRTR	800
Product	ILRTR	
Dimension Ød		800

Dimensions



Ød nom	l_1 mm	m 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

Lengthways swaged duct LRTR

Description

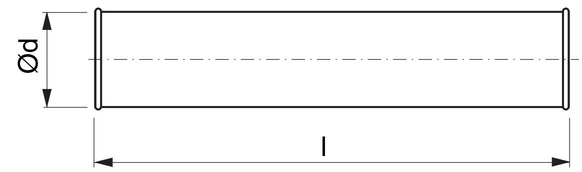
Circular lengthways swaged duct with external seam.

Ød nom	t std mm	1000 mm	2000 mm	3000 mm
		Max permissible static negative pressure, kPa		
80	0,6	36,0	26,0	
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

Ordering example

	LRTR	200	2000
Product	LRTR		
Dimension Ød		200	
Lenght l			2000

Dimensions



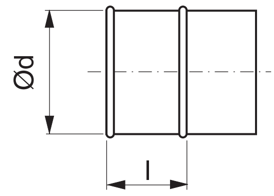
Ød nom	t std mm	500 mm	1000 mm	1500 mm	2000 mm	2960** mm
		Weight for standard lengths, kg				
80	0,6	0,70	1,30			
100	0,6	0,80	1,68	2,50	3,40	
125	0,6	1,00	2,09	3,10	4,20	
140	0,6	1,10	2,29	3,40	4,60	
150	0,6	1,20	2,49	3,70	5,00	
160	0,6	1,30	2,69	4,00	5,40	
180	0,7	1,80	3,60	5,40	7,20	
200	0,7	1,90	3,89	5,80	7,80	
224	0,7	2,20	4,40	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	6,20	9,30	12,4	18,6**
350	0,7	3,50	7,00	10,5	14,0	21,0**
400	0,9	4,70	9,40	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		

* t = 0,9; l = 2970
** t = 0,9
*** Supplied with flange FL

Slide-on stub

PTR

Dimensions



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 285.

Ød nom	t mm	l mm	m 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

	PTR	200
Product		
Dimension Ød		

Telescopic duct

TLTR

Description

Used where it is necessary to adjust duct length when standard lengths are not sufficient.

Unit parts TLTR 1 and TLTR 2 can also be delivered individually.

TLTR 2 can be used as an ordinary duct.

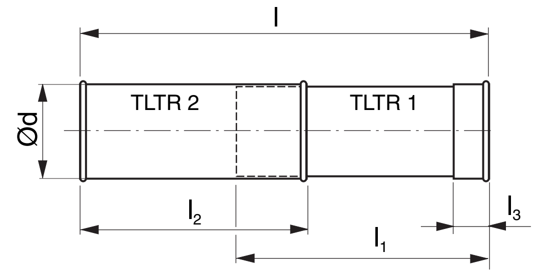
TLTR 1 fits inside all ducts of types SRTR Ø80–200 and LRTR Ø80–500.

The special pipe TLSR fits internally in duct SRTR Ø224–500.

Ordering example

	TLTR	200
Product	TLTR	
Dimension Ød		200

Dimensions

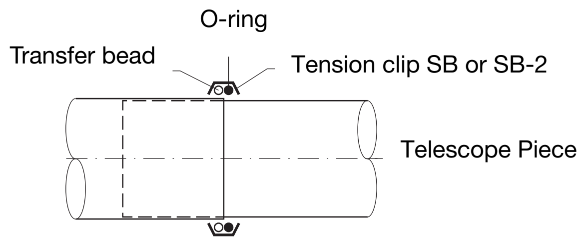


Ød nom	t mm	l_1, l_2 mm	l_3 mm	l_{min} mm	l_{max} mm	m kg
80	0,7	30	220	250	410	0,80
100	0,7	30	220	250	410	0,90
125	0,7	30	220	250	410	1,10
140	0,7	60	220	280	410	1,20
150	0,7	30	220	250	410	1,30
160	0,7	30	220	250	410	1,40
180	0,7	30	220	250	410	1,60
200	0,7	30	350	380	670	2,70
224	0,7	30	350	380	670	3,00
250	0,7	30	350	380	670	3,40
300	0,7	60	350	410	670	4,10
315	0,7	30	350	380	670	4,30
350	0,7	60	350	410	670	4,80
400	0,9	60	350	410	670	6,60
450	0,9	60	350	410	670	7,40
500	0,9	60	350	410	670	8,20

Seal the joint after assembly by using either:

Sealant or tape

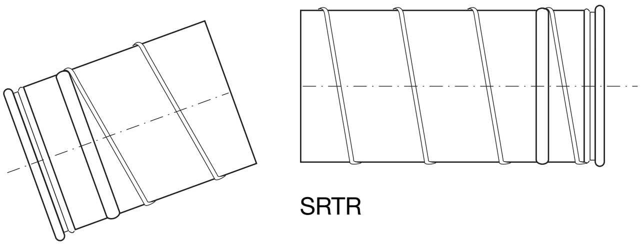
O-ring + tension clip SB or SB–2



Instruction for shortening for length adaptation of Transfer ducts

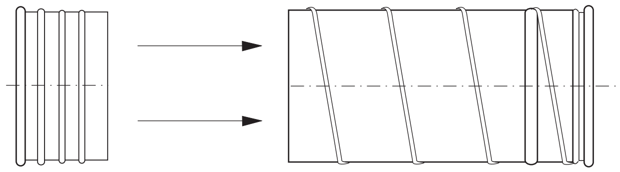
Spiral swaged duct SRTR

Adaption with fixed lengt



SRTR

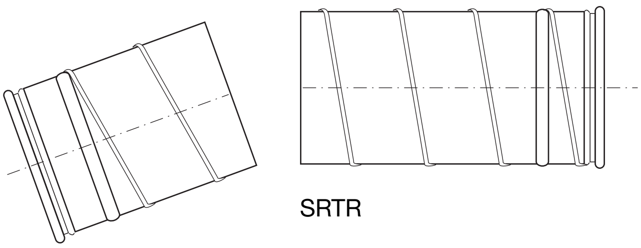
Shorten the duct to the desired length. Also consider the installation length of the slide-on stub.



TSRTR SRTR

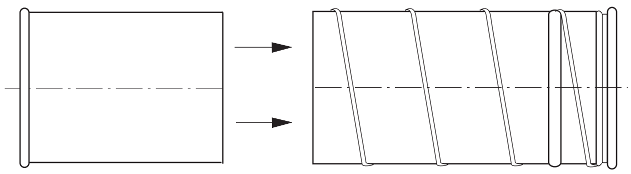
Install slide-on stub TSRTR (please refer to page 280).

Adaption with flexible length



SRTR

Shorten the duct to the desired length. Also consider the installation length of the slide-on stub.



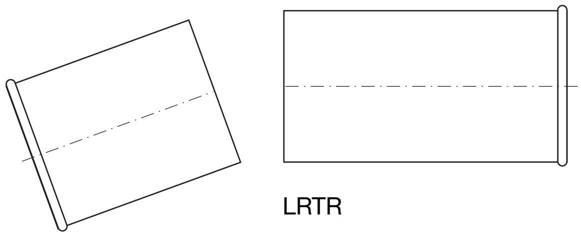
TLTR 1/TLSR SRTR

Install telescopic duct
For Ø80–200 use TLTR-1 (page 284)
For Ø224–500 use TLSR (page 284)

Remember to
Turn the duct so that the joint does not point towards the direction of the air flow.

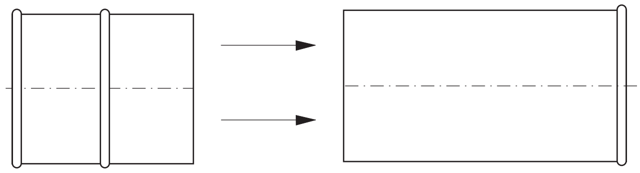
Lengthways swaged duct LRTR

Adaption with fixed length



LRTR

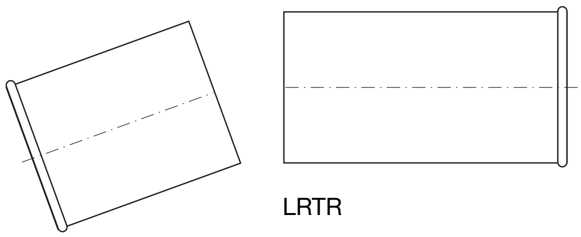
Shorten the duct to the desired length. Also consider the installation length of the slide-on stub.



PTR LRTR

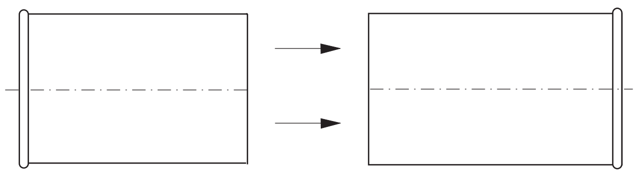
Install slide-on stub PTR (please refer to page 283).

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 284)

Remember to
Turn the duct so that the joint does not point towards the direction of the air flow.

Bend

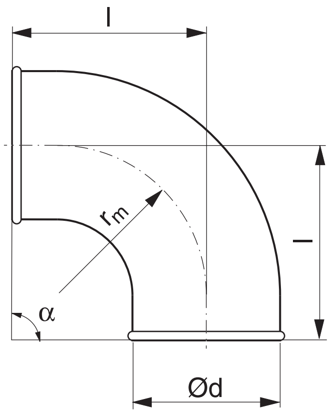
BTR 90°

Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

Dimensions



$r_m \approx 1 \cdot d$

Ød nom	t mm	r_m mm	l mm	m 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	1,40
224	0,7	225	277	1,60
250	0,7	250	302	2,00
300	0,7	300	346	2,70
315	0,7	315	361	3,30

Ordering example

BTR 125 90

- Product — BTR
- Dimension Ød — 125
- Angle α — 90

Bend

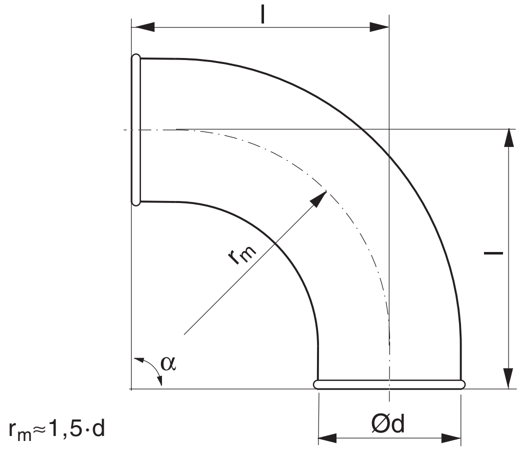
BSTR 90°

Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

Dimensions



Ød nom	t mm	r_m mm	l mm	m 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

BSTR 160 90

Product — BSTR
Dimension Ød — 160
Angle α — 90

Bend

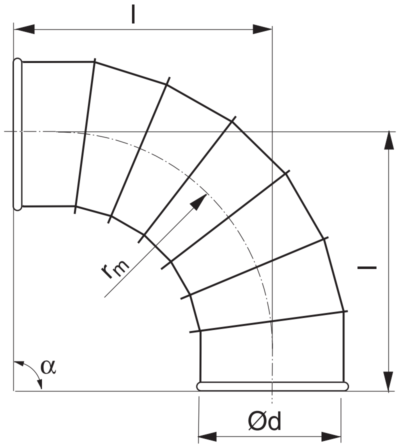
BSFTR 90°

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

Description

Segmented and swaged bend.

Dimensions



$r_m \approx 1{,}5 \cdot d$

Ød nom	t mm	r_m mm	l mm	m 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

BSFTR 250 90

Product — BSFTR
Dimension Ød — 250
Angle α — 90

Bend

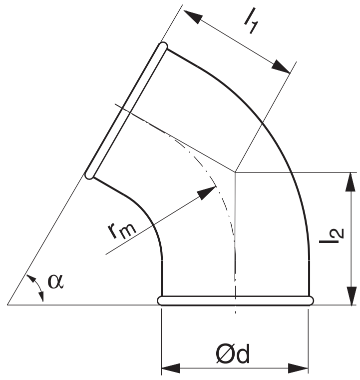
BTR 60°

Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

Dimensions



Ød nom	t mm	r_m mm	l_1 mm	l_2 mm	m 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	1,00
224	0,7	225	182	182	1,20
250	0,7	250	196	196	1,40

Ordering example

	BTR	125	60
Product	BTR		
Dimension Ød		125	
Angle α			60

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

Bend

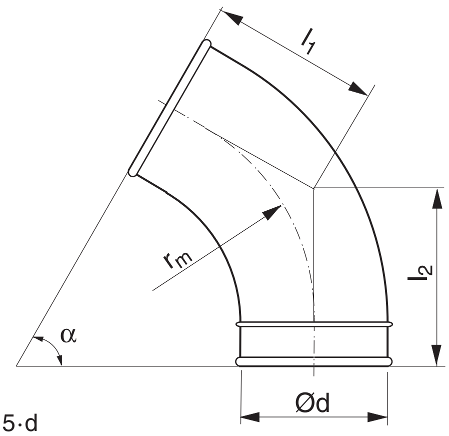
BSTR 60°

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 nom	t mm	r_m mm	l_1 mm	l_2 mm	m 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

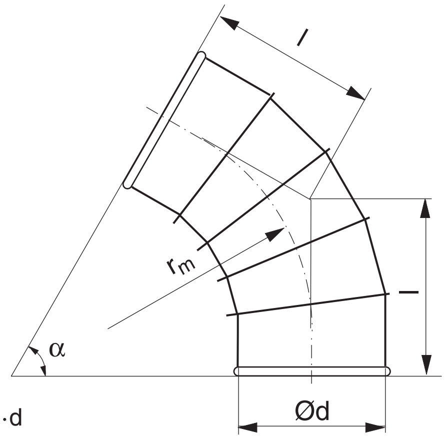
Ordering example

	BSTR	200
Product		
Dimension Ød		
Angle α		

Bend

BSFTR 60°

Dimensions



Description

Segmented and swaged bend.

Ød nom	t mm	r_m mm	l mm	m 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

	BSFTR	250	60
Product	BSFTR		
Dimension Ød		250	
Angle α			60

Bend

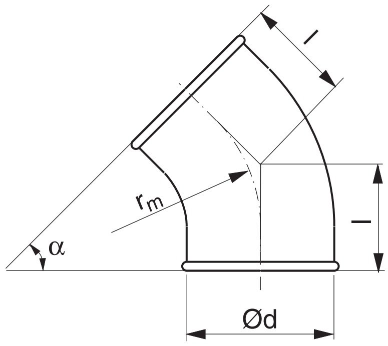
BTR 45°

Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

Dimensions



$r_m \approx 1 \cdot d$

Ød nom	t mm	r_m mm	l mm	m 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	1,00
250	0,7	250	156	1,00
315	0,7	315	176	1,70

Ordering example

BTR **125** **45**

Product — BTR
Dimension Ød — 125
Angle α — 45

Bend

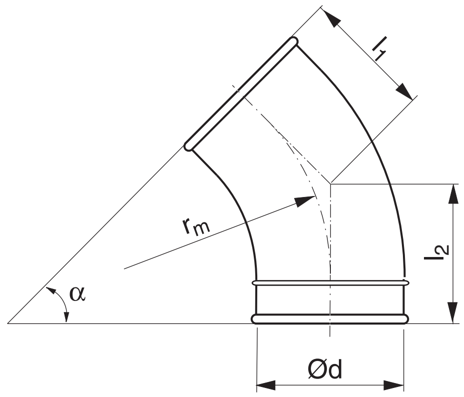
BSTR 45°

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 nom	t mm	r_m mm	l_1 mm	l_2 mm	m 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

	BSTR	200	45
Product			
Dimension Ød			
Angle α			

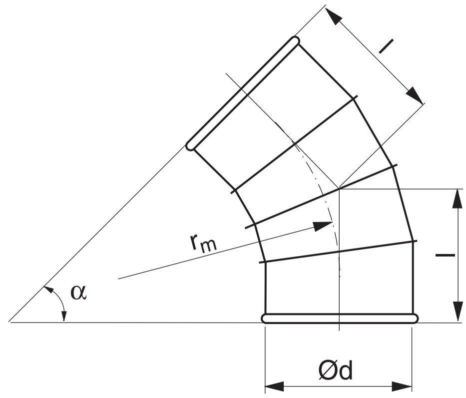
Bend

BSFTR 45°

Description

Segmented and swaged bend.

Dimensions



$r_m \approx 1{,}5 \cdot d$

Ød nom	t mm	r_m mm	l mm	m 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

BSFTR 250 45

Product — BSFTR
Dimension Ød — 250
Angle α — 45

Lindab

Bend

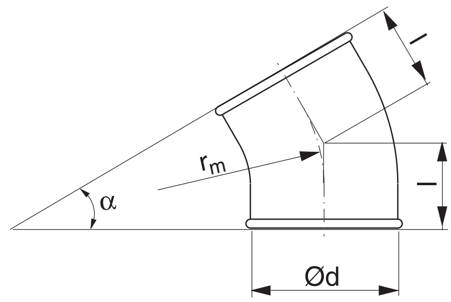
BTR 30°

Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

Dimensions



$r_m \approx 1 \cdot d$

Ød nom	t mm	r_m mm	l_1 mm	l_2 mm	m 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	0,90
250	0,7	250	119	119	1,10

Ordering example

BTR 125 30

Product
Dimension Ød
Angle α

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

Bend

BSTR 30°

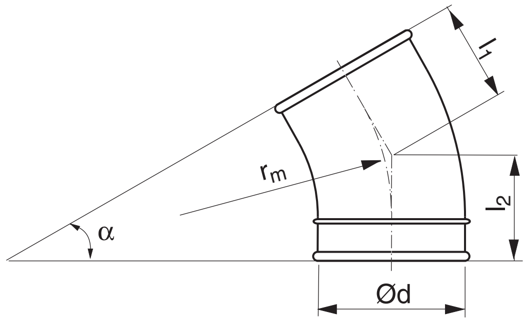
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

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 nom	t mm	r_m mm	l_1 mm	l_2 mm	m 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

BSTR 160 30

Product — BSTR
Dimension Ød — 160
Angle α — 30

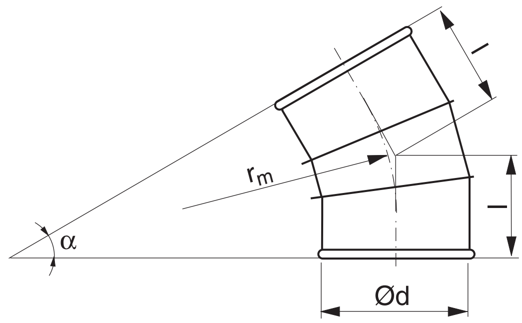
Bend

BSFTR 30°

Description

Segmented and swaged bend.

Dimensions



$r_m \approx 1{,}5 \cdot d$

Ød nom	t mm	r_m mm	l mm	m 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

	BSFTR	250	30
Product	BSFTR		
Dimension Ød		250	
Angle α			30

Bend

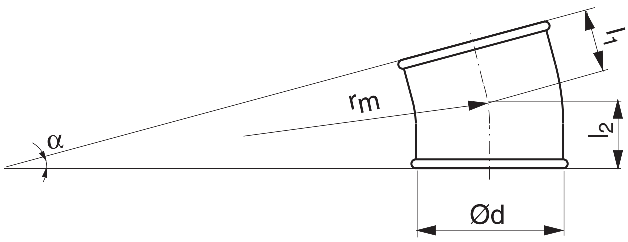
BTR 15°

Description

Pressed and seam welded bend.

Some dimensions are made with a swaged-on beaded end.

Dimensions



$r_m \approx 1 \cdot d$

Ød nom	t mm	r_m mm	l_1 mm	l_2 mm	m 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

BTR 125 15

Product — BTR
Dimension Ød — 125
Angle α — 15

Bend

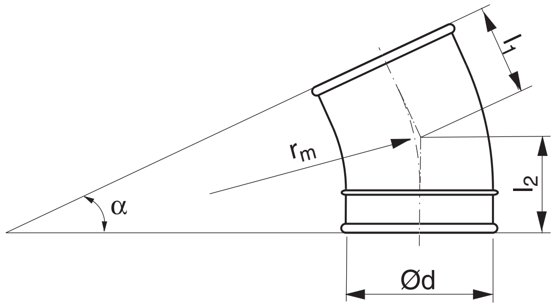
BSTR 15°

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 nom	t mm	r_m mm	l_1 mm	l_2 mm	m 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

	BSTR	160	15
Product	BSTR		
Dimension Ød		160	
Angle α			15

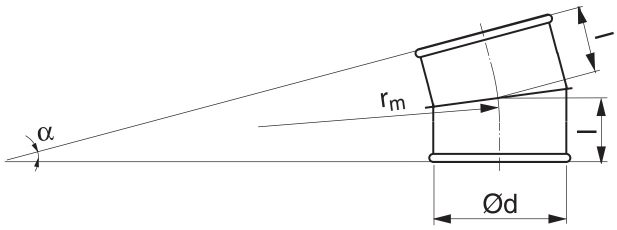
Bend

BSFTR 15°

Description

Segmented and swaged bend.

Dimensions



$r_m \approx 1{,}5 \cdot d$

Ød nom	t mm	r_m mm	l mm	m 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

BSFTR 250 15

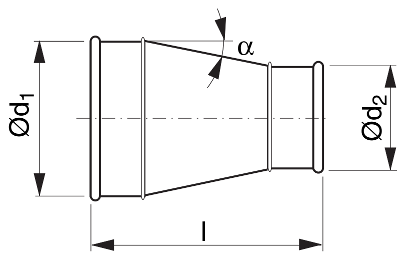
Product — BSFTR
Dimension Ød — 250
Angle α — 15

Reducer

RCLTR

Description

Long, concentric reducer with about 18° angle.



Dimensions

$Ød_1$ nom	$Ød_2$ nom	t mm	l mm	m 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

RCLTR 250 160

- Product: RCLTR
- Dimension $Ød_1$: 250
- Dimension $Ød_2$: 160

Reducer RCLTR

$Ød_1$ nom	$Ød_2$ nom	t mm	l mm	m 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

$Ød_1$ nom	$Ød_2$ nom	t mm	l mm	m 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°

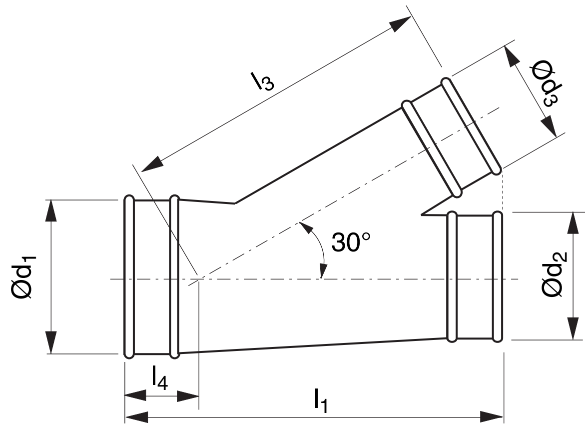
Description

T-piece.

NB
To save space, the adjacent table only contains a limited selection from our range – the T-pieces where all dimensions $Ød_1$, $Ød_2$ and $Ød_3$ 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 $Ød_3$. For example, all T-pieces with $Ød_3$ = 200 have installation length l_1 = 589 mm.

Dimensions



$Ød_1$ nom	$Ød_2$ nom	$Ød_3$ nom	t mm	l_1 mm	l_3 mm	l_4 mm	m 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

TVTR 315 200 200

- Product: TVTR
- Dimension $Ød_1$: 315
- Dimension $Ød_2$: 200
- Dimension $Ød_3$: 200

X-piece

XVTR 30°

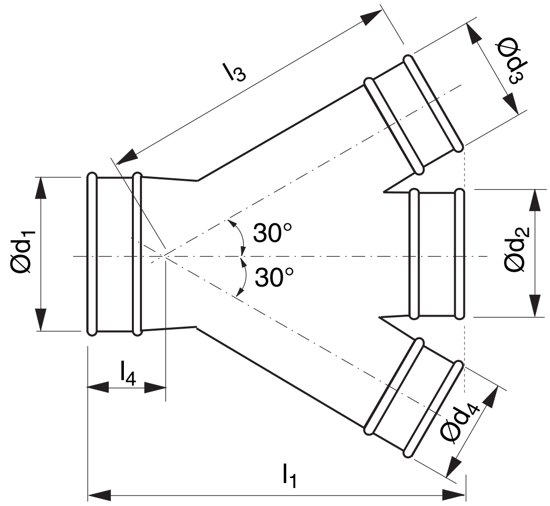
Description

X-piece.

NB
To save space, the adjacent table only contains a limited selection from our range – the X-pieces where all dimensions $Ød_1$, $Ød_2$ and $Ød_3$/$Ød_4$ 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 $Ød_3$/$Ød_4$. For example, all X-pieces with $Ød_3$ = 160 and $Ød_4$ = 200 have installation length l_1 = 589 mm.

Dimensions



$Ød_1$ nom	$Ød_2$ nom	$Ød_3$ $Ød_4$ nom	t mm	l_1 mm	l_3 mm	l_4 mm	m 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

	XVTR	400	200	160	160
Product	XVTR				
Dimension $Ød_1$		400			
Dimension $Ød_2$			200		
Dimension $Ød_3$				160	
Dimension $Ød_4$					160

Y-piece

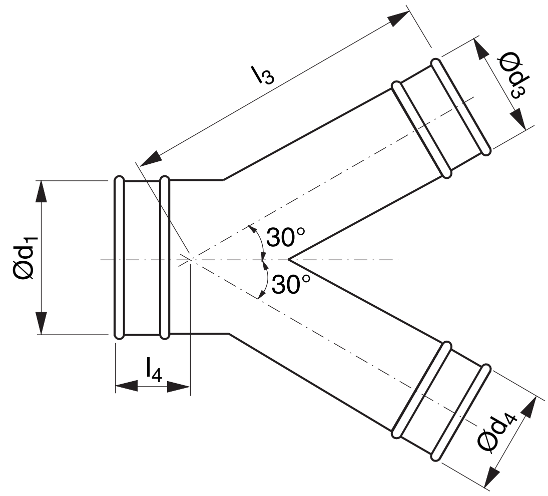
YVTR 30°

Description

Y-piece.

NB
To save space, the adjacent table only contains a limited selection from our range – the Y-pieces where all dimensions $Ød_1$, $Ød_3$ and $Ød_4$ are equal in size. Other dimensions are available to special order.

Dimensions



$Ød_1$ nom	$Ød_3$ $Ød_4$ nom	t mm	l_3 mm	l_4 mm	m 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

	YVTR	400	160	160
Product	←			
Dimension $Ød_1$		←		
Dimension $Ød_2$			←	
Dimension $Ød_3$				←

Saddle

PSVTR 30°

Description

Saddle.

The saddle is fixed with two sealing clamps MFK.

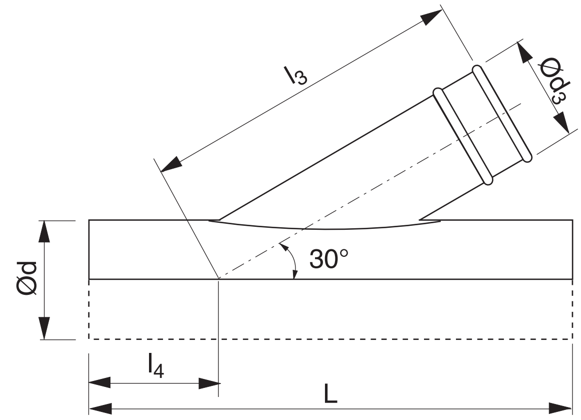
This product should not be installed with screws or blind rivets when used in chip extraction installations.

NB
To save space, the adjacent table only contains a limited selection from our range – the saddles where all dimensions Ød and Ød$_3$ are equal in size. Other dimensions are available to special order.

Ordering example

	PSVTR	400	160
Product	PSVTR		
Dimension Ød$_1$		400	
Dimension Ød$_3$			160

Dimensions



Ød nom	Ød$_3$ nom	t mm	L mm	l$_3$ mm	l$_4$ mm	m 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

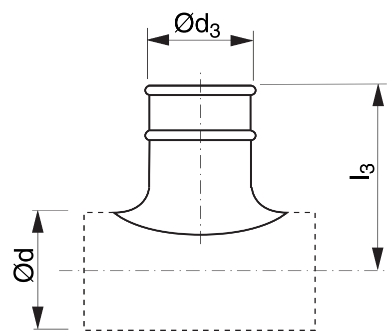
Collar saddle

PSTR

Description

Collar saddle.

Dimensions



Ød nom	Ød3 mm	t mm	l3 mm	m 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

Ordering example

PSTR 400 160

Product
Dimension Ød
Dimension Ød3

Collar saddle

PSTR

Ød nom	Ød_3 mm	t mm	l_3 mm	m kg
200	150	0,6	211	0,50
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
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

Collar saddle PSTR

Ød nom	Ød3 mm	t mm	l3 mm	m kg
500	500	0,7	291	1,70
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

Ød nom	Ød3 mm	t mm	l3 mm	m kg
750	750 *	0,9	416	9,00
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

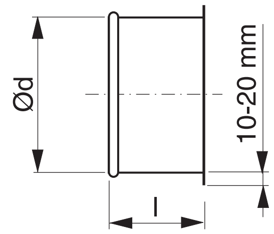
Take-off

ILTR

Description

Take-off.

Dimensions



Ød nom	t mm	l mm	m 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

	ILTR	315
Product	ILTR	
Dimension Ød		315

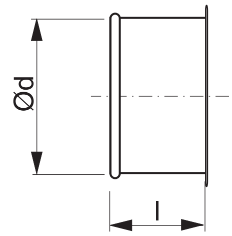
End cover

EPTR

Description

End cover.

Dimensions



Ød nom	t mm	l mm	m 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

EPTR **315**

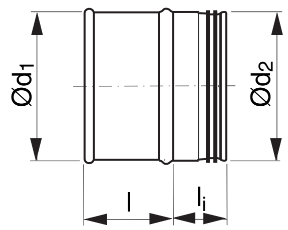
Product — EPTR
Dimension Ød — 315

Transition piece OUTR

Description

Coupling between Transfer and Safe systems.

Dimensions



$Ød_1$ nom	$Ød_2$ nom	t mm	l mm	l_i mm	m 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

Ordering example

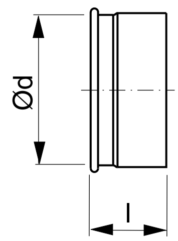
OUTR **315**

Product — OUTR
Dimension Ød — 315

Transition piece

MFTR

Dimensions



Description

Coupling with female end between Transfer and Safe systems.

Ød nom	t mm	l mm	m 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
400	0,9	126	1,20
450	0,9	126	1,40
500	0,9	126	1,60

Ordering example

MFTR **315**

Product

Dimension Ød

Transition piece

OTR

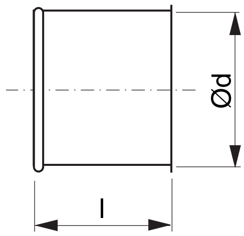
Description

Coupling between Transfer and other joining systems.

Ød = dimension for Transfer.

The l-measure depends on the other joining system used.

Dimensions



Ød nom	t mm
80	0,5
100	0,5
125	0,5
140	0,5
150	0,5
160	0,5
180	0,5
200	0,5
224	0,5
250	0,5
300	0,9
315	0,9
350	0,9
400	0,9
450	0,9
500	0,9

Ordering example

	OTR	200
Product	┘	
Dimension Ød		┘

Transition piece

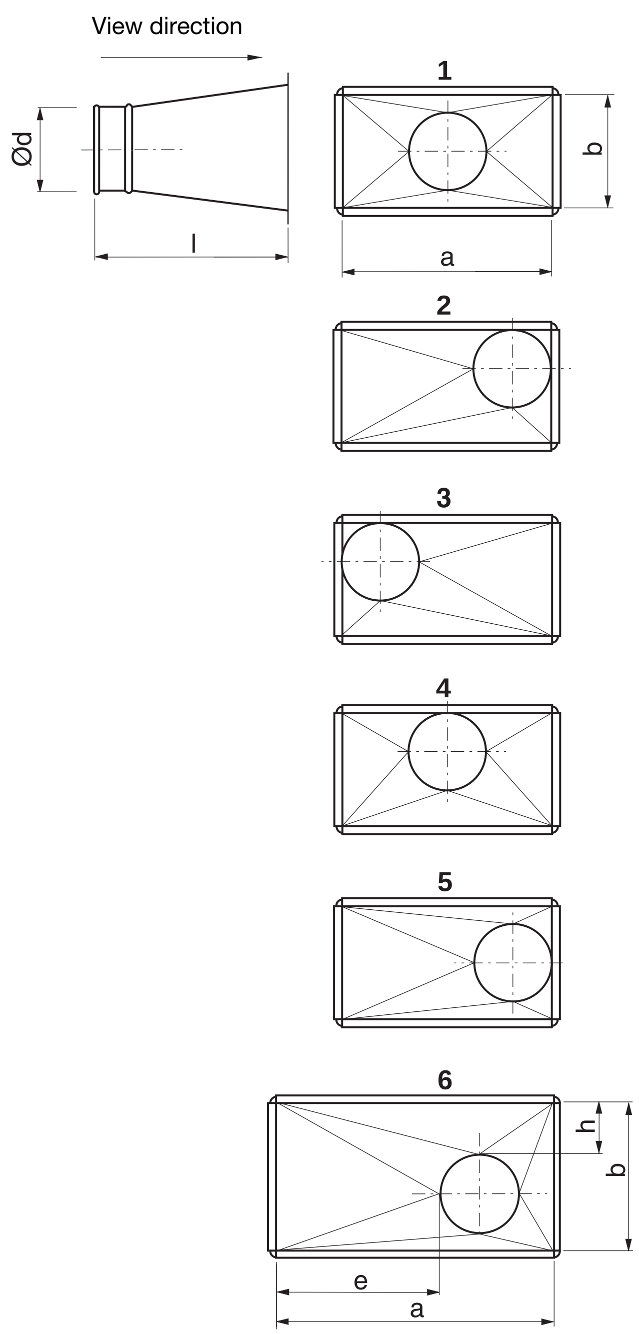
LORTR

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.

Dimensions



a, b largest side mm	l mm
100 – 350	300
351 – 750	450
751 – 1200	600

Ordering example

		LORTR	500	300	160	1
Product						
largest side	a					
Smallest side	b					
Diameter in mm	Ød					
The alt. displacement are seen from the circular end 1–6						

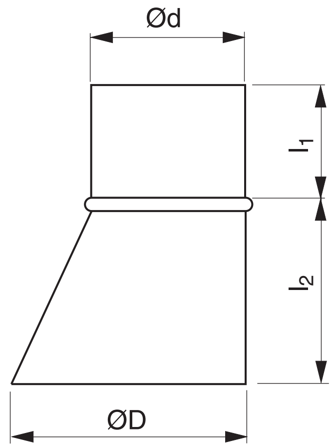
Extraction hood SH

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 nom	ØD nom	l_1 mm	l_2 mm	m kg
80	160	80	95	0,31
160 *	315	120	155	1,00

* Supplied with handle

Ordering example

	SH	160
Product	SH	
Dimension Ød		160

Lindab

Extraction hood

SHTR

Description

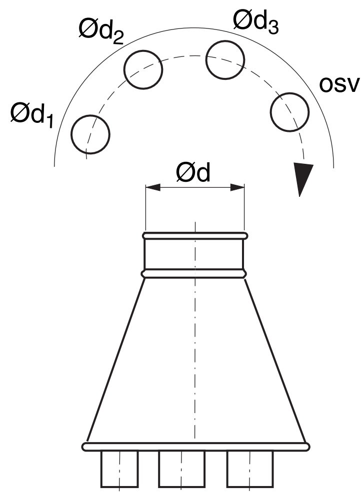
Extraction hood.

To order, specify Ød and dimensions for stubs Ød_1, Ød_2, Ød_3 etc. and the sequence they should be located on the pitch circle.

Ordering example

	SHTR	250	xxx - xxx - xxx
Product			
Dimension Ød			
Dimension Ød_1, Ød_2, Ød_3			

Dimensions



Ød nom	t 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

Extraction hood

SPTR

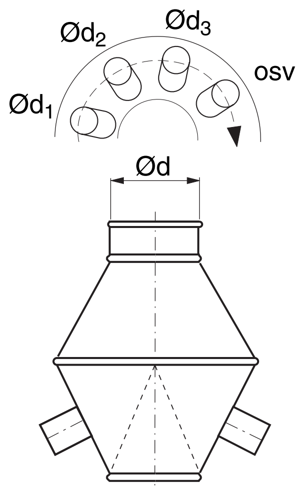
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Description

Extraction hood.

To order, specify Ød and dimensions for stubs $Ød_1$, $Ød_2$, $Ød_3$ etc. and the sequence they should be located on the pitch circle.

Dimensions



Ød nom	t 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

SPTR 315 xxx - xxx - xxx

Product

Dimension Ød

Dimension $Ød_1$, $Ød_2$, $Ød_3$

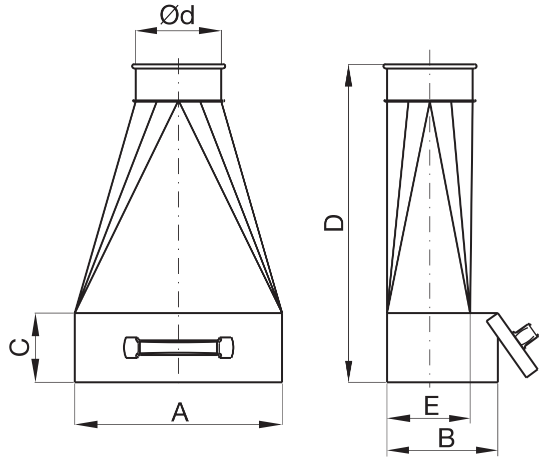
Waste extractor

GSTR

Description

Used for extraction of chips etc. Is to be placed up to a wall.

Dimensions



Ød nom	A mm	B mm	C mm	D mm	E mm
100	300	165	100	460	120
125	300	165	100	460	120
160	300	165	100	460	120

Ordering example

	GSTR	125
Product		
Dimension Ød		

Flexible hose

THTR

1
2
3
4
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11
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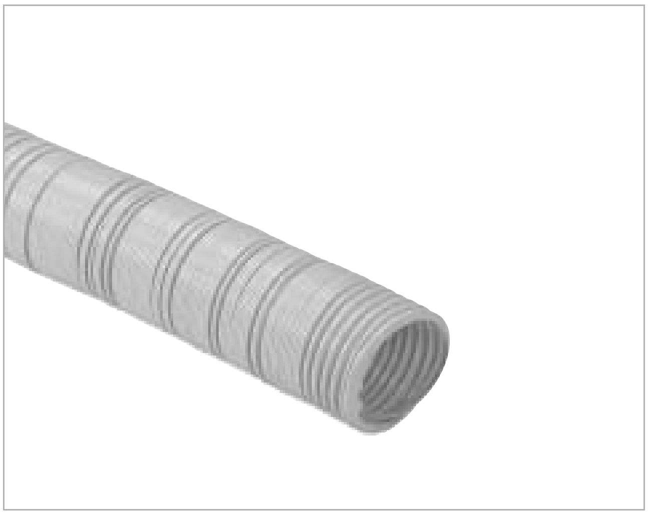
13
14
15
16
17
18



Description

Light, flexible hose built on a bright steel spiral. Transparent with a light bluish tone.

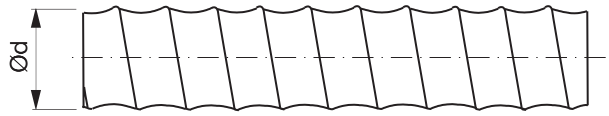
Material polyester – polyurethane
Temperature range -40 to +100 °C

Fits standard fitting dimensions.

Ordering example

	THTR	160
Product	THTR	
Dimension Ød		160

Dimensions



Ød mm	Min. bending radius mm	Max. per-missible negative pressure kPa	l mm	m_l 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

Flexible hose

THVTR

Description

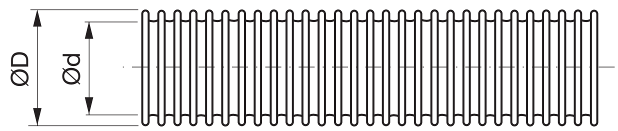
Flexible hose, non-spiral, profiled wall construction, extruded ethylene-vinyl-acetate The design means that the hose has an almost completely smooth interior under high vacuum, with consequent low pressure drop. This is because the open ridges on the inside of the hose are compressed at negative pressure.

Colour	blue
Temperature range	-45 to +65 °C

Ordering example

	THVTR	100
Product	THVTR	
Dimension Ød		100

Dimensions



Ød mm	ØD mm	Min. bending radius mm	Max. permissible negative pressure kPa	l mm	m_l 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

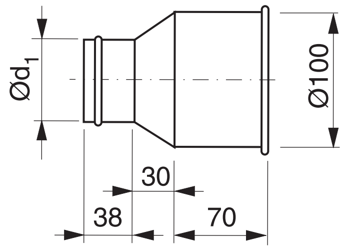
Transition piece

OTRTH

Description

Coupling between Transfer and flexible hose THVTR.

Dimensions



$Ød_1$ mm	m 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 280.

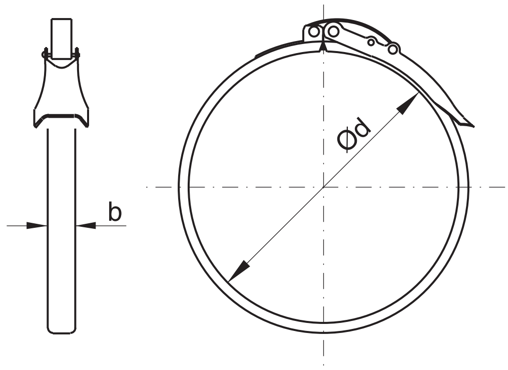
Ordering example

	OTRTH	50
Product	OTRTH	
Dimension $Ød_1$		50

Clip

SB

Dimensions



Ød nom	b mm	m 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

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

Ordering example

	SB	400
Product		
Dimension Ød		

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

Clip

SB-2

Description

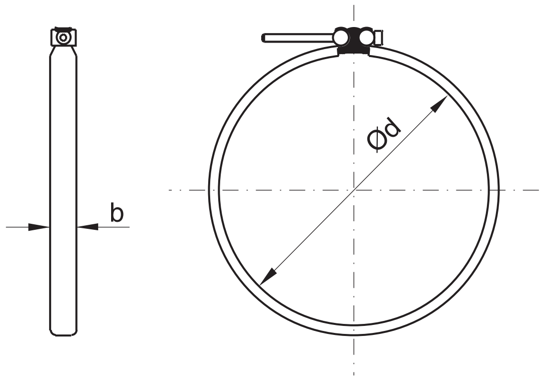
The clip is provided with a rubber gasket. The clip is tensioned by means of a hexagonal socket cap screw. Suitable for tightening with a screw tightener.

Temperature range -30 to +75 °C continuous
-40 to +85 °C intermittent

Ordering example

	SB-2	200
Product	SB-2	
Dimension Ød		200

Dimensions

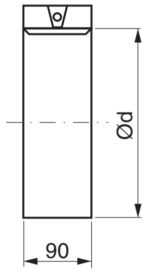


Ød nom	b mm	Key size mm	m kg
80	14	3	0,10
100	14	3	0,10
125	14	3	0,10
140	14	3	0,10
150	14	3	0,10
160	14	3	0,10
180	19	3	0,20
200	19	3	0,30
224	19	3	0,30
250	19	3	0,30
300	25	5	0,40
315	25	5	0,50
350	25	5	0,60
400	25	5	0,60
450	25	5	0,70
500	25	5	0,80

Sealing clamp

MFK

Dimensions



Ød nom	m 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

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.

Ordering example

MFK **200**

Product

Dimension Ød

Index

Index, denomination

Index, denomination

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