

QUICK SELECTION GUIDE 2019



MULTILEAF DAMPERS



SOUND ATTENUATORS



EXTERNAL WEATHER LOUVRES



FIRE AND SMOKE
PROTECTION SYSTEMS



CONTROL UNITS



CONTROL SYSTEMS



FILTER ELEMENTS



FILTER UNITS



X-CUBE AIR HANDLING UNITS



X-FANS





The art of handling air

TROX understands the art of handling air like no other company. Our slogan "The art of handling air" is where we derive our mandate: "Air is life". For all beings depend on air; it is one of the most natural and at the same time one of the most precious goods. [Good air is a factor in people's quality of life;](#) this is why it should be improved. For us, [well-being, safety and efficiency are at the centre of our actions, as people are the measure of all things and their well-being is our goal.](#)

Our products should therefore add to the well-being and comfort of people, i.e. provide indoor air of a good quality. Our production processes have to be efficient, and the resulting products have to be energy-efficient. All components have to be safe to install, safe to use and ensure safety, for example, with regard to fire protection.

Since the company's inception in 1951, we have been developing and producing advanced components, units and systems for the ventilation and air conditioning of rooms as well as for fire and smoke protection. We have become a global leader of innovation in these fields. TROX and their X-Fans building fans ideally complete the TROX portfolio.

The Heinz Trox Foundation, which was founded in 1991 and based in Neukirchen-Vluyn, has a 94 % stake in TROX GmbH. It is an expression of the life's work of its founder, Heinz Trox, and its founding paved the way for [TROX GmbH to continue as an independent company.](#) The object of the foundation is the advancement of scientific projects in the field of ventilation and air-conditioning technology and the support of social and cultural activities.



More than the sum of its parts

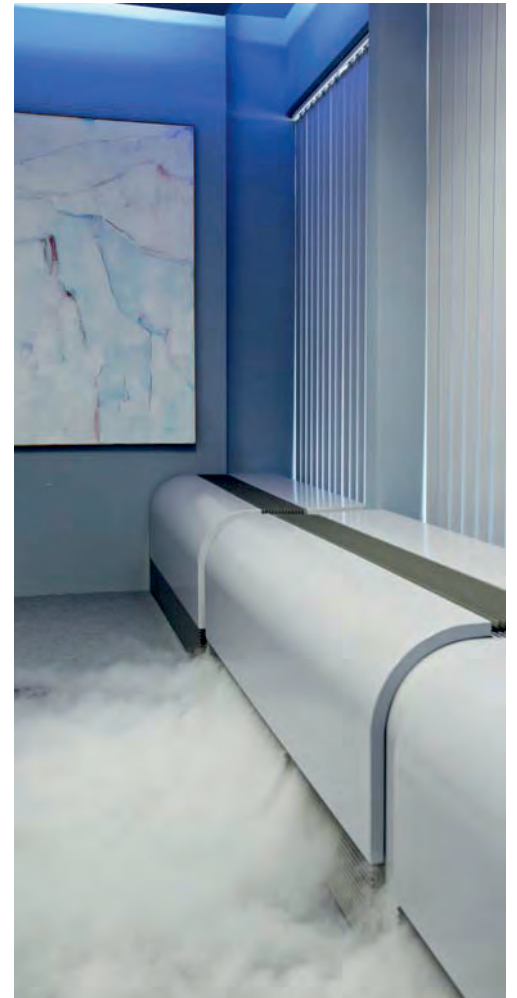
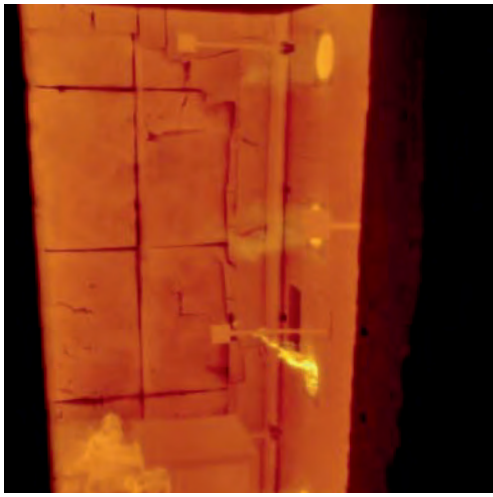
Modern buildings are unimaginable without individually designed air-conditioning and ventilation systems. Architecture and technical functions should complement each other and form a dynamic unit of perfectly coordinated components, devices and systems. For a project to be successful, comprehensive product and systems expertise in the field of ventilation and air conditioning is indispensable. **TROX offer all this from a single source.** The benefits for specialist consultants and HVAC contractors: **one face to the customer.**

Working closely with its customers, TROX develops demand-based solutions that take the relevant criteria for each building into account and meet the requirements of its occupants. This close cooperation leads to sustainable solutions that help to increase people's well-being and to protect life and the environment.

The wide variety of components is what forms the basis of our company. Developments in technology, particularly increasing **digitalisation** – in our sector also – has allowed us to combine various components and devices to create **sub-systems and systems**. As a result, TROX today offers closed loop control and open loop control for a wide range of different applications of ventilation and air-conditioning technology.

- Intelligent control for centralised room air conditioning (X-CUBE control)
- Demand-based control for rooms and zones (X-AIRCONTROL)
- Control of fire and smoke protection systems (TROXNETCOM)
- Control of smoke exhaust fans (X-FAN control)
- Room air management for sensitive areas (LABCONTROL) and
- Visualisation, open loop control and closed loop control of the entire air conditioning and ventilation system (X-TAIRMINAL)

These open loop control and closed loop control systems from TROX work as a system unit to ensure an energy-efficient, safe and highly functional system with a high level of comfort for a number of different types of buildings.



Always a step ahead

Our extensive research and development efforts help to find innovative solutions in all areas of indoor ventilation and air conditioning technology. In total, TROX has over [450 property rights worldwide](#) and [12 development centres](#). In addition to the continuous and planned development work for individual product groups, project-related development is becoming increasingly important.

The [International Center Fire Protection](#) is located at the TROX Group International Head Office in Neukirchen-Vluyn. It is the most modern fire protection laboratory in Europe. The test facilities enable fire tests to be carried out in accordance with all the established international standards. The furnace is the heart of the facility, being large enough to test huge tunnel dampers for the smoke extraction of underground transport systems.

In our [International Center for Air Conditioning and Acoustics](#), in addition to two reverberation chambers – as almost every new or further developed product is acoustically measured and optimised – there are various test equipment for control, indoor air and filter technology as well as demo labs for air management systems or air flow studios.

The main activities of our R&D include:

- Developing new products and technologies
- Optimising existing products
- Project-related tests with product development
- Preparations for technical documentation, lectures and publications and
- Customer support

The Research & Development department also works closely with universities and research institutions around the world.

TROX

International subsidiaries

TROX Arabia
TROX Argentina
TROX Australia
TROX Austria
TROX Belgium
TROX Brazil
TROX Bulgaria
TROX China
TROX Croatia
TROX Czech Republic
TROX Denmark
TROX France
TROX X-FANS Germany
TROX Hong Kong
TROX Hungary
TROX India
TROX Italy
TROX Malaysia
TROX Morocco
TROX Mexico
TROX Middle East
TROX Netherlands
TROX Auranor Norway
TROX BSH Poland
TROX Romania
TROX Russia
TROX Serbia
TROX South Africa
TROX Spain
TROX HESCO Switzerland
TROX Turkey
TROX UK
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Abu Dhabi
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Portugal
Saudi Arabia
Singapore
Slovak Republic
Slovenia
South Korea
Sweden
Taiwan
Thailand
Tunisia
Ukraine
Uruguay
Vietnam
Zimbabwe

www.trox.de/en/international

We are here to help

Good advice doesn't need to be expensive, so please feel free to contact our experts directly. With a [comprehensive customer support service](#) and an extensive service network, TROX can guarantee a full range of services from the initial design stage and throughout the entire life cycle of your system.

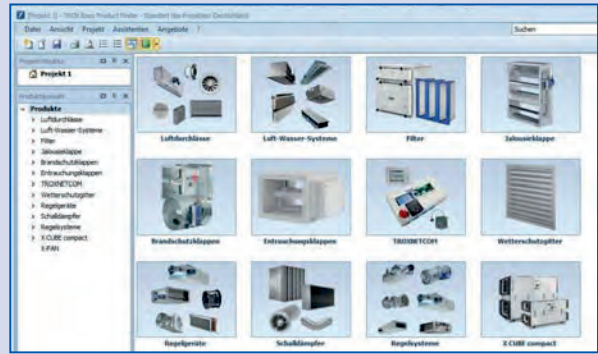
Client-oriented services are an integral part of the successful ventilation and air conditioning solutions at TROX. They decidedly improve the cost-effectiveness of any property during its life.

From as early as the design stage, you can benefit from intensive support from our employees. Thanks to direct contact with your personal TROX advisor and various design aids, you will be given the best chance of ensuring a successful project outcome from the very early stages of development. From product selection through to commissioning, you can count on optimum support from TROX.

Our Technical Service staff are also available beyond the commissioning phase as competent partners and advisors.

TROX also sets a precedent, in that it is continually striving for excellence – which is why TROX offers a wide-ranging training programme in its TROX Academy.

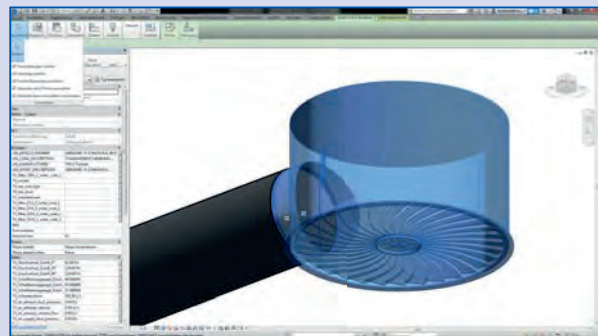
TROX Product Data / Easy Product Finder



X-BIM CAD Browser



Revit / AutoCAD



Simple, optimum design

With its intuitive operating concept, the [TROX design programme Easy Product Finder](#) offers fast, simple design of TROX products for projects. Reliable technical data, interactive design assistants and numerous report functions such as reports on input parameters and design results, specification texts and bills of materials, make the Easy Product Finder an indispensable tool in the building services engineering industry.

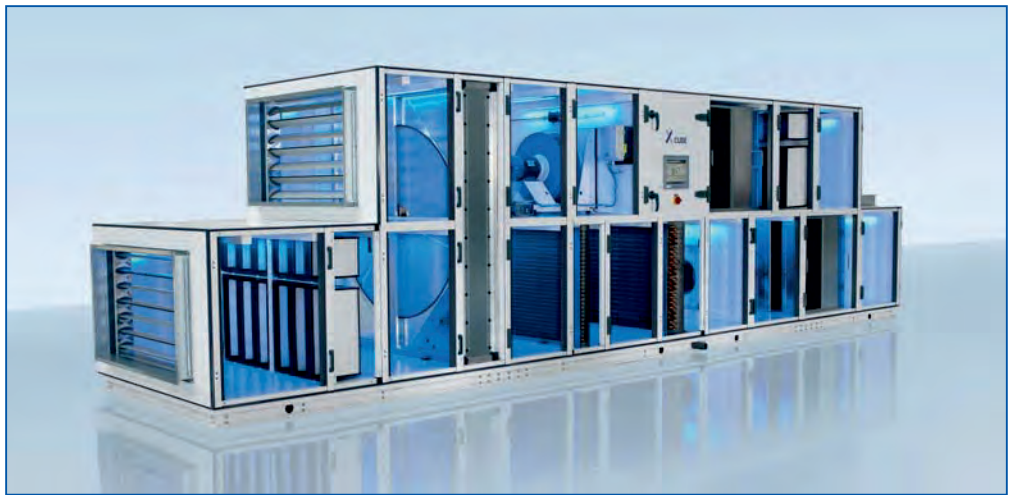
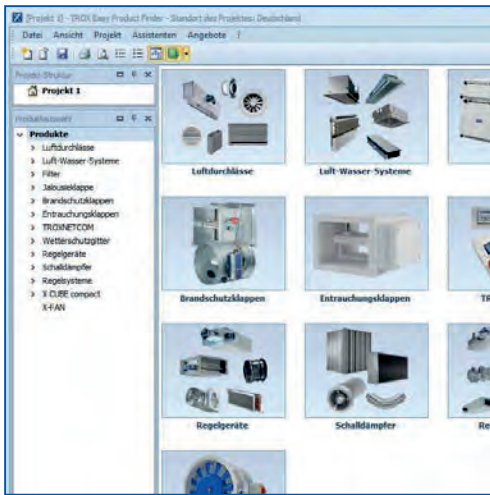
X-BIM – design with digital product models

Interdisciplinary building design and construction, computer-aided, and with all trades working on the same data model: this is what BIM is about. As early as in the project phase, a digital model of the building is created. All relevant data for the design, construction and management of an object are included and made available to all parties involved. To make the benefits of digital design efficiently usable, TROX provides a wide range of digital product data – free of charge – for a large number of TROX products.

One of our solutions is the X-BIM CAD browser to generate digital product data for TROX components and X-CUBE air handling units. At the touch of a button, you can import the data directly into the current Revit or AutoCAD project.

More information on BIM and TROX, the X-BIM CAD browser and all other solutions can be found on our website.

www.trox.de/bim



► Labor-Luft ► ► Perfektes Reiseklima ► ► 5-Sterne-Klima. ► ► Gesundes Klima ► ► Reine Luft ►

Sicheres Klima- und Luft-M Lüftungs- und Brandschutztechnik im Wohlbefinden und Sicherheit für den F Lüftungs- und Klimatechnik im Ho Mehr Sicherheit und Komfort in Intelligentes Klima- und Lüftungsma

TROX[®]TECHNIK
The art of handling air

KONTAKT HOME TROX WORLDWIDE LANGUAGE

PRODUKTE IHR KOMPETENZFELD SERVICES UNTERNEHMEN

PRODUKTE

- Luftdurchlässe
- Luft-Wasser-Systeme
- Dezentrale Lüftung
- Schalldämpfer
- Brand- und Rauchschutzsysteme
- Regelgeräte
- Filtergeräte Filterelemente
- Raumlufttechnische Geräte
- X-FANS

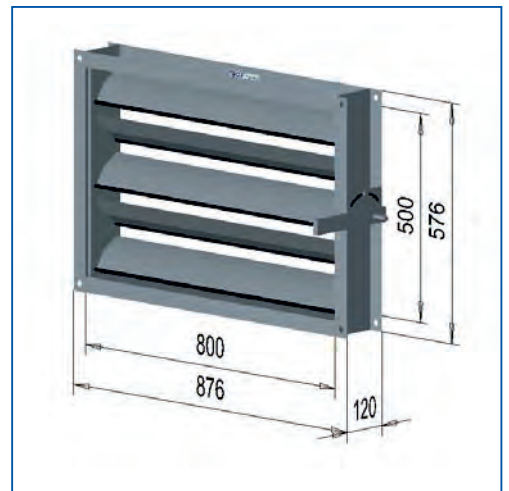


Montage- und Betriebsanleitung DE/de

Brandschutzklappe

Serie FK-EU

gemäß Leistungserklärung
DoP / FK-EU / DE / 003



Deckendralldurchlässe Serie VDW

Mit niedriger Schalleistung für Komfortbereiche, mit einzeln manuell verstellbaren Luftleitelementen

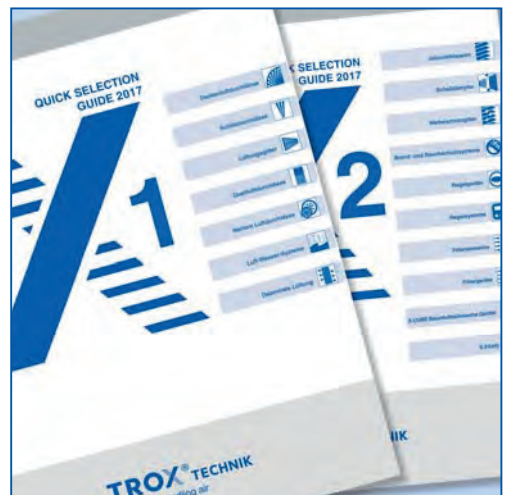
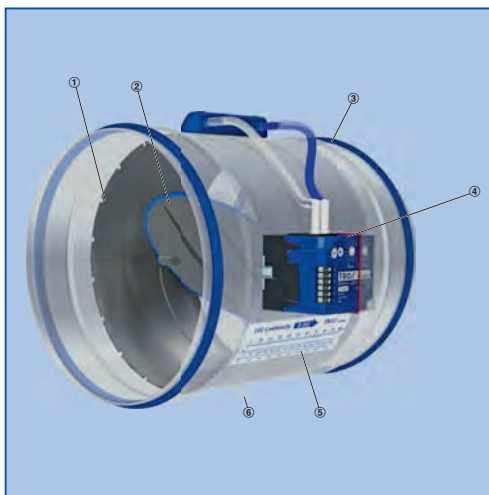
Runde und quadratische Deckendralldurchlässe für hohe Luftwechsel

- Nenngrößen 300, 400, 500, 600, 625, 825
- Volumenstrombereich 7 – 470 l/s oder 25 – 1692 m³/h
- Frontdurchlass aus pulverbeschichtetem verzinktem Stahlblech
- Für Zuluft und Abluft
- Für konstante und variable Volumenströme
- Für Deckensysteme aller Art und mit Randverbreiterung auch freihängend
- Hohe Induktion zum schnellen Abbau der Temperaturdifferenz und der Luftgeschwindigkeit
- Bis 35-facher Luftwechsel durch Reihenanordnung mit minimalem Mittenabstand von 0,9 m
- Ideal für Komfortbereiche

Optionale Ausstattung und Zubehör

- Sichtseite des Frontdurchlasses in Farben nach RAL Classic, Luftleitelemente schwarz und weiß
- Luftleitungsanschluss horizontal und vertikal
- Anschlusskasten mit Drosselement, Seilzugverstellung und Messnippel
- Akustisch optimierter Anschlusskasten FLEXTRO

TROX[®]TECHNIK PD – VDW



All of this – and more!

The TROX media world is just as diverse as the product range. Digital or printed, static or interactive – depending on the demand, we offer a wide range of different media for investors, specialist consultants and HVAC contractors. Have a look – and discover the extensive range of information from TROX.

Product overview

From extract grilles to zone modules, air handling units to air terminal devices or ventilation fans through to all the components needed for a complete smoke and heat extraction system, the [Quick Selection Guide](#) will give you information on everything TROX has to offer. With the most important technical data, dimensions and weights as well as a brief description of the products. Everything you need for an initial overview. All at hand.

Detailed information just a click away

For anyone who would like more than an overview, the TROX website www.troxtechnik.com provides all the information you need on TROX and our products. Product data sheets, operating manuals, certificates and, and ... Everything is available online, just a click away.

Direct design

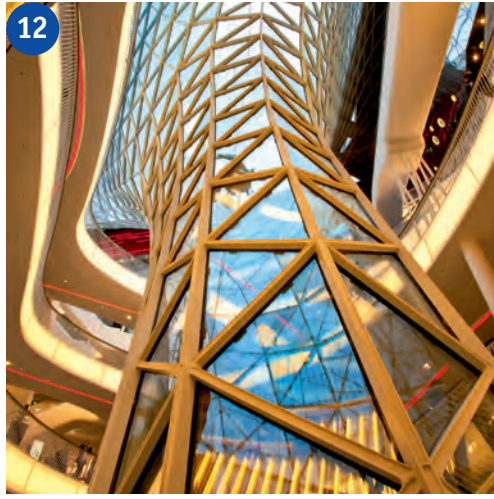
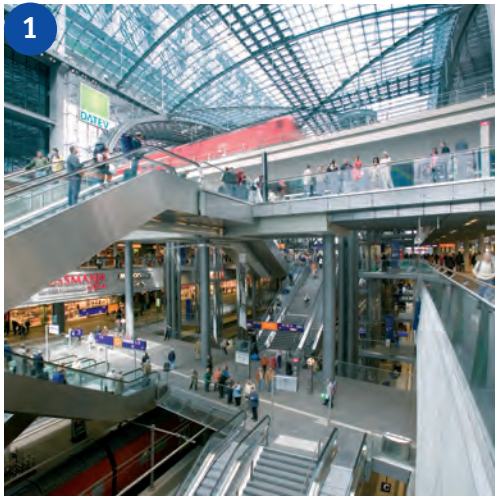
The TROX design tool [Easy Product Finder](#) offers additional technical information – above and beyond the Quick Selection Guide and Internet. Simply download from our website and install on your PC and you'll have all you need to start designing our components for your project. www.trox.de/epf

Simple configuration

The Easy Product Finder for TROX components is what the TROX X-FANS [product configurator](#) is for our fans. Simply go to X-FANS in the product section of our website. From here you are only two clicks away from the configurator . www.trox-xfans.de

Knowing what works

Whether we are talking about hotels, hospitals, offices, labs, airports, clean-rooms or shopping malls, in each of these very different building types there are various tasks and challenges related to ventilation and air-conditioning technology. Depending on the type of building, the focal points are, for instance, hygiene, good room air quality, personal protection but also protection of production processes or fire protection and smoke extraction. Here, investors, specialist consultants and architects get a lot of interesting information and suggestions in advance.



TROX, wherever you look

We have been developing, producing and selling products for ventilation and air-conditioning technology for over 65 years. And this can be seen wherever you look. Around the world in airports, hotels, sports arenas and many other public buildings. Here is a brief overview:

- 1 Berlin main train station – application: infrastructure and transport
- 2 Max Planck Institute, Münster – application: cleanrooms
- 3 Canary Wharf Station, London – application: tunnels
- 4 Frauenkirche Dresden – application: cultural monuments
- 5 Exhibition Hall 11, Frankfurt –
application trade fair and convention buildings
- 6 National stadium, Beijing – application: stadiums
- 7 Crane buildings, Cologne – application: offices and living space
- 8 Rhine-Waal University of Applied Sciences, Kamp-Lintfort, Germany –
application: laboratories
- 9 Frankfurt Airport – application: infrastructure and transport
- 10 Sydney Opera House – application: theatres and concert halls
- 11 Hotel Burj al Arab, Dubai – application: hotels
- 12 MyZeil, Frankfurt – application: shopping centres/retail



MULTILEAF DAMPERS



FIRE AND SMOKE PROTECTION SYSTEMS



CONTROL UNITS



CONTROL SYSTEMS



FILTER ELEMENTS



FILTER UNITS



X-CUBE AIR HANDLING UNITS



X-FANS



GENERAL



PRODUCT INDEX



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Multileaf dampers, External weather louvres



1 Multileaf dampers, External weather louvres

1.1 Multileaf dampers



For shutting off the airflow in air conditioning systems

JZ

14



Multileaf dampers made of aluminium for shutting off the airflow in air conditioning systems

JZ-AL

20



For low-leakage shut-off in air conditioning systems

JZ-HL

24



Multileaf dampers made of aluminium for low-leakage shut-off in air conditioning systems

JZ-HL-AL

29



For extremely low-leakage shut-off in air conditioning systems

JZ-LL

34



Multileaf dampers made of aluminium for extremely low-leakage shut-off in air conditioning systems

JZ-LL-AL

39

1.2 External weather louvres



For the most diverse applications, available also in large sizes

WG

46



With small blade pitch

WGK










55



Specifically for façade installation

WGF

59

	Combination with a multileaf damper	WG-JZ	63
	Combination with a non-return damper	WG-KUL	67
	With sound reduction characteristics	NL	71
1.3 Non-return dampers			
	For installation into walls or rectangular ducts	UL	80
	For installation into ductwork	KUL	84
	For heavy duty applications	ARK	87
1.4 Pressure relief dampers			
	For the prevention of excess pressure in rooms	ARK2	92
1.5 Gas-tight shut-off dampers			
	For the gas-tight shut-off of ducts	NAK	98
1.6 Doors			
	Single and double leaf hinged doors for plant rooms, storage rooms, air handling units, filter chambers, or enclosures for machinery or electrical equipment	ST	105



Inspection access doors for filter chambers, air handling units or other enclosures with machinery or equipment

BS

111

1.7 Splitter sound attenuators



For increased insertion loss and broadband attenuation even in the low frequency range

MSA

115



For high insertion loss with broadband damping, even in the high-frequency range

XSA

121

1.8 Splitters



For increased insertion loss and broadband attenuation even in the low frequency range

MKA

128



For high insertion loss with broadband damping, even in the high-frequency range

XKA

132



Parts kit for high insertion loss in the low-frequency range

RKA

137

1.9 Circular silencers



For the reduction of noise in circular ducts, galvanised sheet steel construction

CA

142



For the increased reduction of noise in circular ducts, galvanised sheet steel construction

CB

149



For the reduction of noise in circular ducts, aluminium construction

CS

156



For the reduction of noise in circular ducts, flexible aluminium construction

CF

162



For the reduction of noise in plastic circular ducts for contaminated air

CAK

169

Multileaf dampers

	Type					
	JZ	JZ-AL	JZ-HL	JZ-HL-AL	JZ-LL	JZ-LL-AL
Closed blade air leakage						
To EN 1751	Class 0	Class 0	Classes 1 - 2	Class 2	Classes 3 - 4	Class 4
Casing and blades						
Galvanised sheet steel	●		●		●	
Stainless steel	●				●	
Aluminium		●		●		●
Rotation						
Parallel	●					
Opposed	●	●	●	●	●	●
Duct connection						
Corner holes	●	●	●	●	●	●
Flange holes	●		●		●	
Bearings						
Plastic	●		●		●	
Brass	●		●		●	
Stainless steel	●		●		●	
Dynamics						
External linkage	●		●		●	
Gears (inside)		●		●		●
Blades						
Reinforced construction	●		●		●	
Nominal sizes						
Width	200 - 2000 mm	200 - 1200 mm	200 - 2000 mm	200 - 1200 mm	200 - 2000 mm	200 - 1200 mm
Increments	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Width subdivided	2001 - 4150		2001 - 4150		2001 - 4150	
Height	180 - 1998 mm	100 - 1000 mm	180 - 1998 mm	100 - 1000 mm	180 - 1998 mm	100 - 1000 mm
Increments	1 mm ¹⁾	50 mm	1 mm ¹⁾	50 mm	1 mm ¹⁾	50 mm
Height subdivided	1999 - 4066		1999 - 4066		1999 - 4066	
Casing						
Length	180 mm	120 mm	180 mm	120 mm	180 mm	120 mm
Casing air leakage to EN 1751	Class C	Class C	Class C	Class C	Class C	Class C
Areas of application						
Operating temperature	-20 to 100 °C	0 - 90 °C	-20 to 100 °C	0 - 90 °C	-20 to 100 °C	0 - 50 °C
Special areas						
Areas with explosive atmospheres	○		○		○	
Explanation						
● - Standard						
○ - Optional	Possible under certain conditions: Specific bearings and specific actuators					

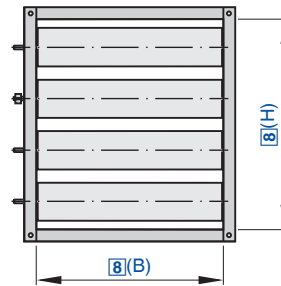
¹⁾ Except standard size H - 1 mm, H + 1 mm, H + 2 mm



List of abbreviations

B [mm]	Duct width
H [mm]	Duct height
n []	Number of flange screw holes
M [kg]	Weight
L_{WA} [dB(A)]	A-weighted sound power level of air-regenerated noise for the multileaf damper
α [°]	Damper blade position, 0°: OPEN, 90°: CLOSED
A [m ²]	Upstream cross section
v [m/s]	Airflow velocity based on the upstream cross section (B × H)
\dot{V} [m ³ /h] and [l/s]	Volume flow rate
Δp_{st} [Pa]	Static differential pressure
$\Delta p_{st\ max}$ [Pa]	Maximum static differential pressure
L_{WA} [dB(A)]	A-weighted sound power level of air-regenerated noise for the multileaf damper
α [°]	Damper blade position, 0°: OPEN, 90°: CLOSED
A [m ²]	Upstream cross section
v [m/s]	Airflow velocity based on the upstream cross section (B × H)
\dot{V} [m ³ /h] and [l/s]	Volume flow rate
Δp_{st} [Pa]	Static differential pressure
$\Delta p_{st\ max}$ [Pa]	Maximum static differential pressure





For shutting off the airflow in air conditioning systems

Order code

JZ - P - A2 - G - M - ... - L / 1000x1005 / ER / Z64 / NC / P1 - RAL ...

1 2 3 4 5 6 7 8 9 10 11 12

1 Type

JZ Multileaf damper

2 Function

S Opposed (standard)
P Parallel

3 Material

No entry: galvanised steel
A2 Stainless steel

4 Duct connection

No entry: corner holes on both sides
G Flange holes on both sides (no corner holes)

5 Bearings

No entry: plastic bearings
M Brass bearings
E Stainless steel bearings

6 Construction of blades

Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings reinforced blades
V

7 Operating side

No entry: on the right
L Left side

8 Nominal size [mm]

B × H
B > 2000: width subdivided
H > 1998: height subdivided

9 Installation subframe

No entry: none
ER With (only for construction G)

10 Attachments

No entry: none
Z04 - Z07 Quadrant stay
Z12 - Z51 Actuators

ZF01 - ZF15 Spring return actuators

Z60 - Z77 Pneumatic actuators
Explosion-proof actuators

Z1EX, Z3EX Electric

Z60EX - Z77EX Pneumatic

11 Damper blade safety function

Only for spring return actuators and pneumatic actuators

NO Pressure off/power off to OPEN

NC Pressure off/power off to CLOSE

12 Surface

No entry: standard construction
P1 Powder-coated, specify RAL CLASSIC colour
PS Powder-coated, specify DB colour

Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

+ Features

Rectangular multileaf dampers for volume flow and pressure control as well as for shutting off ducts and openings in walls and ceiling slabs

- ▶ Maximum dimensions 2000 × 1995 mm
- ▶ Casing air leakage to EN 1751, class C
- ▶ Aerofoil parallel or opposed action blades
- ▶ Blades interconnected by external linkage (for parallel or opposed blade action)
- ▶ Available in standard sizes and many intermediate sizes
- ▶ Can be combined with external weather louvres

Optional equipment and accessories

- ▶ Actuators: Open/Close actuators, modulating actuators
- ▶ Explosion-proof construction with pneumatic actuator or spring return actuator
- ▶ Powder-coated construction

Application

- ▶ Multileaf dampers of Type JZ are used as an acting element in the volume flow and pressure control in air conditioning systems

- ▶ For shutting off ducts and openings in walls and ceiling slabs

- ▶ Parallel action blades are preferably used for opening/closing
- ▶ Opposed action blades are due to their characteristics preferably used for variable operation
- ▶ Stainless steel and powder-coated constructions with increased corrosion resistance
- ▶ Steel and stainless steel variants with brass or stainless steel bearings are suitable for use in potentially explosive atmospheres (ATEX)

◊ Variants

- ▶ JZ-S: Multileaf damper with opposed blade action, made of galvanised sheet steel
- ▶ JZ-P: Multileaf damper with parallel blade action, made of galvanised sheet steel
- ▶ JZ-S-A2: Multileaf damper with opposed blade action, made of stainless steel
- ▶ JZ-P-A2: Multileaf damper with parallel blade action, made of stainless steel

+ Construction

Duct connection

- ▶ Corner holes on both sides
- ▶ G: Flange holes on both sides

Bearings

- ▶ Plastic bearings, operating temperature -20 - 100 °C
- ▶ M: brass bearings, operating temperature -20 - 150 °C
- ▶ E: stainless steel bearings, operating temperature -20 - 150 °C

Blades

Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings (JZ-...-M, JZ-...-E)

- ▶ V: reinforced blades

◻ Attachments

- ▶ Quadrant stays and limit switches: Quadrant stays to adjust the damper blades (stepless adjustment) and for capturing the end positions



- ▶ Open/Close actuators: Actuators for opening and closing multileaf dampers
- ▶ Modulating actuators: Actuators for stepless blade adjustment
- ▶ Pneumatic actuators: Pneumatic actuators for opening and closing multileaf dampers
- ▶ Explosion-proof actuators: Actuators for opening and closing multileaf dampers installed in potentially explosive atmospheres

& Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of multileaf dampers

★ Special characteristics

- ▶ Aerofoil blades
- ▶ Low-maintenance, robust

- ▶ No parts with silicone
- ▶ Available in standard sizes and many intermediate sizes

ISO Standards and guidelines

- ▶ Casing air leakage to EN 1751, class C



Technical data

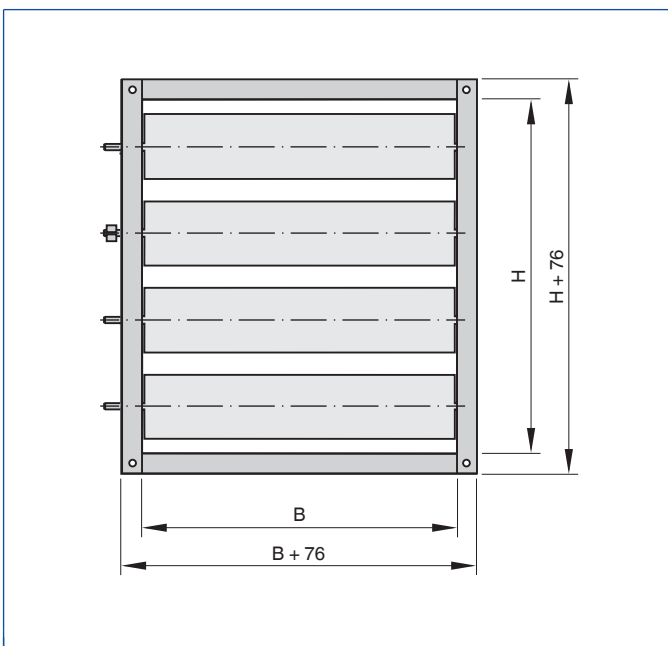
Nominal sizes	200 × 180 mm - 2000 × 1995 mm
Operating temperature	-20 to 100 °C

Steel and stainless steel multileaf dampers, free area

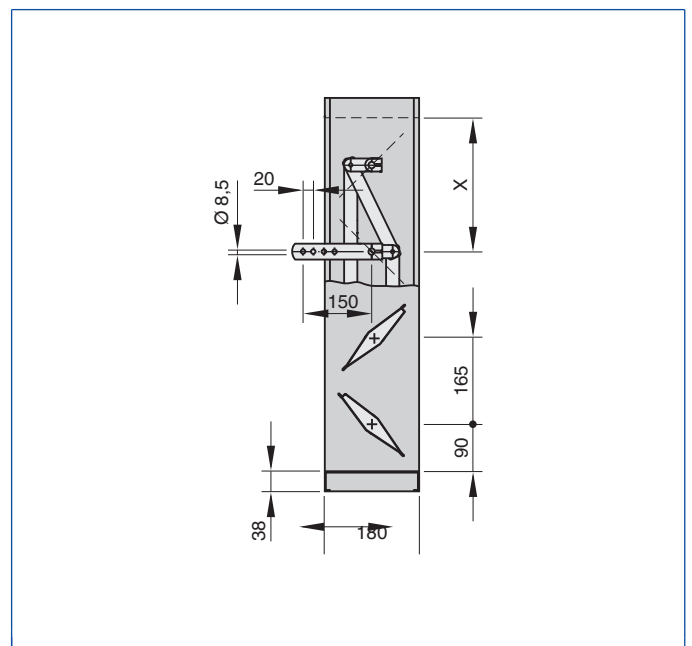
H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	1800	2000
mm	m ²									
180 - 344	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	0.30
345 - 509	0.06	0.11	0.17	0.23	0.28	0.34	0.40	0.45	0.51	0.57
510 - 674	0.08	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.83
675 - 839	0.11	0.22	0.33	0.44	0.55	0.66	0.77	0.88	0.99	1.10
840 - 1004	0.14	0.27	0.41	0.55	0.69	0.82	0.96	1.10	1.23	1.37
1005 - 1169	0.16	0.33	0.49	0.66	0.82	0.98	1.15	1.31	1.47	1.64
1170 - 1334	0.19	0.38	0.57	0.76	0.95	1.14	1.33	1.52	1.72	1.91
1335 - 1499	0.22	0.43	0.65	0.87	1.09	1.30	1.52	1.74	1.96	2.17
1500 - 1664	0.24	0.49	0.73	0.98	1.22	1.47	1.71	1.95	2.20	2.44
1665 - 1829	0.27	0.54	0.81	1.08	1.36	1.63	1.90	2.17	2.44	2.71
1830 - 1994	0.30	0.60	0.89	1.19	1.49	1.79	2.08	2.38	2.68	2.98
1995	0.32	0.65	0.97	1.30	1.62	1.95	2.27	2.60	2.92	3.25

Intermediate sizes: Intermediate widths can be interpolated

JZ-S, standard sizes

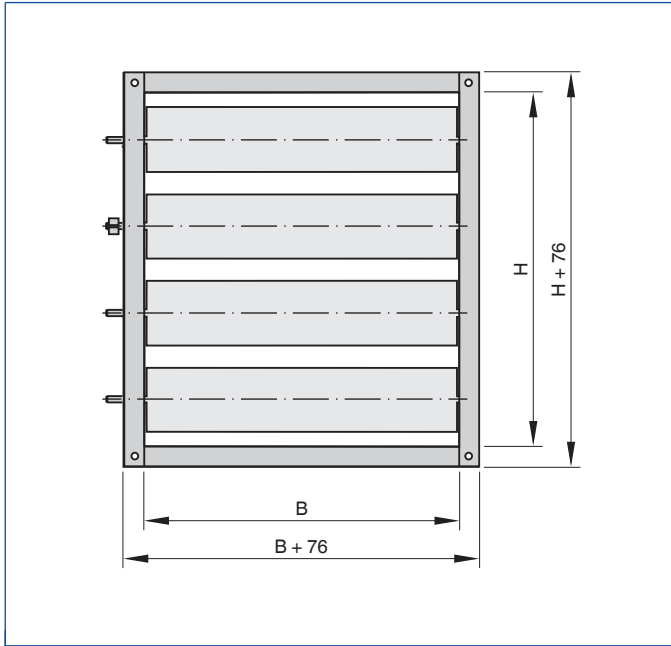


JZ-S, standard sizes

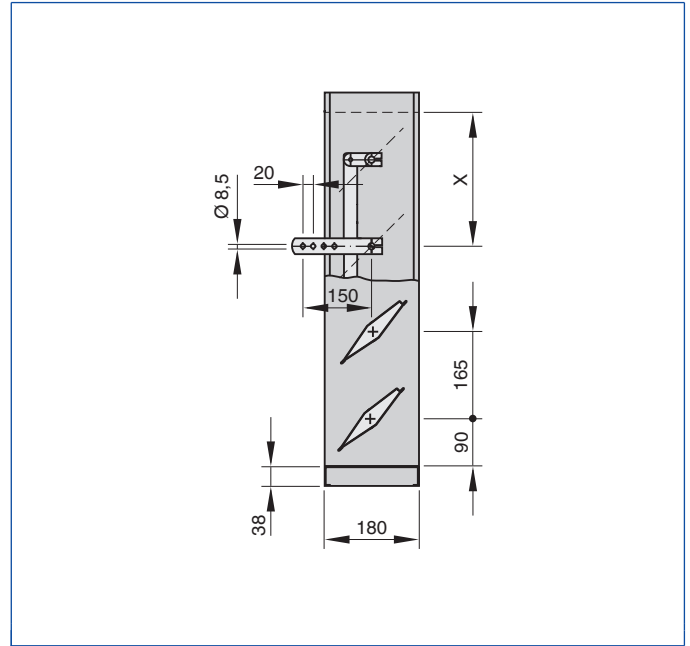




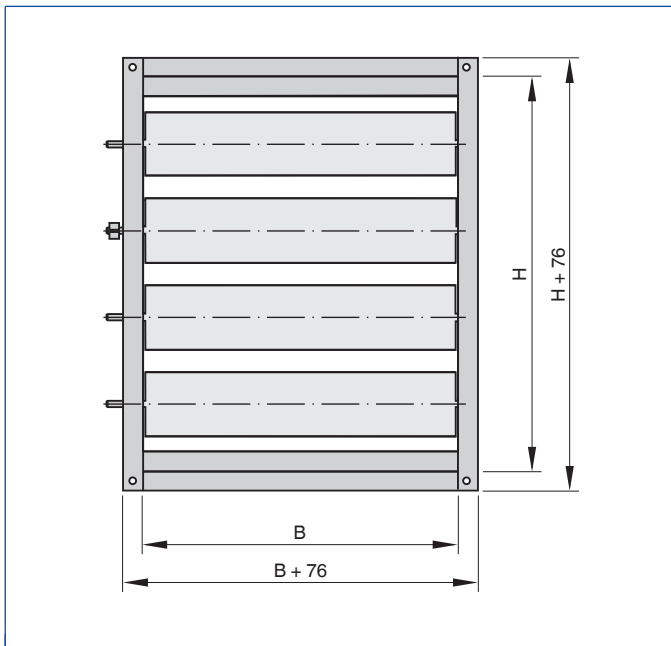
JZ-P, standard sizes



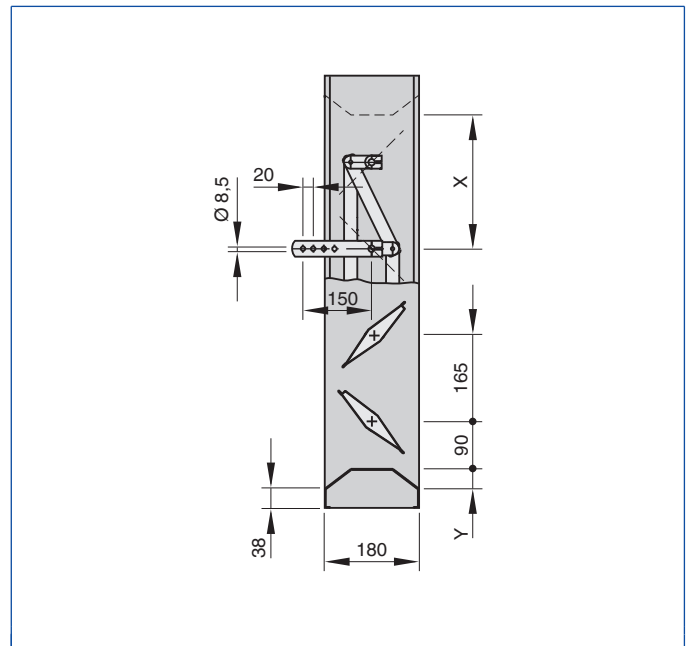
JZ-P, standard sizes



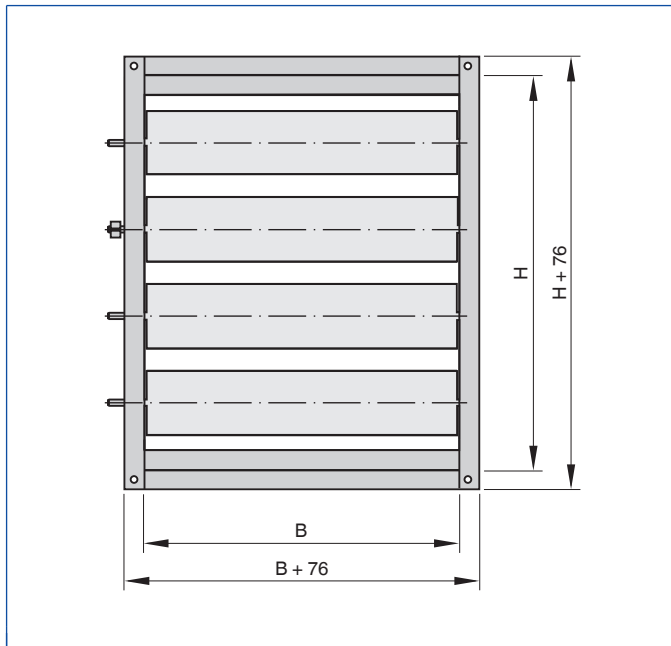
JZ-S, intermediate sizes



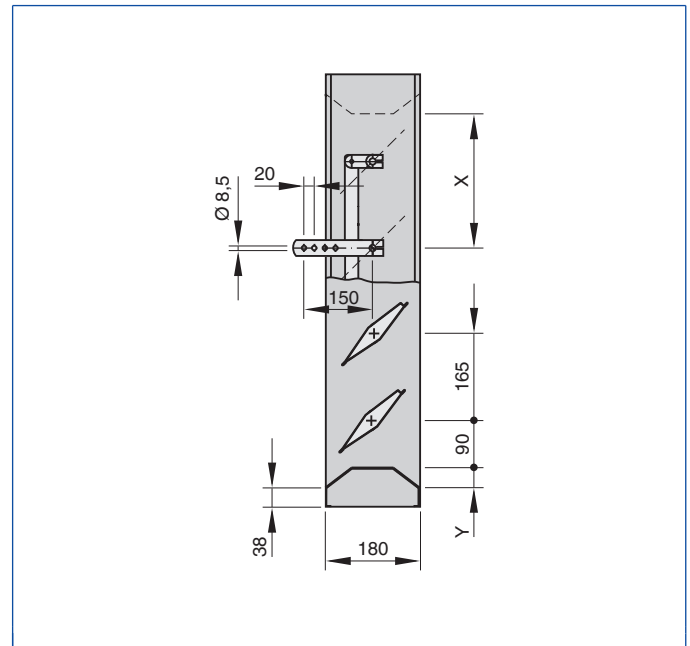
JZ-S, intermediate sizes



JZ-P, intermediate sizes



JZ-P, intermediate sizes



Dimensions [mm] and weight [kg]

H	H	B										n	X
①	②	200	400	600	800	1000	1200	1400	1600	1800	2000	③	④
mm	mm	kg										-	mm
180	183 - 343	4	6	8	9	11	13	14	16	18	19	1	90
345	348 - 508	6	8	10	12	15	17	19	21	24	26	2	90
510	513 - 673	7	10	13	16	19	22	25	27	30	33	3	90
675	678 - 838	10	13	16	20	23	27	30	33	37	40	4	255
840	843 - 1003	11	15	19	23	28	32	37	41	46	50	5	420
1005	1008 - 1168	11	17	22	27	32	38	43	48	53	59	6	420
1170	1173 - 1333	13	19	25	31	37	43	49	55	61	67	7	585
1335	1338 - 1498	15	22	28	35	41	48	55	61	68	74	8	585
1500	1503 - 1663	16	23	30	37	44	51	59	66	73	80	9	750
1665	1668 - 1828	17	25	33	41	49	57	65	72	80	88	10	750
1830	1833 - 1993	18	27	35	44	52	61	69	78	86	95	11	915
1995	1998	19	29	38	47	56	66	75	84	94	103	12	915

① Standard sizes ② Intermediate sizes ③ No. of blades ④ Position of drive arm

Open/Close actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z12	SM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	20 Nm	-
Z13	GM230A	-1-wire-control -2-wire-control (Open/Close)	100 - 240 V AC	40 Nm	-
Z14	SM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	20 Nm	-
Z15	GM24A	-1-wire-control -2-wire-control (Open/Close)	24 V AC/DC	40 Nm	-
Z16	SM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	20 Nm	S2A
Z17	GM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	40 Nm	S2A
Z18	SM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	20 Nm	S2A
Z19	GM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	40 Nm	S2A



Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z43	NM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	10 Nm	-
Z45	NM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	10 Nm	-
Z47	NM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	10 Nm	S2A
Z49	NM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	10 Nm	S2A

Open/Close actuators, fast-running

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZS21	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	-
ZS22	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	S2A

Open/Close actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF01	NF24A	Supply voltage on/off	24 V AC/DC	10 Nm	-
ZF02	NFA	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	-
ZF03	NF24A-S2	Supply voltage on/off	24 V AC/DC	10 Nm	integrated
ZF04	NFA-S2	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	integrated
ZF06	SF24A	Supply voltage on/off	24 V AC/DC	20 Nm	-
ZF07	SFA	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	20 Nm	-
ZF08	SF24A-S2	Supply voltage on/off	24 V AC/DC	20 Nm	integrated
ZF09	SFA-S2	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	20 Nm	integrated
ZF11	EF24A	Supply voltage on/off	24 V AC/DC	30 Nm	-
ZF12	EF230A	Supply voltage on/off	100 - 240 V AC	30 Nm	-
ZF13	EF24A-S2	Supply voltage on/off	24 V AC/DC	30 Nm	integrated
ZF14	EF230A-S2	Supply voltage on/off	100 - 240 V AC	30 Nm	integrated

Modulating actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z20	SM24A-SR	2 - 10 V DC	24 V AC/DC	20 Nm	-
Z21	GM24A-SR	2 - 10 V DC	24 V AC/DC	40 Nm	-
Z51	NM24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-

Modulating actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF05	NF24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-
ZF10	SF24A-SR	2 - 10 V DC	24 V AC/DC	20 Nm	-
ZF15	EF24A-SR	2 - 10 V DC	24 V AC/DC	30 Nm	-

Double acting pneumatic actuators, including explosion-proof actuators

Order code detail	Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
①	②						
Z60	Z60EX	DR030	-	1.2 - 6 bar	35 Nm	-	-
Z61	Z61EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	24 V DC
Z62	Z62EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	230 V AC
Z63	Z63EX	DR030	-	1.2 - 6 bar	35 Nm	2	-



Order code detail ①	Order code detail ②	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
Z64	Z64EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	24 V DC
Z65	Z65EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	230 V AC
Z66	Z66EX	DR060	-	1.2 - 6 bar	70 Nm	-	-
Z67	Z67EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	24 V DC
Z68	Z68EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	230 V AC
Z69	Z69EX	DR060	-	1.2 - 6 bar	70 Nm	2	-
Z70	Z70EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	24 V DC
Z71	Z71EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	230 V AC

① Standard ② Explosion-proof (only with brass or stainless steel bearings)
Z60 - Z65, Z60EX - Z65EX: At 1.2 bar operating pressure only up to height H < 1665 mm

Single acting pneumatic actuators, including explosion-proof actuators

Order code detail ①	Order code detail ②	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
Z72	Z72EX	SC06 0 SO06 0	Pressure off to close/open	6 bar	30 Nm	-	-
Z73	Z73EX	SC06 0 SO06 0	Power off and pressure off to close/open	6 bar	30 Nm	-	24 V DC
Z74	Z74EX	SC06 0 SO06 0	Power off and pressure off to close/open	6 bar	30 Nm	-	230 V AC
Z75	Z75EX	SC06 0 SO06 0	Pressure off to close/open	6 bar	30 Nm	2	-
Z76	Z76EX	SC06 0 SO06 0	Power off and pressure off to close/open	6 bar	30 Nm	2	24 V DC
Z77	Z77EX	SC06 0 SO06 0	Power off and pressure off to close/open	6 bar	30 Nm	2	230 V AC

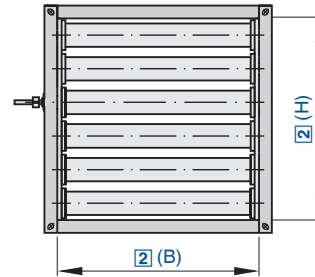
① Standard ② Explosion-proof (only with brass or stainless steel bearings)

Explosion-proof Open/Close actuators, spring return actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z1EX	ExMax15-SF	2-wire-control (3-point)	24 - 240 V AC/DC	15 Nm	integrated
Z3EX	ExMax30-SF	2-wire-control (3-point)	24 - 240 V AC/DC	30 Nm	integrated

Only with brass or stainless steel bearings





Multileaf dampers made of aluminium for shutting off the airflow in air conditioning systems

Order code

JZ - AL / 1100x950 / ER / Z64 / NC / P1 - RAL ...

1 2 3 4 5 6

1 Type

JZ-AL Aluminium multileaf damper

2 Nominal size [mm]

B x H

3 Installation subframe

ER No entry: none
With

4 Attachments

No entry: none
Z04 - Z07 Quadrant stay
Z12 - Z51 Actuators
ZF01 - ZF15 Spring return actuators
Z60 - Z77 Pneumatic actuators

5 Damper blade safety function

Only for spring return actuators or pneumatic actuators
NO Pressure off/power off to OPEN
NC Pressure off/power off to CLOSE

6 Surface

No entry: standard construction
P1 Powder-coated, specify RAL CLASSIC colour
PS Powder-coated, specify DB colour
S3 Anodised to EURAS standard, E6-C-0

Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

+ Features

Rectangular multileaf dampers for volume flow and pressure control as well as for shutting off ducts and openings in walls and ceiling slabs

- ▶ Maximum dimensions 1200 x 1000 mm
- ▶ Casing air leakage to EN 1751, class C
- ▶ Aerofoil opposed action blades
- ▶ Blades interconnected by gears

Optional equipment and accessories

- ▶ Actuators: Open/Close actuators, modulating actuators
- ▶ Powder-coated construction
- ▶ Anodised construction

X Application

- ▶ Multileaf dampers of Type JZ-AL are used

as an acting element in the volume flow and pressure control in air conditioning systems

- ▶ For shutting off ducts and openings in walls and ceiling slabs
- ▶ Opposed action blades are due to their characteristics preferably used for variable operation
- ▶ Powder-coated construction with increased corrosion resistance

⬡ Attachments

- ▶ Quadrant stays and limit switches: Quadrant stays to adjust the damper blades (stepless adjustment) and for capturing the end positions
- ▶ Open/Close actuators: Actuators for opening and closing multileaf dampers
- ▶ Modulating actuators: Actuators for stepless

blade adjustment

- ▶ Pneumatic actuators: Pneumatic actuators for opening and closing multileaf dampers

& Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of multileaf dampers

★ Special characteristics

- ▶ Aerofoil blades
- ▶ Low-maintenance, robust construction
- ▶ No parts with silicone

ISO Standards and guidelines

- ▶ Casing air leakage to EN 1751, class C

📈 Technical data

Nominal sizes	200 x 100 mm - 1200 x 1000 mm
Maximum static differential pressure for a closed multileaf damper	2000 Pa
Operating temperature	0 - 90 °C

Aluminium multileaf dampers, free area

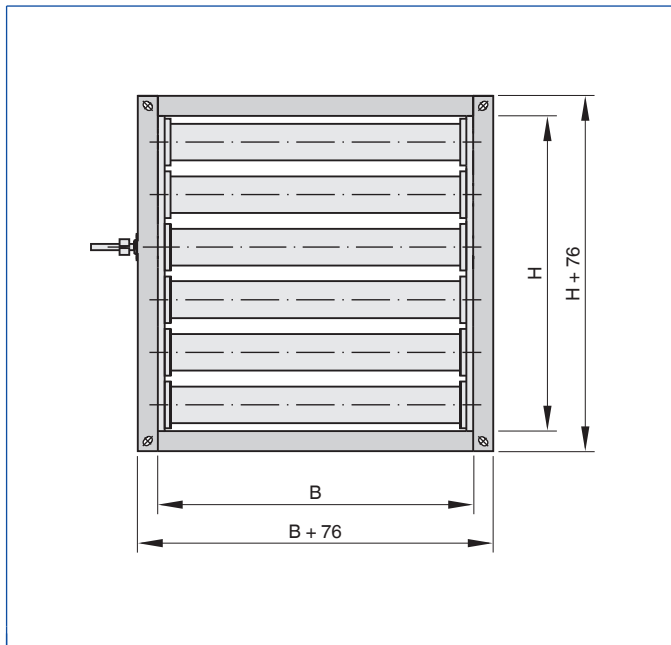
H	B [mm]										
	200	300	400	500	600	700	800	900	1000	1100	1200
mm	m ²										
100, 150	0.014	0.022	0.030	0.038	0.047	0.055	0.063	0.071	0.079	0.087	0.095
200, 250	0.028	0.045	0.061	0.077	0.093	0.109	0.126	0.142	0.158	0.174	0.190



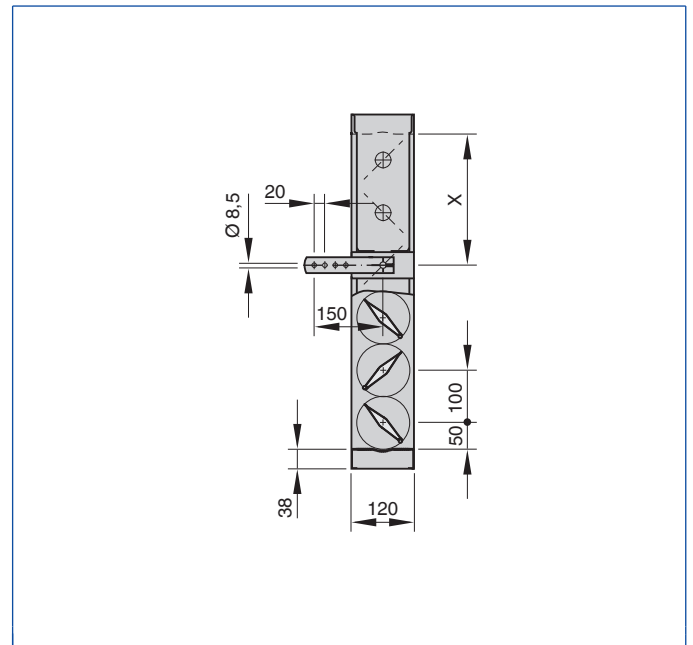
H	B [mm]										
	200	300	400	500	600	700	800	900	1000	1100	1200
mm	m ²										
300, 350	0.043	0.067	0.091	0.115	0.140	0.164	0.188	0.213	0.237	0.261	0.286
400, 450	0.057	0.089	0.122	0.154	0.186	0.219	0.251	0.284	0.316	0.348	0.381
500, 550	0.071	0.111	0.152	0.192	0.233	0.273	0.314	0.354	0.395	0.435	0.476
600, 650	0.085	0.134	0.182	0.231	0.279	0.328	0.377	0.425	0.474	0.522	0.571
700, 750	0.099	0.156	0.213	0.269	0.326	0.383	0.439	0.496	0.553	0.610	0.666
800, 850	0.113	0.178	0.243	0.308	0.373	0.437	0.502	0.567	0.632	0.697	0.761
900, 950	0.128	0.200	0.273	0.346	0.419	0.492	0.565	0.638	0.711	0.784	0.857
1000	0.142	0.223	0.304	0.385	0.466	0.547	0.628	0.709	0.790	0.871	0.952

Intermediate sizes: Intermediate widths can be interpolated

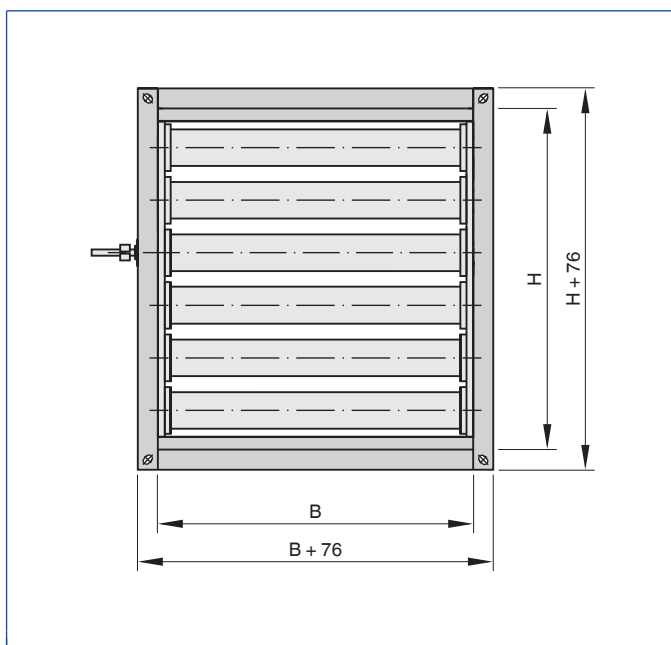
JZ-AL, standard sizes



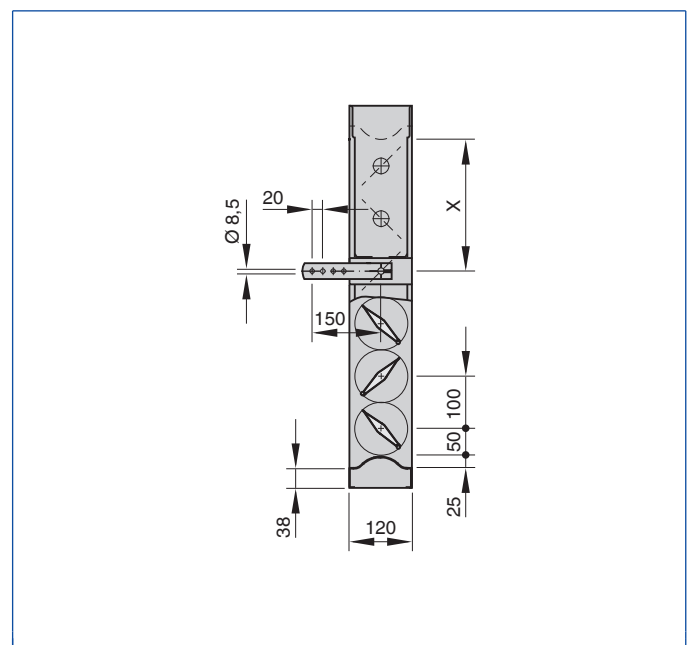
JZ-AL, standard sizes



JZ-AL, intermediate sizes



JZ-AL, intermediate sizes



Dimensions [mm] and weight [kg]

①	②	B											③	④
		200	300	400	500	600	700	800	900	1000	1100	1200		
mm	mm	kg											-	mm
100	150	2	2	2	3	3	3	4	4	4	5	5	1	50
200	250	2	2	3	3	3	4	4	5	5	5	6	2	50
300	350	3	3	4	4	5	5	5	6	6	7	7	3	50
400	450	4	4	5	5	6	6	7	7	8	8	9	4	250
500	550	4	4	5	5	6	7	7	8	9	9	10	5	250
600	650	5	5	6	7	7	8	9	9	10	11	11	6	250
700	750	6	6	7	8	8	9	10	11	11	12	13	7	250
800	850	6	7	8	9	9	10	11	12	13	13	14	8	250
900	950	7	7	8	9	10	11	12	13	14	15	16	9	250
1000	-	7	7	9	10	11	12	13	14	15	16	17	10	250

① Standard sizes ② Intermediate sizes ③ No. of blades ④ Position of drive arm

Open/Close actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z12	SM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	20 Nm	-
Z14	SM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	20 Nm	-
Z16	SM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	20 Nm	S2A
Z18	SM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	20 Nm	S2A
Z42	LM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	5 Nm	-
Z43	NM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	10 Nm	-
Z44	LM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	5 Nm	-
Z45	NM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	10 Nm	-
Z46	LM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	5 Nm	S2A
Z47	NM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	10 Nm	S2A
Z48	LM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	5 Nm	S2A
Z49	NM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	10 Nm	S2A

Minimum torque of multileaf damper has to be considered when selecting the actuator.

Open/Close actuators, fast-running

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZS21	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	-
ZS22	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	S2A

Open/Close actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF01	NF24A	Supply voltage on/off	24 V AC/DC	10 Nm	-
ZF02	NFA	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	-
ZF03	NF24A-S2	Supply voltage on/off	24 V AC/DC	10 Nm	integrated
ZF04	NFA-S2	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	integrated



Modulating actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z20	SM24A-SR	2 - 10 V DC	24 V AC/DC	20 Nm	-
Z50	LM24A-SR-F	2 - 10 V DC	24 V AC/DC	5 Nm	-
Z51	NM24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-

Minimum torque of multileaf damper has to be considered when selecting the actuator.

Modulating actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF05	NF24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-

Double acting pneumatic actuators

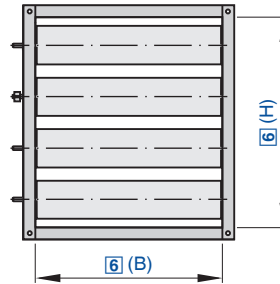
Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
Z60	DR030	-	1.2 - 6 bar	35 Nm	-	-
Z61	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	24 V DC
Z62	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	230 V AC
Z63	DR030	-	1.2 - 6 bar	35 Nm	2	-
Z64	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	24 V DC
Z65	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	230 V AC
Z66	DR060	-	1.2 - 6 bar	70 Nm	-	-
Z67	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	24 V DC
Z68	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	230 V AC
Z69	DR060	-	1.2 - 6 bar	70 Nm	2	-
Z70	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	24 V DC
Z71	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	230 V AC

Z60 - Z65: At 1.2 bar operating pressure only up to height H ≤ 650 mm

Single acting pneumatic actuators

Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
Z72	SC060 SO060	Pressure off to close/open	6 bar	30 Nm	-	-
Z73	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm	-	24 V DC
Z74	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm	-	230 V AC
Z75	SC060 SO060	Pressure off to close/open	6 bar	30 Nm	2	-
Z76	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm	2	24 V DC
Z77	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm	2	230 V AC





For low-leakage shut-off in air conditioning systems

Order code

JZ - HL - G - E - V - L / 1000x1005 / ER / Z64 / NC / P1 - RAL ...

1 2 3 4 5 6 7 8 9 10

1 Type

JZ-HL Low-leakage multileaf damper, closed blade air leakage to EN 1751, class 1 - 2

2 Duct connection

G No entry: corner holes on both sides
Flange holes on both sides (no corner holes)

3 Bearings

No entry: plastic bearings
M Brass bearings
E Stainless steel bearings

4 Construction of blades

Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings
V reinforced blades

5 Operating side

No entry: on the right
L Left side

6 Nominal size [mm]

B × H
B > 2000 = width subdivided
H > 1998 = height subdivided

7 Installation subframe

No entry: none
ER With (only for construction G)

8 Attachments

No entry: none
Z04 - Z07 Quadrant stay
Z12 - Z51 Actuators
ZF01 - ZF15 Spring return actuators
Z60 - Z77 Pneumatic actuators
Explosion-proof actuators
Z1EX, Z3EX Electric
Z60EX - Z77EX Pneumatic

9 Damper blade safety function

Only for spring return actuators or pneumatic actuators
NO Pressure off/power off to OPEN
NC Pressure off/power off to CLOSE

10 Surface

No entry: standard construction
P1 Powder-coated, specify RAL CLASSIC colour
PS Powder-coated, specify DB colour

Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

+ Features

Rectangular multileaf dampers for volume flow and pressure control as well as for low-leakage shut-off of ducts and openings in walls and ceiling slabs

- ▶ Maximum dimensions 2000 × 1995 mm
- ▶ Closed blade air leakage to EN 1751, classes 1 - 2, depending on size
- ▶ Casing air leakage to EN 1751, class C
- ▶ Aerofoil opposed action blades
- ▶ Blades interconnected by external linkage
- ▶ Available in standard sizes and many intermediate sizes

Optional equipment and accessories

- ▶ Actuators: Open/Close actuators, modulating actuators
- ▶ Explosion-proof construction with pneumatic actuator or spring return actuator
- ▶ Powder-coated construction

Y Application

- ▶ Multileaf dampers of Type JZ-HL are used as an acting element in the volume flow and pressure control in air conditioning systems

- ▶ For low-leakage shut-off of ducts and openings in walls and ceiling slabs
- ▶ Powder-coated construction with increased corrosion resistance if required
- ▶ Steel and stainless steel variants with brass or stainless steel bearings are suitable for use in potentially explosive atmospheres (ATEX)

EN Classification

Closed blade air leakage to EN 1751
Test pressure up to 2000 Pa
▶ Up to B = 599 mm, class 1
▶ From B = 600 mm, class 2

+ Construction

Duct connection
▶ Corner holes on both sides
▶ G: Flange holes on both sides

Bearings

- ▶ Plastic bearings, operating temperature 0 - 100 °C
- ▶ M: Brass bearings, operating temperature 0 - 100 °C

- ▶ E: Stainless steel bearings, operating temperature 0 - 100 °C

Blades

Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings (JZ-...-M, JZ-...-E)
▶ V: reinforced blades

Y Attachments

- ▶ Quadrant stays and limit switches: Quadrant stays to adjust the damper blades (stepless adjustment) and for capturing the end positions
- ▶ Open/Close actuators: Actuators for opening and closing multileaf dampers
- ▶ Modulating actuators: Actuators for stepless blade adjustment
- ▶ Pneumatic actuators: Pneumatic actuators for opening and closing multileaf dampers
- ▶ Explosion-proof actuators: Actuators for opening and closing multileaf dampers installed in potentially explosive atmospheres



& Accessories

- Installation subframe: Installation subframe for the fast and simple installation of multileaf dampers

★ Special characteristics

- Aerofoil blades
- Low-maintenance, robust construction
- No parts with silicone
- Available in standard sizes and many intermediate sizes

ISO Standards and guidelines

- Casing air leakage to EN 1751, class C
- Meets the general requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage (from B = 600 mm)



Technical data

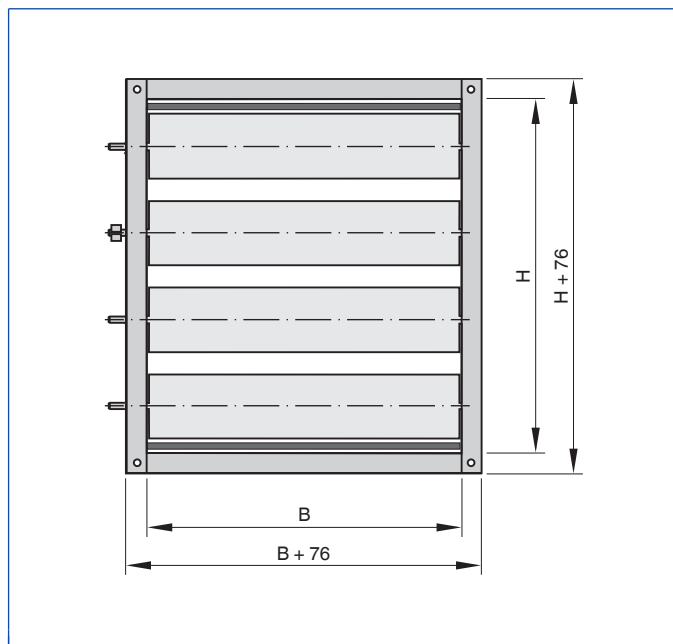
Nominal sizes	200 × 180 mm - 2000 × 1995 mm
Operating temperature	0 - 100 °C

Steel and stainless steel multileaf dampers, free area

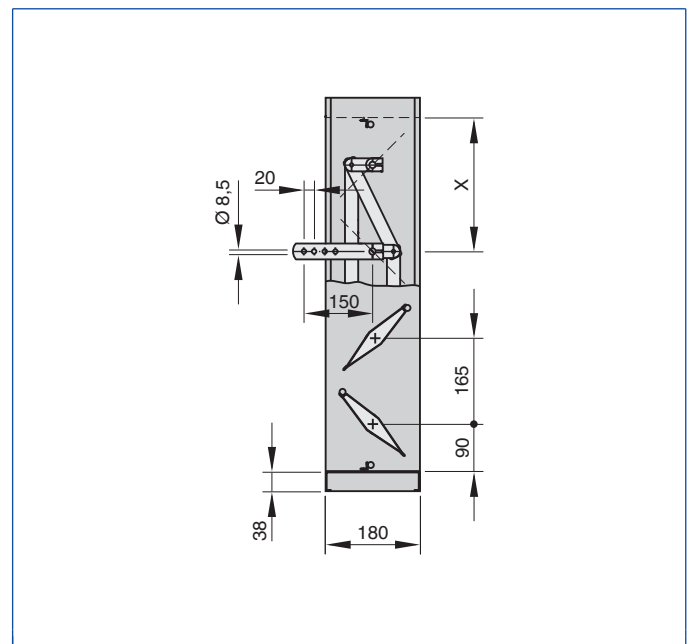
H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	1800	2000
mm	m ²									
180 - 344	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	0.30
345 - 509	0.06	0.11	0.17	0.23	0.28	0.34	0.40	0.45	0.51	0.57
510 - 674	0.08	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.83
675 - 839	0.11	0.22	0.33	0.44	0.55	0.66	0.77	0.88	0.99	1.10
840 - 1004	0.14	0.27	0.41	0.55	0.69	0.82	0.96	1.10	1.23	1.37
1005 - 1169	0.16	0.33	0.49	0.66	0.82	0.98	1.15	1.31	1.47	1.64
1170 - 1334	0.19	0.38	0.57	0.76	0.95	1.14	1.33	1.52	1.72	1.91
1335 - 1499	0.22	0.43	0.65	0.87	1.09	1.30	1.52	1.74	1.96	2.17
1500 - 1664	0.24	0.49	0.73	0.98	1.22	1.47	1.71	1.95	2.20	2.44
1665 - 1829	0.27	0.54	0.81	1.08	1.36	1.63	1.90	2.17	2.44	2.71
1830 - 1994	0.30	0.60	0.89	1.19	1.49	1.79	2.08	2.38	2.68	2.98
1995	0.32	0.65	0.97	1.30	1.62	1.95	2.27	2.60	2.92	3.25

Intermediate sizes: Intermediate widths can be interpolated

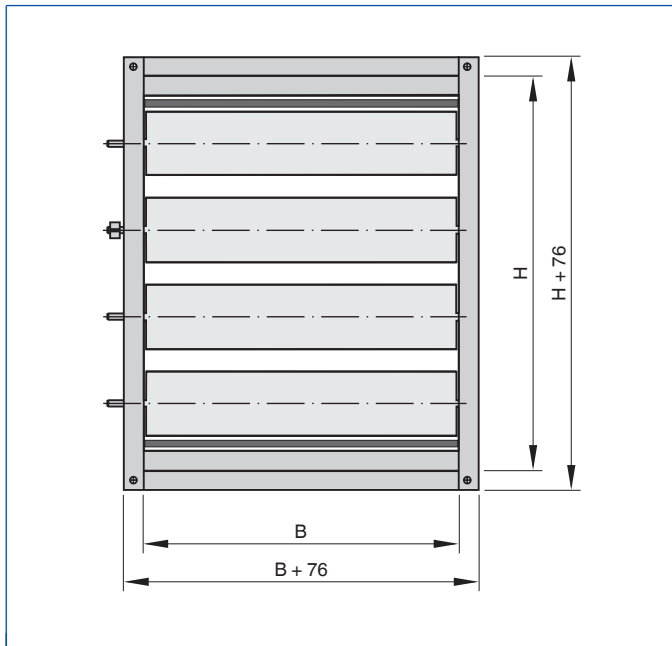
JZ-HL standard sizes



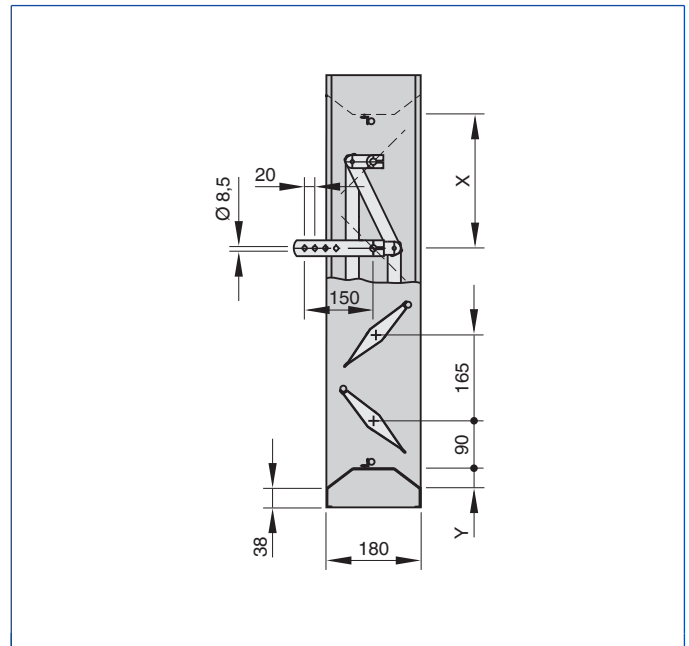
JZ-HL standard sizes



JZ-HL, intermediate sizes



JZ-HL, intermediate sizes



Dimensions [mm] and weight [kg]

H ①	H ②	B										n ③	X ④
		200	400	600	800	1000	1200	1400	1600	1800	2000		
mm	mm	kg										-	mm
180	183 - 343	4	6	8	9	11	13	14	16	18	19	1	90
345	348 - 508	6	8	10	12	15	17	19	21	24	26	2	90
510	513 - 673	7	10	13	16	19	22	25	27	30	33	3	90
675	678 - 838	10	13	16	20	23	27	30	33	37	40	4	255
840	843 - 1003	11	15	19	23	28	32	37	41	46	50	5	420
1005	1008 - 1168	11	17	22	27	32	38	43	48	53	59	6	420
1170	1173 - 1333	13	19	25	31	37	43	49	55	61	67	7	585
1335	1338 - 1498	15	22	28	35	41	48	55	61	68	74	8	585
1500	1503 - 1663	16	23	30	37	44	51	59	66	73	80	9	750
1665	1668 - 1828	17	25	33	41	49	57	65	72	80	88	10	750
1830	1833 - 1993	18	27	35	44	52	61	69	78	86	95	11	915
1995	1998	19	29	38	47	56	66	75	84	94	103	12	915

① Standard sizes ② Intermediate sizes ③ No. of blades ④ Position of drive arm

Open/Close actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z12	SM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	20 Nm	-
Z13	GM230A	-1-wire-control -2-wire-control (Open/Close)	100 - 240 V AC	40 Nm	-
Z14	SM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	20 Nm	-
Z15	GM24A	-1-wire-control -2-wire-control (Open/Close)	24 V AC/DC	40 Nm	-
Z16	SM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	20 Nm	S2A
Z17	GM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	40 Nm	S2A
Z18	SM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	20 Nm	S2A
Z19	GM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	40 Nm	S2A





Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z43	NM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	10 Nm	-
Z45	NM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	10 Nm	-
Z47	NM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	10 Nm	S2A
Z49	NM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	10 Nm	S2A

Open/Close actuators, fast-running

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZS21	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	-
ZS22	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	S2A

Open/Close actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF01	NF24A	Supply voltage on/off	24 V AC/DC	10 Nm	-
ZF02	NFA	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	-
ZF03	NF24A-S2	Supply voltage on/off	24 V AC/DC	10 Nm	integrated
ZF04	NFA-S2	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	integrated
ZF06	SF24A	Supply voltage on/off	24 V AC/DC	20 Nm	-
ZF07	SFA	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	20 Nm	-
ZF08	SF24A-S2	Supply voltage on/off	24 V AC/DC	20 Nm	integrated
ZF09	SFA-S2	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	20 Nm	integrated
ZF11	EF24A	Supply voltage on/off	24 V AC/DC	30 Nm	-
ZF12	EF230A	Supply voltage on/off	100 - 240 V AC	30 Nm	-
ZF13	EF24A-S2	Supply voltage on/off	24 V AC/DC	30 Nm	integrated
ZF14	EF230A-S2	Supply voltage on/off	100 - 240 V AC	30 Nm	integrated

Modulating actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z20	SM24A-SR	2 - 10 V DC	24 V AC/DC	20 Nm	-
Z21	GM24A-SR	2 - 10 V DC	24 V AC/DC	40 Nm	-
Z51	NM24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-

Modulating actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF05	NF24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-
ZF10	SF24A-SR	2 - 10 V DC	24 V AC/DC	20 Nm	-
ZF15	EF24A-SR	2 - 10 V DC	24 V AC/DC	30 Nm	-

Double acting pneumatic actuators, including explosion-proof actuators

Order code detail	Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
①	②						
Z60	Z60EX	DR030	-	1.2 - 6 bar	35 Nm	-	-
Z61	Z61EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	24 V DC
Z62	Z62EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	230 V AC
Z63	Z63EX	DR030	-	1.2 - 6 bar	35 Nm	2	-



Order code detail	Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
①	②						
Z64	Z64EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	24 V DC
Z65	Z65EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	230 V AC
Z66	Z66EX	DR060	-	1.2 - 6 bar	70 Nm	-	
Z67	Z67EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	24 V DC
Z68	Z68EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	230 V AC
Z69	Z69EX	DR060	-	1.2 - 6 bar	70 Nm	2	
Z70	Z70EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	24 V DC
Z71	Z71EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	230 V AC

① Standard ② Explosion-proof (only with brass or stainless steel bearings)
Z60 - Z65, Z60EX - Z65EX: At 1.2 bar operating pressure only up to height H < 1665 mm

Single acting pneumatic actuators, including explosion-proof actuators

Order code detail	Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
①	②						
Z72	Z72EX	SC060 SO060	Pressure off to close/open	6 bar	30 Nm		
Z73	Z73EX	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm		24 V DC
Z74	Z74EX	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm		230 V AC
Z75	Z75EX	SC060 SO060	Pressure off to close/open	6 bar	30 Nm	2	
Z76	Z76EX	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm	2	24 V DC
Z77	Z77EX	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm	2	230 V AC

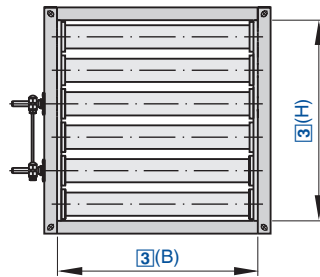
① Standard ② Explosion-proof (only with brass or stainless steel bearings)

Explosion-proof Open/Close actuators, spring return actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z1EX	ExMax15-SF	2-wire-control (3-point)	24 - 240 V AC/DC	15 Nm	integrated
Z3EX	ExMax30-SF	2-wire-control (3-point)	24 - 240 V AC/DC	30 Nm	integrated

Only with brass or stainless steel bearings





Multileaf dampers made of aluminium for low-leakage shut-off in air conditioning systems

Order code

JZ - HL - AL / 1200x800 / ER / Z64 / NO / P1 - RAL ...

<p>1 Type JZ-HL-AL Low-leakage multileaf damper made of aluminium, closed blade air leakage to EN 1751, class 2</p> <p>2 Nominal size [mm] B x H</p> <p>3 Installation subframe No entry: none ER With installation subframe</p>	<p>4 Attachments Z04 Quadrant stay Z05 - Z07 Quadrant stay and limit switches Z12 - Z51 Actuators ZF01 - ZF15 Spring return actuators Z60 - Z77 Pneumatic actuators</p> <p>5 Damper blade safety function Only for spring return actuators or pneumatic actuators NO Pressure off/power off to OPEN NC Pressure off/power off to CLOSE</p>	<p>6 Surface P1 No entry: standard construction Powder-coated, specify RAL CLASSIC colour PS Powder-coated, specify DB colour S3 Anodised to EURAS standard, E6-C-0</p> <p>Gloss level RAL 9010 50 % RAL 9006 30 % All other RAL colours 70 %</p>
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+ Features

Rectangular multileaf dampers for volume flow and pressure control as well as for low-leakage shut-off of ducts and openings in walls and ceiling slabs

- ▶ Maximum dimensions 1200 x 1000 mm
- ▶ Closed blade air leakage to EN 1751, class 2
- ▶ Casing air leakage to EN 1751, class C
- ▶ Aerofoil opposed action blades
- ▶ Blades interconnected by gears
- ▶ Available in standard sizes and many intermediate sizes

Optional equipment and accessories

- ▶ Actuators: Open/Close actuators, modulating actuators
- ▶ Powder-coated construction
- ▶ Anodised construction

X Application

- ▶ Multileaf dampers of Type JZ-HL-AL are used as an acting element in the volume flow and pressure control in air conditioning systems
- ▶ For low-leakage shut-off of ducts and openings in walls and ceiling slabs
- ▶ Powder-coated construction with increased corrosion resistance if required

EN Classification

Closed blade air leakage to EN 1751
Test pressure up to 2000 Pa
▶ Class 2

Attachment

- ▶ Quadrant stays and limit switches: Quadrant stays to adjust the damper blades (stepless adjustment) and for capturing the end positions
- ▶ Open/Close actuators: Actuators for opening and closing multileaf dampers
- ▶ Modulating actuators: Actuators for stepless

- blade adjustment
- ▶ Pneumatic actuators: Pneumatic actuators for opening and closing multileaf dampers

& Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of multileaf dampers

★ Special characteristics

- ▶ Aerofoil blades
- ▶ Low-maintenance, robust construction
- ▶ No parts with silicone
- ▶ Available in standard sizes and many intermediate sizes
- ▶ Closed cell side seals meet increased hygiene requirements

ISO Standards and guidelines

- ▶ Casing air leakage to EN 1751, class C
- ▶ Meets the general requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage

Technical data

Nominal sizes	200 x 100 mm - 1200 x 1000 mm
Maximum static differential pressure for a closed multileaf damper	2000 Pa
Operating temperature	0 - 90 °C

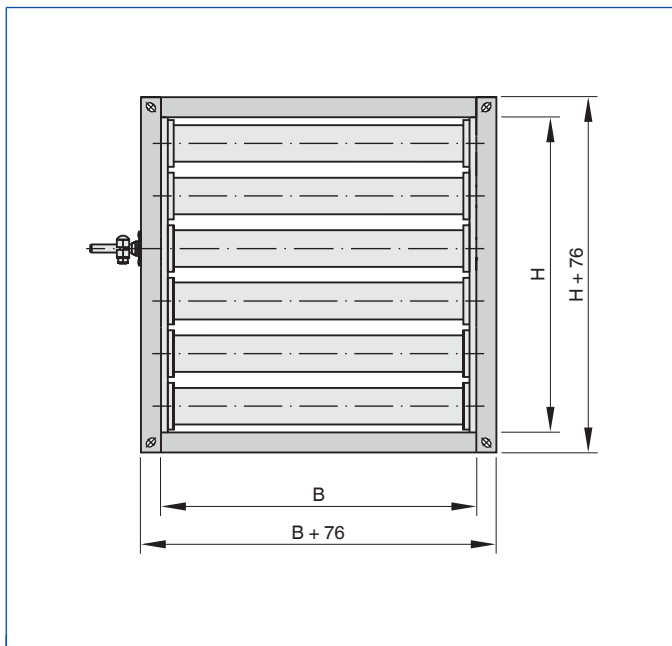


Aluminium multileaf dampers, free area

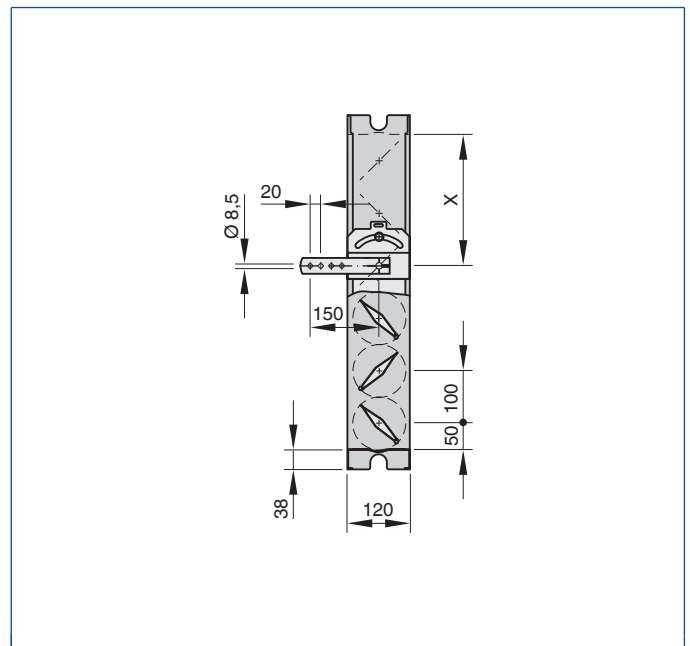
H	B [mm]										
	200	300	400	500	600	700	800	900	1000	1100	1200
mm	m ²										
100, 150	0.014	0.022	0.030	0.038	0.047	0.055	0.063	0.071	0.079	0.087	0.095
200, 250	0.028	0.045	0.061	0.077	0.093	0.109	0.126	0.142	0.158	0.174	0.190
300, 350	0.043	0.067	0.091	0.115	0.140	0.164	0.188	0.213	0.237	0.261	0.286
400, 450	0.057	0.089	0.122	0.154	0.186	0.219	0.251	0.284	0.316	0.348	0.381
500, 550	0.071	0.111	0.152	0.192	0.233	0.273	0.314	0.354	0.395	0.435	0.476
600, 650	0.085	0.134	0.182	0.231	0.279	0.328	0.377	0.425	0.474	0.522	0.571
700, 750	0.099	0.156	0.213	0.269	0.326	0.383	0.439	0.496	0.553	0.610	0.666
800, 850	0.113	0.178	0.243	0.308	0.373	0.437	0.502	0.567	0.632	0.697	0.761
900, 950	0.128	0.200	0.273	0.346	0.419	0.492	0.565	0.638	0.711	0.784	0.857
1000	0.142	0.223	0.304	0.385	0.466	0.547	0.628	0.709	0.790	0.871	0.952

Intermediate sizes: Intermediate widths can be interpolated

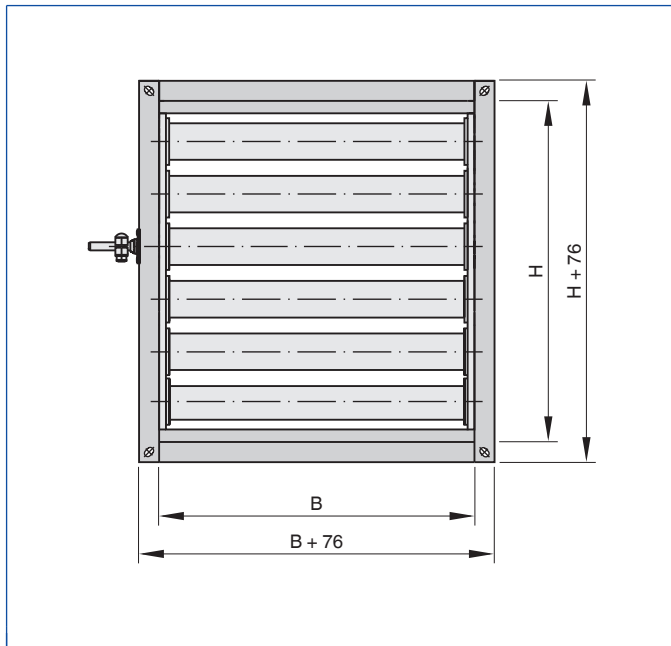
JZ-HL-AL, standard sizes



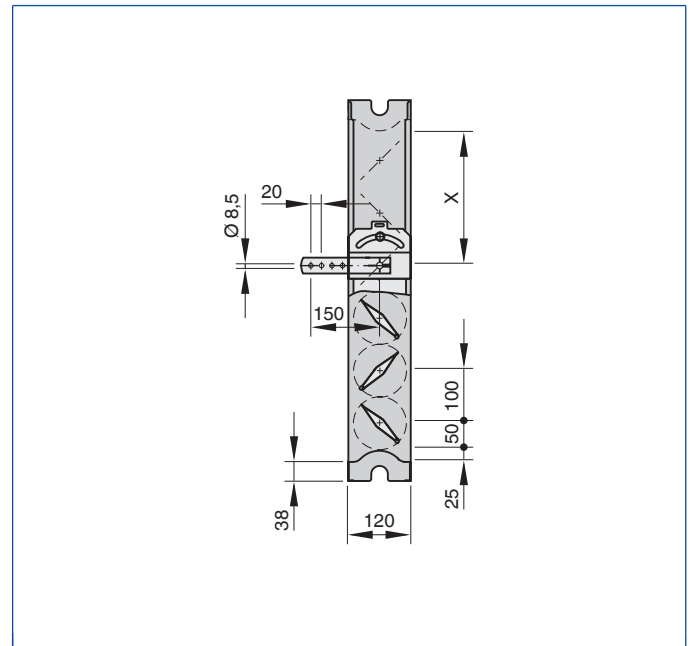
JZ-HL-AL, standard sizes



JZ-HL-AL, intermediate sizes



JZ-HL-AL, intermediate sizes



Dimensions [mm] and weight [kg]

H ①	H ②	B											n ③	X ④
		200	300	400	500	600	700	800	900	1000	1100	1200		
mm	mm	kg											-	mm
100	150	2	2	2	3	3	3	4	4	4	5	5	1	50
200	250	2	2	3	3	3	4	4	5	5	5	6	2	50
300	350	3	3	4	4	5	5	5	6	6	7	7	3	50
400	450	4	4	5	5	6	6	7	7	8	8	9	4	250
500	550	4	4	5	5	6	7	7	8	9	9	10	5	250
600	650	5	5	6	7	7	8	9	9	10	11	11	6	250
700	750	6	6	7	8	8	9	10	11	11	12	13	7	250
800	850	6	7	8	9	9	10	11	12	13	13	14	8	250
900	950	7	7	8	9	10	11	12	13	14	15	16	9	250
1000	-	7	7	9	10	11	12	13	14	15	16	17	10	250

① Standard sizes ② Intermediate sizes ③ No. of blades ④ Position of drive arm

Open/Close actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z12	SM230A	-1-wire-control	100 - 240 V AC	20 Nm	-
		-2-wire-control (3-point)			
Z14	SM24A	-1-wire-control	24 V AC/DC	20 Nm	-
		-2-wire-control (3-point)			
Z16	SM230A	-1-wire-control	100 - 240 V AC	20 Nm	S2A
		-2-wire-control (3-point)			
Z18	SM24A	-1-wire-control	24 V AC/DC	20 Nm	S2A
		-2-wire-control (3-point)			
Z42	LM230A	-1-wire-control	100 - 240 V AC	5 Nm	-
		-2-wire-control (3-point)			
Z43	NM230A	-1-wire-control	100 - 240 V AC	10 Nm	-
		-2-wire-control (3-point)			
Z44	LM24A	-1-wire-control	24 V AC/DC	5 Nm	-
		-2-wire-control (3-point)			
Z45	NM24A	-1-wire-control	24 V AC/DC	10 Nm	-
		-2-wire-control (3-point)			
Z46	LM230A	-1-wire-control	100 - 240 V AC	5 Nm	S2A
		-2-wire-control (3-point)			



Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z47	NM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	10 Nm	S2A
Z48	LM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	5 Nm	S2A
Z49	NM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	10 Nm	S2A

Minimum torque of multileaf damper has to be considered when selecting the actuator.

Open/Close actuators, fast-running

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZS21	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	-
ZS22	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	S2A

Open/Close actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF01	NF24A	Supply voltage on/off	24 V AC/DC	10 Nm	-
ZF02	NFA	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	-
ZF03	NF24A-S2	Supply voltage on/off	24 V AC/DC	10 Nm	integrated
ZF04	NFA-S2	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	integrated

Modulating actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z20	SM24A-SR	2 - 10 V DC	24 V AC/DC	20 Nm	-
Z50	LM24A-SR-F	2 - 10 V DC	24 V AC/DC	5 Nm	-
Z51	NM24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-

Minimum torque of multileaf damper has to be considered when selecting the actuator.

Modulating actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF05	NF24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-

Double acting pneumatic actuators

Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
Z60	DR030	-	1.2 - 6 bar	35 Nm	-	-
Z61	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	24 V DC
Z62	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	230 V AC
Z63	DR030	-	1.2 - 6 bar	35 Nm	2	-
Z64	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	24 V DC
Z65	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	230 V AC
Z66	DR060	-	1.2 - 6 bar	70 Nm	-	-
Z67	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	24 V DC
Z68	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	230 V AC
Z69	DR060	-	1.2 - 6 bar	70 Nm	2	-
Z70	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	24 V DC
Z71	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	230 V AC

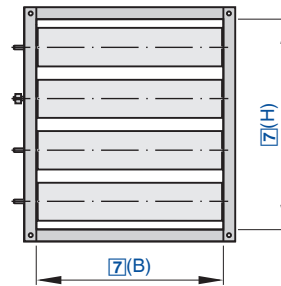
Z60 - Z65: At 1.2 bar operating pressure only up to height H ≤ 650 mm



Single acting pneumatic actuators

Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
Z72	SC060 SO060	Pressure off to close/open	6 bar	30 Nm		
Z73	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm		24 V DC
Z74	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm		230 V AC
Z75	SC060 SO060	Pressure off to close/open	6 bar	30 Nm	2	
Z76	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm	2	24 V DC
Z77	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm	2	230 V AC





For extremely low-leakage shut-off in air conditioning systems

Order code

JZ - LL - A2 - G - E - ... - L / 1000x1005 / ER / Z64 / NC / P1 - RAL ...

1 2 3 4 5 6 7 8 9 10 11

1 Type

JZ-LL Low-leakage multileaf damper, Closed blade air leakage to EN 1751, classes 3 - 4

2 Material

No entry: galvanised steel
A2 Stainless steel

3 Duct connection

No entry: corner holes on both sides
G Flange holes on both sides (no corner holes)

4 Bearings

No entry: plastic bearings
M Brass bearings
E Stainless steel bearings

5 Construction of blades

Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings
V reinforced blades

6 Operating side

No entry: on the right
L Left side

7 Nominal size [mm]

B x H
B > 2000 = width subdivided
H > 1998 = height subdivided

8 Installation subframe

No entry: none
ER With (only for construction G)

9 Attachments

No entry: none
Z04 - Z07 Quadrant stay
Z12 - Z51 Actuators
ZF01 - ZF15 Spring return actuators
Z60 - Z77 Pneumatic actuators

Explosion-proof actuators

Z1EX, Z3EX Electric
Z60EX - Z77EX Pneumatic

10 Damper blade safety function

Only for spring return actuators or pneumatic actuators
NO Pressure off/power off to OPEN
NC Pressure off/power off to CLOSE

11 Surface

No entry: standard construction
P1 Powder-coated, specify RAL CLASSIC colour
PS Powder-coated, specify DB colour
Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

+ Features

Rectangular multileaf dampers for volume flow and pressure control as well as for extremely low-leakage shut-off of ducts and openings in walls and ceiling slabs

- ▶ Maximum dimensions 2000 x 1995 mm
- ▶ Closed blade air leakage to EN 1751, classes 3 - 4, depending on size
- ▶ Casing air leakage to EN 1751, class C
- ▶ Aerofoil opposed action blades
- ▶ Closed cell side seals meet increased hygiene requirements
- ▶ Blades interconnected by external linkage
- ▶ Available in standard sizes and many intermediate sizes

Optional equipment and accessories

- ▶ Actuators: Open/Close actuators, modulating actuators
- ▶ Explosion-proof construction with pneumatic actuator or spring return actuator
- ▶ Powder-coated construction

Application

- ▶ Multileaf dampers of Type JZLL are used as an acting element in the volume flow and pressure control in air conditioning systems
- ▶ For extremely low-leakage shut-off of ducts and openings in walls and ceiling slabs
- ▶ Stainless steel and powder-coated constructions with increased corrosion resistance if required
- ▶ Steel and stainless steel variants with brass or stainless steel bearings are suitable for use in potentially explosive atmospheres (ATEX)

EN Classification

Closed blade air leakage to EN 1751
Test pressure up to 2000 Pa
▶ Up to B = 599 mm, class 3
▶ B = 600 - 1000 mm, class 4
Test pressure up to 1000 Pa
▶ Up to B = 599 mm, class 3
▶ B = 600 - 2000 mm, class 4

Variants

- ▶ JZ-LL: Multileaf damper with opposed blade action, made of galvanised sheet steel
- ▶ JZ-LL-A2: Multileaf damper with opposed blade action, made of stainless steel

+ Construction

Duct connection
▶ Corner holes on both sides
▶ G: Flange holes on both sides

Bearings

- ▶ Plastic bearings, operating temperature 0 - 100 °C
- ▶ M: Brass bearings, operating temperature 0 - 100 °C
- ▶ E: Stainless steel bearings, operating temperature 0 - 100 °C

Blades

Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings (JZ-...-M, JZ-...-E)
▶ V: reinforced blades



Attachments

- ▶ Quadrant stays and limit switches: Quadrant stays to adjust the damper blades (stepless adjustment) and for capturing the end positions
- ▶ Open/Close actuators: Actuators for opening and closing multileaf dampers
- ▶ Modulating actuators: Actuators for stepless blade adjustment
- ▶ Pneumatic actuators: Pneumatic actuators for opening and closing multileaf dampers
- ▶ Explosion-proof actuators: Actuators for opening and closing multileaf dampers

installed in potentially explosive atmospheres

& Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of multileaf dampers

★ Special characteristics

- ▶ Aerofoil blades
- ▶ Low-maintenance, robust construction
- ▶ No parts with silicone
- ▶ Available in standard sizes and many

intermediate sizes

- ▶ Closed cell side seals meet increased hygiene requirements

ISO Standards and guidelines

- ▶ Casing air leakage to EN 1751, class C
- ▶ Meets the general requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Multileaf damper sizes from B = 600 mm meet the increased requirements of DIN 1946, part 4, with regard to the maximum closed blade air leakage

Technical data

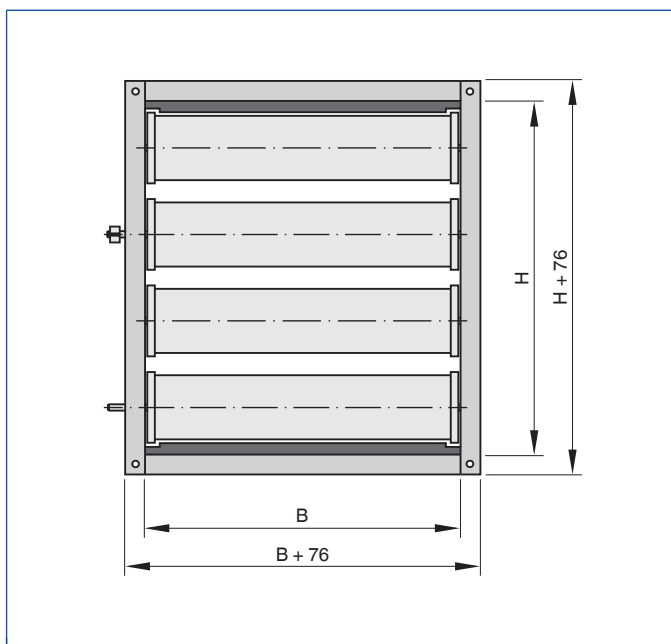
Nominal sizes	200 × 180 mm - 2000 × 1995 mm
Operating temperature	0 - 100 °C

Steel and stainless steel multileaf dampers, free area

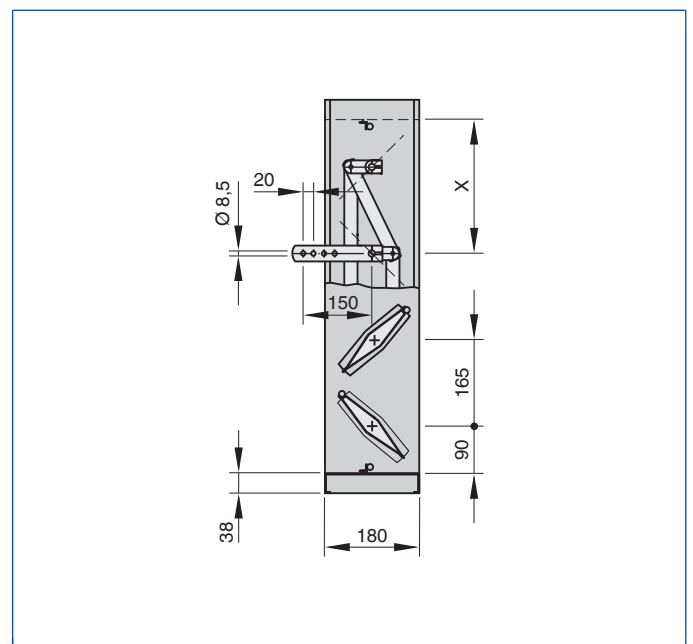
H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	1800	2000
mm	m ²									
180 - 344	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	0.30
345 - 509	0.06	0.11	0.17	0.23	0.28	0.34	0.40	0.45	0.51	0.57
510 - 674	0.08	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.83
675 - 839	0.11	0.22	0.33	0.44	0.55	0.66	0.77	0.88	0.99	1.10
840 - 1004	0.14	0.27	0.41	0.55	0.69	0.82	0.96	1.10	1.23	1.37
1005 - 1169	0.16	0.33	0.49	0.66	0.82	0.98	1.15	1.31	1.47	1.64
1170 - 1334	0.19	0.38	0.57	0.76	0.95	1.14	1.33	1.52	1.72	1.91
1335 - 1499	0.22	0.43	0.65	0.87	1.09	1.30	1.52	1.74	1.96	2.17
1500 - 1664	0.24	0.49	0.73	0.98	1.22	1.47	1.71	1.95	2.20	2.44
1665 - 1829	0.27	0.54	0.81	1.08	1.36	1.63	1.90	2.17	2.44	2.71
1830 - 1994	0.30	0.60	0.89	1.19	1.49	1.79	2.08	2.38	2.68	2.98
1995	0.32	0.65	0.97	1.30	1.62	1.95	2.27	2.60	2.92	3.25

Intermediate sizes: Intermediate widths can be interpolated

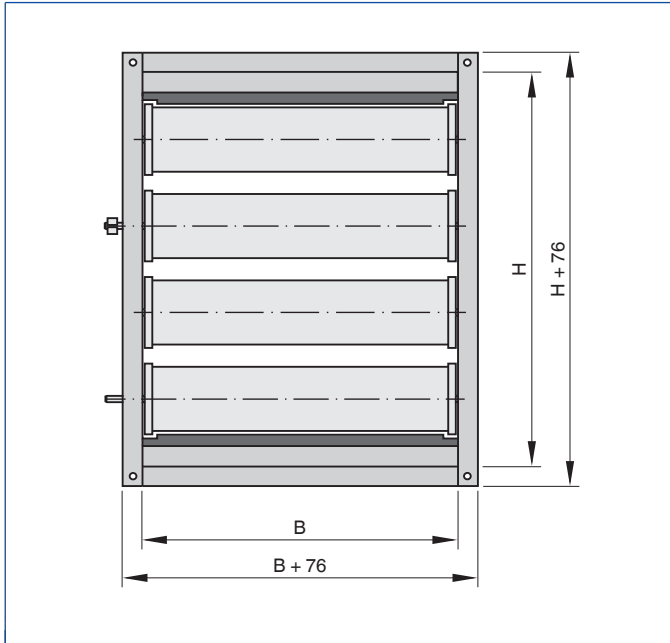
JZ-LL, standard sizes



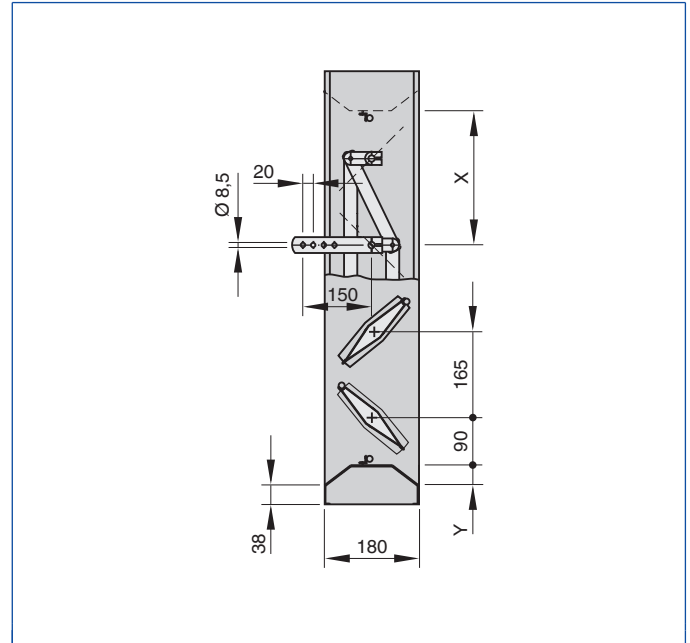
JZ-LL, standard sizes



JZ-LL, intermediate sizes



JZ-LL, intermediate sizes



Dimensions [mm] and weight [kg]

H ①	H ②	B										n ③	X ④
		200	400	600	800	1000	1200	1400	1600	1800	2000		
mm	mm	kg										-	mm
180	183 - 343	4	6	8	9	11	13	14	16	18	19	1	90
345	348 - 508	6	8	10	12	15	17	19	21	24	26	2	255
510	513 - 673	7	10	13	16	19	22	25	27	30	33	3	255
675	678 - 838	10	13	16	20	23	27	30	33	37	40	4	255
840	843 - 1003	11	15	19	23	28	32	37	41	46	50	5	255
1005	1008 - 1168	11	17	22	27	32	38	43	48	53	59	6	255
1170	1173 - 1333	13	19	25	31	37	43	49	55	61	67	7	255
1335	1338 - 1498	15	22	28	35	41	48	55	61	68	74	8	255
1500	1503 - 1663	16	23	30	37	44	51	59	66	73	80	9	255
1665	1668 - 1828	17	25	33	41	49	57	65	72	80	88	10	255
1830	1833 - 1993	18	27	35	44	52	61	69	78	86	95	11	255
1995	1998	19	29	38	47	56	66	75	84	94	103	12	255

① Standard sizes ② Intermediate sizes ③ No. of blades ④ Position of drive arm

Open/Close actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z12	SM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	20 Nm	-
Z13	GM230A	-1-wire-control -2-wire-control (Open/Close)	100 - 240 V AC	40 Nm	-
Z14	SM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	20 Nm	-
Z15	GM24A	-1-wire-control -2-wire-control (Open/Close)	24 V AC/DC	40 Nm	-
Z16	SM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	20 Nm	S2A
Z17	GM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	40 Nm	S2A
Z18	SM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	20 Nm	S2A
Z19	GM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	40 Nm	S2A





Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z43	NM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	10 Nm	-
Z45	NM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	10 Nm	-
Z47	NM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	10 Nm	S2A
Z49	NM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	10 Nm	S2A

Open/Close actuators, fast-running

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZS21	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	-
ZS22	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	S2A

Open/Close actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF01	NF24A	Supply voltage on/off	24 V AC/DC	10 Nm	-
ZF02	NFA	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	-
ZF03	NF24A-S2	Supply voltage on/off	24 V AC/DC	10 Nm	integrated
ZF04	NFA-S2	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	integrated
ZF06	SF24A	Supply voltage on/off	24 V AC/DC	20 Nm	-
ZF07	SFA	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	20 Nm	-
ZF08	SF24A-S2	Supply voltage on/off	24 V AC/DC	20 Nm	integrated
ZF09	SFA-S2	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	20 Nm	integrated
ZF11	EF24A	Supply voltage on/off	24 V AC/DC	30 Nm	-
ZF12	EF230A	Supply voltage on/off	100 - 240 V AC	30 Nm	-
ZF13	EF24A-S2	Supply voltage on/off	24 V AC/DC	30 Nm	integrated
ZF14	EF230A-S2	Supply voltage on/off	100 - 240 V AC	30 Nm	integrated

Modulating actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z20	SM24A-SR	2 - 10 V DC	24 V AC/DC	20 Nm	-
Z21	GM24A-SR	2 - 10 V DC	24 V AC/DC	40 Nm	-
Z51	NM24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-

Modulating actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF05	NF24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-
ZF10	SF24A-SR	2 - 10 V DC	24 V AC/DC	20 Nm	-
ZF15	EF24A-SR	2 - 10 V DC	24 V AC/DC	30 Nm	-

Double acting pneumatic actuators, including explosion-proof actuators

Order code detail	Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
①	②						
Z60	Z60EX	DR030	-	1.2 - 6 bar	35 Nm	-	-
Z61	Z61EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	24 V DC
Z62	Z62EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	230 V AC
Z63	Z63EX	DR030	-	1.2 - 6 bar	35 Nm	2	-



Order code detail	Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
①	②						
Z64	Z64EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	24 V DC
Z65	Z65EX	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	230 V AC
Z66	Z66EX	DR060	-	1.2 - 6 bar	70 Nm	-	
Z67	Z67EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	24 V DC
Z68	Z68EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	230 V AC
Z69	Z69EX	DR060	-	1.2 - 6 bar	70 Nm	2	
Z70	Z70EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	24 V DC
Z71	Z71EX	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	230 V AC

① Standard

② Explosion-proof (only with brass or stainless steel bearings)

Z60 - Z65, Z60EX - Z65EX: At 1.2 bar operating pressure only up to height H < 1665 mm

Single acting pneumatic actuators, including explosion-proof actuators

Order code detail	Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
①	②						
Z72	Z72EX	SC06 0 SO06 0	Pressure off to close/open	6 bar	30 Nm		
Z73	Z73EX	SC06 0 SO06 0	Power off and pressure off to close/open	6 bar	30 Nm		24 V DC
Z74	Z74EX	SC06 0 SO06 0	Power off and pressure off to close/open	6 bar	30 Nm		230 V AC
Z75	Z75EX	SC06 0 SO06 0	Pressure off to close/open	6 bar	30 Nm	2	
Z76	Z76EX	SC06 0 SO06 0	Power off and pressure off to close/open	6 bar	30 Nm	2	24 V DC
Z77	Z77EX	SC06 0 SO06 0	Power off and pressure off to close/open	6 bar	30 Nm	2	230 V AC

① Standard

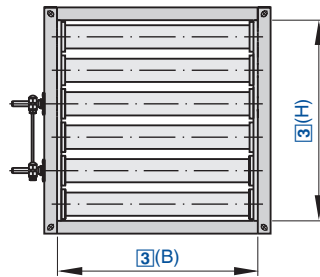
② Explosion-proof (only with brass or stainless steel bearings)

Explosion-proof Open/Close actuators, spring return actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z1EX	ExMax15-SF	2-wire-control (3-point)	24 - 240 V AC/DC	15 Nm	integrated
Z3EX	ExMax30-SF	2-wire-control (3-point)	24 - 240 V AC/DC	30 Nm	integrated

Only with brass or stainless steel bearings





Multileaf dampers made of aluminium for extremely low-leakage shut-off in air conditioning systems

Order code

JZ – LL – AL / 1200x800 / ER / Z64 / NO / P1 – RAL ...

<p>1 Type JZ-LL-AL Low-leakage multileaf damper made of aluminium, closed blade air leakage to EN 1751, class 4</p> <p>2 Nominal size [mm] B x H</p> <p>3 Installation subframe No entry: none ER With installation subframe</p>	<p>4 Attachments Z04 Quadrant stay Z05 - Z07 Quadrant stay and limit switches Z12 - Z51 Actuators ZF01 - ZF15 Spring return actuators Z60 - Z77 Pneumatic actuators</p> <p>5 Damper blade safety function Only for spring return actuators or pneumatic actuators NO Pressure off/power off to OPEN NC Pressure off/power off to CLOSE</p>	<p>6 Surface P1 No entry: standard construction Powder-coated, specify RAL CLASSIC colour PS Powder-coated, specify DB colour S3 Anodised to EURAS standard, E6-C-0</p> <p>Gloss level RAL 9010 50 % RAL 9006 30 % All other RAL colours 70 %</p>
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+ Features

Rectangular multileaf dampers for volume flow and pressure control as well as for extremely low-leakage shut-off of ducts and openings in walls and ceiling slabs

- ▶ Maximum dimensions 1200 x 1000 mm
- ▶ Closed blade air leakage to EN 1751, class 4
- ▶ Casing air leakage to EN 1751, class C
- ▶ Aerofoil opposed action blades
- ▶ Closed cell side seals meet increased hygiene requirements
- ▶ Blades interconnected by gears
- ▶ Available in standard sizes and many intermediate sizes

Optional equipment and accessories

- ▶ Actuators: Open/Close actuators, modulating actuators
- ▶ Powder-coated construction
- ▶ Anodised construction

X Application

- ▶ Multileaf dampers of Type JZ-LL-AL are used as an acting element in the volume flow and pressure control in air conditioning systems
- ▶ For extremely low-leakage shut-off of ducts and openings in walls and ceiling slabs
- ▶ Powder-coated construction with increased corrosion resistance if required

EN Classification

Closed blade air leakage to EN 1751
Test pressure up to 2000 Pa
▶ Class 4

Hexagon Attachments

- ▶ Quadrant stays and limit switches: Quadrant stays to adjust the damper blades (stepless adjustment) and for capturing the end positions
- ▶ Open/Close actuators: Actuators for opening and closing multileaf dampers
- ▶ Modulating actuators: Actuators for stepless blade adjustment
- ▶ Pneumatic actuators: Pneumatic actuators for opening and closing multileaf dampers

& Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of multileaf dampers

★ Special characteristics

- ▶ Aerofoil blades
- ▶ Low-maintenance, robust construction
- ▶ No parts with silicone
- ▶ Available in standard sizes and many intermediate sizes
- ▶ Closed cell side seals meet increased hygiene requirements

ISO Standards and guidelines

- ▶ Casing air leakage to EN 1751, class C
- ▶ Meets the increased requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage

Technical data

Nominal sizes	200 x 100 mm - 1200 x 1000 mm
Maximum static differential pressure for a closed multileaf damper	2000 Pa
Operating temperature	0 - 50 °C

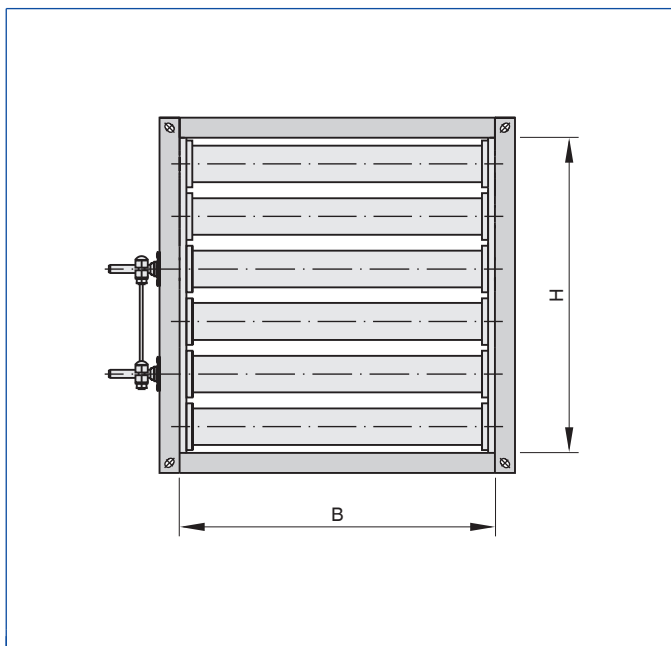


Aluminium multileaf dampers, free area

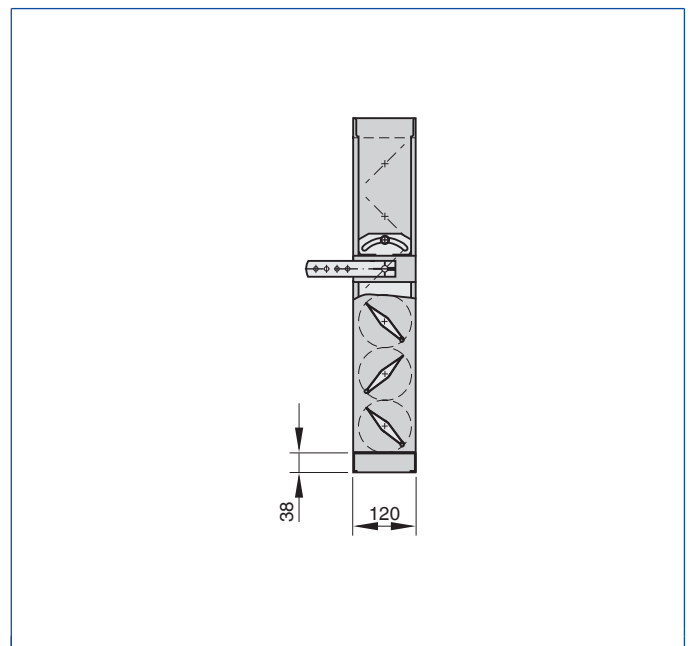
H	B [mm]										
	200	300	400	500	600	700	800	900	1000	1100	1200
mm	m ²										
100, 150	0.014	0.022	0.030	0.038	0.047	0.055	0.063	0.071	0.079	0.087	0.095
200, 250	0.028	0.045	0.061	0.077	0.093	0.109	0.126	0.142	0.158	0.174	0.190
300, 350	0.043	0.067	0.091	0.115	0.140	0.164	0.188	0.213	0.237	0.261	0.286
400, 450	0.057	0.089	0.122	0.154	0.186	0.219	0.251	0.284	0.316	0.348	0.381
500, 550	0.071	0.111	0.152	0.192	0.233	0.273	0.314	0.354	0.395	0.435	0.476
600, 650	0.085	0.134	0.182	0.231	0.279	0.328	0.377	0.425	0.474	0.522	0.571
700, 750	0.099	0.156	0.213	0.269	0.326	0.383	0.439	0.496	0.553	0.610	0.666
800, 850	0.113	0.178	0.243	0.308	0.373	0.437	0.502	0.567	0.632	0.697	0.761
900, 950	0.128	0.200	0.273	0.346	0.419	0.492	0.565	0.638	0.711	0.784	0.857
1000	0.142	0.223	0.304	0.385	0.466	0.547	0.628	0.709	0.790	0.871	0.952

Intermediate sizes: Intermediate widths can be interpolated

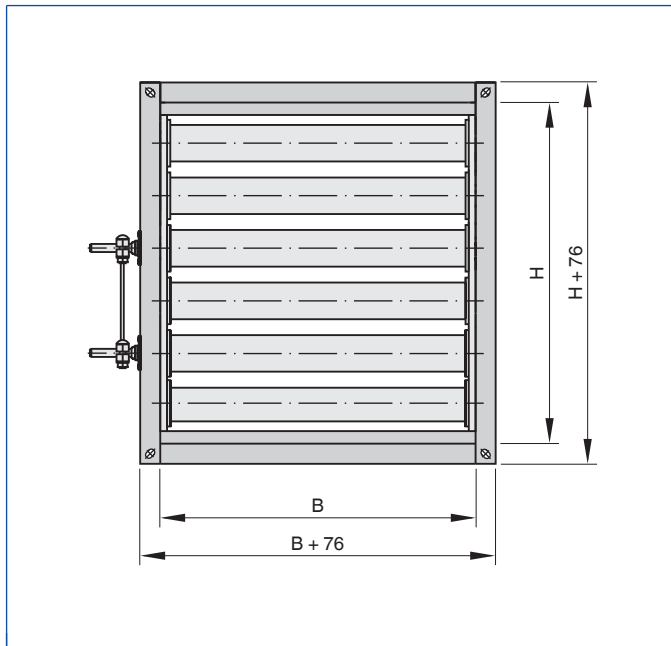
JZ-LL-AL, standard sizes



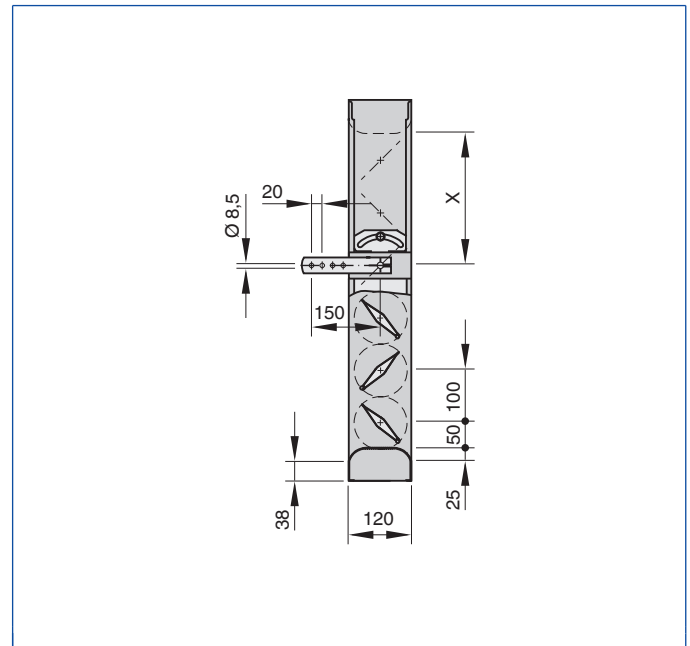
JZ-LL-AL, standard sizes



JZ-LL-AL, intermediate sizes



JZ-LL-AL, intermediate sizes



Dimensions [mm] and weight [kg]

H		B											n	X
①	②	200	300	400	500	600	700	800	900	1000	1100	1200	③	④
mm	mm	kg											-	mm
100	150	2	2	3	3	4	4	4	5	5	6	6	1	50
200	250	2	3	3	4	4	4	5	5	6	6	6	2	50
300	350	4	4	5	5	6	6	6	7	7	8	8	3	50
400	450	4	5	5	6	6	7	7	8	9	9	10	4	250
500	550	4	5	6	6	7	7	8	9	10	10	11	5	250
600	650	5	6	6	7	8	9	9	10	11	12	12	6	250
700	750	6	7	8	8	9	10	11	12	13	13	14	7	250
800	850	7	8	9	10	11	12	13	13	14	15	16	8	250
900	950	8	9	10	11	12	13	14	15	16	17	18	9	250
1000	-	9	10	11	12	13	15	16	17	18	19	21	10	250

① Standard sizes ② Intermediate sizes ③ No. of blades ④ Position of drive arm

Open/Close actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z12	SM230A	-1-wire-control	100 - 240 V AC	20 Nm	-
		-2-wire-control (3-point)			
Z14	SM24A	-1-wire-control	24 V AC/DC	20 Nm	-
		-2-wire-control (3-point)			
Z16	SM230A	-1-wire-control	100 - 240 V AC	20 Nm	S2A
		-2-wire-control (3-point)			
Z18	SM24A	-1-wire-control	24 V AC/DC	20 Nm	S2A
		-2-wire-control (3-point)			
Z42	LM230A	-1-wire-control	100 - 240 V AC	5 Nm	-
		-2-wire-control (3-point)			
Z43	NM230A	-1-wire-control	100 - 240 V AC	10 Nm	-
		-2-wire-control (3-point)			
Z44	LM24A	-1-wire-control	24 V AC/DC	5 Nm	-
		-2-wire-control (3-point)			
Z45	NM24A	-1-wire-control	24 V AC/DC	10 Nm	-
		-2-wire-control (3-point)			
Z46	LM230A	-1-wire-control	100 - 240 V AC	5 Nm	S2A
		-2-wire-control (3-point)			



Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z47	NM230A	-1-wire-control -2-wire-control (3-point)	100 - 240 V AC	10 Nm	S2A
Z48	LM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	5 Nm	S2A
Z49	NM24A	-1-wire-control -2-wire-control (3-point)	24 V AC/DC	10 Nm	S2A

Minimum torque of multileaf damper has to be considered when selecting the actuator.

Open/Close actuators, fast-running

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZS21	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	-
ZS22	SMQ24A	-1-wire-control	24 V AC/DC	16 Nm	S2A

Open/Close actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF01	NF24A	Supply voltage on/off	24 V AC/DC	10 Nm	-
ZF02	NFA	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	-
ZF03	NF24A-S2	Supply voltage on/off	24 V AC/DC	10 Nm	integrated
ZF04	NFA-S2	Supply voltage on/off	24 - 240 V AC 24 - 125 V DC	10 Nm	integrated

Modulating actuators

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
Z20	SM24A-SR	2 - 10 V DC	24 V AC/DC	20 Nm	-
Z50	LM24A-SR-F	2 - 10 V DC	24 V AC/DC	5 Nm	-
Z51	NM24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-

Minimum torque of multileaf damper has to be considered when selecting the actuator.

Modulating actuators, spring return

Order code detail	Meaning	Function	Supply voltage	Torque	Auxiliary switch
ZF05	NF24A-SR	2 - 10 V DC	24 V AC/DC	10 Nm	-

Double acting pneumatic actuators

Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
Z60	DR030	-	1.2 - 6 bar	35 Nm	-	-
Z61	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	24 V DC
Z62	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	-	230 V AC
Z63	DR030	-	1.2 - 6 bar	35 Nm	2	-
Z64	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	24 V DC
Z65	DR030	Power off to close/open	1.2 - 6 bar	35 Nm	2	230 V AC
Z66	DR060	-	1.2 - 6 bar	70 Nm	-	-
Z67	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	24 V DC
Z68	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	-	230 V AC
Z69	DR060	-	1.2 - 6 bar	70 Nm	2	-
Z70	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	24 V DC
Z71	DR060	Power off to close/open	1.2 - 6 bar	70 Nm	2	230 V AC

Z60 - Z65: At 1.2 bar operating pressure only up to height H ≤ 650 mm



Single acting pneumatic actuators

Order code detail	Meaning	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
Z72	SC060 SO060	Pressure off to close/open	6 bar	30 Nm		
Z73	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm		24 V DC
Z74	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm		230 V AC
Z75	SC060 SO060	Pressure off to close/open	6 bar	30 Nm	2	
Z76	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm	2	24 V DC
Z77	SC060 SO060	Power off and pressure off to close/open	6 bar	30 Nm	2	230 V AC



External weather louvres

	Type					
	WG	WGK	WGF	WG-JZ	WG-KUL	NL
Casing and blades						
Galvanised sheet steel	●		●	●	●	●
Stainless steel	●					
Aluminium	●	●	●	●	●	●
Blade pitch	82.5 mm	25 mm	125 mm	82.5 mm	82.5 mm	150 mm
Casing depth	83/95 mm	34 mm		265 mm	205 mm	300/608 mm
Front border						
Without holes	●	●		●	●	
Flange holes	●	●		●	●	
Wire mesh						
Galvanised steel	●	●	●	●	●	
Stainless steel	●		●	●	●	
Insect screen						
Galvanised sheet steel	●	●		●	●	
Stainless steel	●	●		●	●	
Combinations						
Multileaf damper				●		
Non-return damper					●	
Sound reduction						●
Nominal sizes						
Width	200 - 2400 mm	97 - 1997 mm	200 - 2000 mm	200 - 2000 mm	200 - 1600 mm	300 - 1800 mm
Increments	1 mm	1 mm	1 mm	1 mm	1 mm	150 mm
Width subdivided	≤ 4900 mm					
Horizontal run section	●					
Height	165 - 2310 mm	97 - 1997 mm	250 - 2500 mm	180 - 1995 mm	180 - 1665 mm	300 - 2250 mm
Increments	1 mm	1 mm	125 mm	1 mm	1 mm	150 mm
Height subdivided	≤ 4720 mm					
Large areas (e.g. entire façades)			●			
Free area						
External weather louvre only	60 %	60 %	50 %			11 - 29 %
With insect screen	45 %	45 %				
Accessories						
Installation subframe	●	●		●	●	
Surfaces						
Powder-coated	●	●	●	●	●	●
Anodised	●	●	●	●	●	
Explanation						
● - Standard						


List of abbreviations

L_{WA} [dB(A)]	A-weighted sound power level of air-regenerated noise for the louvre
A [m ²]	Upstream cross section
v [m/s]	Airflow velocity based on the upstream cross section
v_t [m/s]	Airflow velocity based on the upstream cross section (Type NL)
\dot{V} [m ³ /h] and [l/s]	Volume flow rate
Δp_t [Pa]	Total differential pressure
B [mm]	Duct width
B_1 [mm]	Duct width for subdivided louvres
H [mm]	Duct height
H_1 [mm]	Duct height for subdivided louvres
n []	Number of flange screw holes
m [kg]	Weight





For the most diverse applications, available also in large sizes

Order code

WG - AL - 2 - ... / 600x1155 / ER / P1 - RAL ...

1 2 3 4 5 6 7

1 Type

WG External weather louvres

2 Material

No entry: galvanised sheet steel
A2 Stainless steel
AL Aluminium

3 Construction

No entry: wire mesh, galvanised steel
1 Insect screen, galvanised steel (only WG, WG-AL)
2 Wire mesh, stainless steel (only WG-AL)
3 Wire mesh and insect screen, stainless steel, (only WG-AL, WG-A2)

4 Border

No entry: With fixing holes
U Without fixing holes

5 Nominal size [mm]

B × H
(B × H > 4 m² when subdivided)

6 Installation subframe

No entry: None
ER With (not for construction without fixing holes)

7 Surface

No entry: standard construction
P1 Powder-coated, RAL Classic colour
PS Powder-coated, special colour

S2 Only for WG-AL
Anodised to EURAS standard, E6-C-... (31 to 35)
S3 Anodised to EURAS standard, E6-C-0

Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

Order code

WG - B - AL - E - R - 2 - ... / 5500x1320 / ER / P1 - RAL ...

1 2 3 4 5 6 7 8

1 Type

WG-B External weather louvre, for continuous horizontal runs of any width

2 Material

AL Aluminium

3 Section

No entry: complete horizontal run, nominal size
E-R Right end section
E-L Left end section
M Middle section

4 Construction

No entry: wire mesh, galvanised steel
1 Insect screen, galvanised steel

2 Wire mesh, stainless steel

3 Wire mesh and insect screen, stainless steel

5 Border

No entry: With fixing holes
U Without fixing holes

6 Nominal size [mm]

B × H
For complete horizontal run
B ≤ 4 m: 2 end sections (E)
B > 4 m: 2 end sections (E) and n middle sections (M)

7 Installation subframe

No entry: None
ER With (not for construction without fixing holes)

8 Surface

No entry: raw aluminium
P1 Powder-coated, RAL Classic colour
PS Powder-coated, special colour
S2 Anodised to EURAS standard, E6-C-... (31 to 35)
S3 Anodised to EURAS standard, E6-C-0

Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

Features

External weather louvres as a protection of air conditioning systems against the direct ingress of rain, leaves and birds into fresh air and exhaust air openings

- ▶ Maximum width of 2400 mm, maximum height of 2310 mm, maximum area of 4 m²

- (aluminium variant also for continuous horizontal runs)
- ▶ Low differential pressure due to aerofoil blades
- ▶ Low air-regenerated noise
- ▶ All aerodynamic data is measured in aerodynamics and acoustics laboratories
- ▶ Available in standard sizes and many intermediate sizes

- ▶ Simple and quick installation due to perimeter border
- ▶ Variants made of galvanised sheet steel, aluminium or stainless steel
- ▶ Flexible arrangement of sections for covering large areas (should then be fixed on a support structure which is to be provided by others)





Optional equipment and accessories

- ▶ Installation subframe
- ▶ Can be combined with multileaf or non-return dampers
- ▶ Insect screen
- ▶ Powder-coated or anodised

Application

- ▶ External weather louvres of Type WG for the fresh air and exhaust air openings of air conditioning systems
- ▶ Protection against the direct ingress of rain as well as against leaves and birds
- ▶ Recommended face velocity for fresh air openings: 2 - 2.5 m/s max.

Variants

- ▶ WG: External weather louvre made of galvanised sheet steel
- ▶ WG-A2: External weather louvre made of stainless steel
- ▶ WG-AL: External weather louvre made of aluminium
- ▶ WG-B-AL: External weather louvre made of aluminium, for continuous horizontal runs

Construction

Cover grille

- ▶ Wire mesh, galvanised steel (only WG, WG-AL, WG-B-AL)
- ▶ 1: With insect screen, galvanised steel (only WG, WG-AL, WG-B-AL)
- ▶ 2: With wire mesh, stainless steel (only WG-AL, WG-B-AL)
- ▶ 3: With insect screen and wire mesh, stainless steel (only WG-A2, WG-AL, WG-B-AL)

Border

- ▶ Border fixing holes
- ▶ U: Without fixing holes

Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of external weather louvres

Special characteristics

- ▶ Large areas can be provided by arranging multiple single sections horizontally and/or vertically (subdivided construction); single sections made of aluminium can also be combined into continuous horizontal runs
- ▶ Low differential pressure and low air-regenerated noise due to aerofoil blades
- ▶ Simple and quick installation due to perimeter border
- ▶ Free area of approx. 60 %, with insect screen approx. 45 %
- ▶ Silicone free

Technical data

Nominal sizes	200 × 165 - 2400 × 1650 / 1600 × 2310 mm
Width subdivided	Up to 4900 mm
Height subdivided	Up to 4720 mm
Horizontal runs (WG-B-AL)	H: 165 - 1980 mm
Volume flow rate range (undivided construction)	40 - 9390 l/s or 144 - 33804 m ³ /h at 2.5 m/s
Free area	Approx. 60 %, with insect screen approx. 45 %
Total differential pressure - exhaust air	30 Pa at 2.5 m/s
Total differential pressure - fresh air	35 Pa at 2.5 m/s

WG, width 200 - 1200 mm, volume flow rate at 2.5 m/s

Height	Width [mm]											
	200		400		600		800		1000		1200	
mm	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
165	40	144	80	288	120	432	160	576	200	720	240	864
330	125	450	245	882	370	1332	490	1764	615	2214	735	2646
495	205	738	410	1476	615	2214	820	2952	1025	3690	1230	4428
660	290	1044	575	2070	865	3114	1150	4140	1440	5184	1725	6210
825	370	1332	740	2664	1110	3996	1480	5328	1850	6660	2220	7992
990	455	1638	905	3258	1360	4896	1810	6516	2265	8154	2715	9774
1155	535	1926	1070	3852	1605	5778	2140	7704	2675	9630	3210	11556
1320	620	2232	1235	4446	1855	6678	2470	8892	3090	11124	3705	13338
1485	700	2520	1400	5040	2100	7560	2800	10080	3500	12600	4200	15120
1650	785	2826	1565	5634	2350	8460	3130	11268	3915	14094	4695	16902
1815	865	3114	1730	6228	2595	9342	3460	12456	4325	15570	5190	18684
1980	950	3420	1895	6822	2845	10242	3790	13644	4740	17064	5690	20484
2145	1030	3708	2060	7416	3090	11124	4120	14832	5150	18540	6180	22248
2310	1115	4014	2225	8010	3340	12024	4450	16020	5560	20016	6680	24048
2740	1235	4446	2470	8892	3705	13338	4940	17784	6180	22248	7410	26676
3070	1400	5040	2800	10080	4200	15120	5600	20160	7000	25200	8400	30240
3400	1565	5634	3130	11268	4695	16902	6260	22536	7830	28188	9390	33804
3730	1730	6228	3460	12456	5190	18684	6920	24912	8650	31140	10380	37368
4060	1895	6822	3790	13644	5690	20484	7580	27288	9480	34128	11370	40932
4390	2060	7416	4120	14832	6180	22248	8240	29664	10300	37080	12360	44496
4720	2225	8010	4450	16020	6680	24048	8900	32040	11130	40068	13350	48060



WG, width 1400 - 2400 mm, volume flow rate at 2.5 m/s

Height mm	Width [mm]											
	1400		1600		1800		2000		2200		2400	
	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h
165	280	1008	320	1152	360	1296	400	1440	440	1584	480	1728
330	860	3096	980	3528	1105	3978	1225	4410	1350	4860	1470	5292
495	1435	5166	1640	5904	1845	6642	2050	7380	2255	8118	2460	8856
660	2015	7254	2300	8280	2590	9324	2875	10350	3165	11394	3450	12420
825	2590	9324	2960	10656	3330	11988	3700	13320	4070	14652	4440	15984
990	3170	11412	3620	13032	4075	14670	4525	16290	4980	17928	5430	19548
1155	3745	13482	4280	15408	4815	17334	5350	19260	5890	21204	6420	23112
1320	4325	15570	4940	17784	5560	20016	6180	22248	6790	24444	7410	26676
1485	4900	17640	5600	20160	6300	22680	7000	25200	7700	27720	8400	30240
1650	5480	19728	6260	22536	7040	25344	7830	28188	8610	30996	9390	33804
1815	6060	21816	6920	24912	7790	28044	8650	31140	9520	34272	10380	37368
1980	6630	23868	7580	27288	8530	30708	9480	34128	10420	37512	11370	40932
2145	7210	25956	8240	29664	9270	33372	10300	37080	11330	40788	12360	44496
2310	7790	28044	8900	32040	10010	36036	11130	40068	12240	44064	13350	48060
2740	8650	31140	9880	35568	11120	40032	12350	44460	13590	48924	14820	53352
3070	9800	35280	11200	40320	12600	45360	14000	50400	15400	55440	16800	60480
3400	10960	39456	12520	45072	14090	50724	15650	56340	17220	61992	18780	67608
3730	12110	43596	13840	49824	15570	56052	17300	62280	19030	68508	20760	74736
4060	13270	47772	15160	54576	17060	61416	18950	68220	20850	75060	22740	81864
4390	14420	51912	16480	59328	18540	66744	20600	74160	22660	81576	24720	88992
4720	15580	56088	17800	64080	20030	72108	22250	80100	24480	88128	26700	96120

WG, width 2900 - 4900 mm, volume flow rate at 2.5 m/s

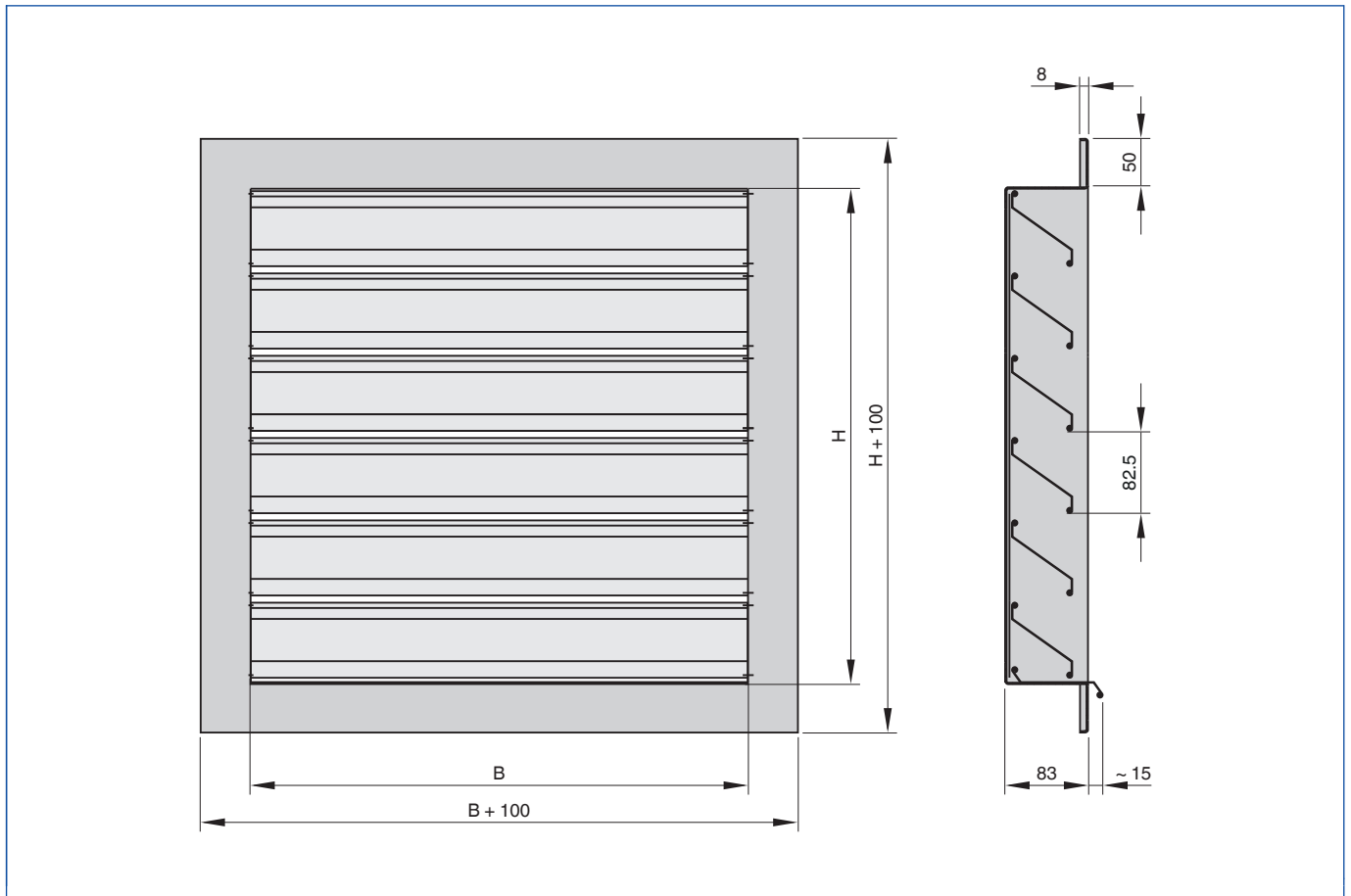
Height mm	Width [mm]											
	2900		3300		3700		4100		4500		4900	
	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h
165	560	2016	640	2304	720	2592	800	2880	880	3168	960	3456
330	1715	6174	1960	7056	2205	7938	2450	8820	2695	9702	2940	10584
495	2870	10332	3280	11808	3690	13284	4100	14760	4510	16236	4920	17712
660	4025	14490	4600	16560	5180	18648	5750	20700	6330	22788	6900	24840
825	5180	18648	5920	21312	6660	23976	7400	26640	8140	29304	8800	31968
990	6340	22824	7240	26064	8150	29340	9050	32580	9960	35856	10860	39096
1155	7490	26964	8560	30816	9630	34668	10700	38520	11770	42372	12840	46224
1320	8650	31140	9880	35568	11120	40032	12350	44460	13590	48924	14820	53352
1485	9800	35280	11200	40320	12600	45360	14000	50400	15400	55440	16800	60480
1650	10960	39456	12520	45072	14090	50724	15650	56340	17220	61992	18780	67608
1815	12110	43596	13840	49824	15570	56052	17300	62280	19030	68508	20750	74736
1980	13270	47772	15160	54576	17060	61416	18950	68220	20850	75060	22750	81864
2145	14420	51912	16480	59328	18540	66744	20600	74160	22660	81576	24700	88992
2310	15580	56088	17800	64080	20030	72108	22250	80100	24480	88128	26700	96120
2740	17290	62244	19760	71136	22230	80028	24700	88920	27170	97812	29650	106704
3070	19600	70560	22400	80640	25200	90720	28000	100800	30800	110880	33600	120960
3400	21910	78876	25040	90144	28170	101412	31300	112680	34430	123948	37550	135216
3730	24220	87192	27680	99648	31140	112104	34600	124560	38060	137016	41500	149472
4060	26530	95508	30320	109152	34110	122796	37900	136440	41690	150084	45500	163728
4390	28840	103824	32960	118656	37080	133488	41200	148320	45320	163152	49450	177984
4720	31150	112140	35600	128160	40050	144180	44500	160200	48950	176220	53400	192240



Differential pressure and sound power level

v	Installation type			
	A and C		B and D	
	Δp_t	L_{WA}	Δp_t	L_{WA}
m/s	Pa	dB(A)	Pa	dB(A)
1.5	10	32	14	34
2	20	41	25	43
2.5	30	48	35	50
3	45	54	55	56
4	75	63	95	66
5	115	70	145	73
6	170	76	210	79

WG, WG-A2



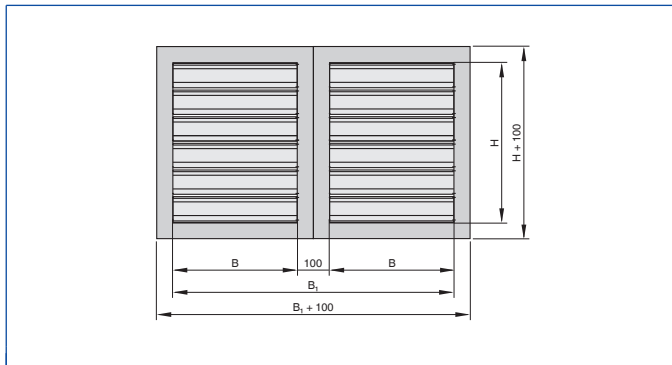
WG, WG-A2, weight

H	B [mm]											
	200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400
mm	kg											
165	3	4	5	6	8	9	11	13	14	15	17	19
330	3	5	6	7	9	11	13	14	15	17	19	20
495	5	6	8	9	11	13	16	18	19	21	24	25
660	6	7	9	11	13	16	19	21	22	26	28	30
825	8	9	12	13	16	18	22	24	26	30	33	36
990	9	10	13	15	18	21	25	28	30	34	38	41
1155	11	12	15	17	20	24	28	31	33	39	43	46



H	B [mm]											
	200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400
mm	kg											
1320	12	14	16	18	22	26	31	35	37	43	48	52
1485	14	16	18	20	24	29	34	38	41	47	52	57
1650	15	16	20	22	27	31	37	41	44	51	57	62
1815	17	18	21	24	29	34	40	45	48	56	62	
1980	18	19	22	26	31	37	43	48	52	60		
2145	20	21	23	28	33	39	46	52	56			
2310	21	23	25	30	35	42	49	55				

WG, WG-A2, WG-AL width subdivided

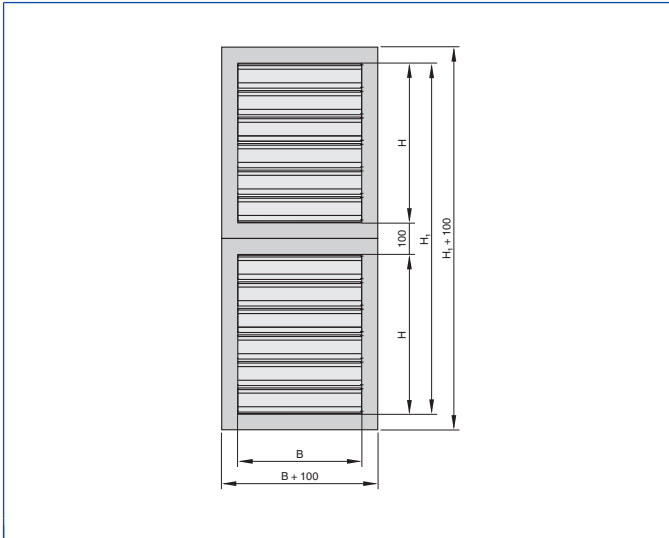


WG, WG-A2, width subdivided, weight

H	B ₁ [mm]									
	1900	2100	2300	2500	2900	3300	3700	4100	4500	4900
	B [mm]									
	900	1000	1100	1200	1400	1600	1800	2000	2200	2400
mm	kg									
165	14	15	17	18	22	25	27	30	34	37
330	16	18	20	21	26	28	30	34	38	40
495	20	22	24	26	32	35	37	43	47	50
660	24	27	29	31	38	42	44	51	57	61
825	28	31	34	37	44	49	52	60	66	71
990	32	36	39	42	50	56	59	68	76	82
1155	37	40	44	47	56	62	67	77	86	93
1320	41	44	48	52	62	69	74	86	95	103
1485	45	49	53	57	68	76	81	94	105	114
1650	49	53	58	63	74	83	89	103	114	124
1815	53	58	63	68	80	90	96	111	124	
1980	57	62	68	73	86	96	104	120		
2145	61	66	72	78	92	103	111			
2310	65	71	77	83	98	110				



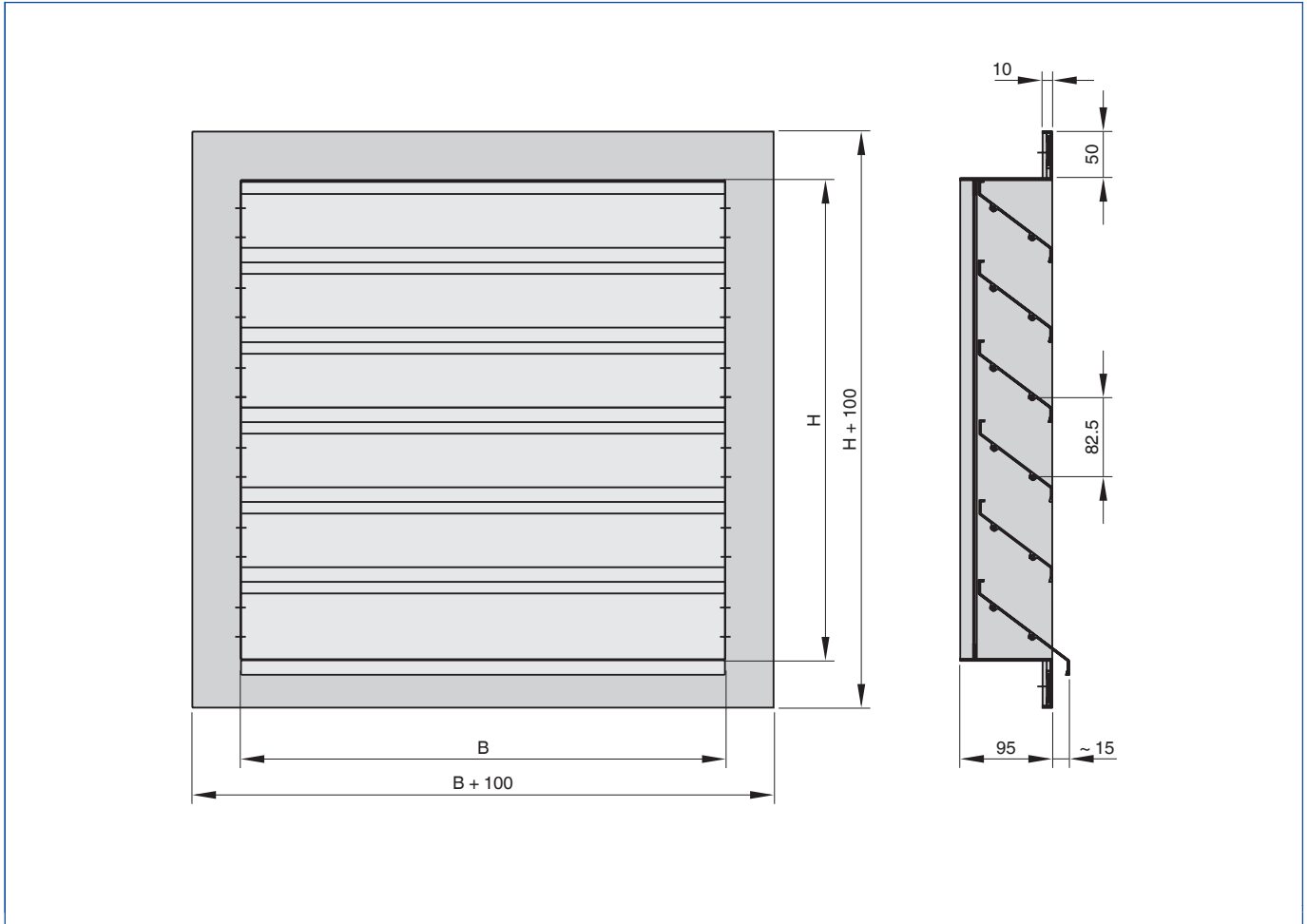
WG, WG-A2, WG-AL height subdivided



WG, WG-A2, height subdivided, weight

H ₁	H	B [mm]											
		200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400
mm	mm	kg											
2410	1155	21	24	30	33	40	47	56	62	67	77	86	93
2740	1320	24	28	33	37	44	52	62	69	74	86	95	103
3070	1485	27	31	37	41	49	57	68	76	81	94	105	114
3400	1650	30	32	40	44	53	63	74	83	89	103	114	124
3730	1815	33	36	42	48	58	68	80	90	96	111	124	
4060	1980	36	38	44	52	62	73	86	96	104	120		
4390	2145	39	42	46	56	66	78	92	103	111			
4720	2310	42	46	50	60	71	83	98	110				





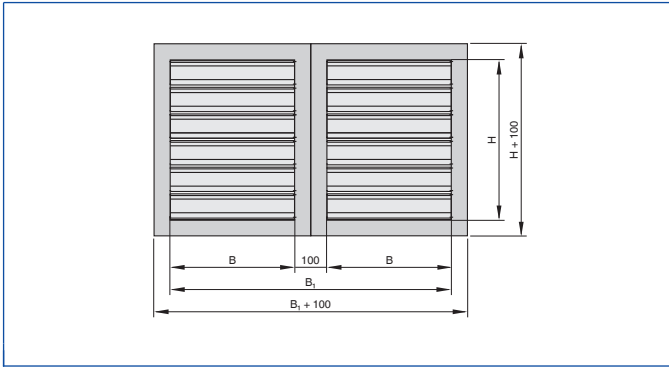
WG-AL, weight

H	B [mm]											
	200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400
mm	kg											
165	2	3	4	5	6	7	8	9	10	11	12	13
330	2	3	4	5	6	7	8	9	10	11	12	13
495	3	4	5	6	7	8	9	10	11	14	16	19
660	4	5	6	7	8	10	12	14	15	17	19	22
825	5	6	7	8	10	12	14	16	19	21	24	26
990	6	7	8	10	12	15	17	19	21	24	27	30
1155	7	8	10	12	14	16	18	21	24	27	30	33
1320	8	10	12	14	16	18	21	24	27	30	33	36
1485	10	12	14	16	18	21	24	27	30	33	36	39
1650	12	14	16	18	21	24	27	30	33	36	39	42
1815	14	16	18	21	24	27	30	33	36	39	42	
1980	16	18	20	24	27	30	33	36	39	42		
2145	18	20	22	27	30	33	36	39	42			
2310	20	22	24	29	33	36	39	42				





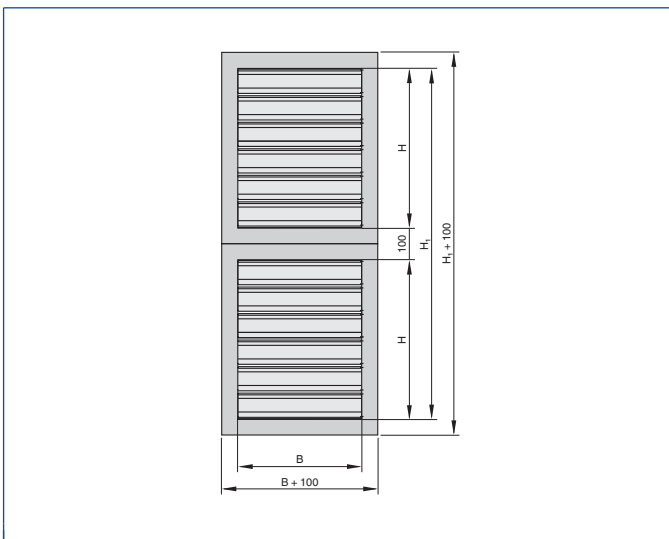
WG, WG-A2, WG-AL width subdivided



WG-AL, width subdivided, weight

H	B ₁ [mm]									
	1900	2100	2300	2500	2900	3300	3700	4100	4500	4900
	B [mm]									
	900	1000	1100	1200	1400	1600	1800	2000	2200	2400
mm	kg									
165	10	11	12	13	15	17	19	21	23	25
330	11	12	13	14	16	18	20	22	24	26
495	13	14	15	16	18	20	22	28	32	38
660	15	16	18	20	24	28	30	34	38	44
825	18	20	22	24	28	32	38	42	48	52
990	22	24	27	30	34	38	42	48	54	60
1155	26	28	30	32	36	42	48	54	60	66
1320	30	32	34	36	42	48	54	60	66	72
1485	34	36	39	42	48	54	60	66	72	78
1650	39	42	45	48	54	60	66	72	78	84
1815	45	48	51	54	60	66	72	78	84	
1980	51	54	57	60	66	72	78	84		
2145	57	60	63	66	72	78	84			
2310	62	66	69	72	78	84				

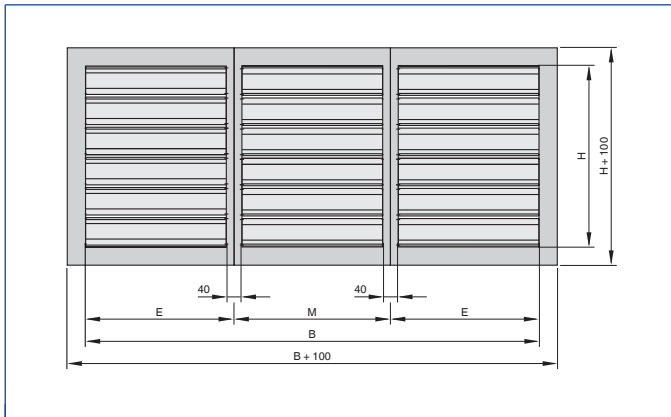
WG, WG-A2, WG-AL height subdivided



WG-AL, height subdivided, weight

H ₁	H	B [mm]											
		200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400
mm	mm	kg											
2410	1155	14	16	20	24	28	32	36	42	48	54	60	66
2740	1320	16	20	24	28	32	36	42	48	54	60	66	72
3070	1485	20	24	28	32	36	42	48	54	60	66	72	78
3400	1650	24	28	32	36	42	48	54	60	66	72	78	84
3730	1815	28	32	36	42	48	54	60	66	72	78	84	90
4060	1980	32	36	40	48	54	60	66	72	78	84	90	96
4390	2145	36	40	44	54	60	66	72	78	84	90	96	102
4720	2310	40	44	48	58	66	72	78	84	90	96	102	108

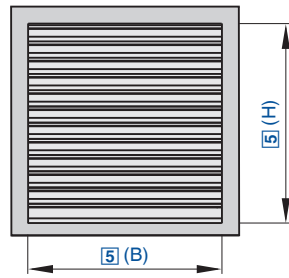
WG-B-AL



WG-B-AL, weight

H	M [mm]	E [mm]					
	2000	1000	1200	1400	1600	1800	2000
mm	kg						
165	10	5	6	7	8	9	10
330	11	6	7	8	9	10	11
495	14	7	8	9	10	11	14
660	17	8	10	12	14	15	17
825	21	10	12	14	16	19	21
990	24	12	15	17	19	21	24
1155	27	14	16	18	21	24	27
1320	30	16	18	21	24	27	30
1485	33	18	21	24	27	30	33
1650	36	21	24	27	30	33	36
1815	39	24	27	30	33	36	39
1980	42	27	30	33	36	39	42





With small blade pitch

Order code

WGK – AL – 3 – ... / 1197x797 / ER / P1 – RAL ...

1 2 3 4 5 6 7

1 Type

WGK External weather louvre with small blade pitch

2 Material

AL Anodised aluminium

3 Construction

- No entry: wire mesh, galvanised steel
- 1** Insect screen, galvanised steel
- 3** Insect screen, stainless steel

4 Border

- U** No entry: With fixing holes
- U** Without fixing holes

5 Nominal size [mm]

B × H

6 Installation subframe

- No entry: None
- ER** With (not for construction without fixing holes)

7 Surface

- No entry: anodised to EURAS standard, E6-C-0, S3, natural colour
- P1** Powder-coated, RAL Classic colour
- PS** Powder-coated, DB colour
- S2** Anodised to EURAS standard, E6-C-... (31 to 35)
- Gloss level
- RAL 9010 50 %
- RAL 9006 30 %
- All other RAL colours 70 %

+ Features

External weather louvres as a protection of air conditioning systems against the direct ingress of rain, leaves and birds into fresh air and exhaust air openings

- ▶ Maximum width of 1997 mm, maximum height of 1997 mm
- ▶ Low differential pressure due to aerofoil blades
- ▶ Low air-regenerated noise
- ▶ All aerodynamic data is measured in aerodynamics and acoustics laboratories
- ▶ Available in standard sizes and many intermediate sizes
- ▶ Simple and quick installation due to perimeter border

Optional equipment and accessories

- ▶ Installation subframe
- ▶ Insect screen
- ▶ Powder-coated or anodised

+ Application

- ▶ External weather louvres of Type WGK, with small blade pitch, for the fresh air and exhaust air openings of air conditioning systems
- ▶ Protection against the direct ingress of rain as well as against leaves and birds
- ▶ Recommended face velocity for fresh air openings: 2 - 2.5 m/s max.

+ Construction

- Cover grille
 - ▶ Wire mesh
 - ▶ 1: With insect screen, galvanised steel
 - ▶ 3: With insect screen, stainless steel

Border

- ▶ Border fixing holes
- ▶ U: Without fixing holes

& Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of external weather louvres

★ Special characteristics

- ▶ Low differential pressure and low air-regenerated noise due to aerofoil blades
- ▶ Simple and quick installation due to perimeter border
- ▶ Free area of approx. 60 %, with insect screen approx. 45 %
- ▶ Silicone free

Technical data

Nominal sizes	97 × 97 - 1997 × 997mm / 1197 × 1997 mm
Volume flow rate range	15 - 5890 l/s or 54 - 21204 m³/h at 2.5 m/s
Free area	Approx. 60 %, with insect screen approx. 45 %
Total differential pressure - exhaust air	30 Pa at 2.5 m/s
Total differential pressure - fresh air	35 Pa at 2.5 m/s



WGK, width 97 - 597 mm, volume flow rate at 2.5 m/s

Height mm	Width [mm]													
	97		147		197		297		397		497		597	
	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
97	15	54	25	90	35	126	50	180	70	252	85	306	105	378
147	30	108	45	162	60	216	90	324	120	432	150	540	180	648
197	40	144	60	216	85	306	125	450	170	612	210	756	250	900
247	55	198	80	288	110	396	165	594	215	774	270	972	325	1170
297	65	234	100	360	130	468	200	720	265	954	335	1206	400	1440
347	75	270	115	414	155	558	235	846	315	1134	395	1422	475	1710
397	90	324	135	486	180	648	275	990	365	1314	460	1656	550	1980
447	100	360	155	558	205	738	310	1116	415	1494	520	1872	625	2250
497	115	414	170	612	230	828	350	1260	465	1674	585	2106	700	2520
597	140	504	210	756	280	1008	420	1512	565	2034	705	2538	850	3060
797	185	666	285	1026	380	1368	570	2052	765	2754	955	3438	1150	4140
997	235	846	355	1278	475	1710	720	2592	960	3456	1205	4338	1445	5202
1197	285	1026	430	1548	575	2070	870	3132	1160	4176	1450	5220	1745	6282
1397	330	1188	505	1818	675	2430	1015	3654	1360	4896	1700	6120	2045	7362
1597	380	1368	575	2070	775	2790	1165	4194	1555	5598	1950	7020	2340	8424
1797	430	1548	650	2340	870	3132	1315	4734	1755	6318	2200	7920	2640	9504
1997	475	1710	725	2610	970	3492	1460	5256	1955	7038	2445	8802	2940	10584

WGK, width 797 - 1997 mm, volume flow rate at 2.5 m/s

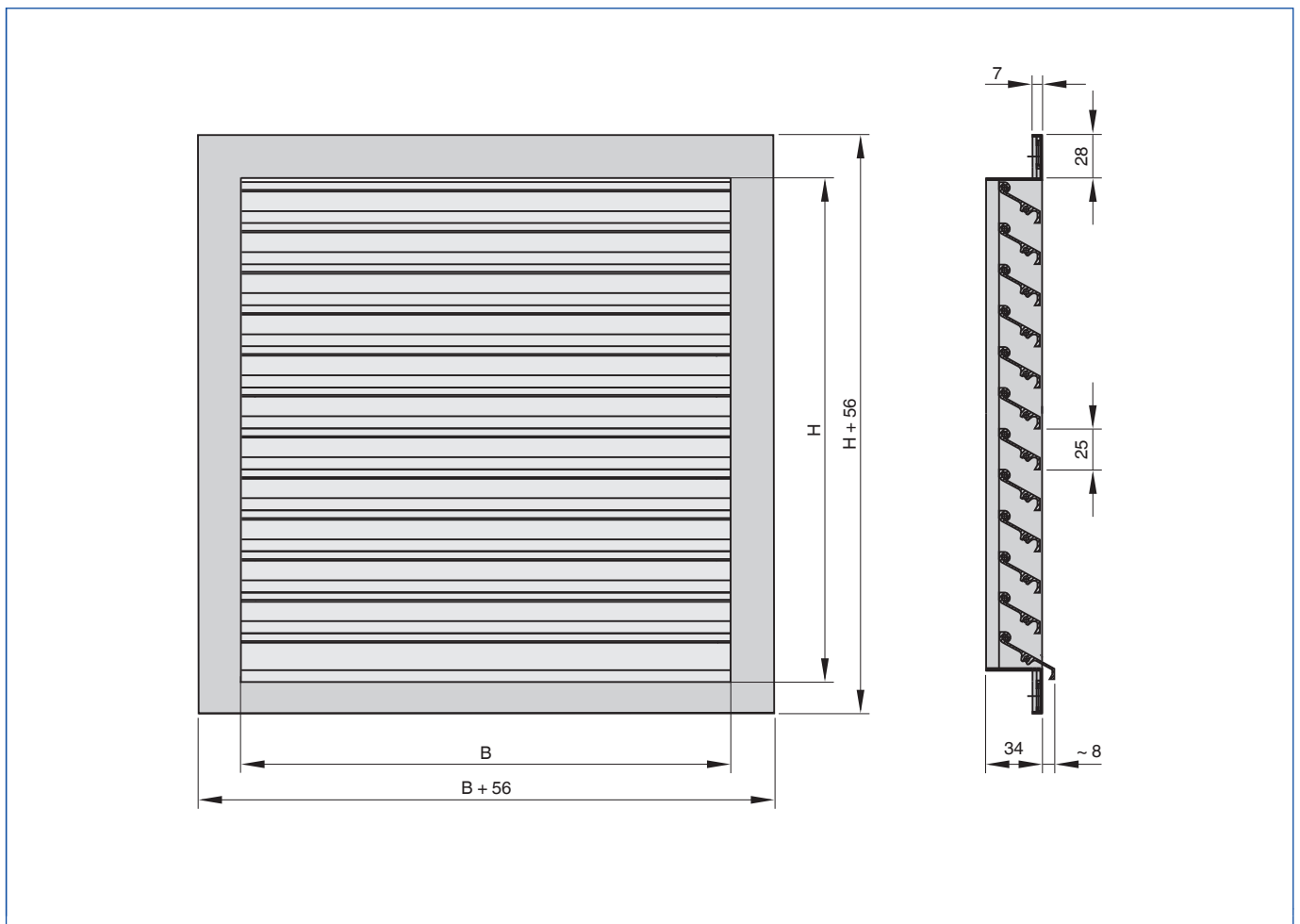
Height mm	Width [mm]													
	797		997		1197		1397		1597		1797		1997	
	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
97	135	486	170	612	205	738	240	864	275	990	310	1116	345	1242
147	235	846	295	1062	355	1278	415	1494	475	1710	535	1926	595	2142
197	335	1206	420	1512	505	1818	590	2124	675	2430	760	2736	845	3042
247	435	1566	545	1962	655	2358	765	2754	875	3150	985	3546	1095	3942
297	535	1926	670	2412	805	2898	940	3384	1075	3870	1210	4356	1345	4842
347	635	2286	795	2862	955	3438	1115	4014	1275	4590	1435	5166	1595	5742
397	735	2646	920	3312	1105	3978	1290	4644	1475	5310	1660	5976	1840	6624
447	835	3006	1045	3762	1255	4518	1465	5274	1675	6030	1880	6768	2090	7524
497	935	3366	1170	4212	1405	5058	1640	5904	1870	6732	2105	7578	2340	8424
597	1135	4086	1420	5112	1705	6138	1985	7146	2270	8172	2555	9198	2840	10224
797	1530	5508	1915	6894	2300	8280	2685	9666	3070	11052	3455	12438	3840	13824
997	1930	6948	2415	8694	2900	10440	3385	12186	3870	13932	4355	15678	4840	17424
1197	2330	8388	2915	10494	3500	12600	4085	14706	4665	16794				
1397	2730	9828	3410	12276	4095	14742	4780	17208						
1597	3125	11250	3910	14076	4695	16902								
1797	3525	12690	4410	15876	5290	19044								
1997	3925	14130	4910	17676	5890	21204								



Differential pressure and sound power level

v	Installation type			
	A and C		B and D	
	Δp_t	L_{WA}	Δp_t	L_{WA}
m/s	Pa	dB(A)	Pa	dB(A)
1.5	10	32	14	34
2	20	41	25	43
2.5	30	48	35	50
3	45	54	55	56
4	75	63	95	66
5	115	70	145	73
6	170	76	210	79

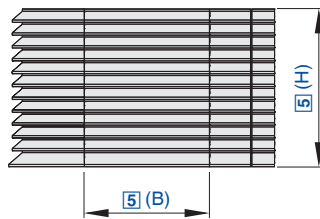
WGK



WGK, weight

H	B [mm]																			
	97	147	197	297	397	497	597	697	797	897	997	1097	1197	1297	1397	1497	1597	1697	1797	1897
mm	kg																			
97	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3
147	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4
197	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4
247	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5
297	1	1	1	2	2	2	3	3	3	3	4	4	4	5	5	5	6	6	6	6
347	1	1	1	2	2	3	3	3	4	4	4	5	5	5	6	6	6	7	7	7
397	1	1	2	2	2	3	3	4	4	4	5	5	6	6	6	7	7	8	8	8
447	1	1	2	2	3	3	4	4	4	5	5	6	6	7	7	8	8	9	9	9
497	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10
597	1	2	2	3	3	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12
797	1	2	3	4	4	5	6	7	8	8	9	10	11	12	12	13	14	15	16	16
997	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1197	2	3	4	5	6	8	9	10	11	12	14	15	16	17	18	20	21	22		
1397	2	3	5	6	7	9	10	12	13	14	16	17	19	20	21	23				
1597	2	4	5	7	8	10	12	13	15	16	18	20	21	23						
1797	2	4	6	8	9	11	13	15	17	18	20	22								
1997	2	4	6	8	10	12	14	16	18	20	22									





Specifically for façade installation

Order code

WGF - AL - E - 2 / 1400x875 / P1 - RAL ...

1 2 3 4 5 6

<p>1 Type WGF External weather louvres for façades</p> <p>2 Material No entry: galvanised steel AL Aluminium</p> <p>3 Section E Corner section T Middle section</p>	<p>4 Construction 2 No entry: wire mesh, galvanised steel Wire mesh, stainless steel (only for material AL)</p> <p>5 Nominal size [mm] B x H</p> <p>6 Surface P1 No entry: standard construction Powder-coated, RAL Classic colour</p>	<p>PS Powder-coated, DB colour</p> <p>S2 Only for WGF-AL Anodised to EURAS standard, E6-C-... (31 to 35)</p> <p>S3 Anodised to EURAS standard, E6-C-0</p> <p>Gloss level RAL 9010 50 % RAL 9006 30 % All other RAL colours 70 %</p>
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+ Features

External weather louvres - specifically for façade installation - as a protection of air conditioning systems against the direct ingress of rain, leaves and birds into fresh air and exhaust air openings

- ▶ Maximum width of 2000 mm, maximum height of 2500 mm per section
- ▶ For the installation into façades or for the construction of enclosures for machinery or electrical equipment
- ▶ Low differential pressure due to aerofoil blades
- ▶ Low air-regenerated noise
- ▶ All aerodynamic data is measured in aerodynamics and acoustics laboratories
- ▶ Variants made of galvanised sheet steel or aluminium
- ▶ Flexible arrangement of sections for covering large areas (should then be fixed on a support structure which is to be provided by others)

Optional equipment and accessories

- ▶ Corner section
- ▶ Insect screen
- ▶ Powder-coated or anodised

Application

- ▶ External weather louvres of Type WGF for the fresh air and exhaust air openings of air conditioning systems
- ▶ Protection against the direct ingress of rain as well as against leaves and birds
- ▶ Recommended face velocity for fresh air openings: 2 - 2.5 m/s max.

Variants

- ▶ WGF-T: Façade weather louvre made of galvanised sheet steel, middle section
- ▶ WGF-E: Façade weather louvre made of galvanised sheet steel, corner section
- ▶ WGF-AL-T: Façade weather louvre made of aluminium, middle section
- ▶ WGF-AL-E: Façade weather louvre made of aluminium, corner section

+ Construction

- ▶ Wire mesh made of galvanised steel
- ▶ 2: Wire mesh, stainless steel (only WGF-AL)

★ Special characteristics

- ▶ Low differential pressure and low noise due to aerofoil blades
- ▶ Large-size covering of air intake and discharge openings on external walls, and complete façades; uniform look with regular blades, without distracting flanges
- ▶ Robust construction
- ▶ Very large dimensions (height and width) are available since any number of sections can be fitted side by side or on top of each other (support structure required)
- ▶ Free area approx. 50 %

Technical data

Nominal sizes (middle section)	1000 x 500 to 2000 x 2500 mm
Volume flow rate range (middle section)	940 - 11880 l/s or 3384 - 42768 m ³ /h
Free area	Approx. 50 %
Total differential pressure - exhaust air	50 Pa at 2.5 m/s (façade installation)
Total differential pressure - fresh air	60 Pa at 2.5 m/s (façade installation)



WGF, volume flow rate at 2.5 m/s

Height	Width [mm]											
	1000		1200		1400		1600		1800		2000	
mm	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
500	940	3384	1125	4050	1315	4734	1500	5400	1690	6084	1875	6750
625	1250	4500	1500	5400	1750	6300	2000	7200	2250	8100	2500	9000
750	1565	5634	1875	6750	2190	7884	2500	9000	2815	10134	3125	11250
875	1875	6750	2250	8100	2625	9450	3000	10800	3375	12150	3750	13500
1000	2190	7884	2625	9450	3065	11034	3500	12600	3940	14184	4375	15750
1250	2815	10134	3375	12150	3940	14184	4500	16200	5060	18216	5630	20268
1500	3440	12384	4125	14850	4815	17334	5500	19800	6190	22284	6880	24768
1750	4065	14634	4875	17550	5690	20484	6500	23400	7310	26316	8130	29268
2000	4690	16884	5630	20268	6560	23616	7500	27000	8440	30384	9380	33768
2250	5310	19116	6380	22968	7440	26784	8500	30600	9560	34416	10630	38268
2500	5940	21384	7130	25668	8310	29916	9500	34200	10690	38484	11880	42768

WGF, corner section, volume flow rate at 2.5 m/s

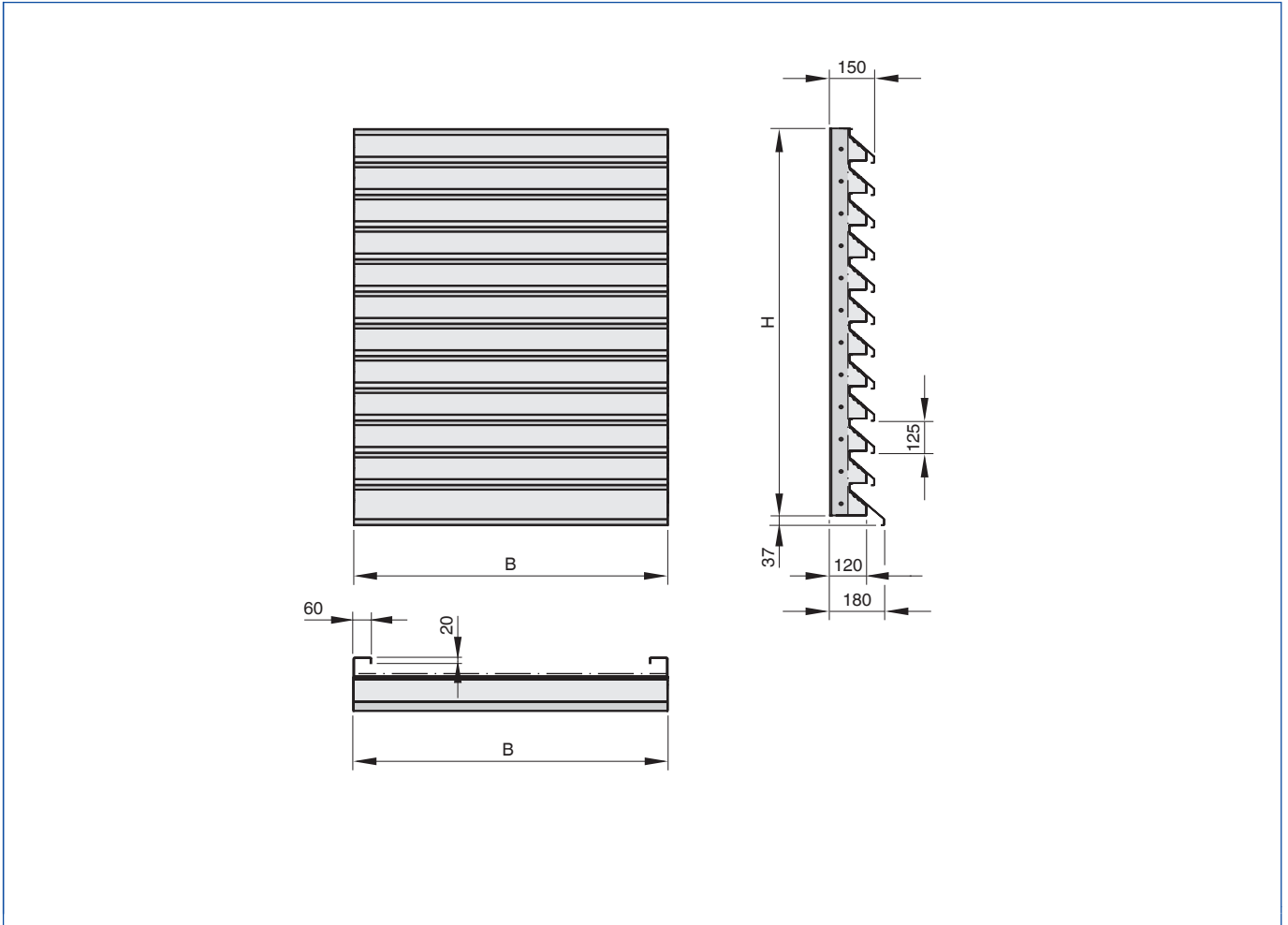
Height	Corner section 90° [mm]	
	600/600	
mm	l/s	m ³ /h
500	1125	4050
625	1500	5400
750	1875	6750
875	2250	8100
1000	2625	9450
1250	3375	12150
1500	4125	14850
1750	4875	17550
2000	5630	20268
2250	6380	22968
2500	7130	25668

Differential pressure and sound power level

v	Installation type					
	A and B		C		D	
	Δp_t	L_{WA}	Δp_t	L_{WA}	Δp_t	L_{WA}
m/s	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
1.5	22	40	18	38	25	45
2	38	49	32	47	40	54
2.5	60	56	50	54	55	61
3	85	62	75	59	90	66
4	150	70	130	68	160	75
5	230	77	200	75	250	82
6	335	83	290	81	360	88



WGF Middle section

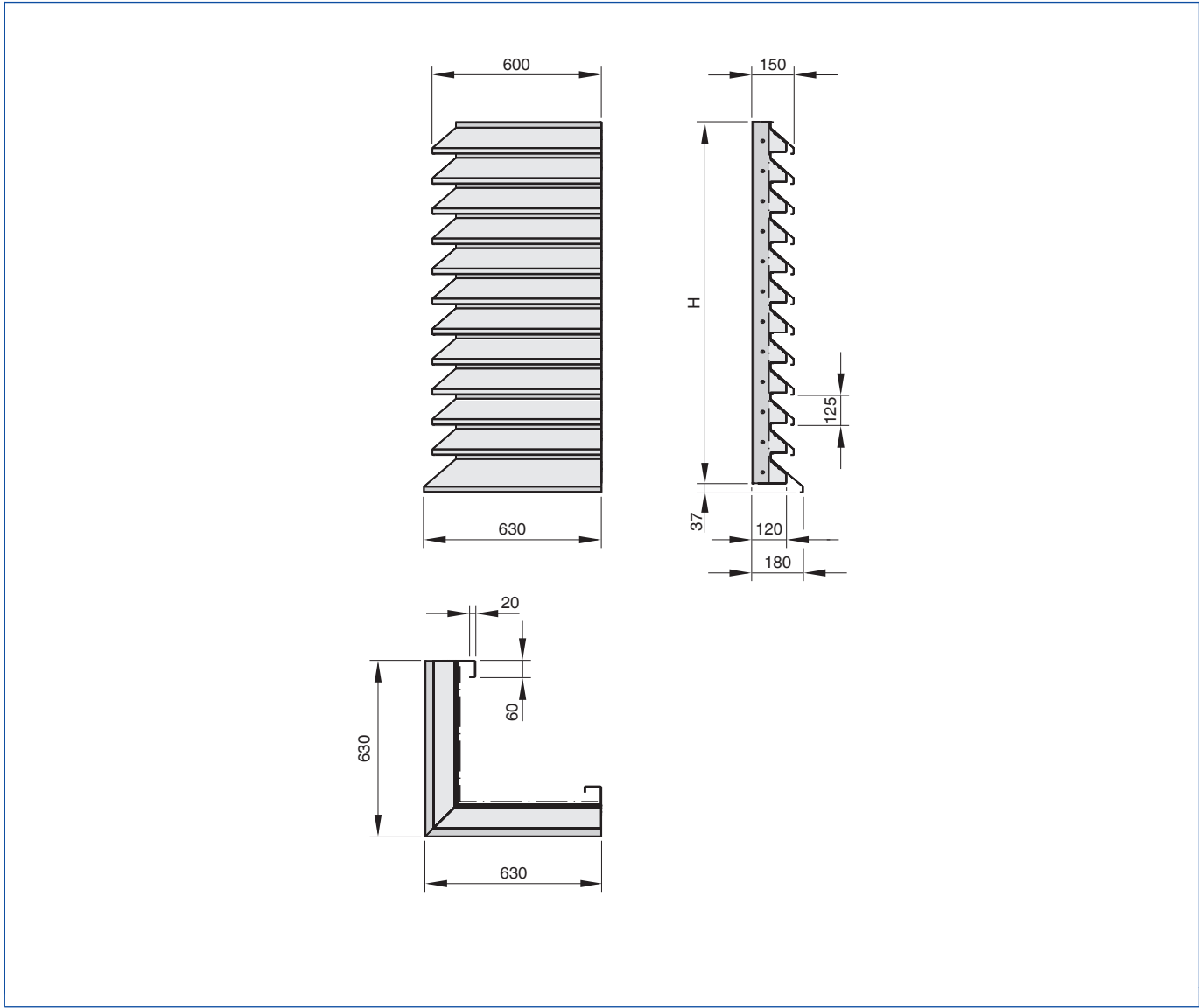


WGF, weight

H	WGF-T						WGF-AL-T					
	B [mm]											
	1000	1200	1400	1600	1800	2000	1000	1200	1400	1600	1800	2000
mm	kg											
500	16	17	18	21	23	25	12	13	14	15	16	17
625	19	22	24	27	29	32	14	16	17	18	19	21
750	23	26	29	32	35	38	17	19	20	22	23	26
875	27	30	34	37	41	44	20	22	24	25	27	30
1000	31	35	39	43	47	51	23	25	27	29	31	34
1250	33	38	43	48	53	61	28	31	34	36	39	42
1500	43	50	56	61	68	73	34	37	41	44	47	51
1750	51	59	65	71	79	86	39	43	48	51	55	59
2000	59	67	74	82	90	97	45	49	55	59	63	68
2250	67	76	83	91	102	109	50	55	62	66	71	76
2500	74	84	93	102	112	121	56	61	69	74	79	85



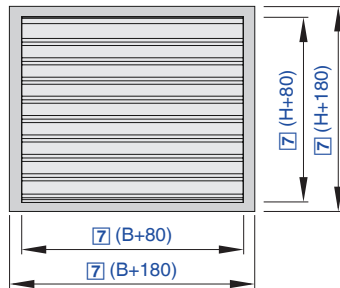
 WGF Corner section



WGF, corner section, weight

H	WGF-E	WGF-AL-E	
	B [mm]		
	600 × 600		
mm	kg		
500	17		13
625	22		16
750	26		19
875	30		22
1000	35		25
1250	38		31
1500	50		37
1750	59		43
2000	67		49
2250	76		55
2500	84		61

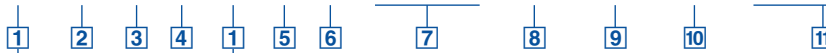




Combination with a multileaf damper

Order code

WG - AL - 2 - ... - JZ - P - L / 600x510 / ER / Z04 / NC / P1 - RAL ...



<p>1 Type WG-JZ Combination of external weather louvre and multileaf damper</p> <p>2 Material - WG AL Aluminium</p> <p>3 Construction - WG 1 No entry: wire mesh, galvanised steel 2 Insect screen, galvanised steel 3 Wire mesh, stainless steel (only WG-AL) 3 Insect screen and wire mesh made of stainless steel (only WG-AL)</p> <p>4 WG border U No entry: With fixing holes Without fixing holes</p>	<p>5 Function - JZ S Opposed (standard) P Parallel</p> <p>6 Operating side - JZ L No entry: on the right Left side</p> <p>7 Nominal size [mm] B x H</p> <p>8 Installation subframe - WG ER No entry: None With (not for construction without fixing holes)</p> <p>9 Attachments - JZ No entry: None Z04 - Z07 Quadrant stay Z12 - Z51 Actuators ZF01 - ZF15 Spring return actuators Z60 - Z77 Pneumatic actuators</p>	<p>10 Damper blade safety function - JZ Only for spring return actuators or pneumatic actuators NO Pressure off/power off to OPEN NC Pressure off/power off to CLOSE</p> <p>11 Surface - WG No entry: standard construction P1 Powder-coated, RAL Classic colour PS Powder-coated, DB colour</p> <p>Only for WG-AL S2 Anodised to EURAS standard, E6-C-... (31 to 35) S3 Anodised to EURAS standard, E6-C-0</p> <p>Gloss level RAL 9010 50 % RAL 9006 30 % All other RAL colours 70 %</p>
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Notes on the order code

The nominal size equals the dimensions of the duct connected to the multileaf damper (without actuator).

Depending on the size of the installation opening, an installation subframe may have to be used.

- Installation opening without installation subframe: B + 95 mm, H + 95 mm
- Installation opening with installation subframe: B + 115 mm, H + 115 mm

WG-JZ multileaf dampers cannot be retrofitted with an actuator

+ Features

Combinations of external weather louvres and multileaf dampers as a protection against the direct ingress of rain, leaves and birds, and for shut-off and control

- ▶ Maximum width of 2000 mm, maximum height of 1995 mm
- ▶ Low differential pressure due to aerofoil blades
- ▶ Low air-regenerated noise
- ▶ All aerodynamic data is measured in aerodynamics and acoustics laboratories
- ▶ Aerofoil parallel or opposed hollow blades
- ▶ Casing air leakage to EN 1751, class C
- ▶ Available in standard sizes and many intermediate sizes
- ▶ Pre-assembled combination, hence fast and easy to install

Optional equipment and accessories

- ▶ Installation subframe
- ▶ Insect screen
- ▶ Powder-coated or anodised surface
- ▶ Actuators: Open/Close actuators, modulating actuators

X Application

- ▶ Combinations of Type WG external weather louvres and Type JZ multileaf dampers for protecting fresh air and exhaust air openings in air conditioning systems
- ▶ Protection against the direct ingress of rain as well as against leaves and birds
- ▶ Recommended face velocity for fresh air openings: 2 - 2.5 m/s max.
- ▶ As an acting element in the volume flow and pressure control
- ▶ For shutting off ducts and openings in walls
- ▶ Parallel action blades are preferably used

for opening/closing

- ▶ Opposed action blades are due to their characteristics preferably used for variable operation

◇ Variants

- ▶ WG-JZ-S: External weather louvre and multileaf damper with opposed blade action, both made of galvanised sheet steel
- ▶ WG-JZ-P: External weather louvre and multileaf damper with parallel blade action, both made of galvanised sheet steel
- ▶ WG-AL-JZ-S: External weather louvre made of aluminium and multileaf damper with opposed blade action made of galvanised sheet steel
- ▶ WG-AL-JZ-P: External weather louvre made of aluminium and multileaf damper with parallel blade action made of galvanised sheet steel





+ Construction

Cover grille

- ▶ Wire mesh
- ▶ 1: With insect screen, galvanised steel (only WG-JZ)
- ▶ 2: With wire mesh, stainless steel (only WG-AL-JZ)
- ▶ 3: With insect screen and wire mesh, stainless steel (only WG-AL-JZ)

Border

- ▶ Border fixing holes
- ▶ U: Without fixing holes



Attachments

- ▶ Quadrant stays and limit switches: Quadrant stays to adjust the damper blades (stepless adjustment) and for capturing the end positions
- ▶ Open/Close actuators: Actuators for opening and closing multileaf dampers
- ▶ Modulating actuators: Actuators for stepless blade adjustment
- ▶ Pneumatic actuators: Pneumatic actuators for opening and closing multileaf dampers



& Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of external weather louvres



Special characteristics

- ▶ Any intermediate sizes within the standard size range are available
- ▶ Low installation effort on site since external weather louvre and multileaf damper are factory combined and assembled
- ▶ Aerofoil parallel or opposed hollow blades
- ▶ Operating temperature -20 - 100 °C
- ▶ For very large sizes, several combinations can be arranged side by side or on top of each other
- ▶ Low-maintenance, robust construction
- ▶ Low differential pressure and low noise due to aerofoil blades



Technical data

Nominal sizes	200 × 180 to 2000 × 1995 mm
Free area	Approx. 60 %, with insect screen approx. 45 %
Total differential pressure - exhaust air	30 Pa at 2.5 m/s
Total differential pressure - fresh air	35 Pa at 2.5 m/s
Operating temperature	-20 to 100 °C

WG-JZ

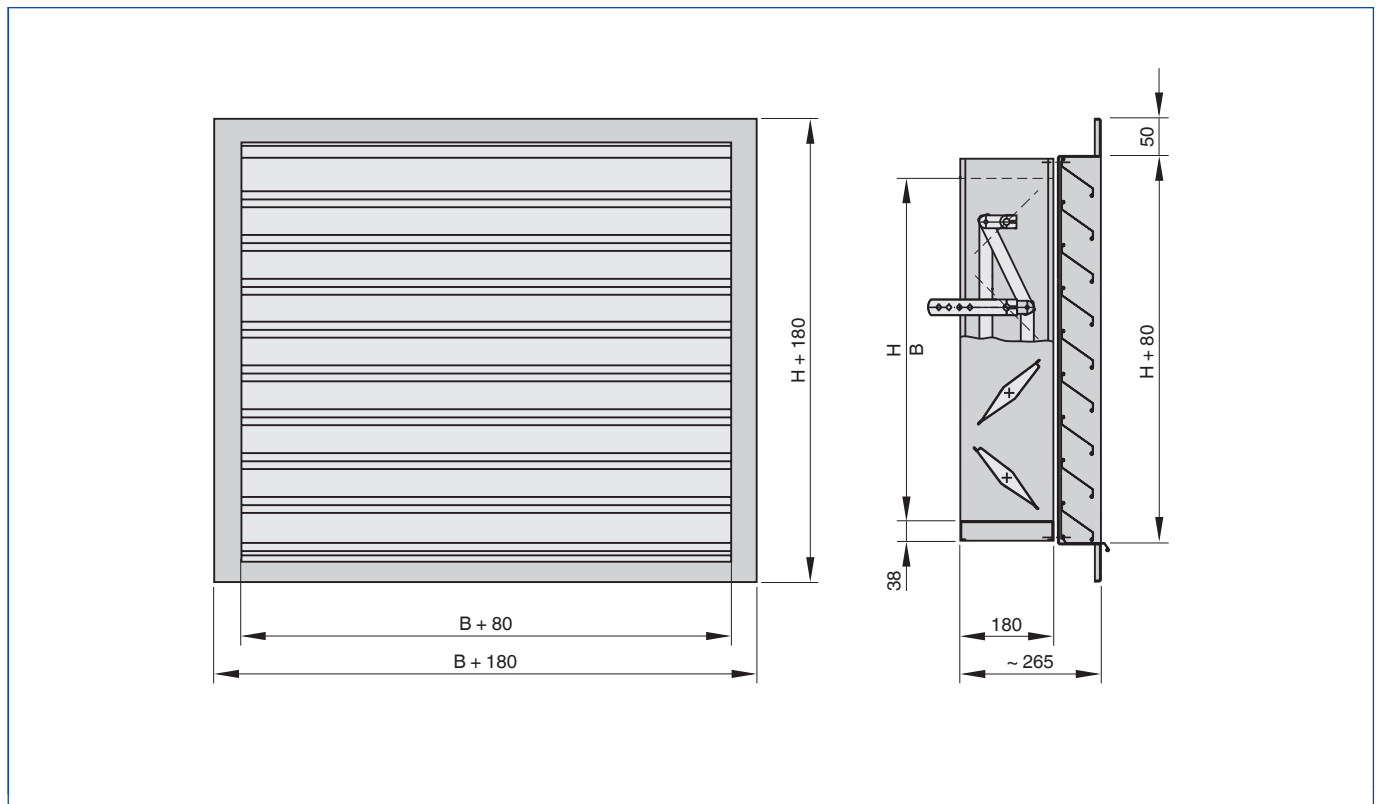


Illustration shows a multileaf damper with drive arm, operating side on the right



WG-JZ, weight

H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	1800	2000
mm	kg									
180	10	15	20	24	29	33	38	42	47	51
345	11	16	21	26	31	36	41	46	51	56
510	13	19	25	31	37	43	49	55	61	67
675	16	23	30	37	44	51	58	65	72	79
840	18	26	34	42	50	58	66	74	82	90
1005	20	28	37	45	54	62	71	79	88	96
1170	23	32	42	51	61	70	80	89	99	108
1335	26	36	47	57	68	78	89	99	110	120
1500	30	41	52	63	74	85	96	107	118	129
1665	34	46	58	70	82	94	106	118	130	142
1830	38	51	64	77	90	103	116	129	142	155
1995	40	56	72	88	104	120	136	152	168	184

WG-AL-JZ, weight

H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	1800	2000
mm	kg									
180	9	14	18	23	27	31	34	38	43	47
345	10	14	19	24	28	33	36	41	46	50
510	12	17	22	28	33	38	42	47	54	60
675	14	21	27	33	39	45	51	58	65	70
840	16	23	30	37	44	52	58	66	75	81
1005	17	25	32	40	48	56	63	70	79	86
1170	19	28	37	47	55	63	70	79	89	97
1335	22	32	42	53	61	70	79	88	100	107
1500	27	38	48	59	68	77	86	96	107	115
1665	31	44	54	66	76	87	96	107	119	127
1830	36	49	61	74	85	96	106	117	130	138
1995	38	55	70	86	100	114	126	140	155	166



 WG-JZ with actuator

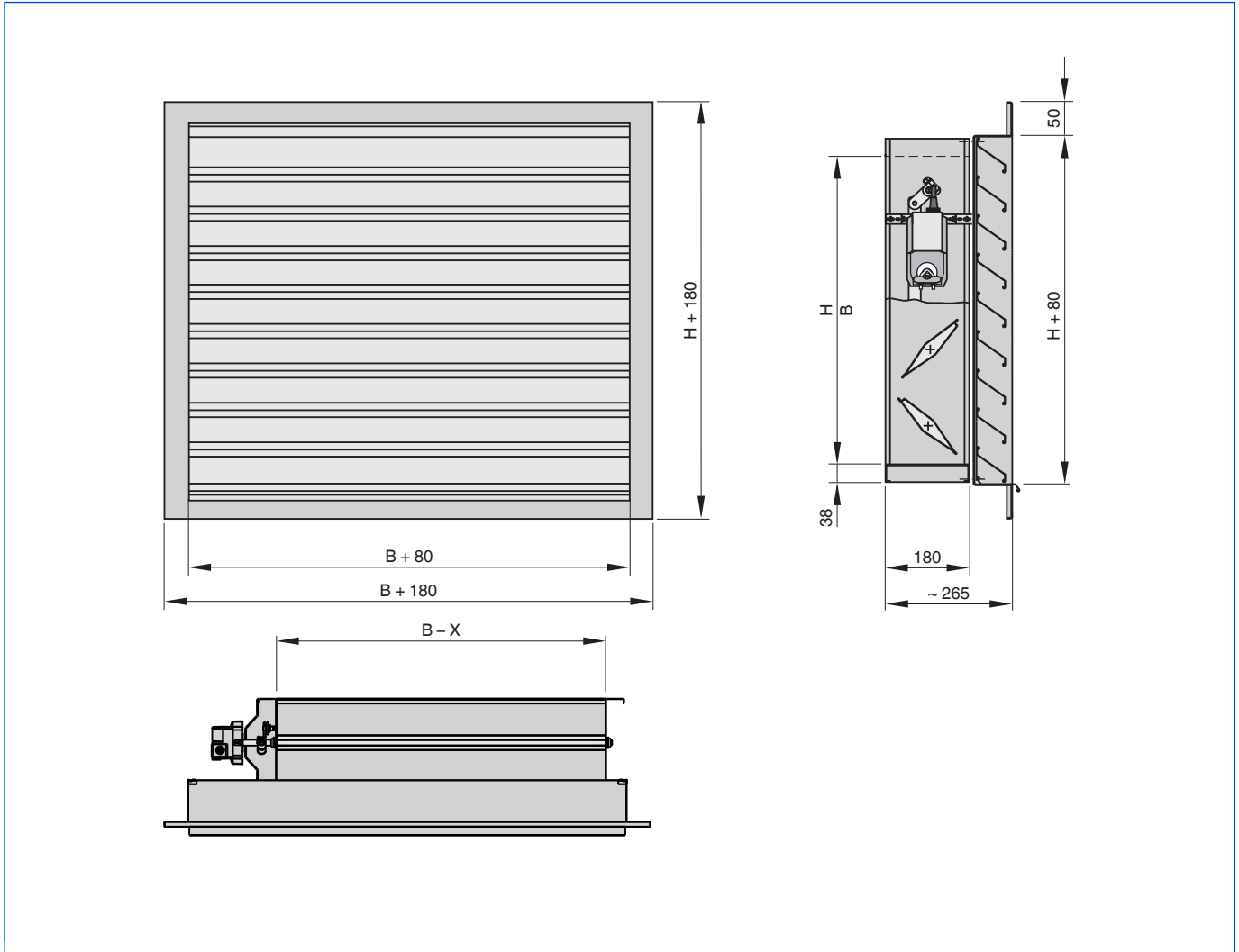


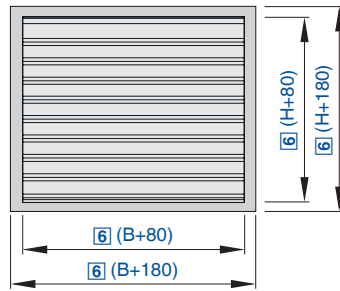
Illustration shows a multileaf damper with actuator, operating side on the right

Space required for attachments

Attachments	X	B _{min}
	mm	
Z12 - Z51	180	385
ZS21 - ZS22	180	385
ZF01 - ZF15	180	385
ZS99	180	385
Z60 - Z77	200	405

In WG-JZ combinations with an attachment the width of the multileaf damper is by X mm shorter than the external weather louvre.
B_{min} is the minimum width of a WG-JZ combination with an attachment (X + 205 mm)





Combination with a non-return damper

Order code

WG - AL - 2 - ... - KUL - 1 / 600x510 / ER / P1 - RAL ...



<p>1 Type WG-KUL Combination of external weather louvre and non-return damper</p> <p>2 Material - WG AL Aluminium</p> <p>3 Construction - WG 1 No entry: wire mesh 2 Insect screen, galvanised steel 3 Wire mesh, stainless steel (only WG-AL) 3 Insect screen and wire mesh made of stainless steel (only WG-AL)</p>	<p>4 WG border U No entry: With fixing holes Without fixing holes</p> <p>5 Airflow direction 1 Fresh air opening 2 Exhaust air opening</p> <p>6 Nominal size [mm] B x H</p> <p>7 Installation subframe - WG ER No entry: None With (not for construction without fixing holes)</p>	<p>8 Surface - WG P1 No entry: standard construction Powder-coated, RAL Classic colour PS Powder-coated, DB colour</p> <p>S2 Only for WG-AL Anodised to EURAS standard, E6-C-... (31 to 35)</p> <p>S3 Anodised to EURAS standard, E6-C-0</p> <p>Gloss level RAL 9010 50 % RAL 9006 30 % All other RAL colours 70 %</p>
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Notes on the order code

The nominal size equals the dimensions of the duct connected to the non-return damper. Depending on the size of the installation opening, an installation subframe may have to be used.

- Installation opening without installation subframe: B + 95 mm, H + 95 mm
- Installation opening with installation subframe: B + 115 mm, H + 115 mm

+ Features

- Combinations of external weather louvres and non-return dampers as a protection against the direct ingress of rain, leaves and birds, and to prevent air from flowing against the intended airflow direction.
- ▶ Maximum width of 2000 mm, maximum height of 1665 mm
 - ▶ Low differential pressure due to aerofoil blades
 - ▶ Low air-regenerated noise
 - ▶ All aerodynamic data is measured in aerodynamics and acoustics laboratories
 - ▶ Maximum differential pressure: 100 Pa
 - ▶ Available in standard sizes and many intermediate sizes
 - ▶ Pre-assembled combination, hence fast and easy to install

Optional equipment and accessories

- ▶ Installation subframe
- ▶ Insect screen
- ▶ Powder-coated or anodised surface

Application

- ▶ Combinations of Type WG external weather louvres and Type KUL non-return dampers for protecting fresh air and exhaust air openings in air conditioning systems
- ▶ Protection against the direct ingress of rain as well as against leaves and birds
- ▶ Recommended face velocity for fresh air openings: 2 - 2.5 m/s max.
- ▶ Prevention of unwanted airflows against the intended airflow direction when the system is not in operation
- ▶ Blades close automatically when the system is shut down

Variants

- ▶ **WG-KUL:** External weather louvre made of galvanised sheet steel, with non-return damper
- ▶ **WG-AL-KUL:** External weather louvre made of aluminium, with non-return damper
- ▶ **1:** Fresh air opening
- ▶ **2:** Exhaust air opening

& Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of external weather louvres

★ Special characteristics

- ▶ Any intermediate sizes within the standard size range are available
- ▶ Low installation effort on site since external weather louvre and non-return damper are factory combined and assembled
- ▶ Operating temperature 20 - 80 °C
- ▶ For very large sizes, several combinations can be arranged side by side or on top of each other
- ▶ Maximum pressure of 100 Pa
- ▶ Low differential pressure due to aerofoil blades
- ▶ Non-return dampers are opened and closed by the airflow; no actuator is required





Technical data

Nominal sizes	200 × 180 to 1600 × 1665 mm
Free area	Approx. 60 %, with insect screen approx. 45 %
Total differential pressure - exhaust air	55 Pa at 2.5 m/s
Total differential pressure - fresh air	60 Pa at 2.5 m/s
Operating temperature	-20 to 80 °C
Maximum pressure	100 Pa

WG-KUL-1, WG-AL-KUL-1

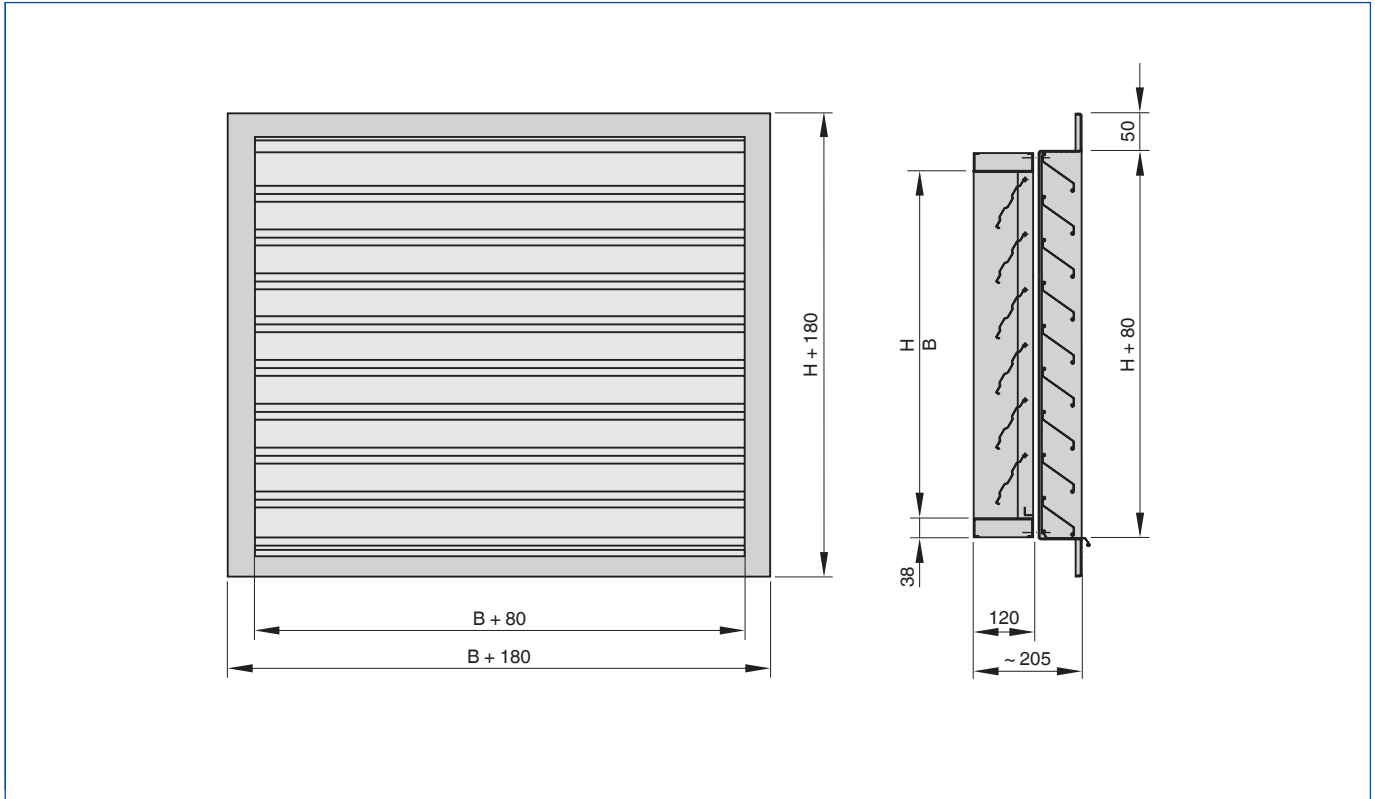


Illustration shows WG-KUL-1



WG-KUL-2, WG-AL-KUL-2

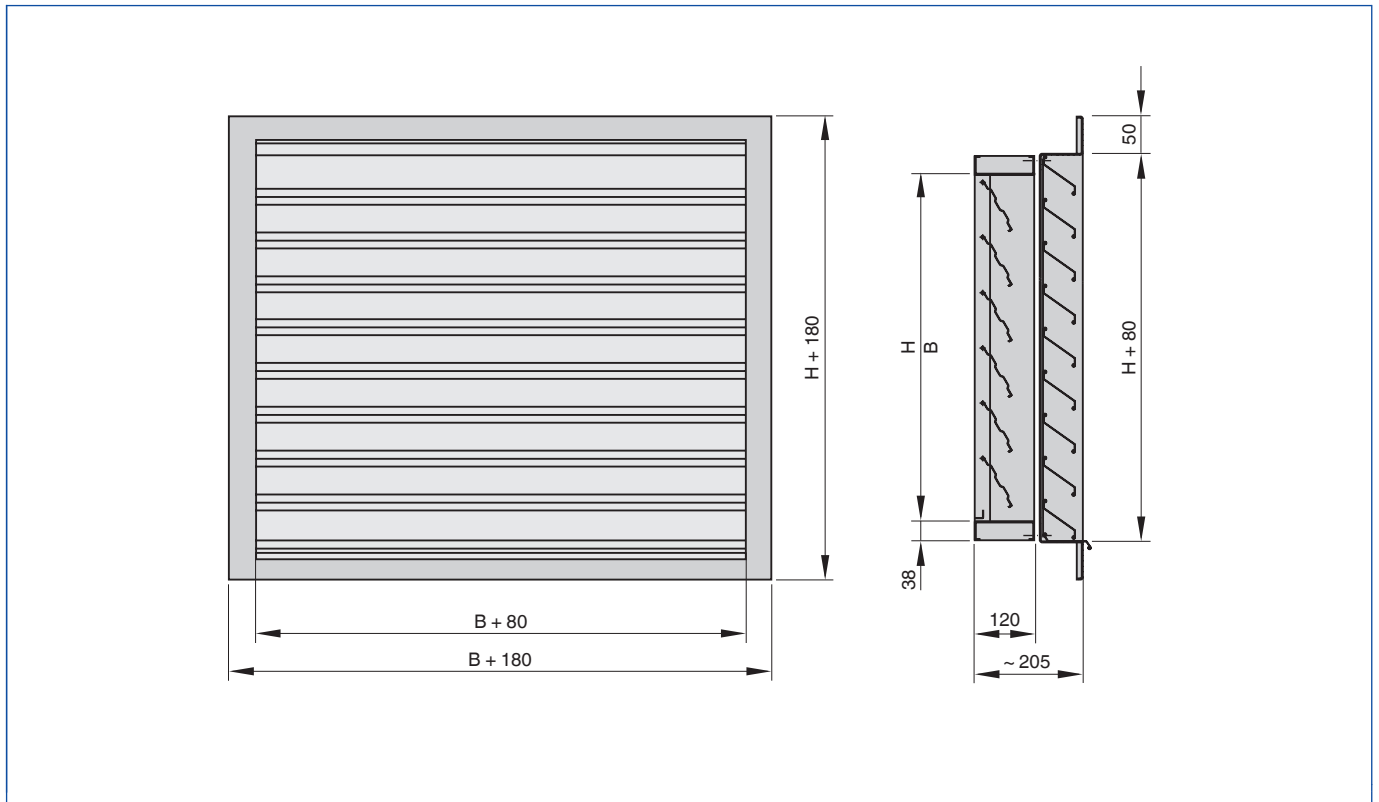


Illustration shows WG-KUL-2

WG-KUL, weight

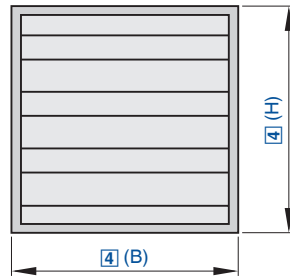
H	B [mm]							
	200	400	600	800	1000	1200	1400	1600
mm	kg							
180	9	10	14	18	22	26	30	34
345	12	14	18	22	26	30	34	38
510	15	18	22	27	31	36	41	46
675	17	22	27	33	38	44	49	54
840	18	24	29	35	40	46	52	58
1005	21	27	33	40	46	53	59	65
1170	23	31	38	45	52	59	66	72
1335	25	33	41	49	56	64	71	79
1500	27	35	43	51	59	67	75	83
1665	30	38	46	54	62	70	78	86



 WG-AL-KUL, weight

H	B [mm]							
	200	400	600	800	1000	1200	1400	1600
mm	kg							
180	8	9	13	17	20	24	27	30
345	11	12	16	20	23	27	29	33
510	14	16	19	24	27	31	34	38
675	15	20	24	29	33	38	42	47
840	16	21	25	30	34	40	44	50
1005	18	24	28	35	40	47	51	56
1170	20	27	33	41	46	52	56	62
1335	21	29	37	45	50	56	61	68
1500	24	32	39	47	53	59	65	72
1665	27	36	42	50	56	63	68	75





With sound reduction characteristics



Order code

NL – H – A / 1800x2250 / P1 – RAL ...

1 2 3 4 5

1 Type

NL Acoustic louvre

2 Acoustic performance

No entry: standard requirement, single louvre

H High, double bank
D Non-active section

3 Material

S Galvanised steel
A Raw aluminium

4 Nominal size [mm]

B x H

5 Surface

P1 No entry: standard construction
Powder-coated, RAL Classic colour

Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %



Features

Acoustic louvres as a protection of air conditioning systems against the direct ingress of rain, leaves and birds into fresh air and exhaust air openings

- ▶ Maximum width of 1800 mm, maximum height of 2250 mm
- ▶ Low differential pressure due to aerofoil blades
- ▶ Low air-regenerated noise
- ▶ All aerodynamic data is measured in aerodynamics and acoustics laboratories
- ▶ Absorption material faced with glass fibre fabric and retained by perforated sheet metal
- ▶ Double bank of louvre blades for demanding acoustic requirements
- ▶ Non-active section, without acoustic function, for a uniform appearance
- ▶ Multi-section constructions for large dimensions

Optional equipment and accessories

- ▶ Powder-coated



Application

- ▶ Acoustic louvres of Type NL for the fresh air and exhaust air openings of air conditioning systems
- ▶ Protection against the direct ingress of rain as well as against leaves and birds
- ▶ Recommended face velocity for fresh air openings: 2 - 2.5 m/s max.
- ▶ Weather and noise protection with a compact-depth unit



Variants

- ▶ NL: Acoustic louvre
- ▶ NL-H: Double bank for demanding acoustic requirements
- ▶ NL-D: Non-active section for a uniform appearance



Construction

- ▶ S: Galvanised sheet steel
- ▶ A: Aluminium



Special characteristics

- ▶ Two construction depths for normal and demanding acoustic requirements
- ▶ Aerofoil blades
- ▶ Absorption material retained by perforated sheet metal



Standards and guidelines

- ▶ Insertion loss and sound power level of air-regenerated noise tested to ISO 7235
- ▶ Sound reduction index determined according to EN ISO 10140-2 und EN ISO 717-1



Technical data

Nominal sizes	300 x 450 to 1800 x 2250 mm
Width subdivided	Up to 3600 mm
Height subdivided	Up to 4500 mm
Volume flow rate range (undivided construction)	120 - 9360 l/s or 432 - 33696 m ³ /h at max. 2.5 m/s



NL, width 300 - 1050 mm, volume flow rate at max. 2.5 m/s

Height	Width [mm]											
	300		450		600		750		900		1050	
mm	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
450	120	432	180	648	240	864	300	1080	360	1296	420	1512
600	240	864	360	1296	480	1728	600	2160	720	2592	840	3024
750	360	1296	540	1944	720	2592	900	3240	1080	3888	1260	4536
900	480	1728	720	2592	960	3456	1200	4320	1440	5184	1680	6048
1050	600	2160	900	3240	1200	4320	1500	5400	1800	6480	2100	7560
1200	720	2592	1080	3888	1440	5184	1800	6480	2160	7776	2520	9072
1350	840	3024	1260	4536	1680	6048	2100	7560	2520	9072	2940	10584
1500	960	3456	1440	5184	1920	6912	2400	8640	2880	10368	3360	12096
1650	1080	3888	1620	5832	2160	7776	2700	9720	3240	11664	3780	13608
1800	1200	4320	1800	6480	2400	8640	3000	10800	3600	12960	4200	15120
1950	1320	4752	1980	7128	2640	9504	3300	11880	3960	14256	4620	16632
2100	1440	5184	2160	7776	2880	10368	3600	12960	4320	15552	5040	18144
2250	1560	5616	2340	8424	3120	11232	3900	14040	4680	16848	5460	19656

NL, width 1200 - 1800 mm, volume flow rate at max. 2.5 m/s

Height	Width [mm]									
	1200		1350		1500		1650		1800	
mm	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
450	480	1728	540	1944	600	2160	660	2376	720	2592
600	960	3456	1080	3888	1200	4320	1320	4752	1440	5184
750	1440	5184	1620	5832	1800	6480	1980	7128	2160	7776
900	1920	6912	2160	7776	2400	8640	2640	9504	2880	10368
1050	2400	8640	2700	9720	3000	10800	3300	11880	3600	12960
1200	2880	10368	3240	11664	3600	12960	3960	14256	4320	15552
1350	3360	12096	3780	13608	4200	15120	4620	16632	5040	18144
1500	3840	13824	4320	15552	4800	17280	5280	19008	5760	20736
1650	4320	15552	4860	17496	5400	19440	5940	21384	6480	23328
1800	4800	17280	5400	19440	6000	21600	6600	23760	7200	25920
1950	5280	19008	5940	21384	6600	23760	7260	26136	7920	28512
2100	5760	20736	6480	23328	7200	25920	7920	28512	8640	31104
2250	6240	22464	7020	25272	7800	28080	8580	30888	9360	33696

NL, differential pressure and sound power level

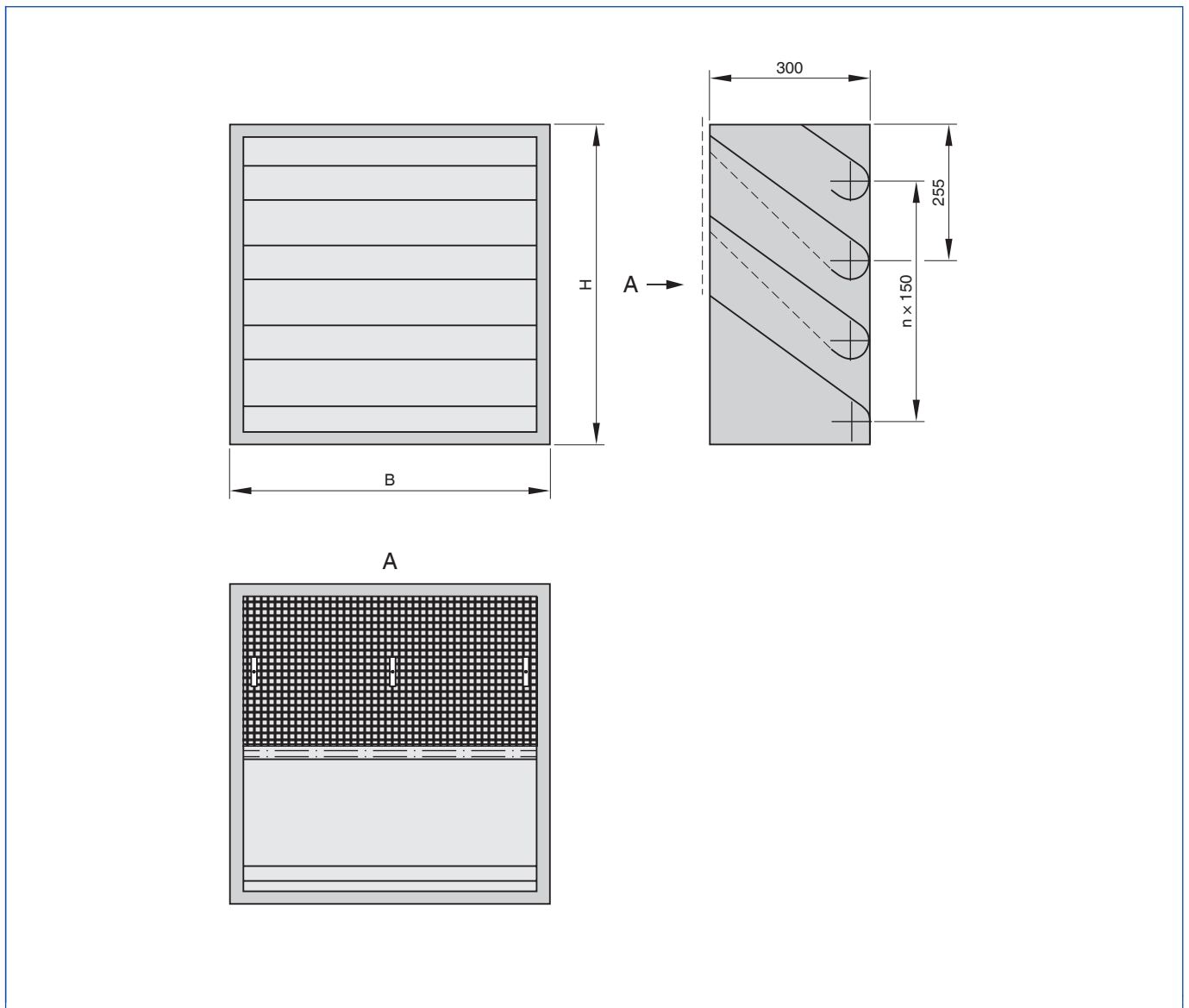
v	v _t	Installation type							
		A		B		C		D	
		Δp _t	L _{WA}	Δp _t	L _{WA}	Δp _t	L _{WA}	Δp _t	L _{WA}
m/s	m/s	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
1.5	0.2 - 0.4	2	<15	2	<15	2	<15	1	<15
2	0.2 - 0.6	4	<15	4	<15	4	<15	4	<15
4	0.4 - 1.2	18	32	14	28	18	29	14	27
6	0.7 - 1.7	40	44	30	40	40	41	28	39
8	0.9 - 2.3	70	52	50	48	65	49	50	47
10	1.1 - 2.9	110	58	80	54	105	55	75	53



NL-H, Differential pressure and sound power level

v	v _t	Installation type							
		A		B		C		D	
		Δp_t	L _{WA}	Δp_t	L _{WA}	Δp_t	L _{WA}	Δp_t	L _{WA}
m/s	m/s	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
1	0.1 - 0.3	2	<15	2	<15	2	<15	2	<15
2	0.2 - 0.6	8	26	6	19	6	18	6	18
3	0.3 - 0.9	16	37	12	30	12	29	12	29
4	0.4 - 1.2	26	45	20	38	20	37	20	37
5	0.6 - 1.5	40	52	30	45	30	44	30	44
7	0.8 - 2.0	80	61	65	54	60	53	60	53

NL



NL-S, weight

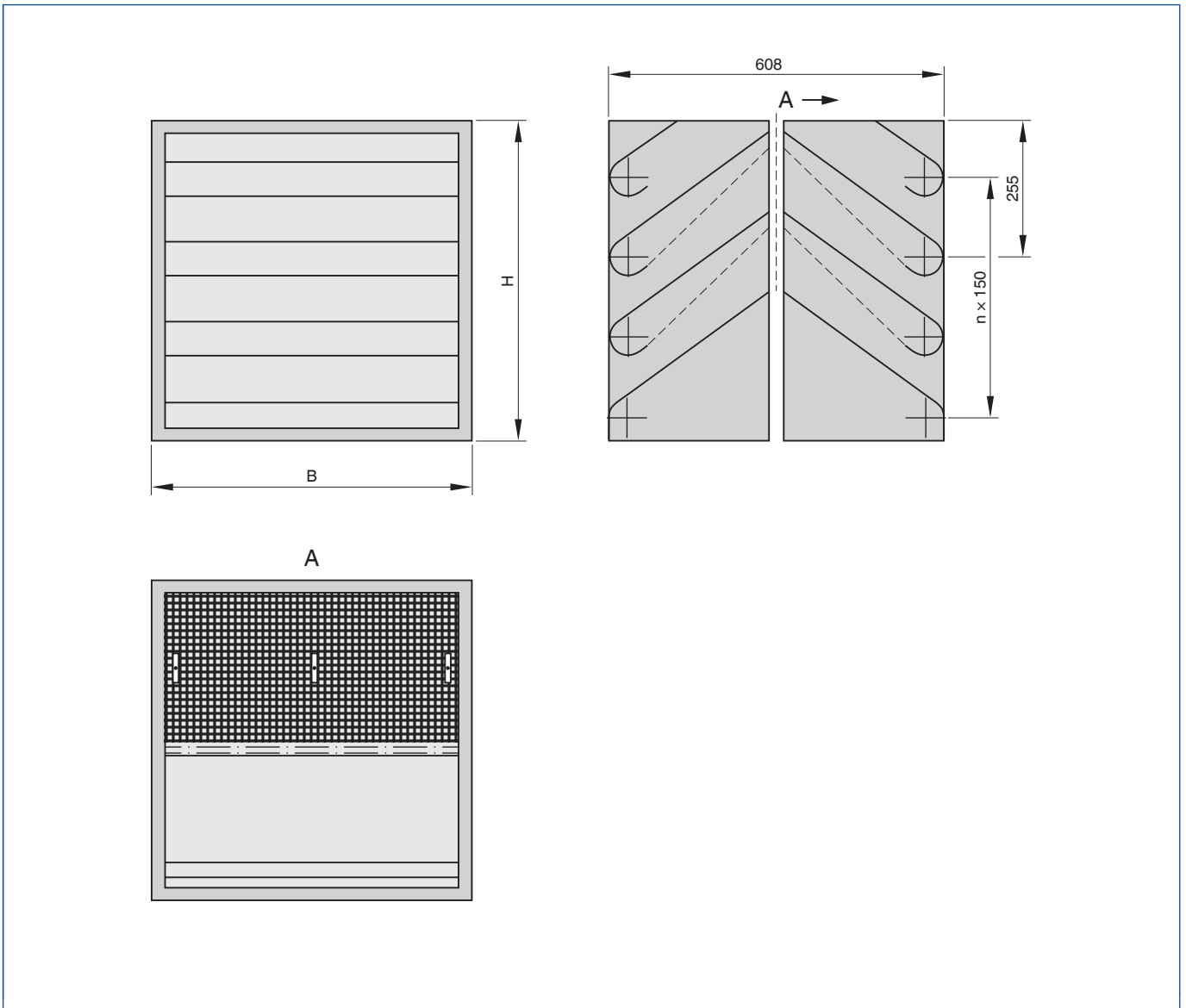
H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	7	10	13	16	19	23	26	29	32	36	39
600	9	13	17	22	26	30	35	39	43	48	52
750	11	16	22	27	32	38	43	49	54	59	65
900	13	19	26	32	39	45	52	58	65	71	78
1050	15	23	30	38	45	53	61	68	76	83	91
1200	17	26	35	43	52	61	69	78	86	95	104
1350	19	29	39	49	58	68	78	88	97	107	117
1500	22	32	43	54	65	76	86	97	108	119	130
1650	24	36	48	59	71	83	95	107	119	131	143
1800	26	39	52	65	78	91	104	117	130	143	156
1950	28	42	56	70	84	98	112	126	140	154	169
2100	30	45	61	76	91	106	121	136	151	166	181
2250	32	49	65	81	97	113	130	146	162	178	194

NL-A, weight

H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	5	7	10	12	14	17	19	21	24	26	28
600	6	10	13	16	19	22	25	28	32	35	38
750	8	12	16	20	24	28	32	35	39	43	47
900	10	14	19	24	28	33	38	43	47	52	57
1050	11	17	22	28	33	39	44	50	55	61	66
1200	13	19	25	32	38	44	50	57	63	69	76
1350	14	21	28	35	43	50	57	64	71	78	85
1500	16	24	32	39	47	55	63	71	79	87	95
1650	17	26	35	43	52	61	69	78	87	95	104
1800	19	28	38	47	57	66	76	85	95	104	113
1950	21	31	41	51	61	72	82	92	102	113	123
2100	22	33	44	55	66	77	88	99	110	121	132
2250	24	35	47	59	71	83	95	106	118	130	142



NL-H



NL-H-S, weight

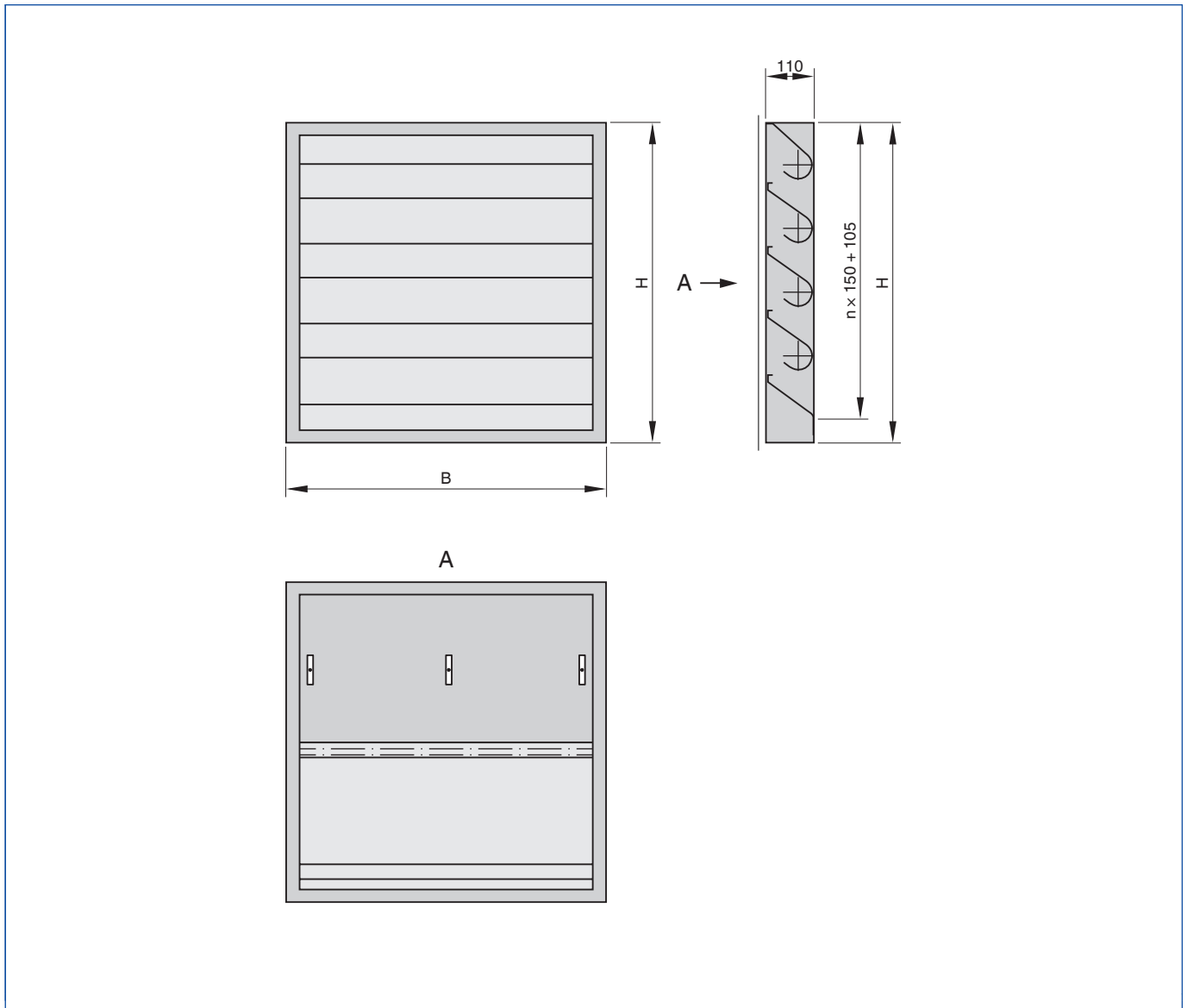
H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	13	19	26	32	39	45	52	58	65	71	78
600	17	26	35	43	52	61	69	78	86	95	104
750	22	32	43	54	65	76	86	97	108	119	130
900	26	39	52	65	78	91	104	117	130	143	156
1050	30	45	61	76	91	106	121	136	151	166	181
1200	35	52	69	86	104	121	138	156	173	190	207
1350	39	58	78	97	117	136	156	175	194	214	233
1500	43	65	86	108	130	151	173	194	216	238	259
1650	48	71	95	119	143	166	190	214	238	261	285
1800	52	78	104	130	156	181	207	233	259	285	311
1950	56	84	112	140	169	197	225	253	281	309	337
2100	61	91	121	151	181	212	242	272	302	333	363
2250	65	97	130	162	194	227	259	292	324	356	389



NL-H-A, weight

H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	10	14	19	24	28	33	38	43	47	52	57
600	13	19	25	32	38	44	50	57	63	69	76
750	16	24	32	39	47	55	63	71	79	87	95
900	19	28	38	47	57	66	76	85	95	104	113
1050	22	33	44	55	66	77	88	99	110	121	132
1200	25	38	50	63	76	88	101	113	126	139	151
1350	28	43	57	71	85	99	113	128	142	156	170
1500	32	47	63	79	95	110	126	142	158	173	189
1650	35	52	69	87	104	121	139	156	173	191	208
1800	38	57	76	95	113	132	151	170	189	208	227
1950	41	61	82	102	123	143	164	184	205	225	246
2100	44	66	88	110	132	154	176	199	221	243	265
2250	47	71	95	118	142	165	189	213	236	260	284

NL-D





NL-D-S, weight

H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	3	5	7	8	10	11	13	15	16	18	19
600	4	7	9	11	13	15	17	19	22	24	26
750	5	8	11	14	16	19	22	24	27	30	32
900	7	10	13	16	19	23	26	29	32	36	39
1050	8	11	15	19	23	27	30	34	38	42	45
1200	9	13	17	22	26	30	35	39	43	48	52
1350	10	15	19	24	29	34	39	44	49	54	58
1500	11	16	22	27	32	38	43	49	54	59	65
1650	12	18	24	30	36	42	48	54	59	65	71
1800	13	19	26	32	39	45	52	58	65	71	78
1950	14	21	28	35	42	49	56	63	70	77	84
2100	15	23	30	38	45	53	61	68	76	83	91
2250	16	24	32	41	49	57	65	73	81	89	97

NL-D-A, weight

H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	2	4	5	6	7	8	10	11	12	13	14
600	3	5	6	8	10	11	13	14	16	17	19
750	4	6	8	10	12	14	16	18	20	22	24
900	5	7	10	12	14	17	19	21	24	26	28
1050	6	8	11	14	17	19	22	25	28	30	33
1200	6	10	13	16	19	22	25	28	32	35	38
1350	7	11	14	18	21	25	28	32	35	39	43
1500	8	12	16	20	24	28	32	35	39	43	47
1650	9	13	17	22	26	30	35	39	43	48	52
1800	10	14	19	24	28	33	38	43	47	52	57
1950	10	15	21	26	31	36	41	46	51	56	61
2100	11	17	22	28	33	39	44	50	55	61	66
2250	12	18	24	30	35	41	47	53	59	65	71



Mechanically self-powered dampers

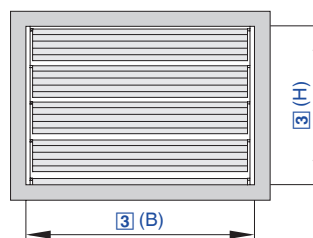
	Type			
	UL	KUL	ARK	ARK2
Function				
Non-return damper	●	●	●	
Pressure relief damper				●
Maximum differential pressure	100 Pa	100 Pa	5000 Pa	5000 Pa
Casing				
Galvanised sheet steel	●	●	●	●
Stainless steel			●	●
Blades				
Aluminium	●	●	●	●
Border / duct connection				
Without holes		●	●	●
Flange holes	●	●	●	●
Bearings				
Plastic / brass	●	●		
DU bearing / stainless steel			●	●
Seals				
Material	Foamed polyester	Foamed polyester	Neoprene	Neoprene
Dynamics				
Linkage			●	
Adjustable blade restrictor			●	
Adjustable differential pressure for blade opening				●
Nominal sizes				
Width	200 - 1600 mm	200 - 1600 mm	200 - 1200 mm	200 - 1200 mm
Increments	1 mm	1 mm	1 mm	1 mm
Height	215 - 1615 mm	215 - 1615 mm	345 - 1995 mm	345 - 1995 mm
Increments	1 mm	1 mm		
Surface				
Powder-coated	●	●	●	●
Casing				
Length	40 mm	120 mm	180 mm	180 mm
Casing air leakage to EN 1751	Class C	Class C	Class C	Class C
Installation				
Duct		●	●	●
Wall	●		●	●
Ceiling			●	
Airflow				
Horizontal	●	●	●	●
Vertical			●	
Explanation				
● - Standard				



List of abbreviations



L_{WA} [dB(A)]	A-weighted sound power level of air-regenerated noise for the mechanically self-powered damper
A [m ²]	Upstream cross section
v [m/s]	Airflow velocity based on the upstream cross section
\dot{V} [m ³ /h] and [l/s]	Volume flow rate
Δp_{st} [Pa]	Static differential pressure
Δp_t [Pa]	Total differential pressure
B [mm]	Duct width
H [mm]	Duct height
n []	Number of flange screw holes
m [kg]	Weight



For installation into walls or rectangular ducts

Order code

UL - 1 / 800x515 / ER / P1 - RAL ...

1 2 3 4 5

1 Type

UL Non-return damper

3 Nominal size [mm]

B x H

5 Surface

No entry: standard construction
P1 Powder-coated, RAL CLASSIC colour
PS Powder-coated, DB colour

2 Airflow direction

- 1 Airflow directed towards the installation side
- 2 Airflow directed towards the rear side (suction)

4 Installation subframe

No entry: none
ER With

Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

Notes on the order code

The nominal size equals the interior dimensions of the front border.
Depending on the size of the installation opening, an installation subframe may have to be used.
- Installation opening without installation subframe: B + 15 mm, H + 15 mm
- Installation opening with installation subframe: B + 35 mm, H + 35 mm

+ Features

- Non-return dampers prevent unwanted airflows against the intended airflow direction when the system is not in operation
- ▶ Maximum differential pressure: 100 Pa
 - ▶ Angle section border to be installed in wall openings
 - ▶ Available in standard sizes and many intermediate sizes
 - ▶ Non-return damper with formed aluminium blades for normal requirements; blades are fitted with seals for sound attenuation

Optional equipment and accessories

- ▶ Installation subframe
- ▶ Powder coating (RAL or DB)

X Application

- ▶ Type UL non-return dampers for installation into internal walls and rectangular ducts
- ▶ Prevention of unwanted airflows against the intended airflow direction when the system is not in operation
- ▶ Blades close automatically when the system is shut down
- ▶ Maximum differential pressure: 100 Pa

◊ Variants

- ▶ UL-1: Non-return damper for airflows directed towards the installation side
- ▶ UL-2: Non-return damper for airflows directed towards the rear side (suction)

& Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of mechanically self-powered dampers

★ Special characteristics

- ▶ Any intermediate sizes within the standard size range are available
- ▶ operating temperature: -20 - 80 °C
- ▶ Maximum differential pressure: 100 Pa
- ▶ Non-return dampers are opened and closed by the airflow; no actuator is required
- ▶ Non-return damper with formed aluminium blades for normal requirements; blades are fitted with seals for sound attenuation

📈 Technical data

Nominal sizes	200 x 215 to 1600 x 1615 mm
Volume flow rate range	110 - 6460 l/s or 396 - 23256 m ³ /h at 2.5 m/s
Total differential pressure	25 Pa at 2.5 m/s
Maximum differential pressure in closing direction	100 Pa
Operating temperature	-20 to 80 °C





UL, KUL: Width 200 - 600 mm, volume flow rate at 2.5 m/s

H	B [mm]									
	200		300		400		500		600	
mm	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h
215	110	396	160	576	215	774	270	972	325	1170
315	160	576	235	846	315	1134	395	1422	475	1710
415	210	756	310	1116	415	1494	520	1872	625	2250
515	260	936	385	1386	515	1854	645	2322	775	2790
615	310	1116	460	1656	615	2214	770	2772	925	3330
715	360	1296	535	1926	715	2574	895	3222	1070	3852
815	410	1476	610	2196	815	2934	1020	3672	1220	4392
1015	510	1836	760	2736	1020	3672	1270	4572	1520	5472
1215	610	2196	910	3276	1220	4392	1520	5472	1820	6552
1415	710	2556	1060	3816	1420	5112	1770	6372	2120	7632
1615	810	2916	1210	4356	1620	5832	2020	7272	2420	8712

UL, KUL: Width 800 - 1600 mm, volume flow rate at 2.5 m/s

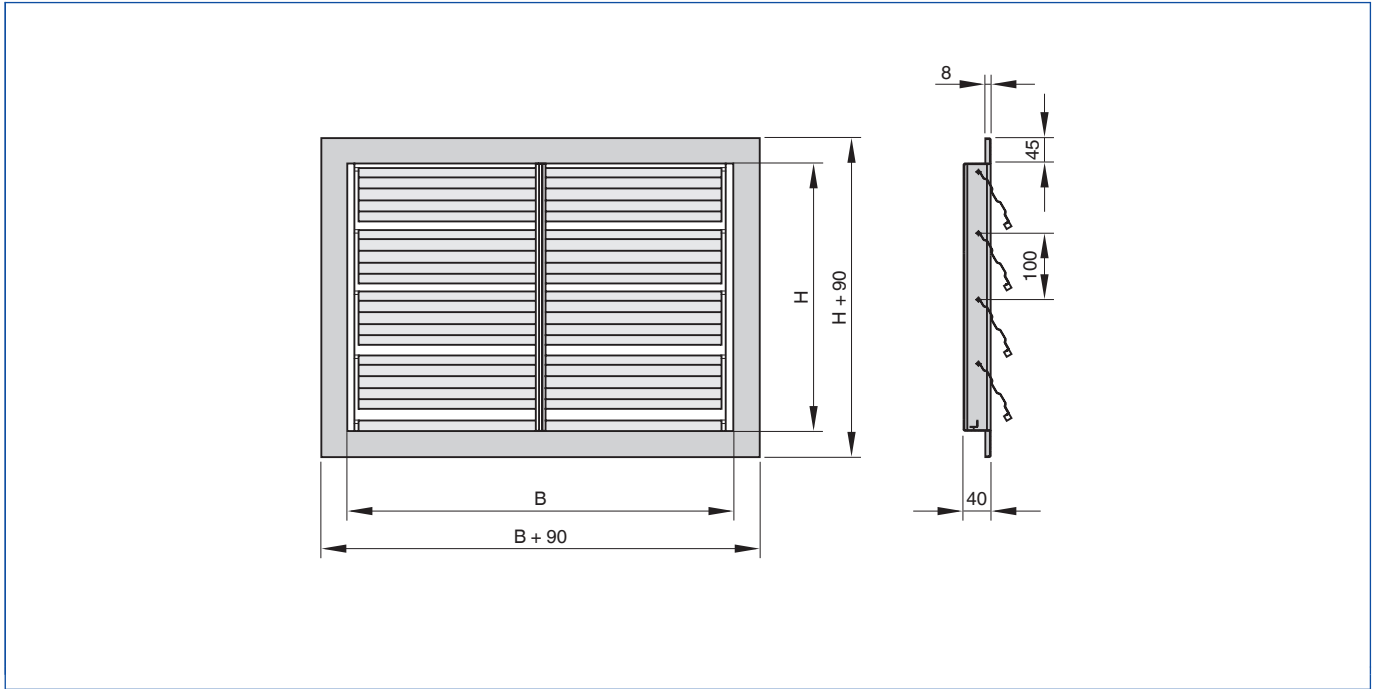
H	B [mm]									
	800		1000		1200		1400		1600	
mm	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h
215	430	1548	540	1944	645	2322	755	2718	860	3096
315	630	2268	790	2844	945	3402	1100	3960	1260	4536
415	830	2988	1040	3744	1250	4500	1450	5220	1660	5976
515	1030	3708	1290	4644	1550	5580	1800	6480	2060	7416
615	1230	4428	1540	5544	1850	6660	2150	7740	2460	8856
715	1430	5148	1790	6444	2150	7740	2500	9000	2860	10296
815	1630	5868	2040	7344	2450	8820	2850	10260	3260	11736
1015	2030	7308	2540	9144	3050	10980	3550	12780	4060	14616
1215	2430	8748	3040	10944	3650	13140	4250	15300	4860	17496
1415	2830	10188	3540	12744	4250	15300	4950	17820	5660	20376
1615	3230	11628	4040	14544	4850	17460	5650	20340	6460	23256

Differential pressure

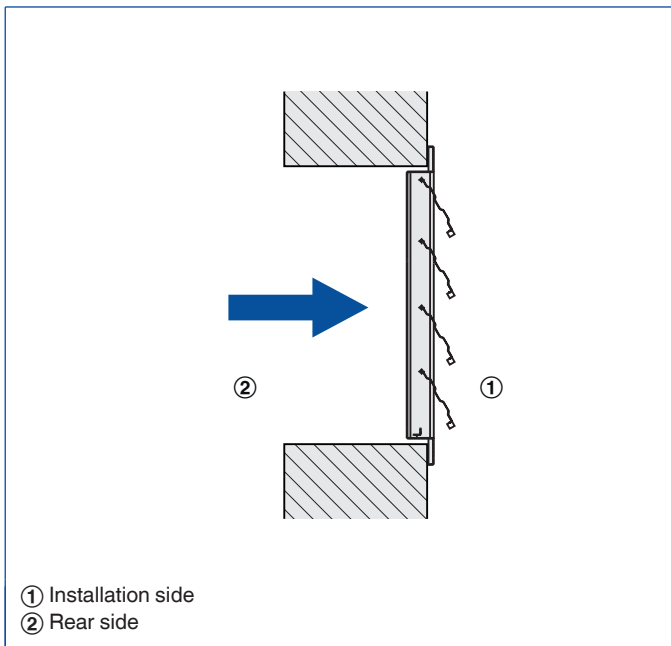
v	UL-1		UL-2	
	Δp_t			
m/s	Pa			
0.5		10		12
1		16		18
2		20		24
3		25		30
4		30		40
5		40		55
6		45		65



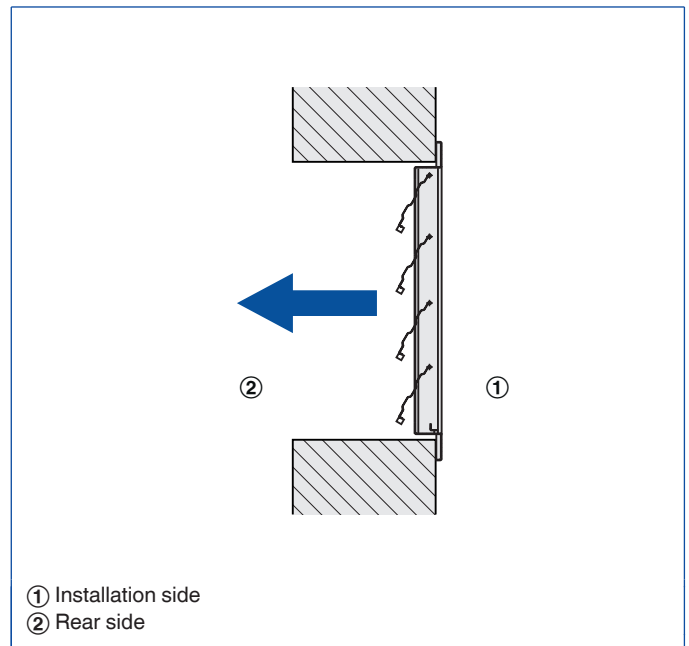
UL-1



UL-1, airflow direction



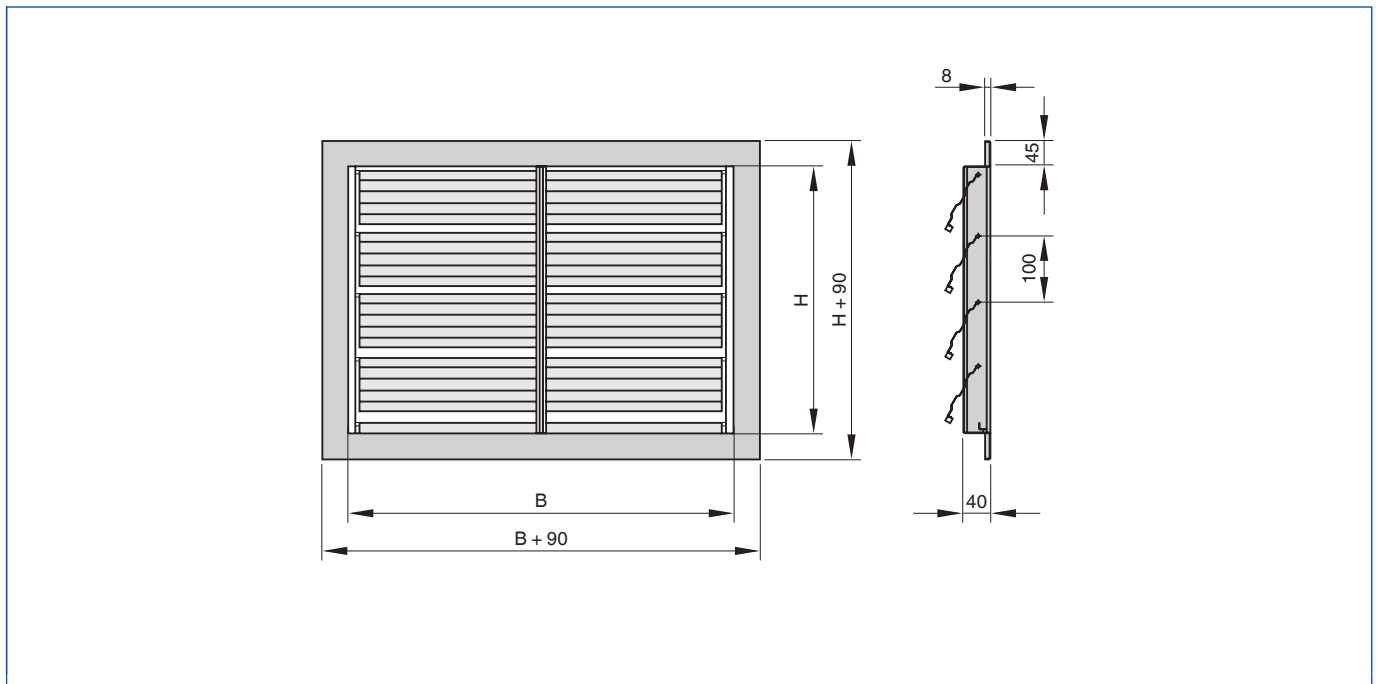
UL-2, airflow direction



UL, weight

H	B [mm]									
	200	300	400	500	600	800	1000	1200	1400	1600
mm	kg									
215	3	3	3	4	4	5	6	7	8	9
315	3	3	4	4	5	6	7	8	9	10
415	3	4	4	5	5	6	7	8	9	10
515	4	4	5	5	6	7	8	9	10	11
615	4	5	5	6	7	8	9	10	11	12
715	5	5	6	7	8	9	10	11	12	13
815	5	6	7	8	9	10	11	12	13	14
1015	7	8	9	10	11	12	13	14	15	16
1215	9	10	11	12	13	14	15	16	17	18
1415	11	12	13	14	15	16	17	18	19	20
1615	13	14	15	16	17	18	19	20	21	22

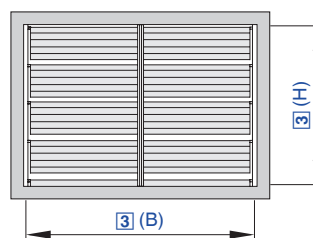
UL-2



UL, weight

H	B [mm]									
	200	300	400	500	600	800	1000	1200	1400	1600
mm	kg									
215	3	3	3	4	4	5	6	7	8	9
315	3	3	4	4	5	6	7	8	9	10
415	3	4	4	5	5	6	7	8	9	10
515	4	4	5	5	6	7	8	9	10	11
615	4	5	5	6	7	8	9	10	11	12
715	5	5	6	7	8	9	10	11	12	13
815	5	6	7	8	9	10	11	12	13	14
1015	7	8	9	10	11	12	13	14	15	16
1215	9	10	11	12	13	14	15	16	17	18
1415	11	12	13	14	15	16	17	18	19	20
1615	13	14	15	16	17	18	19	20	21	22





For installation into ductwork

Order code

KUL - G / 800x1015 / ER / P1 - RAL ...

1 2 3 4 5

1 Type

KUL Non-return damper

2 Construction

No entry: duct connection without flange holes
G Duct connection, flange holes on both sides

3 Nominal size [mm]

B x H

4 Installation subframe

No entry: none
ER With (only KUL-G)

5 Surface

No entry: standard construction
P1 Powder-coated, RAL CLASSIC colour
PS Powder-coated, DB colour

Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

+ Features

Non-return dampers prevent unwanted airflows against the intended airflow direction when the system is not in operation

- ▶ Maximum differential pressure: 100 Pa
- ▶ Casing with U-channel connection suitable for rectangular ducts
- ▶ Available in standard sizes and many intermediate sizes
- ▶ Non-return damper with formed aluminium blades for normal requirements; blades are fitted with seals for sound attenuation

Optional equipment and accessories

- ▶ Installation subframe
- ▶ Powder coating (RAL or DB)

7 Application

- ▶ Type KUL non-return damper for installation into ductwork
- ▶ Prevention of unwanted airflows against the intended airflow direction when the system is not in operation
- ▶ Blades close automatically when the system is shut down
- ▶ Maximum differential pressure 100 Pa

◊ Variants

- ▶ KUL: Non-return damper, duct connection without flange holes
- ▶ KUL-G: Non-return damper, duct connection with flange holes

& Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of mechanically self-powered dampers

★ Special characteristics

- ▶ Any intermediate sizes within the standard size range are available
- ▶ operating temperature: -20 - 80 °C
- ▶ Maximum differential pressure: 100 Pa
- ▶ Non-return dampers are opened and closed by the airflow; no actuator is required
- ▶ Non-return damper with formed aluminium blades for normal requirements; blades are fitted with seals for sound attenuation

📈 Technical data

Nominal sizes	200 x 215 to 1600 x 1615 mm
Volume flow rate range	110 - 6460 l/s or 396 - 23256 m ³ /h at 2.5 m/s
Total differential pressure	25 Pa at 2.5 m/s
Maximum differential pressure in closing direction	100 Pa
Operating temperature	-20 to 80 °C





UL, KUL: Width 200 - 600 mm, volume flow rate at 2.5 m/s

H	B [mm]									
	200		300		400		500		600	
mm	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
215	110	396	160	576	215	774	270	972	325	1170
315	160	576	235	846	315	1134	395	1422	475	1710
415	210	756	310	1116	415	1494	520	1872	625	2250
515	260	936	385	1386	515	1854	645	2322	775	2790
615	310	1116	460	1656	615	2214	770	2772	925	3330
715	360	1296	535	1926	715	2574	895	3222	1070	3852
815	410	1476	610	2196	815	2934	1020	3672	1220	4392
1015	510	1836	760	2736	1020	3672	1270	4572	1520	5472
1215	610	2196	910	3276	1220	4392	1520	5472	1820	6552
1415	710	2556	1060	3816	1420	5112	1770	6372	2120	7632
1615	810	2916	1210	4356	1620	5832	2020	7272	2420	8712

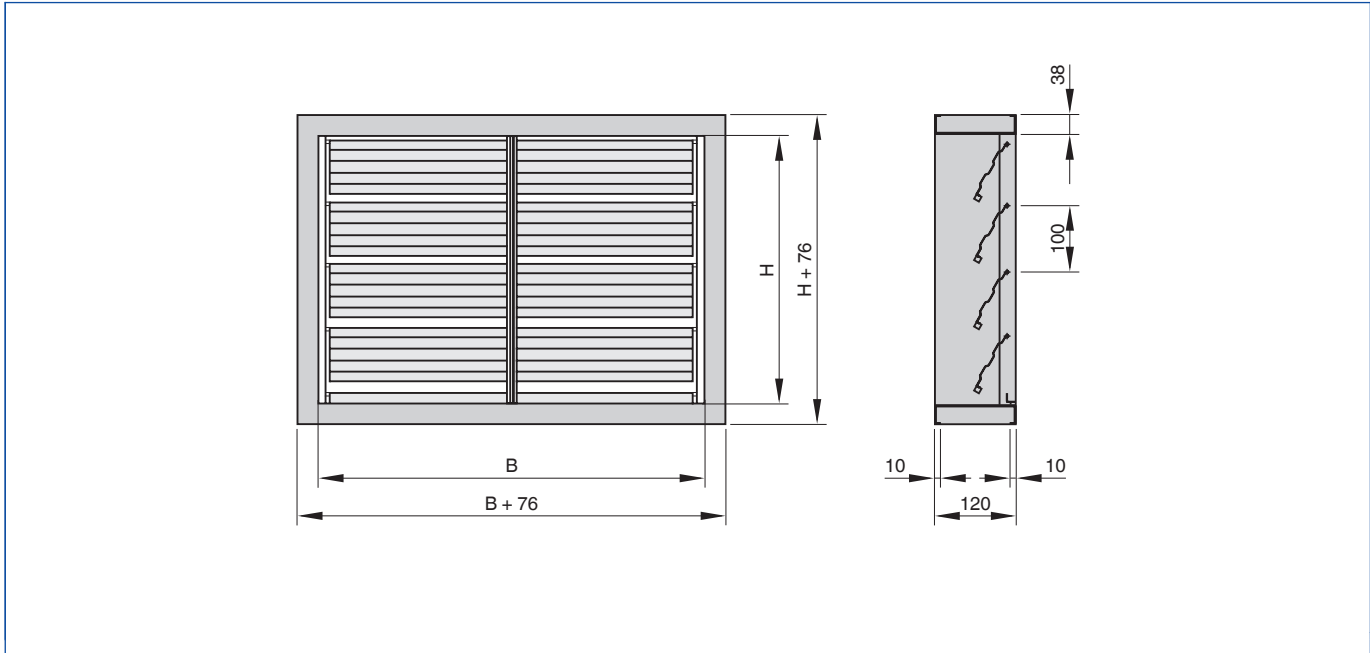
UL, KUL: Width 800 - 1600 mm, volume flow rate at 2.5 m/s

H	B [mm]									
	800		1000		1200		1400		1600	
mm	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
215	430	1548	540	1944	645	2322	755	2718	860	3096
315	630	2268	790	2844	945	3402	1100	3960	1260	4536
415	830	2988	1040	3744	1250	4500	1450	5220	1660	5976
515	1030	3708	1290	4644	1550	5580	1800	6480	2060	7416
615	1230	4428	1540	5544	1850	6660	2150	7740	2460	8856
715	1430	5148	1790	6444	2150	7740	2500	9000	2860	10296
815	1630	5868	2040	7344	2450	8820	2850	10260	3260	11736
1015	2030	7308	2540	9144	3050	10980	3550	12780	4060	14616
1215	2430	8748	3040	10944	3650	13140	4250	15300	4860	17496
1415	2830	10188	3540	12744	4250	15300	4950	17820	5660	20376
1615	3230	11628	4040	14544	4850	17460	5650	20340	6460	23256

Differential pressure

v	Δp_t
m/s	Pa
0.5	10
1	15
2	20
3	25
4	30
5	40
6	45

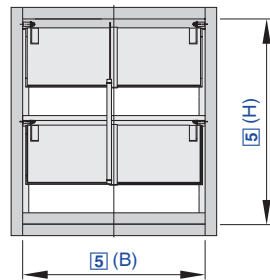




KUL: weight

H	B [mm]									
	200	300	400	500	600	800	1000	1200	1400	1600
mm	kg									
215	2	3	3	4	4	5	6	8	10	11
315	2	3	4	4	5	6	7	9	10	11
415	3	4	4	5	6	7	8	10	11	13
515	3	4	5	6	6	7	9	11	12	15
615	4	5	5	6	7	8	10	12	13	17
715	4	5	6	7	8	8	11	13	15	18
815	5	6	6	8	9	9	13	16	17	19
1015	5	6	7	9	10	11	15	18	19	20
1215	6	7	7	10	11	13	17	20	20	22
1415	6	7	8	11	12	15	18	21	22	24
1615	7	8	8	11	13	17	19	22	24	26





For heavy duty applications

Order code

ARK - 1 - A2 - G / 600x1005 / ER / P1 - RAL ...

1 2 3 4 5 6 7

1 Type ARK Non-return damper	4 Construction No entry: duct connection without flange holes G Duct connection with flange holes	7 Surface No entry: standard construction P1 Powder-coated, RAL CLASSIC colour PS Powder-coated, DB colour
2 Blade mechanism No entry: linked blades 1 Blades with adjustable restrictors	5 Nominal size [mm] B x H	Gloss level RAL 9010 50 % RAL 9006 30 % All other RAL colours 70 %
3 Material No entry: galvanised steel, with aluminium blades A2 Stainless steel with aluminium blades	6 Installation subframe No entry: none ER With (only for construction G)	

+ Features

- Non-return dampers prevent unwanted airflows against the intended airflow direction when the system is not in operation
- ▶ Air leakage with back pressure to EN 1751, class 4
 - ▶ Maximum differential pressure: 5000 Pa
 - ▶ Blades made of aluminium, casing made of galvanised steel
 - ▶ Available in standard sizes and many intermediate sizes
 - ▶ Variant ARK (with linked blades) for variable volume flows
 - ▶ Variant ARK-1 (with adjustable blade restrictors) for constant volume flows
 - ▶ Installation in horizontal or vertical ducts

Optional equipment and accessories

- ▶ Installation subframe
- ▶ Powder coating (RAL or DB)
- ▶ Stainless steel construction with stainless steel casing; blades made of aluminium
- ▶ Temperature resistant up to 200 °C with Viton seal

Application

- ▶ Non-return dampers of Type ARK for the fresh air and exhaust air ducts of air conditioning systems
- ▶ Prevention of unwanted airflows against the intended airflow direction when the system is not in operation
- ▶ Blades close automatically when the system is shut down
- ▶ Maximum differential pressure: 5000 Pa

◊ Variants

- ▶ ARK: Non-return damper with linked blades, preferably for variable volume flows
- ▶ ARK-1: Non-return damper with adjustable blade restrictors, preferably for constant volume flows

+ Construction

- ▶ Galvanised sheet steel, duct connection without flange holes
- ▶ A2: Stainless steel
- ▶ G: Duct connection with flange holes

& Accessories

- ▶ Installation subframe: Installation subframe for the fast and simple installation of mechanically self-powered dampers

★ Special characteristics

- ▶ Robust, maintenance-free construction
- ▶ Maximum differential pressure: 5000 Pa
- ▶ Closed blade air leakage with back pressure, in closing direction, to EN 1751, class 4
- ▶ Damper for negative or positive pressure (air extract or discharge)
- ▶ Operating temperature 0 to 80 °C
- ▶ Optional temperature resistant construction for up to 200 °C, with Viton seal
- ▶ Installation in horizontal or vertical ducts
- ▶ Maintenance-free DU bearings with Teflon coating, bearing shafts made of stainless steel

ISO Standards and guidelines

- ▶ Closed blade air leakage (against the intended airflow direction) to EN 1751, class 4
- ▶ Casing air leakage to EN 1751, class C

Technical data

Nominal sizes	200 x 345 to 1200 x 1995 mm
Volume flow rate range	690 - 23950 l/s or 2484 - 86220 m ³ /h at 10 m/s
Total differential pressure (horizontal airflow)	115 Pa at 10 m/s
Total differential pressure (vertical airflow)	45 Pa at 10 m/s
Maximum differential pressure in closing direction	5000 Pa
Operating temperature	0 - 80 °C





Geometric free area - ARK

H	B [mm]					
	200	400	600	800	1000	1200
mm	m ²					
345	0.043	0.097	0.152	0.206	0.260	0.314
675	0.088	0.198	0.309	0.419	0.529	0.639
1005	0.133	0.299	0.466	0.632	0.798	0.964
1335	0.178	0.400	0.622	0.845	1.067	1.289
1665	0.223	0.501	0.779	1.058	1.336	1.614
1995	0.268	0.602	0.936	1.271	1.605	1.940

Intermediate sizes: Intermediate widths can be interpolated

ARK: Maximum volume flow rate

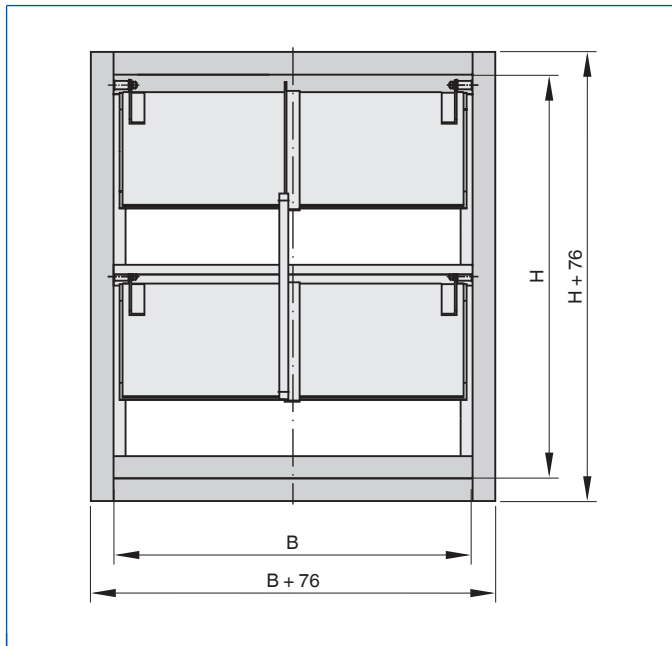
H	B [mm]											
	200		400		600		800		1000		1200	
mm	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
345	690	2484	1380	4968	2070	7452	2760	9936	3450	12420	4140	14904
675	1350	4860	2700	9720	4050	14580	5400	19440	6760	24336	8100	29160
1005	2010	7236	4020	14472	6040	21744	8040	28944	10050	36180	12050	43380
1335	2670	9612	5340	19224	8020	28872	10700	38520	13350	48060	16000	57600
1665	3330	11988	6660	23976	10000	36000	13300	47880	16650	59940	20000	72000
1995	3990	14364	7980	28728	11950	43020	15950	57420	19950	71820	23950	86220

Differential pressure

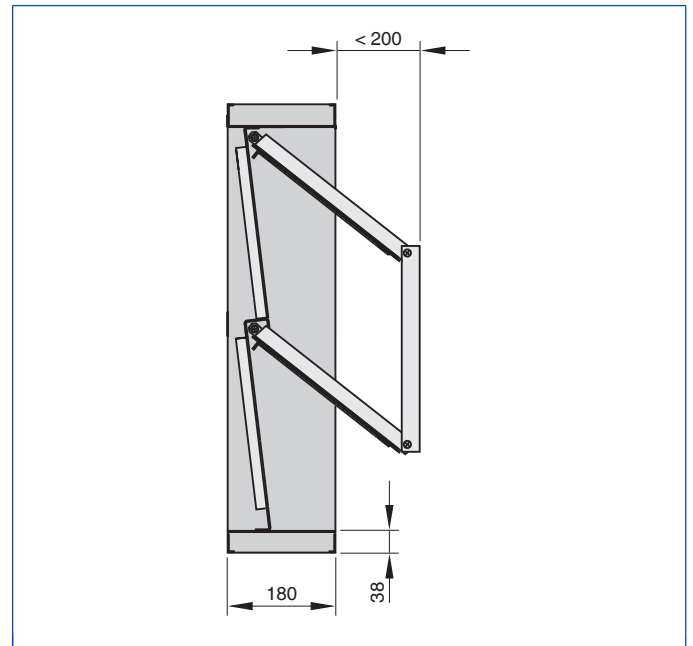
v	Airflow	
	horizontal	vertical
	Δp_{st}	
m/s	Pa	
2	50	135
4	75	125
6	95	105
8	110	65
10	115	45



ARK standard sizes



ARK standard sizes

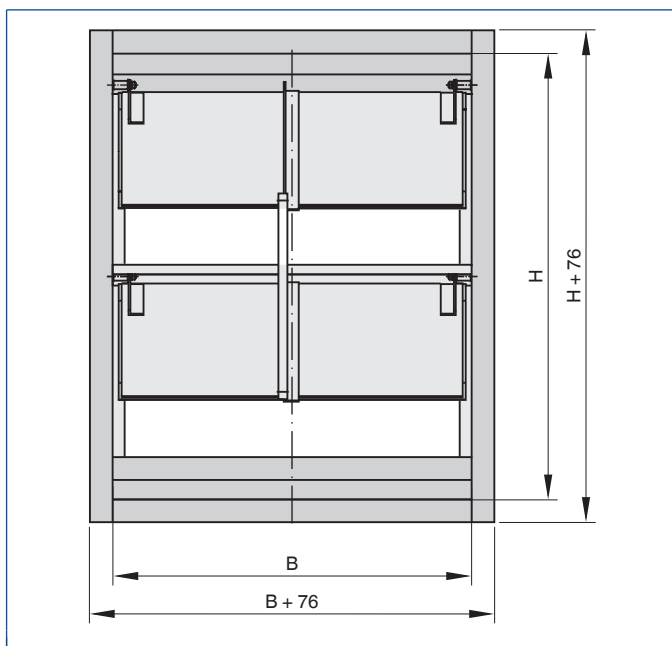


Dimensions [mm] and weight [kg]

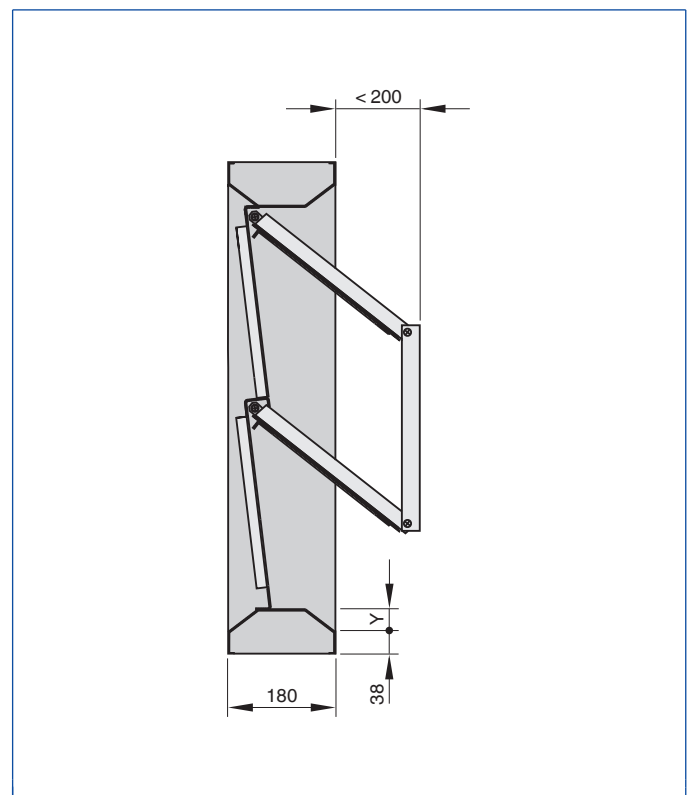
H/B	200	400	600	800	1000	1200	①	②
345	8	10	12	15	18	21	1	0
675	12	16	19	23	27	32	2	1
1005	17	22	26	31	36	41	3	1
1335	22	28	33	39	45	51	4	2
1665	27	34	40	47	54	61	5	2
1995	32	40	47	55	63	71	6	2

① No. of blades ② No. of coupling rods

ARK intermediate sizes



ARK intermediate sizes



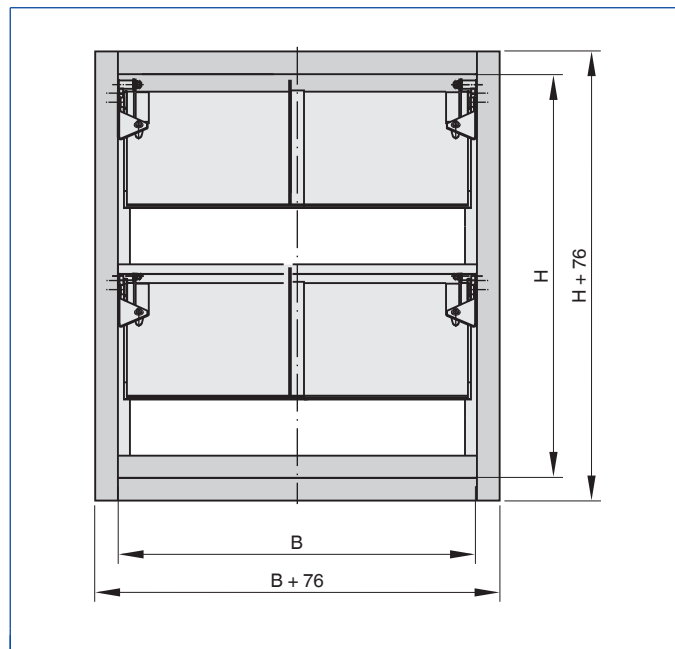


Dimensions [mm] and weight [kg]

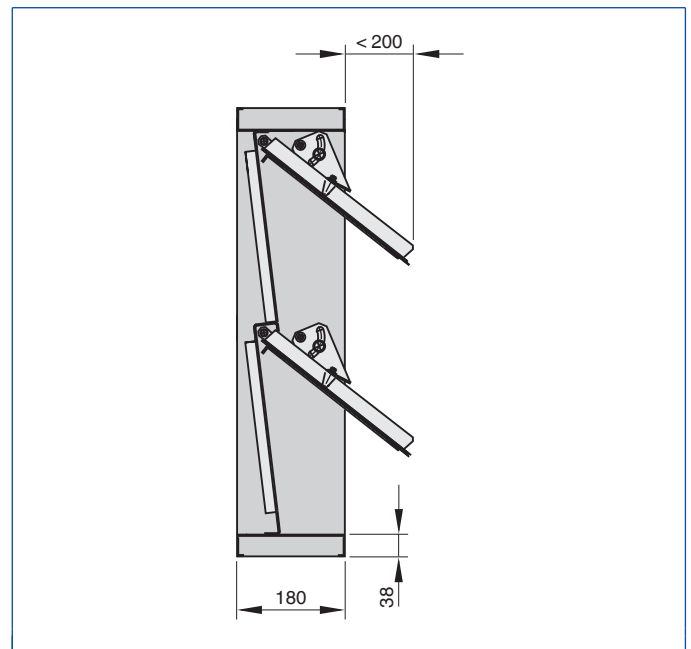
H	①	②	Y
355 - 505	1	0	5 - 80
685 - 835	2	1	5 - 80
1015 - 1165	3	1	5 - 80
1345 - 1495	4	2	5 - 80
1675 - 1825	5	2	5 - 80

① No. of blades ② No. of coupling rods

ARK-1 standard sizes



ARK-1 standard sizes



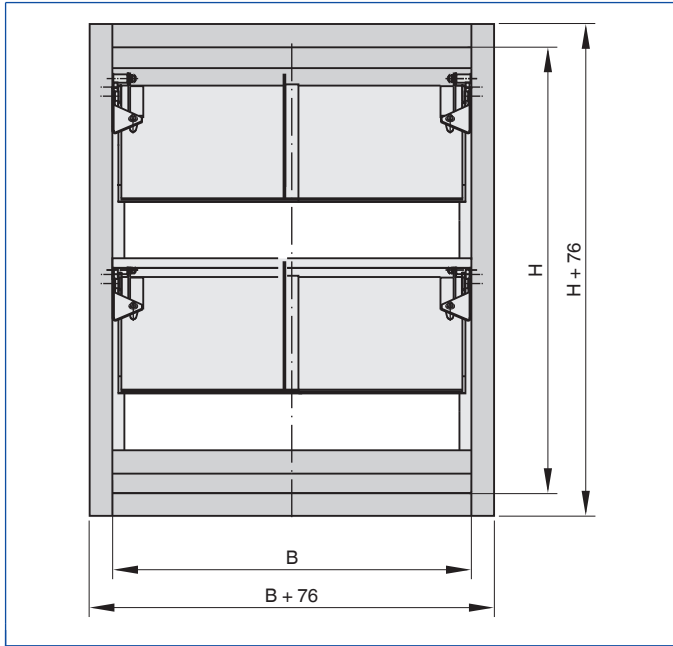
Dimensions [mm] and weight [kg]

H/B	200	400	600	800	1000	1200	①
345	8	10	12	15	18	21	1
675	12	16	19	23	27	32	2
1005	17	22	26	31	36	41	3
1335	22	28	33	39	45	51	4
1665	27	34	40	47	54	61	5
1995	32	40	47	55	63	71	6

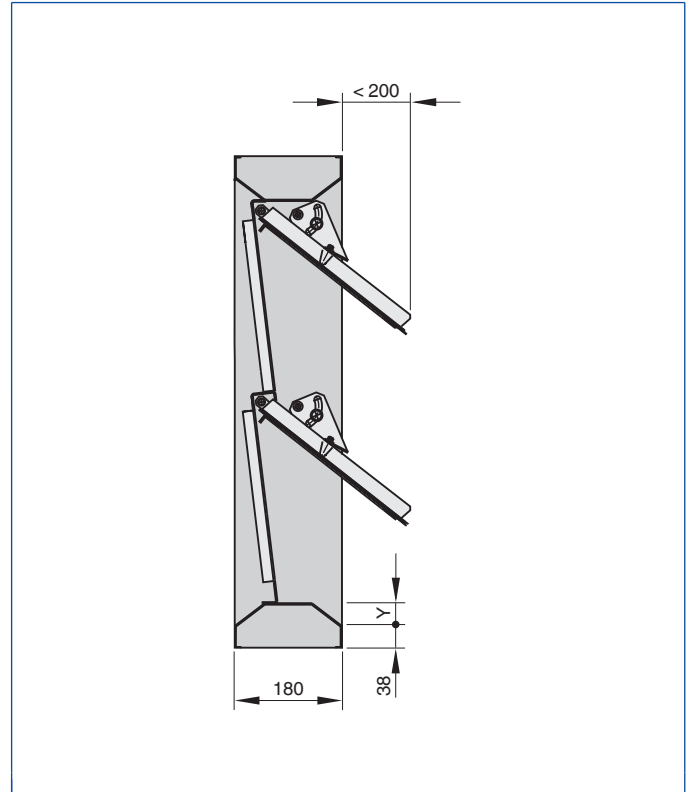
① No. of blades



ARK-1 intermediate sizes



ARK-1 intermediate sizes

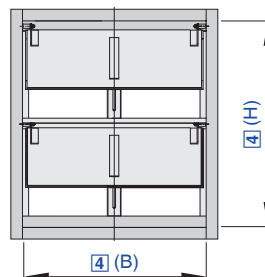


Dimensions [mm] and weight [kg]

H	①	Y
355 - 505	1	5 - 80
685 - 835	2	5 - 80
1015 - 1165	3	5 - 80
1345 - 1495	4	5 - 80
1675 - 1825	5	5 - 80

① No. of blades





For the prevention of excess pressure in rooms

Order code

ARK2 – A2 – G / 600x1005 / ER / ...Pa / P1 – RAL ...

1 2 3 4 5 6

1 Type

ARK2 Pressure relief damper

2 Material

No entry: galvanised steel, with aluminium blades
A2 Stainless steel with aluminium blades

3 Construction

No entry: duct connection without flange holes
G Duct connection with flange holes

4 Nominal size [mm]

B x H

5 Installation subframe

No entry: none
ER With (only for construction G)

6 Maximum differential pressure [Pa]

Specify value in Pa

7 Surface

No entry: standard construction
P1 Powder-coated, RAL CLASSIC colour
PS Powder-coated, DB colour

Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

+ Features

Pressure relief dampers for gas fire extinguishing systems and transformer substations

- ▶ Air leakage with back pressure to EN 1751, class 4
- ▶ Maximum differential pressure: 5000 Pa
- ▶ Differential pressure can be adjusted from 50 - 1000 Pa (B > 600 mm: 600 Pa max.)
- ▶ Blades made of aluminium, casing made of galvanised steel
- ▶ Blades open when the maximum differential pressure is exceeded and close automatically when the pressure drops
- ▶ Blade locking with permanent magnet
- ▶ Robust, maintenance-free construction
- ▶ Available in standard sizes and many intermediate sizes
- ▶ Operating temperature 0 to 80 °C

Optional equipment and accessories

- ▶ Installation subframe
- ▶ Powder coating (RAL or DB)
- ▶ Stainless steel construction with stainless steel casing; blades made of aluminium

X Application

- ▶ Pressure relief dampers of Type ARK2 for the protection of internal spaces from differential pressures in excess of set maximum levels
- ▶ When the set maximum differential pressure is exceeded, the blades automatically open to relieve the excess pressure
- ▶ Pressure peaks will be reliably controlled
- ▶ Differential pressure can be adjusted from 50 - 1000 Pa (B > 600 mm: 600 Pa max.)

+ Construction

- ▶ Galvanised sheet steel, duct connection without flange holes
- ▶ A2: Stainless steel
- ▶ G: Duct connection with flange holes

★ Special characteristics

- ▶ Robust, maintenance-free construction
- ▶ Maximum differential pressure: 5000 Pa
- ▶ Air leakage with back pressure, in closing direction, to EN 1751, class 4
- ▶ Damper for negative or positive pressure (air extract or discharge)
- ▶ Operating temperature 0 to 80 °C
- ▶ Maintenance-free DU bearings with Teflon coating, bearing shafts made of stainless steel
- ▶ Each blade is locked with a factory set permanent magnet
- ▶ Adjustable differential pressure for blade opening: 50 - 1000 Pa, depending on width

ISO Standards and guidelines

- ▶ Closed blade air leakage (against the intended airflow direction) to EN 1751, class 4
- ▶ Casing air leakage to EN 1751, class C

📊 Technical data

Nominal sizes	200 x 345 to 1200 x 1995 mm
Volume flow rate range	140 - 4790 l/s or 504 - 17244 m ³ /h at 50 Pa and 2 m/s
Adjustable differential pressure range	50 - 1000 Pa (B > 600 mm: 600 Pa max.)
Airflow velocity	2 m/s at 50 Pa
Maximum differential pressure in closing direction	5000 Pa
Operating temperature	0 - 80 °C



Geometric free area - ARK2

H	B [mm]					
	200	400	600	800	1000	1200
mm	m ²					
345	0.031	0.085	0.139	0.194	0.248	0.302
675	0.063	0.174	0.284	0.394	0.504	0.614
1005	0.096	0.262	0.428	0.594	0.761	0.927
1335	0.128	0.350	0.572	0.795	1.017	1.239
1665	0.160	0.438	0.717	0.995	1.273	1.552
1995	0.192	0.527	0.861	1.195	1.530	1.864

Intermediate sizes: Intermediate widths can be interpolated

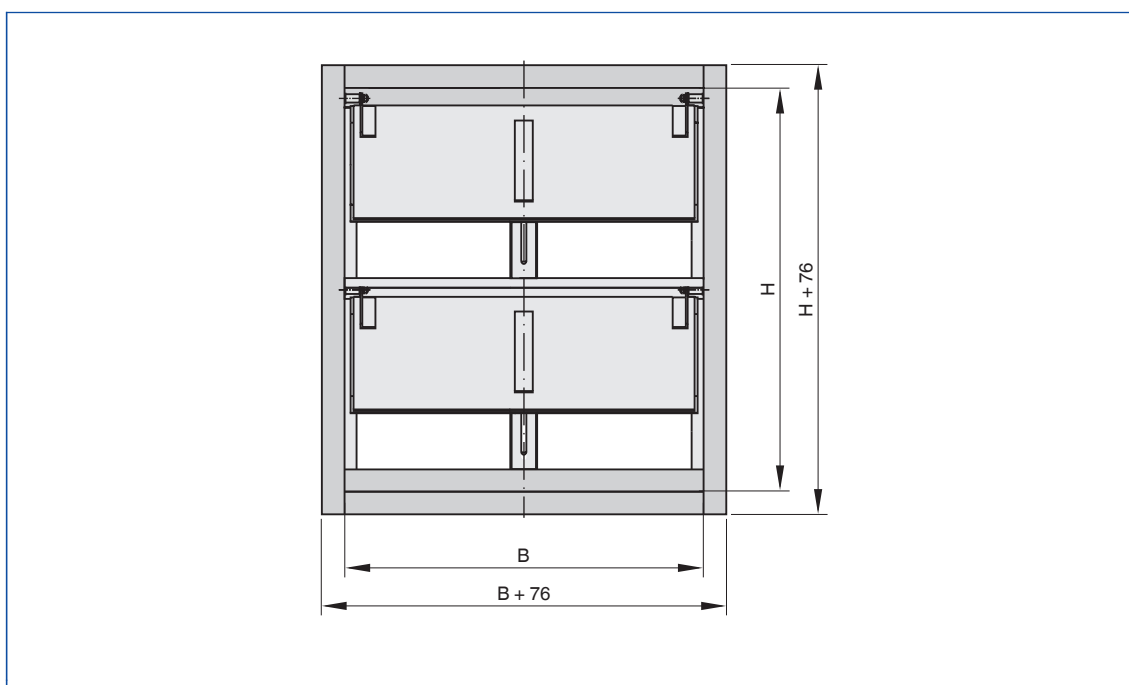
ARK2: Maximum volume flow rate

H	B [mm]											
	200		400		600		800		1000		1200	
mm	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h
345	140	504	275	990	415	1494	550	1980	690	2484	830	2988
675	270	972	540	1944	810	2916	1080	3888	1350	4860	1620	5832
1005	400	1440	805	2898	1210	4356	1610	5796	2010	7236	2410	8676
1335	535	1926	1070	3852	1600	5760	2140	7704	2670	9612	3200	11520
1665	665	2394	1330	4788	2000	7200	2660	9576	3330	11988	4000	14400
1995	800	2880	1600	5760	2390	8604	3190	11484	3990	14364	4790	17244

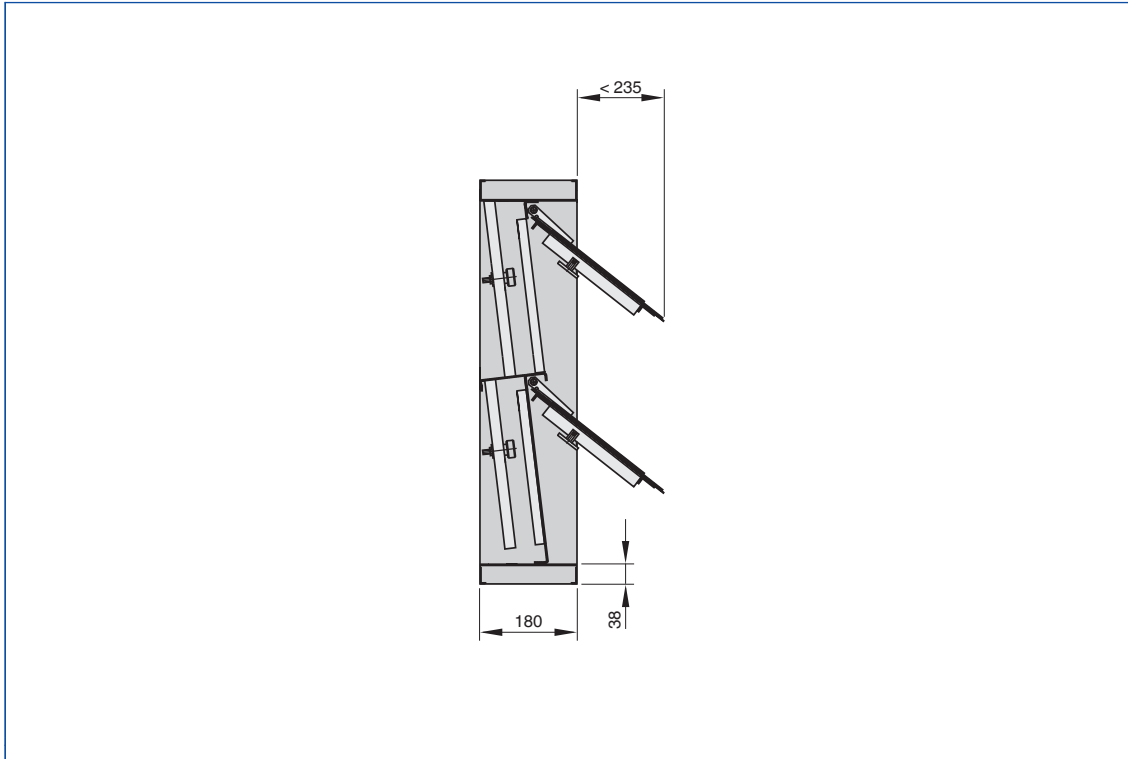
Airflow velocity

Δp_t	v
Pa	m/s
35	1
50	2
65	3
80	4
90	5

ARK2 standard sizes



ARK2 standard sizes

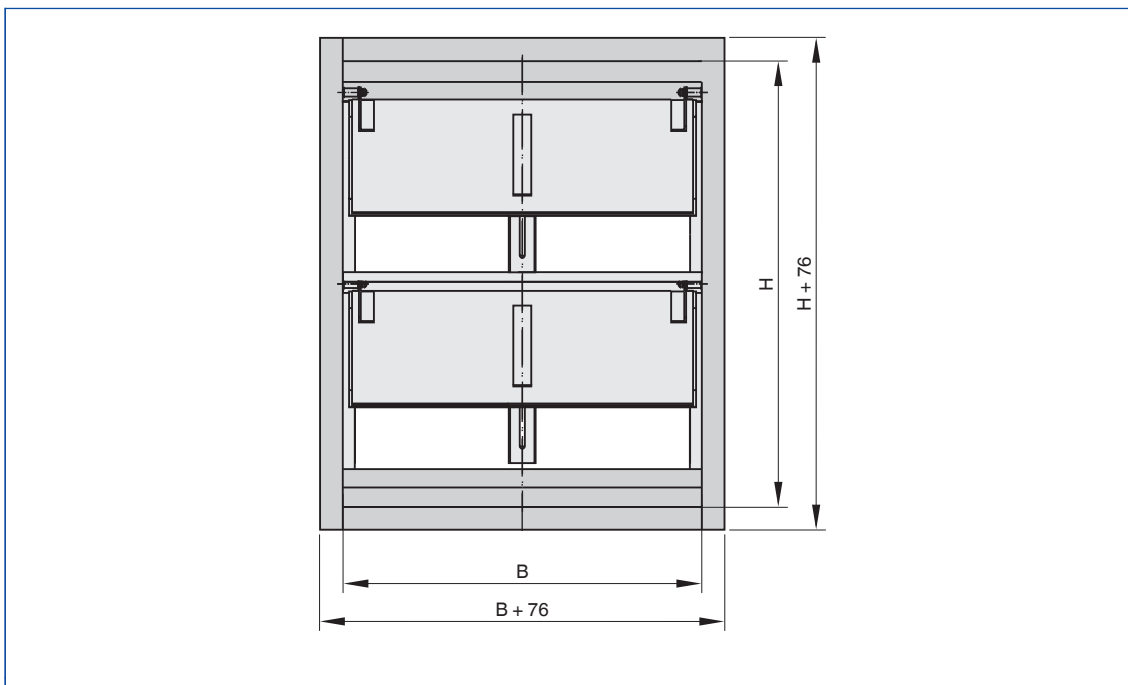


Dimensions [mm] and weight [kg]

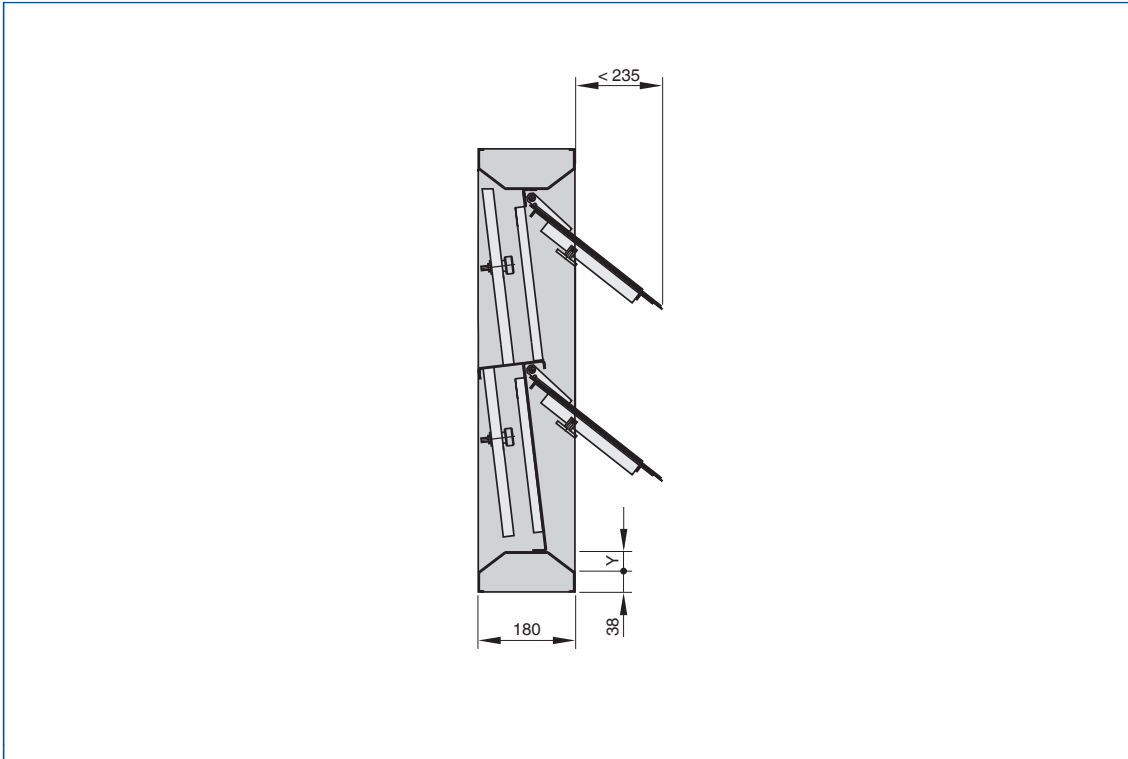
H/B	200	400	600	800	1000	1200	①
345	9	11	13	16	19	22	1
675	13	17	20	24	28	33	2
1005	19	24	28	33	38	43	3
1335	24	30	35	41	47	53	4
1665	30	37	43	50	57	64	5
1995	35	43	50	58	66	74	6

① No. of blades

ARK2 intermediate sizes



ARK2 intermediate sizes



Dimensions [mm] and weight [kg]

H	①	Y
355 - 505	1	5 - 80
685 - 835	2	5 - 80
1015 - 1165	3	5 - 80
1345 - 1495	4	5 - 80
1675 - 1825	5	5 - 80

① No. of blades





Gas-tight shut-off dampers

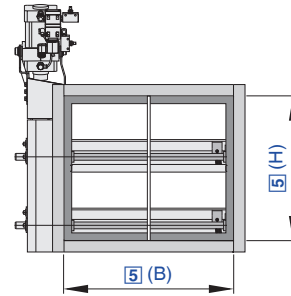
	Variant			
	NAK-H	NAK-E	NAK-E1	NAK-P
Casing and blades				
Galvanised sheet steel, powder-coated	●	●	●	●
Duct connection				
Without holes	●	●	●	●
Flange holes	●	●	●	●
Dynamics				
Hand wheel	●	●	●	
Actuator		Electric 3 × 230 V AC (400 V AC)	Electric 230 V AC	Pneumatic
Running time for 90°	30 turns	~ 60 s	~ 60 s	> 2 s
Nominal sizes				
Width	200 - 1000 mm	200 - 1000 mm	200 - 1000 mm	200 - 1000 mm
Increments	1 mm	1 mm	1 mm	1 mm
Height	270 - 1000 mm	270 - 1000 mm	270 - 1000 mm	270 - 1000 mm
Casing				
Length	350 mm	350 mm	350 mm	350 mm
Explanation				
● - Standard				



List of abbreviations



f_m [Hz]	Octave band centre frequency
L_{PA} [dB(A)]	A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit, system attenuation taken into account
L_{PA1} [dB(A)]	A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit with secondary silencer, system attenuation taken into account
L_{PA2} [dB(A)]	A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit, system attenuation taken into account
L_{PA3} [dB(A)]	A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit with acoustic cladding, system attenuation taken into account
\dot{V}_{nom} [m ³ /h] and [l/s]	Nominal volume flow rate (100 %)
\dot{V} [m ³ /h] and [l/s]	Volume flow rate
$\Delta\dot{V}$ [± %]	Volume flow rate tolerance from setpoint value
$\Delta\dot{V}_{warm}$ [± %]	Volume flow rate tolerance for the warm air flow of dual duct terminal units
ΔP_{st} [Pa]	Static differential pressure
$\Delta P_{st min}$ [Pa]	Static differential pressure, minimum



For the gas-tight shut-off of ducts

Order code

NAK – P – G – R / 800x755 / Z05

1 2 3 4 5 6

1 Type

NAK Shut-off damper, gas-tight

2 Function

- H** Hand wheel
- P** Pneumatic actuator
- E** Electric actuator 400 V
- E1** Electric actuator 230 V

3 Construction

- No entry: duct connection without flange holes
- G** Duct connection with flange holes

4 Operating side

- R** Right side
- L** Left side

5 Nominal size [mm]

B x H

6 Attachments

No entry: none
Z01 - Z07

+ Features

Gas-tight shut-off dampers are designed to ensure the level of tightness required by KTA Guideline 3601 (German Nuclear Safety Standards Commission, KTA) and by DIN 25414 even when the power supply or compressed air supply fails.

- ▶ Compact design and robust actuator mechanism allow for any installation orientation
- ▶ Maximum air leakage rate is 0.0028 (l/s)/m² or 0.01 (m³/h)/m² at a differential pressure of 2000 Pa
- ▶ Gas-tight closure, even when there is no power, due to special over centre locking mechanism
- ▶ Variants with hand wheel, pneumatic actuator or electric actuator
- ▶ Brass and stainless steel bearings
- ▶ Powder-coated casing and blades
- ▶ Maximum pressure loading of 5000 Pa, in closing direction
- ▶ Available in standard sizes and many intermediate sizes

Optional equipment and accessories

- ▶ Flange holes
- ▶ Limit switch
- ▶ Double acting pneumatic actuator, with optional solenoid valve
- ▶ Electric actuator 3 x 230 V AC (400 V AC) or 230 V AC

Application

- ▶ Shut-off dampers of Type NAK for shutting off ducts in air conditioning systems with the most critical safety requirements for tightness (gas-tight)
- ▶ Gas-tight shut-off dampers ensure the level of tightness required by KTA Guideline 3601 (German Nuclear Safety Standards Commission, KTA) and by DIN 25414 even when the power supply or compressed air supply fails

◊ Variants

- ▶ NAK-H: Gas-tight shut-off damper with hand wheel
- ▶ NAK-P: Gas-tight shut-off damper with pneumatic actuator
- ▶ NAK-E: Gas-tight shut-off damper with electric actuator (400 V AC, 50 Hz)
- ▶ NAK-E1: Gas-tight shut-off damper with electric actuator (230 V AC, 50 Hz)

+ Construction

- ▶ Duct connection without flange holes
- ▶ G: Flange holes on both sides

⬡ Attachments

- ▶ Attachments: For opening and closing, and for capturing the blade end positions

★ Special characteristics

- ▶ Compact design and robust actuator mechanism allow for any installation orientation
- ▶ Gas-tight closure, even when there is no power, due to special over centre locking mechanism
- ▶ Maximum closed blade leakage rate is 0.0028 (l/s)/m² or 0.01 (m³/h)/m² at a differential pressure of 2000 Pa
- ▶ Maximum pressure loading of 5000 Pa, in closing direction

ISO Standards and guidelines

- ▶ Closed blade air leakage to KTA 3601 Guideline (German Nuclear Safety Standards Commission, KTA) and DIN 25414
- ▶ Casing air leakage to EN 1751, class C





Technical data

Nominal sizes	400 × 270 to 1000 × 1000 mm
Maximum differential pressure	5000 Pa, in closing direction
Closed blade air leakage	< 0.0028 (l/s)/m ² or 0.01 (m ³ /h)/m ²
Operating temperature	80 °C



NAK-E

Supply voltage	3 × 230 V AC (400 V AC), 50 Hz
Nominal current	0.7 A
Current at maximum torque	1.0 A
Switch-on current	3.0 A
Torque	60 Nm
Actuator speed	22 1/min
Motor rating	0.12 kW S2-15 min
Heating	230 V AC
Running time required to fully close or fully open the damper	Approx. 60 s
Protection level of actuator	IP 68
EC conformity	EMC to 2004/108/EU, low voltage to 2006/95/EU
Operating temperature	-25 to 80 °C
Weight	20 kg

NAK-E1

Supply voltage	220 - 240 V AC, 50 Hz
Nominal current	1.8 A
Current at maximum torque	2.7 A
Switch-on current	7.5 A
Torque	60 Nm
Actuator speed	22 1/min
Motor rating	0.12 kW S2-15 min
Heating	230 V AC
Running time required to fully close or fully open the damper	Approx. 60 s
Protection level of actuator	IP 68
EC conformity	EMC to 2004/108/EU, low voltage to 2006/95/EU
Operating temperature	-25 to 80 °C
Weight	25 kg

NAK-P

Function	Pneumatic, double acting
Operating pressure	6 bar
Running time required to fully close or fully open the damper	At least 2 s
Air consumption	4.4 nl/stroke
Compressed air	Filtered
Weight	5 kg



Differential pressure

v	Δp_{st}
m/s	Pa
2	4
4	10
6	30
8	60
10	70

NAK-H

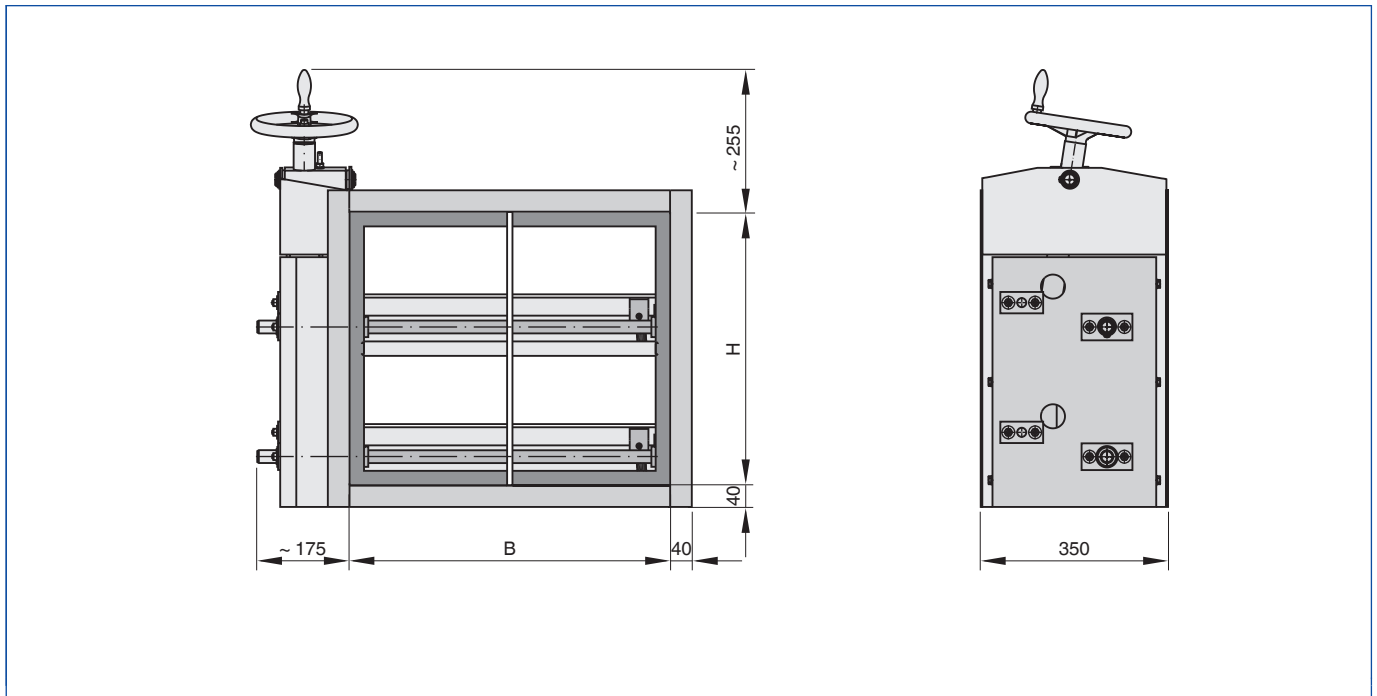


Illustration shows operating side on the right

Dimensions [mm] and weight [kg]

H/B	400	600	800	1000
270	34	45	56	67
510	57	70	82.5	95
755	81	95	109	123
1000	103.5	120	136	153



NAK-E

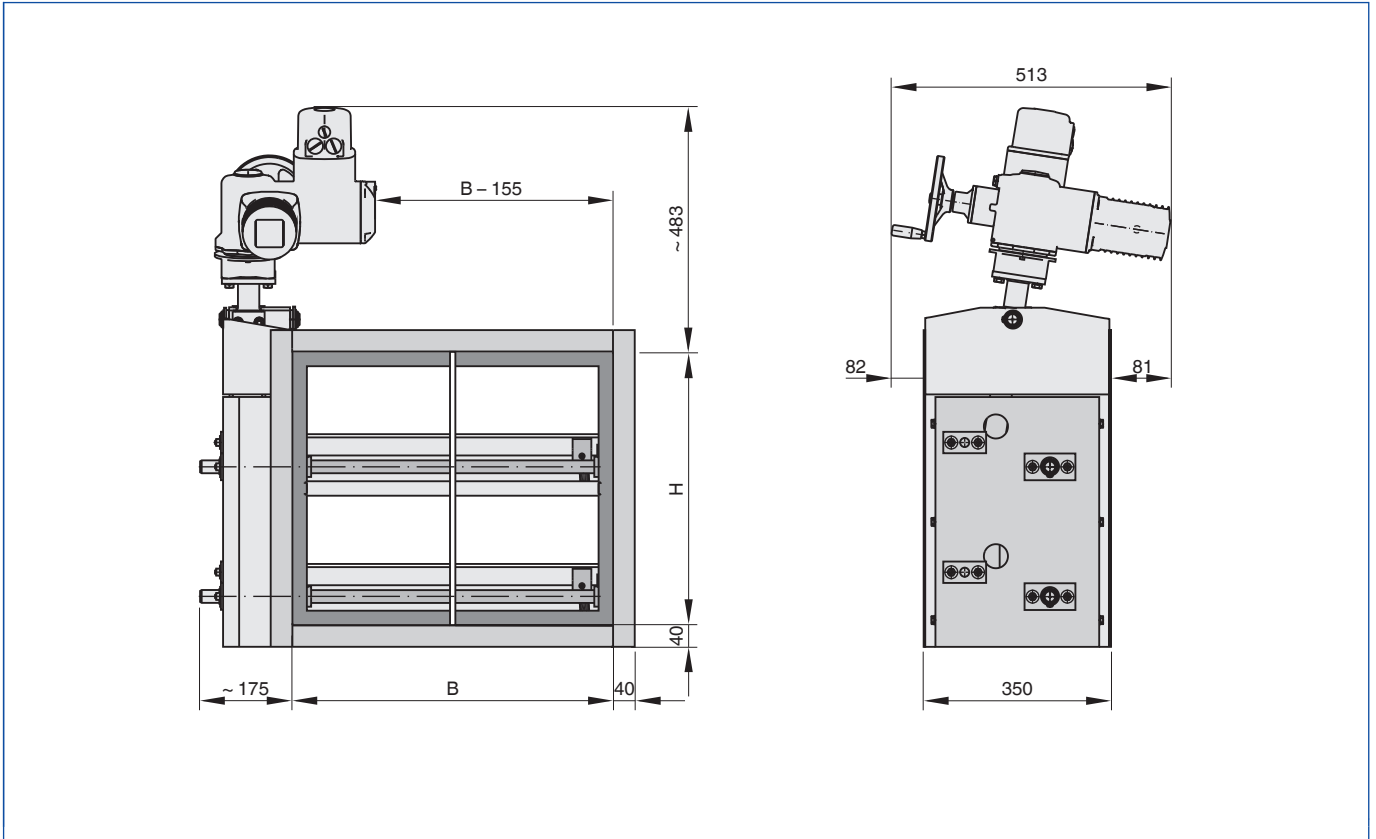


Illustration shows operating side on the right

Dimensions [mm] and weight [kg]

H/B	400	600	800	1000
270	57	68	79	90
510	80	93	106	118
755	104	118	132	146
1000	127	143	159	176



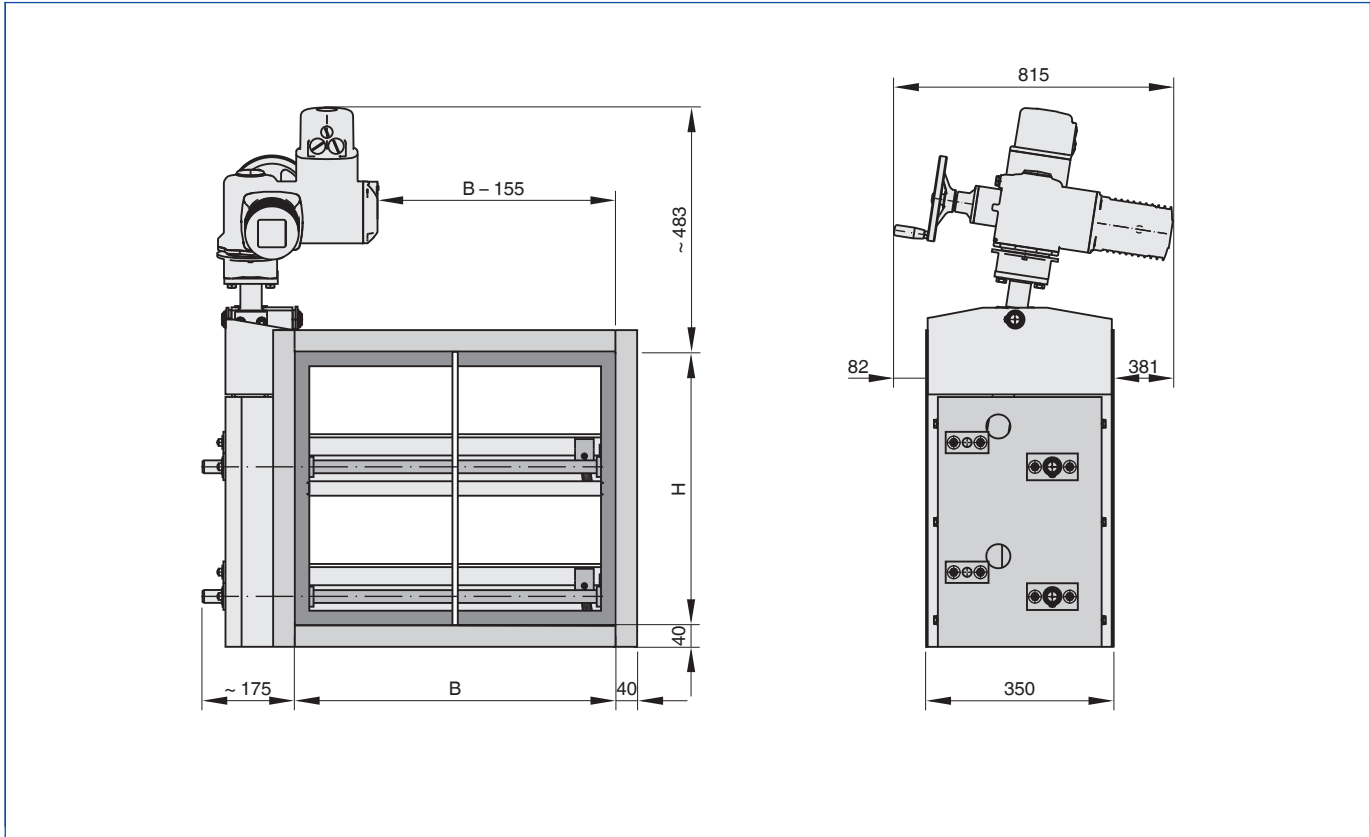


Illustration shows operating side on the right

Dimensions [mm] and weight [kg]

H/B	400	600	800	1000
270	59	70	81	92
510	82	95	107.5	120
755	106	120	134	148
1000	128.5	145	161	178



NAK-P

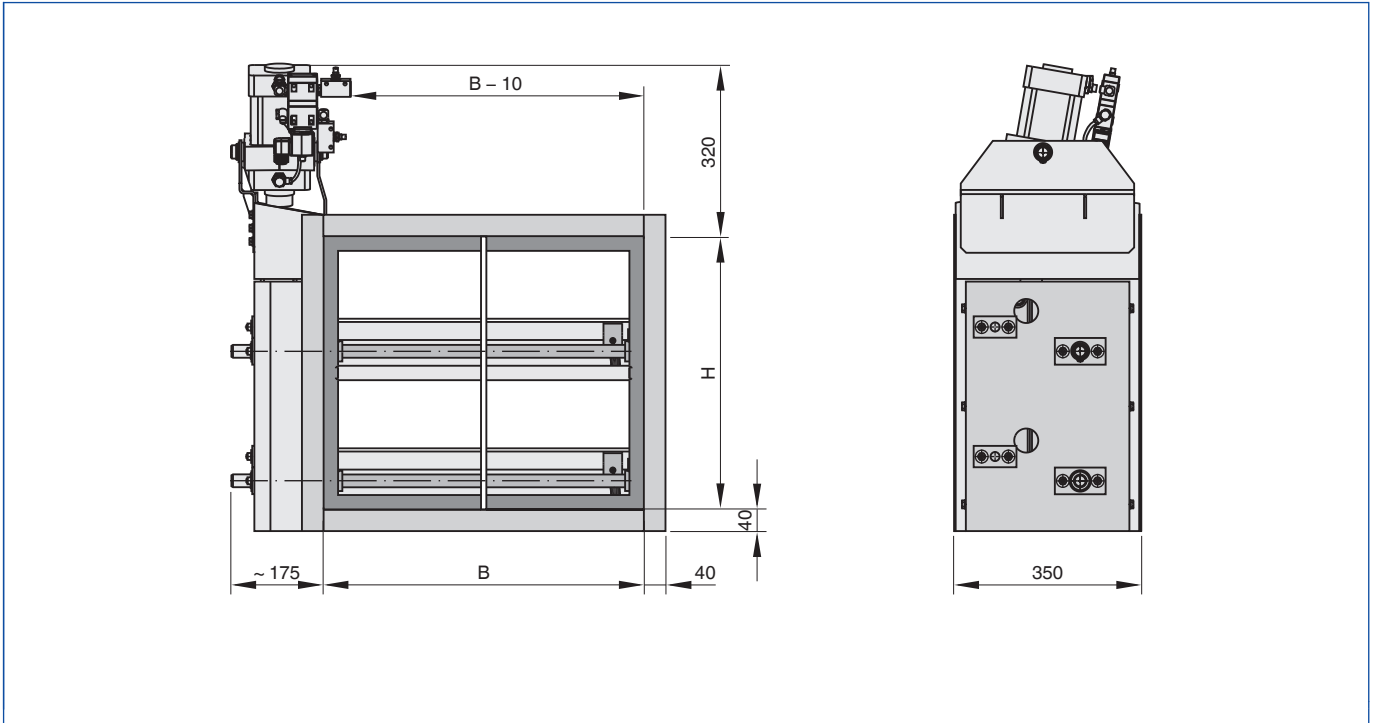


Illustration shows operating side on the right

Dimensions [mm] and weight [kg]

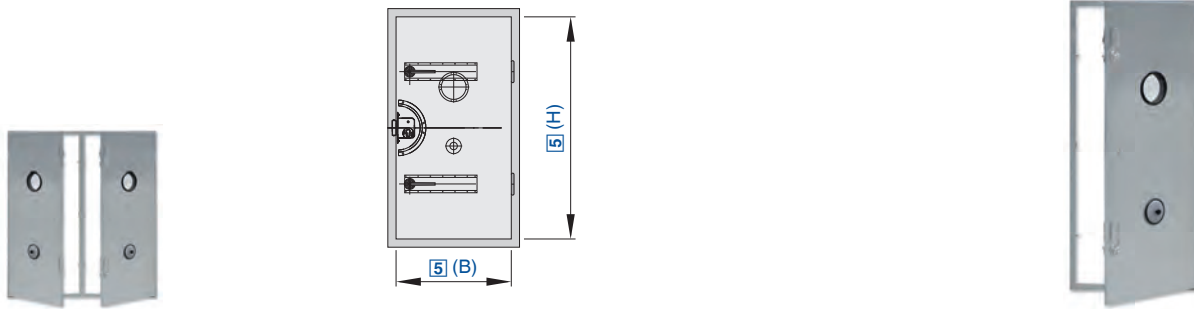
H/B	400	600	800	1000
270	40	51	62	73
510	63	76	89	101
755	87	101	115	129
1000	110	126	142	159





Doors

	Type	
	ST	BS
Variants		
Single leaf door	●	
Double leaf door	●	
Inspection access door		●
Door		
Sound insulating lining	●	
Reinforced construction	●	
Maximum pressure loading	1000 Pa	2000 Pa
Maximum pressure loading	2000 Pa (reinforced construction)	2000 Pa
Hinge		
Right side	●	●
Left side	●	●
Nominal sizes		
Width / double leaf door	400 - 1100 / - 2280 mm	300 - 800 mm
Increments	1 mm	1 mm
Height	800 - 2115 mm	300 - 800 mm
Increments	1	1
Attachments		
U-channel door frame	●	
Angle section frame	●	●
Accessories		
Cylinder rim lock	●	●
Mortice lock	●	●
Inspection window	●	●
Pressure relief valve	●	
Removable front locking lever	●	●
Explanation		
● - Standard		



Single and double leaf hinged doors for plant rooms, storage rooms, air handling units, filter chambers, or enclosures for machinery or electrical equipment

Order code

ST - R - X - V / 500x1500 / 11 / Z01 / P1 - RAL ...

1
2
3
4
5
6
7
8

<p>1 Type ST Low-leakage steel door</p> <p>2 Hinge R Right side L Left side</p> <p>3 Sound insulating lining No entry: none X With</p> <p>4 Construction of door No entry: standard construction V Reinforced door leaf</p>	<p>5 Nominal size [mm] B x H</p> <p>6 Door frame 11 Angle section 50/50/4, with welded fixing tabs 13 U-channel 115/40/4, with welded fixing tabs 15 U-channel 240/40/4, with welded fixing tabs 21 Angle section, without welded fixing tabs (alternatively with flange holes, surcharge)</p>	<p>7 Attachments No entry: none Z01 - Z23</p> <p>8 Surface No entry: standard construction P1 Powder-coated, RAL CLASSIC colour PS Powder-coated, DB colour</p> <p>Gloss level RAL 9010 50 % RAL 9006 30 % All other RAL colours 70 %</p>
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Order code

ST - D - X - V / 1080x1500 / 11 / Z01 / P1 - RAL ...

1
2
3
4
5
6
7
8

<p>1 Type ST Low-leakage steel door</p> <p>2 Number of door leaves D Double leaf low-leakage steel door</p> <p>3 Sound insulating lining No entry: none X With</p> <p>4 Construction of door No entry: standard construction V Reinforced door leaf</p>	<p>5 Nominal size [mm] B x H</p> <p>6 Door frame 11 Angle section 50/50/4, with welded fixing tabs 13 U-channel 115/40/4, with welded fixing tabs 15 U-channel 240/40/4, with welded fixing tabs 21 Angle section, without welded fixing tabs (alternatively with flange holes)</p>	<p>7 Attachments No entry: none Z01 - Z23</p> <p>8 Surface No entry: standard construction P1 Powder-coated, RAL CLASSIC colour PS Powder coated, DB ... colour</p> <p>Gloss level RAL 9010 50 % RAL 9006 30 % All other RAL colours 70 %</p>
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Features

Rectangular single leaf or double leaf doors that are robust and ensure only minimal leakage even in case of large differential pressures

- ▶ Maximum width of 1100 mm, maximum height of 2115 mm
- ▶ Maximum pressure loading of 1000 Pa, in closing direction; reinforced construction for up to 2000 Pa
- ▶ Air leakage rate of approx. 0.6 l/s or 2 m³/h at 1000 Pa (for each door leaf)
- ▶ Double skin door leaf made of galvanised sheet steel and with mineral wool infill
- ▶ Door frame made of angle sections or U-channel sections
- ▶ Two double lever locking devices, can be operated from both sides
- ▶ APT rubber seal, temperature resistant up to 90 °C
- ▶ Available in standard sizes and many intermediate sizes

Optional equipment and accessories

- ▶ Sound insulating lining
- ▶ Reinforced construction
- ▶ Any combination of cylinder rim lock, mortice lock, pressure relief valve, inspection window and removable exterior locking levers
- ▶ Powder-coated for outdoor installation



Application

- ▶ Low-leakage steel doors of Type ST are used as separating elements for walk-in plant rooms, storage rooms, air handling units, filter chambers, or enclosures for machinery or electrical equipment.
- ▶ Robust construction with very low air leakage rate even in case of large differential pressures
- ▶ Powder-coated construction with increased corrosion resistance
- ▶ Maximum pressure on the opening side is 1000 Pa (2000 Pa for reinforced construction)



Variants

- ▶ ST: Low-leakage steel door
- ▶ ST-V: Low-leakage steel door with reinforced leaf
- ▶ ST-X: Low-leakage steel door with sound insulating lining
- ▶ ST-X-V: Low-leakage steel door with sound insulating lining and reinforcing elements
- ▶ ST-D: Double leaf low-leakage steel door
- ▶ ST-D-V: Double leaf low-leakage steel door with reinforced leaves
- ▶ ST-D-X: Double leaf low-leakage steel door with sound insulating lining
- ▶ ST-D-X-V: Double leaf low-leakage steel door with sound insulating lining and reinforcing elements
- ▶ R: Right hinge
- ▶ L: Left hinge



Attachments

- ▶ 11: Angle section frame with welded fixing tabs
- ▶ 13: U-channel frame 115 × 40 × 4 mm
- ▶ 15: U-channel frame 240 × 40 × 4 mm with welded fixing tabs
- ▶ 21: Angle section frame without fixing tabs
- ▶ Locks, inspection window, pressure relief valve, front locking lever: for the improvement and extension of the range of applications



Special characteristics

- ▶ Variants with additional sound insulating lining (X construction variants) provide good sound absorption
- ▶ U-value: 1.02 W/(m²K) at 8 W/(m²K) for internal spaces (air not in motion) and 25 W/(m²K) for outside (air in motion)
- ▶ Optional door frame without fixing tabs (-21) but with flange holes

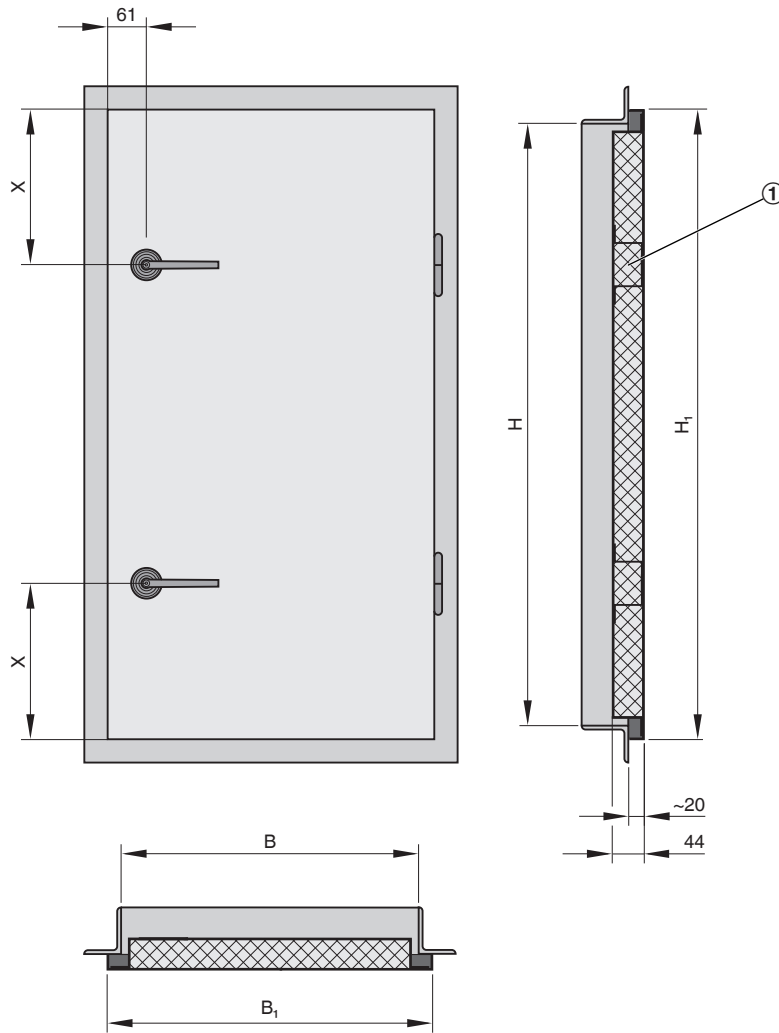


Technical data

Nominal sizes (single leaf)	400 × 800 to 1100 × 2115 mm
Nominal sizes (double leaf)	1080 × 800 to 2280 × 2115 mm
Maximum pressure on the opening side	1000 Pa (reinforced construction: 2000 Pa)
Weighted sound reduction index (with sound absorbing infill)	Single leaf door 43 - 46 dB, double leaf door 44 - 47 dB, doors on both sides of the wall opening 58 - 61 dB



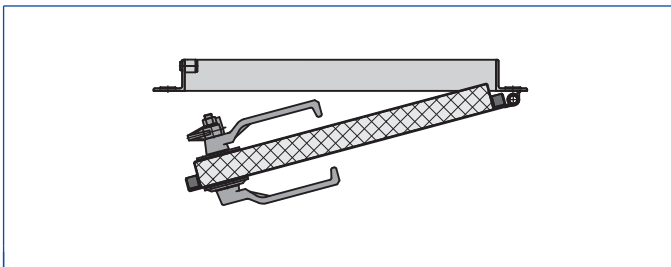
ST



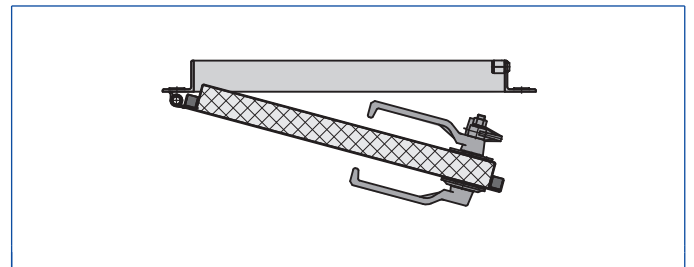
① Stiffeners (additional central stiffener from H = 1800 mm)

Illustration shows right hinge

Right hinge



Left hinge



ST, width, dimensions

B	B ₁
mm	mm
<500	B + 30
500	530
600	630
800	830
940	970



 ST, height, dimensions

H	H ₁	X
mm	mm	
<1500	H + 30	249.5
1500	1530	349.5
1600	1630	349.5
1800	1830	349.5
1940	1970	349.5

ST, ST-V, weight

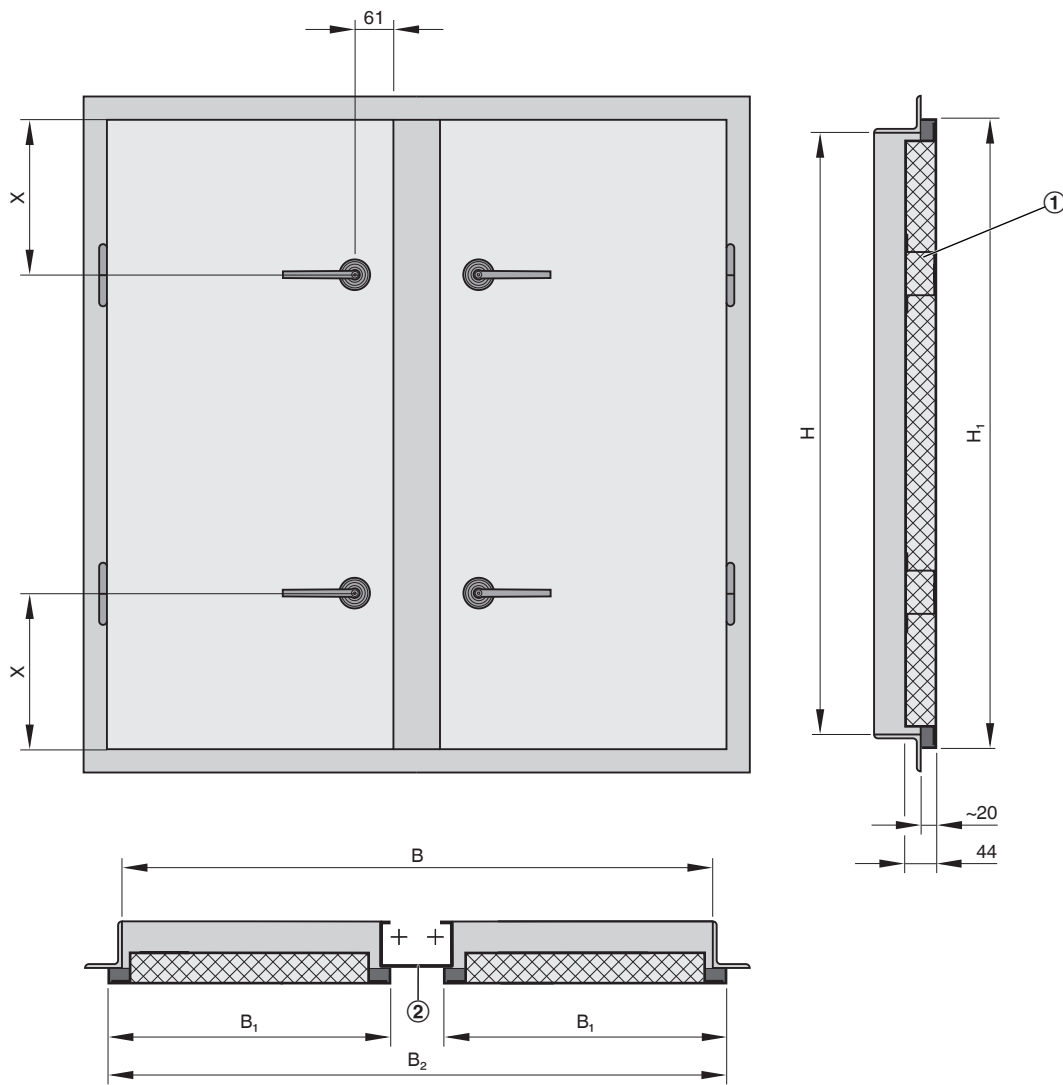
H	B [mm]			
	500	600	800	940
mm	kg			
1500	33	40	53	62
1600	34	41	54	64
1800	35	42	56	66
1940	36	43	57	67

ST-X, ST-X-V, weight

H	B [mm]			
	500	600	800	940
mm	kg			
1500	36	43	58	68
1600	37	44	59	70
1800	38	46	61	71
1940	39	46	62	73



ST-D



① Stiffeners (additional central stiffener from H = 1800 mm)

② Screw-fixed centre mullion

ST-D, width, dimensions

B	B ₁	B ₂
mm	mm	
B < 1080	(B - 20)/2	
1080	530	B + 30
1280	630	1110
1680	830	1310
1960	970	1710

ST, height, dimensions

H	H ₁	X
mm	mm	
<1500	H + 30	249.5
1500	1530	349.5
1600	1630	349.5
1800	1830	349.5
1940	1970	349.5





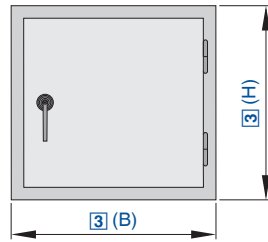
ST-D, ST-D-V, weight

H	B [mm]			
	1080	1280	1680	1960
mm	kg			
1500	66	78	102	120
1600	68	81	106	123
1800	70	83	109	127
1940	72	86	113	131

ST-D-X, ST-D-X-V, weight

H	B [mm]			
	1080	1280	1680	1960
mm	kg			
1500	72	86	113	131
1600	75	88	116	135
1800	77	91	119	139
1940	80	95	124	145





Inspection access doors for filter chambers, air handling units or other enclosures with machinery or equipment

Order code

BS – R / 500x500 / Z03 / P1 – RAL ...

1
 2
 3
 4
 5

<p>1 Type BS Low-leakage inspection access door</p> <p>2 Construction R Right side L Left side</p> <p>3 Nominal size [mm] B × H</p>	<p>4 Attachments No entry: none Z01 - Z03 Z05</p>	<p>5 Surface No entry: standard construction P1 Powder-coated, RAL CLASSIC colour PS Powder-coated, DB colour</p> <p>Gloss level RAL 9010 50 % RAL 9006 30 % All other RAL colours 70 %</p>
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+ **Features**
Rectangular single leaf inspection access doors that are robust and ensure only minimal leakage even in case of large differential pressures

- ▶ Minimum width of 300 mm, minimum height of 300 mm
- ▶ Maximum width of 800 mm, maximum height of 800 mm
- ▶ Maximum pressure loading of 1000 Pa, in closing direction, up to nominal size 600 × 600 mm 2000 Pa
- ▶ Air leakage rate of approx. 0.6 l/s or 2 m³/h at 1000 Pa, up to nominal size 600 × 600 mm approx. 1.1 l/s or 4 m³/h at 2000 Pa
- ▶ Double skin door leaf made of galvanised sheet steel and with mineral wool infill
- ▶ Door frame made of angle sections
- ▶ Double lever locking device, can be operated from both sides
- ▶ APT rubber seal, temperature resistant up to 90 °C
- ▶ Available in standard sizes and many intermediate sizes

Optional equipment and accessories

- ▶ Cylinder rim lock, mortice lock, inspection window and removable exterior locking lever
- ▶ Powder-coated for outdoor installation

X **Application**

- ▶ Low-leakage inspection access doors of Type BS are used as separating elements for air handling units, filter chambers, or enclosures for machinery or electrical equipment
- ▶ Robust construction with very low air leakage rate even in case of large differential pressures
- ▶ Powder-coated construction with increased corrosion resistance
- ▶ Maximum pressure on the opening side is 1000 Pa, up to nominal size 600 × 600 mm 2000 Pa

◊ **Variants**

- ▶ R: Right hinge
- ▶ L: Left hinge
- ▶ 11: Angle section frame with welded fixing tabs
- ▶ 21: Angle section frame without fixing tabs

⬡ **Attachments**

- ▶ Locks, inspection window, front locking lever: for the improvement and extension of the range of applications

★ **Special characteristics**

- ▶ U-value: 1.02 W/(m²K) at 8 W/(m²K) for internal spaces (air not in motion) and 25 W/(m²K) for outside (air in motion)
- ▶ Optional door frame without fixing tabs (-21) but with flange holes

Technical data

Nominal sizes	300 × 300 - 800 × 800 mm
Maximum pressure on the opening side	1000 Pa, up to nominal size 600 × 600 mm 2000 Pa
Weighted sound reduction index	43 - 46 dB



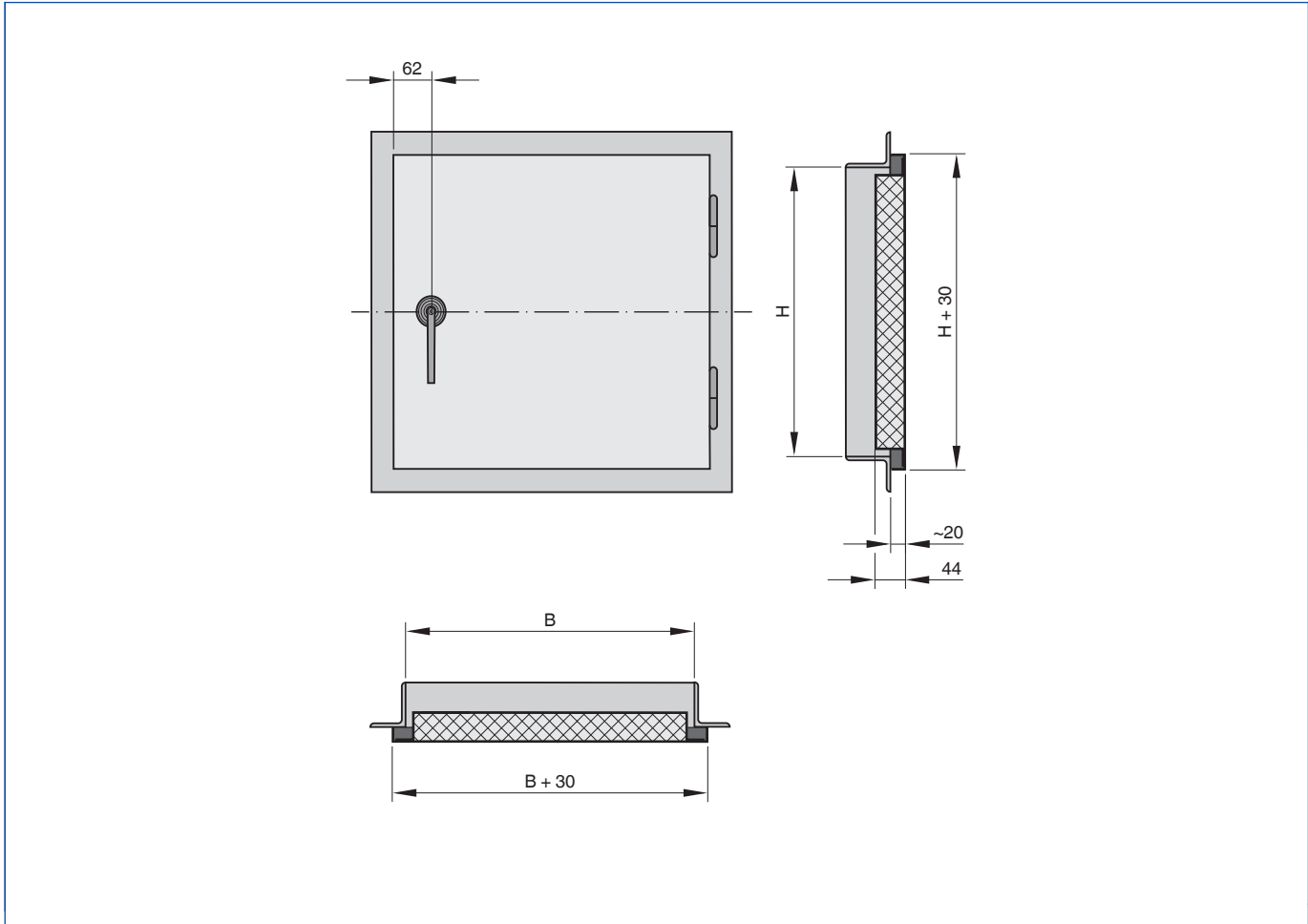
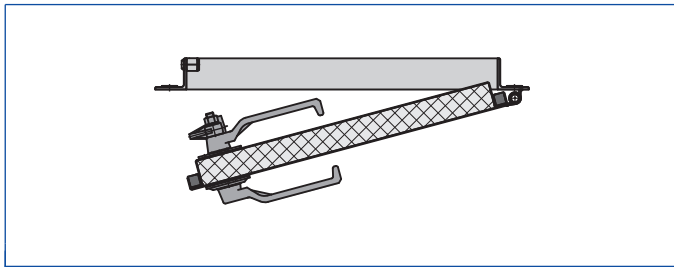
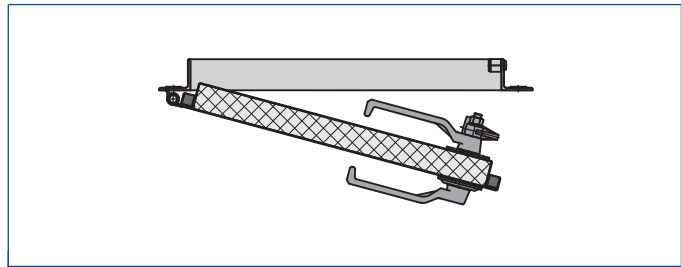


Illustration shows right hinge

Right hinge



Left hinge



Dimensions [mm] and weight [kg]

H/B	400	500	600	800
400	12	15	18	24
500	13	16	19	25
600	13	17	20	26
800	14	18	21	27



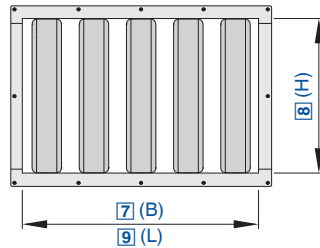


Splitter sound attenuators

	Type	
	Splitter sound attenuators	
	MSA	XSA
Sound attenuator casing		
Rectangular	●	●
Circular		
Galvanised sheet steel	●	●
Aluminium		
Plastic		
Splitters		
Absorption	●	●
Resonance	●	
Duct connection		
Standard flange	●	●
Angle section frame	●	●
Spigot		
Flange on one end		
Flanges on both ends		
Socket-type spigots on both ends		
Raised edges at both ends		
Nominal sizes		
Diameter		
Width	140 - 2400 mm	
Increments	1 mm	
Width subdivided	- 4800 mm	
Height	300 - 1800 mm	300 - 1800 mm
Increments	1 mm	1 mm
Height subdivided	- 4800 mm	- 4800 mm
Length	500 - 1500 mm	500 - 1500 mm
Increments	1 mm	1 mm
Length subdivided	- 3000 mm	- 3000 mm
Splitter surface		
Glass fibre fabric	●	●
Glass fibre fabric and perforated sheet metal	●	●
Explanation		
● - Standard		

 **List of abbreviations**

$\varnothing D$ [mm]	Outer diameter of the spigot
$\varnothing D_3$ [mm]	Outer diameter of circular silencers
L [mm]	Length of attenuator/silencer including spigot (in airflow direction)
L_1 [mm]	Length of acoustic cladding and acoustically effective length
B [mm]	Attenuator width and duct width (upright splitters)
H [mm]	Attenuator height and duct height (upright splitters)
T [mm]	Splitter thickness
S [mm]	Airway width
n []	Number of flange screw holes
m [kg]	Weight
f_m [Hz]	Octave band centre frequency
L_{WA} [dB(A)]	A-weighted sound power level of air-regenerated noise
D_e [dB]	Insertion loss
\dot{V} [m^3/h] and [l/s]	Volume flow rate
Δp_{st} [Pa]	Static differential pressure



For increased insertion loss and broadband attenuation even in the low frequency range

Order code

MSA200 – 100 – 3 – P F / 900x600x1500



1 Type MSA Splitter sound attenuator with casing	P Standard flange 30 mm W Angle section frame 35 × 35 × 3 mm (required for sound attenuators with width and/or height subdivided)	7 Nominal width B [mm]
2 Splitter thickness [mm] 100, 200, 230	6 Splitter surface F Glass fibre fabric L Glass fibre fabric and perforated sheet metal	8 Nominal height H [mm]
3 Airway width (distance between splitters) [mm]		9 Nominal length L in airflow direction [mm]
4 No. of splitters		
5 Duct connection		

+ Features

- Splitter sound attenuators with integral splitters with resonating panels, suitable for air conditioning systems
- ▶ Attenuation effect due to resonance and absorption
 - ▶ Energy efficient due to aerodynamically profiled frame (radius > 15 mm)
 - ▶ Acoustic data measured to ISO 7235
 - ▶ Absorption material is biosoluble and hence hygienically safe
 - ▶ Absorption material faced with glass fibre fabric as a protection against erosion due to airflow velocities up to 20 m/s
 - ▶ Absorption material non-combustible, to EN 13501, fire rating class A1
 - ▶ Intermediate sizes in increments of 1 mm
 - ▶ For use in zones 1 and 2 as well as in zones 21 and 22 according to EU Directive 94/9/EC (ATEX)
 - ▶ Operating temperature up to 100 °C

- Optional equipment and accessories
- ▶ Additional perforated sheet metal to protect the absorption material
 - ▶ Stainless steel, aluminium and PUR-coated constructions upon request

Application

- ▶ Splitter sound attenuators of Type MSA used for the reduction of fan noise and air-regenerated noise in air conditioning systems
- ▶ Attenuation effect due to absorption and resonance
- ▶ Broadband attenuation even in the low frequency range of critical fan noise
- ▶ Hygiene tested and certified to VDI 6022
- ▶ For use in potentially explosive atmospheres (ATEX), zones 1, 2, 21 and 22 (outside)

◊ Variants

- ▶ MSA100: splitter thickness of 100 mm
- ▶ MSA200: splitter thickness of 200 mm
- ▶ MSA230: splitter thickness of 230 mm

+ Construction

- Surface of splitter area not covered by a resonating panel
- ▶ F: Glass fibre fabric
 - ▶ L: Glass fibre fabric and additional perforated sheet metal to protect the absorption material

- Duct connection
- ▶ P: Standard flange 30 mm
 - ▶ W: Angle section frame 35 × 35 × 3 mm

★ Special characteristics

- ▶ Resonating panels ensure increased insertion loss in the frequency range of critical fan noise
- ▶ Up to 30 % lower differential pressure
- ▶ Energy efficient and/or space saving due to aerodynamically profiled frame
- ▶ Hygiene tested and certified
- ▶ Multi-section construction available for large dimensions

ISO Standards and guidelines

- ▶ Insertion loss and sound power level of air-regenerated noise tested to ISO 7235
- ▶ Meets the hygiene requirements of VDI 6022, DIN 1946, parts 1 and 2 as well as of VDI 3803
- ▶ Directive 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres



Technical data

Splitter thickness	100, 200, 230 mm
Nominal sizes	MSA100: 140 × 150 × 500 mm - 2400 × 1800 × 1500 mm, MSA200: 250 × 150 × 500 mm - 2400 × 1800 × 1500 mm, MSA230: 288 × 150 × 500 mm - 2400 × 1800 × 1500 mm
Width subdivided	2401 - 4800 mm
Height subdivided	1801 - 3600 mm
Length subdivided	1501 - 3000 mm
Intermediate sizes	In increments of 1 mm
Operating temperature	- 100 °C

The length (L) of splitter attenuators refers to the airflow direction.

MKA100, MSA100, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	40	4	10	11	13	21	27	24	18	5	32	>80
	60	5	11	17	19	28	32	27	21	5	33	>80
1000	40	5	13	20	23	31	38	32	26	7	44	>80
	60	5	11	17	19	28	32	27	21	5	33	>80
	100	4	10	14	19	29	28	19	14	5	29	>80
1500	40	6	16	30	32	42	48	40	34	9	55	>80
	60	6	14	25	28	38	41	33	27	6	38	>80
	100	4	10	14	19	29	28	19	14	5	29	>80
	200	3	9	10	17	25	15	9	8	4	25	>80
2000	40	8	19	39	42	50	50	49	42	11	66	>80
	60	7	16	32	36	47	50	40	34	7	44	>80
	100	5	12	19	25	37	35	23	16	5	32	>80
	200	3	9	10	17	25	15	9	8	4	25	>80
2500	40	9	22	48	50	50	50	50	50	12	77	>80
	60	8	19	40	45	50	50	47	40	8	50	>80
	100	6	14	24	30	45	41	27	19	6	34	>80
	200	3	12	12	21	33	19	12	11	4	26	>80
3000	40	10	25	50	50	50	50	50	50	14	>80	>80
	60	9	22	48	50	50	50	50	46	9	56	>80
	100	7	16	28	36	50	47	31	22	6	37	>80
	200	2	14	15	26	41	24	16	14	4	27	>80





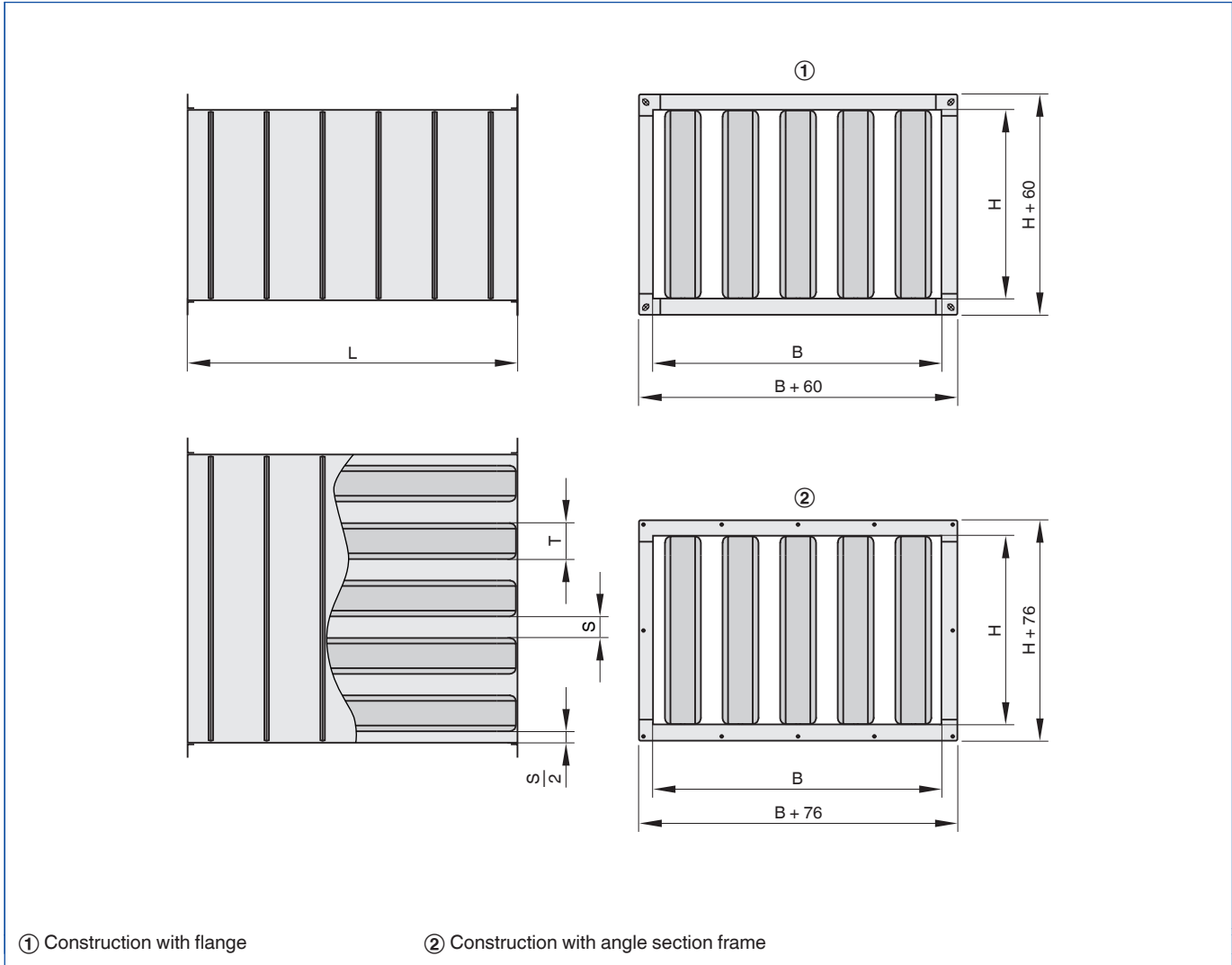
MKA200, MSA200, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	50	5	7	19	21	26	22	17	14	9	58	>80
	100	2	4	12	12	15	11	9	8	5	31	>80
1000	50	6	16	33	39	41	39	26	20	11	67	>80
	100	4	10	22	23	26	19	13	11	6	35	>80
	200	2	7	13	12	12	10	8	6	3	21	>80
1500	50	9	22	44	50	50	50	34	25	12	75	>80
	100	5	15	32	33	37	25	16	14	6	40	>80
	200	3	9	19	18	15	12	10	7	4	23	>80
	400	1	6	10	8	8	6	4	4	2	15	61
2000	50	12	29	50	50	50	50	43	29	13	>80	>80
	100	6	19	42	44	47	31	19	17	7	44	>80
	200	4	12	25	23	18	15	12	9	4	25	>80
	400	1	8	13	10	10	8	5	5	3	17	67
2500	50	14	38	50	50	50	50	49	35	15	>80	>80
	100	8	25	50	50	50	38	23	18	8	48	>80
	200	5	16	30	29	23	16	13	10	4	28	>80
	400	2	10	16	13	12	9	6	5	3	18	72
3000	50	17	48	50	50	50	50	50	40	16	>80	>80
	100	10	30	50	50	50	44	26	19	8	53	>80
	200	6	19	35	35	27	17	15	11	5	30	>80
	400	3	13	19	15	14	10	7	6	3	19	77

MKA230, MSA230, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	60	3	7	16	19	21	17	14	14	9	57	>80
	115	2	5	11	12	13	10	9	10	5	31	>80
1000	60	7	13	27	30	35	25	18	18	10	66	>80
	115	4	10	20	20	22	15	12	13	6	35	>80
	230	1	7	12	10	8	4	6	8	3	20	>80
1500	60	11	19	38	41	49	33	21	21	12	74	>80
	115	7	14	28	28	30	20	15	15	6	40	>80
	230	2	10	18	15	10	6	9	9	4	23	>80
2000	60	15	24	50	50	50	42	25	25	13	>80	>80
	115	9	19	37	36	39	26	18	18	7	44	>80
	230	3	13	24	19	13	8	11	10	4	25	>80
	460	0	7	10	3	0	0	3	3	3	16	64
2500	60	19	30	50	50	50	50	29	28	15	>80	>80
	115	12	24	46	44	47	31	21	20	8	48	>80
	230	4	16	29	24	16	11	13	12	4	27	>80
	460	0	9	13	4	0	0	5	3	3	17	69
3000	60	24	36	50	50	50	50	32	32	16	>80	>80
	115	14	28	50	50	50	36	24	23	8	52	>80
	230	4	19	35	29	18	13	15	13	5	29	>80
	460	0	11	16	6	0	0	7	3	3	19	74





Sound attenuator casing, nominal length

L	mm	500	750	1000	1250	1500
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Sound attenuator casing, nominal height

H	mm	300	600	900	1200	1500	1800
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Sound attenuator casing, nominal width

B	MSA100			MSA200			MSA230		
	T	n	S	T	n	S	T	n	S
	mm	-	mm	mm	-	mm	mm	-	mm
200	100	1	100	-	-	-	-	-	-
400	100	2	100	200	1	200	230	1	85
600	100	2 - 4	50 - 200	200	2	100	230	2	70
800	100	3 - 5	60 - 167	200	2 - 3	67 - 200	230	2	170
1000	100	4 - 7	43 - 150	200	3 - 4	50 - 133	230	3	103
1200	100	4 - 8	50 - 200	200	3 - 5	40 - 200	230	3 - 4	70 - 170
1400	100	5 - 10	40 - 180	200	4 - 5	80 - 150	230	3 - 5	50 - 237
1600	100	6 - 11	46 - 200	200	4 - 7	57 - 200	230	4 - 5	90 - 170
1800	100	6 - 12	50 - 200	200	5 - 8	50 - 160	230	4 - 6	70 - 220
2000	100	7 - 14	43 - 186	200	5 - 8	50 - 200	230	5 - 7	56 - 170
2200	100	7 - 15	47 - 200	200	6 - 9	44 - 167	230	5 - 7	84 - 186
2400	100	8 - 16	50 - 200	200	6 - 10	40 - 200	230	6 - 8	70 - 170

Sound attenuator casing with angle section frame, L = 500, weight

H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	2000	2400
mm	kg									
300	9	13	16	19	23	25	28	32	39	45
600	14	18	21	24	28	30	33	37	44	50
900	18	22	25	28	32	35	38	42	49	55
1200	23	27	30	33	37	40	43	47	54	59
1500	28	32	35	38	42	45	48	52	59	64
1800	33	37	40	43	47	50	53	57	64	69

Sound attenuator casing with angle section frame, L = 750, weight

H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	2000	2400
mm	kg									
300	8	12	16	20	24	25	29	33	41	45
600	13	17	21	25	29	30	34	38	46	50
900	17	21	25	29	33	35	39	43	51	55
1200	22	26	30	34	38	40	44	48	56	59
1500	27	31	35	39	43	45	49	53	61	64
1800	32	36	40	44	48	50	54	58	66	69

Sound attenuator casing with angle section frame, L = 1000, weight

H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	2000	2400
mm	kg									
300	14	18	23	28	32	37	42	46	56	65
600	21	25	30	35	39	44	49	53	63	72
900	28	32	37	42	46	51	56	60	70	79
1200	35	39	44	49	53	58	63	67	77	86
1500	42	46	51	56	60	65	70	74	84	93
1800	49	53	58	63	67	72	77	81	91	100





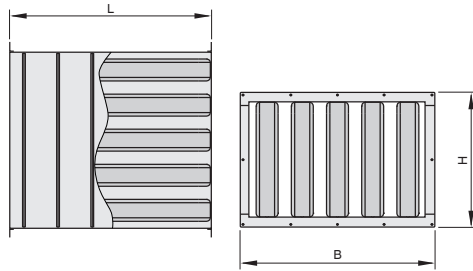
Sound attenuator casing with angle section frame, L = 1250, weight

H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	2000	2400
mm	kg									
300	15	21	26	31	37	42	47	53	63	75
600	23	29	34	39	45	51	56	62	72	83
900	31	37	42	47	53	59	64	70	80	91
1200	40	46	51	56	62	67	73	79	89	99
1500	48	54	59	64	70	75	80	86	96	107
1800	56	62	67	72	78	83	88	94	104	115

Sound attenuator casing with angle section frame, L = 1500, weight

H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	2000	2400
mm	kg									
300	18	24	30	36	42	48	54	60	72	85
600	27	33	39	45	51	57	63	69	81	94
900	36	42	48	54	60	66	72	78	90	103
1200	45	51	57	63	69	76	82	88	100	112
1500	54	60	66	72	78	85	91	97	109	122
1800	63	69	75	81	87	94	100	106	118	131





For high insertion loss with broadband damping, even in the high-frequency range



Order code

XSA200 – 100 – 3 – P F / 900x600x1500

1 2 3 4 5 6 7 8 9

1 Type

XSA Splitter sound attenuator with casing

2 Splitter thickness [mm]

100, 200, 230, 300

3 Airway width (distance between splitters) [mm]

4 No. of splitters

5 Duct connection

P Standard flange 30 mm
W Angle section frame 35 × 35 × 3 mm (required for sound attenuators with width and/or height subdivided)

6 Splitter surface

F Glass fibre fabric
L Glass fibre fabric and perforated sheet metal

7 Nominal width B [mm]

8 Nominal height H [mm]

9 Nominal length L in airflow direction [mm]



Features

- Splitter sound attenuators with splitters, suitable for air conditioning systems
- ▶ Attenuation effect due to absorption
 - ▶ Energy efficient due to aerodynamically profiled frame (radius > 15 mm)
 - ▶ Acoustic data measured to ISO 7235
 - ▶ Absorption material is biosoluble and hence hygienically safe
 - ▶ Absorption material faced with glass fibre fabric as a protection against erosion due to airflow velocities up to 20 m/s
 - ▶ Absorption material non-combustible, to EN 13501, fire rating class A1
 - ▶ Intermediate sizes in increments of 1 mm
 - ▶ For use in zones 1 and 2 as well as in zones 21 and 22 according to EU Directive 94/9/EC (ATEX)
 - ▶ Operating temperature up to 100 °C

Optional equipment and accessories

- ▶ Additional perforated sheet metal to protect the absorption material
- ▶ Stainless steel, aluminium and PUR-coated constructions upon request



Application

- ▶ Splitter sound attenuators of Type XSA used for the reduction of fan noise and air-regenerated noise in air conditioning systems
- ▶ Attenuation effect due to absorption
- ▶ Broadband attenuation even in the high frequency range
- ▶ Hygiene tested and certified to VDI 6022
- ▶ For use in potentially explosive atmospheres (ATEX), zones 1, 2, 21 and 22 (outside)



Variants

- ▶ XSA100: splitter thickness of 100 mm
- ▶ XSA200: splitter thickness of 200 mm
- ▶ XSA230: splitter thickness of 230 mm
- ▶ XSA300: splitter thickness of 300 mm



Construction

Splitter surface

- ▶ F: Glass fibre fabric
- ▶ L: Glass fibre fabric and additional perforated sheet metal to protect the absorption material

Duct connection

- ▶ P: Standard flange 30 mm
- ▶ W: Angle section frame 35 × 35 × 3 mm



Special characteristics

- ▶ Increased insertion loss even in the high-frequency range
- ▶ Up to 30 % lower differential pressure
- ▶ Energy efficient and/or space saving due to aerodynamically profiled frame
- ▶ Hygiene tested and certified
- ▶ Multi-section construction available for large dimensions



Standards and guidelines

- ▶ Insertion loss and sound power level of air-regenerated noise tested to ISO 7235
- ▶ Meets the hygiene requirements of VDI 6022, DIN 1946, parts 1 and 2 as well as of VDI 3803
- ▶ Directive 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres



Technical data

Splitter thickness	100, 200, 230, 300 mm
Nominal sizes	XSA100: 140 × 150 × 500 mm - 2400 × 1800 × 1500 mm, XSA200: 250 × 150 × 500 mm - 2400 × 1800 × 1500 mm, XSA230: 288 × 150 × 500 mm - 2400 × 1800 × 1500 mm, XSA300: 375 × 150 × 500 mm - 2400 × 1800 × 1500 mm
Width subdivided	2401 - 4800 mm
Height subdivided	1801 - 3600 mm
Length subdivided	1501 - 3000 mm
Intermediate sizes	In increments of 1 mm
Operating temperature	- 100 °C

The length (L) of splitter attenuators refers to the airflow direction.

XKA100, XSA100, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	40	3	5	10	18	37	45	31	23	5	32	>80
	60	4	7	16	26	42	47	34	26	5	33	>80
1000	40	4	8	19	29	46	50	39	32	7	44	>80
	60	4	7	16	26	42	47	34	26	5	33	>80
	100	5	5	14	27	44	46	31	20	5	29	>80
1500	40	6	11	27	39	50	50	47	40	9	55	>80
	60	6	9	23	35	50	50	42	34	6	38	>80
	100	5	5	14	27	44	46	31	20	5	29	>80
	200	3	4	11	24	38	24	14	10	4	25	>80
2000	40	7	14	36	50	50	50	50	49	11	66	>80
	60	7	12	30	45	50	50	50	41	7	44	>80
	100	6	7	19	34	50	50	39	26	5	32	>80
	200	3	4	11	24	38	24	14	10	4	25	>80
2500	40	9	18	44	50	50	50	50	50	12	77	>80
	60	8	14	37	50	50	50	50	49	8	50	>80
	100	7	8	23	42	50	50	48	32	6	34	>80
	200	4	5	13	29	46	30	17	12	4	26	>80
3000	40	10	21	50	50	50	50	50	50	14	>80	>80
	60	10	17	44	50	50	50	50	50	9	56	>80
	100	8	9	28	49	50	50	50	37	6	37	>80
	200	5	6	16	34	50	35	20	13	4	27	>80

XKA200, XSA200, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	50	2	12	18	31	44	42	29	23	9	58	>80
	100	3	8	15	32	46	38	23	16	6	35	>80
1000	50	6	14	22	44	50	50	36	27	11	67	>80
	100	3	8	15	32	46	38	23	16	6	35	>80
	200	2	5	11	22	25	18	11	7	3	21	>80
1500	50	8	20	31	50	50	50	48	33	12	75	>80
	100	5	12	22	47	50	50	31	20	6	40	>80
	200	3	7	15	31	35	24	14	8	4	23	>80
	400	2	4	11	18	15	9	6	5	2	15	61
2000	50	10	27	40	50	50	50	50	39	13	>80	>80
	100	6	16	28	50	50	50	39	24	7	44	>80
	200	4	9	20	41	45	30	17	10	4	25	>80
	400	2	5	14	24	19	11	7	6	3	17	67
2500	50	13	34	47	50	50	50	50	45	15	>80	>80
	100	7	21	34	50	50	50	45	27	8	48	>80
	200	4	11	23	50	50	36	19	11	4	28	>80
	400	3	7	16	29	21	13	8	6	3	18	72





L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
3000	50	16	42	50	50	50	50	50	50	16	>80	>80
	100	8	26	39	50	50	50	50	31	8	53	>80
	200	5	13	27	50	50	41	21	12	5	30	>80
	400	3	8	18	34	24	14	9	7	3	19	77

XKA230, XSA230, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]			
		63	125	250	500	1000	2000	4000	8000	4	10	20	
		D_e								Δp_{st}			
mm	mm	Hz								Pa			
500	60	4	7	12	25	34	25	19	18	9	57	>80	
	1000	60	5	12	20	35	48	40	27	21	10	66	>80
	115	4	8	16	27	35	27	18	15	6	35	>80	
1500	230	3	5	12	18	20	14	10	9	3	20	>80	
	60	6	16	27	46	50	50	35	25	12	74	>80	
	115	5	12	22	36	46	37	24	18	6	40	>80	
	230	3	7	16	25	28	19	12	11	4	23	>80	
2000	460	2	2	11	15	10	1	0	3	2	15	59	
	60	7	21	35	50	50	50	43	29	13	>80	>80	
	115	5	15	28	45	50	47	29	21	7	44	>80	
	230	4	9	21	32	36	24	14	13	4	25	>80	
2500	460	3	4	14	20	15	1	0	4	3	16	64	
	60	8	25	43	50	50	50	50	33	15	>80	>80	
	115	6	19	35	50	50	50	34	24	8	48	>80	
	230	5	12	26	40	43	28	17	14	4	27	>80	
3000	460	4	5	18	25	19	0	0	5	3	17	69	
	60	9	30	50	50	50	50	50	37	16	>80	>80	
	115	7	22	41	50	50	50	40	27	8	52	>80	
	230	6	14	31	47	50	33	19	16	5	29	>80	
3000	460	5	6	21	31	23	0	0	5	3	19	74	

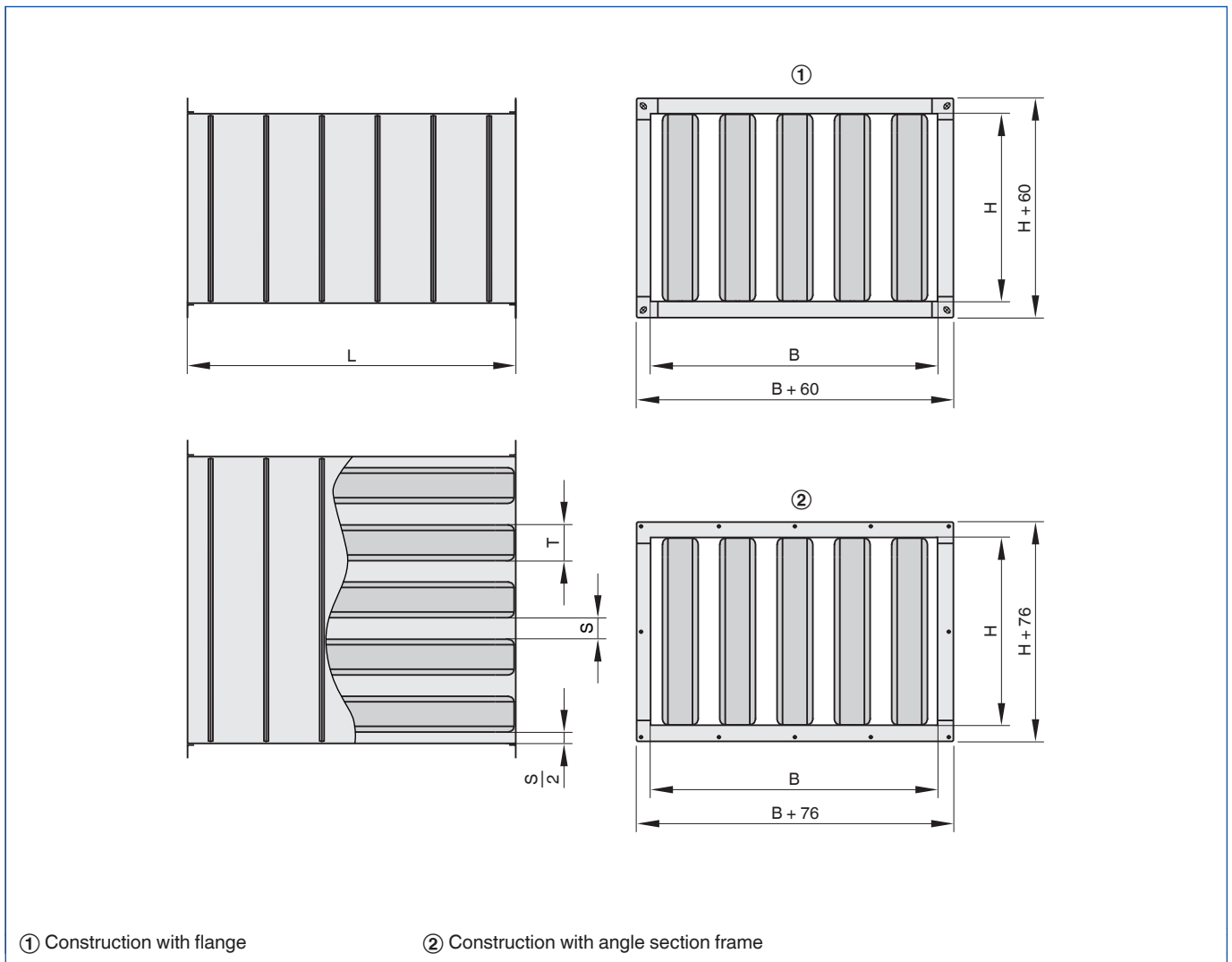
XKA300, XSA300, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	75	4	7	17	25	34	32	22	18	10	63	>80
	150	2	5	11	16	19	17	12	9	5	33	>80
1000	75	6	15	24	42	48	50	33	26	11	71	>80
	150	3	9	18	27	34	28	17	11	6	36	>80
	300	1	6	11	15	16	13	8	7	3	21	>80
1500	75	8	20	33	50	50	50	44	30	13	79	>80
	150	3	14	26	38	46	39	21	13	6	39	>80
	300	2	8	16	21	21	17	10	8	4	22	>80
	600	1	6	11	12	9	6	4	5	2	15	60
2000	75	10	25	42	50	50	50	50	34	14	>80	>80
	150	4	18	33	48	50	50	26	16	7	42	>80
	300	2	11	20	26	26	21	12	9	4	23	>80
	600	1	7	14	16	11	7	5	5	2	15	60



L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
2500	75	13	30	50	50	50	50	50	38	15	>80	>80
	150	5	23	40	50	50	50	30	18	7	45	>80
	300	3	14	25	32	32	25	13	10	4	25	>80
	600	1	9	17	19	13	7	5	6	3	16	64
3000	75	15	35	50	50	50	50	50	42	16	>80	>80
	150	6	28	48	50	50	50	35	20	8	48	>80
	300	3	17	30	38	37	29	15	11	4	26	>80
	600	2	11	21	23	14	8	5	6	3	17	68

XSA



Sound attenuator casing, nominal length

L	mm	500	750	1000	1250	1500
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Sound attenuator casing, nominal height

H	mm	300	600	900	1200	1500	1800
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Sound attenuator casing, nominal width

B	XSA100			XSA200			XSA230			XSA300		
	T	n	S	T	n	S	T	n	S	T	n	S
	mm	-	mm	mm	-	mm	mm	-	mm	mm	-	mm
200	100	1	100	-	-	-	-	-	-	-	-	-
400	100	2	100	200	1	200	230	1	85	300	1	100
600	100	2 - 4	50 - 200	200	2	100	230	2	70	300	1	300
800	100	3 - 5	60 - 167	200	2 - 3	67 - 200	230	2	170	300	1 - 2	100 - 250
1000	100	4 - 7	43 - 150	200	3 - 4	50 - 133	230	3	103	300	2	200
1200	100	4 - 8	50 - 200	200	3 - 5	40 - 200	230	3 - 4	70 - 170	300	2 - 3	100 - 300
1400	100	5 - 10	40 - 180	200	4 - 5	80 - 150	230	3 - 5	50 - 237	300	3 - 4	50 - 167
1600	100	6 - 11	46 - 200	200	4 - 7	57 - 200	230	4 - 5	90 - 170	300	3 - 4	100 - 233
1800	100	6 - 12	50 - 200	200	5 - 8	50 - 160	230	4 - 6	70 - 220	300	3 - 5	60 - 300
2000	100	7 - 14	43 - 186	200	5 - 8	50 - 200	230	5 - 7	56 - 170	300	4 - 5	100 - 200
2200	100	7 - 15	47 - 200	200	6 - 9	44 - 167	230	5 - 7	84 - 186	300	4 - 6	67 - 250
2400	100	8 - 16	50 - 200	200	6 - 10	40 - 200	230	6 - 8	70 - 170	300	4 - 7	43 - 300

Sound attenuator casing with angle section frame, L = 500, weight

H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	2000	2400
mm	kg									
300	9	13	16	19	23	25	28	32	39	45
600	14	18	21	24	28	30	33	37	44	50
900	18	22	25	28	32	35	38	42	49	55
1200	23	27	30	33	37	40	43	47	54	59
1500	28	32	35	38	42	45	48	52	59	64
1800	33	37	40	43	47	50	53	57	64	69

Sound attenuator casing with angle section frame, L = 750, weight

H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	2000	2400
mm	kg									
300	8	12	16	20	24	25	29	33	41	45
600	13	17	21	25	29	30	34	38	46	50
900	17	21	25	29	33	35	39	43	51	55
1200	22	26	30	34	38	40	44	48	56	59
1500	27	31	35	39	43	45	49	53	61	64
1800	32	36	40	44	48	50	54	58	66	69

Sound attenuator casing with angle section frame, L = 1000, weight

H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	2000	2400
mm	kg									
300	14	18	23	28	32	37	42	46	56	65
600	21	25	30	35	39	44	49	53	63	72
900	28	32	37	42	46	51	56	60	70	79
1200	35	39	44	49	53	58	63	67	77	86
1500	42	46	51	56	60	65	70	74	84	93
1800	49	53	58	63	67	72	77	81	91	100





Sound attenuator casing with angle section frame, L = 1250, weight

H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	2000	2400
mm	kg									
300	15	21	26	31	37	42	47	53	63	75
600	23	29	34	39	45	51	56	62	72	83
900	31	37	42	47	53	59	64	70	80	91
1200	40	46	51	56	62	67	73	79	89	99
1500	48	54	59	64	70	75	80	86	96	107
1800	56	62	67	72	78	83	88	94	104	115

Sound attenuator casing with angle section frame, L = 1500, weight

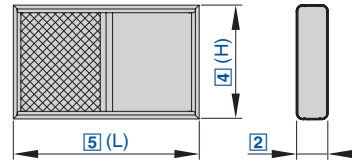
H	B [mm]									
	200	400	600	800	1000	1200	1400	1600	2000	2400
mm	kg									
300	18	24	30	36	42	48	54	60	72	85
600	27	33	39	45	51	57	63	69	81	94
900	36	42	48	54	60	66	72	78	90	103
1200	45	51	57	63	69	76	82	88	100	112
1500	54	60	66	72	78	85	91	97	109	122
1800	63	69	75	81	87	94	100	106	118	131





Splitters

	Type		
	Splitters		
	MKA	XKA	RKA
Sound attenuator casing			
Rectangular			
Circular			
Galvanised sheet steel			
Aluminium			
Plastic			
Splitters			
Absorption	●	●	
Resonance	●		●
Duct connection			
Standard flange			
Angle section frame			
Spigot			
Flange on one end			
Flanges on both ends			
Socket-type spigots on both ends			
Raised edges at both ends			
Nominal sizes			
Diameter			
Width			
Increments			
Width subdivided			
Height	300 - 1800 mm	300 - 1800 mm	300 - 1800 mm
Increments	1 mm	1 mm	1 mm
Height subdivided	- 4800 mm	- 4800 mm	- 4800 mm
Length	500 - 1500 mm	500 - 1500 mm	500 - 1500 mm
Increments	1 mm	1 mm	1 mm
Length subdivided	- 3000 mm	- 3000 mm	- 3000 mm
Splitter surface			
Glass fibre fabric	●	●	
Glass fibre fabric and perforated sheet metal	●	●	
Explanation			
● - Standard			



For increased insertion loss and broadband attenuation even in the low frequency range

Order code

MKA200 – F / 600×1500



1 Type

MKA Sound attenuator splitter with resonating panels

3 Splitter surface

F Glass fibre fabric
L Glass fibre fabric and perforated sheet metal

4 Height H [mm]

5 Length L in airflow direction [mm]

2 Splitter thickness [mm]

100, 200, 230

+ Features

- Energy-saving splitters with resonating panels, ready to be used in air conditioning systems
- ▶ Attenuation effect due to resonance and absorption
 - ▶ Energy efficient due to aerodynamically profiled frame (radius > 15 mm)
 - ▶ Acoustic data measured to ISO 7235
 - ▶ Absorption material is biosoluble and hence hygienically safe
 - ▶ Absorption material faced with glass fibre fabric as a protection against erosion due to airflow velocities up to 20 m/s
 - ▶ Absorption material non-combustible, to EN 13501, fire rating class A1
 - ▶ Intermediate sizes in increments of 1 mm
 - ▶ Operating temperature up to 100 °C

Optional equipment and accessories

- ▶ Additional perforated sheet metal to protect the absorption material
- ▶ Stainless steel, aluminium and PUR-coated constructions upon request

✂ Application

- ▶ Sound attenuator splitters with resonating panels, Type MKA, used for the reduction of fan noise and air-regenerated noise in air conditioning systems
- ▶ Attenuation effect due to absorption and resonance
- ▶ Broadband attenuation even in the low frequency range of critical fan noise
- ▶ Hygiene tested and certified to VDI 6022
- ▶ For use in potentially explosive atmospheres (ATEX), zones 1, 2, 21 and 22 (outside)

◊ Variants

- ▶ MKA100: splitter thickness 100 mm
- ▶ MKA200: splitter thickness 200 mm
- ▶ MKA230: splitter thickness 230 mm

+ Construction

Surface of splitter area not covered by a resonating panel

- ▶ F: Glass fibre fabric
- ▶ L: Glass fibre fabric and additional perforated sheet metal to protect the absorption material

+ Useful additions

- ▶ U-sheets/clamp sheets to join subdivided attenuator splitters

★ Special characteristics

- ▶ Resonating panels ensure increased insertion loss in the frequency range of critical fan noise
- ▶ Up to 30 % lower differential pressure
- ▶ Energy efficient and/or space saving due to aerodynamically profiled frame
- ▶ Hygiene tested and certified
- ▶ Multi-section construction available for large dimensions

ISO Standards and guidelines

- ▶ Insertion loss and sound power level of air-regenerated noise tested to ISO 7235
- ▶ Meets the hygiene requirements of VDI 6022, DIN 1946, parts 1 and 2 as well as of VDI 3803
- ▶ Directive 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres

📊 Technical data

Splitter thickness	100, 200, 230 mm
Nominal sizes	150 × 500 mm - 1499 × 2500, 2500 × 1499 or 1500 × 1500 mm
Height subdivided	2501 - 5000 mm
Length subdivided	1501 - 3000 mm
Intermediate sizes	In increments of 1 mm
Operating temperature	Up to 100 °C

The length (L) of sound attenuator splitters refers to the airflow direction





MKA100, MSA100, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	40	4	10	11	13	21	27	24	18	5	32	>80
	60	5	11	17	19	28	32	27	21	5	33	>80
1000	40	5	13	20	23	31	38	32	26	7	44	>80
	60	5	11	17	19	28	32	27	21	5	33	>80
	100	4	10	14	19	29	28	19	14	5	29	>80
1500	40	6	16	30	32	42	48	40	34	9	55	>80
	60	6	14	25	28	38	41	33	27	6	38	>80
	100	4	10	14	19	29	28	19	14	5	29	>80
2000	40	8	19	39	42	50	50	49	42	11	66	>80
	60	7	16	32	36	47	50	40	34	7	44	>80
	100	5	12	19	25	37	35	23	16	5	32	>80
	200	3	9	10	17	25	15	9	8	4	25	>80
2500	40	9	22	48	50	50	50	50	50	12	77	>80
	60	8	19	40	45	50	50	47	40	8	50	>80
	100	6	14	24	30	45	41	27	19	6	34	>80
	200	3	12	12	21	33	19	12	11	4	26	>80
3000	40	10	25	50	50	50	50	50	50	14	>80	>80
	60	9	22	48	50	50	50	50	46	9	56	>80
	100	7	16	28	36	50	47	31	22	6	37	>80
	200	2	14	15	26	41	24	16	14	4	27	>80

MKA200, MSA200, insertion loss and differential pressure

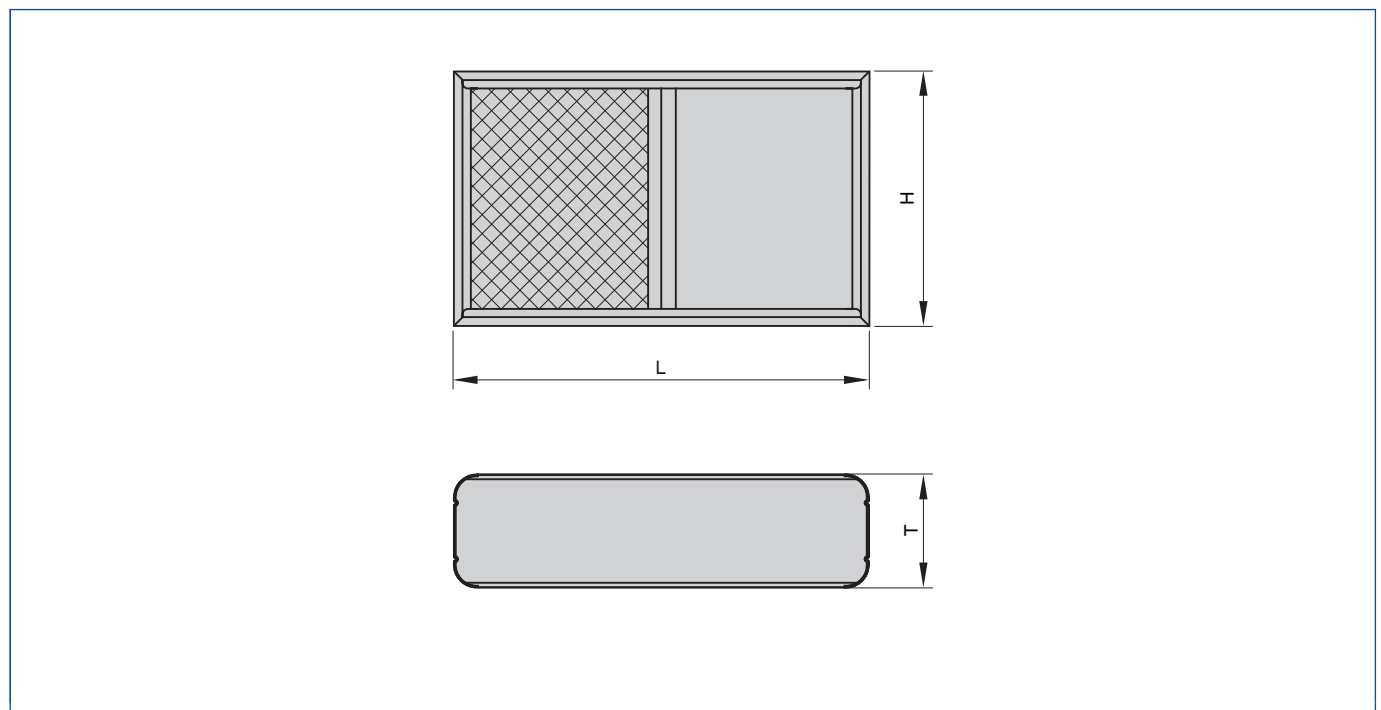
L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	50	5	7	19	21	26	22	17	14	9	58	>80
	100	2	4	12	12	15	11	9	8	5	31	>80
1000	50	6	16	33	39	41	39	26	20	11	67	>80
	100	4	10	22	23	26	19	13	11	6	35	>80
	200	2	7	13	12	12	10	8	6	3	21	>80
1500	50	9	22	44	50	50	50	34	25	12	75	>80
	100	5	15	32	33	37	25	16	14	6	40	>80
	200	3	9	19	18	15	12	10	7	4	23	>80
	400	1	6	10	8	8	6	4	4	2	15	61
2000	50	12	29	50	50	50	50	43	29	13	>80	>80
	100	6	19	42	44	47	31	19	17	7	44	>80
	200	4	12	25	23	18	15	12	9	4	25	>80
	400	1	8	13	10	10	8	5	5	3	17	67
2500	50	14	38	50	50	50	50	49	35	15	>80	>80
	100	8	25	50	50	50	38	23	18	8	48	>80
	200	5	16	30	29	23	16	13	10	4	28	>80
	400	2	10	16	13	12	9	6	5	3	18	72
3000	50	17	48	50	50	50	50	50	40	16	>80	>80
	100	10	30	50	50	50	44	26	19	8	53	>80
	200	6	19	35	35	27	17	15	11	5	30	>80
	400	3	13	19	15	14	10	7	6	3	19	77



MKA230, MSA230, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	60	3	7	16	19	21	17	14	14	9	57	>80
	115	2	5	11	12	13	10	9	10	5	31	>80
1000	60	7	13	27	30	35	25	18	18	10	66	>80
	115	4	10	20	20	22	15	12	13	6	35	>80
	230	1	7	12	10	8	4	6	8	3	20	>80
1500	60	11	19	38	41	49	33	21	21	12	74	>80
	115	7	14	28	28	30	20	15	15	6	40	>80
	230	2	10	18	15	10	6	9	9	4	23	>80
2000	60	15	24	50	50	50	42	25	25	13	>80	>80
	115	9	19	37	36	39	26	18	18	7	44	>80
	230	3	13	24	19	13	8	11	10	4	25	>80
	460	0	7	10	3	0	0	3	3	3	16	64
2500	60	19	30	50	50	50	50	29	28	15	>80	>80
	115	12	24	46	44	47	31	21	20	8	48	>80
	230	4	16	29	24	16	11	13	12	4	27	>80
	460	0	9	13	4	0	0	5	3	3	17	69
3000	60	24	36	50	50	50	50	32	32	16	>80	>80
	115	14	28	50	50	50	36	24	23	8	52	>80
	230	4	19	35	29	18	13	15	13	5	29	>80
	460	0	11	16	6	0	0	7	3	3	19	74

MKA





MKA100, weight

H	Glass fibre fabric (-F)					Glass fibre fabric and perforated sheet metal (-L)				
	L [mm]									
	500	750	1000	1250	1500	500	750	1000	1250	1500
mm	kg									
300	2	3	4	5	6	3	4	5	6	8
600	4	5	7	8	10	5	7	9	11	13
900	5	7	9	11	13	7	10	13	16	18
1200	7	10	12	15	17	9	13	16	20	24
1500	8	12	15	18	21	11	16	20	25	29
1800	10	14	19	23	27	14	19	25	31	36

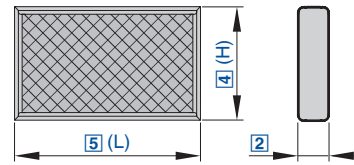
MKA200, weight

H	Glass fibre fabric (-F)					Glass fibre fabric and perforated sheet metal (-L)				
	L [mm]									
	500	750	1000	1250	1500	500	750	1000	1250	1500
mm	kg									
300	4	5	6	7.5	9	4	6	7	9	11
600	6	8	10	12	15	7	10	12	15	18
900	8	11	14	17	20	10	14	17	21	25
1200	10	14	18	22	26	13	18	22	27	32
1500	13	17	22	27	31	15	21	27	33	40
1800	16	22	28	34	40	19	27	34	42	50

MKA230, weight

H	Glass fibre fabric (-F)					Glass fibre fabric and perforated sheet metal (-L)				
	L [mm]									
	500	750	1000	1250	1500	500	750	1000	1250	1500
mm	kg									
300	4	5	7	8	10	5	6	8	10	12
600	6	9	11	14	16	8	11	13	16	19
900	9	12	16	19	22	11	15	19	23	27
1200	11	16	20	24	28	14	19	24	30	35
1500	14	19	24	29	34	17	23	30	36	43
1800	18	24	31	37	44	21	29	37	45	54





For high insertion loss with broadband damping, even in the high-frequency range

Order code

XKA200 – F / 600×1500



1 Type
XKA Sound attenuator splitter

2 Splitter thickness [mm]
100, 200, 230, 300

3 Splitter surface
F Glass fibre fabric
L Glass fibre fabric under perforated sheet metal

4 Height H [mm]
5 Length L in airflow direction [mm]

Features

Energy-saving splitters, ready to be used in air conditioning systems

- ▶ Attenuation effect due to absorption
- ▶ Energy efficient due to aerodynamically profiled frame (radius > 15 mm)
- ▶ Acoustic data measured to ISO 7235
- ▶ Absorption material is biosoluble and hence hygienically safe
- ▶ Absorption material faced with glass fibre fabric as a protection against erosion due to airflow velocities up to 20 m/s
- ▶ Absorption material non-combustible, to EN 13501, fire rating class A1
- ▶ Intermediate sizes in increments of 1 mm
- ▶ Operating temperature up to 100 °C

Optional equipment and accessories

- ▶ Additional perforated sheet metal to protect the absorption material
- ▶ Stainless steel, aluminium and PUR-coated constructions upon request

Application

- ▶ Sound attenuator splitters of Type XKA, used for the reduction of fan noise and air-regenerated noise in air conditioning systems
- ▶ Attenuation effect due to absorption
- ▶ Broadband attenuation even in the high frequency range
- ▶ Hygiene tested and certified to VDI 6022
- ▶ For use in potentially explosive atmospheres (ATEX), zones 1, 2, 21 and 22 (outside)

Variants

- ▶ XKA100: Splitter thickness 100 mm
- ▶ XKA200: Splitter thickness 200 mm
- ▶ XKA230: Splitter thickness 230 mm
- ▶ XKA300: Splitter thickness 300 mm

Construction

- Splitter surface
- ▶ F: Glass fibre fabric
 - ▶ L: Glass fibre fabric and additional perforated sheet metal to protect the absorption material

Useful additions

- ▶ U-sheets/clamp sheets to join subdivided attenuator splitters

Special characteristics

- ▶ Increased insertion loss even in the high-frequency range
- ▶ Up to 30 % lower differential pressure
- ▶ Energy efficient and/or space saving due to aerodynamically profiled frame
- ▶ Hygiene tested and certified
- ▶ Multi-section construction available for large dimensions

Standards and guidelines

- ▶ Insertion loss and sound power level of air-regenerated noise tested to ISO 7235
- ▶ Meets the hygiene requirements of VDI 6022, DIN 1946, parts 1 and 2 as well as of VDI 3803
- ▶ Directive 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres

Technical data

Splitter thickness	100, 200, 230, 300 mm
Nominal sizes	150 × 500 mm - 1499 × 2500, 2500 × 1499 or 1500 × 1500 mm
Height subdivided	2501 - 5000 mm
Length subdivided	1501 - 3000 mm
Intermediate sizes	In increments of 1 mm
Operating temperature	Up to 100 °C

The length (L) of sound attenuator splitters refers to the airflow direction





XKA100, XSA100, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	40	3	5	10	18	37	45	31	23	5	32	>80
	60	4	7	16	26	42	47	34	26	5	33	>80
1000	40	4	8	19	29	46	50	39	32	7	44	>80
	60	4	7	16	26	42	47	34	26	5	33	>80
	100	5	5	14	27	44	46	31	20	5	29	>80
1500	40	6	11	27	39	50	50	47	40	9	55	>80
	60	6	9	23	35	50	50	42	34	6	38	>80
	100	5	5	14	27	44	46	31	20	5	29	>80
2000	40	7	14	36	50	50	50	50	49	11	66	>80
	60	7	12	30	45	50	50	50	41	7	44	>80
	100	6	7	19	34	50	50	39	26	5	32	>80
	200	3	4	11	24	38	24	14	10	4	25	>80
2500	40	9	18	44	50	50	50	50	50	12	77	>80
	60	8	14	37	50	50	50	50	49	8	50	>80
	100	7	8	23	42	50	50	48	32	6	34	>80
	200	4	5	13	29	46	30	17	12	4	26	>80
3000	40	10	21	50	50	50	50	50	50	14	>80	>80
	60	10	17	44	50	50	50	50	50	9	56	>80
	100	8	9	28	49	50	50	50	37	6	37	>80
	200	5	6	16	34	50	35	20	13	4	27	>80

XKA200, XSA200, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	50	2	12	18	31	44	42	29	23	9	58	>80
	100	3	8	15	32	46	38	23	16	6	35	>80
1000	50	6	14	22	44	50	50	36	27	11	67	>80
	100	3	8	15	32	46	38	23	16	6	35	>80
	200	2	5	11	22	25	18	11	7	3	21	>80
1500	50	8	20	31	50	50	50	48	33	12	75	>80
	100	5	12	22	47	50	50	31	20	6	40	>80
	200	3	7	15	31	35	24	14	8	4	23	>80
	400	2	4	11	18	15	9	6	5	2	15	61
2000	50	10	27	40	50	50	50	50	39	13	>80	>80
	100	6	16	28	50	50	50	39	24	7	44	>80
	200	4	9	20	41	45	30	17	10	4	25	>80
	400	2	5	14	24	19	11	7	6	3	17	67
2500	50	13	34	47	50	50	50	50	45	15	>80	>80
	100	7	21	34	50	50	50	45	27	8	48	>80
	200	4	11	23	50	50	36	19	11	4	28	>80
	400	3	7	16	29	21	13	8	6	3	18	72
3000	50	16	42	50	50	50	50	50	50	16	>80	>80
	100	8	26	39	50	50	50	50	31	8	53	>80
	200	5	13	27	50	50	41	21	12	5	30	>80
	400	3	8	18	34	24	14	9	7	3	19	77



XKA230, XSA230, insertion loss and differential pressure

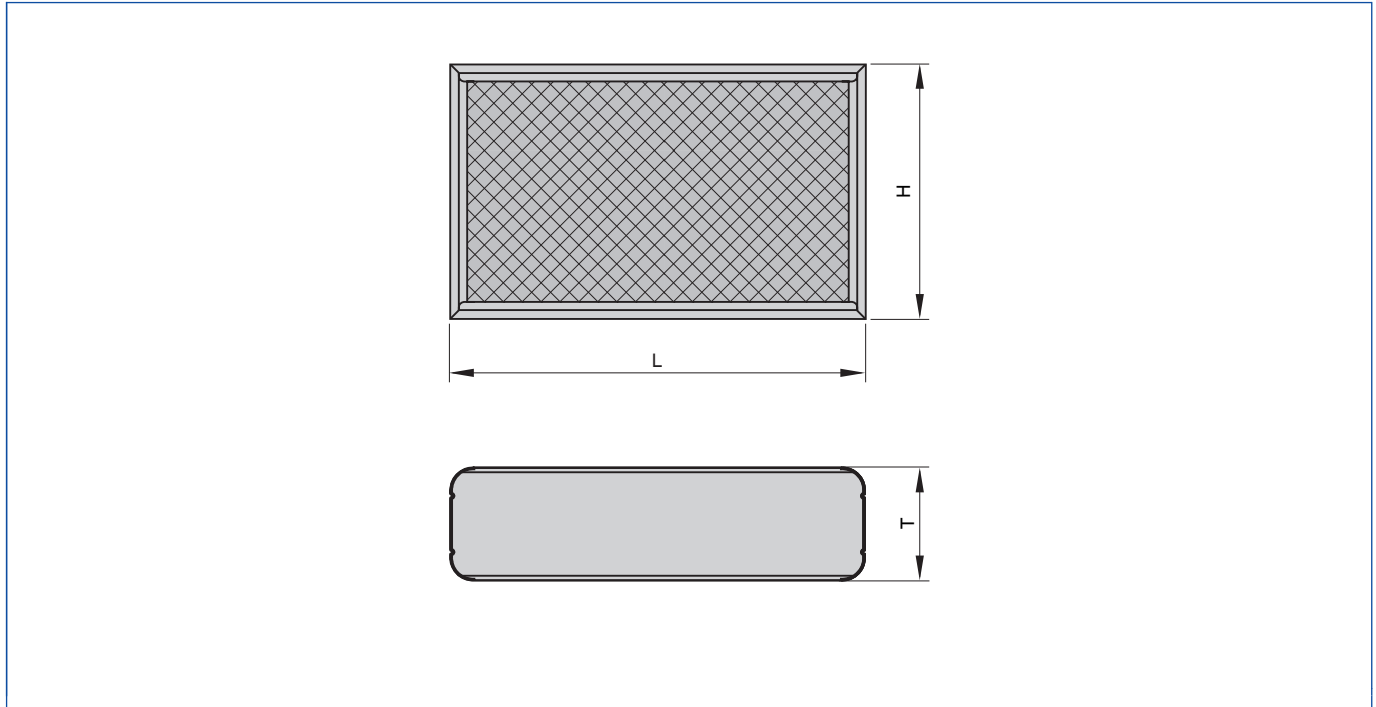
L	S	Centre frequency f_m [Hz]								v_s [m/s]			
		63	125	250	500	1000	2000	4000	8000	4	10	20	
		D_e								Δp_{st}			
mm	mm	Hz								Pa			
500	60	4	7	12	25	34	25	19	18	9	57	>80	
	1000	60	5	12	20	35	48	40	27	21	10	66	>80
		115	4	8	16	27	35	27	18	15	6	35	>80
1500		230	3	5	12	18	20	14	10	9	3	20	>80
	60	6	16	27	46	50	50	35	25	12	74	>80	
	115	5	12	22	36	46	37	24	18	6	40	>80	
	230	3	7	16	25	28	19	12	11	4	23	>80	
2000	460	2	2	11	15	10	1	0	3	2	15	59	
	60	7	21	35	50	50	50	43	29	13	>80	>80	
	115	5	15	28	45	50	47	29	21	7	44	>80	
	230	4	9	21	32	36	24	14	13	4	25	>80	
2500	460	3	4	14	20	15	1	0	4	3	16	64	
	60	8	25	43	50	50	50	50	33	15	>80	>80	
	115	6	19	35	50	50	50	34	24	8	48	>80	
	230	5	12	26	40	43	28	17	14	4	27	>80	
3000	460	4	5	18	25	19	0	0	5	3	17	69	
	60	9	30	50	50	50	50	50	37	16	>80	>80	
	115	7	22	41	50	50	50	40	27	8	52	>80	
	230	6	14	31	47	50	33	19	16	5	29	>80	
	460	5	6	21	31	23	0	0	5	3	19	74	

XKA300, XSA300, insertion loss and differential pressure

L	S	Centre frequency f_m [Hz]								v_s [m/s]		
		63	125	250	500	1000	2000	4000	8000	4	10	20
		D_e								Δp_{st}		
mm	mm	Hz								Pa		
500	75	4	7	17	25	34	32	22	18	10	63	>80
	150	2	5	11	16	19	17	12	9	5	33	>80
1000	75	6	15	24	42	48	50	33	26	11	71	>80
	150	3	9	18	27	34	28	17	11	6	36	>80
	300	1	6	11	15	16	13	8	7	3	21	>80
1500	75	8	20	33	50	50	50	44	30	13	79	>80
	150	3	14	26	38	46	39	21	13	6	39	>80
	300	2	8	16	21	21	17	10	8	4	22	>80
	600	1	6	11	12	9	6	4	5	2	15	60
2000	75	10	25	42	50	50	50	50	34	14	>80	>80
	150	4	18	33	48	50	50	26	16	7	42	>80
	300	2	11	20	26	26	21	12	9	4	23	>80
	600	1	7	14	16	11	7	5	5	2	15	60
2500	75	13	30	50	50	50	50	50	38	15	>80	>80
	150	5	23	40	50	50	50	30	18	7	45	>80
	300	3	14	25	32	32	25	13	10	4	25	>80
	600	1	9	17	19	13	7	5	6	3	16	64
3000	75	15	35	50	50	50	50	50	42	16	>80	>80
	150	6	28	48	50	50	50	35	20	8	48	>80
	300	3	17	30	38	37	29	15	11	4	26	>80
	600	2	11	21	23	14	8	5	6	3	17	68



XKA



XKA100, weight

H	Glass fibre fabric (-F)					Glass fibre fabric and perforated sheet metal (-L)				
	L [mm]									
	500	750	1000	1250	1500	500	750	1000	1250	1500
mm	kg									
300	2	2	3	4	4	3	4	5	6	7
600	3	4	4	5	6	5	7	9	11	13
900	4	5	6	7	8	7	10	12	15	18
1200	5	6	7	9	10	9	12	16	20	23
1500	5	7	9	10	12	11	15	20	24	28
1800	7	9	11	14	16	13	19	24	30	35

XKA200, weight

H	Glass fibre fabric (-F)					Glass fibre fabric and perforated sheet metal (-L)				
	L [mm]									
	500	750	1000	1250	1500	500	750	1000	1250	1500
mm	kg									
300	3	4	5	6	7	4	6	7	9	10
600	5	6	8	9	11	7	10	12	15	18
900	6	8	11	13	15	10	13	17	21	25
1200	8	11	13	16	19	12	17	22	27	32
1500	10	13	16	19	22	15	21	27	33	39
1800	12	16	21	25	29	19	26	34	41	49



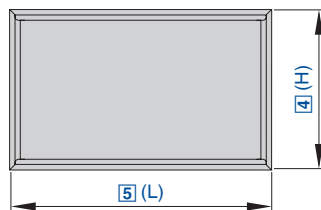
 XKA230, weight

H	Glass fibre fabric (-F)					Glass fibre fabric and perforated sheet metal (-L)				
	L [mm]									
	500	750	1000	1250	1500	500	750	1000	1250	1500
mm	kg									
300	3	5	6	7	8	4	6	8	10	11
600	5	7	9	11	12	7	10	13	16	19
900	7	10	12	14	17	10	14	19	23	27
1200	9	12	15	18	21	13	19	24	29	34
1500	11	15	18	22	25	16	23	29	35	42
1800	14	19	24	28	33	20	29	37	45	53

XKA300, weight

H	Glass fibre fabric (-F)					Glass fibre fabric and perforated sheet metal (-L)				
	L [mm]									
	500	750	1000	1250	1500	500	750	1000	1250	1500
mm	kg									
300	4	6	7	9	10	5	7	9	11	14
600	7	9	11	14	16	9	12	16	19	22
900	9	12	15	18	21	12	17	22	27	31
1200	12	15	19	23	27	16	22	28	34	40
1500	14	19	23	28	33	19	27	34	42	49
1800	18	24	30	36	42	24	34	43	53	62





Parts kit for high insertion loss in the low-frequency range

Order code

RKA200 – D / 600x1500

1
2
3
4
5

1 Type
RKA Sound attenuator splitter

2 Splitter thickness [mm]
200

3 Resonator construction
Optimised for the following frequencies

A 250/125 Hz
B 125/250 Hz
C 125/63 Hz
D 63/125 Hz

4 Height H [mm]
5 Length L in airflow direction [mm]

Features

- Energy-saving splitters with resonating panels, ready to be used in air conditioning systems
- ▶ Installation in combination with other attenuator splitters
 - ▶ Energy efficient due to aerodynamically profiled frame (radius > 15 mm)
 - ▶ Acoustic data measured to ISO 7235
 - ▶ Absorption material is biosoluble and hence hygienically safe
 - ▶ Absorption material faced with glass fibre fabric as a protection against erosion due to airflow velocities up to 20 m/s
 - ▶ Absorption material non-combustible, to EN 13501, fire rating class A1
 - ▶ Intermediate sizes in increments of 1 mm
 - ▶ Operating temperature up to 100 °C

- Optional equipment and accessories
- ▶ Stainless steel and powder-coated constructions upon request

Application

- ▶ Sound attenuator splitters with resonating panels, Type RKA, used for the reduction of fan noise and air-regenerated noise in air conditioning systems
- ▶ Installation in combination with other Type MKA or XKA splitters
- ▶ Attenuation effect due to resonance
- ▶ Broadband attenuation particularly in the low frequency range of critical fan noise
- ▶ Hygiene tested and certified to VDI 6022
- ▶ For use in potentially explosive atmospheres (ATEX), zones 1, 2, 21 and 22 (outside)

Variants

- Maximum attenuation
- ▶ A: 250 - 125 Hz
 - ▶ B: 125 - 250 Hz
 - ▶ C: 125 - 63 Hz
 - ▶ D: 63 - 125 Hz

Useful additions

- ▶ U-sheets/clamp sheets to join subdivided attenuator splitters

Special characteristics

- ▶ Resonating panels ensure increased insertion loss in the frequency range of critical fan noise
- ▶ Up to 30 % lower differential pressure
- ▶ Energy efficient and/or space saving due to aerodynamically profiled frame
- ▶ Hygiene tested and certified
- ▶ Multi-section construction available for large dimensions

Standards and guidelines

- ▶ Insertion loss and sound power level of air-regenerated noise tested to ISO 7235
- ▶ Meets the hygiene requirements of VDI 6022, DIN 1946, parts 1 and 2 as well as of VDI 3803
- ▶ Directive 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres

Technical data

Splitter thickness	200 mm
Nominal sizes	150 × 500 mm - 1499 × 2500, 2500 × 1499 or 1500 × 1500 mm
Height subdivided	2501 - 5000 mm
Length subdivided	1501 - 3000 mm
Intermediate sizes	In increments of 1 mm
Operating temperature	Up to 100 °C

The length (L) of sound attenuator splitters refers to the airflow direction





RKA200-A, additional insertion loss

L	S	Centre frequency f_m [Hz]					
		63		125		250	
		$D_{e, add}$					
mm	mm	Hz					
500	50	5	12	4			
	100	2	6	2			
1000	50	10	25	9			
	100	5	13	5			
1500	50	14	38	14			
	100	7	19	6			

RKA200-B, additional insertion loss

L	S	Centre frequency f_m [Hz]					
		63		125		250	
		$D_{e, add}$					
mm	mm	Hz					
500	50	6	8	1			
	100	3	4	1			
1000	50	12	19	5			
	100	6	9	3			
1500	50	18	28	8			
	100	9	14	4			

RKA200-C, additional insertion loss

L	S	Centre frequency f_m [Hz]					
		63		125		250	
		$D_{e, add}$					
mm	mm	Hz					
500	50	7	7	2			
	100	3	3	1			
1000	50	14	15	4			
	100	7	7	2			
1500	50	21	22	6			
	100	10	11	3			

RKA200-D, additional insertion loss

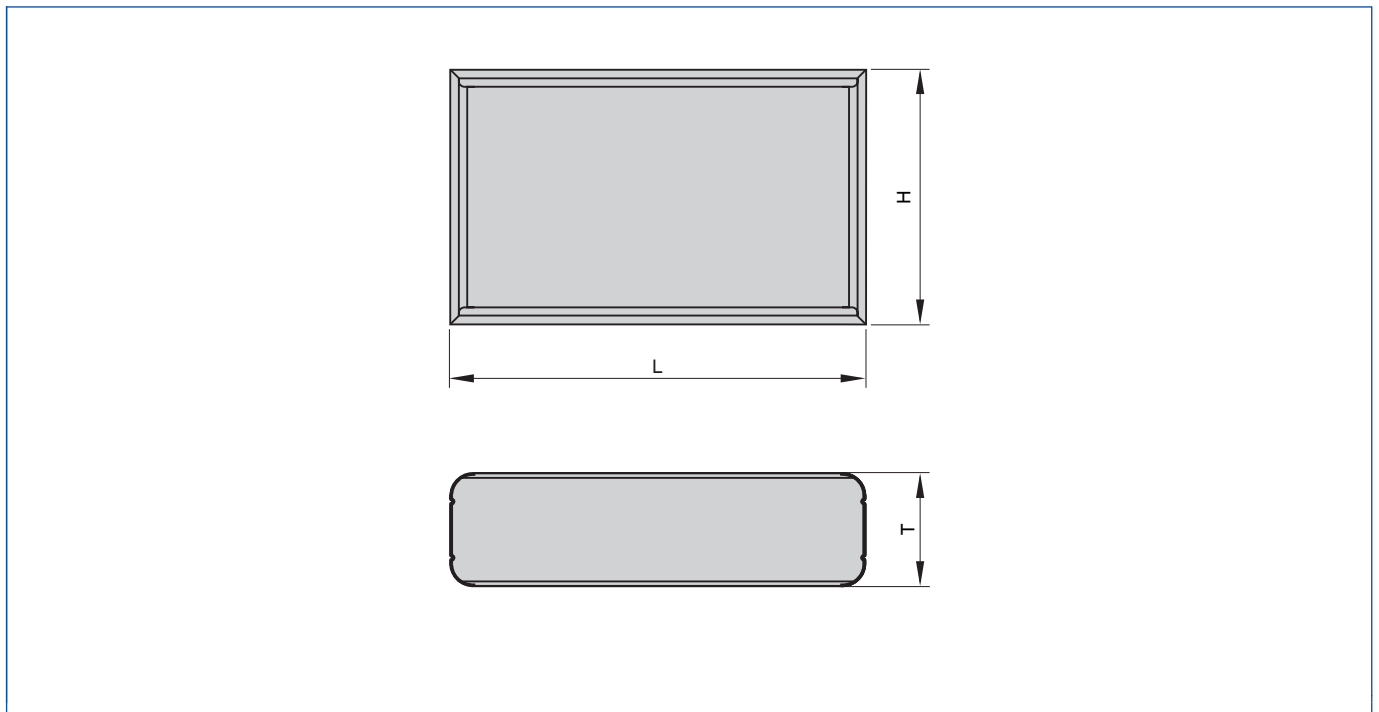
L	S	Centre frequency f_m [Hz]					
		63		125		250	
		$D_{e, add}$					
mm	mm	Hz					
500	50	8	6	2			
	100	4	3	1			
1000	50	16	12	4			
	100	8	6	2			
1500	50	24	19	5			
	100	12	9	3			



MKA200/XKA200 + RKA200 differential pressure

L _{tot}	S	v _s [m/s]		
		4	10	20
mm	mm	Δp _{st} Pa		
1000	50	11	67	>80
	100	6	35	>80
1500	50	12	75	>80
	100	6	40	>80
2000	50	13	>80	>80
	100	7	44	>80
2500	50	15	>80	>80
	100	8	48	>80
3000	50	16	>80	>80
	100	8	53	>80

RKA



RKA200-A, RKA200-B, weight

H	RKA200-A					RKA200-B				
	L [mm]									
mm	500	750	1000	1250	1500	500	750	1000	1250	1500
300	4	6	7	9	10	5	7	9	12	14
600	7	9	12	14	16	9	13	16	20	23
900	9	13	16	19	23	13	18	23	28	33
1200	12	16	20	24	29	16	23	29	36	43
1500	14	20	25	30	35	20	28	36	44	52





RKA200-C, RKA200-D, weight

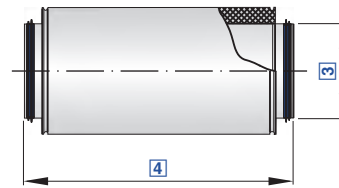
H	RKA200-C					RKA200-D				
	L [mm]									
	500	750	1000	1250	1500	500	750	1000	1250	1500
mm	kg									
300	6	9	12	14	17	7	11	14	17	21
600	11	16	21	26	30	14	19	25	31	37
900	16	23	30	37	43	20	28	37	45	54
1200	21	30	39	48	56	26	37	48	59	-
1500	26	37	48	59	69	32	45	59	-	-



Circular silencers



	Type				
	Circular silencers				
	CA	CB	CS	CF	CAK
Sound attenuator casing					
Rectangular					
Circular	●	●	●	●	●
Galvanised sheet steel	●	●			
Aluminium			●	●	
Plastic					●
Splitters					
Absorption		●			
Resonance					
Duct connection					
Standard flange					
Angle section frame					
Spigot	●	●	●	●	●
Flange on one end	●	●			
Flanges on both ends	●	●			●
Socket-type spigots on both ends			●	●	
Raised edges at both ends			●	●	
Nominal sizes					
Diameter	100 - 800 mm	250 - 1000 mm	80 - 400 mm	80 - 400 mm	110 - 400 mm
Width					
Increments					
Width subdivided					
Height					
Increments					
Height subdivided					
Length					
Increments					
Length subdivided					
Splitter surface					
Glass fibre fabric					
Glass fibre fabric and perforated sheet metal					
Explanation					
● - Standard					



For the reduction of noise in circular ducts, galvanised sheet steel construction

Order code

CA – 050 / 315x1000 / GZ / VF2

1 2 3 4 5 6

1 Type

CA Circular silencer

2 Insulation thickness [mm]

050 50
100 100

3 Nominal size [mm]

100, 125, 160, 200, 250, 315, 400, 450, 500, 560, 630, 710, 800

4 Nominal length [mm]

500, 1000, 1500

5 Matching flange

No entry: none
GE on one end (only VF1)
GZ on both ends (only VF2)

6 Type of connection

No entry: spigot
VD2 Spigot with lip seal on both ends
VF1 Flange on one end
VF2 Flanges on both ends

+ Features

Circular silencers Type CA for the reduction of noise in the circular ducts of air conditioning systems

- ▶ Absorption material is non-combustible mineral wool with RAL quality mark, biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EC
- ▶ Mineral wool faced with non-woven glass fibre as protection against erosion due to airflow velocities up to 20 m/s
- ▶ Casing and perforated inner duct are galvanised sheet steel
- ▶ Variant with spigot has a groove for a lip seal, suitable for circular connecting ducts to EN 1506 or EN 13180
- ▶ Insertion loss measured according to ISO 7235
- ▶ Casing air leakage to EN 15727, class B

Optional equipment and accessories

- ▶ With flanges on both ends
- ▶ With lip seals on both ends

Technical data

Nominal sizes	100 - 800 mm
Operating pressure	1000 Pa max.
Operating temperature	100 °C max.

Application

- ▶ Circular silencers Type CA for the reduction of noise in the circular ducts of air conditioning systems
- ▶ For the reduction of air-regenerated noise of air terminal units such as LVC and TVR, and of mechanical self-powered controllers such as RN and VFC
- ▶ For the reduction of fan noise
- ▶ Can be used as cross talk silencer to reduce the transfer of noise through ducts between neighbouring rooms

Variants

- ▶ 050: Circular silencer with 50 mm insulation
- ▶ 100: Circular silencer with 100 mm insulation
- ▶ VF1: Circular silencer with flange on one end
- ▶ VF2: Circular silencer with flanges on both ends

& Accessories

- ▶ GE: Matching flange for one end
- ▶ GZ: Matching flanges for both ends
- ▶ VD2: With lip seals on both ends

Special characteristics

- ▶ Insertion loss measured according to ISO 7235
- ▶ Absorption material is non-combustible
- ▶ Insulation thickness 50 mm or 100 mm

ISO Standards and guidelines

- ▶ Insertion loss measured according to ISO 7235
- ▶ Casing air leakage to EN 15727, class B



CA050 (insulation thickness 50 mm), insertion loss

Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
100	500	3	5	8	14	23	30	18	13
	1000	4	9	15	27	42	50	43	25
125	500	3	4	7	12	21	23	12	10
	1000	4	7	12	23	38	42	29	20
160	500	2	3	6	10	18	17	8	8
	1000	3	5	9	19	34	30	18	15
200	500	1	2	5	9	16	13	5	6
	1000	2	4	8	16	31	22	12	11
250	500	1	2	4	8	14	10	3	4
	1000	2	3	6	14	28	17	8	9
	1500	2	4	8	19	39	23	13	12
315	500	1	1	3	7	12	7	2	3
	1000	1	2	5	12	25	13	5	6
	1500	2	3	7	17	35	17	9	9
400	500	1	1	3	6	11	6	1	2
	1000	1	2	4	10	22	10	3	5
	1500	1	2	6	14	31	13	6	7

CA100 (insulation thickness 100 mm), insertion loss

Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
100	500	4	9	12	18	35	33	26	14
	1000	5	17	24	35	50	50	47	25
125	500	4	7	10	17	31	26	19	11
	1000	5	14	21	32	48	44	33	20
160	500	3	6	9	15	28	20	13	8
	1000	5	11	18	30	42	33	22	15
200	500	3	5	8	15	25	16	9	7
	1000	4	9	16	28	38	26	16	12
250	500	2	4	7	14	21	13	6	5
	1000	3	8	14	26	33	21	11	9
	1500	4	11	21	37	41	27	15	12
315	500	2	3	6	13	18	10	4	4
	1000	3	6	12	24	29	16	8	7
	1500	3	9	18	34	35	21	10	9
400	500	1	3	6	12	17	8	3	3
	1000	2	5	11	23	25	12	5	5
	1500	3	7	16	32	31	16	7	7
450	1000	2	5	10	22	23	11	4	5
	1500	2	6	15	31	29	14	6	6
500	1000	2	4	10	21	22	10	4	4
	1500	2	6	14	30	27	13	5	6
560	1500	2	5	13	29	25	11	4	5
630	1500	2	5	12	28	23	10	4	4
710	1500	2	5	11	27	22	9	3	4
800	1500	2	4	11	26	20	8	2	3

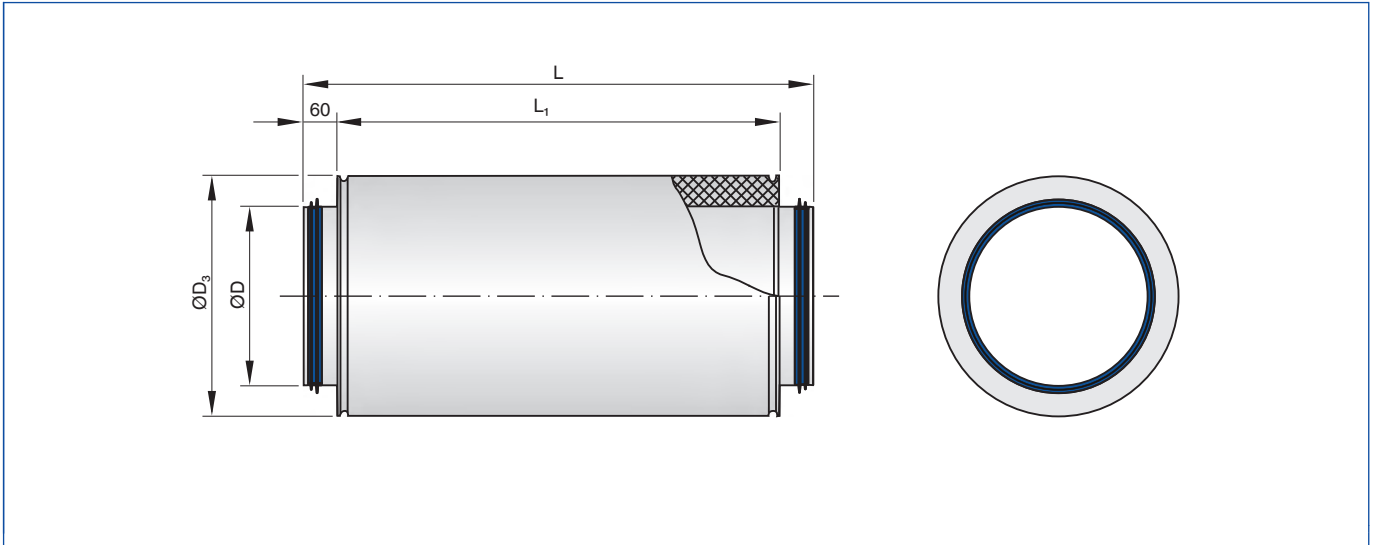


 CA, differential pressure

Nominal size	\dot{V}	\dot{V}	Nominal length [mm]		
			500	1000	1500
			Δp_{st}		
			Pa		
	l/s	m ³ /h			
100	30	108	2	2	
	60	216	4	8	
	75	270	6	12	
	90	324	8	18	
125	50	180	2	2	
	95	342	4	6	
	120	432	6	10	
	145	522	6	14	
160	80	288	2	2	
	155	558	2	6	
	195	702	4	8	
	235	846	6	10	
200	125	450	2	2	
	245	882	2	4	
	310	1116	4	6	
	370	1332	4	8	
250	195	702	<2	<2	<2
	385	1386	<2	4	4
	485	1746	2	4	6
	580	2088	4	6	8
315	310	1116	<2	<2	<2
	615	2214	<2	2	4
	770	2772	<2	4	4
	925	3330	2	4	6
400	500	1800	<2	<2	<2
	995	3582	<2	<2	2
	1245	4482	<2	2	4
	1495	5382	<2	4	4
450	630	2268		<2	<2
	1260	4536		<2	<2
	1575	5670		<2	4
	1890	6804		2	4
500	780	2808		<2	<2
	1560	5616		<2	2
	1950	7020		2	2
	2335	8406		2	4
560	980	3528			<2
	1955	7038			<2
	2445	8802			2
	2935	10566			4
630	1240	4464			<2
	2480	8928			<2
	3095	11142			<2
	3715	13374			<2
710	1575	5670			<2
	3150	11340			<2
	3935	14166			<2
	4725	17010			<2
800	2000	7200			<2
	4000	14400			<2
	5000	18000			<2
	6000	21600			<2



CA



Dimensions [mm]

Nominal size	CA-050		CA-100		ØD mm
	ØD ₃				
	mm		mm		
100		199		299	99
125		224		324	124
160		259		359	159
200		299		399	199
250		349		449	249
315		414		514	314
400		499		599	399
450				648	448
500				698	498
560				758	558
630				828	628
710				908	708
800				998	798

Dimensions [mm]

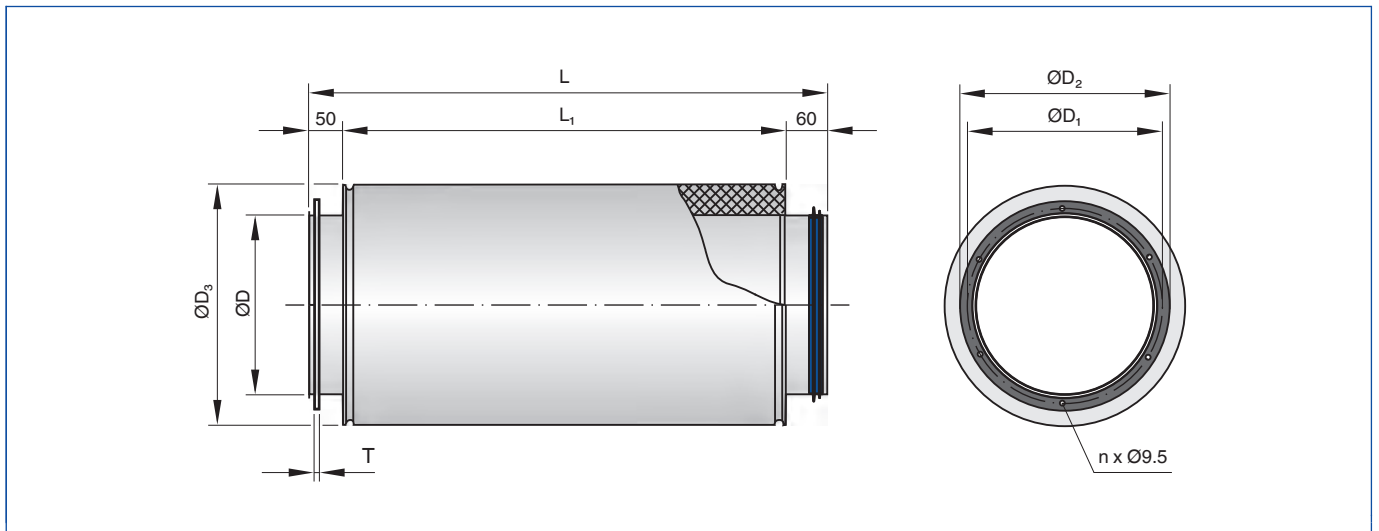
Nominal length	L		L ₁	
	mm		mm	
500		500		380
1000		1000		880
1500		1500		1380



Dimensions [mm] and weight [kg]

Nominal size	CA-050			CA-100		
	500	1000	1500	500	1000	1500
	m					
	kg	kg	kg	kg	kg	kg
100	4	7		6	11	
125	5	9		7	13	
160	70	12		9	16	
200	7	13		9	17	
250	9	16	22	11	20	29
315	12	20	28	14	25	35
400	15	25	34	18	30	42
450					33	46
500					36	52
560						55
630						62
710						68
800						76

CA.../VF1



Dimensions [mm]

Nominal size	CA-050		CA-100		ØD mm	ØD_1 mm	ØD_2 mm	n	T mm
	ØD_3		mm	mm					
	mm	mm							
100	199	299	99	132	152	4	4		
125	224	324	124	157	177	4	4		
160	259	359	159	192	212	6	4		
200	299	399	199	233	253	6	4		
250	349	449	249	283	303	6	4		
315	414	514	314	352	378	8	4		
400	499	599	399	438	464	8	4		
450		648	448	488	514	8	4		
500		698	498	538	564	8	4		
560		758	558	600	634	12	4		
630		828	628	670	704	12	4		
710		908	708	750	784	12	4		
800		998	798	840	874	16	4		



Dimensions [mm]

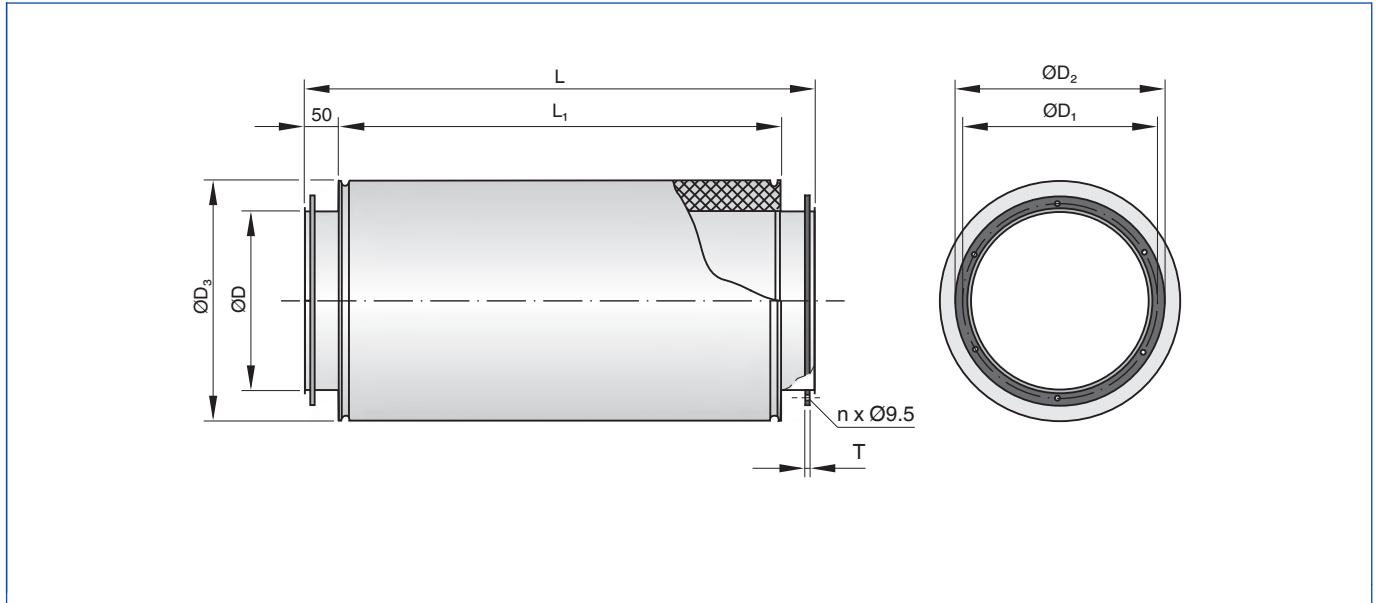
Nominal length	L	
	mm	
500	490	380
1000	990	880
1500	1490	1380



Dimensions [mm] and weight [kg]

Nominal size	CA-050			CA-100		
	500	1000	1500	500	1000	1500
	m					
	kg	kg	kg	kg	kg	kg
100	4	7		6	11	
125	5	9		7	13	
160	8	13		10	17	
200	8	14		10	18	
250	10	17	23	12	21	30
315	13	21	29	15	26	36
400	16	26	35	19	31	43
450					34	47
500					38	54
560						57
630						64
710						71
800						79

CA/.../VF2





Dimensions [mm]

Nominal size	ØD ₃	ØD ₃	ØD	ØD ₁	ØD ₂	n	T
				mm	mm		mm
100	199	299	99	132	152	4	4
125	224	324	124	157	177	4	4
160	259	359	159	192	212	6	4
200	299	399	199	233	253	6	4
250	349	449	249	283	303	6	4
315	414	514	314	352	378	8	4
400	499	599	399	438	464	8	4
450		648	448	488	514	8	4
500		698	498	538	564	8	4
560		758	558	600	634	12	4
630		828	628	670	704	12	4
710		908	708	750	784	12	4
800		998	798	840	874	16	4

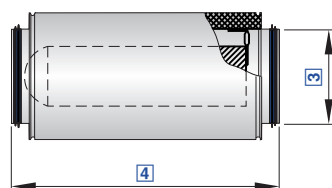
Dimensions [mm]

Nominal length	L	L ₁
	mm	mm
500	480	380
1000	980	880
1500	1480	1380

Dimensions [mm] and weight [kg]

Nominal size	CA-050			CA-100		
	500	1000	1500	500	1000	1500
	m					
	kg	kg	kg	kg	kg	kg
100	4	7		6	11	
125	6	10		8	14	
160	8	13		10	17	
200	8	14		10	18	
250	10	17	23	12	21	30
315	14	22	30	16	27	37
400	18	28	37	21	33	45
450					36	49
500					39	55
560						59
630						67
710						73
800						82





For the increased reduction of noise in circular ducts, galvanised sheet steel construction

Order code

CB – 050 / 315×1000 / GZ / VF2

1 2 3 4 5 6

1 Type

CB Circular silencer with pod

2 Insulation thickness [mm]

050 50
100 100

3 Nominal size [mm]

250, 315, 400, 450, 500, 560, 630, 710, 800, 900, 1000

4 Length [mm]

500, 1000, 1500

5 Matching flange

No entry: none
GE on one end (only VF1)
GZ on both ends (only VF2)

6 Type of connection

No entry: spigot
VD2 Spigot with lip seal on both ends (up to nominal size 800)
VF1 Flange on one end
VF2 Flanges on both ends

+ Features

Circular silencers made of galvanised sheet steel for the reduction of noise in circular ducts of air conditioning systems, with increased insertion loss due to sound absorbing pod

- ▶ Absorption material is non-combustible mineral wool with RAL quality mark, biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EC
- ▶ Mineral wool faced with glass fibre as protection against erosion due to airflow velocities up to 20 m/s
- ▶ Casing, perforated inner duct and pod are galvanised sheet steel
- ▶ Pod with domed end upstream to reduce the differential pressure
- ▶ Variant with spigot has a groove for a lip seal, suitable for circular connecting ducts to EN 1506 or EN 13180
- ▶ Insertion loss measured according to ISO 7235
- ▶ Casing air leakage to EN 15727, class B

Optional equipment and accessories

- ▶ With flanges on both ends
- ▶ Lip seal

Application

- ▶ Circular silencers Type CB for the reduction of air-regenerated noise in the circular ducts of air conditioning systems
- ▶ For the reduction of air-regenerated noise
- ▶ For the reduction of fan noise

Variants

- ▶ 050: Circular silencer with 50 mm insulation
- ▶ 100: Circular silencer with 100 mm insulation
- ▶ CB ../VF1: Circular silencer with flange on one end (end with domed cap)
- ▶ CB ../VF2: Circular silencer with flanges on both ends

& Accessories

- ▶ Matching flange for one end
- ▶ Matching flanges for both ends
- ▶ With lip seals on both ends

★ Special characteristics

- ▶ Insertion loss measured according to ISO 7235
- ▶ Increased insertion loss due to sound

absorbing pod

- ▶ Pod with domed end upstream to reduce the differential pressure
- ▶ Absorption material is non-combustible
- ▶ Insulation thickness 50 mm or 100 mm

ISO Standards and guidelines

- ▶ Insertion loss measured according to ISO 7235
- ▶ Casing air leakage to EN 15727, at least class B

Technical data

Nominal sizes	250 - 1000 mm
Operating pressure	1000 Pa max.
Operating temperature	100 °C max.



CB050 (insulation thickness 50 mm), insertion loss

Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
250	500	1	3	6	11	17	20	23	23
	1000	3	5	9	18	42	48	47	35
	1500	5	7	10	23	50	50	50	44
315	500	1	3	5	10	15	17	18	18
	1000	2	5	8	15	40	42	36	27
	1500	5	6	8	19	50	50	50	34
400	500	1	2	5	8	13	15	14	13
	1000	2	4	6	12	38	35	28	20
	1500	5	5	7	15	50	50	39	25

CB100 (insulation thickness 100 mm), insertion loss

Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
250	500	2	5	10	17	24	23	26	24
	1000	5	10	17	30	47	50	50	36
	1500	7	14	22	41	50	50	50	44
315	500	2	5	9	16	21	20	21	18
	1000	4	9	15	27	44	45	39	27
	1500	7	12	20	37	50	50	50	34
400	500	1	4	8	14	18	17	16	14
	1000	3	7	13	25	40	38	29	21
	1500	6	10	17	33	50	50	40	26
450	500	1	4	7	14	16	16	14	12
	1000	3	7	12	24	39	35	26	18
	1500	5	9	16	31	50	50	36	23
500	500	1	3	7	13	16	15	13	11
	1000	2	6	12	23	38	33	24	17
	1500	5	9	16	30	50	50	33	21
560	500	1	3	6	13	15	14	11	10
	1000	2	6	11	22	36	31	21	15
	1500	4	8	15	30	50	48	29	19
630	500	1	3	6	12	15	13	10	9
	1000	2	5	11	21	34	29	19	13
	1500	4	8	14	29	50	44	26	16
710	500	1	3	6	12	14	12	9	8
	1000	2	5	10	20	33	27	17	12
	1500	4	7	13	28	50	41	23	14
800	500	1	2	5	11	13	11	8	7
	1000	2	5	9	19	31	25	14	10
	1500	3	6	13	26	49	37	20	12
900	500	1	2	5	10	13	10	7	6
	1000	2	4	9	18	30	23	13	9
	1500	3	6	12	24	47	34	17	11
1000	500	1	2	5	10	12	10	6	5
	1000	2	4	8	17	29	22	12	8
	1500	3	6	11	23	45	33	16	10

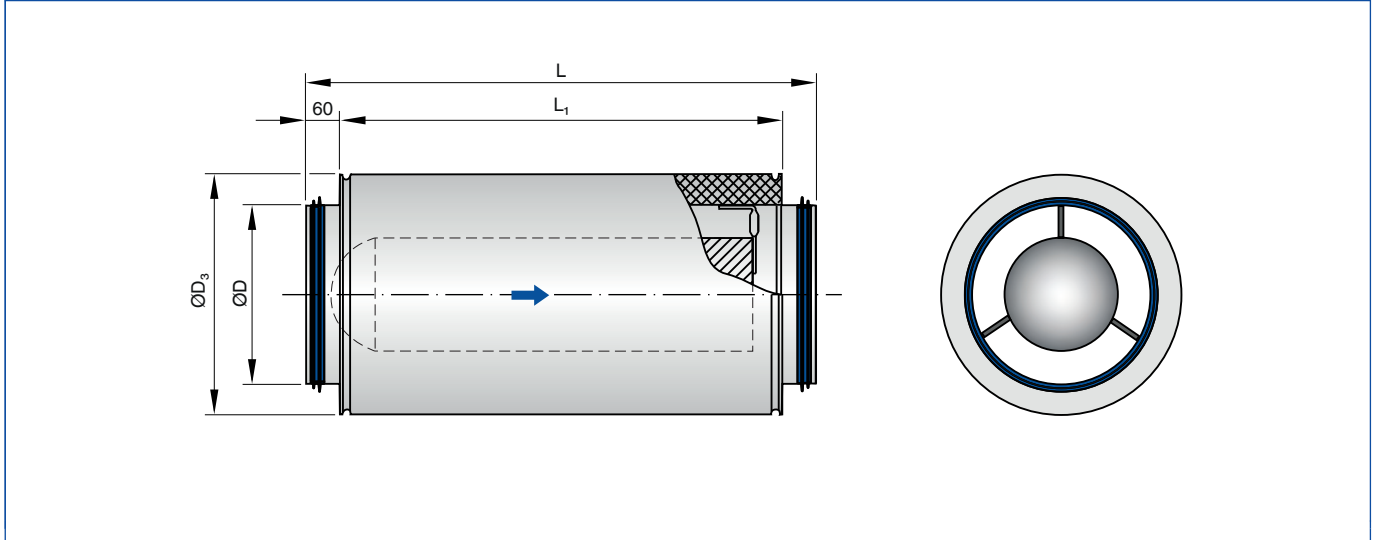


CB, differential pressure and air-regenerated noise



Nominal size	\dot{V}	\dot{V}	L_{WA}	Nominal length [mm]		
				500	1000	1500
	l/s	m ³ /h	dB(A)	Δp_{st}		
				Pa		
250	190	684	34	14	18	25
	385	1386	51	55	75	95
	480	1728	56	85	115	150
	575	2070	60	120	165	210
315	305	1098	35	14	18	25
	610	2196	52	50	95	120
	765	2754	57	80	105	130
	915	3294	61	115	145	180
400	495	1782	36	12	16	20
	990	3564	52	50	60	75
	1240	4464	58	75	95	115
	1485	5346	62	110	135	165
450	630	2268	36	12	16	20
	1255	4518	53	50	60	70
	1570	5652	58	75	90	110
	1885	6786	63	107	130	155
500	775	2790	36	12	14	18
	1550	5580	53	45	55	65
	1940	6984	59	70	85	100
	2330	8388	63	100	125	150
560	975	3510	37	12	14	18
	1950	7020	53	45	55	65
	2435	8766	59	70	85	100
	2925	10530	63	100	120	140
630	1235	4446	37	12	14	16
	2470	8892	54	45	55	65
	3090	11124	59	70	80	95
	3705	13338	64	100	115	135
710	1570	5652	37	12	14	16
	3140	11304	54	45	50	60
	3925	14130	59	70	80	95
	4710	16956	64	95	115	135
800	1995	7182	37	12	12	14
	3990	14364	54	45	50	60
	4990	17964	60	70	75	85
	5985	21546	64	95	110	125
900	2530	9108	38	12	12	14
	5055	18198	54	45	50	55
	6320	22752	60	65	75	85
	7585	27306	64	95	105	120
1000	3125	11250	38	12	12	14
	6245	22482	55	45	50	55
	7805	28098	60	65	75	85
	9370	33732	64	95	105	120





Dimensions [mm]

Nominal size	CB-050		CB-100		ØD mm
	ØD ₃ mm		mm		
250	349		449		249
315	414		514		314
400	499		599		399
450			648		448
500			698		498
560			758		558
630			828		628
710			908		708
800			998		798
900			1098		898
1000			1198		998

Dimensions [mm]

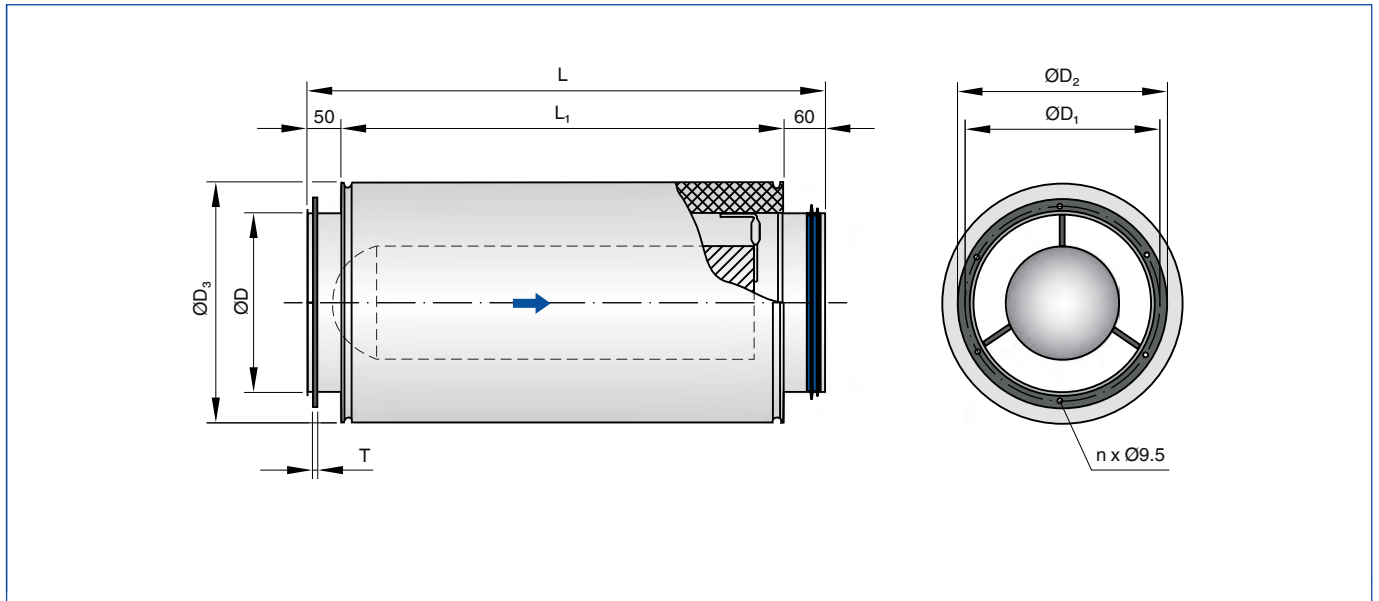
Nominal length	L mm		L ₁ mm
	mm		
500	500		380
1000	1000		880
1500	1500		1380



Dimensions [mm] and weight [kg]

Nominal size	CB-050			CB-100		
	500	1000	1500	500	1000	1500
	m					
	kg	kg	kg	kg	kg	kg
250	10	17	24	12	21	31
315	12	21	30	15	26	37
400	16	27	38	19	32	46
450				21	35	50
500				22	38	56
560				26	44	62
630				30	49	69
710				33	55	77
800				37	61	86
900				40	68	95
1000				45	75	105

CB/.../VF1



Dimensions [mm]

Nominal size	CB-050		CB-100		ØD mm	ØD_1 mm	ØD_2 mm	n	T mm
	ØD_3								
	mm	mm							
250	349	449	249	283	303	6	4		
315	414	514	314	352	378	8	4		
400	499	599	399	438	464	8	4		
450		648	448	488	514	8	4		
500		698	498	538	564	8	4		
560		758	558	600	634	12	4		
630		828	628	670	704	12	4		
710		908	708	750	784	12	4		
800		998	798	840	874	16	4		
900		1098	898	940	974	16	4		
1000		1198	998	1041	1075	16	4		



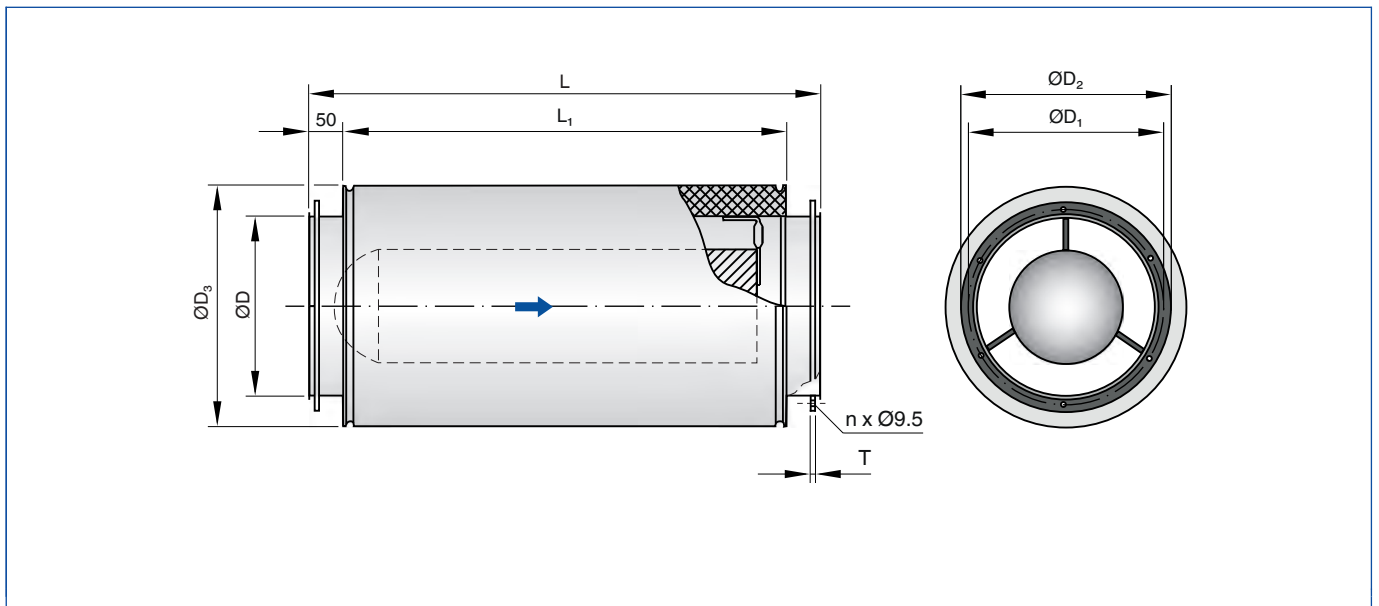
Dimensions [mm]

Nominal length	L		L ₁	
	mm		mm	
500	490		380	
1000	990		880	
1500	1490		1380	

Dimensions [mm] and weight [kg]

Nominal size	CB-050			CB-100		
	500	1000	1500	500	1000	1500
	m					
	kg	kg	kg	kg	kg	kg
250	11	18	25	13	22	32
315	14	22	31	16	27	38
400	17	28	39	20	33	47
450				22	36	51
500				24	40	58
560				28	46	64
630				32	51	71
710				36	58	80
800				40	64	89
900				43	71	98
1000				49	79	110

CB/.../VF2





Dimensions [mm]

Nominal size	CB-050		CB-100		ØD	ØD ₁	ØD ₂	n	T
	ØD ₃		mm						
	mm	mm	mm	mm					
250	349	449	249	283	303	6	4		
315	414	514	314	352	378	8	4		
400	499	599	399	438	464	8	4		
450		648	448	488	514	8	4		
500		698	498	538	564	8	4		
560		758	558	600	634	12	4		
630		828	628	670	704	12	4		
710		908	708	750	784	12	4		
800		998	798	840	874	16	4		
900		1098	898	940	974	16	4		
1000		1198	998	1041	1075	16	4		

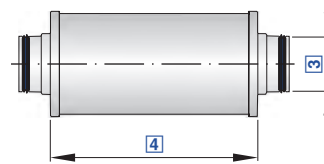
Dimensions [mm]

Nominal length	L		L ₁	
	mm		mm	
500		480		380
1000		980		880
1500		1480		1380

Dimensions [mm] and weight [kg]

Nominal size	CB-050			CB-100		
	500	1000	1500	500	1000	1500
	m					
	kg	kg	kg	kg	kg	kg
250	11	18	25	13	22	32
315	15	23	32	17	28	39
400	19	30	41	22	35	49
450				24	38	53
500				25	41	59
560				30	48	66
630				35	54	74
710				38	60	82
800				43	67	92
900				47	75	102
1000				52	82	113





For the reduction of noise in circular ducts, aluminium construction

Order code

CS – 025 / 160×1000 / VD2

1 2 3 4 5

1 Type
CS Circular silencer

3 Nominal size [mm]
80, 100, 125, 160, 200, 250, 315, 400

5 Type of connection
No entry: spigot
VD2 Spigot with lip seal on both ends
AS2 Socket-type spigots on both ends
BK2 Raised edges at both ends

2 Insulation thickness [mm]
025 25
050 50

4 Nominal length [mm]
500, 1000, 1500

+ **Features**

- Circular silencers, in rigid aluminium construction, for the reduction of noise in the circular ducts of air conditioning systems
- ▶ Absorption material is non-combustible mineral wool with RAL quality mark, biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EC
 - ▶ Casing and perforated inner duct made of aluminium
 - ▶ Variant with spigot has a groove for a lip seal, suitable for circular connecting ducts to EN 1506 or EN 13180
 - ▶ Insertion loss measured according to ISO 7235
 - ▶ Casing air leakage to EN 15727, class D

- Optional equipment and accessories
- ▶ Socket-type spigots on both ends
 - ▶ Raised edges at both ends
 - ▶ With lip seals on both ends

X **Application**

- ▶ Circular silencers Type CS for the reduction of air-regenerated noise in the circular ducts of air conditioning systems
- ▶ For the reduction of air-regenerated noise of air terminal units LVC and TVR, and of mechanical self-powered controllers RN and VFC
- ▶ For the reduction of fan noise
- ▶ Can be used as cross talk silencer to reduce the transfer of noise through ducts between neighbouring rooms

◇ **Variants**

- ▶ 025: Circular silencer with 25 mm insulation
- ▶ 050: Circular silencer with 50 mm insulation
- ▶ AS2: Circular silencer with socket-type spigots on both ends
- ▶ BK2: Circular silencer with raised edges at both ends

& **Accessories**

- ▶ VD2: With lip seals on both ends
- ▶ AS2: Socket-type spigots on both ends
- ▶ BK2: Raised edges at both ends

★ **Special characteristics**

- ▶ Insertion loss measured according to ISO 7235
- ▶ Absorption material is non-combustible
- ▶ Insulation thickness 25 mm or 50 mm

ISO **Standards and guidelines**

- ▶ Insertion loss measured according to ISO 7235
- ▶ Casing air leakage to EN 15727, class D

📊 **Technical data**

Nominal sizes	80 - 400 mm
Operating pressure	1000 Pa max.
Operating temperature	100 °C max.





CS025 (insulation thickness 25 mm), insertion loss

Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
80	500	1	2	4	9	20	16	15	10
	1000	3	5	10	21	44	46	37	23
	1500	3	5	13	28	47	48	44	31
100	500	1	1	4	8	17	14	12	9
	1000	2	3	8	17	44	34	28	21
	1500	2	4	12	24	47	41	34	26
125	500	1	1	3	8	15	11	9	7
	1000	2	3	7	17	43	30	24	17
	1500	2	3	10	22	45	34	28	20
160	500	1	1	2	5	14	10	8	6
	1000	1	1	4	12	40	27	20	16
	1500	2	2	6	16	42	30	25	19
200	500	1	1	2	5	14	9	6	5
	1000	1	1	3	11	35	22	16	13
	1500	2	2	5	15	41	27	19	15
250	500	0	1	2	5	13	8	5	4
	1000	1	1	3	11	30	19	12	10
	1500	1	2	5	15	38	25	14	11
315	500	0	1	1	4	9	7	4	3
	1000	0	1	3	9	21	10	12	8
	1500	1	2	4	12	27	19	13	10
400	500	0	0	1	3	6	5	3	3
	1000	0	1	3	8	16	8	8	7
	1500	1	1	4	10	23	17	11	8

CS050 (insulation thickness 50 mm), insertion loss

Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
80	500	4	5	11	20	30	27	16	12
	1000	8	14	23	47	50	50	44	27
	1500	11	14	33	48	50	50	47	37
100	500	3	4	9	17	24	21	12	10
	1000	7	10	21	38	50	50	29	22
	1500	10	11	27	44	50	50	37	30
125	500	2	3	7	14	20	16	11	9
	1000	5	7	16	32	50	42	25	22
	1500	7	9	21	41	50	46	33	27
160	500	2	2	6	12	17	14	8	6
	1000	4	5	12	26	47	34	20	16
	1500	5	7	17	37	48	42	24	19
200	500	1	2	5	12	16	11	6	5
	1000	3	5	11	25	45	26	16	13
	1500	4	6	14	37	48	34	18	15
250	500	1	2	4	12	15	8	5	4
	1000	2	4	9	25	40	19	12	10
	1500	3	5	11	35	45	25	14	11
315	500	1	1	3	9	12	6	4	3
	1000	1	4	8	22	28	13	12	8
	1500	2	4	10	26	35	19	12	10



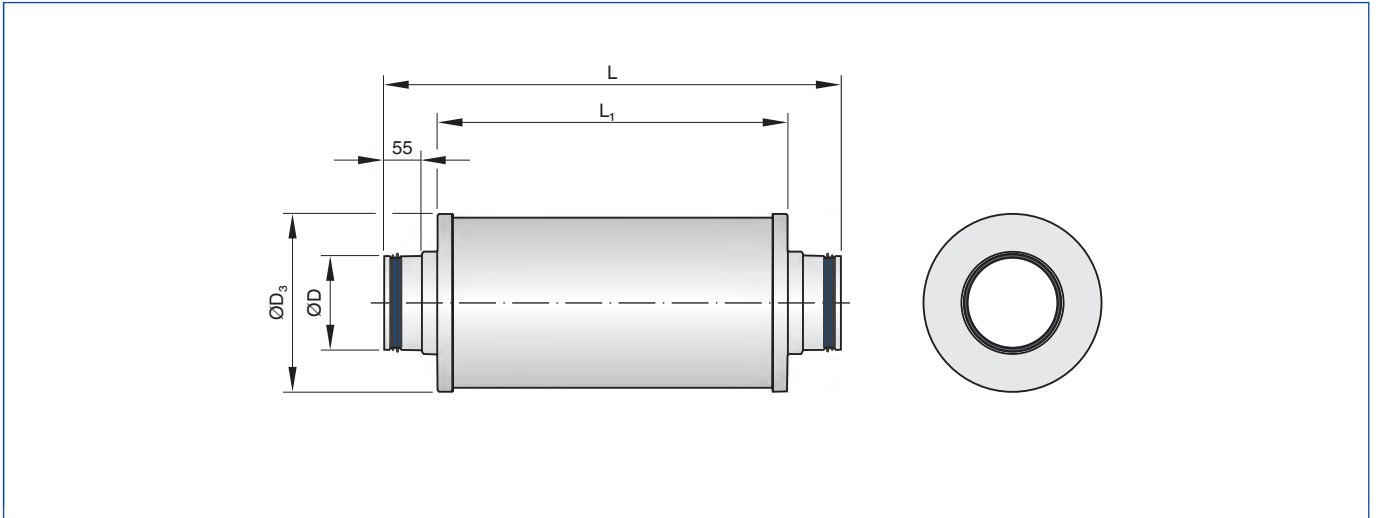
Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
400	500	1	1	3	7	9	6	4	3
	1000	1	4	8	18	23	11	10	7
	1500	2	4	9	20	26	17	11	8

CS, differential pressure

Nominal size	\dot{V}	\dot{V}	Nominal length [mm]		
			500	1000	1500
	l/s	m ³ /h	Δp_{st} Pa		
80	20	72	2	4	6
	40	144	6	12	16
	50	180	8	16	25
	55	198	12	25	35
100	30	108	2	2	4
	60	216	4	8	12
	75	270	6	12	18
	90	324	8	18	25
125	50	180	2	2	4
	95	342	4	6	10
	120	432	6	10	14
	145	522	6	14	20
160	80	288	2	2	2
	155	558	2	6	8
	195	702	4	8	10
	235	846	6	10	14
200	125	450	2	2	2
	245	882	2	4	6
	310	1116	4	6	8
	370	1332	4	8	10
250	195	702	<2	<2	<2
	385	1386	<2	4	4
	485	1746	2	4	6
	580	2088	4	6	8
315	310	1116	<2	<2	<2
	615	2214	<2	2	4
	770	2772	<2	4	4
	925	3330	2	4	6
400	500	1800	<2	<2	<2
	995	3582	<2	<2	2
	1245	4482	<2	2	4
	1495	5382	<2	4	4



CS



Dimensions [mm]

Nominal size	CS-025		CS-050		ØD mm
	ØD ₃				
	mm		mm		
80		135		192	79
100		160		212	99
125		191		236	124
160		221		271	159
200		261		311	199
250		311		366	249
315		376		426	314
400		461		511	399

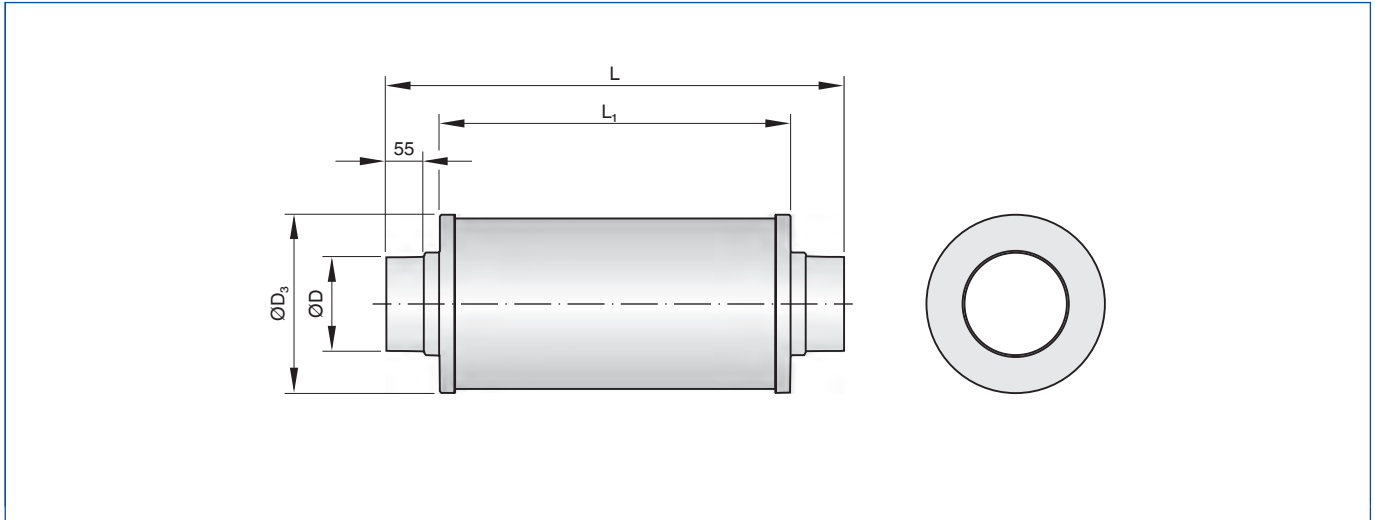
Dimensions [mm]

Nominal length	L		L ₁	
	mm		mm	
500		650		500
1000		1150		1000
1500		1650		1500

Dimensions [mm] and weight [kg]

Nominal size	CS-025			CS-050		
	500	1000	1500	500	1000	1500
	m					
	kg	kg	kg	kg	kg	kg
80	1.0	1.8	2.6	1.4	2.6	3.7
100	1.2	2.1	3.1	1.6	2.9	4.2
125	1.4	2.5	3.7	1.9	3.3	4.7
160	1.6	2.9	4.2	2.1	3.8	5.4
200	2.0	3.6	5.2	2.6	4.6	6.5
250	2.5	4.4	6.2	3.1	5.5	7.8
315	2.9	5.2	7.5	3.5	6.2	8.9
400	3.7	6.6	9.4	4.5	7.9	11.3





Dimensions [mm]

Nominal size	CS-025		CS-050		ØD mm
	ØD ₃				
	mm		mm		
80		135		192	80
100		160		212	100
125		191		236	125
160		221		271	160
200		261		311	200
250		311		366	250
315		376		426	315
400		461		511	400

Dimensions [mm]

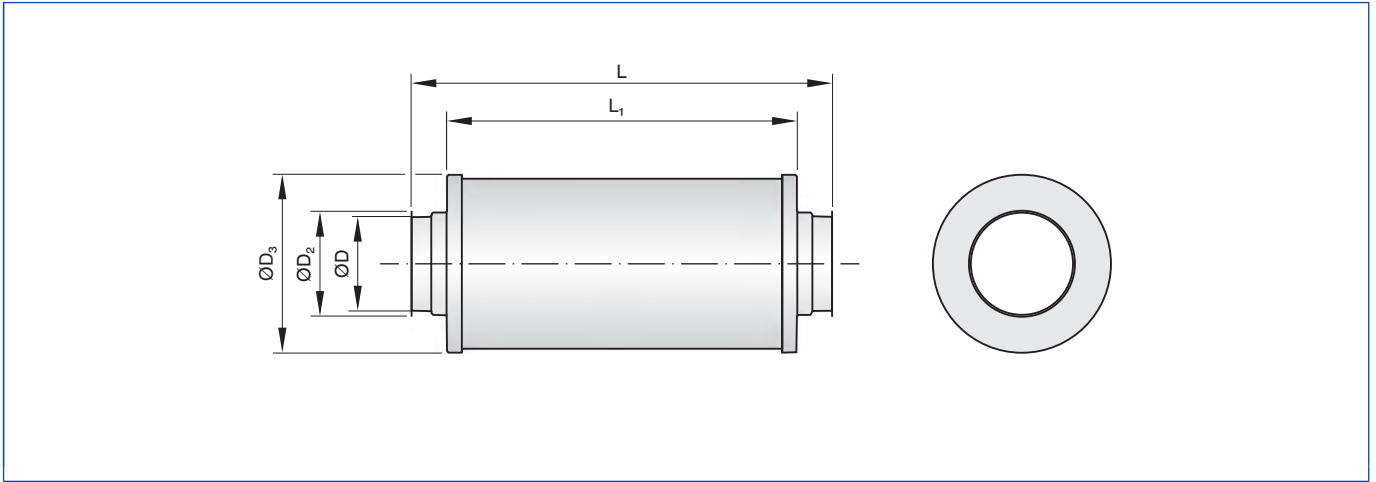
Nominal length	L		L ₁	
	mm		mm	
500		650		500
1000		1150		1000
1500		1650		1500

Dimensions [mm] and weight [kg]

Nominal size	CS-025			CS-050		
	500	1000	1500	500	1000	1500
	m					
	kg	kg	kg	kg	kg	kg
80	1.0	1.8	2.6	1.4	2.6	3.7
100	1.2	2.1	3.1	1.6	2.9	4.2
125	1.4	2.5	3.7	1.9	3.3	4.7
160	1.6	2.9	4.2	2.1	3.8	5.4
200	2.0	3.6	5.2	2.6	4.6	6.5
250	2.5	4.4	6.2	3.1	5.5	7.8
315	2.9	5.2	7.5	3.5	6.2	8.9
400	3.7	6.6	9.4	4.5	7.9	11.3



CS/.../BK2



Dimensions [mm]

Nominal size	CS-025		CS-050		ØD mm	ØD_2 mm
	ØD_3 mm		mm			
80	135	192	79	93		
100	160	212	99	113		
125	191	236	124	138		
160	221	271	159	173		
200	261	311	199	213		
250	311	366	249	263		
315	376	426	314	328		
400	461	511	399	413		

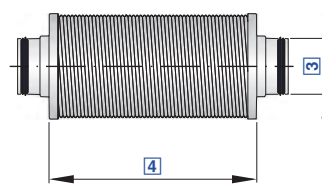
Dimensions [mm]

Nominal length	L		L_1 mm
	mm		
500	638	500	
1000	1138	1000	
1500	1638	1500	

Dimensions [mm] and weight [kg]

Nominal size	CS-025			CS-050		
	500	1000	1500	500	1000	1500
	m					
	kg	kg	kg	kg	kg	kg
80	1.0	1.8	2.6	1.4	2.6	3.7
100	1.2	2.1	3.1	1.6	2.9	4.2
125	1.4	2.5	3.7	1.9	3.3	4.7
160	1.6	2.9	4.2	2.1	3.8	5.4
200	2.0	3.6	5.2	2.6	4.6	6.5
250	2.5	4.4	6.2	3.1	5.5	7.8
315	2.9	5.2	7.5	3.5	6.2	8.9
400	3.7	6.6	9.4	4.5	7.9	11.3





For the reduction of noise in circular ducts, flexible aluminium construction

Order code

CF – 025 / 160×1000 / VD2

1 2 3 4 5

1 Type

CF Flexible circular silencer

3 Nominal size [mm]

80, 100, 125, 160, 200, 250, 315, 400

5 Type of connection

No entry: spigot
VD2 Spigot with lip seal on both ends
AS2 Socket-type spigots on both ends
BK2 Raised edges at both ends

2 Insulation thickness [mm]

025 25
050 50

4 Nominal length [mm]

500, 1000, 1500, 2000

+ Features

- Circular silencers, in flexible aluminium construction, for the reduction of noise in the circular ducts of air conditioning systems
- ▶ Absorption material is non-combustible mineral wool with RAL quality mark, biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EC
 - ▶ Casing and perforated inner duct made of aluminium
 - ▶ Variant with spigot has a groove for a lip seal, suitable for circular connecting ducts to EN 1506 or EN 13180
 - ▶ Insertion loss measured according to ISO 7235
 - ▶ Casing air leakage to EN 15727, class D

Optional equipment and accessories

- ▶ Socket-type spigots on both ends
- ▶ Raised edges at both ends
- ▶ With lip seals on both ends

/ Application

- ▶ Flexible circular silencers Type CF for the reduction of noise in the circular ducts of air conditioning systems
- ▶ For the reduction of air-regenerated noise of air terminal units LVC and TVR, and of mechanical self-powered controllers RN and VFC
- ▶ For the reduction of fan noise
- ▶ Can be used as cross talk silencer to reduce the transfer of noise through ducts between neighbouring rooms

◊ Variants

- ▶ 025: Circular silencer with 25 mm insulation
- ▶ 050: Circular silencer with 50 mm insulation
- ▶ AS2: Circular silencer with socket-type spigots on both ends
- ▶ BK2: Circular silencer with raised edges at both ends

& Accessories

- ▶ VD2: With lip seals on both ends
- ▶ AS2: Socket-type spigots on both ends
- ▶ BK2: Raised edges at both ends

★ Special characteristics

- ▶ Insertion loss measured according to ISO 7235
- ▶ Very flexible and consequently suitable for installation in complicated duct systems and restricted spaces
- ▶ Absorption material is non-combustible
- ▶ Insulation thickness 25 mm or 50 mm
- ▶ Smallest bend radius 3 × outer diameter D₃

ISO Standards and guidelines

- ▶ Insertion loss measured according to ISO 7235
- ▶ Casing air leakage to EN 15727, class D

📊 Technical data

Nominal sizes	80 - 400 mm
Operating pressure	1000 Pa max.
Operating temperature	100 °C max.





CF025 (insulation thickness 25 mm), insertion loss

Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
80	500	1	2	4	9	20	16	15	10
	1000	3	5	10	21	44	46	37	23
	1500	3	5	13	28	47	48	44	31
	2000	3	6	15	35	50	50	50	39
100	500	1	1	4	8	17	14	12	9
	1000	2	3	8	17	44	34	28	21
	1500	2	4	12	24	47	41	34	26
	2000	2	5	15	30	50	49	41	31
125	500	1	1	3	8	15	11	9	7
	1000	2	3	7	17	43	30	24	17
	1500	2	3	10	22	45	34	28	20
	2000	2	4	12	28	48	37	32	23
160	500	1	1	2	5	14	10	8	6
	1000	1	1	4	12	40	27	20	16
	1500	2	2	6	16	42	30	25	19
	2000	2	3	8	20	47	34	28	21
200	500	1	1	2	5	14	9	6	5
	1000	1	1	3	11	35	22	16	13
	1500	2	2	5	15	41	27	19	15
	2000	1	3	7	19	47	32	20	16
250	500	0	1	2	5	13	8	5	4
	1000	1	1	3	11	30	19	12	10
	1500	1	2	5	15	38	25	14	11
	2000	1	3	6	17	43	30	15	13
315	500	0	1	1	4	9	7	4	3
	1000	0	1	3	9	21	10	12	8
	1500	1	2	4	12	27	19	13	10
	2000	1	2	6	14	32	27	13	11
400	500	0	0	1	3	6	5	3	3
	1000	0	1	3	8	16	8	8	7
	1500	1	1	4	10	23	17	11	8
	2000	1	2	4	10	23	22	11	9

CF050 (insulation thickness 50 mm), insertion loss

Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
80	500	4	5	11	20	30	27	16	12
	1000	8	14	23	47	50	50	44	27
	1500	11	14	33	48	50	50	47	37
	2000	15	15	42	50	50	50	50	47
100	500	3	4	9	17	24	21	12	10
	1000	7	10	21	38	50	50	29	22
	1500	10	11	27	44	50	50	37	30
	2000	12	12	34	50	50	50	46	37
125	500	2	3	7	14	20	16	11	9
	1000	5	7	16	32	50	42	25	22
	1500	7	9	21	41	50	46	33	27
	2000	9	11	27	50	50	50	40	31





Nominal size	Nominal length	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
	mm	D_e Hz							
160	500	2	2	6	12	17	14	8	6
	1000	4	5	12	26	47	34	20	16
	1500	5	7	17	37	48	42	24	19
	2000	6	9	22	48	50	50	29	21
200	500	1	2	5	12	16	11	6	5
	1000	3	5	11	25	45	26	16	13
	1500	4	6	14	37	48	34	18	15
	2000	5	8	18	47	50	42	22	18
250	500	1	2	4	12	15	8	5	4
	1000	2	4	9	25	40	19	12	10
	1500	3	5	11	35	45	25	14	11
	2000	4	6	15	45	50	30	16	13
315	500	1	1	3	9	12	6	4	3
	1000	1	4	8	22	28	13	12	8
	1500	2	4	10	26	35	19	12	10
	2000	3	4	12	33	41	27	14	11
400	500	1	1	3	7	9	6	4	3
	1000	1	4	8	18	23	11	10	7
	1500	2	4	9	20	26	17	11	8
	2000	3	3	9	22	29	22	11	9

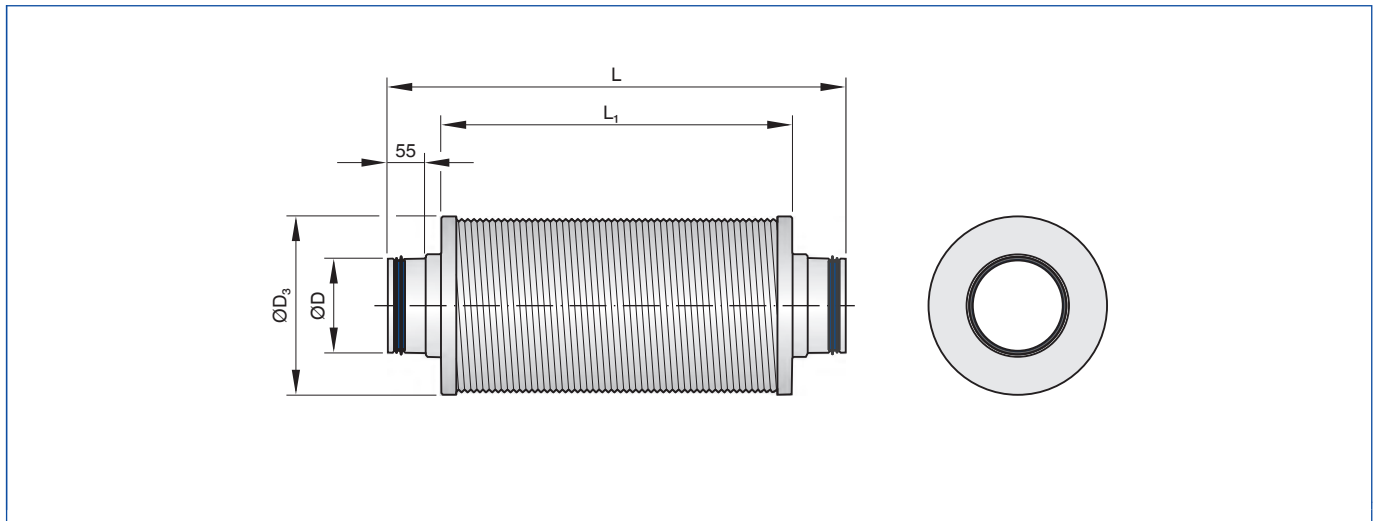
CF, differential pressure

Nominal size	\dot{V}	\dot{V}	Nominal length [mm]			
			500	1000	1500	2000
	l/s	m ³ /h	Δp_{st} Pa			
80	20	72	2	4	6	6
	40	144	6	12	16	25
	50	180	8	16	25	35
	55	198	12	25	35	45
100	30	108	2	2	4	5
	60	216	4	8	12	16
	75	270	6	12	18	25
	90	324	8	18	25	35
125	50	180	2	2	4	4
	95	342	4	6	10	12
	120	432	6	10	14	18
	145	522	6	14	20	25
160	80	288	2	2	2	4
	155	558	2	6	8	10
	195	702	4	8	10	14
	235	846	6	10	14	18
200	125	450	2	2	2	2
	245	882	2	4	6	8
	310	1116	4	6	8	10
	370	1332	4	8	10	14
250	195	702	<2	<2	<2	2
	385	1386	<2	4	4	6
	485	1746	2	4	6	8
	580	2088	4	6	8	10



Nominal size	\dot{V}	\dot{V}	Nominal length [mm]			
			500	1000	1500	2000
	l/s	m ³ /h	Δp_{st}			
			Pa			
315	310	1116	<2	<2	<2	<2
	615	2214	<2	2	4	4
	770	2772	<2	4	4	6
	925	3330	2	4	6	8
400	500	1800	<2	<2	<2	<2
	995	3582	<2	<2	2	4
	1245	4482	<2	2	4	4
	1495	5382	<2	4	4	6

CF



Dimensions [mm]

Nominal size	CF-025		CF-050		ØD mm
	ØD ₃		mm		
	mm		mm		mm
80	135		192		79
100	160		212		99
125	191		236		124
160	221		271		159
200	261		311		199
250	311		366		249
315	376		426		314
400	461		511		399

Dimensions [mm]

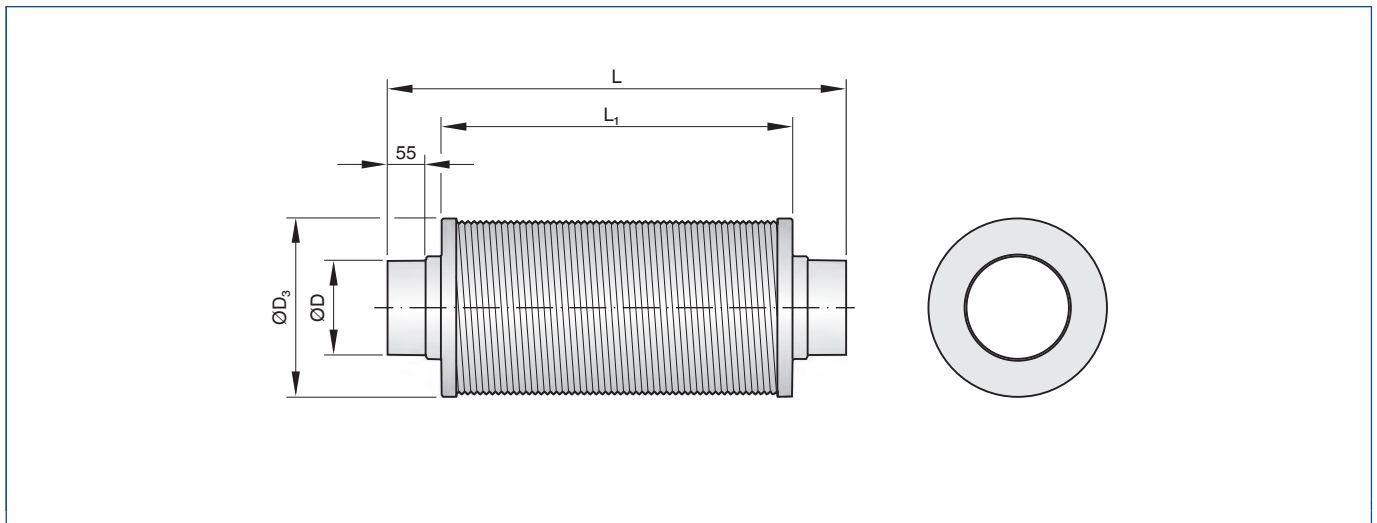
Nominal length	L		L ₁	
	mm		mm	
500	650		500	
1000	1150		1000	
1500	1650		1500	
2000	2150		2000	



Dimensions [mm] and weight [kg]

Nominal size	CF-025				CF-050			
	500	1000	1500	2000	500	1000	1500	2000
	m							
	kg	kg	kg	kg	kg	kg	kg	kg
80	0.6	1.0	1.5	1.9	0.9	1.5	2.2	2.8
100	0.8	1.3	1.7	2.2	1.1	1.8	2.5	3.2
125	0.9	1.5	2.1	2.7	1.2	2.0	2.9	3.7
160	1.1	1.8	2.5	3.2	1.4	2.4	3.3	4.3
200	1.3	2.2	3.0	3.9	1.7	2.9	4.0	5.1
250	1.6	2.7	3.7	4.7	2.1	3.5	4.8	6.2
315	1.9	3.2	4.5	5.7	2.4	4.0	5.6	7.2
400	2.5	4.1	5.6	7.2	3.1	5.1	7.1	9.1

CF/.../AS2



Dimensions [mm]

Nominal size	CF-025		CF-050		
	ØD ₃				ØD
	mm		mm		mm
80	135		192		80
100	160		212		100
125	191		236		125
160	221		271		160
200	261		311		200
250	311		366		250
315	376		426		315
400	461		511		400

Dimensions [mm]

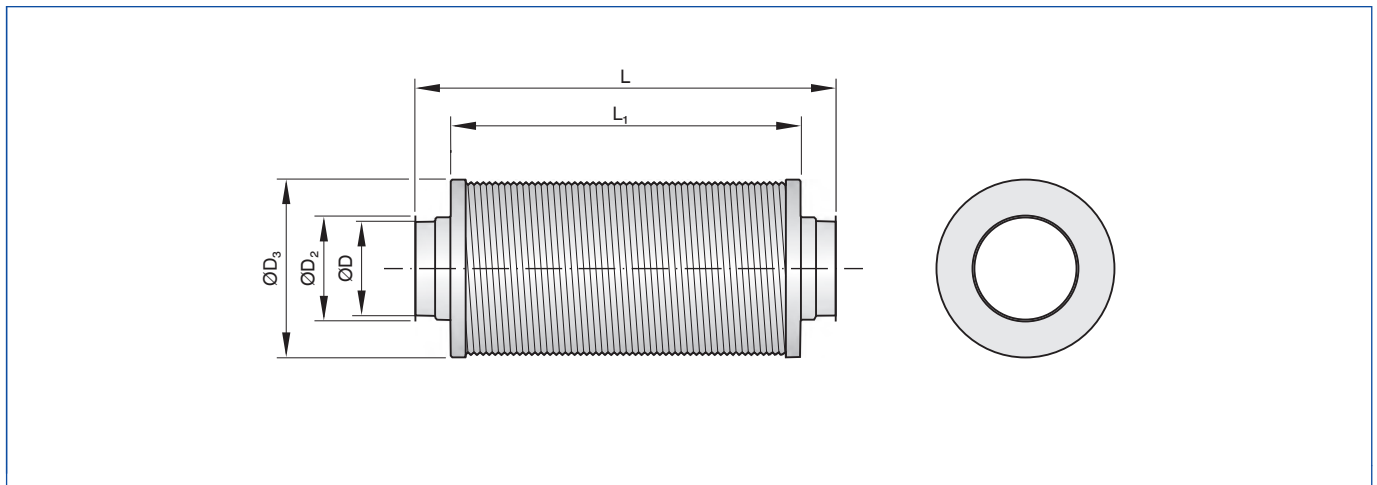
Nominal length	L		L ₁	
	mm		mm	
500	650		500	
1000	1150		1000	
1500	1650		1500	
2000	2150		2000	



Dimensions [mm] and weight [kg]

Nominal size	CF-025				CF-050			
	500	1000	1500	2000	500	1000	1500	2000
	m							
	kg	kg	kg	kg	kg	kg	kg	kg
80	0.6	1.0	1.5	1.9	0.9	1.5	2.2	2.8
100	0.8	1.3	1.7	2.2	1.1	1.8	2.5	3.2
125	0.9	1.5	2.1	2.7	1.2	2.0	2.9	3.7
160	1.1	1.8	2.5	3.2	1.4	2.4	3.3	4.3
200	1.3	2.2	3.0	3.9	1.7	2.9	4.0	5.1
250	1.6	2.7	3.7	4.7	2.1	3.5	4.8	6.2
315	1.9	3.2	4.5	5.7	2.4	4.0	5.6	7.2
400	2.5	4.1	5.6	7.2	3.1	5.1	7.1	9.1

CF/.../BK2



Dimensions [mm]

Nominal size	CF-025		CF-050		ØD mm	ØD_2 mm
	ØD_3		ØD_3			
	mm	mm	mm	mm	mm	mm
80	135	192	79	93		
100	160	212	99	113		
125	191	236	124	138		
160	221	271	159	173		
200	261	311	199	213		
250	311	366	249	263		
315	376	426	314	328		
400	461	511	399	413		

Dimensions [mm]

Nominal length	L		L_1	
	mm		mm	
500	638	500		
1000	1138	1000		
1500	1638	1500		
2000	2138	2000		

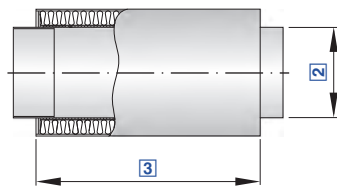




Dimensions [mm] and weight [kg]

Nominal size	CF-025				CF-050			
	500	1000	1500	2000	500	1000	1500	2000
	m							
	kg	kg	kg	kg	kg	kg	kg	kg
80	0.6	1.0	1.5	1.9	0.9	1.5	2.2	2.8
100	0.8	1.3	1.7	2.2	1.1	1.8	2.5	3.2
125	0.9	1.5	2.1	2.7	1.2	2.0	2.9	3.7
160	1.1	1.8	2.5	3.2	1.4	2.4	3.3	4.3
200	1.3	2.2	3.0	3.9	1.7	2.9	4.0	5.1
250	1.6	2.7	3.7	4.7	2.1	3.5	4.8	6.2
315	1.9	3.2	4.5	5.7	2.4	4.0	5.6	7.2
400	2.5	4.1	5.6	7.2	3.1	5.1	7.1	9.1





For the reduction of noise in plastic circular ducts for contaminated air

Order code

CAK / 160×1000 / GZ / VF2				
1	2	3	4	5

1 Type
CAK Circular silencer

2 Nominal size [mm]
125, 160, 200, 250, 315, 400

3 Length [mm]
500, 1000, 1500

4 Matching flange
No entry: none
GZ on both ends (only VF2)

5 Type of connection
No entry: spigot
VF2 Flanges on both ends

+ Features

Plastic circular silencers for the reduction of noise in the circular ducts of extract air systems for aggressive media

- ▶ Absorption material is non-combustible mineral wool with RAL quality mark, biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EC
- ▶ Mineral wool faced with non-woven glass fibre as protection against erosion due to airflow velocities up to 20 m/s
- ▶ Casing and perforated inner duct are flame-resistant polypropylene (PPs) to DIN 4102, building class B1
- ▶ Variant with spigot suitable for circular ducts according to DIN 8077 or DIN 8078
- ▶ Insertion loss measured according to ISO 7235
- ▶ Casing air leakage to EN 15727, class D

Optional equipment and accessories
▶ With flanges on both ends

Application

- ▶ Plastic circular silencers Type CAK for the reduction of noise in the circular ducts of air conditioning systems
- ▶ Suitable for contaminated air
- ▶ For the reduction of air-regenerated noise of air terminal units TVRK and TVLK
- ▶ For the reduction of fan noise

Variants

- ▶ CAK: Circular silencer
- ▶ VF2: Circular silencer with flanges on both ends

& Accessories

- ▶ Matching flanges for both ends, including seals

★ Special characteristics

- ▶ Insertion loss measured according to ISO 7235
- ▶ Absorption material is non-combustible

ISO Standards and guidelines

- ▶ Insertion loss measured according to ISO 7235
- ▶ Casing air leakage to EN 15727, class D

Technical data

Nominal sizes	125 - 400 mm
Operating pressure	1000 Pa
Operating temperature	100 °C max.



 CAK, insertion loss

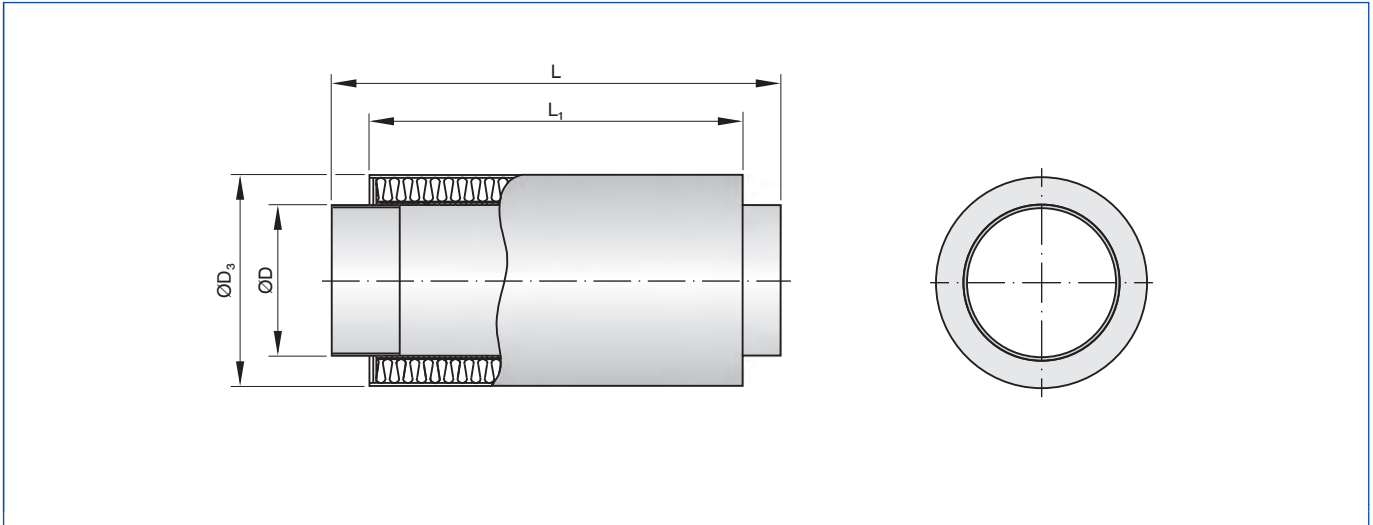
Nominal size	Nominal length mm	Centre frequency f_m [Hz]							
		63	125	250	500	1000	2000	4000	8000
		D_e Hz							
125	500	1	6	7	14	25	23	14	12
	1000	2	9	13	22	34	35	24	16
	1500	3	12	19	31	42	43	33	20
160	500	0	3	5	11	22	21	12	10
	1000	1	4	9	18	30	31	19	13
	1500	2	7	13	25	38	41	27	17
200	500	0	2	4	10	21	17	10	8
	1000	1	4	9	15	29	25	16	11
	1500	1	6	12	21	36	33	20	14
250	500	0	2	4	9	19	13	9	8
	1000	0	4	8	14	26	22	15	11
	1500	1	6	11	20	35	30	20	15
315	500	0	2	3	8	18	12	7	6
	1000	0	4	6	14	26	17	11	8
	1500	1	6	9	19	34	23	15	10
400	500	0	2	3	6	14	8	6	4
	1000	0	3	6	11	25	13	10	7
	1500	1	4	8	16	29	15	11	8

CAK, differential pressure

Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Nominal length [mm]		
			500	1000	1500
			Δp_{st} Pa		
125	50	180	2	2	4
	95	342	4	6	10
	120	432	6	10	14
	145	522	6	14	20
160	80	288	2	2	2
	155	558	2	6	8
	195	702	4	8	10
	235	846	6	10	14
200	125	450	2	2	2
	245	882	2	4	6
	310	1116	4	6	8
	370	1332	4	8	10
250	195	702	<2	<2	<2
	385	1386	<2	4	4
	485	1746	2	4	6
	580	2088	4	6	8
315	310	1116	<2	<2	<2
	615	2214	<2	2	4
	770	2772	<2	4	4
	925	3330	2	4	6
400	500	1800	<2	<2	<2
	995	3582	<2	<2	2
	1245	4482	<2	2	4
	1495	5382	<2	4	4



CAK



Dimensions [mm]

Nominal size	ØD	ØD ₃
	mm	mm
125	125	225
160	160	250
200	200	280
250	250	355
315	315	415
400	400	500

Dimensions [mm]

Nominal length	L	L ₁
	mm	mm
500	595	495
1000	1095	995
1500	1595	1495

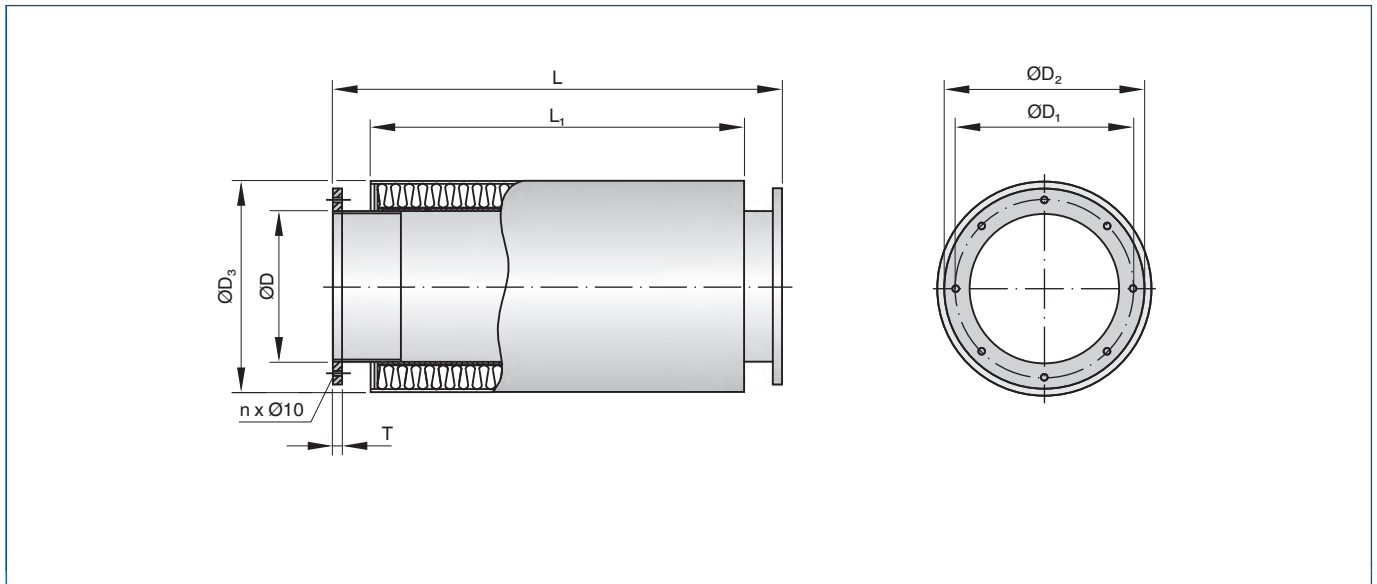
Dimensions [mm] and weight [kg]

Nominal size	500	1000	1500
	m		
	kg	kg	kg
125	2.2	4.1	5.9
160	2.6	4.7	6.8
200	3.2	5.8	8.5
250	4.3	7.6	10.9
315	4.6	8.6	12.5
400	5.2	9.3	13.4





CAK/.../VF2



Dimensions [mm]

Nominal size	ØD	ØD ₃	ØD ₁	ØD ₂	n	T
	mm	mm	mm	mm		
125	125	225	165	185	8	8
160	160	250	200	230	8	8
200	200	280	240	270	8	8
250	250	355	290	320	12	8
315	315	415	350	395	12	10
400	400	500	445	475	16	10

Dimensions [mm]

Nominal length	L	L ₁
	mm	mm
500	595	495
1000	1095	995
1500	1595	1495

Dimensions [mm] and weight [kg]

Nominal size	500	1000	1500
	m		
	kg	kg	kg
125	2.5	4.4	6.2
160	3.0	5.1	7.2
200	3.6	6.2	8.9
250	4.9	8.2	11.5
315	5.3	9.3	13.7
400	6.8	10.9	15.0





Fire and Smoke Protection Systems



2 Fire and Smoke Protection Systems

2.1 Fire dampers

	For diverse applications	FK-EU	180
	Compact dimensions, ideal for restricted spaces	FKS-EU	192
	For large diameters, with or without a flange	FKR-EU	198
	Compact dimensions, ideal for restricted spaces	FKRS-EU	203
	For diffusers in suspended F30 ceilings	KU-K30	212
	For the extract air of commercial kitchens	KA-EU	214
	Fire protection valves for supply and extract air	FV-EU	218
2.2 Smoke protection damper			
	To prevent the spreading of smoke	JZ-RS	222
2.3 Smoke control dampers			
	For mechanical smoke extract systems and as an additional supply air inlet, also for natural smoke and heat exhaust systems	EK-EU	227



For use in mechanical smoke extract systems, pressurisation systems, and natural smoke and heat exhaust systems, also for use as an additional supply air inlet

EK-JZ

234

2.4 Tunnel dampers



For the ventilation of and smoke extract from underground transport systems

JF

245

2.5 Easycontrol



System for controlling and monitoring motorised fire dampers

TNC-EASYCONTROL

252

2.6 Extract air and smoke extract controller



Controller for extract air and smoke extract

AES

257

2.7 Smoke detectors



For smoke detection in ducts

RM-O-3-D

262

2.8 TROXNETCOM AS-i



Controllers for the data acquisition and control of the field modules

Controller

265



Repeaters for a maximum expansion of the network

Repeater

266



For the control and operation of a system with several controller and power units, and for the display of its functions

Master and display units

267



Communication interface between a component and the controller

Modules

268

	AS-i system voltage for master, sensors, actuators, and modules	Power supply units	270
	Switching power supply unit for 24 V power supply	Switching power supply units	271
	For the control of fire and smoke protection systems	Pre-configured switch boxes	272
	Accessories for easy and safe installation	AS-i installation set	274
	For the addressing of field modules (slaves)	Adjustment and addressing devices	277
		Safety components	279
2.9 TROXNETCOM LON			
	Communication interface for exchanging variables via LonWorks	Modules	281
2.10 Smoke control dampers on third-party systems			
	TROX smoke control dampers on third-party systems	SLC	285



Fire dampers

Usage	Usage	Minimum thickness	Type							
			FK-EU				FKS-EU		FKR-EU	
			Mortar-based installation		Dry mortarless installation		Mortar-based installation	Dry mortarless installation	Mortar-based installation	Dry mortarless installation
			perimeter	partially ^{2 5}	Fire batt	Installation kit ²	perimeter	Installation kit ²	perimeter	Installation kit ²
mm		Fire resistance class								
In solid walls	Walls/gross density ≥500 kg/m ³	100	EI 90 S	EI 90 S	EI 120 S	-	EI 120 S	EI 90 S	EI 120 S	-
In solid walls with movement joint	Walls/gross density ≥500 kg/m ³	100	-	EI 90 S	-	-	-	-	-	-
On the face of solid walls	Walls/gross density ≥500 kg/m ³	100	-	-	-	EI 90 S	-	-	-	-
Adjacent to solid walls ¹	Walls/gross density ≥500 kg/m ³	100	-	-	-	EI 90 S	-	-	-	-
Remote from solid walls ¹	Walls/gross density ≥500 kg/m ³	100	-	-	-	EI 90 S	-	-	-	-
In solid ceiling slabs	Ceiling slabs/gross density ≥600 kg/m ³	125	EI 90 S	-	-	-	-	-	-	-
In solid ceiling slabs	Ceiling slabs/gross density ≥600 kg/m ³	150	EI 90 S	-	EI 120 S/EI 180 S	-	EI 120 S	EI 90 S	EI 120 S	-
In solid ceiling slabs, with concrete base	Ceiling slabs/gross density ≥600 kg/m ³	125	EI 90 S	-	-	-	-	-	-	-
In solid ceiling slabs, with concrete base	Ceiling slabs/gross density ≥600 kg/m ³	150	EI 90 S	-	-	-	EI 90 S	-	EI 90 S	-
Remote from solid ceiling slabs ¹	Ceiling slabs/gross density ≥600 kg/m ³	125	-	-	-	EI 90 S	-	-	-	-
Lightweight partition walls with metal support structure and cladding on both sides	Lightweight partition walls	100	EI 90 S	-	EI 120 S	EI 90 S	EI 90 S	EI 90 S	EI 90 S	EI 90 S
Lightweight partition walls with metal support structure and cladding on both sides	Lightweight partition walls	75	EI 30 S	-	-	EI 30 S	EI 30 S	EI 30 S	EI 30 S	EI 30 S
Lightweight partition walls with metal support structure and cladding on both sides, and with flexible ceiling joint ⁵	Lightweight partition walls	100	-	-	-	EI 90 S	-	-	-	-
Compartment walls with metal support structure and cladding on both sides	Compartment walls	115	EI 90 S	-	-	EI 90 S	EI 90 S	EI 90 S	EI 90 S	EI 90 S
Lightweight partition walls with metal support structure and cladding on one side	Shaft walls	90	-	-	-	EI 90 S	EI 90 S	EI 90 S	EI 90 S	-
Lightweight partition walls without metal support structure and cladding on one side	Shaft walls	40 or 50 ⁴	-	-	-	EI 90 S	-	-	EI 90 S	-
In self supporting fire-resistant suspended ceilings	Tile ceilings, screw-fixed and primed	-	-	-	-	-	-	-	-	-
In self supporting fire-resistant suspended ceilings	Lay-in ceiling tiles made of panel materials	-	-	-	-	-	-	-	-	-
In self supporting fire-resistant suspended ceilings	Metal ceilings	-	-	-	-	-	-	-	-	-

¹Not for FK-EU used as an air transfer opening ²Installation kit for the selected installation situation

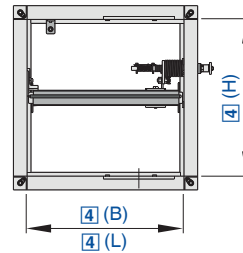
³For ØDN 100 to 200 in lightweight partition wall with metal support structure and mineral wool ⁴50 only for FKR-EU ⁵Mineral wool



List of abbreviations

L [mm]	Length of the fire damper
\dot{V} [m ³ /h] and [l/s]	Volume flow rate
L_{WA} [dB(A)]	A-weighted sound power level of air-regenerated noise for the fire damper
A [m ²]	Free area
ζ	Resistance coefficient (fully ducted)
B [mm]	Width of the fire damper
H [mm]	Height of the fire damper
Nominal size [mm]	Diameter of the fire damper
L [mm]	Length of the fire damper
Δp_{st} [Pa]	Static differential pressure
v [m/s]	Airflow velocity based on the upstream cross section (B × H or diameter)





For diverse applications

Order code

FK - EU - 1 / DE / 600x400x500 / ES / SS / Z43

1 2 3 4 5 6 7

1 Type

FK-EU Fire damper

2 Construction

- No entry: standard construction
- 1** Powder-coated casing, RAL 7001
- 2** Stainless steel casing
- 7** Coated damper blade
- 1 - 7** Powder-coated casing, RAL 7001, and coated damper blade
- 2 - 7** Stainless steel casing and coated damper blade

- W** With fusible link 95 °C (only for use in warm air ventilation systems)
- B** With coated fusible link 72 °C
- WB** With coated fusible link 95 °C (only for use in warm air ventilation systems)

3 Country of destination

- DE** Germany
- Other destination countries upon request

4 Nominal size [mm]
B x H x L

5 Accessories 1
No entry: none
WA - GL 100

6 Accessories 2
No entry: none
R0 - 0A

7 Attachments
ZL09 - ZA14

+ Features

- Rectangular fire damper for the isolation of duct penetrations between fire compartments, for a variety of installation situations, available in many different sizes and constructions
- ▶ Nominal sizes 200 x 200 - 1500 x 800 mm, in increments of 1 mm
 - ▶ Low differential pressure and sound power level
 - ▶ Explosion-proof construction (ATEX) as an option
 - ▶ Can also be used as an air transfer damper
 - ▶ Optional stainless steel casing or powder-coated casing for increased corrosion protection
 - ▶ Integration into the central BMS with TROXNETCOM
 - ▶ Universal installation options
- Optional equipment and accessories
- ▶ Electric actuator 24 V/230 V
 - ▶ Release temperature 72/95 °C
 - ▶ Duct smoke detectors

Application

- ▶ TROX fire dampers of Type FK-EU, with CE marking and declaration of performance, for the isolation of duct penetrations between fire compartments in the event of a fire
- ▶ To prevent the propagation of fire and smoke through ductwork to adjacent designated fire compartments

EN Classification

- ▶ Class of performance to EN 13501-3, up to EI 180 (v_e, h_e, i ↔ o) S

Variants

- ▶ With fusible link
- ▶ With fusible link for use in potentially explosive atmospheres
- ▶ With spring return actuator
- ▶ With spring return actuator for use in potentially explosive atmospheres
- ▶ With spring return actuator and duct smoke detector
- ▶ With spring return actuator, duct smoke detector and cover grilles on both ends for use as an air transfer opening, with general building inspectorate licence Z-6.50-2031

Attachments*

- ▶ Limit switch for damper blade position indication
- ▶ Limit switch for damper blade position indication for use in potentially explosive atmospheres
- ▶ Spring return actuator for 24 V AC/DC or 230 V AC supply voltage
- ▶ Spring return actuator for 24 - 230 V supply voltage, for use in potentially explosive atmospheres
- ▶ Network module for the integration with AS-i or LON networks
- ▶ Spring return actuator and pre-wired duct smoke detector, 24 V or 230 V supply voltage

*All attachments can be retrofitted

& Accessories

- ▶ Installation kit for installation into solid non-load-bearing walls with flexible ceiling joint
- ▶ Installation kit for dry mortarless installation on the face of solid walls
- ▶ Installation kit for dry mortarless installation adjacent to solid walls
- ▶ Installation kit for dry mortarless installation remote from solid walls and ceiling slabs
- ▶ Installation kit for dry mortarless installation in lightweight partition walls or compartment walls with metal support structure and cladding on both sides
- ▶ Installation kit for dry mortarless installation into shaft walls with or without metal support structure but with cladding on one side
- ▶ Installation kit for dry mortarless installation into timber stud walls and half-timbered constructions
- ▶ Installation kit for installation into lightweight partition walls or compartment walls with flexible ceiling joint
- ▶ Flexible connectors
- ▶ Cover grille
- ▶ Circular spigots

Useful additions

- ▶ Duct smoke detector RM-O-3-D
- ▶ Duct smoke detector with airflow monitor RM-O-VS-D



★ Special characteristics

- ▶ Declaration of performance according to Construction Products Regulation
- ▶ Classification to EN 13501-3, up to EI 180 ($v_e, h_o, i \leftrightarrow o$) S
- ▶ Building inspectorate licence Z-56.4212-991 for fire resistance properties
- ▶ Complies with the requirements of EN 15650
- ▶ Tested to EN 1366-2 for fire resistance properties
- ▶ Hygiene complies with VDI 6022 part 1

- (07/2011), VDI 3803 (02/2010), DIN 1946 part 4 (12/2008), and EN 13779 (09/2007)
- ▶ Corrosion protection according to EN 15650 in connection with EN 60068-2-52
 - ▶ Closed blade air leakage to EN 1751, class 2
 - ▶ Casing air leakage to EN 1751, class C; $(B + H) \leq 700$, class B
 - ▶ Low differential pressure and sound power level
 - ▶ Any airflow direction
 - ▶ Integration into the central BMS with TROXNETCOM

ISO Standards and guidelines

- ▶ Construction Products Regulation
- ▶ EN 15650:2010 Ventilation for buildings - Fire dampers
- ▶ EN 1366-2:1999 Fire resistance tests for service installations - Fire dampers
- ▶ EN 13501-3:2010 Fire classification of construction products and building elements
- ▶ EN 1751:1999 Ventilation for buildings - Air terminal devices



Technical data

Nominal sizes	200 × 200 - 1500 × 800 mm ¹⁾
Casing lengths	375 and 500 mm
Volume flow rate range	Up to 14400 l/s or up to 51840 m ³ /h
Differential pressure range	Up to 2000 Pa
Operating temperature	At least 0 - 50 °C **
Release temperature	72 °C or 95 °C (for warm air ventilation systems)
Upstream velocity*	≤ 8 m/s with standard construction; ≤ 12 m/s with spring return actuator

Note: Upstream velocity for the explosion-proof actuator ExMax/RedMax-15-BF TR is ≤ 10 m/s

Volume flow rate at differential pressure $\Delta p_{st} < 35$ Pa

L_{WA}	35	45	35	45
Nominal size B × H	\dot{V}			
mm	l/s		m ³ /h	
200 × 200	184	258	663	927
250 × 200	239	334	859	1201
300 × 200	291	408	1049	1467
350 × 200	343	480	1235	1727
400 × 200	394	550	1417	1981
450 × 200	443	620	1596	2232
500 × 200	492	688	1772	2478
550 × 200	541	756	1946	2721
600 × 200	588	823	2118	2962
650 × 200	382	543	1376	1956
700 × 200	414	588	1490	2118
750 × 200	446	633	1604	2281
800 × 200	477	678	1718	2443
900 × 200	541	768	1946	2766
1000 × 200	604	858	2174	3090
1100 × 200	667	948	2401	3413
1200 × 200	730	1038	2628	3737
1300 × 200	793	1128	2856	4060
1400 × 200	856	1217	3083	4382
1500 × 200	919	1307	3310	4705
200 × 250	254	355	914	1278
250 × 250	325	454	1169	1635
300 × 250	394	550	1417	1981
350 × 250	461	644	1659	2320
400 × 250	527	737	1897	2652
450 × 250	592	828	2130	2979
500 × 250	656	917	2361	3301
550 × 250	719	1005	2588	3619
600 × 250	781	1093	2813	3933
650 × 250	553	787	1992	2832
700 × 250	599	852	2157	3066
750 × 250	645	917	2321	3300



L_{WA}	35	45	35	45
Nominal size B x H	\dot{V}			
mm	l/s		m ³ /h	
800 x 250	691	982	2486	3534
900 x 250	782	1112	2815	4002
1000 x 250	873	1241	3144	4469
1100 x 250	964	1371	3472	4936
1200 x 250	1056	1501	3800	5403
1300 x 250	1147	1630	4128	5869
1400 x 250	1238	1760	4456	6335
1500 x 250	1329	1889	4784	6801
200 x 300	321	449	1156	1616
250 x 300	408	570	1468	2053
300 x 300	492	688	1772	2478
350 x 300	575	804	2069	2894
400 x 300	656	917	2361	3301
450 x 300	735	1028	2648	3702
500 x 300	814	1138	2930	4097
550 x 300	892	1247	3209	4488
600 x 300	968	1354	3485	4874
650 x 300	721	1025	2595	3689
700 x 300	780	1109	2809	3993
750 x 300	840	1194	3023	4298
800 x 300	899	1278	3237	4602
900 x 300	1018	1447	3665	5210
1000 x 300	1137	1616	4092	5817
1100 x 300	1255	1785	4519	6424
1200 x 300	1374	1953	4946	7031
1300 x 300	1492	2121	5372	7637
1400 x 300	1611	2290	5798	8243
1500 x 300	1729	2458	6224	8849
200 x 350	386	540	1391	1945
250 x 350	489	684	1760	2461
300 x 350	588	823	2118	2962
350 x 350	686	959	2469	3452
400 x 350	781	1093	2813	3933
450 x 350	875	1224	3152	4407
500 x 350	968	1354	3485	4874
550 x 350	1060	1482	3815	5335
600 x 350	1150	1609	4141	5791
650 x 350	886	1260	3190	4534
700 x 350	959	1363	3452	4908
750 x 350	1032	1467	3715	5281
800 x 350	1105	1571	3978	5655
900 x 350	1251	1778	4502	6400
1000 x 350	1396	1985	5026	7146
1100 x 350	1542	2192	5550	7890
1200 x 350	1687	2398	6073	8634
1300 x 350	1832	2605	6597	9378
1400 x 350	1978	2811	7119	10121
1500 x 350	2123	3018	7642	10864
200 x 400	450	630	1621	2267
250 x 400	568	794	2045	2859
300 x 400	682	954	2457	3435
350 x 400	794	1111	2860	3999
400 x 400	904	1265	3256	4552
450 x 400	1013	1416	3645	5097



L _{WA}	35	45	35	45
Nominal size B x H	V̇			
mm	l/s		m ³ /h	
500 x 400	1119	1565	4029	5634
550 x 400	1225	1712	4409	6164
600 x 400	1329	1858	4784	6689
650 x 400	1050	1492	3778	5372
700 x 400	1136	1615	4089	5813
750 x 400	1222	1738	4400	6255
800 x 400	1308	1860	4710	6696
900 x 400	1481	2105	5331	7578
1000 x 400	1653	2350	5950	8459
1100 x 400	1825	2594	6570	9339
1200 x 400	1997	2839	7188	10219
1300 x 400	2169	3083	7807	11098
1400 x 400	2340	3327	8425	11977
1500 x 400	2512	3571	9042	12855
200 x 450	307	437	1106	1573
250 x 450	409	582	1474	2096
300 x 450	511	726	1839	2615
350 x 450	612	870	2202	3131
400 x 450	712	1013	2564	3645
450 x 450	813	1155	2925	4159
500 x 450	913	1297	3285	4671
550 x 450	1013	1439	3645	5182
600 x 450	1112	1581	4004	5692
650 x 450	1212	1723	4363	6202
700 x 450	1311	1864	4721	6712
750 x 450	1411	2006	5079	7221
800 x 450	1510	2147	5437	7730
900 x 450	1709	2429	6152	8746
1000 x 450	1907	2711	6866	9761
1100 x 450	2106	2993	7580	10776
1200 x 450	2304	3275	8293	11790
1300 x 450	2502	3556	9006	12803
1400 x 450	2699	3837	9718	13815
1500 x 450	2897	4119	10430	14827
200 x 500	349	496	1256	1786
250 x 500	465	661	1673	2379
300 x 500	580	824	2087	2967
350 x 500	694	987	2498	3552
400 x 500	808	1148	2908	4134
450 x 500	921	1310	3317	4715
500 x 500	1035	1471	3724	5295
550 x 500	1148	1631	4131	5873
600 x 500	1261	1792	4538	6451
650 x 500	1373	1952	4944	7028
700 x 500	1486	2112	5349	7605
750 x 500	1598	2272	5754	8181
800 x 500	1711	2432	6159	8756
900 x 500	1936	2752	6968	9906
1000 x 500	2160	3071	7776	11054
1100 x 500	2384	3389	8583	12202
1200 x 500	2608	3708	9390	13348
1300 x 500	2832	4026	10196	14494
1400 x 500	3056	4344	11001	15639
1500 x 500	3279	4662	11806	16784

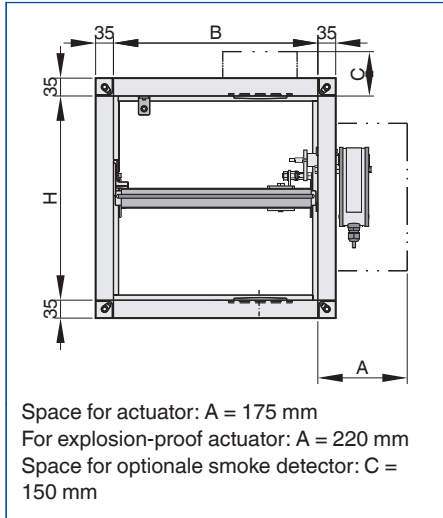


L _{WA}	35	45	35	45
Nominal size B x H	V̇			
mm	l/s		m ³ /h	
300 x 550	648	922	2334	3318
350 x 550	776	1103	2793	3971
400 x 550	903	1284	3251	4621
450 x 550	1030	1464	3707	5270
500 x 550	1156	1643	4162	5916
550 x 550	1282	1823	4616	6562
600 x 550	1408	2002	5069	7206
650 x 550	1534	2181	5522	7850
700 x 550	1659	2359	5974	8493
750 x 550	1785	2538	6426	9135
800 x 550	1910	2716	6877	9777
900 x 550	2161	3072	7779	11059
1000 x 550	2411	3428	8680	12340
1100 x 550	2661	3783	9580	13620
1200 x 550	2911	4138	10480	14898
1300 x 550	3161	4493	11378	16175
1400 x 550	3410	4848	12276	17452
1500 x 550	3659	5202	13174	18728
300 x 600	717	1019	2580	3668
350 x 600	858	1219	3087	4389
400 x 600	998	1419	3592	5107
450 x 600	1138	1617	4095	5822
500 x 600	1277	1815	4597	6536
550 x 600	1416	2013	5098	7248
600 x 600	1555	2211	5598	7959
650 x 600	1694	2408	6098	8669
700 x 600	1832	2605	6596	9378
750 x 600	1971	2802	7095	10086
800 x 600	2109	2998	7592	10794
900 x 600	2385	3391	8587	12207
1000 x 600	2661	3783	9580	13619
1100 x 600	2937	4175	10572	15030
1200 x 600	3212	4566	11564	16439
1300 x 600	3487	4958	12554	17847
1400 x 600	3762	5349	13544	19255
1500 x 600	4037	5739	14533	20661
300 x 650	785	1116	2826	4018
350 x 650	939	1335	3381	4806
400 x 650	1092	1553	3933	5591
450 x 650	1245	1770	4483	6373
500 x 650	1398	1987	5032	7153
550 x 650	1550	2203	5579	7931
600 x 650	1702	2419	6126	8708
650 x 650	1853	2634	6671	9484
700 x 650	2005	2850	7216	10259
750 x 650	2156	3065	7761	11033
800 x 650	2307	3280	8305	11806
900 x 650	2609	3709	9391	13351
1000 x 650	2910	4137	10476	14893
1100 x 650	3211	4565	11560	16434
1200 x 650	3512	4993	12643	17974
1300 x 650	3813	5420	13725	19512
1400 x 650	4113	5847	14806	21049
1500 x 650	4413	6274	15887	22585

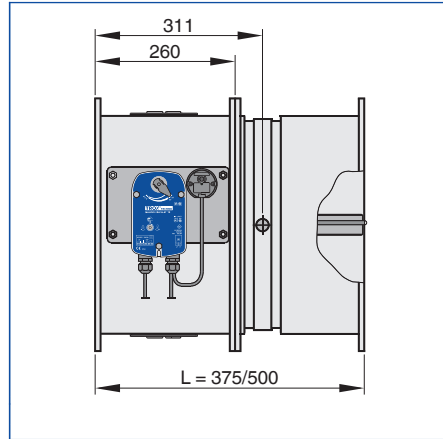


L _{WA}	35	45	35	45
Nominal size B x H	V̇			
mm	l/s		m ³ /h	
300 x 700	853	1213	3072	4367
350 x 700	1020	1451	3674	5223
400 x 700	1187	1687	4273	6074
450 x 700	1353	1923	4870	6923
500 x 700	1518	2158	5465	7769
550 x 700	1683	2393	6059	8613
600 x 700	1848	2627	6652	9456
650 x 700	2012	2860	7243	10297
700 x 700	2176	3094	7835	11138
750 x 700	2340	3327	8425	11977
800 x 700	2504	3560	9015	12815
900 x 700	2831	4025	10193	14490
1000 x 700	3158	4490	11369	16163
1100 x 700	3485	4954	12544	17833
1200 x 700	3811	5417	13718	19502
1300 x 700	4136	5880	14891	21169
1400 x 700	4462	6343	16063	22836
1500 x 700	4787	6806	17234	24501
300 x 750	921	1310	3317	4715
350 x 750	1102	1566	3966	5638
400 x 750	1281	1821	4612	6556
450 x 750	1460	2075	5256	7471
500 x 750	1638	2329	5897	8384
550 x 750	1816	2582	6537	9294
600 x 750	1993	2834	7176	10202
650 x 750	2171	3086	7814	11109
700 x 750	2347	3337	8451	12014
750 x 750	2524	3588	9087	12918
800 x 750	2701	3839	9723	13822
900 x 750	3053	4341	10992	15626
1000 x 750	3405	4841	12259	17428
1100 x 750	3757	5341	13525	19227
1200 x 750	4108	5840	14789	21025
1300 x 750	4459	6339	16053	22821
1400 x 750	4810	6838	17315	24616
1500 x 750	5160	7336	18577	26409
300 x 800	989	1406	3561	5063
350 x 800	1183	1681	4258	6053
400 x 800	1375	1955	4951	7038
450 x 800	1567	2227	5641	8019
500 x 800	1758	2499	6329	8997
550 x 800	1949	2770	7015	9973
600 x 800	2139	3041	7700	10946
650 x 800	2329	3311	8383	11918
700 x 800	2518	3580	9066	12888
750 x 800	2708	3849	9748	13858
800 x 800	2897	4118	10429	14826
900 x 800	3275	4655	11789	16759
1000 x 800	3652	5192	13147	18690
1100 x 800	4029	5727	14503	20617
1200 x 800	4405	6262	15857	22543
1300 x 800	4781	6797	17211	24467
1400 x 800	5156	7331	18563	26390
1500 x 800	5532	7864	19915	28311

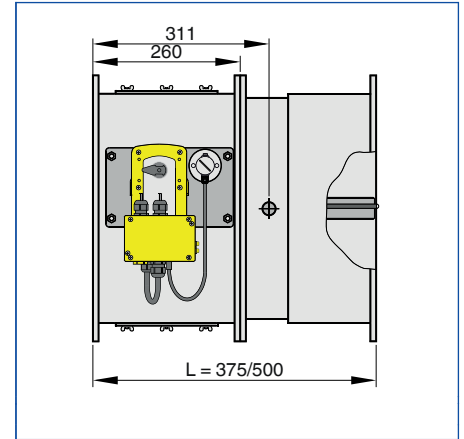




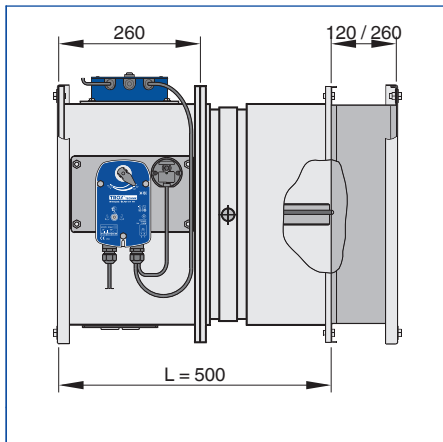
FK-EU with spring return actuator



FK-EU with explosion-proof actuator



FK-EU as air transfer damper




Weights

H	B									
	200	250	300	350	400	450	500	550	600	650
200	10	11	12	13	15	16	17	18	19	20
250	11	12	13	15	16	17	18	19	21	22
300	12	13	14	16	17	18	19	21	23	24
350	13	15	16	17	18	20	22	23	25	26
400	15	16	17	18	20	22	24	26	27	28
450	16	17	18	20	22	24	26	28	29	29
500	17	18	19	22	24	26	28	29	30	31
550			21	23	26	28	29	30	32	34
600			23	25	27	29	30	31	34	36
650			24	26	28	29	31	33	35	37
700			25	27	28	31	33	35	37	40
750			26	28	30	32	34	37	39	42
800			27	29	32	34	36	38	42	45




Essential characteristic: fire resistance — size [mm]: 200 × 200 to 1500 × 800


Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 Solid wall	<ul style="list-style-type: none"> d ≥ 100 mm Distance to load-bearing structural elements ≥ 40 mm Distance between casings ≥ 70 mm 	in the wall	Mortar-based installation	EI 120 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Distance between casings ≥ 70 mm 	in the wall	Mortar-based installation (partially with mineral wool)	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Installation kit E1/E2 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Installation kit WA (L = 500 mm) 	on the face of the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Installation kit WA (L = 375 mm) 	on the face of the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Installation kit WV 	adjacent to the wall	Dry mortarless installation	EI 90 (v _e i↔o) S



Essential characteristic: fire resistance – size [mm]: 200 × 200 to 1500 × 800


Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 <p>Solid wall</p>	<ul style="list-style-type: none"> d ≥ 100 mm Installation kit WE 	remote from the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 120 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Distance to load-bearing structural elements ≥ 40 mm Distance between casings ≥ 70 mm 	in the wall	Fire batt	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Flexible ceiling joint Distance to load-bearing structural elements ≥ 40 mm Installation kit GM Distance between casings ≥ 100 mm 	in the wall	Mortar-based installation (and installation kit)	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Flexible ceiling joint Distance to load-bearing structural elements ≥ 40 mm Installation kit GM With reinforcing strips made of calcium silicate or mineral wool ≤ 20 mm Distance between casings ≥ 100 mm 	in the wall	Mortar-based installation (and installation kit)	EI 90 (v _e i↔o) S
 <p>Lightweight partition wall</p>	<ul style="list-style-type: none"> Metal stud wall Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum d ≥ 98 mm With or without mineral wool Distance to load-bearing structural elements ≥ 40 mm Distance between casings ≥ 70 mm 	in the wall	Mortar-based installation	EI 120 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal stud wall Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum d ≥ 98 mm With or without mineral wool Distance to load-bearing structural elements ≥ 40 mm Distance between casings ≥ 70 mm 	in the wall	Fire batt	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal stud wall Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum d ≥ 98 mm With or without mineral wool Installation kit ES Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal stud wall with sheet steel insert, used as a fire wall, safety partition wall or to provide radiation protection Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum d ≥ 100 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal stud wall with sheet steel insert, used as a fire wall, safety partition wall or to provide radiation protection Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum d ≥ 100 mm Installation kit ES Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S

Essential characteristic: fire resistance — size [mm]: 200 × 200 to 1500 × 800



Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 <p>Lightweight partition wall</p>	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 98 mm • With or without mineral wool • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 120 (v _e i↔o) S
	<ul style="list-style-type: none"> • Lightweight partition wall with metal support structure • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 100 mm • With or without mineral wool • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the wall	Mortar-based installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> • Lightweight partition wall with metal support structure • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 100 mm • With or without mineral wool • Installation kit ES • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 75 mm • With or without mineral wool • Wall thickness increased to d ≥ 98 mm • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the wall	Mortar-based installation	EI 30 (v _e i↔o) S
	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 75 mm • With or without mineral wool • Wall thickness increased to d ≥ 98 mm • Installation kit ES • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 30 (v _e i↔o) S
	<ul style="list-style-type: none"> • Metal stud wall or fire wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 100 mm • With or without mineral wool • Flexible ceiling joint • Installation kit GL • Distance to load-bearing structural elements = 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> • Timber stud wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 130 mm • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the wall	Mortar-based installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> • Timber stud wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 130 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 120 (v _e i↔o) S



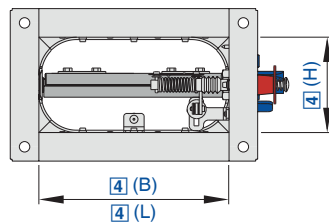
Essential characteristic: fire resistance — size [mm]: 200 × 200 to 1500 × 800

Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 Lightweight partition wall	<ul style="list-style-type: none"> • Timber stud wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 130 mm • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the wall	Fire batt	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 130 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 120 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel construction) • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 130 mm • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the wall	Mortar-based installation	EI 30 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel construction) • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 130 mm • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the wall	Fire batt	EI 30 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel construction) • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 130 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 30 (v _e i→o) S
	<ul style="list-style-type: none"> • Half-timbered wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 140 mm • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the wall	Mortar-based installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Half-timbered wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 140 mm • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the wall	Fire batt	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Half-timbered wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 140 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i→o) S
 Shaft wall	<ul style="list-style-type: none"> • Shaft wall with metal support structure or additional safety board. • Cladding on one side • d ≥ 90 mm • 2 x 20 mm gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • Installation kit ES • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i→o) S

Essential characteristic: fire resistance — size [mm]: 200 × 200 to 1500 × 800

Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 Shaft wall	<ul style="list-style-type: none"> • Shaft wall with metal support structure made of steel • Cladding on one side • d ≥ 90 mm • 2 x 20 mm gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • Installation kit ES • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> • Shaft wall with metal support structure • Cladding on one side • d ≥ 90 mm • 2 x 20 mm PROMAXON • Installation kit ES • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> • Shaft wall without metal support structure • d ≥ 40 mm • 2 x 20 mm gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • Installation kit ES • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
 Solid ceiling slab	<ul style="list-style-type: none"> • d ≥ 100 mm • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the ceiling	Mortar-based installation	EI 90 (h _o i↔o) S
	<ul style="list-style-type: none"> • d ≥ 100 mm • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the ceiling	Fire batt	EI 90 (h _o i↔o) S
	<ul style="list-style-type: none"> • d ≥ 100 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the ceiling	Fire batt	EI 120 (h _o i↔o) S
	<ul style="list-style-type: none"> • d ≥ 150 mm • Hensomastik fire batt system • Distance to load-bearing structural elements ≥ 40 mm 	in the ceiling	Fire batt	EI 180 (h _o i↔o) S
	<ul style="list-style-type: none"> • d ≥ 125 mm • Below the ceiling, with horizontal duct • With or without reinforcing section • Perimeter gap filled with mortar or mineral wool • Installation kit WE 	remote from the ceiling	Dry mortarless installation	EI 90 (h _o i↔o) S
	<ul style="list-style-type: none"> • d ≥ 100 mm • Combined with timber beam ceilings • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the ceiling	Mortar-based installation	EI 90 (h _o i↔o) S
	<ul style="list-style-type: none"> • d ≥ 100 mm • Combined with suspended ceiling systems (Cadolto system) • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 70 mm 	in the ceiling	Mortar-based installation	EI 90 (h _o i↔o) S





Compact dimensions, ideal for restricted spaces

Order code

FKS – EU – 1 / DE / 800x200x300 / E / A0 / Z43

1 2 3 4 5 6 7

1 Type

FKS-EU Fire damper

3 Country of destination

DE Germany
Other destination countries upon request

7 Attachments

Z00 - ZA12

¹W can be combined with all constructions listed under **2**, but not with attachments Z43RM, Z45RM and ZA12

2 Construction

- No entry: standard construction
- 1** Powder-coated casing, RAL 7001
- 2** Stainless steel casing
- 7** Impregnated damper blade
- 1 - 7** Powder-coated casing RAL 7001 and impregnated damper blade
- 2 - 7** Stainless steel casing and impregnated damper blade
- W¹** With fusible link 95 °C (only for use in warm air ventilation systems)
- B** With coated fusible link 72 °C
- WB¹** With coated fusible link 95 °C (only for use in warm air ventilation systems)

4 Nominal size [mm]

B x H x L

5 Accessories 1

- E** No entry: none
- E** Installation block
- B** Cover plate

6 Accessories 2

- No entry: none
- A0 - SS**

+ Features

- Small rectangular fire damper for the isolation of duct penetrations between fire compartments, available in many sizes
- ▶ Nominal sizes 200 x 100 to 800 x 200 mm
 - ▶ Low differential pressure and sound power level
 - ▶ Optional stainless steel casing or powder-coated casing for increased corrosion protection
 - ▶ Can also be used as an air transfer damper or air transfer unit
 - ▶ Integration into the central BMS with TROXNETCOM
 - ▶ Universal installation options

Optional equipment and accessories

- ▶ Electric actuator 24 V/230 V
- ▶ Release temperature 72/95 °C
- ▶ Duct smoke detectors

Application

- ▶ Fire dampers of Type FKS-EU, with CE marking and declaration of performance, for the isolation of duct penetrations between fire compartments in the event of a fire
- ▶ To prevent the propagation of fire and smoke through ductwork to adjacent designated fire compartments

EN Classification

- ▶ Class of performance to EN 13501-3, up to EI 120 (v_e, h_e, i ↔ o) S

Variants

- ▶ With fusible link
- ▶ With spring return actuator
- ▶ With cover grilles both ends as air transfer unit with general building inspectorate licence: Z-19.18-2127
- ▶ With spring return actuator and duct smoke detector
- ▶ With spring return actuator, duct smoke detector and cover grilles on both ends for use as an air transfer opening, with general building inspectorate licence Z-6.50-2231

Attachments

- Retrofit possible
- ▶ Limit switch for damper blade position indication
 - ▶ Spring return actuator for 24 V AC/DC or 230 V AC supply voltage
 - ▶ Network module for the integration with AS-i or LON networks

No retrofit possible

- ▶ Spring return actuator and pre-wired duct smoke detector, 24 V or 230 V supply voltage

& Accessories

- ▶ Cover plate (to keep the fire damper stable and hence facilitate mortaring)
- ▶ Cover grille
- ▶ Flexible connectors
- ▶ Extension piece
- ▶ Rectangular installation block E

+ Useful additions

- ▶ Duct smoke detector RM-O-3-D
- ▶ Duct smoke detector with airflow monitor RM-O-VS-D



★ Special characteristics

- ▶ Declaration of performance according to Construction Products Regulation
- ▶ Classification to EN 13501-3, up to EI 120 ($v_e, h_o, i \leftrightarrow o$) S
- ▶ Building inspectorate licence Z-56.4212-991 for fire resistance properties
- ▶ Complies with the requirements of EN 15650
- ▶ Tested to EN 1366-2 for fire resistance properties

- ▶ Hygiene complies with VDI 6022 part 1, VDI 3803, DIN 1946 part 4 and EN 13779
- ▶ Corrosion protection according to EN 15650 in connection with EN 60068-2-52
- ▶ Closed blade air leakage to EN 1751, class 3 ($B + H \leq 600$ mm: class 2)
- ▶ Casing air leakage to EN 1751, class C
- ▶ Low differential pressure and sound power level
- ▶ Any airflow direction
- ▶ Integration into the central BMS with TROXNETCOM

ISO Standards and guidelines

- ▶ Construction Products Regulation
- ▶ EN 15650: Ventilation for buildings - Fire dampers
- ▶ EN 1366-2: Fire resistance tests for service installations - Fire dampers
- ▶ EN 13501-3: Fire classification of construction products and building elements
- ▶ EN 1751: Ventilation for buildings - Air terminal devices



Technical data

Nominal sizes	200 × 100 to 800 × 200 mm
Casing length	300 mm
Volume flow rate range	Up to 1600 l/s or up to 5760 m ³ /h
Differential pressure range	Up to 1500 Pa
Operating temperature	-20 - 50 °C **
Release temperature	72 °C or 95 °C (for warm air ventilation systems)
Upstream velocity*	≤ 8 m/s with standard construction; ≤ 10 m/s with spring return actuator

* Data applies to uniform upstream and downstream conditions for the fire damper

Volume flow rate \dot{V} [m³/h] at differential pressure $\Delta p_{st} < 35$ Pa

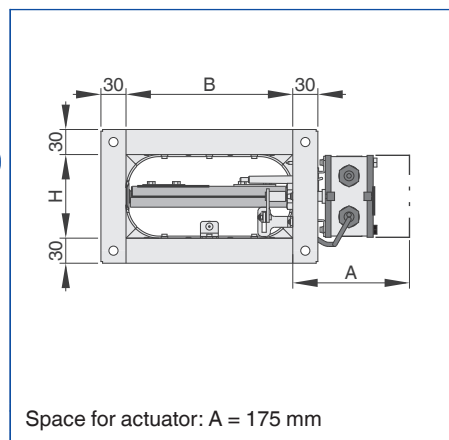
H [mm]	L_{WA} [dB(A)]	B [mm]						
		200	300	400	500	600	700	800
100	35	300	480	660	840	1030	1230	1420
	45	420	670	920	1180	1450	1720	2000
125	35	410	650	890	1150	1400	1700	1940
	45	570	900	1250	1600	1960	2350	2700
150	35	520	830	1140	1470	1800	2140	2480
	45	730	1160	1600	2060	2520	3000	3480
160	35	570	900	1250	1600	1970	2340	2700
	45	790	1260	1750	2240	2750	3280	3800
200	35	760	1220	1690	2170	2660	3170	3680
	45	1060	1700	2360	3040	3750	4430	5150

Volume flow rate \dot{V} [l/s] at differential pressure $\Delta p_{st} < 35$ Pa

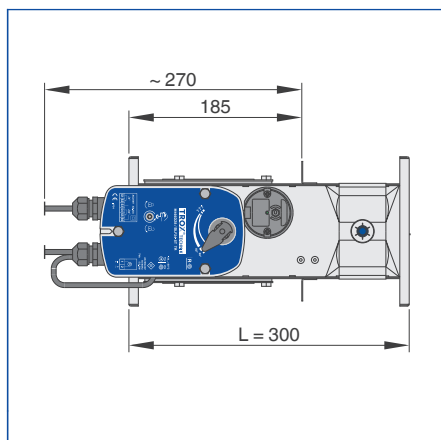
H [mm]	L_{WA} [dB(A)]	B [mm]						
		200	300	400	500	600	700	800
100	35	83	133	183	233	286	342	394
	45	117	186	256	328	403	478	556
125	35	114	181	247	319	389	472	539
	45	158	250	347	444	544	653	750
150	35	144	231	317	408	500	594	689
	45	203	322	444	572	700	833	967
160	35	158	250	347	444	547	650	750
	45	219	350	486	622	764	911	1056
200	35	211	339	469	603	739	881	1022
	45	294	472	656	844	1042	1231	1431



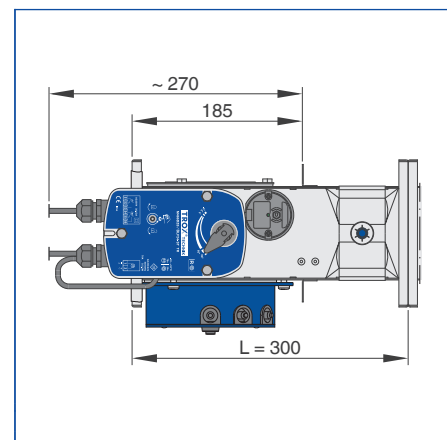
FKS-EU with spring return actuator



FKS-EU with spring return actuator





FKS-EU as air transfer damper



H/B	200	300	400	500	600	700	800
100	5.3	6.1	6.9	7.7	8.5	9.4	10.2
125	5.6	6.5	7.3	8.2	9	9.8	10.6
150	5.7	6.7	7.6	8.6	9.5	10.4	11.2
160	5.8	6.8	7.7	8.7	9.7	10.6	11.4
200	6.1	7.3	8.5	9.5	10.4	11.4	12.3


Width B: Intermediate dimensions in 50 mm increments are available.

Essential characteristic: fire resistance — size [mm]: 200 × 100 to 800 × 200

Supporting construction	Construction	Installation location	Installation type	Performance class (EI TT) up to
 Solid wall	$d \geq 100$ mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 80 mm distance between casings	in the wall	Mortar-based installation	EI 120 (v_e i \leftrightarrow o) S
	$d \geq 100$ mm, ≥ 50 mm distance to load-bearing structural elements, ≥ 150 mm horizontal distance between casings, ≥ 100 mm vertical distance between casings	in the wall	Dry mortarless installation	EI 90 (v_e i \leftrightarrow o) S
 Lightweight partition wall	Metal stud wall, gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, $d \geq 98$ mm, with or without mineral wool, ≥ 40 mm distance to load-bearing structural elements, ≥ 80 mm distance between casings	in the wall	Mortar-based installation	EI 120 (v_e i \leftrightarrow o) S



Essential characteristic: fire resistance — size [mm]: 200 × 100 to 800 × 200

Supporting construction	Construction	Installation location	Installation type	Performance class (EI TT) up to
 <p>Lightweight partition wall</p>	Metal stud wall, gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, d ≥ 98 mm, with or without mineral wool, ≥ 40 mm distance to load-bearing structural elements, ≥ 150 mm distance between casings	in the wall	Dry mortarless installation	EI 90 (v _e i→o) S
	Metal stud wall with sheet steel insert, used as a compartment wall, safety partition wall or to provide radiation protection, gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum boards, d ≥ 100 mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 80 mm distance between casings	in the wall	Mortar-based installation	EI 120 (v _e i→o) S
	Metal stud wall with sheet steel insert, used as a compartment wall, safety partition wall or to provide radiation protection, gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum boards, d ≥ 100 mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 150 mm distance between casings	in the wall	Dry mortarless installation	EI 90 (v _e i→o) S
	Metal stud wall, gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, d ≥ 75 mm, with or without mineral wool, wall thickness increased to d ≥ 98 mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 80 mm distance between casings	in the wall	Mortar-based installation	EI 30 (v _e i→o) S
	Metal stud wall, gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, d ≥ 75 mm, with or without mineral wool, wall thickness increased to d ≥ 98 mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 150 mm distance between casings	in the wall	Dry mortarless installation	EI 30 (v _e i→o) S
	Timber stud wall (also timber panel constructions and timber frames), gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, d ≥ 130 mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 80 mm distance between casings	in the wall	Mortar-based installation	EI 90 (v _e i→o) S
	Timber stud wall (also timber panel constructions and timber frames), gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, d ≥ 130 mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 150 mm distance between casings	in the wall	Dry mortarless installation	EI 90 (v _e i→o) S
	Timber stud wall (also timber panel constructions and timber frames), gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, d ≥ 105 mm, wall thickness increased to d ≥ 130 mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 80 mm distance between casings	in the wall	Mortar-based installation	EI 30 (v _e i→o) S
	Timber stud wall (also timber panel constructions and timber frames), gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, d ≥ 105 mm, wall thickness increased to d ≥ 130 mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 150 mm distance between casings	in the wall	Dry mortarless installation	EI 30 (v _e i→o) S

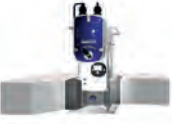


Essential characteristic: fire resistance — size [mm]: 200 × 100 to 800 × 200

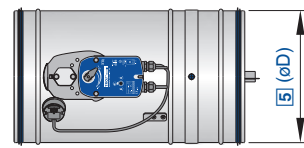
Supporting construction	Construction	Installation location	Installation type	Performance class (EI TT) up to
 Lightweight partition wall	Half-timbered construction, gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, $d \geq 140$ mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 80 mm distance between casings	in the wall	Mortar-based installation	EI 90 (v_e i↔o) S
	Half-timbered construction, gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, $d \geq 140$ mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 150 mm distance between casings	in the wall	Dry mortarless installation	EI 90 (v_e i↔o) S
	Half-timbered construction, gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, $d \geq 115$ mm, wall thickness increased to $d \geq 140$ mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 80 mm distance between casings	in the wall	Mortar-based installation	EI 30 (v_e i↔o) S
	Half-timbered construction, gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards, $d \geq 115$ mm, wall thickness increased to $d \geq 140$ mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 150 mm distance between casings	in the wall	Dry mortarless installation	EI 30 (v_e i↔o) S
 Lightweight partition wall	Solid wood wall/CLT wall, $d \geq 95$ mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 80 mm distance between casings	in the wall	Mortar-based installation	EI 90 (v_e i↔o) S
	Solid wood wall/CLT wall, $d \geq 95$ mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 150 mm distance between casings	in the wall	Dry mortarless installation	EI 90 (v_e i↔o) S
 Shaft wall	Metal support structure or steel support structure, gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards with cladding on one side, $d \geq 90$ mm, ≥ 40 mm distance to load-bearing structural elements, ≥ 150 mm distance between casings	in the wall	Mortar-based installation	EI 90 (v_e i↔o) S
	Metal support structure or additional safety board, gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards with cladding on one side, $d \geq 90$ mm with reinforcing board, ≥ 40 mm distance to load-bearing structural elements, ≥ 150 mm distance between casings	in the wall	Mortar-based installation	EI 30 (v_e i↔o) S
	Metal support structure, additional safety board, gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards with cladding on one side, $d \geq 90$ mm, ≥ 150 mm distance between casings	in the wall	Dry mortarless installation	EI 90 (v_e i↔o) S
 Solid ceiling slab	$d \geq 100$ mm, ≥ 80 mm distance between casings	in the ceiling	Mortar-based installation	EI 120 (h_o i↔o) S



Essential characteristic: fire resistance — size [mm]: 200 × 100 to 800 × 200

Supporting construction	Construction	Installation location	Installation type	Performance class (EI TT) up to
 Solid ceiling slab	d ≥ 100 mm, combined with wooden beam ceilings, ≥ 80 mm distance between casings	in the ceiling	Mortar-based installation	EI 90 (h _o i↔o) S
	d ≥ 100 mm, combined with suspended ceiling systems (Cadolto system), ≥ 80 mm distance between casings	in the ceiling	Mortar-based installation	EI 120 (h _o i↔o) S





For large diameters, with or without a flange

Order code

FKR – EU – ... – 1 / DE / 315 / TQ / A0 / Z43

1 **2** **3** **4** **5** **6** **7** **8**

<p>1 Type FKR-EU Fire damper</p> <p>2 Flange No entry: none (construction with spigots) FL² Flanges on both ends</p> <p>3 Construction No entry: none 1 Powder-coated casing, RAL 7001 2 Stainless steel casing 7 Impregnated damper blade 1 - 7 Powder-coated casing RAL 7001 and impregnated damper blade</p>	<p>2 - 7 Stainless steel casing and impregnated damper blade</p> <p>W¹ With fusible link 95 °C (only for use in warm air ventilation systems) B With coated fusible link 72 °C WB¹ With coated fusible link 95 °C (only for use in warm air ventilation systems)</p> <p>4 Country of destination DE Germany Other destination countries upon request</p> <p>5 Nominal size [mm] 315, 355, 400, 450, 500, 560, 630, 710, 800</p>	<p>6 Accessories 1 No entry: none TQ² Installation kit (construction with spigots)</p> <p>7 Accessories 2 No entry: none S0 - AS</p> <p>8 Attachments Z00 - ZEX4</p> <p>¹ can be combined with all constructions 2 and 3, but not with attachments 8 ZEX1 - ZEX4 ² TQ cannot be combined with FKR-EU-FL</p>
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+ **Features**

- Large circular fire damper for the isolation of duct penetrations between fire compartments, available in nine nominal sizes
- ▶ Nominal sizes: 315 - 800 mm
 - ▶ Low differential pressure and sound power level
 - ▶ Flanges as an option
 - ▶ Explosion-proof construction (ATEX) as an option
 - ▶ Optional stainless steel casing or powder-coated casing for increased corrosion protection
 - ▶ Integration into the central BMS with TROXNETCOM

- Optional equipment and accessories
- ▶ Electric actuator 24 V/230 V
 - ▶ Release temperature 72/95 °C
 - ▶ Duct smoke detectors

X **Application**

- ▶ Fire dampers of Type FKR-EU, with CE marking and declaration of performance, for the isolation of duct penetrations between fire compartments in the event of a fire
- ▶ To prevent the propagation of fire and smoke through ductwork to adjacent designated fire compartments

EN **Classification**

- ▶ Class of performance to EN 13501-3, up to EI 120 (v_e, h_o, i ↔ o) S

◇ **Variants**

- ▶ With fusible link
- ▶ With fusible link for use in potentially explosive atmospheres
- ▶ With spring return actuator
- ▶ With spring return actuator for use in potentially explosive atmospheres

⬡ **Attachments**

- ▶ Limit switch for damper blade position indication*
- ▶ Limit switch for damper blade position indicator for use in potentially explosive atmospheres*
- ▶ Spring return actuator for 24 V AC/DC or 230 V AC supply voltage*
- ▶ Spring return actuator for 24 - 230 V supply voltage, for use in potentially explosive atmospheres
- ▶ Network module for the integration with AS-i or LON networks*

*All attachments can be retrofitted

& **Accessories**

- ▶ Installation block TQ for dry mortarless installation into lightweight partition walls / fire walls with metal support structure and cladding on both sides, as well as timber stud walls and half-timbered constructions
- ▶ Cover grille
- ▶ Flexible connectors
- ▶ Extension piece

+ **Useful additions**

- ▶ Duct smoke detector RM-O-3-D
- ▶ Duct smoke detector with airflow monitor RM-O-VS-D

★ **Special characteristics**

- ▶ Declaration of performance according to Construction Products Regulation
- ▶ Classification to EN 13501-3, up to EI 120 (v_e, h_o, i ↔ o) S
- ▶ Building inspectorate licence Z-56.4212-991 for fire resistance properties
- ▶ Complies with the requirements of EN 15650
- ▶ Tested to EN 1366-2 for fire resistance properties
- ▶ Hygiene complies with VDI 6022 part 1 (07/2011), VDI 3803 (02/2010), DIN 1946 part 4 (12/2008), and EN 13779 (09/2007)



- ▶ Corrosion protection according to EN 15650 in connection with EN 60068-2-52
- ▶ Closed blade air leakage to EN 1751, class 4
- ▶ Casing air leakage to EN 1751, class C
- ▶ Low differential pressure and sound power level
- ▶ Any airflow direction

- ▶ Integration into the central BMS with TROXNETCOM

ISO Standards and guidelines

- ▶ Construction Products Regulation
- ▶ EN 15650:2010 Ventilation for buildings - Fire dampers

- ▶ EN 1366-2:2015 Fire resistance tests for service installations - Fire dampers
- ▶ EN 13501-3:2010 Fire classification of construction products and building elements
- ▶ EN 1751:2014 Ventilation for buildings - Air terminal devices



Technical data

Nominal sizes	315 - 800 mm
Casing lengths	495 and 550 mm
Volume flow rate range	Up to 6000 l/s or up to 21600 m³/h
Differential pressure range	Up to 2000 Pa
Temperature range	-20 - 50 °C **
Release temperature	72 °C or 95 °C (for warm air ventilation systems)
Upstream velocity*	≤ 8 m/s with standard construction; ≤ 12 m/s with spring return actuator

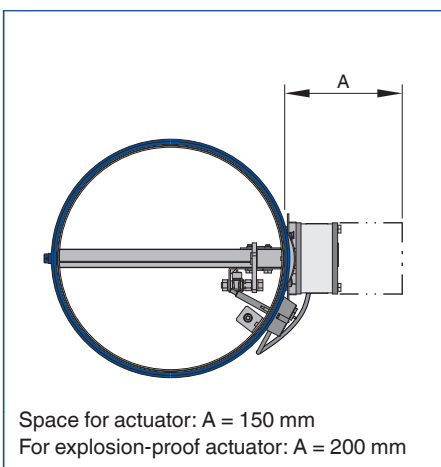
Note: Upstream velocity for the explosion-proof actuator ExMax/RedMax-15-BF TR is ≤ 10 m/s

Volume flow rate at differential pressure $\Delta p_{st} < 35$ Pa

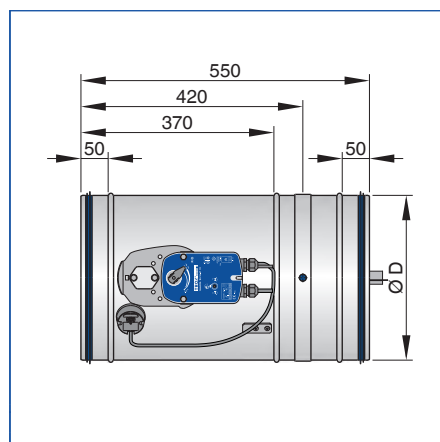
L_{WA} [dB(A)]	35	45	35	45
Nominal size	\dot{V}			
mm	l/s		m³/h	
315	460	670	1660	2400
355	570	820	2040	2940
400	700	1000	2500	3610
450	820	1180	2940	4240
500	980	1410	3530	5080
560	1190	1710	4280	6160
630	1450	2090	5230	7520
710	1780	2560	6400	9210
800	2170	3130	7810	11250

The Easy Product Finder allows you to size products using your project-specific data. You will find the Easy Product Finder on our website.

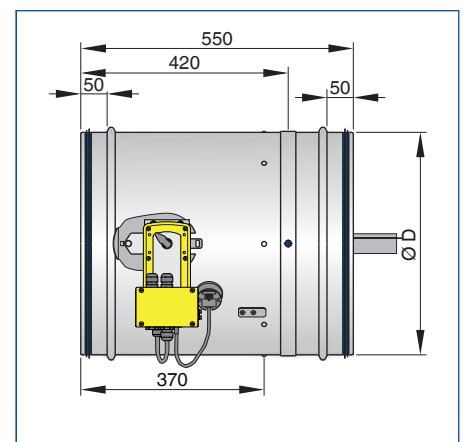
FKR-EU with spigot and spring return actuator



FKR-EU with spigot and spring return actuator



FKR-EU spigot construction with explosion-proof actuator

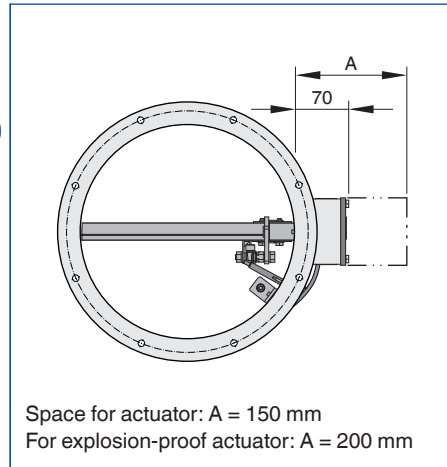


Dimensions [mm] and weight [kg]

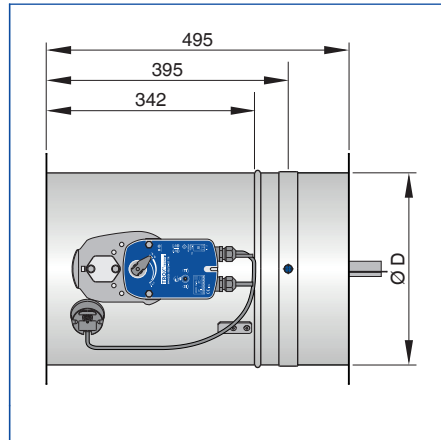
Nominal size	315	355	400	450	500	560	630	710	800
ØD	314	354	399	448	498	558	628	708	798
Weight	8.2	8.7	9.9	16.7	19	20.6	23.9	28.3	31.3



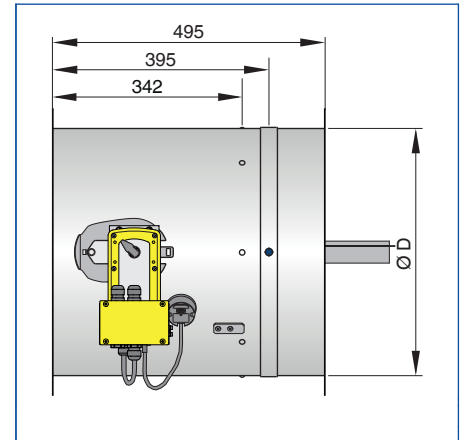
FKR-EU with flange and explosion-proof spring return actuator



FKR-EU with flange and explosion-proof spring return actuator



FKR-EU flange construction with explosion-proof actuator




Dimensions [mm] and weight [kg]

Nominal size	315	355	400	450	500	560	630	710	800
ØD	314	354	399	448	498	558	628	708	798
Weight	8.2	8.7	9.9	16.7	19	20.6	23.9	28.3	31.3

Essential characteristic: fire resistance – size [mm]: Ø 315 to Ø 800				
Supporting construction	Construction	Installation location	Installation type	Class of performance (EI TT)
 Solid wall	<ul style="list-style-type: none"> d ≥ 100 mm Distance to load-bearing structural elements ≥ 40 mm Distance between casings ≥ 40 mm 	in the wall	Mortar-based installation	EI 120 (v _e i↔o) S
 Lightweight partition wall	<ul style="list-style-type: none"> Metal support structure or steel support structure Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 98 mm With or without mineral wool Distance to load-bearing structural elements ≥ 40 mm Installation kit TQ 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal support structure or steel support structure Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 98 mm With or without mineral wool Distance to load-bearing structural elements ≥ 40 mm Distance between casings ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i↔o) S






Essential characteristic: fire resistance – size [mm]: Ø 315 to Ø 800

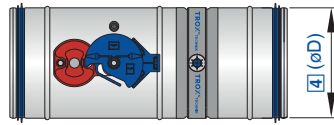
Supporting construction	Construction	Installation location	Installation type	Class of performance (EI TT)
 <p>Lightweight partition wall</p>	<ul style="list-style-type: none"> • Metal stud wall with sheet steel insert, used as a fire wall, safety partition wall or to provide radiation protection • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 100 mm • With or without mineral wool • Distance to load-bearing structural elements ≥ 40 mm • Distance between casings ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Metal stud wall with sheet steel insert, used as a fire wall, safety partition wall or to provide radiation protection • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 100 mm • With or without mineral wool • Installation kit TQ 	in the wall	Dry mortarless installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 75 mm • With or without mineral wool • Wall thickness increased to d ≥ 98 mm 	in the wall	Mortar-based installation	EI 30 (v _e i→o) S
	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 75 mm • With or without mineral wool • Wall thickness increased to d ≥ 98 mm • Installation kit TQ 	in the wall	Dry mortarless installation	EI 30 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel constructions and timber frames) • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 130 mm • Distance between casings ≥ 40 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel constructions and timber frames) • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 130 mm • Installation kit TQ 	in the wall	Dry mortarless installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel constructions and timber frames) • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 105 mm • Wall thickness increased to d ≥ 130 mm • Distance between casings ≥ 40 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 30 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel constructions and timber frames) • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 105 mm • Wall thickness increased to d ≥ 130 mm • Installation kit TQ 	in the wall	Dry mortarless installation	EI 30 (v _e i→o) S



Essential characteristic: fire resistance – size [mm]: Ø 315 to Ø 800

Supporting construction	Construction	Installation location	Installation type	Class of performance (EI TT)
 <p>Lightweight partition wall</p>	<ul style="list-style-type: none"> Half-timbered wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 140 mm Distance between casings ≥ 40 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> Half-timbered wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 140 mm Installation kit TQ 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> Half-timbered wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 115 mm Wall thickness increased to d ≥ 140 mm Distance between casings ≥ 40 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 30 (v _e i↔o) S
	<ul style="list-style-type: none"> Half-timbered wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 115 mm Wall thickness increased to d ≥ 140 mm Installation kit TQ 	in the wall	Dry mortarless installation	EI 30 (v _e i↔o) S
 <p>Shaft wall</p>	<ul style="list-style-type: none"> Metal support structure or steel support structure Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards Cladding on one side d ≥ 90 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal support structure Additional safety board Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards Cladding on one side with reinforcing board ≥ 90 mm 	in the wall	Mortar-based installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> without metal support structure Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards Cladding on one side d ≥ 50 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i↔o) S
 <p>Solid ceiling slab</p>	<ul style="list-style-type: none"> d ≥ 100 mm Distance between casings ≥ 40 mm Distance to load-bearing structural elements ≥ 40 mm 	in the ceiling	Mortar-based installation	EI 120 (h _o i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm combined with wooden beam ceilings Distance between casings ≥ 40 mm Distance to load-bearing structural elements ≥ 40 mm 	in the ceiling	Mortar-based installation	EI 90 (h _o i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Combined with suspended ceiling systems (Cadolto system) Distance between casings ≥ 40 mm Distance to load-bearing structural elements ≥ 40 mm 	in the ceiling	Mortar-based installation	EI 120 (h _o i↔o) S





Compact dimensions, ideal for restricted spaces

Order code

FKRS – EU – 1 / DE / 160 / ER / A0 / Z43

1 2 3 4 5 6 7

1 Type

FKRS-EU Fire damper

2 Construction

- No entry: standard construction
- 1** Powder-coated casing, RAL 7001
- 2** Stainless steel casing
- 7** Coated damper blade
- 1 - 7** Powder-coated casing, RAL 7001, and coated damper blade
- 2 - 7** Stainless steel casing and coated damper blade
- W¹** With fusible link 95 °C (only for use in warm air ventilation systems)
- B** With coated fusible link 72 °C
- WB** With coated fusible link 95 °C (only for use in warm air ventilation systems)

3 Country of destination

DE Germany
Other destination countries upon request

4 Nominal size [mm]

100, 125, 150, 160, 180, 200, 224, 250, 280, 315

5 Accessories 1

- No entry: none
- ER** Circular installation block
- TQ** Square installation kit
- WA** Wall face frame
- GL** Installation kit for flexible ceiling joint
- WE** Installation kit for installation remote from walls and ceilings

6 Accessories 2

No entry: none
A0 - AS

7 Attachments

Z00 - ZEX4

¹W can be combined with all constructions **2**, but not with attachments **7** ZEX1 - ZEX4

+ Features

- Small circular fire damper for the isolation of duct penetrations between fire compartments, available in ten nominal sizes
- ▶ Nominal sizes: 100 - 315 mm
 - ▶ Low differential pressure and sound power level
 - ▶ Optional stainless steel casing or powder-coated casing for increased corrosion protection
 - ▶ Can also be used as an air transfer unit
 - ▶ Explosion-proof construction (ATEX) as an option
 - ▶ Integration into the central BMS with TROXNETCOM
 - ▶ Universal installation options

Optional equipment and accessories

- ▶ Electric actuator 24 V/230 V
- ▶ Release temperature 72/95 °C
- ▶ Duct smoke detectors

X Application

- ▶ Fire dampers of Type FKRS-EU, with CE marking and declaration of performance, for the isolation of duct penetrations between fire compartments in the event of a fire
- ▶ To prevent the propagation of fire and smoke through ductwork to adjacent designated fire compartments

EN Classification

- ▶ Class of performance to EN 13501-3, up to EI 120 (v_e, h_o, i ↔ o) S

◻ Variants

- ▶ With fusible link
- ▶ With spring return actuator
- ▶ With spring return actuator for use in potentially explosive atmospheres
- ▶ With cover grilles both ends as air transfer unit with general building inspectorate licence: Z-19.18-2128

◻ Attachments

- ▶ Limit switch for damper blade position indication*
- ▶ Spring return actuator for 24 V AC/DC or 230 V AC supply voltage*
- ▶ Spring return actuator for 24 - 230 V supply voltage, for use in potentially explosive atmospheres
- ▶ Network module for the integration with AS-i or LON networks*

*All attachments can be retrofitted

& Accessories

- ▶ Installation block ER for dry mortarless installation into solid walls and ceiling slabs
- ▶ Installation block TQ for dry mortarless installation into lightweight partition walls or compartment walls with metal support structure and cladding on both sides, into shaft walls with or without metal support structure, and into timber stud walls and half-timbered constructions
- ▶ Installation kit WA for dry mortarless installation on the face of solid walls
- ▶ Installation kit GL for installation into lightweight partition walls or compartment walls with flexible ceiling joint
- ▶ Installation kit WE for dry mortarless installation remote from solid walls, ceiling slabs and lightweight partition walls
- ▶ Cover grille
- ▶ Flexible connectors
- ▶ Extension piece

+ Useful additions

- ▶ Duct smoke detector RM-O-3-D
- ▶ Duct smoke detector with airflow monitor RM-O-VS-D



★ Special characteristics

- ▶ Declaration of performance according to Construction Products Regulation
- ▶ Classification to EN 13501-3, up to EI 120 ($v_g, h_o, i \leftrightarrow o$) S
- ▶ Building inspectorate licence Z-56.4212-991 for fire resistance properties
- ▶ Complies with the requirements of EN 15650
- ▶ Tested to EN 1366-2 for fire resistance properties

- ▶ Hygiene complies with VDI 6022 part 1 (07/2011), VDI 3803 (02/2010), DIN 1946 part 4 (12/2008), and EN 13779 (09/2007)
- ▶ Corrosion protection according to EN 15650 in connection with EN 60068-2-52
- ▶ Closed blade air leakage to EN 1751, class 3
- ▶ Casing air leakage to EN 1751, class C
- ▶ Low differential pressure and sound power level
- ▶ Any airflow direction
- ▶ Integration into the central BMS with TROXNETCOM

ISO Standards and guidelines

- ▶ Construction Products Regulation
- ▶ EN 15650:2010 Ventilation for buildings - Fire dampers
- ▶ EN 1366-2:1999 Fire resistance tests for service installations - Fire dampers
- ▶ EN 13501-3:2010 Fire classification of construction products and building elements
- ▶ EN 1751:1999 Ventilation for buildings - Air terminal devices

Technical data

Nominal sizes	100 - 315 mm
Casing length	400 mm
Volume flow rate range	Up to 770 l/s or up to 2770 m ³ /h
Differential pressure range	Up to 1500 Pa
Operating temperature	At least 0 - 50 °C **
Release temperature	72 °C or 95 °C (for warm air ventilation systems)
Upstream velocity*	≤ 8 m/s with standard construction; ≤ 10 m/s with spring return actuator

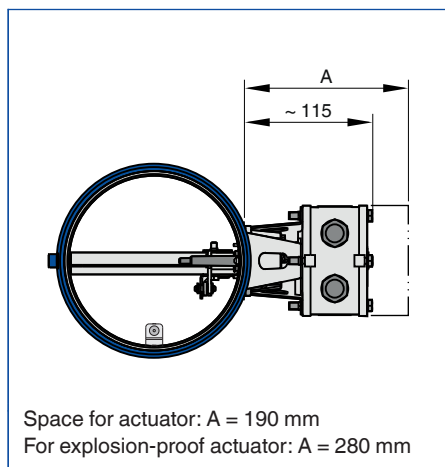
* Data applies to uniform upstream and downstream conditions for the fire damper

Volume flow rate at differential pressure $\Delta p_{st} < 35$ Pa

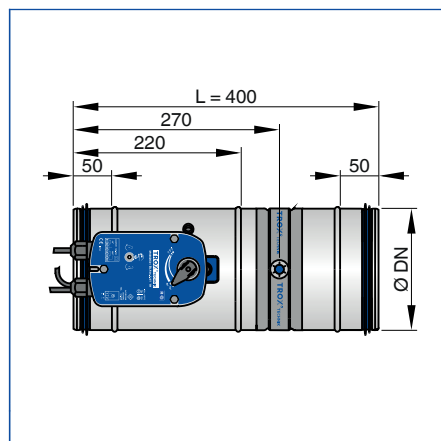
L_{WA} [dB(A)]	25	35	45	25	35	45
Nominal size	\dot{V}					
mm	l/s			m ³ /h		
100	22	35	43	79	126	157
125	40	65	87	144	234	315
150	70	105	150	252	378	540
160	80	125	180	288	450	648
180	105	165	235	388	587	847
200	140	210	295	504	756	1062
224	170	245	345	612	882	1242
250	215	315	445	774	1134	1602
280	280	405	570	1008	1458	2052
315	360	525	735	1296	1890	2646

The Easy Product Finder allows you to size products using your project-specific data. You will find the Easy Product Finder on our website.

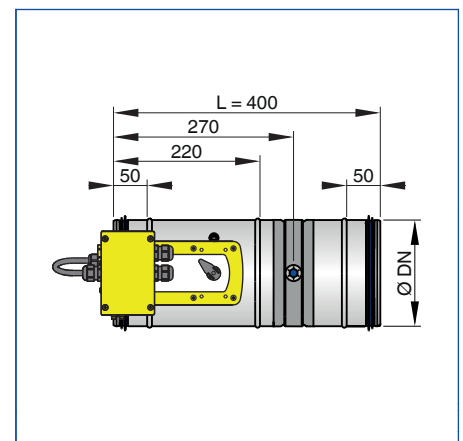
FKRS-EU with spring return actuator



FKRS-EU with spring return actuator



FKRS-EU with explosion-proof actuator


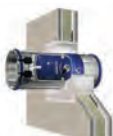




Dimensions [mm] / Weight [kg]

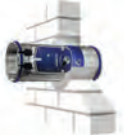
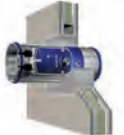
Nominal size	100	125	150	160	180	200	224	250	280	315
ØD	99	124	149	159	179	199	223	249	279	314
Weight	2.5	2.8	3.0	3.1	3.4	3.6	3.9	4.4	4.9	5.6

Explosion-proof actuator: weight + 2.5 kg

Essential characteristic: fire resistance – size [mm]: Ø 100 to Ø 200				
Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 Solid wall	<ul style="list-style-type: none"> d ≥ 100 mm Coating or sleeve Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 120 (v _e i↔o) S
 Lightweight partition wall	<ul style="list-style-type: none"> Metal stud wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 98 mm With mineral wool 	in the wall	Mortar-based installation	EI 120 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal stud wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 98 mm With mineral wool Installation block EQ 	in the wall	Dry mortarless installation	EI 120 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal stud wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 98 mm With mineral wool Coating or sleeve Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 120 (v _e i↔o) S
	<ul style="list-style-type: none"> Timber stud wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 130 mm Coating or sleeve 	in the wall	Fire batt	EI 120 (v _e i↔o) S



Essential characteristic: fire resistance – size [mm]: Ø 100 to Ø 315

Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 Solid wall	<ul style="list-style-type: none"> d ≥ 100 mm Coating or sleeve Distance between casings ≥ 40 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Coating or two sleeves Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 120 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Installation block ER 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Installation kit WA 	on the face of the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Installation kit WE Cladding on 2, 3 or 4 sides 	remote from the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Distance between casings ≥ 40 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 120 (v _e i↔o) S
 Lightweight partition wall	<ul style="list-style-type: none"> Metal stud wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 98 mm Coating or two sleeves Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 120 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal stud wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 98 mm Coating or sleeve Distance between casings ≥ 40 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 90 (v _e i↔o) S




Essential characteristic: fire resistance — size [mm]: Ø 100 to Ø 315

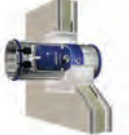
Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 <p>Lightweight partition wall</p>	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 98 mm • With or without mineral wool • Distance between casings ≥ 40 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 98 mm • Reinforcing board on both sides • With or without mineral wool 	in the wall	Mortar-based installation	EI 120 (v _e i→o) S
	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 98 mm • With or without mineral wool • Installation block EQ 	in the wall	Dry mortarless installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 98 mm • With mineral wool • Installation kit TQ • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Metal stud wall with sheet steel insert, used as a fire wall, safety partition wall or to provide radiation protection • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 100 mm • With or without mineral wool • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Metal stud wall with sheet steel insert, used as a fire wall, safety partition wall or to provide radiation protection • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 100 mm • With mineral wool • Installation kit TQ • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Metal stud wall with sheet steel as fire wall • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 100 mm • With or without mineral wool • Installation block EQ 	in the wall	Dry mortarless installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 75 mm • With or without mineral wool • Wall thickness increased to d ≥ 98 mm • Distance between casings ≥ 40 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 30 (v _e i→o) S



Essential characteristic: fire resistance – size [mm]: Ø 100 to Ø 315

Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 <p>Lightweight partition wall</p>	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 80 mm • With or without mineral wool • Wall thickness increased to d ≥ 98 mm • Distance between casings ≥ 40 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 60 (v _e i↔o) S
	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 75 mm • With or without mineral wool • Wall thickness increased to d ≥ 98 mm • Installation kit TQ • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 30 (v _e i↔o) S
	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • Flexible ceiling joint • d ≥ 100 mm • With or without mineral wool • Installation kit GL • Distance to load-bearing structural elements ≥ 50 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> • Lightweight partition wall with metal support structure made of steel • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 98 mm • With or without mineral wool • Distance between casings ≥ 40 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> • Lightweight partition wall with metal support structure made of steel • Gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum • d ≥ 98 mm • With or without mineral wool • Installation kit TQ • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> • Metal stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 98 mm • With or without mineral wool • Cladding on 2, 3 or 4 sides • Installation kit WE 	remote from the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel constructions and timber frames) • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 130 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 120 (v _e i↔o) S

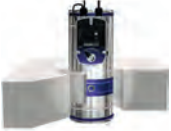


Essential characteristic: fire resistance – size [mm]: Ø 100 to Ø 315				
Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 <p>Lightweight partition wall</p>	<ul style="list-style-type: none"> • Timber stud wall (also timber panel constructions and timber frames) • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 130 mm • Distance between casings ≥ 40 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 130 mm • Coating or two sleeves • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 120 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 130 mm • Coating or sleeve • Distance between casings ≥ 40 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 90 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel constructions and timber frames) • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 130 mm • Installation kit TQ • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 120 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel constructions and timber frames) • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 130 mm • Distance between casings ≥ 40 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 30 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel constructions and timber frames) • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 130 mm • Distance between casings ≥ 40 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 30 (v _e i→o) S
	<ul style="list-style-type: none"> • Timber stud wall (also timber panel constructions and timber frames) • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 130 mm • Installation kit TQ • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Dry mortarless installation	EI 30 (v _e i→o) S
	<ul style="list-style-type: none"> • Half-timbered wall • Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards • d ≥ 140 mm • Distance between casings ≥ 40 mm • Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i→o) S

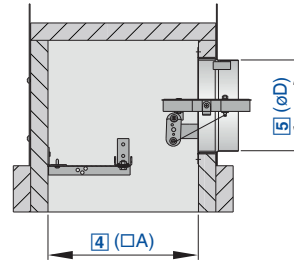
Essential characteristic: fire resistance – size [mm]: Ø 100 to Ø 315

Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 Lightweight partition wall	<ul style="list-style-type: none"> Half-timbered wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 140 mm Coating or sleeve Distance between casings ≥ 40 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Fire batt	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> Half-timbered wall Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards d ≥ 140 mm Distance to load-bearing structural elements ≥ 40 mm Installation kit TQ 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
 Shaft wall	<ul style="list-style-type: none"> Metal support structure or steel support structure Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards Cladding on one side d ≥ 90 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal support structure or additional safety board Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards Cladding on one side With reinforcing board d ≥ 90 mm Distance to load-bearing structural elements ≥ 40 mm 	in the wall	Mortar-based installation	EI 30 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal support structure Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards Cladding on one side d ≥ 90 mm Installation block EQ 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> Metal support structure Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards Cladding on one side d ≥ 90 mm Installation kit TQ 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
	<ul style="list-style-type: none"> Without metal support structure Gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire rated calcium silicate boards Cladding on one side d ≥ 50 mm Installation kit TQ 	in the wall	Dry mortarless installation	EI 90 (v _e i↔o) S
 Solid ceiling slab	<ul style="list-style-type: none"> d ≥ 100 mm Distance between casings ≥ 45 mm Distance to load-bearing structural elements ≥ 40 mm 	in the ceiling	Mortar-based installation	EI 120 (h ₀ i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Installation block ER 	in the ceiling	Dry mortarless installation	EI 90 (h ₀ i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Coating or sleeve 	in the ceiling	Fire batt	EI 90 (h ₀ i↔o) S

Essential characteristic: fire resistance – size [mm]: Ø 100 to Ø 315

Supporting construction	Construction details	Installation location	Installation type	Performance class (EI TT) up to
 Solid ceiling slab	<ul style="list-style-type: none"> d ≥ 100 mm Coating or two sleeves 	in the ceiling	Fire batt	EI 120 (h ₀ i↔o) S
	<ul style="list-style-type: none"> Combined with wooden beam ceilings Concrete bed, d ≥ 150 mm Distance between casings ≥ 45 mm Distance to load-bearing structural elements ≥ 40 mm 	in the ceiling	Mortar-based installation	EI 90 (h ₀ i↔o) S
	<ul style="list-style-type: none"> Combined with suspended ceiling systems (Cadolto system) Concrete bed, d ≥ 150 mm Distance between casings ≥ 45 mm Distance to load-bearing structural elements ≥ 40 mm 	in the ceiling	Mortar-based installation	EI 120 (h ₀ i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm Below the ceiling, with horizontal duct Perimeter gap filled with mortar or mineral wool Cladding on 2, 3 or 4 sides Installation kit WE 	remote from the ceiling	Dry mortarless installation	EI 90 (h ₀ i↔o) S





For diffusers in suspended F30 ceilings

Order code

KU – K30 / LB / W / 300x160 / Z01

1 2 3 4 5 6

1 Type

KU-K30
L-KU-K30¹

2 Construction 1

- 1 No entry: standard construction
- 1 With RAL 7001 coating
- LB** With perforated sheet metal
- 1-LB** With RAL 7001 coating and perforated sheet metal

3 Construction 2

W Release temperature 95 °C

4 Nominal size [mm] Fire damper
300, 400, 500, 600, 625

5 Nominal size [mm] - spigot
160, 200, 250, 315

6 Attachments
Z00 Standard construction
Z00 - ZL08

¹ Type L-KU-K30: For Lindner ceilings LMD F30 Types 1,3,4,5 and 6-11, Geipel ceilings F30 and OWAacoustic F30 barriere B

Diffuser types (to be ordered separately)

FD
TDF-SilentAir
DLQ
ADLQ

Note

For L-KU-K30 the plate width has to be equal to the nominal size of the fire damper

+ **Features**

Square fire damper for installation in suspended fire-resistant F30 ceilings For the isolation of duct penetrations between fire compartments, available in five nominal nominal sizes

- ▶ Nominal sizes for diffusers sized 300 × 300 - 625 × 625 mm
- ▶ Satisfies high ventilation requirements when combined with a diffuser
- ▶ Coated construction meets high hygiene requirements
- ▶ Integration into the central BMS with TROXNETCOM

Optional equipment and accessories

- ▶ Ceiling diffusers/swirl diffusers
- ▶ External fusible link, 72 °C
- ▶ Electric actuator
- ▶ Release temperature 72/95 °C

X **Application**

- ▶ Fire dampers of Type KU-K30 for the isolation of air terminal devices in self supporting fire-resistant suspended ceilings in the event of a fire
- ▶ To prevent the propagation of fire and smoke through ductwork to adjacent designated fire compartments

EN **Classification**

- ▶ Fire resistance class K30-U to DIN 4102-6

◊ **Variants**

- ▶ With fusible link
- ▶ With spring return actuator

⬡ **Attachments**

- ▶ Limit switch for damper blade position indication
- ▶ Spring return actuator for 24 V or 230 V supply voltage
- ▶ External fusible link

+ **Useful additions**

- ▶ Diffuser: FD, TDF-SilentAir, DLQ or ADLQ

★ **Special characteristics**

- ▶ Licence Z-41.3-320
- ▶ Tested to DIN 4102-6 for fire resistance properties
- ▶ Classification to DIN 4102, K30-U
- ▶ Low differential pressure and sound power level
- ▶ For use with supply air or extract air systems (for supply air systems with perforated sheet metal)
- ▶ Integration into the central BMS with TROXNETCOM

ISO **Standards and guidelines**

- ▶ DIN 4102-6, standard fire resistance test
- ▶ EN 1751 Ventilation for buildings - Air terminal devices





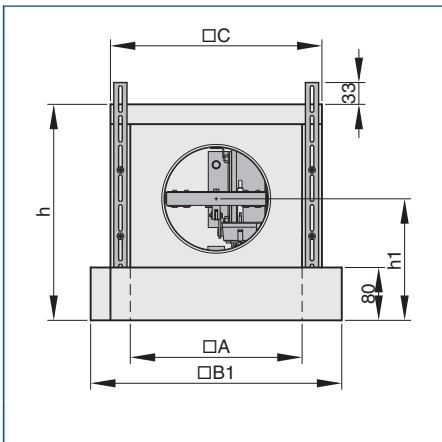
Technical data

Nominal sizes - fire damper	300, 400, 500, 600, 625 mm
Nominal sizes - spigot	160, 200, 250, 315 mm
Differential pressure range	Depends on the spigot and diffuser
Operating temperature	At least 0 - 50 °C **
Release temperature	72 °C or 95 °C (for warm air ventilation systems)
Upstream velocity	Depends on the spigot and diffuser, usually about 3 - 5 m/s

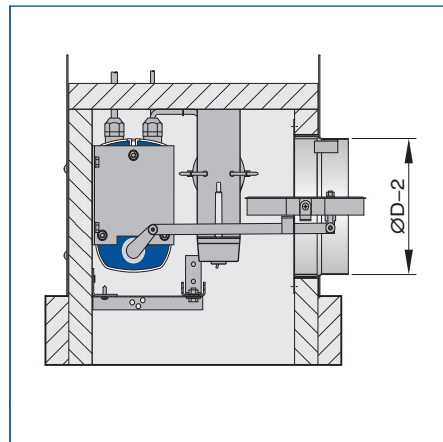
** Temperatures may differ for units with attachments



KU-K30 with spring return actuator



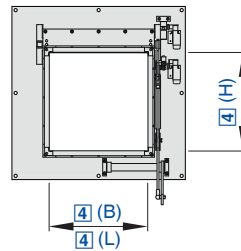
KU-K30 with spring return actuator



Dimensions [mm] and weight [kg]

Nominal size	A	B1	B2	C	D	h	h1	Weight
300	260	380	360	320	160	327	184	10
400	360	480	460	420	160 ¹	327	184	14
400	360	480	460	420	200	367	204	15
500	460	580	560	520	160 ¹	327	184	18
500	460	580	560	520	200 ¹	367	204	20
500	460	580	560	520	250	417	229	21
600	560	680	660	620	160 ¹	327	184	24
600	560	680	660	620	200 ¹	367	204	25
600	560	680	660	620	250 ¹	417	229	26
600	560	680	660	620	315	782	261	28
625	585	705	685	645	160 ¹	327	184	25
625	585	705	685	645	200 ¹	367	204	26
625	585	705	685	645	250 ¹	417	229	28
625	585	705	685	645	315	482	261	30





For the extract air of commercial kitchens

Order code

KA - EU - 2 / DE / 400x300x680 / Z02

1 2 3 4 5

1 Type

KA-EU Fire damper for the extract air of commercial kitchens

2 Material

2 No entry: galvanised casing
Stainless steel 1.4301

3 Country of destination

DE Germany
Other destination countries upon request

4 Nominal size [mm]

B x H x L

5 Attachments

Z00 Standard construction
Control module and electric blade opening actuator
Z02 bottom centred / standard
Z02LO top left*
Z02LU bottom left*
Z02RO top right
Z02RU bottom right
*only when B ≥ 700 mm

+ Features

Rectangular fire damper for use in extract air and exhaust air ducts of commercial kitchens. For the isolation of duct penetrations between fire compartments, available in 16 nominal sizes

- ▶ Nominal sizes from 250 x 225 to 1200 x 500 mm
- ▶ 100% free area ensures maximum safety
- ▶ No differential pressure, low sound power level
- ▶ Easy to clean
- ▶ Integration into the central BMS with TROXNETCOM

Optional equipment and accessories

- ▶ Electric blade opening actuator, 230 V
- ▶ Control module

Application

- ▶ Fire dampers of Type KA-EU for shutting off extract air and exhaust air ducts of commercial kitchens, with general building inspectorate licence
- ▶ To prevent the propagation of fire and smoke through ductwork to adjacent designated fire compartments

EN Classification

- ▶ Fire resistance class K90to DIN 4102-6

Variants

- ▶ With thermal release mechanism
- ▶ With thermal release mechanism and control module
- ▶ With electric blade opening actuator and control module

Attachments

- ▶ Capillary tube sensor

★ Special characteristics

- ▶ General building inspectorate licence Z-41.3-692
- ▶ Tested for fire resistance properties to DIN 4104-6 and EN 1366-2
- ▶ 100% free area
- ▶ Low differential pressure and sound power level
- ▶ Integration into the central BMS with TROXNETCOM

ISO Standards and guidelines

- ▶ EN 1366-2:1999 Fire resistance tests for service installations - Fire dampers
- ▶ DIN 4102-6, standard fire resistance test
- ▶ EN 1751 Ventilation for buildings - Air terminal devices
- ▶ VDI 2052 Ventilation equipment for kitchens

Technical data

Nominal sizes	250 x 225 - 1200 x 500 mm
Volume flow rate range	Up to 6000 l/s or 21600 m ³ /h
Operating temperature	10 - 50 °C
Release temperature	72 °C

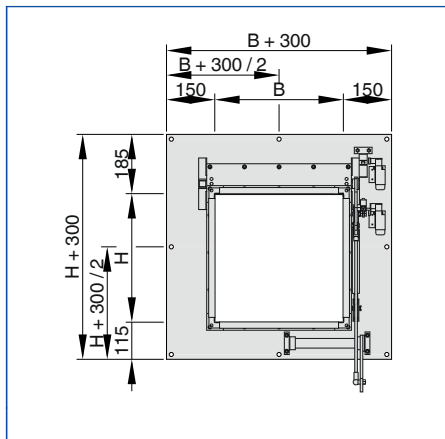


Quick selection

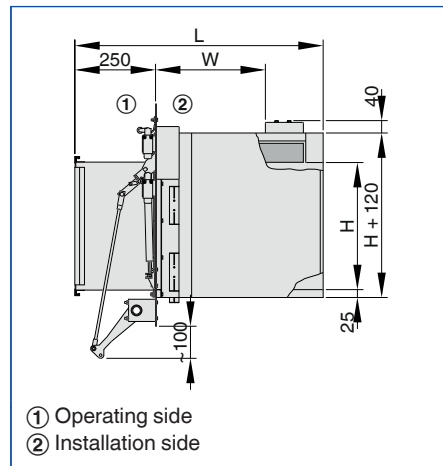
Duct dimensions B x H in mm	Volume flow rate \dot{V} [l/s]						Volume flow rate \dot{V} [m³/h]					
	Airflow velocity v_A [m/s]											
	5	6	7	8	9	10	5	6	7	8	9	10
250 x 225	280	340	390	450	505	560	1008	1224	1404	1620	1818	2016
300 x 225	340	410	470	540	610	675	1224	1476	1692	1944	2196	2430
300 x 300	450	540	630	720	810	900	1620	1944	2268	2592	2916	3240
400 x 300	600	720	840	960	1080	1200	2160	2592	3024	3456	3888	4320
400 x 400	800	960	1120	1280	1440	1600	2880	3456	4032	4608	5184	5760
500 x 400	1000	1200	1400	1600	1800	2000	3600	4320	5040	5760	6480	7200
600 x 400	1200	1440	1680	1920	2160	2400	4320	5184	6048	6912	7776	8640
700 x 400	1400	1680	1960	2240	2520	2800	5040	6048	7056	8064	9072	10080
500 x 500	1250	1500	1750	2000	2250	2500	4500	5400	6300	7200	8100	9000
600 x 500	1500	1800	2100	2400	2700	3000	5400	6480	7560	8640	9720	10800
700 x 500	1750	2100	2450	2800	3150	3500	6300	7560	8820	10080	11340	12600
800 x 500	2000	2400	2800	3200	3600	4000	7200	8640	10080	11520	12960	14400
900 x 500	2250	2700	3150	3600	4050	4500	8100	9720	11340	12960	14580	16200
1000 x 500	2500	3000	3500	4000	4500	5000	9000	10800	12600	14400	16200	18000
1100 x 500	2750	3300	3850	4400	4950	5500	9900	11880	13860	15840	17820	19800
1200 x 500	3000	3600	4200	4800	5400	6000	10800	12960	15120	17280	19440	21600



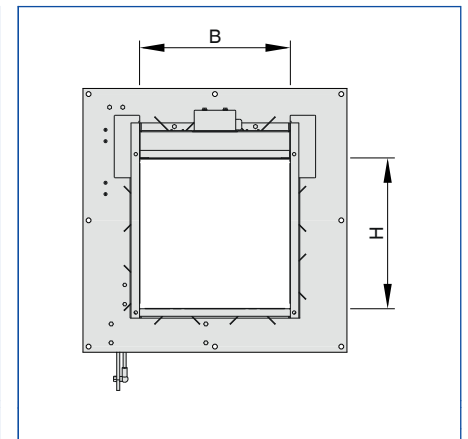
KA-EU



KA-EU



KA-EU

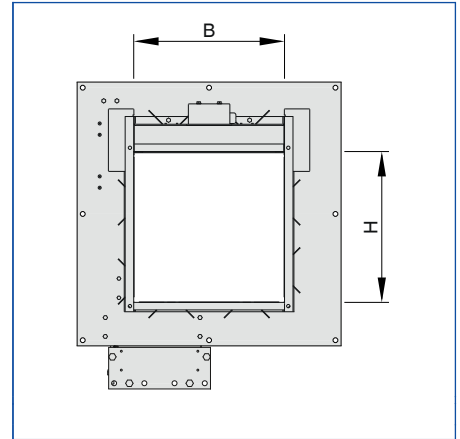
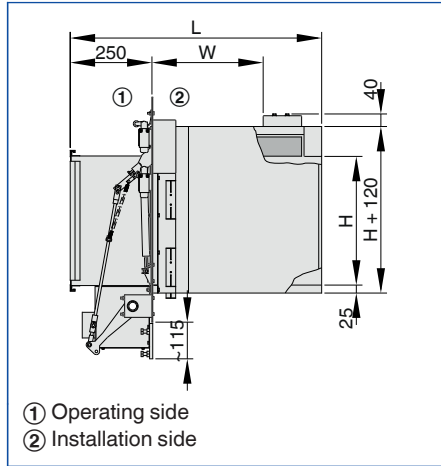
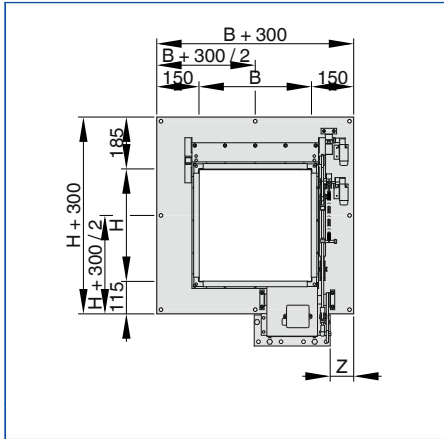


Dimensions [mm] / Weight [kg]

H	B	L	W	Weight
225	250	595	160	26
	300	595	160	28
300	300	680	235	30
	400	680	235	40
400	400	780	335	45
	500	780	335	53
	600	780	335	59
	700	780	335	70
500	500	880	435	60
	600	880	435	68
	700	880	435	79
	800	880	435	85
	900	880	435	91
	1000	880	435	99
	1100	880	435	105
1200	880	435	110	



KA-EU with electric blade opening actuator KA-EU with electric blade opening actuator KA-EU with electric blade opening actuator






Dimensions [mm] / Weight [kg]

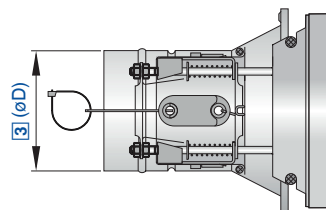
H	B	L	W	Z	Weight
225	250	595	160	85	37
	300	595	160	85	39
300	300	680	235	85	41
	400	680	235	85	51
400	400	780	335	85	56
	500	780	335	85	64
	600	780	335	85	70
	700	780	335	285	81
500	500	880	435	85	71
	600	880	435	85	79
	700	880	435	285	90
	800	880	435	335	96
	900	880	435	385	102
	1000	880	435	435	110
	1100	880	435	485	116
1200	880	435	535	121	



Essential characteristic: fire resistance – size [mm]: 250 × 225 to 1200 × 500

Supporting construction	Construction details	Installation location	Installation type	Class of performance (EI TT)
 Solid wall	<ul style="list-style-type: none"> • $d \geq 100$ mm • $\rho \geq 500$ kg/m³ 	in the wall	Mortar-based installation	EI 90 (v _e i \leftrightarrow o) S
 Lightweight partition wall	<ul style="list-style-type: none"> • Metal stud wall, gypsum plasterboard DF • $d \geq 100$ mm • With or without mineral wool 	in the wall	Mortar-based installation	EI 90 (v _e i \leftrightarrow o) S
	<p>Fire wall</p> <ul style="list-style-type: none"> • Metal stud wall with sheet steel • $d \geq 115$ mm 	in the wall	Mortar-based installation	EI 90 (v _e i \leftrightarrow o) S
 Solid ceiling slab	<ul style="list-style-type: none"> • $d \geq 150$ mm • $\rho \geq 600$ kg/m³ 	in the ceiling	Mortar-based installation	EI 90 (h _o i \leftrightarrow o) S





Fire protection valves for supply and extract air

Order code

FV - EU / DE / 160 / R / Z05

1 **2** **3** **4** **5**

1 Type

FV-EU Fire protection valve

3 Nominal size [mm]

100, 125, 160, 200

5 Attachments

Z04 - Z07

2 Country of destination

DE Germany
Other destination countries upon request

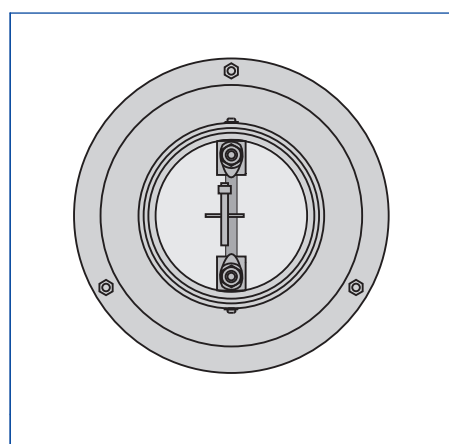
4 Accessories

No entry: none
R Trim ring - circular
Q Trim ring - square

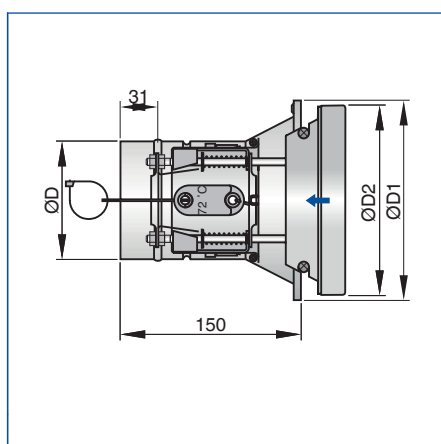
Technical data

Nominal sizes	Ø100, 125, 160, 200 mm
Casing length	150 mm (300 mm with extension piece)
Release temperature	72 °C
Operating temperature	0 - 50 °C
Volume flow rate range	Extract air up to 400 m³/h or supply air up to 210 m³/h

FV-EU



FV-EU





Dimensions [mm] / Weight [kg]

Nominal size	100	125	160	200
ØD	98	123	158	198
ØD1	164	189	224	264
ØD2	158	183	218	258
Weight	2.9	3.5	4.7	5.7
Weight*	1.7	2.2	3.0	4.0



* without extension piece and limit switches





Essential characteristic: fire resistance – size [mm]: Ø 100 to Ø 200				
Supporting construction	Construction details	Installation location	Installation type	Class of performance (EI TT)
 Solid wall	<ul style="list-style-type: none"> d ≥ 100 mm ρ ≥ 500 kg/m³ 	in the wall	Mortar-based installation	EI 120 (v _e i↔o) S
	<ul style="list-style-type: none"> d ≥ 100 mm ρ ≥ 500 kg/m³ 	in the wall	Dry mortarless installation	EI 90 (v _e o → i) S (*)
 Lightweight partition wall	<ul style="list-style-type: none"> Metal stud wall, gypsum plasterboard DF d ≥ 100 mm 	in the wall	Mortar-based installation	EI 120 (v _e i↔o) S

(*) o → i: tested with the connection on the non-exposed side

Essential characteristic: fire resistance – size [mm]: Ø 100 to Ø 200				
Supporting construction	Construction details	Installation location	Installation type	Class of performance (EI TT)
 Lightweight partition wall	<ul style="list-style-type: none"> Metal stud wall, gypsum plasterboard DF d ≥ 100 mm 	in the wall	Dry mortarless installation	EI 60 (v _e o → i) S (*)
 Solid ceiling slab	<ul style="list-style-type: none"> d ≥ 150 mm ρ ≥ 600 kg/m³ 	in the ceiling	Mortar-based installation	EI 90 (h _o i↔o) S
	<ul style="list-style-type: none"> d ≥ 150 mm ρ ≥ 600 kg/m³ 	in the ceiling	Mortar-based installation	EI 120 (h _o o → i) S (*)
	<ul style="list-style-type: none"> d ≥ 150 mm ρ ≥ 600 kg/m³ 	in the ceiling	Dry mortarless installation	EI 60 (h _o o → i) S (*)

(*) o → i: connection on the non-exposed side



smoke protection damper

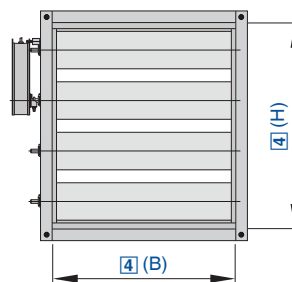
	Smoke protection dampers
	JZ-RS
Casing and blades	
Galvanised sheet steel	●
Rotation	
Opposed	●
Duct connection	
Corner holes	●
Flange holes	●
Bearings	
Brass	●
Dynamics	
External linkage	●
Spring return actuators	
24 V AC/DC without limit switches	●
230 V AC without limit switches	●
24 V AC/DC with limit switches	●
230 V AC with limit switches	●
Actuator without spring return	
24 V AC/DC with limit switches	●
Nominal sizes	
Width	357 - 2000 mm
Increments	1 mm
Width subdivided	●
Height	345 - 1998 mm
Increments	1 mm
Height subdivided	●
Casing	
Length	180 mm
Areas of application	
Temperature resistance	150 °C
Casing air leakage to EN 1751	Class C
Closed blade air leakage	200 m ³ /h per m ² at 40 Pa
Equipment and accessories	
Duct smoke detector RM-O-VS-D or RM-O-3-D	●
Installation subframe	●
Integration into the central BMS with TROXNETCOM	●
Explanation	
● - Standard	



List of abbreviations

L_{WA} [dB(A)]	A-weighted sound power level of air-regenerated noise for the fire damper
Δp_{st} [Pa]	Static differential pressure





To prevent the spreading of smoke

Order code

JZ - RS - G - R / 1000x1005 / ER / ZF06

1 2 3 4 5 6

1 Type

JZ-RS Smoke protection damper

2 Construction

No entry: standard construction
G Flange holes on both sides

3 Drive side

R Right side
L Left side
(If the drive side is not specified with the order, R will be supplied.)

4 Nominal size [mm]

B x H

5 Installation subframe

No entry: none
ER With (only for construction G)

6 Attachments

Spring return actuator (power off to close), IP 54
ZF06 24 V AC / DC
ZF07 24 - 240 V AC

ZF08 24 V AC / DC, with limit switches
ZF09 24 - 240 V AC, with limit switches
Actuator without spring return (power off to close), IP 54
ZF10 24 V AC / DC

+ Features

Smoke protection dampers are used in ventilation plant rooms or in ducts to prevent smoke from spreading

- ▶ Casing air leakage to EN 1751, class C
- ▶ Low differential pressure and sound power level
- ▶ Airflow direction is not critical
- ▶ Available in standard sizes and many intermediate sizes

Optional equipment and accessories

- ▶ Duct smoke detector RM-O-VS-D or RM-O-3-D
- ▶ Installation subframe
- ▶ Integration into the central BMS with TROXNETCOM

X Application

▶ Smoke protection dampers of Type JZ-RS are used in ventilation plant rooms or in ducts to prevent smoke from spreading (according to the German guideline regarding fire protection requirements on ventilation systems, LüAR)

- ▶ For the refurbishment of systems with regard to fire safety
- ▶ Can be triggered by duct smoke detectors with general building inspectorate licence
- ▶ Integration into the central BMS with TROXNETCOM

EN Classification

- ▶ Building inspectorate licence Z-78.4-51 from the DIBt, Berlin, Germany
- ▶ Casing air leakage to EN 1751, class C
- ▶ Closed blade air leakage at a differential pressure of 40 Pa = 200 m³/h per m²
- ▶ Long-term testing: 10,000 open/close cycles

+ Construction

- ▶ Galvanised sheet steel, corner holes on both sides, brass bearings
- ▶ G: Flange holes on both sides

⬡ Attachments

- ▶ Installation subframe ER
- ▶ Duct smoke detector
- ▶ TROXNETCOM

★ Special characteristics

- ▶ Low differential pressure and sound power level
- ▶ Aerofoil blades
- ▶ Low-maintenance, robust construction
- ▶ No parts with silicone
- ▶ Available in standard sizes and many intermediate sizes
- ▶ Closed cell side seals meet increased hygiene requirements

ISO Standards and guidelines

- ▶ German 'Bau- und Prüfgrundsätze' [Principles of Construction and Testing], 2/84 edition
- ▶ Maintenance standards DIN 31051 and EN 13305

Technical data

Nominal sizes	357 x 345 to 2000 x 1998 mm
Volume flow rate range	200 - 40,000 l/s or 720 - 143,640 m ³ /h
Maximum static differential pressure	Up to 3000 Pa
Operating temperature	-20 to 150 °C

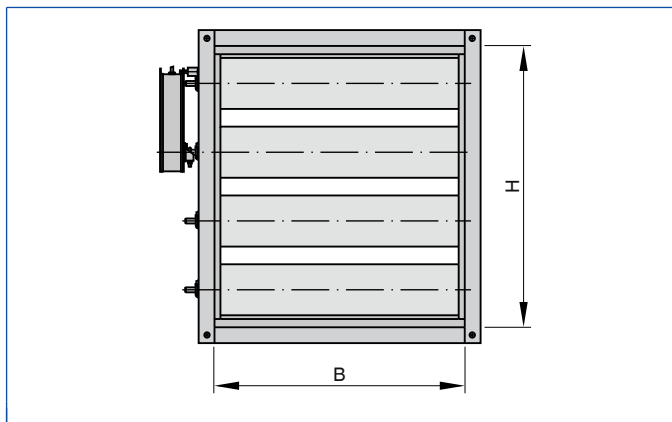


Quick sizing - differential pressure and sound power level for JZ-RS

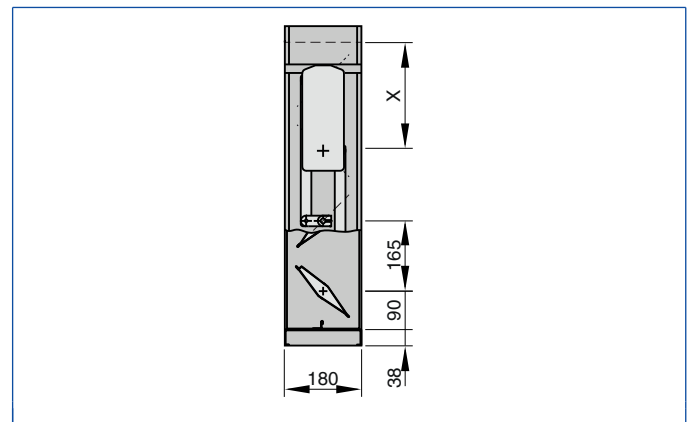
v	Damper blade position α									
	OPEN/0°		20°		40°		60°		80°	
	Δp_{st}	L_{WA}	Δp_{st}	L_{WA}	Δp_{st}	L_{WA}	Δp_{st}	L_{WA}	Δp_{st}	L_{WA}
m/s	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
0.5	<5	<30	<5	<30	<5	<30	22	44	255	67
1	<5	<30	<5	<30	8	38	85	59	1010	82
2	<5	31	<5	35	28	53	335	74	>2000	>90
4	<5	46	10	50	110	68	1395	89	>2000	>90
6	<5	55	22	59	250	77	>2000	>90	>2000	>90
8	8	61	40	65	440	83	>2000	>90	>2000	>90
10	14	66	60	70	690	88	>2000	>90	>2000	>90



JZ-RS
Standard sizes



JZ-RS
Standard sizes



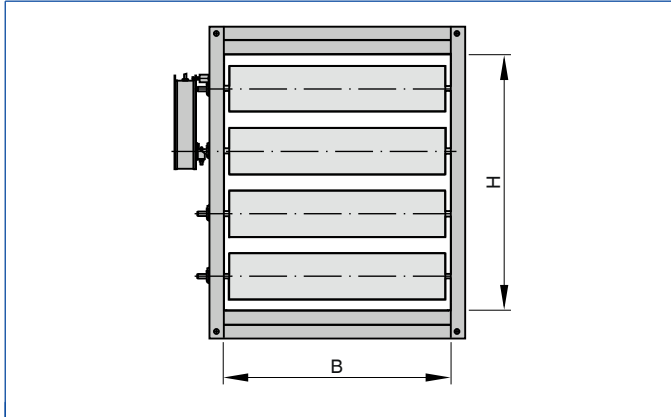
Dimensions [mm] and weight [kg]

H/B	400	600	800	1000	1200	1400	1600	1800	2000	①	②
345	13	15	17	20	22	24	26	29	31	2	255
510	15	18	21	24	27	30	32	35	38	3	255
675	18	21	25	28	32	35	38	42	45	4	255
840	20	24	28	33	37	42	46	51	55	5	255
1005	22	27	32	37	43	48	53	58	64	6	255
1170	24	30	36	42	48	54	60	66	72	7	255
1335	27	33	40	46	53	60	66	73	79	8	255
1500	28	35	42	49	56	64	71	78	85	9	255
1665	30	38	46	54	62	70	77	85	93	10	255
1830	32	40	49	57	66	74	83	91	100	11	255
1995	34	43	52	61	71	80	89	99	108	12	255

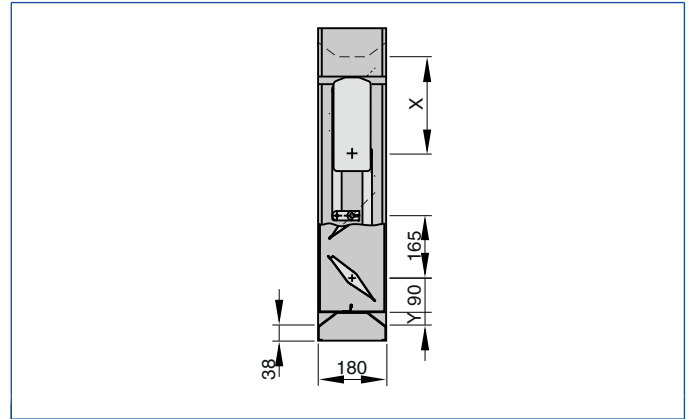
① No. of blade ② X (actuator position)



JZ-RS
 intermediate sizes



JZ-RS intermediate sizes



Dimensions [mm] and weight [kg]

H	①	②	③
348 - 508	2	255	1.5 - 81.5
513 - 673	3	255	1.5 - 81.5
678 - 838	4	255	1.5 - 81.5
843 - 1003	5	255	1.5 - 81.5
1008 - 1168	6	255	1.5 - 81.5
1173 - 1333	7	255	1.5 - 81.5
1338 - 1498	8	255	1.5 - 81.5
1503 - 1663	9	255	1.5 - 81.5
1668 - 1828	10	255	1.5 - 81.5
1833 - 1993	11	255	1.5 - 81.5
1995	12	255	1.5

① No. of blades ② X (actuator position) ③ Y (actuator position)



Smoke control dampers

	Smoke control dampers	
	EK-EU	EK-JZ
Casing and blades		
Calcium silicate	●	●
Rotation		
Anti-clockwise to OPEN, clockwise to CLOSE	●	●
Duct connection		
As specified for the duct	●	●
Open/Close actuators		
Belimo 24 V AC/DC, with limit switches	●	●
Belimo 230 V AC, with limit switches	●	●
Belimo 24 V AC/DC, with limit switches and with AS-EM/EK module	●	●
Belimo 24 V AC/DC, with limit switches and with AS-EM/SIL2 module	●	●
Belimo BKNE 230 V, for 24 V actuators	●	●
Belimo 24 A AC/DC, with limit switches, with BC24	●	●
Belimo 24 A AC/DC, with limit switches, with BRM-10-F-ST	●	●
Belimo 230 V AC, with limit switches, with BRM-10-F-ST	●	●
Nominal sizes		
Width	200 - 1500 mm	200 - 1200 mm
Increments	1 mm	1 mm
Height	200 - 800 mm	430 - 2030 mm
Increments	1 mm	200 mm
Casing		
Length depends on height	600/800 mm	250 mm
Casing air leakage to EN 1751	Class C	Class C
Equipment and accessories		
Inspection access panels	●	
Connecting subframe	●	●
Cover grille	●	●
Cover grille		●
Integration into the central BMS with TROXNETCOM	●	●
Explanation		
● - Standard		

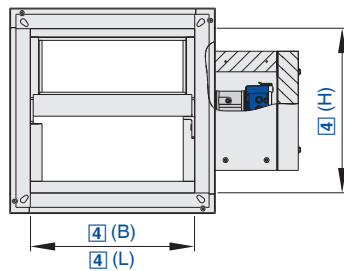




List of abbreviations

\dot{V} [m ³ /h] and [l/s]	Volume flow rate
L_{WA} [dB(A)]	A-weighted sound power level of air-regenerated noise for the smoke control damper
A [m ²]	Free area
B [mm]	Width of the smoke control damper
H [mm]	Height of the smoke control damper
L [mm]	Length of the smoke control damper
Δp_{st} [Pa]	Static differential pressure
v [m/s]	Airflow velocity based on the upstream cross section (B × H)





For mechanical smoke extract systems and as an additional supply air inlet, also for natural smoke and heat exhaust systems

Order code

EK-EU - R / DE / 1200x600x800 / F0 / B24



<p>1 Type EK-EU Smoke control damper</p> <p>2 Inspection access No entry: none R On the operating side, at the top/bottom</p> <p>3 Country of destination DE Germany Other destination countries upon request</p> <p>4 Nominal size [mm] B x H x L</p> <p>5 Attachments 1 No entry: none F0 Connecting subframe on the operating side</p>	<p>OF Connecting subframe on the installation side</p> <p>FF Connecting subframes on both sides</p> <p>A0 Cover grille on the operating side Square perforated metal plate 10 x 10, galvanised steel</p> <p>0A Cover grille on the installation side Square perforated metal plate 10 x 10, galvanised steel</p> <p>AA Cover grilles on both sides</p> <p>FA Connecting subframe on the operating side and cover grille on the installation side</p> <p>AF Connecting subframe on the installation side and cover grille on the operating side</p>	<p>6 Attachments 2 Belimo</p> <p>B24 BE 24-12, 24 V AC/DC</p> <p>B230 BE 230-12, 230 V AC/DC</p> <p>B24A BE 24-12, with AS-EM/EK, 30 V DC (AS-i)</p> <p>B24M BE 24-12, with switch for intermediate position</p> <p>B230M BE 230-12, with switch for intermediate position</p> <p>B24AM BE 24-12, with AS-EM/EK, 30 V DC (AS-i), switch for intermediate position</p> <p>B24AS BE 24-12, with AS-EM/SIL2, 24 V AC/DC</p> <p>B24BKNE BE 24-12 / BLE 24-12, with BKNE230-24</p>
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+ Features

- Rectangular smoke control dampers with extract ventilation function, for smoke extract with mechanical smoke extract systems or as an additional supply air inlet
- ▶ Nominal sizes 200 x 200 - 1500 x 800 mm, in increments of 1 mm
 - ▶ Casing, damper blade and actuator encasing made of temperature-resistant calcium silicate
 - ▶ Remote control with actuator
 - ▶ Pressure level 3 (operating pressure -1500 to 500 Pa)
 - ▶ Manual or automatic release
 - ▶ For smoke extract ducts from 35 mm wall thickness
 - ▶ Energy efficient due to low differential pressures and sound power levels
 - ▶ Casing air leakage to EN 1751, class C
- Optional equipment and accessories
- ▶ Connecting subframe
 - ▶ Cover grille
 - ▶ Inspection access panels
 - ▶ Integration into the central BMS with TROXNETCOM
 - ▶ C_{mod} = ventilation function and intermediate positions for flow rate balancing with

TROXNETCOM

Application

- ▶ Smoke control dampers of Type EK-EU, with CE marking and declaration of performance, for smoke extract with mechanical smoke extract systems; also for natural smoke and heat exhaust systems
- ▶ Provision of fresh air supply for mechanical smoke extract systems
- ▶ Extract ventilation function is possible if the mechanical smoke extract system has been approved (general building approval) for extract ventilation
- ▶ Integration into the central BMS with TROXNETCOM

EN Classification

- ▶ EI 90 (v_{edw} - h_{odw}, i ↔ o)
- ▶ S1500 C_{mod} MA multi to EN 13501-4

Attachments

- ▶ Open/Close actuator, 24 V AC/DC or 230 V AC supply voltage
- ▶ Network module for the integration with AS-i networks, e.g. AS-EM/EK, AS-EM/SIL2

& Accessories

- ▶ Connecting subframe
- ▶ Cover grille tested to EN 1366-10
- ▶ Inspection access on the operating side, at the top/bottom

Useful additions

- ▶ Duct smoke detector RM-O-3-D
- ▶ Duct smoke detector with airflow monitor RM-O-VS-D

X-FANS smoke exhaust fans

- ▶ Smoke exhaust fan for roof installation BVDAX/BVD
- ▶ Smoke exhaust fan for wall installation BVW/BVWAXN
- ▶ Smoke exhaust centrifugal fan BVREH/BVRA
- ▶ Smoke exhaust jet fans BVGAX/BVGAXN

All smoke exhaust fans are tested to EN 12101-3, for F200/F300/F400 and F600, depending on the type. With CE marking, declaration of performance and application approval for the German market.



Special characteristics

- ▶ Declaration of performance according to Construction Products Regulation
- ▶ Classification to EN 13501-4, EI 90 ($v_{ed,w} - h_{od,w}, i \leftrightarrow o$) S1500 C_{mod} MA multi
- ▶ C_{mod} Use for ventilation function in combined systems and intermediate position for hydraulic balancing with TROXNETCOM
- ▶ Complies with the requirements of EN 12101-8
- ▶ Tested for fire resistance properties to DIN 1366-10 and EN 1366-2

- ▶ Casing air leakage to EN 1751, class C
- ▶ Low sound power level and differential pressure
- ▶ Any airflow direction
- ▶ Integration into the central BMS with TROXNETCOM
- ▶ General building inspectorate licence Z-56.4212-990

ISO Standards and guidelines

- ▶ Construction Products Regulation
- ▶ EN 12101-8:2011 Smoke and heat control systems - Smoke control dampers

- ▶ EN 1366-10:2011 Fire resistance tests for service installations - Smoke control dampers
- ▶ EN 1366-2:1999 Fire resistance tests for service installations - Fire dampers
- ▶ EN 13501-4:2009 Fire classification of construction products and building elements
- ▶ EN 1751:1999 Ventilation for buildings - Air terminal devices
- ▶ German MLAR guideline (guideline on fire protection requirements for duct systems)

Technical data

Nominal sizes	200 × 200 mm - 1500 × 800 mm, in increments of 1 mm
Casing length	600 and 800 mm
Volume flow rate range	Up to 12000 l/s or up to 43200 m ³ /h
Differential pressure range	Pressure level 3: -1500 to 500 Pa
Operating temperature	-30 to 50 °C
Upstream velocity*	≤ 10 m/s

* Data applies to uniform upstream and downstream conditions for the smoke control damper

Volume flow rate [m³/h], pressure loss ΔP [Pa] and sound power level [dB(A)] based on damper blade dimensions, at 10 m/s upstream velocity

H	10 m/s	B									
		200	250	300	350	400	450	500	550	600	650
200	m ³ /h	1440	1800	2160	2520	2880	3240	3600	3960	4320	4680
	Pa	683	388	282	226	191	167	149	135	124	115
	dB(A)	79	76	75	74	74	74	74	73	73	73
250	m ³ /h	1800	2250	2700	3150	3600	4050	4500	4950	5400	5850
	Pa	304	213	168	141	123	110	100	91	85	79
	dB(A)	72	70	69	68	68	68	68	68	68	68
300	m ³ /h	2160	2700	3240	3780	4320	4860	5400	5940	6480	7020
	Pa	209	155	126	108	95	85	78	72	67	63
	dB(A)	68	67	66	65	65	65	65	65	65	65
350	m ³ /h	2520	3150	3780	4410	5040	5670	6300	6930	7560	8190
	Pa	164	125	103	89	79	71	65	60	56	53
	dB(A)	66	65	64	64	63	63	63	63	63	64
400	m ³ /h	2880	3600	4320	5040	5760	6480	7200	7920	8640	9360
	Pa	137	106	88	77	68	62	57	53	49	46
	dB(A)	65	64	63	63	62	62	62	62	62	63
450	m ³ /h	3240	4050	4860	5670	6480	7290	8100	8910	9720	10530
	Pa	119	93	78	68	61	55	51	47	44	41
	dB(A)	64	63	62	62	62	62	62	62	62	62
500	m ³ /h	3600	4500	5400	6300	7200	8100	9000	9900	10800	11700
	Pa	106	83	70	61	55	50	46	43	40	38
	dB(A)	63	62	62	61	61	61	61	61	61	61
550	m ³ /h	3960	4950	5940	6930	7920	8910	9900	10890	11880	12870
	Pa	96	76	64	56	50	46	42	39	37	35
	dB(A)	63	62	61	61	61	61	61	61	61	61
600	m ³ /h	4320	5400	6480	7560	8640	9720	10800	11880	12960	14040
	Pa	88	70	59	52	47	43	39	37	34	32
	dB(A)	63	62	61	61	61	61	61	61	61	61
650	m ³ /h	4680	5850	7020	8190	9360	10530	11700	12870	14040	15210
	Pa	81	65	55	49	44	40	37	34	32	30
	dB(A)	63	61	61	61	60	60	60	61	61	61
700	m ³ /h	5040	6300	7560	8820	10080	11340	12600	13860	15120	16380
	Pa	76	61	52	46	41	38	35	32	30	29
	dB(A)	62	61	61	60	60	60	60	60	60	61





H	10 m/s	B									
		200	250	300	350	400	450	500	550	600	650
750	m ³ /h	5400	6750	8100	9450	10800	12150	13500	14850	16200	17550
	Pa	72	58	49	43	39	36	33	31	29	27
	dB(A)	62	61	61	60	60	60	60	60	60	61
	dB(A)										
800	m ³ /h	5760	7200	8640	10080	11520	12960	14400	15840	17280	18720
	Pa	68	55	47	41	37	34	31	29	27	26
	dB(A)	62	61	61	60	60	60	60	60	60	60
	dB(A)										

Cover grilles have not been considered for the pressure loss values. The extra zeta value applies to air transfer including two cover grilles, and for exhaust with one cover grille. The Easy Product Finder allows you to size products using your project-specific data. You will find the Easy Product Finder on our website.

Volume flow rate [m³/h], pressure loss ΔP [Pa] and sound power level [dB(A)] based on damper blade dimensions, at 10 m/s upstream velocity

H	10 m/s	B									
		700	750	800	900	1000	1100	1200	1300	1400	1500
200	m ³ /h	5040	5400	5760	6480	7200	7920	8640	9360	10080	10800
	Pa	108	101	96	87	80	74	69	65	61	58
	dB(A)	73	73	73	74	74	74	74	74	74	75
	dB(A)										
250	m ³ /h	6300	6750	7200	8100	9000	9900	10800	11700	12600	13500
	Pa	75	71	67	61	57	53	49	47	44	42
	dB(A)	68	68	68	68	68	69	69	69	69	69
	dB(A)										
300	m ³ /h	7560	8100	8640	9720	10800	11880	12960	14040	15120	16200
	Pa	59	56	53	49	45	42	40	38	36	34
	dB(A)	65	65	65	66	66	66	66	66	67	67
	dB(A)										
350	m ³ /h	8820	9450	10080	11340	12600	13860	15120	16380	17640	18900
	Pa	50	48	45	42	39	36	34	32	31	29
	dB(A)	64	64	64	64	64	64	65	65	65	65
	dB(A)										
400	m ³ /h	10080	10800	11520	12960	14400	15840	17280	18720	20160	21600
	Pa	44	42	40	37	34	32	30	28	27	26
	dB(A)	63	63	63	63	63	63	64	64	64	64
	dB(A)										
450	m ³ /h	11340	12150	12960	14580	16200	17820	19440	21060	22680	24300
	Pa	39	37	36	33	30	29	27	25	24	23
	dB(A)	62	62	62	62	63	63	63	63	63	64
	dB(A)										
500	m ³ /h	12600	13500	14400	16200	18000	19800	21600	23400	25200	27000
	Pa	36	34	33	30	28	26	25	23	22	21
	dB(A)	61	62	62	62	62	62	63	63	63	63
	dB(A)										
550	m ³ /h	13860	14850	15840	17820	19800	21780	23760	25740	27720	29700
	Pa	33	31	30	28	26	24	23	22	21	20
	dB(A)	61	61	61	62	62	62	62	62	63	63
	dB(A)										
600	m ³ /h	15120	16200	17280	19440	21600	23760	25920	28080	30240	32400
	Pa	31	29	28	26	24	22	21	20	19	18
	dB(A)	61	61	61	61	62	62	62	62	62	63
	dB(A)										
650	m ³ /h	16380	17550	18720	21060	23400	25740	28080	30420	32760	35100
	Pa	29	27	26	24	23	21	20	19	18	17
	dB(A)	61	61	61	61	61	62	62	62	62	62
	dB(A)										
700	m ³ /h	17640	18900	20160	22680	25200	27720	30240	32760	35280	37800
	Pa	27	26	25	23	21	20	19	18	17	16
	dB(A)	61	61	61	61	61	62	62	62	62	62
	dB(A)										
750	m ³ /h	18900	20250	21600	24300	27000	29700	32400	35100	37800	40500
	Pa	26	25	24	22	20	19	18	17	16	15
	dB(A)	61	61	61	61	61	62	62	62	62	62
	dB(A)										
800	m ³ /h	20160	21600	23040	25920	28800	31680	34560	37440	40320	43200
	Pa	25	23	22	21	19	18	17	16	15	15
	dB(A)	61	61	61	61	61	61	62	62	62	62
	dB(A)										

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Volume flow rate [m³/h], pressure loss ΔP [Pa] and sound power level [dB(A)] based on damper blade dimensions, at 5 m/s upstream velocity

H	5 m/s	B									
		200	250	300	350	400	450	500	550	600	650
200	m ³ /h	720	900	1080	1260	1440	1620	1800	1980	2160	2340
	Pa	171	97	70	56	48	42	37	34	31	29
	dB(A)	57	55	55	54	54	54	54	54	54	54
250	m ³ /h	900	1125	1350	1575	1800	2025	2250	2475	2700	2925
	Pa	76	53	42	35	31	27	25	23	21	20
	dB(A)	52	50	50	49	49	49	49	49	49	49
300	m ³ /h	1080	1350	1620	1890	2160	2430	2700	2970	3240	3510
	Pa	52	39	31	27	24	21	19	18	17	16
	dB(A)	49	47	47	46	46	46	46	46	46	46
350	m ³ /h	1260	1575	1890	2205	2520	2835	3150	3465	3780	4095
	Pa	41	31	26	22	20	18	16	15	14	13
	dB(A)	47	45	45	44	44	44	44	44	44	44
400	m ³ /h	1440	1800	2160	2520	2880	3240	3600	3960	4320	4680
	Pa	34	27	22	19	17	15	14	13	12	12
	dB(A)	46	44	44	43	43	43	43	43	43	43
450	m ³ /h	1620	2025	2430	2835	3240	3645	4050	4455	4860	5265
	Pa	30	23	19	17	15	14	13	12	11	10
	dB(A)	45	43	43	42	42	42	42	42	42	42
500	m ³ /h	1800	2250	2700	3150	3600	4050	4500	4950	5400	5850
	Pa	26	21	18	15	14	12	11	11	10	9
	dB(A)	45	43	43	42	42	42	42	42	42	42
550	m ³ /h	1980	2475	2970	3465	3960	4455	4950	5445	5940	6435
	Pa	24	19	16	14	13	11	11	10	9	9
	dB(A)	45	43	43	42	42	42	42	42	42	42
600	m ³ /h	2160	2700	3240	3780	4320	4860	5400	5940	6480	7020
	Pa	22	18	15	13	12	11	10	9	9	8
	dB(A)	44	42	42	41	41	41	41	41	41	41
650	m ³ /h	2340	2925	3510	4095	4680	5265	5850	6435	7020	7605
	Pa	20	16	14	12	11	10	9	9	8	8
	dB(A)	44	42	42	41	41	41	41	41	41	41
700	m ³ /h	2520	3150	3780	4410	5040	5670	6300	6930	7560	8190
	Pa	19	15	13	11	10	9	9	8	8	7
	dB(A)	44	42	42	41	41	41	41	41	41	41
750	m ³ /h	2700	3375	4050	4725	5400	6075	6750	7425	8100	8775
	Pa	18	14	12	11	10	9	8	8	7	7
	dB(A)	44	42	42	41	41	41	41	41	41	41
800	m ³ /h	2880	3600	4320	5040	5760	6480	7200	7920	8640	9360
	Pa	17	14	12	10	9	8	8	7	7	6
	dB(A)	44	42	42	41	41	41	41	41	41	41

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Volume flow rate [m³/h], pressure loss ΔP [Pa] and sound power level [dB(A)] based on damper blade dimensions, at 5 m/s upstream velocity

H	5 m/s	B									
		700	750	800	900	1000	1100	1200	1300	1400	1500
200	m ³ /h	2520	2700	2880	3240	3600	3960	4320	4680	5040	5400
	Pa	27	25	24	22	20	18	17	16	15	15
	dB(A)	54	54	54	55	55	55	55	55	56	56
250	m ³ /h	3150	3375	3600	4050	4500	4950	5400	5850	6300	6750
	Pa	19	18	17	15	14	13	12	12	11	11
	dB(A)	49	49	49	50	50	50	50	50	51	51

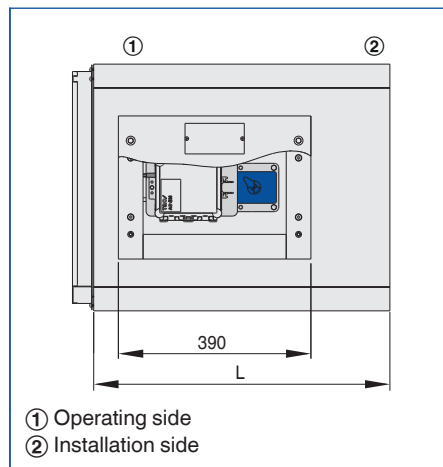
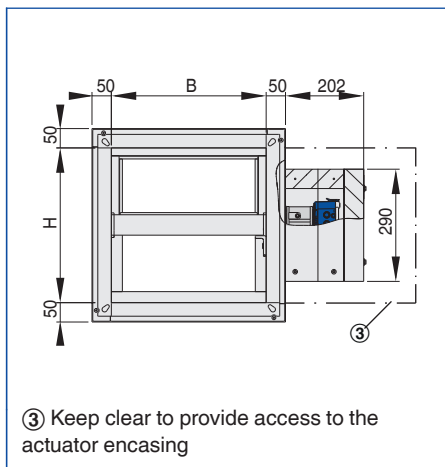


H	5 m/s	B									
		700	750	800	900	1000	1100	1200	1300	1400	1500
300	m ³ /h	3780	4050	4320	4860	5400	5940	6480	7020	7560	8100
	Pa	15	14	13	12	11	11	10	9	9	9
	dB(A)	46	46	46	47	47	47	47	47	48	48
350	m ³ /h	4410	4725	5040	5670	6300	6930	7560	8190	8820	9450
	Pa	13	12	11	10	10	9	8	8	8	7
	dB(A)	44	44	44	45	45	45	45	45	46	46
400	m ³ /h	5040	5400	5760	6480	7200	7920	8640	9360	10080	10800
	Pa	11	10	10	9	8	8	7	7	7	6
	dB(A)	43	43	43	44	44	44	44	44	45	45
450	m ³ /h	5670	6075	6480	7290	8100	8910	9720	10530	11340	12150
	Pa	10	9	9	8	8	7	7	6	6	6
	dB(A)	42	42	42	43	43	43	43	43	44	44
500	m ³ /h	6300	6750	7200	8100	9000	9900	10800	11700	12600	13500
	Pa	9	9	8	7	7	7	6	6	6	5
	dB(A)	42	42	42	43	43	43	43	43	44	44
550	m ³ /h	6930	7425	7920	8910	9900	10890	11880	12870	13860	14850
	Pa	8	8	8	7	6	6	6	5	5	5
	dB(A)	42	42	42	43	43	43	43	43	44	44
600	m ³ /h	7560	8100	8640	9720	10800	11880	12960	14040	15120	16200
	Pa	8	7	7	6	6	6	5	5	5	5
	dB(A)	41	41	41	42	42	42	42	42	43	43
650	m ³ /h	8190	8775	9360	10530	11700	12870	14040	15210	16380	17550
	Pa	7	7	7	6	6	5	5	5	5	4
	dB(A)	41	41	41	42	42	42	42	42	43	43
700	m ³ /h	8820	9450	10080	11340	12600	13860	15120	16380	17640	18900
	Pa	7	6	6	6	5	5	5	4	4	4
	dB(A)	41	41	41	42	42	42	42	42	43	43
750	m ³ /h	9450	10125	10800	12150	13500	14850	16200	17550	18900	20250
	Pa	6	6	6	5	5	5	4	4	4	4
	dB(A)	41	41	41	42	42	42	42	42	43	43
800	m ³ /h	10080	10800	11520	12960	14400	15840	17280	18720	20160	21600
	Pa	6	6	6	5	5	5	4	4	4	4
	dB(A)	41	41	41	42	42	42	42	42	43	43



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EK-EU with open/close actuator of Type BE **EK-EU with open/close actuator of Type BE**



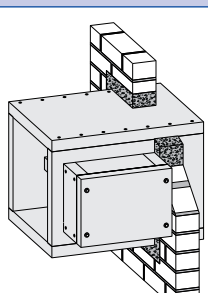
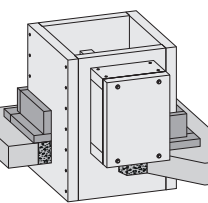
Weight [kg]

L [mm]	H [mm]	B [mm]									
		200	250	300	350	400	450	500	550	600	650
600	200	39	42	45	48	50	53	56	59	62	65
	250	42	45	48	51	54	57	60	63	66	68
	300	45	48	51	54	57	60	63	66	69	72
	350	48	51	54	57	60	63	67	70	73	76
	400	50	54	57	60	64	67	70	73	77	80
	450	53	57	60	63	67	70	74	77	80	84
	500	56	60	63	67	70	74	77	81	84	88
	550	59	63	66	70	73	77	81	84	88	92
800	600	62	66	69	73	77	80	84	88	92	95
	650	79	84	88	93	97	102	107	111	116	120
	700	83	87	92	97	102	106	111	116	120	125
	750	86	91	96	101	106	110	115	120	125	130
	800	90	95	100	105	110	115	119	124	129	134

Weight [kg]

L [mm]	H [mm]	B [mm]									
		700	750	800	900	1000	1100	1200	1300	1400	1500
600	200	67	70	73	79	84	90	96	101	107	113
	250	71	74	77	83	89	95	101	107	113	118
	300	75	78	81	88	94	100	106	112	118	124
	350	79	82	86	92	98	105	111	117	124	130
	400	83	87	90	96	103	110	116	123	129	136
	450	87	91	94	101	108	114	121	128	135	141
	500	91	95	98	105	112	119	126	133	140	147
	550	95	99	102	110	117	124	131	139	146	153
800	600	99	103	107	114	121	129	136	144	151	159
	650	125	130	134	143	153	162	171	180	189	199
	700	130	135	139	149	158	168	177	186	196	205
	750	135	139	144	154	163	173	183	192	202	212
	800	139	144	149	159	169	179	189	198	208	218

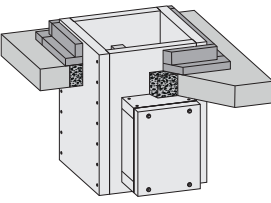
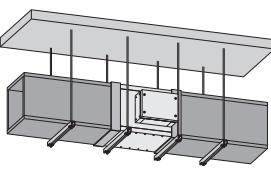
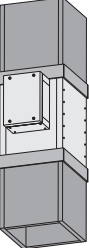
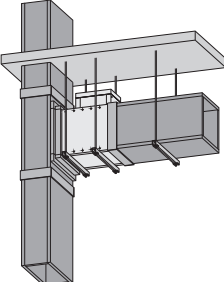
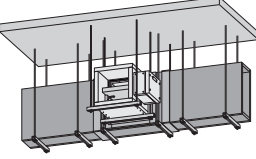
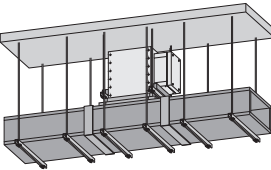
Essential characteristics: fire resistance for nominal sizes [mm]: 200 × 200 to 1500 × 800

Supporting construction	Construction details	Installation location	Installation type	Performance level
 <p>Solid wall</p>	<ul style="list-style-type: none"> • $d \geq 100$ mm • $\rho \geq 500$ kg/m³ • Distance to load-bearing structural elements ≥ 75 mm • Distance between casings ≥ 200 mm 	in the wall	Mortar-based installation	EI 90 ($v_{ew}, i \leftrightarrow o$) S 1500 C _{mod} MA multi HOT 400/30
 <p>Solid ceiling slab</p>	<ul style="list-style-type: none"> • $d \geq 150$ mm • $\rho \geq 600$ kg/m³ • Distance between casings ≥ 200 mm 	in the ceiling	Mortar-based installation	EI 120 ($h_{ow}, i \leftrightarrow o$) S 1500 C _{mod} MA multi HOT 400/30

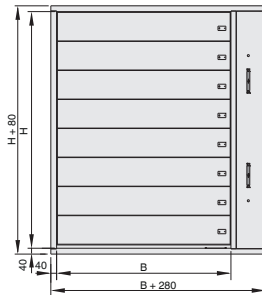


Essential characteristics: fire resistance for nominal sizes [mm]: 200 × 200 to 1500 × 800



Supporting construction	Construction details	Installation location	Installation type	Performance level
 Solid ceiling slab	<ul style="list-style-type: none"> • $d \geq 150$ mm • $\rho \geq 600$ kg/m³ • Distance between casings ≥ 200 mm 	in the ceiling	Mortar-based installation	EI 120 (h _{ow} , i↔o) S 1500 C _{mod} MA multi HOT 400/30
 Fire-resistant smoke extract duct	<ul style="list-style-type: none"> • $\rho \geq 520$ kg/m³ • Wall thickness $W \geq 35$ mm 	in a horizontal duct	Dry mortarless installation	EI 90 (v _{ed} , i↔o) S 1500 C _{mod} MA multi
 Fire-resistant smoke extract duct	<ul style="list-style-type: none"> • $\rho \geq 520$ kg/m³ • Wall thickness $W \geq 35$ mm 	in a vertical duct	Dry mortarless installation	EI 120 (h _{od} , i↔o) S 1500 C _{mod} MA multi
 Fire-resistant smoke extract duct	<ul style="list-style-type: none"> • $\rho \geq 520$ kg/m³ • Wall thickness $W \geq 35$ mm 	in a horizontal and on a vertical duct	Dry mortarless installation	EI 90 (v _{ed} , i↔o) S 1500 C _{mod} MA multi
 Fire-resistant smoke extract duct	<ul style="list-style-type: none"> • $\rho \geq 520$ kg/m³ • Wall thickness $W \geq 35$ mm 	on a horizontal duct	Dry mortarless installation	EI 90 (v _{ed} , i↔o) S 1500 C _{mod} MA multi
 Fire-resistant smoke extract duct	<ul style="list-style-type: none"> • $\rho \geq 520$ kg/m³ • Wall thickness $W \geq 35$ mm 	on top of a horizontal duct	Dry mortarless installation	EI 120 (h _{od} , i↔o) S 1500 C _{mod} MA multi





For use in mechanical smoke extract systems, pressurisation systems, and natural smoke and heat exhaust systems, also for use as an additional supply air inlet



Order code

EK-JZ - R / DE / 1200x2030x250 / A0 / B24A

1

2

3

4

5

6

1 Type

EK-JZ Smoke control damper

2 Actuator encasing as seen from the operating side

R On the right (as standard)

3 Country of destination

DE Germany
Other destination countries upon request

4 Nominal size [mm]

B x H x L

5 Attachments 1

No entry: none

F0, 0F, FF

Connecting subframe, galvanised steel

Cover grille

A0, 0A, AA

Crimped wire mesh, 20 x 20, galvanised steel

B0, 0B, BB

Square perforated metal plate, 10 x 10, galvanised steel

C0, 0C, CC

Grille with slanted blades, aluminium

D0, 0D, DD

Grille with slanted blades, aluminium, additionally with crimped wire mesh, 20 x 20, galvanised steel

E0, 0E, EE

Grille with slanted blades, aluminium, additionally with welded wire mesh, 6 x 6, galvanised steel

G0, 0G, GG

Grille with straight blades, aluminium, blade pitch 25 mm

H0, 0H, HH

Grille with straight blades, aluminium, blade pitch 16.7 mm

The first character refers to the operating side, the second character refers to the installation side e.g. FA: Connecting subframe on the operating side, crimped wire mesh on the installation side Any combination is possible

6 Attachments 2

Belimo actuators

B24

BE 24-12; BLE 24-12, 24 V AC/DC

B230

BE 230-12; BLE 230-12, 230 V AC

Combinations of actuator and control module

B24A

BE 24-12 / BLE 24-12, with AS-EM/EK, 30 V DC (AS-i)

B24AS

BE24-12 / BLE 24-12, with AS-EM/SIL2, 30 V DC (AS-i)

B24BKNE

BE 24-12 / BLE 24-12, with BKNE230-24

B24C

BE 24-12 / BLE24-12, with BC24

B24D

BE 24-12 / BLE 24-12, with BRM-10-F-ST

B230D

BE 230-12 / BLE 230-12, with BRM-10-F

+ Features

Rectangular smoke control dampers with ventilation function, low installation depth and large cross section for heat and smoke exhaust with mechanical smoke extract systems, for the provision of additional supply air and for use in pressurisation systems

- ▶ Nominal sizes 200 × 430 - 1200 × 2030 mm, for smoke gas flow rates of up to 87,700 m³/h or 24,360 l/s at 10 m/s
- ▶ Quick and easy installation in or on building structures, for smoke and heat exhaust, remote control with an actuator
- ▶ Casing, damper blades and actuator encasing made of temperature-resistant calcium silicate
- ▶ Pressure level 2 (operating pressure -1000 to 500 Pa)
- ▶ Automatic release (AA), option of manual override (MA)
- ▶ For smoke extract ducts from 35 mm wall thickness
- ▶ C_{10,000} = for combined smoke extract and ventilation systems
- ▶ Closed blade air leakage to EN 1751, class 3
- ▶ Casing air leakage to EN 1751, class C

Optional equipment and accessories

- ▶ Cover grille (various constructions)
- ▶ Connecting subframe for calcium silicate and sheet steel smoke extract ducts
- ▶ Integration into the central BMS with TROXNETCOM

Application

- ▶ Smoke control damper of Type EK-JZ, with CE marking and declaration of performance, for heat and smoke exhaust with mechanical smoke extract systems
- ▶ For the provision of fresh air (additional supply air) to mechanical smoke extract systems
- ▶ In pressurisation systems
- ▶ Can be used for ventilation if the mechanical smoke extract system has been certified (general building inspectorate licence) for use with combined systems
- ▶ Integration into the central BMS with TROXNETCOM

Technical data

Nominal sizes B × H	200 × 430 mm - 1200 × 2030 mm
Casing length	250 mm
Volume flow rate range	Up to 24361 l/s or up to 87700 m ³ /h
Differential pressure range	Pressure level 2: -1000 Pa to 500 Pa
Operating temperature	-30 to 50 °C; the temperature should not fall below the dew point
Upstream velocity*	≤ 10 m/s with the largest size, > 10 - 15 m/s with smaller sizes; 87700 m ³ /h max.

* Data applies to uniform upstream and downstream conditions for the smoke control damper

EN Classification

- ▶ EI 120/90 (V_{edw}, i ↔ o) S1000 C_{10,000} MA multi

Attachments 1

- ▶ Connecting subframe for calcium silicate and sheet steel smoke extract ducts
- ▶ Cover grille - crimped wire mesh or square perforated metal plate
- ▶ Cover grille - grille with straight or slanted blades

Attachments 2

- ▶ Open/Close actuators, 24 V AC/DC or 230 V AC supply voltage
- ▶ Network modules for the integration with AS-i networks
- ▶ Network modules for other standard bus systems

Useful additions

- TROXNETCOM
- ▶ AES extract air and smoke extract controller X-FANS smoke exhaust fans
 - ▶ Smoke exhaust fan for roof installation BVDAX/BVD
 - ▶ Smoke exhaust fan for wall installation BVW/BVWAXN
 - ▶ Smoke exhaust centrifugal fan BVREH/BVRA
 - ▶ Smoke exhaust jet fans BVGAX/BVGAXN

All smoke exhaust fans are tested to EN 12101-3, for F200/F300/F400 and F600, depending on the type. With CE marking, declaration of performance and application approval for the German market.

Speed adjustment on smoke exhaust fans

- ▶ Certified frequency inverter unit X FAN-Control

Safe and precise speed adjustment of smoke exhaust fans both in one-zone and in multi-zone systems.

Special characteristics

- ▶ C_{10,000} for combined smoke extract and ventilation systems
- ▶ Complies with the requirements of EN 12101-8
- ▶ Tested to EN 1366-2 and 1366-10 for fire resistance properties
- ▶ Closed blade air leakage to EN 1751, class 3, and casing air leakage to EN 1751, class C
- ▶ Low sound power level and differential pressure
- ▶ Any airflow direction
- ▶ Manual release is also possible using TROXNETCOM
- ▶ Integration into the central BMS with standard bus systems
- ▶ Long-time testing to EN 1366-10, with a weight being attached to the blades, 10,000 open/close cycles

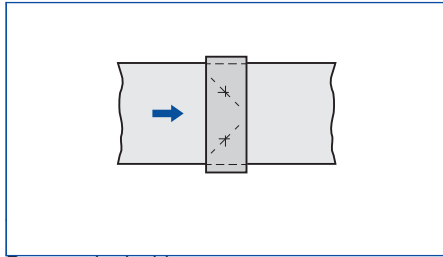


ISO Standards and guidelines

- ▶ Construction Products Regulation
- ▶ EN 12101-8 Smoke and heat control systems - Smoke control dampers
- ▶ EN 1366-10 Fire resistance tests for service installations - Smoke control dampers
- ▶ EN 1366-2 Fire resistance tests for service installations - Fire dampers
- ▶ EN 13501-4 Fire classification of construction products and building elements using data from fire resistance tests
- ▶ EN 1751 Ventilation for buildings - Air terminal devices

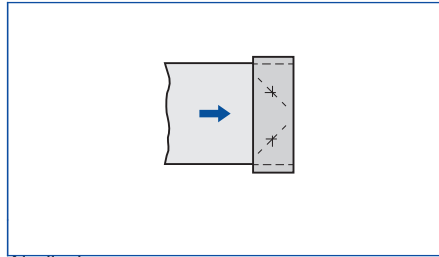


Einbauart A



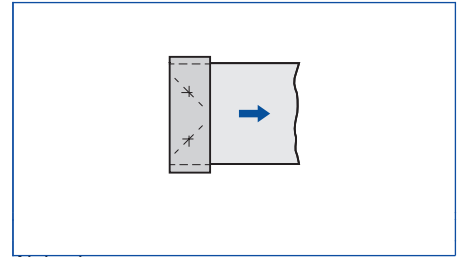
Ducts on both sides

Einbauart B



Air discharge

Einbauart C



Air intake

EK-JZ, volume flow rates and differential pressures

Nominal size B	Nominal size H	2.5 m/s			5 m/s			10 m/s		
		\dot{V}		Δp_t	\dot{V}		Δp_t	\dot{V}		Δp_t
		l/s	m ³ /h	Pa	l/s	m ³ /h	Pa	l/s	m ³ /h	Pa
200	430	215	774	4	430	1548	18	860	3096	71
250		269	968	4	538	1935	17	1075	3870	68
300		323	1161	4	645	2322	17	1290	4644	66
350		376	1355	4	753	2709	16	1505	5418	65
400		430	1548	4	860	3096	16	1720	6192	63
450		484	1742	4	968	3483	15	1935	6966	62
500		538	1935	4	1075	3870	15	2150	7740	61
550		591	2129	4	1183	4257	15	2365	8514	60
600		645	2322	4	1290	4644	15	2580	9288	59
650		699	2516	4	1398	5031	15	2795	10062	58
700		753	2709	4	1505	5418	14	3010	10836	58
750		806	2903	4	1613	5805	14	3225	11610	57
800		860	3096	4	1720	6192	14	3440	12384	56
850		914	3290	3	1828	6579	14	3655	13158	56
900		968	3483	3	1935	6966	14	3870	13932	55
950		1021	3677	3	2043	7353	14	4085	14706	55
1000		1075	3870	3	2150	7740	14	4300	15480	54
1050		1129	4064	3	2258	8127	13	4515	16254	54
1100		1183	4257	3	2365	8514	13	4730	17028	53
1150		1236	4451	3	2473	8901	13	4945	17802	53
1200	1290	4644	3	2580	9288	13	5160	18576	52	
200	630	315	1134	4	630	2268	17	1260	4536	66
250		394	1418	4	788	2835	16	1575	5670	64
300		473	1701	4	945	3402	15	1890	6804	62
350		551	1985	4	1103	3969	15	2205	7938	60
400		630	2268	4	1260	4536	15	2520	9072	59
450		709	2552	4	1418	5103	14	2835	10206	58
500		788	2835	4	1575	5670	14	3150	11340	57
550		866	3119	3	1733	6237	14	3465	12474	56
600		945	3402	3	1890	6804	14	3780	13608	55
650		1024	3686	3	2048	7371	14	4095	14742	54
700		1103	3969	3	2205	7938	13	4410	15876	54
750		1181	4253	3	2363	8505	13	4725	17010	53
800		1260	4536	3	2520	9072	13	5040	18144	52
850		1339	4820	3	2678	9639	13	5355	19278	52
900		1418	5103	3	2835	10206	13	5670	20412	51
950		1496	5387	3	2993	10773	13	5985	21546	51
1000		1575	5670	3	3150	11340	13	6300	22680	50
1050		1654	5954	3	3308	11907	12	6615	23814	50
1100		1733	6237	3	3465	12474	12	6930	24948	50
1150		1811	6521	3	3623	13041	12	7245	26082	49
1200	1890	6804	3	3780	13608	12	7560	27216	49	



Nominal size	Nominal size	2.5 m/s			5 m/s			10 m/s		
B	H	V̇		Δp _t	V̇		Δp _t	V̇		Δp _t
mm	mm	l/s	m ³ /h	Pa	l/s	m ³ /h	Pa	l/s	m ³ /h	Pa
200	830	415	1494	4	830	2988	16	1660	5976	63
250		519	1868	4	1038	3735	15	2075	7470	61
300		623	2241	4	1245	4482	15	2490	8964	59
350		726	2615	4	1453	5229	14	2905	10458	57
400		830	2988	4	1660	5976	14	3320	11952	56
450		934	3362	3	1868	6723	14	3735	13446	55
500		1038	3735	3	2075	7470	13	4150	14940	54
550		1141	4109	3	2283	8217	13	4565	16434	53
600		1245	4482	3	2490	8964	13	4980	17928	52
650		1349	4856	3	2698	9711	13	5395	19422	52
700		1453	5229	3	2905	10458	13	5810	20916	51
750		1556	5603	3	3113	11205	13	6225	22410	50
800		1660	5976	3	3320	11952	12	6640	23904	50
850		1764	6350	3	3528	12699	12	7055	25398	49
900		1868	6723	3	3735	13446	12	7470	26892	49
950		1971	7097	3	3943	14193	12	7885	28386	48
1000		2075	7470	3	4150	14940	12	8300	29880	48
1050		2179	7844	3	4358	15687	12	8715	31374	47
1100		2283	8217	3	4565	16434	12	9130	32868	47
1150		2386	8591	3	4773	17181	12	9545	34362	47
1200	2490	8964	3	4980	17928	12	9960	35856	46	
200	1030	515	1854	4	1030	3708	15	2060	7416	61
250		644	2318	4	1288	4635	15	2575	9270	58
300		773	2781	4	1545	5562	14	3090	11124	57
350		901	3245	3	1803	6489	14	3605	12978	55
400		1030	3708	3	2060	7416	13	4120	14832	54
450		1159	4172	3	2318	8343	13	4635	16686	53
500		1288	4635	3	2575	9270	13	5150	18540	52
550		1416	5099	3	2833	10197	13	5665	20394	51
600		1545	5562	3	3090	11124	13	6180	22248	50
650		1674	6026	3	3348	12051	12	6695	24102	50
700		1803	6489	3	3605	12978	12	7210	25956	49
750		1931	6953	3	3863	13905	12	7725	27810	48
800		2060	7416	3	4120	14832	12	8240	29664	48
850		2189	7880	3	4378	15759	12	8755	31518	47
900		2318	8343	3	4635	16686	12	9270	33372	47
950		2446	8807	3	4893	17613	12	9785	35226	46
1000		2575	9270	3	5150	18540	12	10300	37080	46
1050		2704	9734	3	5408	19467	11	10815	38934	46
1100		2833	10197	3	5665	20394	11	11330	40788	45
1150		2961	10661	3	5923	21321	11	11845	42642	45
1200	3090	11124	3	6180	22248	11	12360	44496	45	
200	1230	615	2214	4	1230	4428	15	2460	8856	59
250		769	2768	4	1538	5535	14	3075	11070	57
300		923	3321	3	1845	6642	14	3690	13284	55
350		1076	3875	3	2153	7749	13	4305	15498	53
400		1230	4428	3	2460	8856	13	4920	17712	52
450		1384	4982	3	2768	9963	13	5535	19926	51
500		1538	5535	3	3075	11070	13	6150	22140	50
550		1691	6089	3	3383	12177	12	6765	24354	49
600		1845	6642	3	3690	13284	12	7380	26568	49
650		1999	7196	3	3998	14391	12	7995	28782	48
700	2153	7749	3	4305	15498	12	8610	30996	47	



Smoke extract, no cover grille (installation type C)



Nominal size	Nominal size	2.5 m/s			5 m/s			10 m/s			
B	H	V̇		Δp _t	V̇		Δp _t	V̇		Δp _t	
mm	mm	l/s	m ³ /h	Pa	l/s	m ³ /h	Pa	l/s	m ³ /h	Pa	
750	1230	2306	8303	3	4613	16605	12	9225	33210	47	
800		2460	8856	3	4920	17712	12	9840	35424	46	
850		2614	9410	3	5228	18819	11	10455	37638	46	
900		2768	9963	3	5535	19926	11	11070	39852	45	
950		2921	10517	3	5843	21033	11	11685	42066	45	
1000		3075	11070	3	6150	22140	11	12300	44280	45	
1050		3229	11624	3	6458	23247	11	12915	46494	44	
1100		3383	12177	3	6765	24354	11	13530	48708	44	
1150		3536	12731	3	7073	25461	11	14145	50922	43	
1200		3690	13284	3	7380	26568	11	14760	53136	43	
200		1430	715	2574	4	1430	5148	14	2860	10296	57
250			894	3218	3	1788	6435	14	3575	12870	55
300	1073		3861	3	2145	7722	13	4290	15444	53	
350	1251		4505	3	2503	9009	13	5005	18018	52	
400	1430		5148	3	2860	10296	13	5720	20592	51	
450	1609		5792	3	3218	11583	12	6435	23166	50	
500	1788		6435	3	3575	12870	12	7150	25740	49	
550	1966		7079	3	3933	14157	12	7865	28314	48	
600	2145		7722	3	4290	15444	12	8580	30888	47	
650	2324		8366	3	4648	16731	12	9295	33462	47	
700	2503		9009	3	5005	18018	12	10010	36036	46	
750	2681		9653	3	5363	19305	11	10725	38610	46	
800	2860		10296	3	5720	20592	11	11440	41184	45	
850	3039		10940	3	6078	21879	11	12155	43758	45	
900	3218		11583	3	6435	23166	11	12870	46332	44	
950	3396		12227	3	6793	24453	11	13585	48906	44	
1000	3575		12870	3	7150	25740	11	14300	51480	43	
1050	3754		13514	3	7508	27027	11	15015	54054	43	
1100	3933		14157	3	7865	28314	11	15730	56628	43	
1150	4111		14801	3	8223	29601	11	16445	59202	42	
1200	4290		15444	3	8580	30888	10	17160	61776	42	
200	1630		815	2934	3	1630	5868	14	3260	11736	56
250			1019	3668	3	2038	7335	13	4075	14670	54
300			1223	4401	3	2445	8802	13	4890	17604	52
350		1426	5135	3	2853	10269	13	5705	20538	51	
400		1630	5868	3	3260	11736	12	6520	23472	50	
450		1834	6602	3	3668	13203	12	7335	26406	49	
500		2038	7335	3	4075	14670	12	8150	29340	48	
550		2241	8069	3	4483	16137	12	8965	32274	47	
600		2445	8802	3	4890	17604	12	9780	35208	46	
650		2649	9536	3	5298	19071	11	10595	38142	46	
700		2853	10269	3	5705	20538	11	11410	41076	45	
750		3056	11003	3	6113	22005	11	12225	44010	45	
800		3260	11736	3	6520	23472	11	13040	46944	44	
850		3464	12470	3	6928	24939	11	13855	49878	44	
900		3668	13203	3	7335	26406	11	14670	52812	43	
950		3871	13937	3	7743	27873	11	15485	55746	43	
1000		4075	14670	3	8150	29340	11	16300	58680	42	
1050		4279	15404	3	8558	30807	10	17115	61614	42	
1100		4483	16137	3	8965	32274	10	17930	64548	42	
1150		4686	16871	3	9373	33741	10	18745	67482	41	
1200		4890	17604	3	9780	35208	10	19560	70416	41	

Smoke extract, no cover grille (installation type C)



Nominal size	Nominal size	2.5 m/s			5 m/s			10 m/s		
B	H	V̇		Δp _t	V̇		Δp _t	V̇		Δp _t
mm	mm	l/s	m ³ /h	Pa	l/s	m ³ /h	Pa	l/s	m ³ /h	Pa
200	1830	915	3294	3	1830	6588	14	3660	13176	55
250		1144	4118	3	2288	8235	13	4575	16470	53
300		1373	4941	3	2745	9882	13	5490	19764	51
350		1601	5765	3	3203	11529	12	6405	23058	50
400		1830	6588	3	3660	13176	12	7320	26352	49
450		2059	7412	3	4118	14823	12	8235	29646	48
500		2288	8235	3	4575	16470	12	9150	32940	47
550		2516	9059	3	5033	18117	12	10065	36234	46
600		2745	9882	3	5490	19764	11	10980	39528	45
650		2974	10706	3	5948	21411	11	11895	42822	45
700		3203	11529	3	6405	23058	11	12810	46116	44
750		3431	12353	3	6863	24705	11	13725	49410	44
800		3660	13176	3	7320	26352	11	14640	52704	43
850		3889	14000	3	7778	27999	11	15555	55998	43
900		4118	14823	3	8235	29646	11	16470	59292	42
950		4346	15647	3	8693	31293	10	17385	62586	42
1000		4575	16470	3	9150	32940	10	18300	65880	41
1050		4804	17294	3	9608	34587	10	19215	69174	41
1100		5033	18117	3	10065	36234	10	20130	72468	41
1150		5261	18941	3	10523	37881	10	21045	75762	40
1200	5490	19764	3	10980	39528	10	21960	79056	40	
200	2030	1015	3654	3	2030	7308	13	4060	14616	54
250		1269	4568	3	2538	9135	13	5075	18270	52
300		1523	5481	3	3045	10962	13	6090	21924	50
350		1776	6395	3	3553	12789	12	7105	25578	49
400		2030	7308	3	4060	14616	12	8120	29232	48
450		2284	8222	3	4568	16443	12	9135	32886	47
500		2538	9135	3	5075	18270	11	10150	36540	46
550		2791	10049	3	5583	20097	11	11165	40194	45
600		3045	10962	3	6090	21924	11	12180	43848	44
650		3299	11876	3	6598	23751	11	13195	47502	44
700		3553	12789	3	7105	25578	11	14210	51156	43
750		3806	13703	3	7613	27405	11	15225	54810	43
800		4060	14616	3	8120	29232	11	16240	58464	42
850		4314	15530	3	8628	31059	10	17255	62118	42
900		4568	16443	3	9135	32886	10	18270	65772	41
950		4821	17357	3	9643	34713	10	19285	69426	41
1000		5075	18270	3	10150	36540	10	20300	73080	41
1050		5329	19184	3	10658	38367	10	21315	76734	40
1100		5583	20097	2	11165	40194	10	22330	80388	40
1150		5836	21011	2	11673	42021	10	23345	84042	40
1200	6090	21924	2	12180	43848	10	24360	87696	39	



Smoke extract, no cover grille (installation type C)



Installation type A, for intake, correction factors

EK-JZ	EK-JZ	Cover grille							
		Without	A	B	C	D	E	G	H
A _{free}	A _{geo}	-							
m ²	m ²	-							
0.06	0.10	0.56	1.55	2.40	2.94	3.59	3.70	1.69	1.94
0.17	0.25	0.57	1.75	2.76	3.39	4.17	4.30	1.91	2.21
0.37	0.50	0.58	1.93	3.08	3.80	4.69	4.84	2.11	2.45
0.57	0.75	0.58	2.04	3.28	4.06	5.02	5.18	2.23	2.60
0.78	1.00	0.59	2.12	3.44	4.26	5.27	5.44	2.33	2.72
1.16	1.50	0.59	2.24	3.65	4.53	5.62	5.80	2.46	2.88
1.57	2.00	0.60	2.34	3.82	4.75	5.90	6.09	2.57	3.01
1.91	2.44	0.60	2.40	3.94	4.90	6.09	6.29	2.65	3.10

Installation type A, for discharge, correction factors

EK-JZ	EK-JZ	Cover grille							
		Without	A	B	C	D	E	G	H
A _{free}	A _{geo}	-							
m ²	m ²	-							
0.06	0.10	0.56	1.22	1.90	3.13	3.71	3.86	1.44	1.76
0.17	0.25	0.57	1.35	2.16	3.62	4.31	4.49	1.62	2.00
0.37	0.50	0.58	1.47	2.39	4.06	4.85	5.06	1.78	2.21
0.57	0.75	0.58	1.54	2.54	4.34	5.19	5.41	1.88	2.34
0.78	1.00	0.59	1.60	2.66	4.56	5.46	5.69	1.95	2.45
1.16	1.50	0.59	1.68	2.81	4.85	5.81	6.07	2.06	2.59
1.57	2.00	0.60	1.75	2.94	5.09	6.11	6.37	2.14	2.70
1.91	2.44	0.60	1.79	3.03	5.25	6.31	6.58	2.20	2.78

Installation type B, for discharge, correction factors

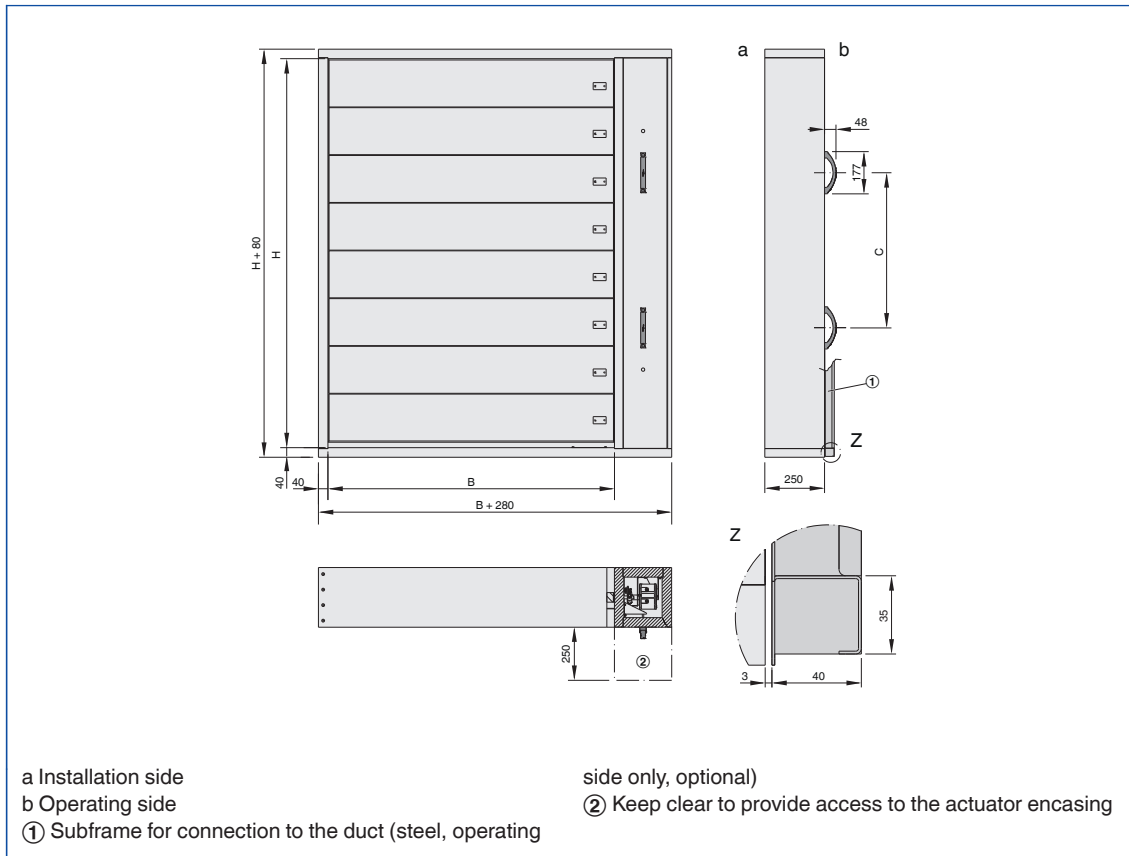
EK-JZ	EK-JZ	Cover grille							
		Without	A	B	C	D	E	G	H
A _{free}	A _{geo}	-							
m ²	m ²	-							
0.06	0.10	2.14	2.33	2.58	3.30	3.83	4.02	2.21	2.41
0.17	0.25	2.25	2.46	2.85	3.79	4.41	4.64	2.35	2.58
0.37	0.50	2.35	2.57	3.08	4.22	4.92	5.19	2.46	2.71
0.57	0.75	2.40	2.64	3.21	4.49	5.23	5.52	2.53	2.79
0.78	1.00	2.44	2.68	3.32	4.69	5.47	5.78	2.58	2.85
1.16	1.50	2.49	2.74	3.45	4.96	5.79	6.12	2.64	2.92
1.57	2.00	2.53	2.79	3.56	5.18	6.05	6.40	2.69	2.98
1.91	2.44	2.56	2.82	3.63	5.33	6.22	6.59	2.72	3.02

Installation type C, for intake, correction factors

EK-JZ	EK-JZ	Cover grille							
		Without	A	B	C	D	E	G	H
A _{free}	A _{geo}	-							
m ²	m ²	-							
0.06	0.10	1	1.18	1.80	2.68	3.18	3.55	1.62	1.89
0.17	0.25	1	1.19	1.93	3.02	3.61	4.07	1.72	2.09
0.37	0.50	1	1.20	2.02	3.31	3.99	4.52	1.80	2.27
0.57	0.75	1	1.20	2.08	3.48	4.22	4.79	1.85	2.37
0.78	1.00	1	1.20	2.12	3.62	4.39	5.00	1.89	2.45
1.16	1.50	1	1.20	2.18	3.79	4.62	5.28	1.93	2.56
1.57	2.00	1	1.21	2.22	3.93	4.81	5.50	1.97	2.64
1.91	2.44	1	1.21	2.25	4.03	4.93	5.65	1.99	2.70



EK-JZ



EK-JZ, weight [kg], width 200 - 650 mm

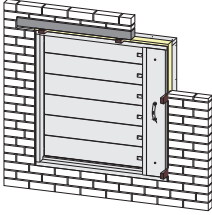
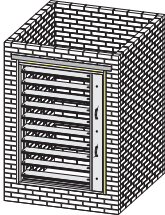
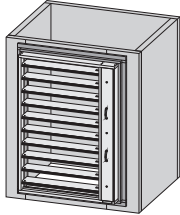
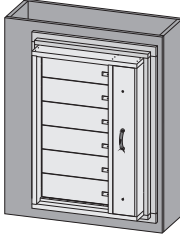
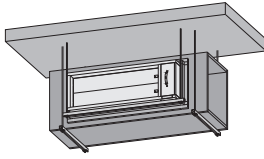
L [mm]	H [mm]	B [mm]									
		200	250	300	350	400	450	500	550	600	650
250	430	29	31	32	33	35	36	38	39	41	42
	630	37	39	41	43	44	46	48	50	51	53
	830	46	48	50	53	54	56	58	61	62	64
	1030	54	56	59	61	63	66	68	70	73	75
	1230	62	65	67	70	73	75	78	81	83	86
	1430	71	73	76	79	82	85	88	91	94	97
	1630	79	82	85	88	92	95	98	101	105	108
	1830	87	91	94	98	101	105	108	112	115	119
	2030	95	99	103	107	111	114	118	122	126	130

EK-JZ, weight [kg], width 700 - 1200 mm

L [mm]	H [mm]	B [mm]										
		700	750	800	850	900	950	1000	1050	1100	1150	1200
250	430	44	45	47	48	49	51	52	54	55	57	58
	630	55	57	58	60	62	64	65	67	69	71	72
	830	66	69	70	72	75	77	78	80	83	85	87
	1030	77	80	82	84	87	89	91	94	96	98	101
	1230	89	91	94	97	99	102	104	107	110	112	115
	1430	100	103	106	109	112	115	117	120	123	126	129
	1630	111	114	118	121	124	127	130	134	137	140	143
	1830	122	126	129	133	136	140	143	147	150	154	158
	2030	134	137	141	145	149	153	156	160	164	168	172



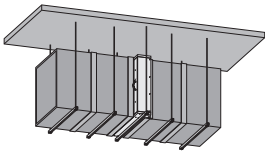
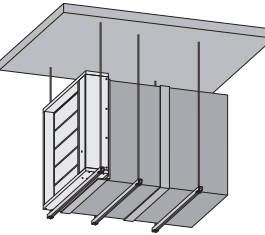
Essential characteristics: fire resistance for nominal sizes [mm]: 200 × 430 to 1200 × 2030

Supporting construction	Construction	Installation location	Installation type	Performance level
 <p>Solid wall</p>	<ul style="list-style-type: none"> Concrete, aerated concrete, bricks $d \geq 100$ mm $\rho \geq 500$ kg/m³ Adjoined installation of two dampers is possible EN 1366-8 (smoke extract ducts for multi compartments can be attached) EN 1366-9 (smoke extract ducts for single compartments can be attached) 	In a solid wall (wall is not part of the smoke extract duct)	T; N is possible on one side	<p>EI 90 (V_{ew}, i↔o) S 1000 C₁₀₀₀₀ MA multi</p> <p>EI 120 (V_{ed}, i↔o) S 1000 C₁₀₀₀₀ MA multi</p>
 <p>Solid wall as part of a smoke extract shaft (e.g. brick wall)</p>	<ul style="list-style-type: none"> Concrete, aerated concrete, bricks $d \geq 100$ mm $\rho \geq 500$ kg/m³ Adjoined installation of two dampers is possible EN 1366-8 (smoke extract ducts for multi compartments can be attached) EN 1366-9 (smoke extract ducts for single compartments can be attached) 	In a shaft wall (the shaft is part of a smoke extract duct)	T; N is possible on one side	<p>EI 120 (V_{ed}, i↔o) S 1000 C₁₀₀₀₀ MA multi</p>
 <p>Solid wall as part of a smoke extract shaft (e.g. concrete)</p>	<ul style="list-style-type: none"> Concrete, aerated concrete, bricks $d \geq 100$ mm $\rho \geq 500$ kg/m³ Adjoined installation of two dampers is possible EN 1366-8 (smoke extract ducts for multi compartments can be attached) EN 1366-9 (smoke extract ducts for single compartments can be attached) 	On a shaft wall (the shaft is part of a smoke extract duct)	(T)	<p>EI 120 (V_{ed}, i↔o) S 1000 C₁₀₀₀₀ MA multi</p>
 <p>Fire-resistant vertical smoke extract duct NOTE! ①</p>	<ul style="list-style-type: none"> Firestop board (calcium silicate) $d \geq 35$ mm $\rho \geq 500$ kg/m³ Perimeter strips (i.e. on four sides) Adjoined installation of two dampers is possible EN 1366-8 (smoke extract ducts for multi compartments can be used) EN 1366-9 (smoke extract ducts for single compartments can be used) 	On a vertical duct	(LE)	<p>EI 120 (V_{ed}, i↔o) S 1000 C₁₀₀₀₀ MA multi</p>
 <p>Fire-resistant horizontal smoke extract duct NOTE! ①</p>	<ul style="list-style-type: none"> Firestop board (calcium silicate) $d \geq 35$ mm $\rho \geq 500$ kg/m³ Perimeter strips (i.e. on four sides) Adjoined installation of two dampers is possible EN 1366-8 (smoke extract ducts for multi compartments can be used) EN 1366-9 (smoke extract ducts for single compartments can be used) 	On a horizontal duct	(LE)	<p>EI 120 (V_{ed}, i↔o) S 1000 C₁₀₀₀₀ MA multi</p>

Explanation: T = dry mortarless installation • N = mortar-based installation • LE = as specified for the duct



Essential characteristics: fire resistance for nominal sizes [mm]: 200 × 430 to 1200 × 2030

Supporting construction	Construction	Installation location	Installation type	Performance level
 <p>Fire-resistant horizontal smoke extract duct NOTE! ①</p>	<ul style="list-style-type: none"> • Firestop board (calcium silicate) • $d \geq 35 \text{ mm}$ • $\rho \geq 500 \text{ kg/m}^3$ • Adjoined installation of two dampers is possible • EN 1366-8 (smoke extract ducts for multi compartments can be used) • EN 1366-9 (smoke extract ducts for single compartments can be used) 	In a horizontal duct	(LE)	EI 120 ($V_{ed}, i \rightarrow 0$) S 1000 C_{10000} MA multi
 <p>Fire-resistant horizontal smoke extract duct NOTE! ①</p>	<ul style="list-style-type: none"> • Firestop board (calcium silicate) • $d \geq 35 \text{ mm}$ • $\rho \geq 500 \text{ kg/m}^3$ • Adjoined installation of two dampers is possible • EN 1366-8 (smoke extract ducts for multi compartments can be used) • EN 1366-9 (smoke extract ducts for single compartments can be used) 	At the end of a horizontal duct	(LE)	EI 120 ($V_{ed}, i \rightarrow 0$) S 1000 C_{10000} MA multi

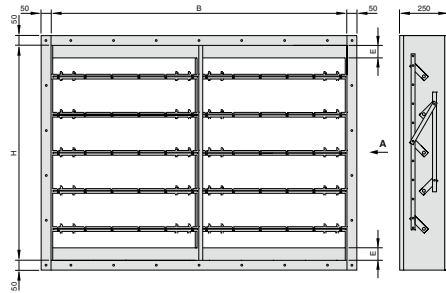


Explanation: T = dry mortarless installation • N = mortar-based installation • LE = as specified for the duct



TUNNEL DAMPERS

	Tunnel dampers	
	JF-S	JF-P
Casing and blades		
Galvanised sheet steel	●	●
Galvanised sheet steel, powder-coated, RAL colour	●	●
Stainless steel 1.4571	●	●
Rotation		
Parallel		●
Opposed	●	
Dynamics		
External linkage	●	●
Nominal sizes		
Width	400 - 2200 mm	400 - 2200 mm
Increments	1 mm	1 mm
Width subdivided	●	●
Height	440 - 2175 mm	440 - 2175 mm
Increments	1 mm	1 mm
Height subdivided	●	●
Casing		
Depth	250 mm	250 mm
Areas of application		
Temperature resistance	400 °C for 120 mins	400 °C for 120 mins
Closed blade air leakage	0.1 m ³ /s per m ² at 3000 Pa	0.1 m ³ /s per m ² at 3000 Pa
Equipment and accessories		
Installation subframe for installation into intermediate concrete ceilings	●	●
Support structure for wall installation of subdivided construction	●	●
Explanation		
● - Standard		



For the ventilation of and smoke extract from underground transport systems

Order code

JF – S – A4 / 1000x1000 / Z01 / NO

1 2 3 6 7 8

1 Type

JF Tunnel / industrial damper

2 Function

S Opposed
P Parallel

3 Material

No entry: galvanised steel
A4 Stainless steel 1.4571

4 Operating side

No entry: on the right
L Left side

5 Linkage-to-actuator connection

No entry: on the right
L Left side

6 Nominal size [mm]

B x H

7 Attachments

No entry: none
Z01 Belimo BE230-12 with Promat enclosure
Z02 Schischek InMax50-SF with Promat enclosure

8 Damper blade safety function

NO Power off to OPEN
NC Power off to CLOSE

9 Surface

No entry: standard construction
P1 Powder-coated, RAL CLASSIC colour (not with A4)
KM Anti-corrosive varnish (only with A4)

Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

+ Features

- Tunnel dampers are safety components specially designed for underground transport systems and meet the requirements of the German Guideline for the Equipping and Operation of Roadway Tunnels (Richtlinie für die Ausstattung und den Betrieb von Straßentunneln, RABT) and of the Austrian Guidelines and Provisions for Road Traffic (Richtlinien und Vorschriften für das Straßenwesen, RVS)
- ▶ Certified construction and production according to ISO 9001
 - ▶ Temperature resistance of 120 minutes at 400 °C
 - ▶ Excellent low leakage performance even at high pressure
 - ▶ Galvanised steel, powder-coated, or stainless steel construction
 - ▶ Side seals made of sprung stainless steel compensate for the longitudinal expansion of the blades at high temperatures
 - ▶ Parallel or opposed action blades
 - ▶ Low pressure drop due to aerofoil blades
 - ▶ With electric actuators encased in thermally insulated protective enclosures

Optional equipment and accessories

- ▶ Installation subframe for installation into intermediate concrete ceilings
- ▶ Support structure for installation of multiple dampers into walls

+ Application

- ▶ TROX tunnel dampers of Type JF are specially designed safety components that meet the RABT and RVS requirements
- ▶ For opening and closing smoke extract ducts
- ▶ Used in ventilation and smoke extract systems in underground transport systems
- ▶ Can also be used as shut-off dampers for fans
- ▶ Installation usually either above the roadway in an intermediate concrete ceiling or in the ventilation plant room
- ▶ Bespoke solutions upon request

EN Classification

- ▶ Machinery Directive 2006/42/EG, Declaration of incorporation
- ▶ Test report no. 210004049 - MPA NRW (Germany)
- ▶ Stability report no. 7317/06 - Afiti Licof (Spain)
- ▶ Test report no. 2007-757.01 - MA 39 VFA (Austria)
- ▶ Test report no. 210005454 - MPA NRW (Germany)

◊ Variants

- ▶ JF-S: Tunnel damper with opposed action blades
- ▶ JF-P: Tunnel damper with parallel action blades

+ Construction

- ▶ Galvanised sheet steel, flange holes on both sides, brass bearings, seals made of stainless steel
- ▶ A4: Stainless steel sheet, flange holes on both sides, stainless steel bearings, seals made of stainless steel

⬡ Optional equipment

- ▶ Installation subframe
- ▶ Baffle plates
- ▶ Walk-on grilles as bridges
- ▶ Support structure

& Accessories

- ▶ Actuator
- ▶ Thermally insulated enclosure
- ▶ Quadrant stay with position indicator

★ Special characteristics

- ▶ Excellent low leakage performance of 0.1 m³/s per m² at a differential pressure of 3000 Pa
- ▶ For high operating pressure of up to 5000 Pa
- ▶ Low pressure drop
- ▶ Maximum corrosion and temperature resistance
- ▶ Excellent fire resistance of 120 minutes at 400 °C
- ▶ Remote control with actuator



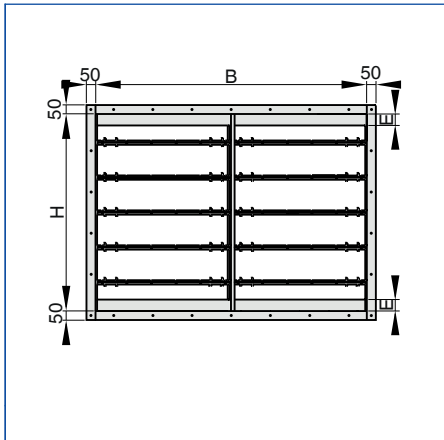


Technical data

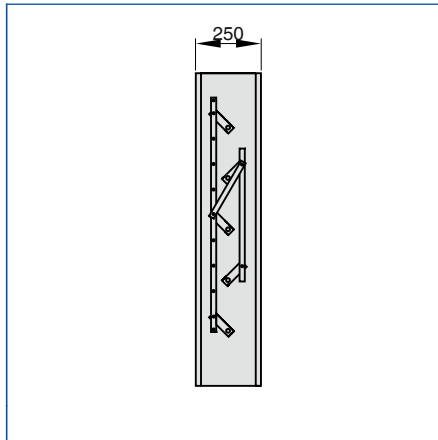
Nominal sizes	400 × 440 - 2200 × 2175 mm
Volume flow rate range	350 - 95,700 l/s or 1260 - 344,520 m ³ /h
Differential pressure range	Up to 5000 Pa
Operating temperature	0 - 400 °C/120 mins
Leakage rate	0.1 m ³ /s per m ² at 3000 Pa



JF-S with opposed blades



JF-S with opposed blades

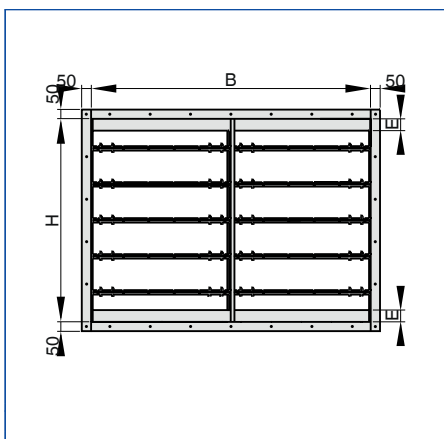


Dimensions [mm] and weight [kg]

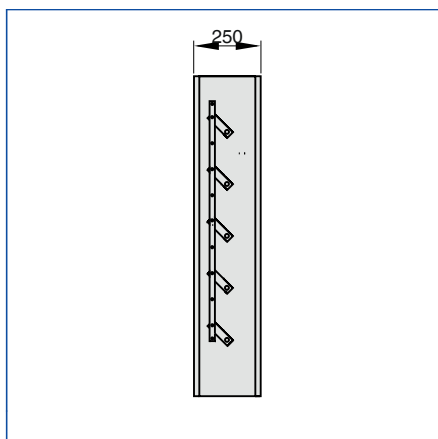
H/B	400	600	800	1000	1200	1400	1600	1800	2000	2200	①	②
440	26	31	36	40	46	51	57	62	68	73	2	26.5
635	32	38	44	50	59	66	72	79	86	92	3	26.5
830	38	46	53	61	73	81	89	97	104	112	4	26.5
1025	45	53	62	71	86	95	105	114	123	132	5	26.5
1220	51	61	71	81	100	110	121	131	142	152	6	26.5
1415	57	69	80	91	114	125	137	149	160	172	7	26.5
1610	64	76	88	101	127	140	153	166	179	192	8	26.5
1805	70	84	97	111	141	155	169	183	197	212	9	26.5
2000	77	91	106	121	154	169	185	201	216	219	10	26.5
2175	79	94	108	123	157	172	188	204	219	234		

① No. of blades ② E

JF-P with parallel action blades



JF-P with parallel action blades



Dimensions [mm] and weight [kg]

H	①	②
430 - 624	2	21.5 - 118.5
625 - 819	3	21.5 - 118.5
820 - 1014	4	21.5 - 118.5
1015 - 1209	5	21.5 - 118.5
1210 - 1404	6	21.5 - 118.5
1405 - 1599	7	21.5 - 118.5
1600 - 1794	8	21.5 - 118.5
1795 - 1989	9	21.5 - 118.5
1990 - 2175	10	21.5 - 118.5



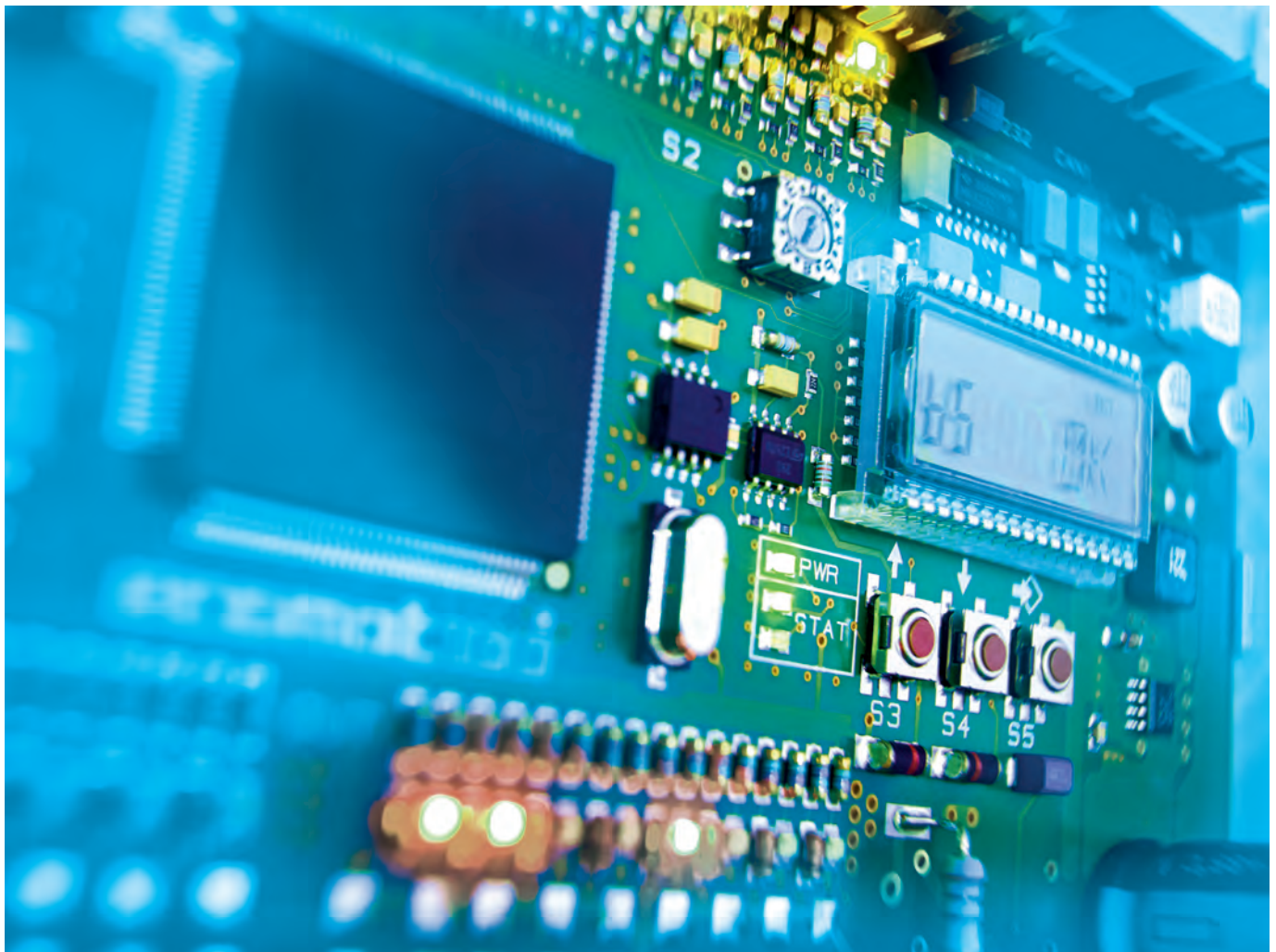
① No. of blades ② E





TROXNETCOM

The intelligent communication system



The exchange of information and the communication between systems and within buildings are becoming more and more important. People require more and more detailed information, and then constantly. Safe and secure communication at a very early stage is particularly important when it comes to safety-related components and systems. If a building has to be evacuated in the event of a fire, every second counts. Our duct smoke detectors are a significant factor in the early and secure detection of smoke. If a duct smoke detector detects smoke, this information has to be processed quickly, securely and reliably. And this is where TROXNETCOM comes in, a control system that makes use of AS-Interface.

It ensures that all fire dampers are closed, that smoke control dampers move to the required position, and that smoke exhaust fans are switched on. AS-Interface, or AS-i, is a safe and secure bus system that meets the requirements of EN 50295. It uses a two-core flat cable or a fire-rated E(xx) cable in a free topology. This reduces the wiring effort and minimises wiring errors. The entire system is very flexible. It is easy to commission as it supports users with tools that simplify commissioning.

TROXNETCOM Advantages



Economic efficiency: Just one two-core cable for both communication and energy. The system can be adapted to the layout of the building. Modular structure.

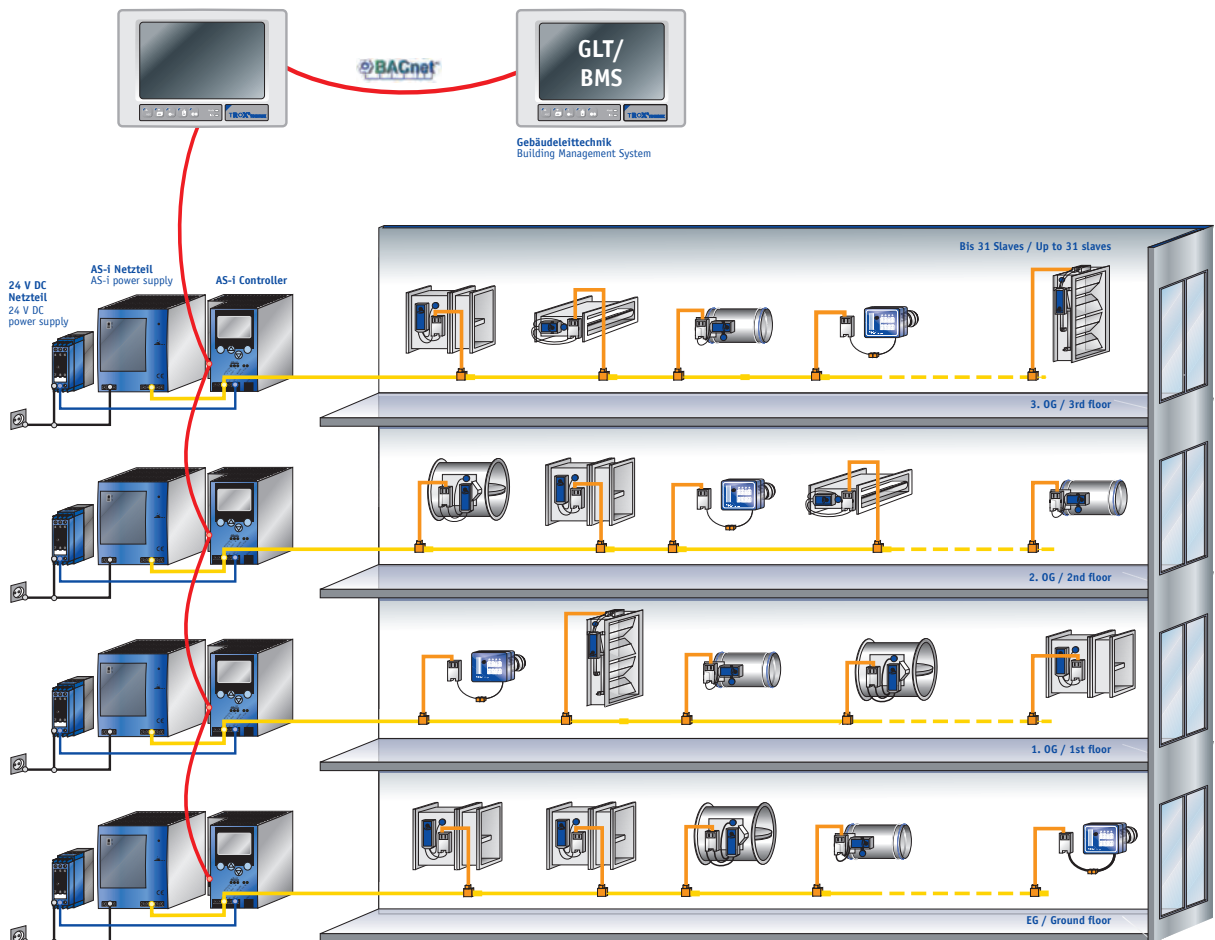
Wiring: Flat cable insulation displacement connectors reduce the required wiring effort. A dependable electrical connection is made as two metal pins penetrate the insulation of the flat cable; the profile of the flat cable ensures reverse polarity protection. It is not necessary to cut the cable open or to strip the insulation from the wires. Installation is basically error-free!

Backward compatibility: If the system has to be expanded at a later stage, it is easy to in-

tegrate the new components with the existing system. Modular system that can be expanded.

Flexibility: Easy implementation of comprehensive safety strategies with easy adjustment to building services, including integration with central building management systems based on LON, BACnet or Modbus. Any network topology can be used.

Safety: Safety related components allow for using the system for up to SIL 3 to IEC/EN 61508.



TROXNETCOM

The system solution. Monitoring. Safety. Efficiency.



Everything from a single source:
Whether airports, hospitals, office buildings, hotels, schools or labs - TROX has a suitable system solution for each type of application.

1 X-CUBE air handling units



2 Control units and systems



3 X-FANS Jet Ventilations Systeme



4 X-FANS impulse jet fan



5 X-FANS axial ventilation and smoke exhaust fans



X-FANS EC roof fans **6**



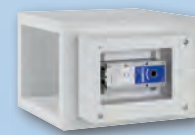
Fire dampers **10**



Duct smoke detectors **9**

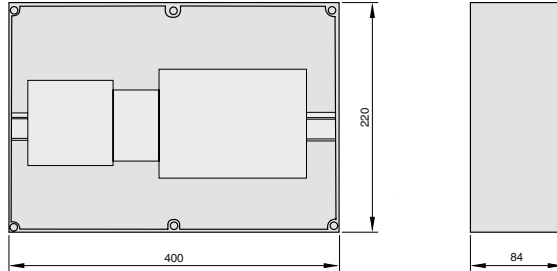


Smoke control dampers **8**



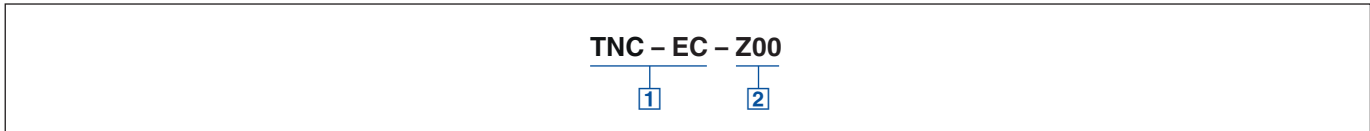
X-FANS smoke exhaust fans for roof installation **7**





System for controlling and monitoring motorised fire dampers

Order code



<p>1 Type TNC-EC Decentralised operating and monitoring system</p> <p>2 Variant Z00 Decentralised operating and monitoring system, in a casing</p>	<p>Z01 Decentralised operating and monitoring system, in a casing, with signal lamp</p> <p>Z02 Decentralised operating and monitoring system, in a casing, with display module</p>	<p>Z03 Decentralised operating and monitoring system, in a casing, with signal lamp and display module</p> <p>GP Decentralised operating and monitoring system, main PCB only</p> <p>AZM Display module</p>
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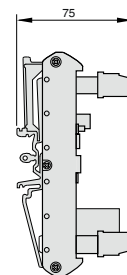
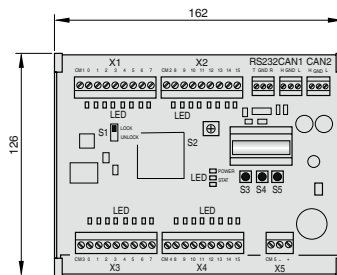
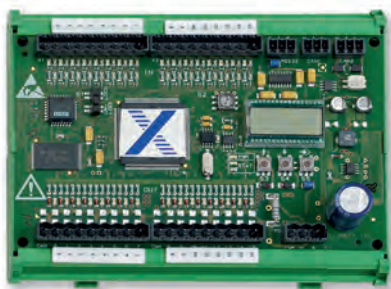
Application

- Stand-alone solution for controlling and monitoring up to 12 motorised fire dampers or up to 24 damper blade end positions
- ▶ Easy electrical installation using coded plug connections
 - ▶ Pre-installed application software
 - ▶ No additional programming required
 - ▶ Improves the fire safety

Accessories

- Z01**
- ▶ LED/buzzer combination for alarm signalling
 - ▶ Mounted into the cover plate and completely wired (ready to use)
- Z02**
- ▶ 2.8 inch colour LCD, mounted into the cover plate and completely wired (ready to use)
 - ▶ For displaying damper blade positions
 - ▶ For controlling individual fire dampers
 - ▶ For starting a functional test

- Z03**
- ▶ 2.8 inch colour LCD and LED/buzzer combination
- TNC-EC-GP**
- ▶ Main PCB, without casing and without power supply unit
- Installation on mounting rail





Switching power supply unit

Input voltage (N, L)	90 - 264 V AC
Output voltage	24 - 28 V DC (adjustable)
Output current	4.2 A
Internal fuse, input	T3.15A/250 V AC
External fuse, output	T4 A/24 V DC (fuse holder in switch box)
Ambient temperature	-25 to 71 °C
Protection level	IP 20
Dimensions B x H x T	91 × 90 × 57 mm
Connection	Screw terminals up to 2.5 mm ²
Installation	On mounting rail



Switching power supply unit

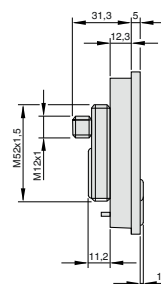
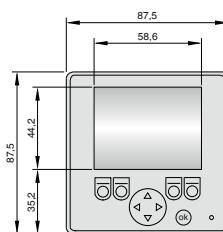
Input voltage (N, L)	90 - 264 V AC
Output voltage	24 - 28 V DC (adjustable)
Output current	4.2 A
Internal fuse, input	T3.15A/250 V AC
External fuse, output	T4 A/24 V DC (fuse holder in switch box)
Ambient temperature	-25 to 71 °C
Protection level	IP 20
Dimensions B x H x T	91 × 90 × 57 mm
Connection	Screw terminals up to 2.5 mm ²
Installation	On mounting rail



Casing

Dimensions (B × H × T)	400 × 220 × 84 mm
Casing material	Galvanised sheet steel, powder-coated RAL 9010
Inspection window	Plexiglass XT, colourless
Components	Installed on mounting rail
Protection level	IP 40





Display module

Display	2.8" TFT colour LCD
Resolution	320 × 240 pixels
Colours	256
Backlighting	LED
Dimensions (B x H x T)	87.5 × 87.5 × 37.7 mm
Casing material	Plastic, black
Buttons	5 function buttons
Rocker switch	Cursor functions (UP, DOWN, LEFT, RIGHT)
Protection level	IP 67 when installed in the front panel of the casing, otherwise IP 65
Operating temperature	-20 to 30 °C
Supply voltage	8 to 32 V DC
Current consumption	70 mA at 24 V DC
CAN interface	CANopen protocol



Signal lamp

Casing	PC-ABS-Blend
Dome cap	PC, transparent
Illumination pattern	LED continuous
Type of tone	Continuous tone
Dimensions (Ø × H)	49.5 × 75 mm
Noise level	80 dB
Tone frequency	3 kHz
Switch-on current	0.5 A
Current consumption	80 mA
Supply voltage	24 V DC
Protection level	IP65
Service life	50,000 h
Connection	Plug with screw terminal, max. 0.5 mm ²





Order code

TP043EC

1

1 Communication master and display

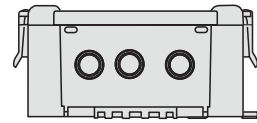
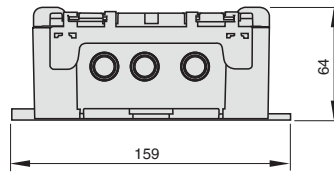
TP043EC 4.3" display



Communication master and display

Type	TP043EC
Resolution	480 × 272 pixels
Display area B × H	58.8 × 95 mm
Diagonal	4.3"
Front B × H × T	140 × 100 × 5 mm
Cut-out B × H	132 × 92 mm
Installation depth without plug (approx.)	42 mm
Interfaces	Ethernet, USB
Communication master	Communication master for 2 TNC-EASYCONTROL
Power consumption at 24 V	400 mA max.
Power required	max. 9.6 W





Connection box (linkbox) for decentralised operating and monitoring systems, for easy connection of actuator cables

Order code

TNC – Linkbox

1

Type

TNC-Linkbox

Application

- ▶ Control system encased in sheet steel casing with cutout window, including power supply unit and timer, completely wired and ready for plug-in
- ▶ Stand-alone solution for controlling and monitoring of up to 6 motorised fire dampers with 24 V DC (up to 12 fire dampers with parallel operation);

- alternatively for capturing the end positions of up to 12 mechanical dampers with one limit switch (up to 24 limit switches with parallel operation)
- ▶ With pre-installed user software, ready to use
- ▶ Topology: star-shaped with 4-wire line
- ▶ Manual control (OPEN/CLOSE) of individual fire dampers
- ▶ Monitoring of the fire damper opening and closure times

- ▶ Automated and time-controlled functional test using timer, or external control by central BMS and manual triggering
- ▶ Output of alarm messages: fire, smoke, fire damper closed, fault during functional test, running/limit switch faults, smoke detector contamination
- ▶ Menu-driven operation using integral LCD and softkeys on the main PCB, signalling with LEDs

Technical data

Supply voltage	24 V DC
Current consumption	≤ 850 mA
IEC protection class	IP 42
Double-stack terminal block	4-pole; 0.12 - 1.5 mm ²
AMP-Mate-N-LOK socket	Control cable, 3-pole; end positions, 6-pole



Controller for extract air and smoke extract



Application

Smoke extraction control AES-ST3.2 for one smoke extraction zone or several zones in conjunction with a frequency inverter, and the possibility of extract ventilation based on operational requirements. The control is particularly suitable for smaller buildings.

Smoke exhaust fans can be connected directly via a power supply unit. The functions of the control correspond to VDMA 24177, as well as the BHE guidelines for machine smoke extract systems. All motor protection elements are functional in the extract ventilation function, all motor protection elements are bypassed in the smoke extract function so as to achieve the

longest possible functional duration until destruction of the fan. The connected peripheral elements are monitored for discontinuity and short-circuit. Customer-specific switch boxes for special smoke extract solutions are available upon request.



AES extract air and smoke extract controller

Motor rating (max) [kW]	
4	x
5,5	x
7,5	x
11	x
15	x
18,5	x
22	x
30	x
45	x
55	x



AES extract air and smoke extract controller

Starting	
Frequency inverter	0-10 V for ventilation
Frequency inverter	0-10 V for smoke exhaust
Direct start, star delta, separate windings, Dahlander	depending on fan and rating



AES extract air and smoke extract controller

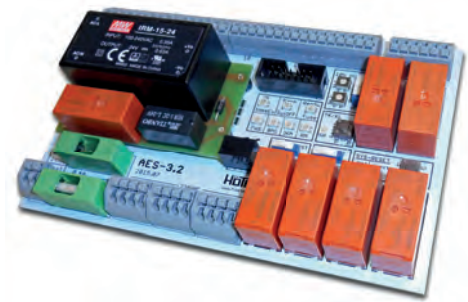
Technical data	
Ambient temperature	0°C bis 40 °C
Casing dimensions L × B × T	150 × 97 × 65 mm
Casing	plastic or metal



AES extract air and smoke extract controller

Connection options	
Fire alarm system	1x input
Duct smoke detector	up to 60, to VDE 0833 part 2, 32 per group
Push button fire alarm	up to 20, to VDE 0833, 10 per group Fire
Fighters' switch	max. 6
Isolator	1x input
Damper actuator 230V AC	up to 4 dampers without galvanic isolation
Damper actuator 24 V AC/ DC	additional transformer as an option
Fault contact	1x volt-free, max. 230 V AC / 6A
Flash	1x volt-free, max. 230 V AC / 6A
Alarm sounder	1x volt-free, max. 230 V AC / 6A
Timer	optional
Fan diagnosis system	optional
AS-i interface	optional





 **Accessory for AES extract air and smoke extract control unit**

Duct smoke detectors	
Smoke detector ARM 1	Smoke detector, optical, to DIN EN 54-7
Smoke detector ARM 2	Smoke detector with multiple sensors, optical/thermal
Supply voltage	9V - 33V
Quiescent current	30 uA
Current, alarm signal generation	20 mA
Licence	VdS G 203036
Casing dimensions Ø × H	100 × 44 mm

 **Accessory for AES extract air and smoke extract control unit**

Smoke vent call point	Push button to generate an alarm
Supply voltage	24 V
Quiescent current	2 mA
Current, alarm signal generation	20 mA
Casing colours	RAL 1018 (yellow), RAL 2011 (orange)
Casing dimensions (BxHxT)	125 x 125 x 37 mm
Casing	Plastic, metal

 **Accessory for AES extract air and smoke extract control unit**

Fire fighters' switch	
Supply voltage	24 V
Quiescent current	2 mA
Current, alarm signal generation	20 mA
Switch contact	Momentary switch (returns automatically to original state)
Prepared to accommodate a profile cylinder	Yes; DIN profile cylinder is not part of the supply package
LEDs	Fault; device ready; smoke extract; OFF
Protection level	IP 44
Ambient temperature	-20 °C bis 65 °C
Casing	Plastic
Casing colours	Grey-red
Casing dimensions (BxHxT)	125 x 125 x 70 mm

AES extract air and smoke extract controller



- | | | |
|--|------------------------|-----------------------------|
| ① AES extract air and smoke extract controller | ④ Frequency inverter | ⑦ Smoke detector |
| ② Fire fighters' switch | ⑤ Smoke control damper | ⑧ Smoke vent call point |
| ③ Connection to AS-i | ⑥ Smoke exhaust fan | ⑨ Central fire alarm system |





For smoke detection in ducts



Order code

RM - O - 3 - D

1

1 Type

RM-O-3-D

Duct smoke detector



For smoke detection in ducts with integrated airflow monitoring



Order code

RM - O - VS - D

1

1 Type

RM-O-VS-D

Duct smoke detector



Application

- ▶ With or without integrated airflow monitoring
- ▶ For airflow velocities up to 20 m/s
- ▶ For any airflow direction
- ▶ Contamination level indicator
- ▶ Automatic adjustment of the alarm threshold, hence long service life and little requirement for maintenance
- ▶ Volt-free signal and alarm relays
- ▶ Supply voltage 230 V



Options / variants

- ▶ Optional integration with TROXNETCOM
- ▶ Supply voltage 24 V DC (RM-O-3-D)
- ▶ Integrated airflow monitoring (RM-O-VS-D)
- ▶ Can be installed into the inspection access openings of rectangular fire dampers (RM-O-3-D)

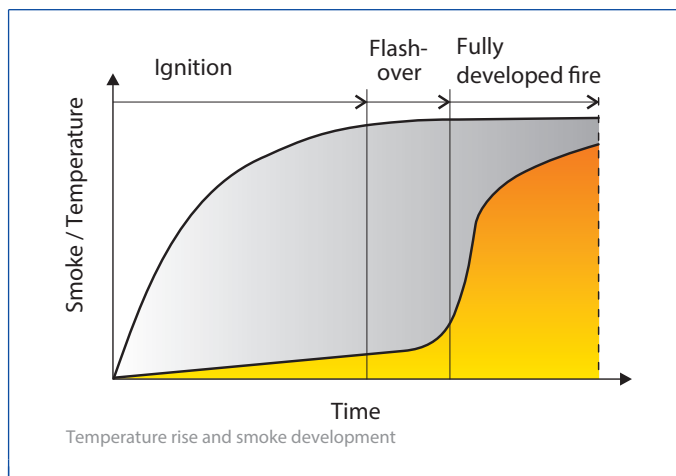


Note

Duct smoke detectors save lives. In the initial development phase of a fire, the temperature increases only very slightly over a period of time. There is hence a risk that the smoke spreads through the ventilation and air conditioning ducting in the entire building. This is because the smoke temperature remains

below 72 °C for quite some time such that fire dampers are not released. The dampers remain open. Duct smoke detectors detect smoke in ducts at an early stage and independent of the temperature, and they release motorised fire dampers or smoke control dampers.

Ventilation and air conditioning systems have to be designed and installed according to the German guideline regarding fire protection requirements on ventilation systems (Lüftungsanlagen-Richtlinie, LüAR). This guideline describes the necessity of duct smoke detectors.

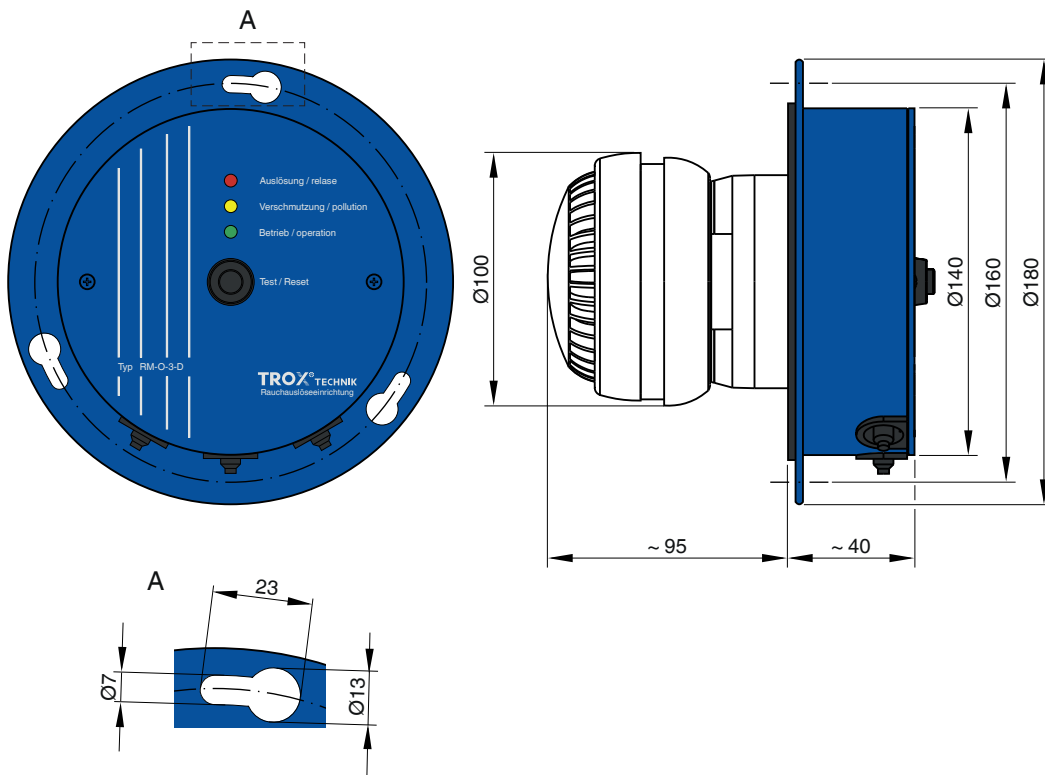


RM-O-3-D and RM-O-VS-D

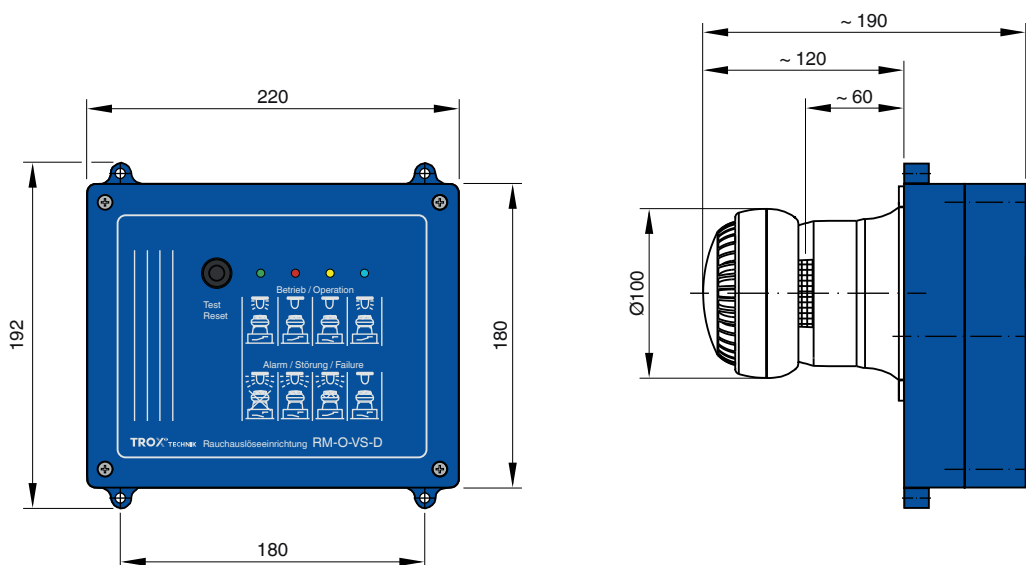
Type	RM-O-3-D	RM-O-VS-D
General building inspectorate licence	Z-78.6-125	Z-78.6-67
Control input signal for fire dampers	X	X
Control input signal for smoke protection dampers	X	X
Supply voltage	230 V AC, 24 V DC	230 V AC
Max. airflow velocity: 1 - 20 m/s	1 - 20 m/s	1 - 20 m/s
Airflow monitoring	-	> 2 m/s
Alarm threshold for increased contamination	> 70 %	> 70 %
Humidity (relative humidity, no condensation)	≤ 90 %	≤ 90 %
Protection level	IP 42	IP 42
Ambient temperature	0 to 60 °C	0 to 60 °C
Annual inspection	X	X
Integral volt-free signal and alarm relays	X	X
Integral signal lamps	X	X
Automatic adjustment of alarm threshold	X	X
Airflow direction is not critical	X	X
Sensor head inside the duct, hence in the airflow	X	X
Sensor head not inside the duct, airflow is redirected	-	-
Installation onto FK-EU	X	-
LON bus interface	-	X
Modbus/BACnet interface	-	-
AS-i interface	-	-
Relay board	-	-
Removable display and control module	-	-
Display of operating states and contamination level in % with additional 7-segment display	-	-



RM-O-3-D



RM-O-VS-D





Controllers for the data acquisition and control of the field modules

 **Order code**

TNC – A1305

1

 **Component**

- TNC-A1305** Controller with PROFIBUS DP interface; 1 master
- TNC-A1306** Controller with PROFIBUS DP interface; 2 masters
- TNC-A1353** Controller with Modbus/TCP interface; 1 master
- TNC-A1354** Controller with Modbus/TCP interface; 2 masters
- TNC-A1375** Gateway with PROFIBUS DP interface; 1 master

 **Application**

Controllers (AS-i masters) are basically used for management functions. They initialise the AS-Interface network, recognise all slaves on a bus, perform error diagnosis, and send signals. The data for all slaves is stored in the controller. A single controller can manage 31 slaves, a

dual controller can manage 62 slaves. Controllers provide interfaces (gateway functions) to higher-level central units or controls, e.g. PROFIBUS DP and Ethernet. Controllers can be linked through these interfaces and hence allow for building independent systems without a central unit. The programming effort for the central unit is

fairly low thanks to the integral TROXNETCOM Basis user software. The AS-Interface controller is treated as a slave of the higher-level system. AS-Interface does not incur the cost for programming the gateway function, which is usually required for other systems.

 **Controller**

Type	TNC-A1305	TNC-A1306	TNC-A1353	TNC-A1354	TNC-A1375
Number of master	1	2	1	2	1
TROXNETCOM BASIC-USER-SOFTWARE incl.	YES	YES	Yes	Yes	No only GATEWAY
Supply voltage	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Current consumption	< 500 mA	< 500 mA	< 400 mA	< 400 mA	< 200 mA
Power consumption	< 10 VA	< 10 VA	< 10 VA	< 10 VA	< 4 VA
Programming interface	RS232C: RJ11	RS232C: RJ11	RS232C: RJ11	RS232C: RJ11	---
Data interface	PROFIBUS DP	PROFIBUS DP	Modbus/TCP	Modbus/TCP	PROFIBUS DP
Graphic LC display	128 × 64 pixels,	128 × 64 pixels,	128 × 64 pixels,	128 × 64 pixels,	128 × 64 pixels,
Max. acceptable rel. humidity	< 95 %	< 95 %	< 95 %	< 95 %	< 95 %
Status LED	2 × red;	3 × red;	1 × red;	2 × red;	2 × red;
Ambient temperature	0 - 60 °C	0 - 60 °C	0 - 60 °C	0 - 60 °C	0 - 60 °C
Storage temperature	-20 to 70 °C	-20 to 70 °C	-20 to 70 °C	-20 to 70 °C	-20 to 70 °C
Protection level	IP 20	IP 20	IP 20	IP 20	IP 20
MTTF	5 years	5 years	5 years	5 years	5 years
AS-i profile	M3	M3	M3	M3	M3
Casing dimensions (mm)	124 × 97 × 86	124 × 97 × 86	124 × 97 × 86	124 × 97 × 86	124 × 97 × 86
Installation	DIN mounting rail	DIN mounting rail	DIN mounting rail	DIN mounting rail	DIN mounting rail



Repeaters for a maximum expansion of the network



Order code

TNC – A3225

1

1 Repeater

TNC-A3225



Application

AS-i repeaters are used to extend the usual length of AS-i networks by another 100 m. An existing 100 m segment can be extended by another 100 m. Two repeaters can be used on one AS-i segment, i.e. one segment can be up

to 300 m long. The total number of 31 slaves per controller cannot be exceeded. A repeater acts also as galvanic isolation of the two AS-i segments, hence providing safety against short circuits. Active slaves can be positioned before and after the repeater. Each repeater requires an AS-i power supply unit.

Note

The AS-i repeater has no slave address; total no. of AS-i slaves per master segment (31 or 62) remains unchanged, no parameter setting required.



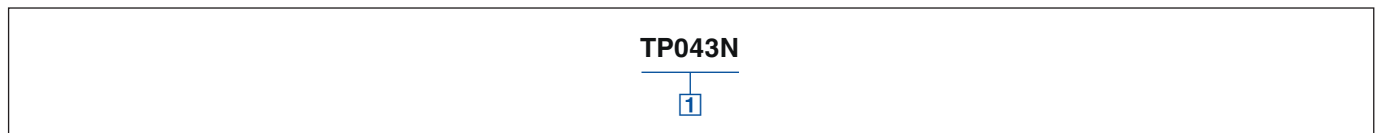
Repeater

Type	TNC-A3225
Supply voltage	26.5 - 31.6 V DC
Current consumption	60 mA per AS-i segment
AS-i interfaces	2
No. of additionally required AS-i power supply units	1
No. of repeaters/controllers/parallel operation	Any number if according to AS-i specification
No. of repeaters/controllers/series operation	Up to 2
Galvanically isolated	Yes
Power LED	2 × green
Error LED	2 × red
Ambient temperature	-25 to 70 °C
Protection level	IP 20
Casing dimensions [mm]	114 × 26 × 108



For the control and operation of a system with several controller and power units, and for the display of its functions

Order code



Master and display units

TP043N 4.3" display
(3 Controllers, ModBus TCP)

TP043EC 4.3" display
(2 TNC-EASYCONTROL)

TP057N 5.7" display
(28 Controllers, Profibus DP)

TP104N 10.4" display
(28 Controllers, Profibus DP)

TP121N 12.1" display
(28 Controllers, Profibus DP)

Application

Displays

- ▶ Graphical colour TFT displays
- ▶ Display and control of all operating states
- ▶ With TNC Basic User Software
- ▶ Configuration of the entire system
- ▶ For the logging of fire damper function tests
- ▶ ModBus TCP and BACnet/IP interfaces for integration with central BMS

- ▶ Touch displays as communication master for 28 controllers, with PROFIBUS DP except for TP043N
- ▶ TP043N Communication master for 3 controllers, Modbus TCP
- ▶ TP043EC Communication master for 2 TNC-EASYCONTROL

PLC master control

- ▶ PLC master control (e.g. S7)
- ▶ For the administration of AS-i controllers based on standard PROFIBUS DP communication
- ▶ Integration with the central BMS, e.g. via Modbus RTU

General

- ▶ Supply voltage: 24 V DC
- ▶ Aluminium, anodised (natural colour)
- ▶ Real time clock

Communication master and Display

Type	TP043N	TP043EC	TP057N	TP104N	TP121N
Resolution [pixel]	480 × 272	480 × 272	320 × 240	800 × 600	800 × 600
Display area B × H [mm]	53.8 × 95	53.8 × 95	115.2 × 86.4	211 × 158	246 × 185
Diagonal	4.3"	4.3"	5.7"	10.4"	12.1"
Front B × H × T [mm]	140 × 100 × 5	140 × 100 × 5	203 × 147 × 5	295 × 220 × 5	320 × 270 × 5
Cut-out B × H [mm]	132 × 92	132 × 92	195 × 139	287 × 212	315 × 243.5
Installation depth without plug (approx.) [mm]	42	42	49	56	65
Interfaces	Ethernet, USB	Ethernet, USB	Ethernet, USB, RS232, PROFIBUS DP master	Ethernet, USB, RS232, PROFIBUS DP master	Ethernet, USB, RS232, PROFIBUS DP master
Communication master	3 controller ModBus TCP	2 TNC-EASYCONTROL	28 controller PROFIBUS DP	28 controller PROFIBUS DP	28 controller PROFIBUS DP
Power consumption at 24 V [mA] (max)	400	400	800	1000	1000
Power required [W]	7.2	7.2	12	16.8	16.8



Communication interface between a component and the controller



Order code

AS – EM

1

1 Module

AS-EM	Module for the connection of four limit switches	TNC-Z0094	Relaismodul 4E/4A
AS-EP	Module for the connection of four limit switches	TNC-Z0047	Illuminated push button module
AS-EPR	Module for the connection of four limit switches	BC24	SLC Communication module for fire dampers and smoke control dampers
AS-EM/EK	Module for controlling actuators on smoke control dampers	BKNE230-24	Communication and power supply unit
AS-EM/SO	Module for controlling actuators with special functions		
AS-EM/C	Module for universal control functions, 2 outputs, 4 inputs		



Application

AS-i modules

TROXNETCOM can be combined with various AS-i modules for the integration of fire dampers with or without actuator, of multileaf dampers, of smoke control dampers, and of other digital actuators and sensors. The voltage supply for all modules comes from AS-i.

AS-i module AS-EM with two outputs with voltage supply and four inputs

AS-i module AS-EM is used for fire dampers and multileaf dampers with 24 V Belime actuators; it is also used for TROX duct smoke detectors; it captures the status of up to 4 volt-free contacts; it also supplies 24 V DC, up to 0.4 A. It can be used for various applications if an application code is entered.

AS-i module AS-EM/EK with two outputs with voltage supply and four inputs

AS-i module AS-EM/EK is based on AS-i module AS-EM and is used for smoke control dampers with 24 V Belimo actuators; it captures the status of up to 4 volt-free contacts; it also supplies 24 V DC, up to 0.4 A. It includes a cable kit and the casing variant for installation into EK-EU smoke control dampers.

AS-i module AS-EM/SO with two outputs with super capacitors and four inputs

AS-i module AS-EM/SO is used for special functions; it captures the status of up to 4 volt-free contacts; it also supplies 24 V DC, up to 0.4 A. The outputs are provided with super capacitors.

AS-i module AS-EPR with four inputs

AS-i module AS-EPR is used for fire dampers with fusible links and can capture the status of up to four volt-free contacts.

AS-i module AS-EM/C with two switch outputs and four inputs

AS-i module AS-EM/C is used for fire dampers, smoke control dampers and multileaf dampers with actuators, fire dampers with fusible links, extract air dampers for commercial kitchens, and dampers with explosion-proof actuators. It has 2 switch relays with common contact and 4 inputs that capture the status of volt-free contacts. It can be used for different applications if the specific application code is entered.

Illuminated push button module with 2 push buttons

AS-i module TNC-Z0047 ist used for system status displays and to acknowledge alarms.

AS-i module TNC-Z0094 with four relay outputs (changeover contacts) and four inputs

AS-i module TNC-Z0094 is used to capture the status of volt-free contacts (fire alarm) and to signal accordingly (e.g. switch off devices; alarms). It has 4 changeover relays and 4 inputs.

BC 24: SLC Communication module for fire dampers and smoke control dampers

BC 24 connects the SLC control module and the damper actuator.

BKNE230-24: Communication and power supply unit

BKNE230-24 is a decentralised power supply unit for the actuators of smoke control dampers. It is also used as a communication interface between the actuator and the control module and monitoring device.

Important:

Actuators and communication modules are factory tested together; only tested combinations must be used.



AS-i modules

Type	AS-EM	AS-EM/EK	AS-EM/SO	AS-EPR	AS-EM/C	TNC-Z0047	TNC-Z0094
Inputs	4	4	4		4		4
Outputs	2 (24 V DC)	2 (24 V DC)	2 (24 V DC) power buffered		2 normally open contacts		4 changeover contacts
Maximum current [mA]	450	450	450	50	50		50
Maximum switching current [A]					2.5		6
Extended addressing	Yes	Yes	Yes	Yes	Yes	No	No
Flat cable insulation displacement connector	Yes	No	Yes	Yes	No	No	No
Protection level	IP 54	IP 54	IP 54	IP 54	IP 54	IP 67	IP 20
AS-i current consumption [mA]	<480	<480	<480	<80	<60	<55	<250
Operating temperature	-5 to 75 °C	-5 to 75 °C	-5 to 75 °C	-20 to 60 °C	-25 to 50 °C	-20 to 60 °C	
Power required [W]							On DIN mounting rail
Dimensions of casing B × H × T [mm]	139 × 159 × 54	139 × 159 × 54	139 × 159 × 54	139 × 159 × 54	113 × 113 × 60	80 × 45 × 30	114 × 50 × 105





AS-i system voltage for master, sensors, actuators, and modules



Order code

TNC - A1256

1

1 Power supply unit

TNC-A1256 Output current 2.8 A

TNC-A1258 Output current 8 A



Application

Power supply units provide energy to the AS-i network and the connected slaves; power supply units with data decoupling are used to simultaneously transmit data and energy.



AS-i Power supply units

Type	TNC-A1256	TNC-A1258
Input voltage range [V AC]	100...120, 200 ... 240	100...120, 200 ... 240
Nominal voltage [V AC]	115/230	115/230
Nominal frequency [Hz]	50/60	50/60
Output voltage (AS-i) [V DC]	30.5	30.5
Max. output [W]	85	244
Output current [A]	2.8	8
Efficiency [%]	86.9	89.4
With short circuit protection/overload protection	Yes	Yes
Derating [W/K] of 60 to 70°C	0	6
Mains buffering time [ms] of 120 V AC, 60 Hz	98	44
Mains buffering time [ms] of 230 V AC, 50 Hz	96	42
Overvoltage protection [V]	< 36	< 36
Residual ripple [mV]	< 50	< 100
Ambient temperature [°C]	-25...70	-25...70
Protection level	IP20	IP20
EMC	EN61000-6-1, EN61000-6-2, EN61000-6-4	EN61000-6-1, EN61000-6-2, EN61000-6-4
MTBF [h]	801000	771000
Casing material	Sheet steel	Sheet steel
Installation	Cross bar TH35	Cross bar TH35
Dimensions [mm]	40 × 124.5 × 130.5	62 × 124.3 × 130.8
Weight [kg]	0.615	0.883
Display	LED green (AS-i voltage)	LED green (AS-i voltage)
Connection	Screw terminals	Screw terminals
AS-i certificate	98701	98501



Switching power supply unit for 24 V power supply

Order code

TNC – D1030



Switching power supply unit

TNC-D1030 Output current 1.25 A

TNC-D4011 Output current 3.3 A

TNC-D4012 Output current 5 A

TNC-D4013 Output current 10 A

Application

24 V power supply for AS-i controllers and for operating and display units Highly efficient electronic subassemblies that transform an unbalanced input voltage to direct voltage of a different level.

Switching power supply units

Type	TNC-D1030	TNC-D4011	TNC-D4012	TNC-D4013
Input voltage range [V]	100...240 AC	100...240 AC/ 110...300 DC	100...120 AC/ 200...240 DC	100...120 AC/ 200...240 DC
Nominal voltage [V AC]	115/230	115/230	115/230	115/230
Nominal frequency [Hz]	47...63	50/60	50/60	50/60
Output voltage SELV/PELV [V DC]	24...28	24...28	24...28	24...28
Max. output [W]	30	80	120	240
Output current [A]	1.25	3.3	5	10
Efficiency [%]	84	88	89.4	91
With short circuit protection/ overload protection	Yes	Yes	Yes	Yes
Derating [W/K]	> 60 °C	1.8 (60...70 °C)	3 (60...70 °C)	6 (60...70 °C)
Mains buffering time [ms] of 120 V AC, 60 Hz	120	30	80	46
Mains buffering time [ms] of 230 V AC, 50 Hz	-	128	78	47
Overvoltage protection [V]	<34	<39	<39	<39
Residual ripple [mV]	≤ 50	<50	<50	<50
Ambient temperature [°C]	0...70	-25...70	-25...70	-25...70
Protection level	IP20	IP20	IP20	IP20
EMC EN61000-3-2		X		
EMC EN61000-6-1		X	X	X
EMC EN61000-6-2	X	X	X	X
EMC EN61000-6-3	X	X		
EMC EN61000-6-4		X	X	X
MTBF [h]		EN61000-3-2	EN61000-6-4	EN61000-6-4
Casing material	-	224300	869000	821000
Installation	115/230 AC	115/230 AC	115/230 AC	115/230 AC
Dimensions [mm]	≤ 50	<50	<50	<50
Weight [kg]	0.615	0.883		
Display	LED green (AS-i voltage)	LED green (AS-i voltage)		
Connection	Screw terminals	Screw terminals		



For the control of fire and smoke protection systems



Order code

TNC – SV	C	01DP	R
1	2	3	4

1 Type

TNC-SV Standard switch box

2 Type of base station

- R** Repeater
- C** Controller
- D** Display

3 Components

- Repeater (R)
- 01** 1×TNC-A3225, 1×TNC-A1256
- 02** 1×TNC-A3225, 1×TNC-A1258
- Controller (C)
- 01DP** 1×TNC-A1305, 1×TNC-A1256, 1×TNC-D1030
- 02DP** 1×TNC-A1305, 1×TNC-A1258, 1×TNC-D1030
- 03DP** 1×TNC-A1306, 2×TNC-A1256, 1×TNC-D1030
- 04DP** 1×TNC-A1306, 2×TNC-A1258, 1×TNC-D1030

- 01MB** 1×TNC-A1353, 1×TNC-A1256, 1×TNC-D1030
- 02MB** 1×TNC-A1353, 1×TNC-A1258, 1×TNC-D1030
- 03MB** 1×TNC-A1354, 2×TNC-A1256, 1×TNC-D1030
- 04MB** 1×TNC-A1354, 2×TNC-A1258, 1×TNC-D1030

Display (D)

- TP043** 1×TP043N, 1×TNC-D1030
- TP057** 1×TP057N, 1×TNC-D1030
- TP104** 1×TP104N, 1×TNC-D1030
- TP121** 1×TP121N, 1×TNC-D1030

4 Relay module

- For controllers only (C)
- No entry: no relay module
- R** 1×TNC-Z0094
- RR** 2×TNC-Z0094



Application

Standard switch cabinets (base stations) for control panels, AS-i controllers and AS-i repeaters, power supply units and I/O modules, completely assembled and wired. control panels and controller include the application "Basic-User-Software" the substations for operating units and AS-i Controller include a 24 V DC supply (TNC-D1030)



Standard switch boxes

Type ↓	①	②	③	④	⑤	⑥	⑦	⑧ [mm]
TNC-SVD-TP043	TP043N							500×500×210
TNC-SVD-TP057	TP057N							500×500×210
TNC-SVD-TP104	TP104N							500×500×210
TNC-SVD-TP121	TP121N							500×500×210
TNC-SVC01DP		A1305			1			450×300×210
TNC-SVC02DP		A1305				1		450×300×210
TNC-SVC03DP		A1306			2			450×300×210
TNC-SVC04DP		A1306				2		450×300×210
TNC-SVC01MB			A1353		1			450×300×210
TNC-SVC02MB			A1353			1		450×300×210
TNC-SVC03MB			A1354		2			450×300×210
TNC-SVC04MB			A1354			2		450×300×210
TNC-SVC01DPR		A1305		1	1			450×300×210
TNC-SVC02DPR		A1305		1		1		450×300×210
TNC-SVC03DPR		A1306		1	2			450×300×210
TNC-SVC04DPR		A1306		1		2		450×300×210
TNC-SVC01MBR			A1353	1	1			450×300×210
TNC-SVC02MBR			A1353	1		1		450×300×210
TNC-SVC03MBR			A1354	1	2			450×300×210
TNC-SVC04MBR			A1354	1		2		450×300×210
TNC-SVC01DPRR		A1305		2	1			450×300×210
TNC-SVC02DPRR		A1305		2		1		450×300×210
TNC-SVC03DPRR		A1306		2	2			600×300×210
TNC-SVC04DPRR		A1306		2		2		600×300×210
TNC-SVC01MBRR			A1353	2	1			450×300×210
TNC-SVC02MBRR			A1353	2		1		450×300×210
TNC-SVC03MBRR			A1354	2	2			600×300×210
TNC-SVC04MBRR			A1354	2		2		600×300×210
TNC-SVR01					1		1	300×300×210
TNC-SVR02						1	1	300×300×210



① Control panel ② Profibus controller ③ Modbus controller ④ I/O module TNC-Z0094 ⑤ AS- i power supply unit TNC-A1256
 ⑥ AS- i power supply unit TNC-A1258 ⑦ Repeater TNC-A3225 ⑧ Switching power supply units ⑨ Dimensions [mm]

 Order code

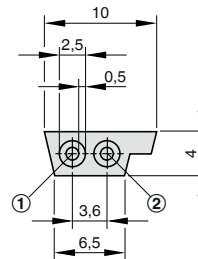
TNC – A4000

1

 Useful additions

TNC-A4000 Flat cable (100 m)
TNC-70581 Flat cable distributor
TNC-70413 End seals (10 pieces)

TNC-70113 Heat shrink caps (10 pieces)
TNC-70067 Cable clips for flat cables (100 pieces)
TNC-DP connector
TNC-Z 0119 Passive bus termination

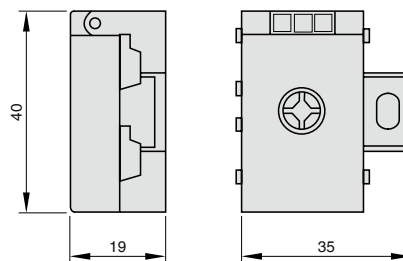


AS-i flat cable for use with flat cable insulation displacement connectors and Compact modules, available as a roll of 25 m, 50 m or 100 m

 Application

Flat cable type TNC-A4000

- AS-i flat cable for the transmission of data (communication) and voltage to the slaves
- For use with flat cable connectors and mounting bases

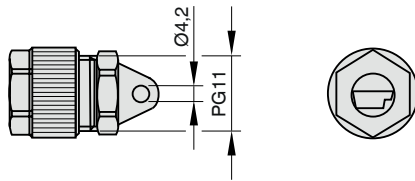


Flat cable distributors allow for an inexpensive and quick wiring of AS-i installations. Distributors are available for one or two AS-i flat cables.

 Application

Flat cable distributors TNC-70581

- Flat cable distributor to create a topology Distributors may be connected even while a voltage is being applied
- To distribute power from one to two cables



End seals to protect the ends of flat cables

Application

TNC-70413 end seals for flat cables, and TNC-70113 heat shrink caps for flat cables

- ▶ To prevent short circuits, cable ends (bare wire ends) should be protected from moisture and from accidental contact. Protect cable ends with an end seal (TNC-70413) or with a heat shrink cap (TNC-70113)



Cable clip for fixing the flat cable

Application

Cable clips for flat cables TNC-70067

- ▶ Fixing of the flat cable with cable clips.
- ▶ Fixing of the cable clips with adhesive tape or screw (drilled hole has been provided).

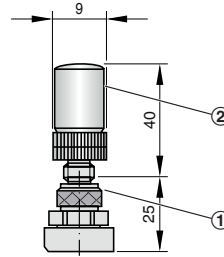


One PROFIBUS DP connector per AS-i DP controller and DP master system (display).

Application

PROFIBUS connector TNC-DP

- ▶ For the connection of a PROFIBUS controller or display to the PROFIBUS bus
- ▶ Easy assembly
- ▶ With terminal resistor



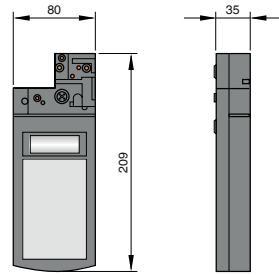
Passive bus termination with flat cable connector to make a connection to the AS-i flat cable.



Application

PROFIBUS connector TNC-DP

- ▶ Flat cable type TNC-A4000
- ▶ AS-i flat cable for the transmission of data (communication) and voltage to the slaves
- ▶ For use with flat cable connectors and mounting bases



AS-i addressing device for commissioning and diagnosis, easy slave addressing. Compact device with integral universal adapter, including cable.

 **Order code**

TNC – Z0045

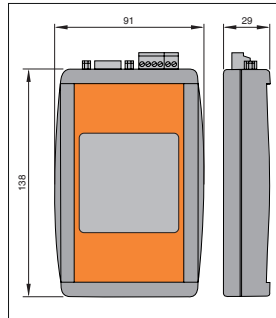
1

1 TNC-Z0045 Addressing device

 **Application**

Addressing device TNC-Z0045

- ▶ Addressing device for the addressing of active AS-i modules and intelligent sensors and actuators
- ▶ Display of all slaves on a bus
- ▶ Reading and writing slave data and slave parameters
- ▶ Compact device, with battery pack



Local diagnosis of the AS-i network, creation of test reports for AS-i networks, diagnosis and evaluation using the connected PC

 Order code

TNC – A1145

1

1 TNC-A1145 AS-i Tester

Application

Diagnosis and analysis tool TNC-A1145

- ▶ Passive AS-i participant as an interface for AS-i system analysis with a PC
- ▶ Slave lists as system overview

- ▶ Slave data (inputs and outputs)
- ▶ Configuration data for the connected slaves
- ▶ Communication error statistics
- ▶ Complete message evaluation in expert mode

Note Safety Integrity Level (SIL)

To reduce risks for people and the environment from technical facilities and safety systems, components are tested according to safety-related criteria. A unit to assess and ideally reduce risks is the so-called safety

integrity level, or SIL. The required safety integrity level depends on the risk which a system poses. TROX components can be used to build safety-related systems.



X Application

AS-i safety monitor TNC-A041S

- ▶ Safety monitor for monitoring data transmission and the AS-i controller, for safety related applications such as the control of smoke control dampers.
- ▶ Approved up to SIL3 to IEC/EN61508



X Application

AS-i safety gateway TNC-ZB0252

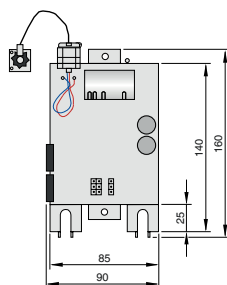
- ▶ Gateway for monitoring the inputs of safety related binary AS-i slaves and for data transmission via PROFIsafe.
- ▶ Direct integration with PROFIBUS networks via PROFIBUS type file (GSD).
- ▶ Connection of up to 20 AS-i safety modules AS-EM/SIL2.



X Application

AS-i safety input module TNC-A005S

- ▶ Input module for capturing the blade actuator end positions
- ▶ Supplied mounted on the damper blade and wired to the actuator
- ▶ Integral AS-Interface slave and monitoring of signal reception.



Application

AS-EM/SIL2 control module

- Can be used to control dampers and to indicate damper blade positions OPEN and CLOSED as well as intermediate positions.
- Can also be used to monitor the running time of the damper blade actuator.
- Approved up to SIL2 to IEC/EN61508

Technical data

Type	TNC-A041S	TNC-ZB0252	TNC-A005S	AS-EM/SIL2
Supply voltage [V DC]	24	24		
Separate supply voltage		Yes		
Current consumption [mA]	150	100	Typ. 80; 200 max.	
Switch-on current [mA]	600			
Response time [ms]	<40			
No. of AS-i slaves		Up to 62		
Bus cycle time with 31 slaves [ms]		5		
Bus cycle time with 62 slaves [ms] [ms]		10		
AS-i voltage range [V]	18.5 - 31.6		26.5 - 31.6	26.5 - 31.6
AS-i current consumption [mA]	<45			<400 from AS-i
Interface	USB 2.0 interface	RS 485; PROFIBUS DP		
Supported protocols		AS-i safe; PROFIsafe, Profibus		
Message output 2- duct [mA]	500 per output			
Operating temperature [C°]	0 to 55	0 to 50	-20 to 60	-20 to 70
Storage temperature [°C]	-30 to 70			-20 to 75
Relative humidity [%]		10 - 95		
Protection level	IP 20	IP 20	IP 67	IP 54
Mounting	On DIN mounting rail	On DIN mounting rail	On DIN mounting rail	
Casing H x B x T [mm]	22.5 x 108 x 114.5	45 x 111 x 124	80 x 45 x 24	54 x 90 x 160

LON modules

LON modules are used for the control of motorised fire dampers or smoke control dampers (24 V or 230 V) and for monitoring fire dampers with electric limit switches.

The modules are mounted either onto the dampers or anywhere else, as required. These modules can provide the central BMS with all fire damper signals for control purposes.



Application

type LON-WA1/B3

- ▶ LON-module for control input signal of up to two motorised 24 V fire dampers or one motorised 24 V smoke control damper
- ▶ The actuators for the dampers are connected with plugs.
- ▶ The second motorised fire damper should be connected using WA1/AD or WA1/AD230 (accessories).



Application

type WA1/B3-AD

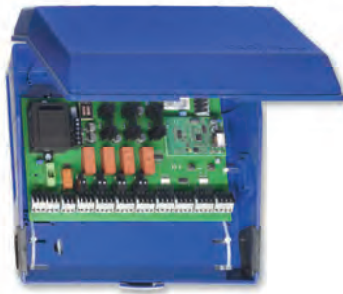
- ▶ Connection box for connecting a second motorised fire damper (24 V) to the LON-WA1/B3.
- ▶ The damper actuator is connected with plugs.



Application

Type WA1/B3-AD230

- ▶ Connection box with integral 230 V/24 V power supply unit for connecting a second motorised fire damper (24 V) to the LON-WA1/B3.
- ▶ The 24 V voltage for the actuators and the LON-WA1/B3 is provided by the integral power supply unit.



Application

Type LON-WA1/FT3

- ▶ The functional module LON-WA1/FT3 has been specially developed for the monitoring of motorised fire dampers and smoke control dampers
- ▶ Up to four motorised fire dampers or smoke control dampers can be controlled with LON-WA1/FT3 the supply voltage for the module is 230 V AC, 24 V AC or 24 V DC
- ▶ The connections for the damper actuators are either designed for the respective supply voltage or volt-free
- ▶ an FT5000 transceiver is used as LonWorks® interface



Application

type LON-WA4/B

Module with 4 digital inputs. used to capture the status of volt-free switches Due to additional link options and alarm signalling particularly suitable for monitoring fire dampers with electric limit switches



Application

type MB-BAC-WA1/2

- ▶ module for control input signal of up to two motorised 24 V fire dampers or one motorised 24 V smoke control damper
- ▶ The actuators for the dampers are connected with plugs.
- ▶ The second motorised fire damper should be connected using LON-WA1/AD or WA1/AD230 (accessories).



Application

type MB-BAC-WA1/4

- ▶ module for the control of up to four motorised fire dampers or smoke control dampers (230 V or 24 V AC/DC). Also for monitoring up to 8 mechanical fire dampers with one limit switch for end position OPEN or CLOSED, or up to 4 mechanical fire dampers with two limit switches for capturing end positions OPEN and CLOSED.
- ▶ Transmission of all signals and control input signal for motorised fire dampers; transmission of the system status; integral watchdog and heartbeat functions

LON modules

Type	LON-WA1/B3	WA1/B3-AD	WA1/B3-AD230	LON-WA1/FT3
Supply voltage (V)	20.0 - 28.0 AC/DC		200 - 240 AC	230 V AC
Nominal frequency (Hz)	50/60		50/60	50/60
Output current (mA)			750	
Power consumption (VA or W) (without actuator)	3,12 or 1,32			12
Inputs	4 digital inputs for volt-free switches			8 digital inputs for
Outputs	3 digital outputs (relay) for 2 fire dampers or 1 smoke control damper and also FireChain			5 digital outputs (relay)
Interface	4 Connection terminals LON			4 Connection terminals LON
Protection level	IP42	IP42	IP42	IP20
Operating temperature [°C]	10 to 60	10 to 60	10 to 60	10 to 60
relative humidity (%) (no condensation)	20 ... 95	20 ... 95	20 ... 95	20 ... 95
Connection terminals	Actuator control: 3-pole AMP MATE-N_LOK socket; actuators for position indication: 6-pole AMP MATE-N_LOK socket	Actuator control: 3-pole AMP MATE-N_LOK socket; actuators for position indication: 6-pole AMP MATE-N_LOK socket	Actuator control: 3-pole AMP MATE-N_LOK socket; actuators for position indication: 6-pole AMP MATE-N_LOK socket	Actuator control: 4-pole spring-loaded terminals for 0.08 mm ² - 2.5 mm ² , actuator end positions: 4-pole spring-loaded terminals for 0.08 mm ² - 2.5 mm ²
Supply voltage for terminals	Clamp terminals, 90°, for 0,08 mm ² - 2,5 mm ²	0.08 mm ² - 2.5 mm ²		2 x 3-pole for 0,08 mm ² - 2,5 mm ²
Connection LON-WA1/B3	-	Clamp terminals 8-polig	Clamp terminals 8-polig	-
Fire Chain Signal	Clamp terminals, 90°, for 0,08 mm ² - 1,5 mm ²	Clamp terminals, 90°, for 0,08 mm ² - 1,5 mm ²		3-pole spring-loaded terminals for 0,08 mm ² - 2,5 mm ²
Dimensions [mm]	139 x 159 x 54	139 x 159 x 54	139 x 159 x 54	285 x 270 x 150
Casing material	Plastic	Plastic	Plastic	ABS plastic, blue (RAL 5002)
Delivery loose	Yes	Yes	Yes	Yes
Delivery mounted	yes (ZL09)	yes (ZL10)	yes (ZL11)	-

 LON modules

Type	LON-WA4/B	MB-BAC-WA1/2	MB-BAC-WA1/4
Supply voltage (V)	20.0 - 28.0 AC/DC	20.0 - 28.0 AC/DC	230 V AC
Nominal frequency (Hz)	50/60	50/60	50/60
Output current (mA)	approx. 45		
Power consumption (VA or W) (without actuator)		3,12 or 1,32	12
Inputs	4 digital inputs for volt-free switches or voltage inputs; input voltage depends on jumper setting (J), either A1 (24 V AC/DC) or A2 (GND)	4 digital inputs for volt-free switches	8 digital inputs for
Outputs	LON interface, standard network variables (SNVT)	3 digital outputs (relay) for 2 fire dampers or 1 smoke control damper and also FireChain	5 digital outputs (changeover relay)
Interface	FT5000 free topology	4 terminals LON FTT10 free topology	4-pole spring-loaded terminals for 0.08 mm ² - 2.5 mm ² EIA-RS485 Standard (BACnet MS/TP or MODBUS RTU)
Protection level	IP65	IP42	IP20
Operating temperature [°C]	-5 to 55	10 to 60	10 to 60
relative humidity (%) (no condensation)		20 ... 95	20 ... 95
Connection terminals	Spring-loaded terminals for nominal diameter; 1.5 mm ² , one wire; 1.0 mm ² ultra-fine wire; AWG 16	Actuator control: 3-pole AMP MATE-N_LOK socket	Actuator control: 4-pole spring-loaded terminals for 0.08 - 2.5 mm ² ; actuators for position indication: 4-pole spring-loaded terminals for 0.08 - 2.5 mm ²
Supply voltage for terminals		Clamp terminals 90 for	2 x 3-pole for 0,08 mm ² - 2,5 mm ²
Connection LON-WA1/B3	-	-	-
Fire Chain Signal		Clamp terminals, 90°, for 0.08 mm ² - 1,5 mm ²	3-pole spring-loaded terminals for 0,08 mm ² - 2,5 mm ²
Dimensions [mm]	159 x 120 x 41.5	139 x 159 x 54	285 x 270 x 150
Casing material	ASA (LURAN S KR 2867 C WU)	Plastic	ABS plastic, blue (RAL 5002)
Delivery loose	Yes	Yes	Yes
Delivery mounted	-	Non-standard	-

Note

Actuators and communication modules are factory tested together; only tested combinations must be used.



Application

SLC-technology

- ▶ The BC 24 module is used for the control of damper actuators
- ▶ Power supply and communication are carried by an exchangeable two-core cable
- ▶ A thermoelectric release mechanism and/or duct smoke detector can be connected without additional devices



Application

AGNOSYS-technology

- ▶ BRM-F-ST module is used for monitoring and control of smoke control dampers.
- ▶ Up to 126 modules can be connected per ring bus system



Technical data

	SLC Technic	AGNOSYS Technic
Nominal voltage	from SLC® control module	18 - 32 V Typ. 24 V
Power consumption [W]	1	
Connections	plug connections; screw terminals	plug connections; screw terminals
Damper power supply	24 V	24/230 V AC 24 V DC
Ambient temperature [°C]	-20 to 50	0 to 45
Storage temperature [°C]	-20 to 80	
Humidity [%]	95 rh, no condensation	95 rh, no condensation
Weight [g]	255	510
B × H × T [mm]	114 × 153 × 54	158 × 180 × 65
Max. impulse voltage	2,5 kV (EN60730-1)	



Smoke control dampers

Type	B24A AS-EM/EK	B24AS AS-EM-SIL2	B24C BC24	B230D BRM-10-F	B24D BRM-10-F-ST	B24BKNE BKNE230-24
EK-EU	x	x	x	x	x	x
EK-JZ	x	x	x	x	x	x



Control units



3 Control units

3.1 VAV terminal units



For low airflow velocities and low duct pressures

LVC

298



For the most diverse applications regarding standard volume flow rate ranges

TVR

300



For normal and high volume flow rate ranges

TVJ

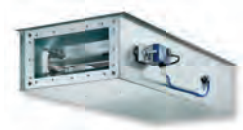
308



For normal and high volume flow rate ranges and low-leakage shut-off

TVT

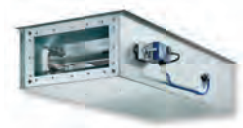
321



For supply air systems with demanding acoustic requirements and low airflow velocities

TZ-Silenzio

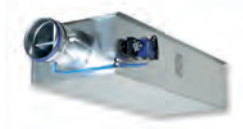
334



For extract air systems with demanding acoustic requirements and low airflow velocities

TA-Silenzio

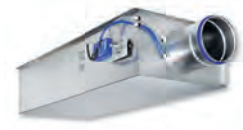
339



For supply air systems with demanding acoustic requirements

TVZ

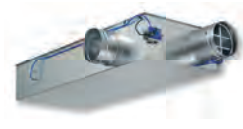
345



For extract air systems with demanding acoustic requirements

TVA

351



For dual duct systems

TVM

357



For contaminated air

TVRK

363

	Optimised for use in laboratories and on fume cupboards	TVLK	371
	For the control of variable air volume flows in potentially explosive atmospheres (ATEX)	TVR-Ex	377
3.2 Secondary silencers for VAV terminal units			
	For the reduction of air-regenerated noise of air terminal units Type TVZ, TVA, TZ-Silenzio, TA-Silenzio or TVM	TS	383
	For the reduction of air-regenerated noise of air terminal units Type TVJ, TVT or EN	TX	384
3.3 Control components for VAV terminal units			
	Quick and easy handling	Easy	386
	With service interface and bus communication facility	Compact, dynamic	390
	For different actuators	Universal, dynamic	396
	For contaminated extract air or for pressure control	Universal, static	400
	Rapid replacement without interruption of system operation	RETROFIT	409
	For the individual temperature control in rooms	RC	413

3.4 Adjustment devices for VAV terminal units



For service and commissioning

Adjustment devices 416

3.5 CAV Controllers



For the precise control of constant volume flow rates

RN 420



For low airflow velocities

VFC 425



Volume flow limiter for insertion into ducting

VFL 428



For the precise control of normal and high constant volume flows

EN 431



For the precise control of constant volume flows in potentially explosive atmospheres (ATEX)

RN-Ex 436



For the precise control of normal and high constant volume flows in potentially explosive atmospheres (ATEX)

EN-Ex 440

3.6 Actuators



For constant volume flows with $\dot{V}_{min}/\dot{V}_{max}$ switching in air conditioning systems




Min/Max actuators 445




For variable volume flows in air conditioning systems

Modulating actuators 450




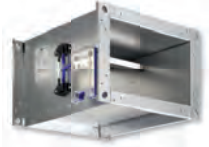
3.7 Shut-off devices

	For low-leakage shut-off	AK	456
	For contaminated air	AKK	462
	For low-leakage shut-off of volume flows in potentially explosive atmospheres (ATEX)	AK-Ex	466

3.8 Flow adjustment dampers

	For the reliable balancing of volume flow rates	VFR	469
---	---	-----	-----

3.9 Volume flow rate measuring units

	For the opening and closing of shut-off dampers in air conditioning systems	Open/Close actuators	473
	For moving the damper blades of shut-off dampers to any position	Modulating actuators	478
	For the measurement of volume flow rates in ducts	VMR	481
	For the measurement of volume flow rates in ducts	VME	485
	For the measurement of volume flow rates in ducts with contaminated air	VMRK	489
	For the measurement of volume flow rates in ducts with contaminated air from laboratories	VMLK	494

3.10 Differential pressure transducers for volume flow rate measuring units



For the dynamic measurement of effective and differential pressures

Dynamic differential pressure transducers 497



For the static effective and differential pressure measurement

Static differential pressure transducers 498

3.11 Heat exchangers and air heaters



For the reheating of airflows in circular ducting

WL 502



For the electric reheating of airflows in circular ducting

EL 505



For the reheating of airflows in rectangular ducting

WT 508

Variable volume flow control - VARYCONTROL

	Type											
	LVC	TVR	TVJ	TVT	TZ-Si-lenzio	TA-Si-lenzio	TVZ	TVA	TVM	TVRK	TVLK	TVR-Ex
Type of system												
Supply air	●	●	●	●	●		●			●		●
Extract air	●	●	●	●		●		●		●	●	●
Dual duct (supply air)									●			
Duct connection, fan end												
Circular	●	●					●	●	●	●	●	●
Rectangular			●	●	●	●						
Volume flow rate range												
Up to [m³/h]	1080	6050	36360	36360	3025	3025	6050	6050	6050	6050	1295	6050
Up to [l/s]	300	1680	10100	10100	840	840	1680	1680	1680	1680	360	1680
Air quality												
Filtered	●	●	●	●	●	●	●		●	●	●	●
Office extract air	●	●	●	●		●		●		●	●	●
Polluted		○	○	○		○		○		●	●	○
Contaminated										●	●	
Control function												
Variable	●	●	●	●	●	●	●	●	●	●	●	●
Constant	●	●	●	●	●	●	●	●	●	●	●	●
Min/Max	●	●	●	●	●	●	●	●	●	●	●	●
Pressure control		○	○	○	○	○	○	○		○		○
Master/Slave	●	●	●	●	●	●	●	●	Master	●	●	●
Shut-off												
Leakage			●									
Low leakage	●	●		●	●	●	●	●	●	●	●	●
Acoustic requirements												
High < 40 dB(A)			○	○	●	●	●	●	○			
Low < 50 dB (A)	●	●	●	●	●	●	●	●	●	●	●	●
Other functions												
Volume flow rate measurement	●	●	●	●	●	●	●	●	●	●	●	●
Special areas												
Areas with explosive atmospheres												●
Labs, clean rooms, operating theatres (EASYLAB, TCU-LON II)		●	●	●			●	●		●	●	
Explanation												
● - Standard												
○ - Optional												
Possible under certain conditions: Robust unit variant and/or specific control component (attachment) or useful additional product												



Attachments: VARYCONTROL control components

Attachment	Controlled variable	Interface	Differential pressure transducer	Actuator	Manufacturer
		Easy controller	Dynamic		
Easy	\dot{V}		Integral	Integral	①
		Compact controller	Dynamic		
BC0	\dot{V}	MP bus	Integral	Integral	②
BF0	\dot{V}	MP bus	Integral	Integral	②
BL0	\dot{V}	LonWorks	Integral	Integral	②
BM0	\dot{V}	Modbus	Integral	Integral	②
BM0-J6	\dot{V}	Modbus and plug-in connecting cable	Integral	Integral	②
XG0	\dot{V}		Integral	Integral	③
XB0	\dot{V}		Integral	Integral	③
LN0	\dot{V}		Integral	Integral	⑤
LK0	\dot{V}	KNX			⑤
LY0	\dot{V}		Integral	Integral	⑤
		Compact controller	Static		
SA0	\dot{V}		Integral	Integral	④
SC0	Δp		Integral	Fast-running actuator, integral	④
		Universal controller	Dynamic		
B11	\dot{V}		Integral	Actuator, torque for TVT	②
B13	\dot{V}		Integral	Actuator	②
B27	\dot{V}		Integral	Actuator	②
B1B	\dot{V}		Integral	Spring return actuator	②
XC3	\dot{V}		Integral	Spring return actuator	③
		Universal controller	Static		
BP1	\dot{V}	MP bus	Separate part	Actuator, torque for TVT	②
BP3	\dot{V}	MP bus	Separate part	Actuator	②
BPB	\dot{V}	MP bus	Separate part	Spring return actuator	②
BPG	\dot{V}	MP bus	Separate part	Fast-running actuator	②
BB1	\dot{V}		Separate part	Actuator, torque for TVT	②
BB3	\dot{V}		Separate part	Actuator	②
BBB	\dot{V}		Separate part	Spring return actuator	②
XD1	\dot{V}		Integral	Actuator	③
XD3	\dot{V}		Integral	Spring return actuator	③
BR1	Δp	MP bus	100 Pa	Actuator, torque for TVT	②
BR3	Δp	MP bus	100 Pa	Actuator	②
BRB	Δp	MP bus	100 Pa	Spring return actuator	②
BRG	Δp	MP bus	100 Pa	Fast-running actuator	②
BS1	Δp	MP bus	600 Pa	Actuator, torque for TVT	②
BS3	Δp	MP bus	600 Pa	Actuator	②
BSB	Δp	MP bus	600 Pa	Spring return actuator	②
BSG	Δp	MP bus	600 Pa	Fast-running actuator	②
BG1	Δp		100 Pa	Actuator, torque for TVT	②
BG3	Δp		100 Pa	Actuator	②
BGB	Δp		100 Pa	Spring return actuator	②
BH1	Δp		600 Pa	Actuator, torque for TVT	②
BH3	Δp		600 Pa	Actuator	②
BHB	Δp		600 Pa	Spring return actuator	②
XE1	Δp		Integral, 100 Pa	Actuator	③
XE3	Δp		Integral, 100 Pa	Spring return actuator	③
XF1	Δp		Integral, 600 Pa	Actuator	③
XF3	Δp		Integral, 600 Pa	Spring return actuator	③

① TROX, ② TROX/Belimo, ③ TROX/Gruner, ④ Sauter, ⑤ Siemens
Attachment order code detail, \dot{V} volume flow rate, Δp differential pressure

	Attachment	LVC	TVR	TVJ	TVT	TZ-S	TA-S	TVZ	TVA	TVM	TVRK	TVLK
	Easy	●	●	●	●	●	●	●	●			
	BC0	●	●	●	●	●	●	●	●			
	BF0									●		
	BL0		●	●	●	●	●	●	●			
	BM0											
	BM0-J6											
	XG0									●		
	XB0		●	●	●	●	●	●	●			
	LN0		●	●	●	●	●	●	●			
	LK0											
	LY0									●		
	SA0											
	SC0											
	B11				●							
	B13		●	●		●	●	●	●			
	B27									●		
	B1B		●	●	●	●	●	●	●			
	XC3		●	●	●	●	●	●	●			
	BP1				●							
	BP3		●	●		●	●	●	●		●	●
	BPB		●	●	●	●	●	●	●		●	
	BPG		●	●	●	●	●	●	●		●	●
	BB1				●							
	BB3		●	●		●	●	●	●		●	●
	BBB			●	●	●	●	●	●		●	
	XD1		●	●	●	●	●	●	●		●	
	XD3		●	●	●	●	●	●	●		●	
	BR1				●							
	BR3		●	●		●	●	●	●		●	
	BRB		●	●	●	●	●	●	●		●	
	BRG		●			●	●	●	●		●	
	BS1				●							
	BS3		●	●					●		●	
	BSB		●	●	●						●	
	BSG		●	●	●						●	
	BG1				●							
	BG3		●	●		●	●	●	●		●	
	BGB		●	●	●	●	●	●	●		●	
	BH1				●							
	BH3		●	●							●	
	BHB		●	●	●						●	
	XE1		●	●	●	●	●	●	●		●	
	XE3		●	●	●	●	●	●	●		●	
	XF1		●	●	●						●	
	XF3		●	●	●						●	



Attachments: LABCONTROL control components

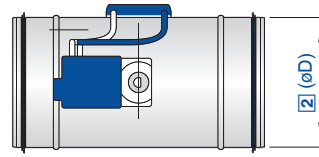
Attachment	Controlled variable	Interface	\dot{V}_{\min} - / \dot{V}_{\max} - adjustment	Differential pressure transducer	Actuator	LVC	TVR	TVJ	TVT	TZ-S	TA-S	TVZ	TVA	TV RK	TV LK
		Easylab controller		Static											
Elab	Room supply air	TCU3		Integral	Fast-running actuator		●	●	●						
Elab	Room supply air	TCU3		Integral	Fast-running actuator					●		●			
Elab	Room extract air	TCU3		Integral	Fast-running actuator						●		●		
Elab	Room supply air	TCU3		Integral	Fast-running actuator									●	●
		Electronic controller		Static											
TMA	Room supply air	TCU-LON-II with LonWorks interface	Integral	Fast-running actuator		●	●	●							
TMB	Fast-running actuator (brushless motor)		●	●	●										
TMA	Room supply air	TCU-LON-II with LonWorks interface	Integral	Fast-running actuator					●		●				
TMB	Fast-running actuator (brushless motor)					●		●							
TMA	Room extract air	TCU-LON-II with LonWorks interface	Integral	Fast-running actuator						●		●			
TMB	Fast-running actuator (brushless motor)						●		●						
TMA	Room supply air	TCU-LON-II with LonWorks interface	Integral	Fast-running actuator									●	●	
TMB	Fast-running actuator (brushless motor)									●	●				



List of abbreviations

$\varnothing D$ [mm]	VAV terminal units made of stainless steel: Outer diameter of the spigot
$\varnothing D_1$ [mm]	Pitch circle diameter of flanges
$\varnothing D_2$ [mm]	Outer diameter of flanges
$\varnothing D_4$ [mm]	Inside diameter of the screw holes of flanges
L [mm]	Length of unit including connecting spigot
L_1 [mm]	Length of casing or acoustic cladding
B [mm]	Duct width
B_1 [mm]	Screw hole pitch of flange (horizontal)
B_2 [mm]	Outside dimension of flange (width)
B_3 [mm]	Width of device
H [mm]	Duct height
H_1 [mm]	Screw hole pitch of flange (vertical)
H_2 [mm]	Outside dimension of flange (height)
H_3 [mm]	Unit height
n []	Number of flange screw holes
T [mm]	Flange thickness
m [kg]	Unit weight including the minimum required attachments (e.g. Compact controller)
f_m [Hz]	Octave band centre frequency
L_{PA} [dB(A)]	A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit, system attenuation taken into account
L_{PA1} [dB(A)]	A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit with secondary silencer, system attenuation taken into account
L_{PA2} [dB(A)]	A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit, system attenuation taken into account
L_{PA3} [dB(A)]	A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit with acoustic cladding, system attenuation taken into account
v_{nom} [m ³ /h] and [l/s]	Nominal volume flow rate (100 %)
$v_{min\ unit}$ [m ³ /h] and [l/s]	Technically possible minimum volume flow rate
v_{max} [m ³ /h] and [l/s]	Upper limit of the operating range for the VAV terminal unit that can be set by customers
v_{min} [m ³ /h] and [l/s]	Lower limit of the operating range for the VAV terminal unit that can be set by customers
[m ³ /h] and [l/s]	Volume flow rate
$\Delta \dot{V}$ [± %]	Volume flow rate tolerance from setpoint value
$\Delta \dot{V}_{warm}$ [± %]	Volume flow rate tolerance for the warm air flow of dual duct terminal units
Δp_{st} [Pa]	Static differential pressure
$\Delta p_{st\ min}$ [Pa]	Static differential pressure, minimum
Galvanised sheet steel	External parts, e.g. mounting brackets or covers, are usually made of galvanised sheet steel
Powder-coated surface (P1)	<ul style="list-style-type: none"> ▶ Casing made of galvanised sheet steel, powder-coated RAL 7001, silver grey ▶ Parts in contact with the airflow are powder-coated or made of plastic ▶ Due to production, some parts that come into contact with the airflow may be stainless steel or aluminium, powder-coated ▶ External parts, e.g. mounting brackets or covers, are usually made of galvanised sheet steel
Stainless steel (A2)	<ul style="list-style-type: none"> ▶ Casing made of stainless steel 1.4201 ▶ Parts in contact with the airflow are powder-coated or made of stainless steel ▶ External parts, e.g. mounting brackets or covers, are usually made of galvanised sheet steel





For low airflow velocities and low duct pressures

Order code

LVC / 160 / BC0 / E 0 / 80 - 400

1 2 3 4 5 6

LVC / 160 / Easy

1 2 3

1 Type

LVC VAV terminal unit

2 Nominal size [mm]

125, 160, 200, 250

3 Attachments (control component)

Easy Easy controller
BC0 Compact controller

4 Operating mode

E Single
M Master
S Slave
F Constant value

5 Signal voltage range

For the actual and setpoint value signals
0 0 - 10 V DC
2 2 - 10 V DC

6 Volume flow rates [m³/h or l/s]

$V_{min} - V_{max}$ for factory setting

+ Features

Circular VAV terminal units for supply air and extract air systems with variable volume flows, low airflow velocities and low duct pressures

- ▶ New measurement principle, optimised for airflow velocities from 0.6 to 6 m/s
- ▶ High control accuracy even in case of unfavourable upstream conditions
- ▶ Electronic control components for different applications (Easy, Compact)
- ▶ Easy handling due to innovative controls
- ▶ Casing length of only 310 mm for all nominal sizes
- ▶ Any installation orientation
- ▶ Closed blade air leakage to EN 1751, up to class 2
- ▶ Casing air leakage to EN 1751, class C

Optional equipment and accessories

- ▶ Secondary silencer Type CA, CS or CF for the reduction of air-regenerated noise
- ▶ Hot water heat exchanger Type WL and electric air heater Type EL for reheating the airflow

Y Application

- ▶ Circular VAV terminal units of Type LVC for the precise supply air or extract air flow control in variable air volume systems with low airflow velocities.
- ▶ Closed-loop volume flow control using an external power supply
- ▶ For low airflow velocities and low duct pressures
- ▶ Effective pressure (differential pressure) as the result of two measurements, one upstream and one downstream of the damper blade
- ▶ The relation between damper blade position and differential pressure is stored as a characteristic relationship in the controller
- ▶ Shut-off by means of switching (equipment supplied by others)

⬡ Attachments

- ▶ Easy controller: Compact unit consisting of controller with potentiometers, differential pressure transducer and actuator
- ▶ Compact controller: Compact unit consisting of controller, differential pressure transducer and actuator

+ Useful additions

- ▶ Secondary silencer Type CA, CS or CF for demanding acoustic requirements

★ Special features

- ▶ Optimised for low airflow velocities from 0.6 to 6 m/s
- ▶ High control accuracy even in case of unfavourable upstream conditions
- ▶ Any installation orientation
- ▶ Volume flow rate control with Easy or Compact controller
- ▶ Casing length of only 310 mm

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ Closed blade air leakage to EN 1751, class 2 (nominal sizes 160 - 250, class 1)
- ▶ Nominal size 125 meets the general requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class C





Technical data

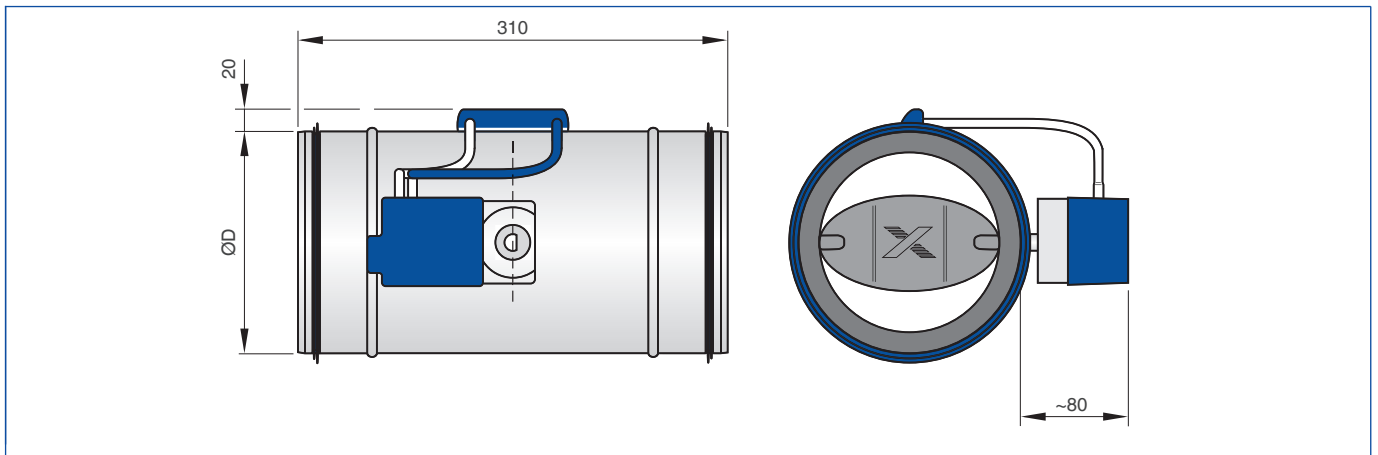
Nominal sizes	125 - 250 mm
Volume flow rate range	8 - 300 l/s or 30 - 1080 m ³ /h
Volume flow rate control range	Approx. 10 to 100% of the nominal volume flow rate
Minimum differential pressure	5 - 30 Pa
Maximum differential pressure	600 Pa
Operating temperature	10 - 50 °C

LVC, Sound pressure level at differential pressure 50 Pa

Nominal size	V̇ l/s	V̇ m ³ /h	Air-regenerated noise				Case-radiated noise
			①	②	③	④	①
			L _{PA}	L _{PA1}			L _{PA2}
dB(A)							
125	8	29	27	<15	<15	<15	<15
	30	108	35	24	17	<15	17
	55	198	39	30	24	21	21
	75	270	42	34	28	25	23
160	12	43	29	19	<15	<15	<15
	50	180	34	26	23	19	19
	85	306	36	28	23	20	22
	120	432	38	31	26	23	24
200	20	72	31	21	<15	<15	<15
	75	270	35	26	19	17	19
	135	486	36	28	22	20	22
	190	684	36	28	23	21	24
250	30	108	31	24	18	16	17
	120	432	36	28	22	19	25
	210	756	36	28	22	20	28
	300	1080	36	29	23	21	31

- ① LVC
- ② LVC with secondary silencer CS/CF, insulation thickness 50 mm, length 500 mm
- ③ LVC with secondary silencer CS/CF, insulation thickness 50 mm, length 1000 mm
- ④ LVC with secondary silencer CS/CF, insulation thickness 50 mm, length 1500 mm

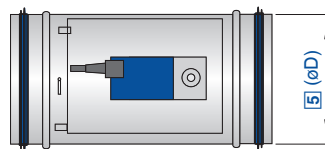
LVC



Dimensions [mm]

Nominal size	ØD	m
	mm	
125	124	1.5
160	159	1.9
200	199	2.1
250	249	2.7





For the most diverse applications regarding standard volume flow rate ranges

 Order code

TVR - D - ... -FL / 160 / G2 / B1B / E 0 / 200 - 900 / NO

1 2 3 4 5 6 7 8 9 10 11

TVR - D / 200 / D2 / Easy

1 2 5 6 7

1 Type

TVR VAV terminal unit

2 Acoustic cladding

No entry: none

D With acoustic cladding

3 Material

No entry: galvanised sheet steel

P1 Powder-coated (RAL 7001), silver grey

A2 Stainless steel

4 Flange

No entry: none

FL Both ends (not for TVR-D-P1)

5 Nominal size [mm]

100, 125, 160, 200, 250, 315, 400

6 Accessories

No entry: none

D2 Lip seals on both ends

G2 Matching flanges for both ends

7 Attachments (control component)

Example

Easy Compact controller

BC0 Compact controller

B13 Universal controller

8 Operating mode

E Single

M Master

S Slave

F Constant value

A Differential pressure control - extract air

Z Differential pressure control - supply air

9 Signal voltage range

For the actual and setpoint value signals

0 0 - 10 V DC

2 2 - 10 V DC

10 Volume flow rates [m³/h or l/s], differential pressure [Pa]

\dot{V}_{\min} - \dot{V}_{\max} for factory setting

Δp_{\min} for factory setting (operating modes A, Z)

11 Damper blade position

Only with spring return actuators

NO Power off to open

NC Power off to close



 **Order code**

TVR - D - ... - FL / 160 / G2 / ELAB / RS / ULZ / LAB / ...

1 2 3 4 5 6 7 8 10 11 12

TVR - D - ... - FL / 160 / G2 / ELAB / EC - E0 / ULZ / ...

1 2 3 4 5 6 7 8 9 10 12

1 Type

TVR VAV terminal unit

2 Acoustic cladding

D No entry: none
With acoustic cladding

3 Material

P1 No entry: galvanised sheet steel
Powder-coated (RAL 7001), silver grey
A2 Stainless steel

4 Flange

FL No entry: none
Both ends (not for TVR-D-P1)

5 Nominal size [mm]

D_N

6 Accessories

D2 No entry: none
Lip seals on both ends
G2 Matching flanges for both ends

7 Attachments (control component)

ELAB EASYLAB controller TCU3 with fast-running actuator

8 Equipment function

RS Room control
Supply air control (Room Supply)
RE Extract air control (Room Exhaust)
PC Differential pressure control

Single operation
SC Supply air controller
EC Extract air controller

9 External volume flow rate setting

Only for single operation
E0 Voltage signal 0 - 10 V DC
E2 Voltage signal 2 - 10 V DC
2P Switch contacts (provided by others) for 2 switching steps
3P Switch contacts (provided by others) for 3 switching steps
F Volume flow rate constant value, without signalling

10 Expansion modules

Option 1: Power supply
No entry: 24 V AC
T EM-TRF for 230 V AC
U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)
Option 2: Communication interface
No entry: none
L EM-LON for LonWorks FTT-10A
B EM-BAC-MOD-01 for BACnet MS/TP
M EM-BAC-MOD-01 for Modbus RTU
I EM-IP for BACnet/IP, Modbus/IP and webservice
R EM-IP with real time clock
Option 3: Automatic zero point correction
No entry: none
Z EM-AUTOZERO with solenoid valve

11 Additional functions

Only for room control (equipment function)
Room management function has been deactivated
LAB Extract air led system (laboratories)
CLR Supply air led system (clean rooms)
Room management function is active
LAB-RMF Extract air led system (LAB)
CLR-RMF Supply air led system

12 Operating values [m³/h or l/s, Pa]

For equipment function 'room control' with additional function RMF
Total room extract air/supply air
 \dot{V}_1 : Standard mode
 \dot{V}_2 : Reduced operation
 \dot{V}_3 : Increased operation
 \dot{V}_4 : Constant room supply air
 \dot{V}_5 : Constant room extract air
 \dot{V}_6 : Supply air/extract air difference
 $\Delta p_{\text{setpoint}}$: Setpoint pressure (only with differential pressure control)
For equipment function 'single operation'
 $E0, E2$: $\dot{V}_{\min} / \dot{V}_{\max}$
 $2P$: \dot{V}_1 / \dot{V}_2
 $3P$: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$
 F : \dot{V}_1

Useful additions

Room control panel
BE-LCD-01 40-character display



 Order code

TVR - D - ... - FL / 160 / G2 / ELAB / FH - VS / ULZS / 200 - 900

1 2 3 4 5 6 7 8 9 10

1 Type

TVR VAV terminal unit

2 Acoustic cladding

D No entry: none
With acoustic cladding

3 Material

No entry: galvanised sheet steel
P1 Powder-coated (RAL 7001), silver grey
A2 Stainless steel

4 Flange

No entry: none
FL Both ends (not for TVR-D-P1)

5 Nominal size [mm]

100, 125, 160, 200, 250, 315, 400

6 Accessories

No entry: none
D2 Lip seals on both ends
G2 Matching flanges for both ends

7 Attachments (control component)

ELAB EASYLAB controller TCU3 with fast-running actuator

8 Equipment function

With face velocity transducer
FH-VS Face velocity control
With sash distance sensor
FH-DS Linear control strategy
FH-DV Safety-optimised control strategy
With switching steps for switch contacts provided by others
FH-2P 2 switching steps
FH-3P 3 switching steps
Without signalling
FH-F Volume flow rate constant value

9 Expansion modules

Option 1: Supply voltage
No entry: 24 V AC
T EM-TRF for 230 V AC
U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communication interface
No entry: none
L EM-LON for LonWorks FTT-10A
B EM-BAC-MOD-01 for BACnet MS/TP
M EM-BAC-MOD-01 for Modbus RTU
I EM-IP for BACnet/IP, Modbus/IP and webserver
R EM-IP with real time clock

Option 3: Automatic zero point correction

No entry: none
Z EM-AUTOZERO Solenoid valve for automatic zero point correction

Option 4: Lighting

No entry: none
S EM-LIGHT Wired socket for the connection of lighting and for switching the lighting on/off using the control panel (only with EM-TRF or EM-TRF-USV)

10 Operating values [m³/h or l/s]

Depending on the equipment function
VS: $\dot{V}_{\min} - \dot{V}_{\max}$
DS: $\dot{V}_{\min} - \dot{V}_{\max}$
DV: $\dot{V}_{\min} - \dot{V}_{\max}$
2P: \dot{V}_1 / \dot{V}_2
3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$
F: \dot{V}_1

Useful additions

Control panel for fume cupboard controller, for displaying the functions of the control system according to EN 14175
BE-SEG-** OLED display
BE-LCD-01 40-character display

 Order code

TVR - D - ... - FL / 160 / G2 / TMA / RE / 1500 / 750 / 100

1 2 3 4 5 6 7 8 9

1 Type

TVR VAV terminal unit

2 Acoustic cladding

No entry: none
D With acoustic cladding

3 Material

No entry: galvanised sheet steel
P1 Powder-coated (RAL 7001), silver grey
A2 Stainless steel

4 Flange

No entry: none
FL Flanges on both ends

5 Nominal size [mm]

100, 125, 160, 200, 250, 315, 400

6 Accessories

No entry: none
G2 Matching flanges for both ends
D2 Lip seals on both ends

7 Attachments (control component)

TMA TCU-LON-II with fast-running actuator
TMB TCU-LON-II with fast-running actuator (brushless motor)

8 Equipment function

FH Fume cupboard
RS Room supply air
RE Room extract air
PS Differential pressure control - supply air (Pressure Supply)
PE Differential pressure control - extract air (Pressure Extract)

9 Operating values [m³/h or l/s, Pa]

Depending on equipment function
FH: $\dot{V}_{\min} - \dot{V}_{\max}$
RS: $\Delta V / \dot{V}_{\text{constant}}$
RE: $\dot{V}_{\text{Tag}} / \dot{V}_{\text{night}} / \dot{V}_{\text{constant}}$
PS: $\Delta V / \dot{V}_{\text{constant}} / \Delta p_{\text{setpoint}}$
PE: $\dot{V}_{\text{day}} / \dot{V}_{\text{night}} / \dot{V}_{\text{constant}} / \Delta p_{\text{setpoint}}$
The room control volume flow rates (RS, RE, PS, PE) are related to the total extract air volume flow rate for the room

Useful additions

Control panel for fume cupboard controller, for displaying the functions of the control system according to EN 14175
BE-TCU-LON-II Control panel



+ Features

- Circular VAV terminal units for standard applications regarding the supply air or extract air control in variable air volume systems
- ▶ Suitable for the control of volume flow rate, room pressure or duct pressure
 - ▶ Electronic control components for different applications (Easy, Compact, Universal, and LABCONTROL)
 - ▶ High control accuracy even with upstream bend (R = 1D)
 - ▶ Suitable for airflow velocities up to 13 m/s
 - ▶ Closed blade air leakage to EN 1751, up to class 4
 - ▶ Casing air leakage to EN 1751, class C

Optional equipment and accessories

- ▶ Acoustic cladding for the reduction of case-radiated noise
- ▶ Secondary silencer Type CA, CS or CF for the reduction of air-regenerated noise
- ▶ Hot water heat exchanger Type WL and electric air heater Type EL for reheating the airflow

Application

- ▶ Circular VARYCONTROL VAV terminal units of Type TVR for the precise supply air or extract air flow control in variable air volume systems
- ▶ Closed-loop volume flow control using an external power supply
- ▶ For controlling, restricting, or shutting off the airflow in air conditioning systems
- ▶ Shut-off by means of switching (equipment supplied by others)

◉ Variants

- ▶ TVR: VAV terminal unit
- ▶ TVR-D: VAV terminal unit with acoustic cladding
- ▶ TVR-FL: VAV terminal unit with flanges on both ends
- ▶ TVR-D-FL: VAV terminal unit with acoustic cladding and flanges on both ends
- ▶ Units with acoustic cladding and/or a secondary silencer Type CA, CS or CF for demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted

+ Construction

- ▶ Galvanised sheet steel
- ▶ P1: Powder-coated, silver grey (RAL 7001)
- ▶ A2: Stainless steel

◉ Attachments

- ▶ Easy controller: Compact unit consisting of controller with potentiometers, differential pressure transducer and actuator
- ▶ Compact controller: Compact unit consisting of controller, differential pressure transducer and actuator
- ▶ Universal controller: Controller, differential pressure transducer and actuators for special applications
- ▶ LABCONTROL: Control components for air management systems

& Accessories

- ▶ G2: Matching flanges for both ends
- ▶ D2: Lip seals on both ends (factory fitted)

+ Useful additions

- ▶ Secondary silencer Type CA, CS or CF for demanding acoustic requirements
- ▶ Heat exchanger Type WL
- ▶ Electric air heater Type EL

★ Special characteristics

- ▶ Integral differential pressure sensor with 3 mm measuring holes (resistant to dust and pollution)
- ▶ Factory set-up or programming and aerodynamic function testing
- ▶ Volume flow rate can be measured and subsequently adjusted on site; additional adjustment tool may be necessary

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ Closed blade air leakage to EN 1751, class 4 (nominal size 100, class 2; nominal sizes 125 and 160, class 3)
- ▶ Nominal sizes 100, 125, and 160 meet the general requirements, nominal sizes 200 - 400 meet the increased requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class C

Technical data

Nominal sizes	100 - 400 mm
Volume flow rate range	10 - 1680 l/s or 36 - 6048 m ³ /h
Volume flow rate control range (unit with dynamic differential pressure measurement)	Approx. 10 to 100% of the nominal volume flow rate
Minimum differential pressure	5 - 90 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	③	④	$\Delta\dot{V}$ ± %
	l/s	m ³ /h	$\Delta p_{st\ min}$				
			Pa	Pa	Pa	Pa	
100	10	36	5	5	5	5	15
	40	144	15	15	20	20	8
	65	234	35	40	45	50	7
	95	342	70	85	95	105	5
125	15	54	5	5	5	5	15
	60	216	15	20	20	20	7
	105	378	45	50	55	60	6
	150	540	90	100	110	115	5
160	25	90	5	5	5	5	15
	100	360	15	15	15	15	8
	175	630	35	40	45	45	7
	250	900	70	80	85	95	5
200	40	144	5	5	5	5	15
	160	576	15	15	15	15	7
	280	1008	35	35	40	40	5
	405	1458	65	70	75	80	5
250	60	216	5	5	5	5	15
	250	900	10	10	10	15	7
	430	1548	25	25	30	35	5
	615	2214	45	50	55	65	5
315	100	360	5	5	5	5	15
	410	1476	5	10	10	10	7
	720	2592	15	20	20	20	6
	1030	3708	30	35	40	40	5
400	170	612	5	5	5	5	15
	670	2412	5	5	5	5	7
	1175	4230	15	15	15	15	6
	1680	6048	25	30	30	35	5

TVR, Sound pressure level at differential pressure 150 Pa

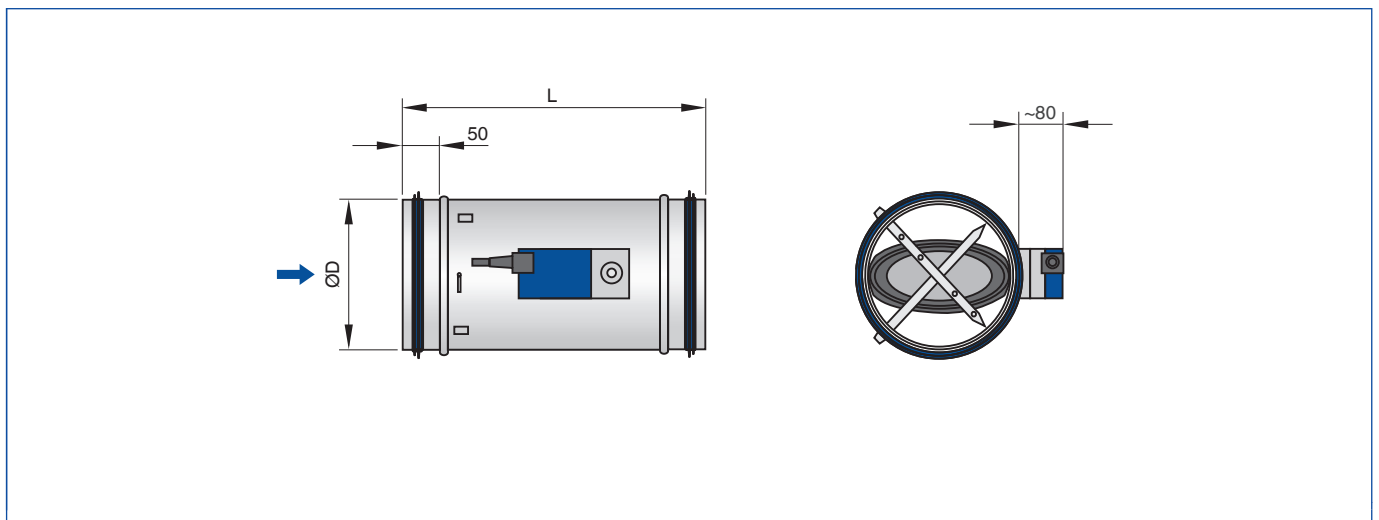
Nominal size	\dot{V}	\dot{V}	Air-regenerated noise				Case-radiated noise	
			①	②	③	④	①	⑤
	l/s	m ³ /h	L _{PA}	L _{PA1}		L _{PA2}	L _{PA3}	
			dB (A)					
100	10	36	32	20	<15	<15	<15	<15
	40	144	45	36	28	26	25	18
	65	234	51	41	33	31	31	24
	95	342	54	42	33	31	36	27
125	15	54	33	22	<15	<15	<15	<15
	60	216	45	36	30	28	25	17
	105	378	49	40	34	32	31	21
	150	540	52	41	34	32	35	24
160	25	90	40	28	20	16	20	<15
	100	360	47	39	34	31	28	19
	175	630	50	42	37	34	32	23
	250	900	53	44	39	36	37	28
200	40	144	40	31	23	20	20	<15
	160	576	47	40	34	33	29	15
	280	1008	50	44	40	38	32	21
	405	1458	54	45	39	38	38	25



Nominal size	\dot{V}	\dot{V}	Air-regenerated noise				Case-radiated noise	
			①	②	③	④	①	⑤
			L_{PA}	L_{PA1}		L_{PA2}	L_{PA3}	
	l/s	m ³ /h	dB (A)					
250	60	216	37	28	22	20	20	<15
	250	900	47	40	34	33	35	18
	430	1548	48	42	38	37	37	25
	615	2214	52	44	38	37	42	29
315	105	378	42	35	28	25	28	<15
	410	1476	47	42	35	34	39	21
	720	2592	49	44	39	38	42	28
	1030	3708	53	48	42	41	46	35
400	170	612	43	36	30	26	30	<15
	670	2412	44	38	32	30	37	21
	1175	4230	47	42	36	35	41	29
	1680	6048	50	44	38	37	46	33

- ① TVR
- ② TVR with secondary silencer CS/CF, insulation thickness 50 mm, length 500 mm
- ③ TVR with secondary silencer CS/CF, insulation thickness 50 mm, length 1000 mm
- ④ TVR with secondary silencer CS/CF, insulation thickness 50 mm, length 1500 mm
- ⑤ TVR-D

TVR, Universal

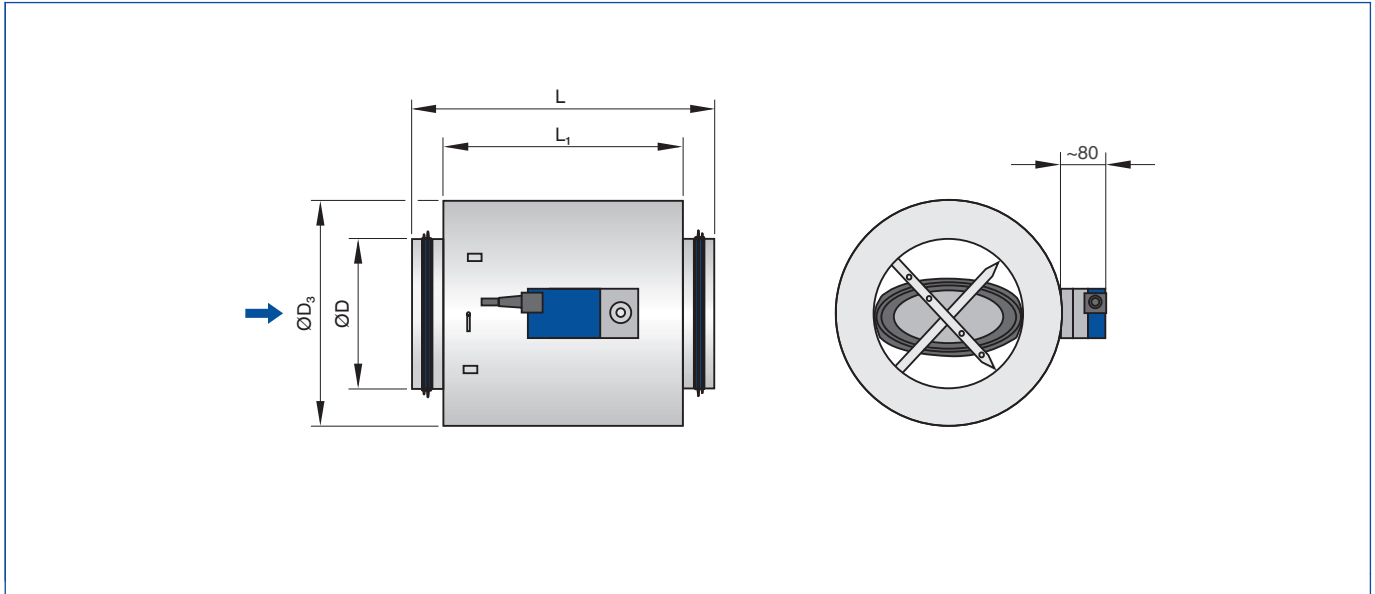


Dimensions [mm] and weight [kg]

Nominal size	Easy Compact	Universal LABCONTROL		ØD mm	m kg
	L				
	mm	mm			
100	310	600	99	3.3	
125	310	600	124	3.6	
160	400	600	159	4.2	
200	400	600	199	5.1	
250	400	600	249	6.1	
315	500	600	314	7.2	
400	500	600	399	9.4	



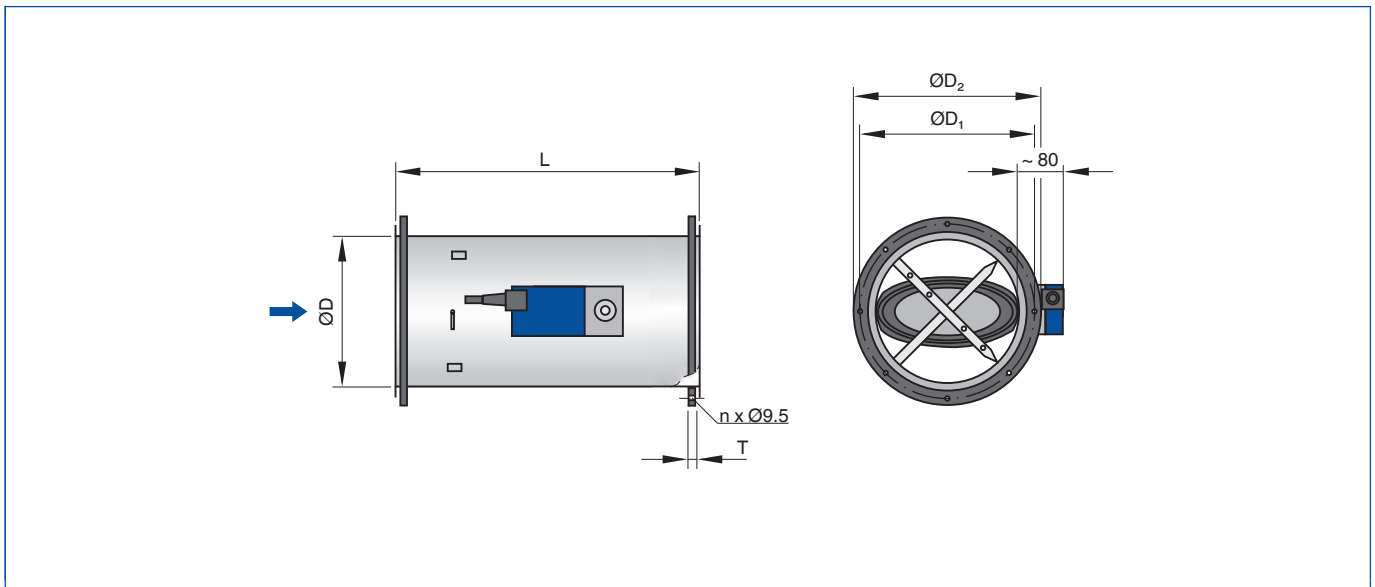
TVR-D



Dimensions [mm] and weight [kg]

Nominal size	Easy Compact		Universal LABCONTROL		ØD mm	ØD_3 mm	m kg
	L mm	L_1 mm	L mm	L_1 mm			
100	310	232	600	517	99	198	7.2
125	310	232	600	517	124	223	8.5
160	400	312	600	517	159	258	11.0
200	400	312	600	517	199	298	13.9
250	400	312	600	517	249	348	15.9
315	500	417	600	517	314	413	18.0
400	500	417	600	517	399	498	22.6

TVR-FL

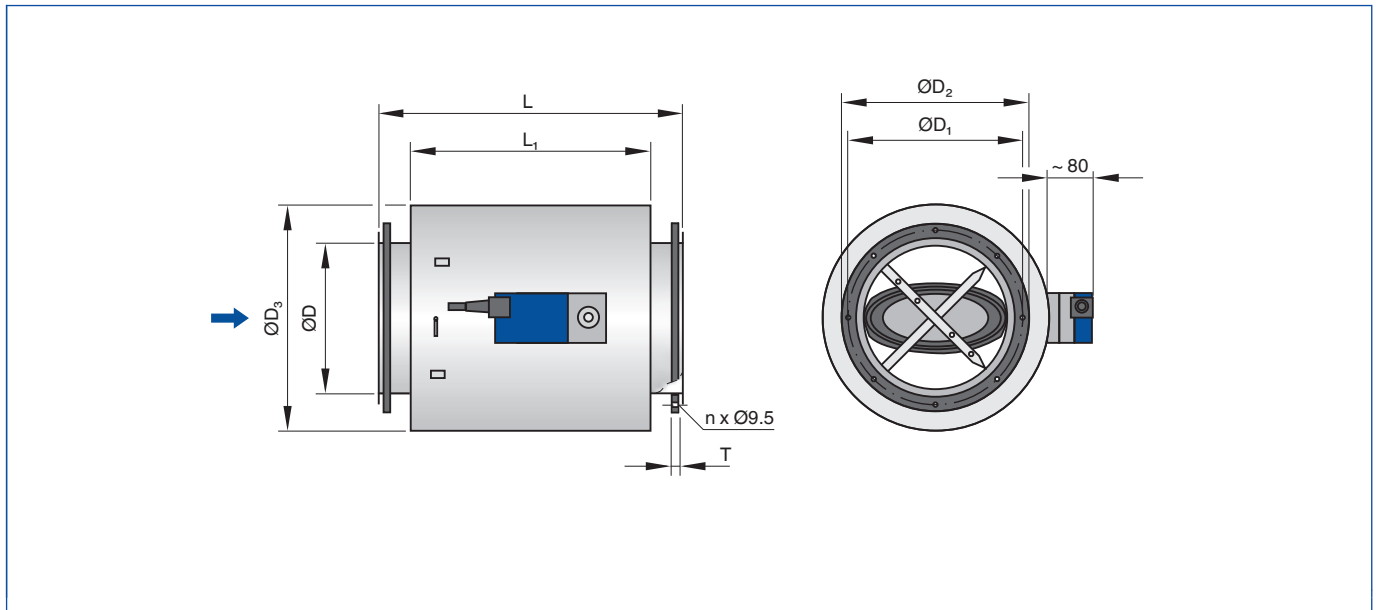


Dimensions [mm] and weight [kg]

Nominal size	Easy Compact	Universal LABCONTROL							
	L		ØD	ØD ₁	ØD ₂	n	T	m	
	mm	mm	mm	mm	mm		mm	kg	
100	290	580	99	132	152	4	4	3.9	
125	290	580	124	157	177	4	4	4.2	
160	380	580	159	192	212	6	4	5.3	
200	380	580	199	233	253	6	4	6.5	
250	380	580	249	283	303	6	4	7.8	
315	480	580	314	352	378	8	4	10.3	
400	480	580	399	438	464	8	4	13.3	



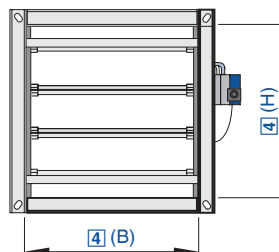
TVR-D-FL



Dimensions [mm] and weight [kg]

Nominal size	Easy Compact		Universal LABCONTROL								
	L	L ₁	L	L ₁	ØD	ØD ₁	ØD ₂	ØD ₃	n	T	m
	mm	mm	mm	mm	mm	mm	mm	mm		mm	kg
100	290	232	580	517	99	132	152	198	4	4	7.8
125	290	232	580	517	124	157	177	223	4	4	9.1
160	380	312	580	517	159	192	212	258	6	4	12.1
200	380	312	580	517	199	233	253	298	6	4	14.3
250	380	312	580	517	249	283	303	348	6	4	17.6
315	480	417	580	517	314	352	378	413	8	4	21.2
400	480	417	580	517	399	438	464	498	8	4	26.5





For normal and high volume flow rate ranges

Order code

TVJ - D - P1 / 600x400 / B1B / E 0 / 200 - 900 / NO

1 2 3 4 5 6 7 8 9

TVJ - D / 900x300 / Easy

1 2 4 5

1 Type

TVJ VAV terminal unit

2 Acoustic cladding

D No entry: none
With acoustic cladding

3 Material

No entry: galvanised sheet steel
P1 Powder-coated (RAL 7001), silver grey

4 Nominal size [mm]

B x H

5 Attachments (control component)

Example

Easy Easy controller
BC0 Compact controller
B13 Universal controller

6 Operating mode

E Single
M Master
S Slave
F Constant value
A Differential pressure control - extract air
Z Differential pressure control - supply air

7 Signal voltage range

For the actual and setpoint value signals

0 0 - 10 V DC
2 2 - 10 V DC

8 Volume flow rates [m³/h or l/s], differential pressure [Pa]

$\dot{V}_{\min} - \dot{V}_{\max}$ for factory setting
 Δp_{\min} for factory setting (operating modes A, Z)

9 Damper blade position

Only with spring return actuators
NO Power off to OPEN
NC Power off to CLOSE



Order code

TVJ – D – P1 / 600x400 / ELAB / RS / ULZ / LAB / ...

1 2 3 4 5 6 8 9 10

TVJ – D / P1 / 600x400 / ELAB / EC – E0 / ULZ / ...

1 2 3 4 5 6 7 8 10

1 Type TVJ VAV terminal unit	3P Switch contacts (provided by others) for 3 switching steps	LAB Extract air led system (laboratories)
2 Acoustic cladding No entry: none D With acoustic cladding	F Volume flow rate constant value, without signalling	CLR Supply air led system (clean rooms) Room management function is active
3 Material No entry: galvanised sheet steel P1 Powder-coated (RAL 7001), silver grey	8 Expansion modules Option 1: Power supply No entry: 24 V AC T EM-TRF for 230 V AC U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)	LAB-RMF Extract air led system (LAB) CLR-RMF Supply air led system
4 Nominal size [mm] B x H	Option 2: Communication interface No entry: none L EM-LON for LonWorks FTT-10A B EM-BAC-MOD-01 for BACnet MS/TP M EM-BAC-MOD-01 for Modbus RTU I EM-IP for BACnet/IP, Modbus/IP and webservice R EM-IP with real time clock	10 Operating values [m³/h or l/s, Pa] For equipment function 'room control' with additional function RMF Total room extract air/supply air \dot{V}_1 : Standard mode \dot{V}_2 : Reduced operation \dot{V}_3 : Increased operation \dot{V}_4 : Constant room supply air \dot{V}_5 : Constant room extract air \dot{V}_6 : Supply air/extract air difference $\Delta p_{\text{setpoint}}$: Setpoint pressure (only with differential pressure control) For equipment function 'single operation'
5 Attachments (control component) ELAB EASYLAB controller TCU3 with fast-running actuator	Option 3: Automatic zero point correction No entry: none Z EM-AUTOZERO Solenoid valve for automatic zero point correction	$E0, E2: \dot{V}_{\min} / \dot{V}_{\max}$ $2P: \dot{V}_1 / \dot{V}_2$ $3P: \dot{V}_1 / \dot{V}_2 / \dot{V}_3$ $F: \dot{V}_1$
6 Equipment function Room control RS Supply air control (Room Supply) RE Extract air control (Room Exhaust) PC Differential pressure control Single operation SC Supply air controller EC Extract air controller	9 Additional functions Only for room control (equipment function) Room management function has been deactivated	Useful additions Room control panel BE-LCD-01 40-character display
7 External volume flow rate setting Only for single operation E0 Voltage signal 0 - 10 V DC E2 Voltage signal 2 - 10 V DC 2P Switch contacts (provided by others) for 2 switching steps		

Order code

TVJ – D – P1 / 600x400 / TMA / RE / 1500 / 750 / 100

1 2 3 4 5 6 7

1 Types TVJ VAV terminal unit	TMA TCU-LON-II with fast-running actuator TMB TCU-LON-II with fast-running actuator (brushless motor)	$RS: \Delta \dot{V} / \dot{V}_{\text{constant}}$ $RE: \dot{V}_{\text{day}} / \dot{V}_{\text{night}} / \dot{V}_{\text{constant}}$ $PS: \Delta \dot{V} / \dot{V}_{\text{constant}} / \Delta p_{\text{setpoint}}$ $PE: \dot{V}_{\text{day}} / \dot{V}_{\text{night}} / \dot{V}_{\text{constant}} / \Delta p_{\text{setpoint}}$ The room control volume flow rates are related to the total extract air volume flow rate for the room
2 Acoustic cladding No entry: none D With acoustic cladding	6 Equipment function RS Room supply air RE Room extract air PS Differential pressure control - supply air (Pressure Supply) PE Differential pressure control - extract air (Pressure Extract)	
3 Material No entry: galvanised sheet steel P1 Powder-coated (RAL 7001), silver grey	7 Operating values [m³/h or l/s, Pa] Depending on equipment function	
4 Nominal size [mm] B x H		
5 Attachments (control component)		



+ Features

Rectangular VAV terminal units for standard applications regarding the supply air or extract air control in variable air volume systems

- ▶ For volume flow rate ranges up to 36,000 m³/h or 10,000 l/s
- ▶ Suitable for the control of volume flow rate, room pressure or duct pressure
- ▶ Electronic control components for different applications (Easy, Compact, Universal, and LABCONTROL)
- ▶ High control accuracy
- ▶ Suitable for airflow velocities up to 10 m/s
- ▶ Casing air leakage to EN 1751, class B

Optional equipment and accessories

- ▶ Acoustic cladding for the reduction of case-radiated noise
- ▶ Secondary silencer Type TX for the reduction of air-regenerated noise
- ▶ Hot water heat exchanger of Type WT for reheating the airflow

Application

- ▶ Rectangular VARYCONTROL VAV terminal units of Type TVJ for the precise supply air or extract air flow control in variable air volume systems
- ▶ Closed-loop volume flow control using an external power supply
- ▶ For controlling, restricting, or shutting off the airflow in air conditioning systems

◊ Variants

- ▶ TVJ: VAV terminal unit
- ▶ TVJ-D: VAV terminal unit with acoustic cladding
- ▶ Units with acoustic cladding and/or secondary silencer Type TX for demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted

+ Construction

- ▶ Galvanised sheet steel
- ▶ P1: Powder-coated, silver grey (RAL 7001)

⬡ Attachments

- ▶ Easy controller: Compact unit consisting of controller with potentiometers, differential pressure transducer and actuator
- ▶ Compact controller: Compact unit consisting of controller, differential pressure transducer and actuator
- ▶ Universal controller: Controller, differential pressure transducer and actuators for special applications
- ▶ LABCONTROL: Control components for air management systems

⊕ Useful additions

- ▶ Secondary silencer Type TX for demanding acoustic requirements
- ▶ Heat exchanger Type WT

★ Special characteristics

- ▶ Integral differential pressure sensor with 3 mm measuring holes (resistant to dust and pollution)
- ▶ Factory set-up or programming and aerodynamic function testing
- ▶ Volume flow rate can be measured and subsequently adjusted on site; additional adjustment tool may be necessary

ISO Standards and guidelines

- ▶ Casing air leakage to EN 1751, class B

📊 Technical data

Nominal sizes	200 × 100 to 1000 × 1000 mm
Volume flow rate range	45 - 10100 l/s or 162 - 36360 m ³ /h
Volume flow rate control range (unit with dynamic differential pressure measurement)	Approx. 20 to 100% of the nominal volume flow rate
Minimum differential pressure	5 - 40 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	$\Delta \dot{V}$ ± %
	l/s	m ³ /h	$\Delta p_{st \min}$		
			Pa	Pa	
200 x 100	45	162	5	10	14
	85	306	10	25	8
	150	540	20	80	5
	215	774	40	155	5
300 x 100	65	234	5	10	14
	120	432	10	25	8
	210	756	20	70	5
	320	1152	40	155	5
400 x 100	85	306	5	10	14
	170	612	10	25	8
	300	1080	20	80	5
	425	1530	40	155	5
500 x 100	105	378	5	10	14
	200	720	10	25	8
	350	1260	20	70	5
	535	1926	40	155	5
600 x 100	130	468	5	10	14
	260	936	10	25	8
	450	1620	20	75	5
	650	2340	40	155	5
200 x 200	85	306	5	10	14
	160	576	10	25	8
	280	1008	20	75	5
	415	1494	40	155	5
300 x 200	125	450	5	10	14
	240	864	10	25	8
	420	1512	20	75	5
	620	2232	40	155	5
400 x 200	165	594	5	10	14
	330	1188	10	25	8
	580	2088	20	80	5
	825	2970	40	155	5
500 x 200	205	738	5	10	14
	400	1440	10	25	8
	700	2520	20	75	5
	1035	3726	40	155	5
600 x 200	250	900	5	10	14
	500	1800	10	25	8
	870	3132	20	80	5
	1250	4500	40	155	5
700 x 200	290	1044	5	10	14
	560	2016	10	25	8
	980	3528	20	75	5
	1450	5220	40	155	5
800 x 200	330	1188	5	10	14
	660	2376	10	25	8
	1160	4176	20	80	5
	1650	5940	40	155	5

① TVJ ② TVJ with secondary silencer TX ③ TVJ-D



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	$\Delta\dot{V}$ ± %
	l/s	m ³ /h	$\Delta p_{st\ min}$		
			Pa	Pa	
300 × 300	185	666	5	10	14
	360	1296	10	25	8
	630	2268	20	75	5
	920	3312	35	150	5
400 × 300	245	882	5	10	14
	480	1728	10	25	8
	840	3024	20	70	8
	1230	4428	35	150	5
500 × 300	305	1098	5	10	14
	600	2160	10	25	8
	1050	3780	20	70	5
	1535	5526	35	150	5
600 × 300	370	1332	5	10	14
	740	2664	10	25	8
	1290	4644	20	75	5
	1850	6660	35	150	5
700 × 300	430	1548	5	10	14
	840	3024	10	25	8
	1470	5292	20	70	5
	2150	7740	35	150	5
800 × 300	490	1764	5	10	14
	980	3528	10	25	8
	1720	6192	20	75	5
	2450	8820	35	150	5
900 × 300	555	1998	5	10	14
	1080	3888	10	25	8
	1890	6804	20	70	5
	2770	9972	35	150	5
1000 × 300	620	2232	5	10	14
	1240	4464	10	25	8
	2150	7740	20	75	5
	3100	11160	35	150	5
400 × 400	325	1170	5	10	14
	640	2304	10	25	8
	1120	4032	20	75	5
	1630	5868	35	150	5
500 × 400	410	1476	5	10	14
	800	2880	10	25	8
	1400	5040	20	75	5
	2040	7344	35	150	5
600 × 400	490	1764	5	10	14
	980	3528	10	25	8
	1720	6192	20	75	5
	2450	8820	35	150	5
700 × 400	570	2052	5	10	14
	1120	4032	10	25	8
	1960	7056	20	75	5
	2850	10260	35	150	5

① TVJ ② TVJ with secondary silencer TX ③ TVJ-D



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	$\Delta\dot{V}$ ± %
			$\Delta p_{st\ min}$		
	l/s	m ³ /h	Pa	Pa	
800 x 400	650	2340	5	10	14
	1300	4680	10	25	8
	2280	8208	20	75	5
	3250	11700	35	150	5
900 x 400	735	2646	5	10	14
	1440	5184	10	25	8
	2520	9072	20	75	5
	3670	13212	35	150	5
1000 x 400	820	2952	5	10	14
	1640	5904	10	25	8
	2850	10260	20	75	5
	4100	14760	35	150	5
500 x 500	510	1836	5	10	14
	1000	3600	10	25	8
	1750	6300	20	75	5
	2540	9144	40	155	5
600 x 500	610	2196	5	10	14
	1200	4320	10	25	8
	2100	7560	20	75	5
	3050	10980	40	155	5
700 x 500	710	2556	5	10	14
	1400	5040	10	25	8
	2450	8820	20	75	5
	3550	12780	40	155	5
800 x 500	810	2916	5	10	14
	1600	5760	10	25	8
	2800	10080	20	75	5
	4050	14580	40	155	5
900 x 500	915	3294	5	10	14
	1800	6480	10	25	8
	3150	11340	20	75	5
	4570	16452	40	155	5

① TVJ ② TVJ with secondary silencer TX ③ TVJ-D



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	$\Delta\dot{V}$ ± %
	l/s	m ³ /h	$\Delta p_{st min}$		
			Pa	Pa	
1000 x 500	1020	3672	5	10	14
	2000	7200	10	25	8
	3500	12600	20	75	5
	5100	18360	40	155	5
600 x 600	730	2628	5	10	14
	1440	5184	10	25	8
	2520	9072	20	75	5
	3650	13140	40	155	5
800 x 600	970	3492	5	10	14
	1920	6912	10	25	8
	3360	12096	20	75	5
	4850	17460	40	155	5
1000 x 600	1220	4392	5	10	14
	2400	8640	10	25	8
	4200	15120	20	75	5
	6100	21960	40	155	5
800 x 800	1300	4680	5	10	14
	2560	9216	10	25	8
	4480	16128	20	75	5
	6500	23400	40	155	5
1000 x 800	1620	5832	5	10	14
	3200	11520	10	25	8
	5600	20160	20	75	5
	8100	29160	40	155	5
1000 x 1000	2020	7272	5	10	14
	4000	14400	10	25	8
	7000	25200	20	75	5
	10100	36360	40	155	5

① TVJ ② TVJ with secondary silencer TX ③ TVJ-D

TVJ, Sound pressure level at differential pressure 150 Pa

Nominal size	\dot{V}	\dot{V}	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
	l/s	m ³ /h	L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}
			dB (A)			
200 x 100	45	162	43	17	31	19
	85	306	47	26	35	24
	150	540	49	36	38	29
	215	774	49	41	41	33
300 x 100	65	234	44	18	32	20
	120	432	47	27	35	25
	210	756	48	34	38	30
	320	1152	48	40	41	34
400 x 100	85	306	45	20	33	21
	170	612	47	28	37	27
	300	1080	47	35	40	32
	425	1530	48	40	43	36
500 x 100	105	378	46	20	34	22
	200	720	47	28	37	27
	350	1260	47	34	41	32
	535	1926	48	40	44	37



Nominal size	\dot{V}	\dot{V}	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
			L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}
	l/s	m ³ /h	dB (A)			
600 x 100	130	468	46	22	34	22
	260	936	47	28	38	29
	450	1620	47	35	42	34
	650	2340	48	39	45	37
200 x 200	85	306	45	20	33	21
	160	576	48	28	36	26
	280	1008	48	35	41	32
	415	1494	49	40	43	36
300 x 200	125	450	46	21	34	22
	240	864	47	27	37	27
	420	1512	48	34	41	33
	620	2232	48	39	44	37
400 x 200	165	594	46	22	35	23
	330	1188	46	27	38	29
	580	2088	47	34	43	35
	825	2970	48	39	46	39
500 x 200	205	738	46	22	36	24
	400	1440	46	27	39	30
	700	2520	47	34	44	36
	1035	3726	48	39	47	40
600 x 200	250	900	46	22	36	25
	500	1800	46	27	40	31
	870	1800	47	34	45	37
	1250	4500	47	39	47	41
700 x 200	290	1044	46	22	37	25
	560	2016	46	27	40	31
	980	3528	47	34	45	38
	1450	5220	47	39	48	42
800 x 200	330	1188	46	22	37	26
	660	2376	46	27	41	32
	1160	4176	47	34	46	38
	1650	5940	47	39	49	42
300 x 300	185	666	46	21	35	23
	360	1296	46	26	39	29
	630	2268	47	33	43	35
	920	3312	47	39	46	39
400 x 300	245	882	46	21	36	24
	480	1728	46	27	40	30
	840	3024	46	33	44	37
	1230	4428	47	39	47	41
500 x 300	305	1098	46	22	67	25
	600	2160	46	27	41	31
	1050	3780	47	33	45	38
	1535	5526	47	39	48	42
600 x 300	370	1332	46	22	37	26
	740	2664	46	27	42	32
	1290	4644	47	33	46	39
	1850	6660	47	39	49	42
700 x 300	430	1548	46	22	38	27
	840	3024	46	27	42	33
	1470	5292	46	33	47	40
	2150	7740	47	39	50	43

① TVJ ② TVJ with secondary silencer TX ③ TVJ-D



Nominal size	V̇	V̇	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
			L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}
	l/s	m ³ /h	dB (A)			
800 x 300	490	1764	45	22	38	27
	980	3528	46	27	43	34
	1720	6192	46	33	47	40
	2450	8820	47	39	50	44
900 x 300	555	1998	46	22	39	28
	1080	3888	46	27	43	34
	1890	6804	46	33	48	41
	2770	9972	47	39	51	44
1000 x 300	620	2232	45	22	39	28
	1240	4464	46	28	44	35
	2150	7740	46	33	48	41
	3100	11160	47	38	51	45
400 x 400	325	1170	45	21	37	26
	640	2304	46	27	41	31
	1120	4032	46	34	45	37
	1630	5868	47	40	49	42
500 x 400	410	1476	45	21	38	27
	800	2880	46	27	42	32
	1400	5040	46	34	46	38
	2040	7344	47	40	50	43
600 x 400	490	1764	45	21	38	27
	980	3528	46	27	43	33
	1720	6192	46	34	47	40
	2450	8820	47	39	50	44
700 x 400	570	2052	45	22	39	28
	1120	4032	46	27	43	34
	1960	7056	46	33	48	40
	2850	10260	47	39	51	44
800 x 400	650	2340	45	22	39	28
	1300	4680	45	27	44	35
	2280	8208	46	33	48	41
	3250	11700	47	39	51	45
900 x 400	735	2646	45	22	40	29
	1440	5184	46	26	44	35
	2520	9072	46	33	49	41
	3670	13212	47	39	52	46
1000 x 400	820	2952	45	22	40	29
	1640	5904	45	27	44	36
	2850	10260	46	33	49	42
	4100	14760	47	38	52	46
500 x 500	510	1836	45	21	38	27
	1000	3600	46	26	43	33
	1750	6300	46	33	47	39
	2540	9144	47	39	50	44
600 x 500	610	2196	45	21	39	28
	1200	4320	46	26	43	34
	2100	7560	46	33	48	40
	3050	10980	47	39	51	44
700 x 500	710	2556	45	21	39	29
	1400	5040	46	27	44	35
	2450	8820	46	33	48	41
	3550	12780	47	39	52	45

① TVJ ② TVJ with secondary silencer TX ③ TVJ-D

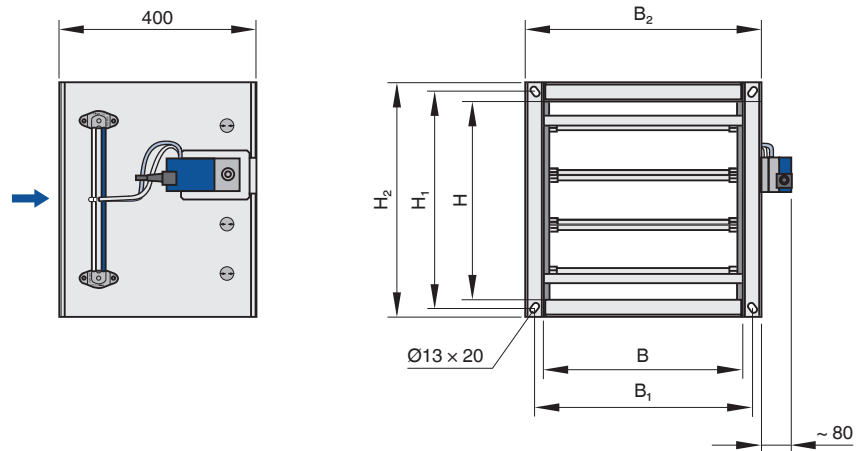


Nominal size	\dot{V}	\dot{V}	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
			L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}
	l/s	m ³ /h	dB (A)			
800 x 500	810	2916	45	22	40	29
	1600	5760	45	27	44	36
	2800	10080	46	33	49	42
	4050	14580	47	39	52	46
900 x 500	915	3294	45	21	40	30
	1800	6480	46	27	45	36
	3150	11340	46	33	50	42
	4570	16452	47	39	53	47
1000 x 500	1020	3672	44	22	41	30
	2000	7200	45	27	45	37
	3500	12600	46	33	50	43
	5100	18360	46	38	53	47
600 x 600	730	2628	45	21	40	28
	1440	5184	45	27	44	35
	2520	9072	46	33	49	41
	3650	13140	46	39	52	45
800 x 600	970	3492	45	22	41	30
	1920	6912	45	27	45	36
	3360	12096	46	33	50	43
	4850	17460	46	39	53	47
1000 x 600	1220	4392	45	22	41	31
	2400	8640	45	27	46	37
	4200	15120	46	33	51	44
	6100	21960	46	38	54	48
800 x 800	1300	4680	44	21	42	31
	2560	9216	45	27	47	38
	4480	16128	46	33	51	44
	6500	23400	46	39	55	49
1000 x 800	1620	5832	44	21	42	32
	3200	11520	45	26	47	39
	5600	20160	46	33	52	45
	8100	29160	46	39	55	49
1000 x 1000	2020	7272	44	21	43	33
	4000	14400	45	26	48	40
	7000	25200	45	33	53	46
	10100	36360	46	39	57	51

① TVJ ② TVJ with secondary silencer TX ③ TVJ-D



TVJ



Dimensions [mm] and weight [kg]

Nominal size	B	H	B ₁	B ₂	H ₁	H ₂	m kg
	mm	mm	mm	mm	mm	mm	
200 × 100	200	100	234	276	134	176	6
300 × 100	300	100	334	376	134	176	7
400 × 100	400	100	434	476	134	176	8
500 × 100	500	100	534	576	134	176	9
600 × 100	600	100	634	676	134	176	10
200 × 200	200	200	234	276	234	276	9
300 × 200	300	200	334	376	234	276	10
400 × 200	400	200	434	476	234	276	11
500 × 200	500	200	534	576	234	276	12
600 × 200	600	200	634	676	234	276	13
700 × 200	700	200	734	776	234	276	14
800 × 200	800	200	834	876	234	276	15
300 × 300	300	300	334	376	334	376	10
400 × 300	400	300	434	476	334	376	11
500 × 300	500	300	534	576	334	376	12
600 × 300	600	300	634	676	334	376	13
700 × 300	700	300	734	776	334	376	15
800 × 300	800	300	834	876	334	376	16
900 × 300	900	300	934	976	334	376	18
1000 × 300	1000	300	1034	1076	334	376	19

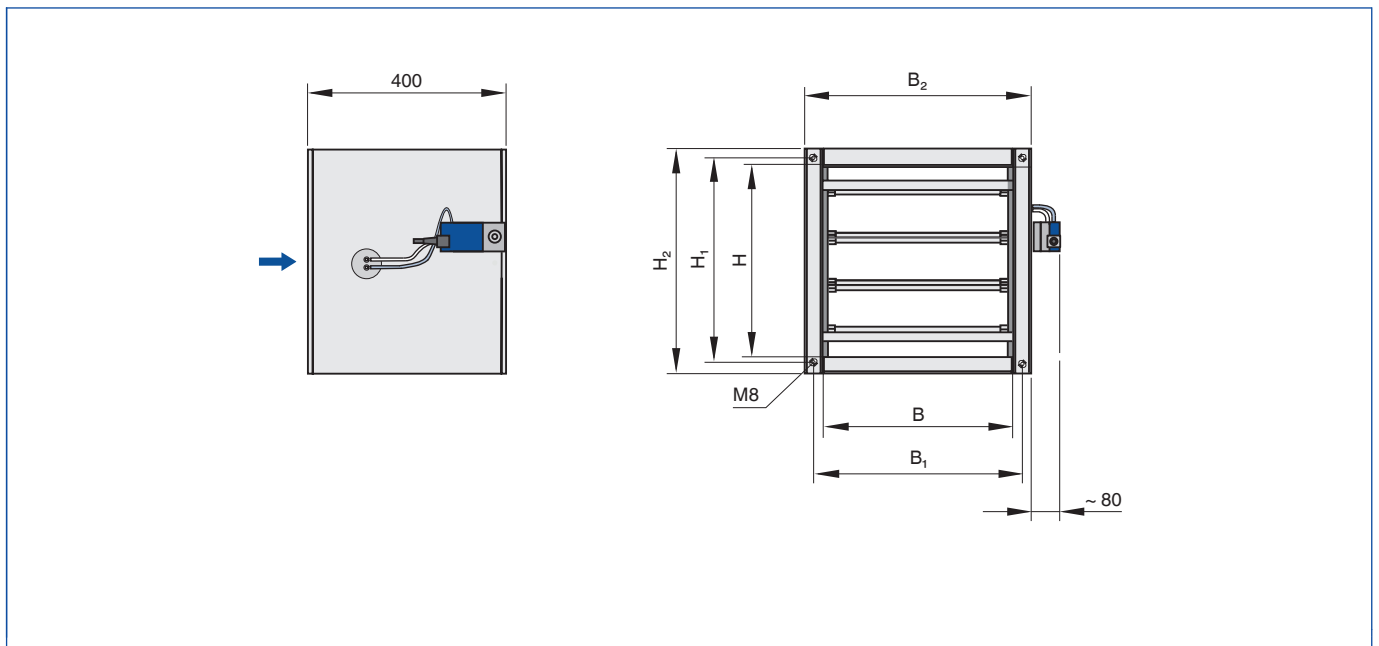


Dimensions [mm] and weight [kg]

Nominal size	B mm	H mm	B ₁ mm	B ₂ mm	H ₁ mm	H ₂ mm	m kg
400 x 400	400	400	434	476	434	476	14
500 x 400	500	400	534	576	434	476	15
600 x 400	600	400	634	676	434	476	16
700 x 400	700	400	734	776	434	476	17
800 x 400	800	400	834	876	434	476	18
900 x 400	900	400	934	976	434	476	21
1000 x 400	1000	400	1034	1076	434	476	20
500 x 500	500	500	534	576	534	576	19
600 x 500	600	500	634	676	534	576	20
700 x 500	700	500	734	776	534	576	22
800 x 500	800	500	834	876	534	576	23
900 x 500	900	500	934	976	534	576	25
1000 x 500	1000	500	1034	1076	534	576	26
600 x 600	600	600	634	676	634	676	19
800 x 600	800	600	834	876	634	676	23
1000 x 600	1000	600	1034	1076	634	676	27
800 x 800	800	800	834	876	834	876	28
1000 x 800	1000	800	1034	1076	834	876	32
1000 x 1000	1000	1000	1034	1076	1034	1076	38



TVJ-D



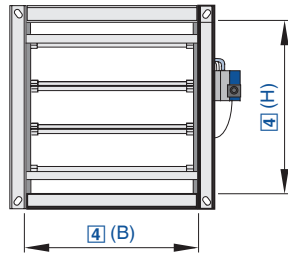
Dimensions [mm] and weight [kg]

Nominal size	B	H	B ₁	B ₂	H ₁	H ₂	m
	mm	mm	mm	mm	mm	mm	kg
200 × 100	200	100	234	280	134	180	9
300 × 100	300	100	334	380	134	180	11
400 × 100	400	100	434	480	134	180	12
500 × 100	500	100	534	580	134	180	14
600 × 100	600	100	634	680	134	180	15
200 × 200	200	200	234	280	234	280	14
300 × 200	300	200	334	380	234	280	15
400 × 200	400	200	434	480	234	280	17
500 × 200	500	200	534	580	234	280	18
600 × 200	600	200	634	680	234	280	20
700 × 200	700	200	734	780	234	280	21
800 × 200	800	200	834	880	234	280	23
300 × 300	300	300	334	380	334	380	15
400 × 300	400	300	434	480	334	380	17
500 × 300	500	300	534	580	334	380	18
600 × 300	600	300	634	680	334	380	20
700 × 300	700	300	734	780	334	380	22
800 × 300	800	300	834	880	334	380	24
900 × 300	900	300	934	980	334	380	26
1000 × 300	1000	300	1034	1080	334	380	29

Dimensions [mm] and weight [kg]

Nominal size	B	H	B ₁	B ₂	H ₁	H ₂	m
	mm	mm	mm	mm	mm	mm	kg
400 × 400	400	400	434	480	434	480	21
500 × 400	500	400	534	580	434	480	23
600 × 400	600	400	634	680	434	480	24
700 × 400	700	400	734	780	434	480	26
800 × 400	800	400	834	880	434	480	27
900 × 400	900	400	934	980	434	480	29
1000 × 400	1000	400	1034	1080	434	480	32
500 × 500	500	500	534	580	534	580	28
600 × 500	600	500	634	680	534	580	30
700 × 500	700	500	734	780	534	580	32
800 × 500	800	500	834	880	534	580	35
900 × 500	900	500	934	980	534	580	37
1000 × 500	1000	500	1034	1080	534	580	39
600 × 600	600	600	634	680	634	680	29
800 × 600	800	600	834	880	634	680	35
1000 × 600	1000	600	1034	1080	634	680	41
800 × 800	800	800	834	880	834	880	42
1000 × 800	1000	800	1034	1080	834	880	48
1000 × 1000	1000	1000	1034	1080	1034	1080	57





For normal and high volume flow rate ranges and low-leakage shut-off

Order code

TVT - D - P1 / 600x400 / B1B / E 0 / 200 - 900 / NO								
1	2	3	4	5	6	7	8	9
TVT - D / 600x400 / Easy								
1	2	4	5					

<p>1 Type TVT VAV terminal unit</p> <p>2 Acoustic cladding No entry: none D With acoustic cladding</p> <p>3 Material No entry: galvanised sheet steel P1 Powder-coated (RAL 7001), silver grey</p> <p>4 Nominal size [mm] B x H</p> <p>5 Attachments (control component) Example Easy Easy controller BC0 Compact controller B11 Universal controller</p>	<p>6 Operating mode E Single M Master S Slave F Constant value A Differential pressure control - extract air Z Differential pressure control - supply air</p> <p>7 Signal voltage range For the actual and setpoint value signals 0 0 - 10 V DC 2 2 - 10 V DC</p>	<p>8 Volume flow rates [m³/h or l/s], differential pressure [Pa] $\dot{V}_{min} - \dot{V}_{max}$ for factory setting Δp_{min} for factory setting (operating modes A, Z)</p> <p>9 Damper blade position Only with spring return actuators NO Power off to OPEN NC Power off to CLOSE</p>
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 Order code

TVT - D - P1 / 600x400 / ELAB / RS / ULZ / LAB / ...									
1	2	3	4	5	6	8	9	10	
TVT - D / P1 / 600x400 / ELAB / EC - E0 / ULZ / ...									
1	2	3	4	5	6	7	8	10	



<p>1 Type TVT VAV terminal unit</p> <p>2 Acoustic cladding No entry: none D With acoustic cladding</p> <p>3 Material No entry: galvanised sheet steel P1 Powder-coated (RAL 7001), silver grey</p> <p>4 Nominal size [mm] B x H</p> <p>5 Attachments (control component) ELAB EASYLAB controller TCU3 with fast-running actuator</p> <p>6 Equipment function Room control RS Supply air control (Room Supply) RE Extract air control (Room Exhaust) PC Differential pressure control Single operation SC Supply air controller EC Extract air controller</p> <p>7 External volume flow rate setting Only for single operation E0 Voltage signal 0 - 10 V DC E2 Voltage signal 2 - 10 V DC 2P Switch contacts (provided by others) for 2 switching steps</p>	<p>3P Switch contacts (provided by others) for 3 switching steps</p> <p>F Volume flow rate constant value, without signalling</p> <p>8 Expansion modules Option 1: Power supply No entry: 24 V AC T EM-TRF for 230 V AC U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS) Option 2: Communication interface No entry: none L EM-LON for LonWorks FTT-10A B EM-BAC-MOD-01 for BACnet MS/TP M EM-BAC-MOD-01 for Modbus RTU I EM-IP for BACnet/IP, Modbus/IP and webserver R EM-IP with real time clock Option 3: Automatic zero point correction No entry: none Z EM-AUTOZERO Solenoid valve for automatic zero point correction</p> <p>9 Additional functions Only for room control (equipment function) Room management function has been deactivated</p>	<p>LAB Extract air led system (laboratories) CLR Supply air led system (clean rooms) Room management function is active LAB-RMF Extract air led system (LAB) CLR-RMF Supply air led system</p> <p>10 Operating values [m³/h or l/s, Pa] For equipment function 'room control' with additional function RMF Total room extract air/supply air V₁: Standard mode V₂: Reduced operation V₃: Increased operation V₄: Constant room supply air V₅: Constant room extract air V₆: Supply air/extract air difference Δp_{setpoint}: Setpoint pressure (only with differential pressure control) For equipment function 'single operation' E0, E2: V_{min} / V_{max} 2P: V₁ / V₂ 3P: V₁ / V₂ / V₃ F: V₁</p> <p>Useful additions Room control panel BE-LCD-01 40-character display</p>
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 Order code

TVT - D - P1 / 600x400 / TMA / RE / 1500 / 750 / 100						
1	2	3	4	5	6	7

<p>1 Types TVT VAV terminal unit</p> <p>2 Acoustic cladding No entry: none D With acoustic cladding</p> <p>3 Material No entry: galvanised sheet steel P1 Powder-coated (RAL 7001), silver grey</p> <p>4 Nominal size [mm] B x H</p>	<p>5 Attachments (control component) TMA TCU-LON-II with fast-running actuator TMB TCU-LON-II with fast-running actuator (brushless motor)</p> <p>6 Equipment function RS Room supply air RE Room extract air PS Differential pressure control - supply air (Pressure Supply) PE Differential pressure control - extract air (Pressure Extract)</p>	<p>7 Operating values [m³/h or l/s, Pa] Depending on equipment function RS: ΔV / V_{constant} RE: V_{day} / V_{night} / V_{constant} PS: ΔV / V_{constant} / Δp_{setpoint} PE: V_{day} / V_{night} / V_{constant} / Δp_{setpoint} The room control volume flow rates are related to the total extract air volume flow rate for the room</p>
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Features

Rectangular VAV terminal units for standard applications regarding the supply air or extract air control in variable air volume systems where low-leakage shut-off is required

- ▶ For volume flow rate ranges up to 21,000 m³/h or 5,800 l/s
- ▶ Suitable for the control of volume flow rate, room pressure or duct pressure
- ▶ Electronic control components for different applications (Easy, Compact, Universal, and LABCONTROL)
- ▶ High control accuracy
- ▶ Suitable for airflow velocities up to 10 m/s
- ▶ Closed blade air leakage to EN 1751, class 3
- ▶ Casing air leakage to EN 1751, up to class C

Optional equipment and accessories

- ▶ Acoustic cladding for the reduction of case-radiated noise
- ▶ Secondary silencer Type TX for the reduction of air-regenerated noise
- ▶ Hot water heat exchanger of Type WT for reheating the airflow



Application

- ▶ Rectangular VARYCONTROL VAV terminal units of Type TVT for the precise supply air or extract air flow control in variable air volume systems
- ▶ Closed-loop volume flow control using an external power supply
- ▶ For controlling, restricting, or shutting off the airflow in air conditioning systems
- ▶ Shut-off by means of switching (equipment supplied by others)



Variants

- ▶ TVT: VAV terminal unit
- ▶ TVT-D: VAV terminal unit with acoustic cladding
- ▶ Units with acoustic cladding and/or secondary silencer Type TX for demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted



Construction

- ▶ Galvanised sheet steel
- ▶ P1: Powder-coated, silver grey (RAL 7001)



Attachments

- ▶ Easy controller: Compact unit consisting of controller with potentiometers, differential pressure transducer and actuator
- ▶ Compact controller: Compact unit consisting of controller, differential pressure transducer and actuator
- ▶ Universal controller: Controller, differential pressure transducer and actuators for special applications
- ▶ LABCONTROL: Control components for air management systems



Useful additions

- ▶ Secondary silencer Type TX for demanding acoustic requirements
- ▶ Heat exchanger Type WT



Special characteristics

- ▶ Integral differential pressure sensor with 3 mm measuring holes (resistant to dust and pollution)
- ▶ Factory set-up or programming and aerodynamic function testing
- ▶ Volume flow rate can be measured and subsequently adjusted on site; additional adjustment tool may be necessary



Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ Closed blade air leakage to EN 1751, class 3
- ▶ Meets the general requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class C (B + H ≤400, class B)



Technical data

Nominal sizes	200 × 100 to 1000 × 600 mm
Volume flow rate range	45 - 6100 l/s or 162 - 21960 m ³ /h
Volume flow rate control range (unit with dynamic differential pressure measurement)	Approx. 20 to 100% of the nominal volume flow rate
Minimum differential pressure	5 - 40 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}	\dot{V}	①	②	$\Delta\dot{V}$ ± %
			$\Delta p_{st\ min}$		
			Pa	Pa	
200 × 100	45	162	5	10	14
	85	306	10	25	8
	150	540	20	80	5
	215	774	40	155	5
300 × 100	65	234	5	10	14
	120	432	10	25	8
	210	756	20	70	5
	320	1152	40	155	5
400 × 100	85	306	5	10	14
	170	612	10	25	8
	300	1080	20	80	5
	425	1530	40	155	5
500 × 100	105	378	5	10	14
	200	720	10	25	8
	350	1260	20	70	5
	535	1926	40	155	5
600 × 100	130	468	5	10	14
	260	936	10	25	8
	450	1620	20	75	5
	650	2340	40	155	5
200 × 200	85	306	5	10	14
	160	576	10	25	8
	280	1008	20	75	5
	415	1494	40	155	5
300 × 200	125	450	5	10	14
	240	864	10	25	8
	420	1512	20	75	5
	620	2232	40	155	5
400 × 200	165	594	5	10	14
	330	1188	10	25	8
	580	2088	20	80	5
	825	2970	40	155	5
500 × 200	205	738	5	10	14
	400	1440	10	25	8
	700	2520	20	75	5
	1035	3726	40	155	5
600 × 200	250	900	5	10	14
	500	1800	10	25	8
	870	3132	20	80	5
	1250	4500	40	155	5
700 × 200	290	1044	5	10	14
	560	2016	10	25	8
	980	3528	20	75	5
	1450	5220	40	155	5



Volume flow rate ranges and minimum differential pressure values

Nominal size	Ḃ	Ḃ	①	②	ΔḂ ± %
			Δp _{st min}		
			Pa	Pa	
800 x 200	330	1188	5	10	14
	660	2376	10	25	8
	1160	4176	20	80	5
	1650	5940	40	155	5
300 x 300	185	666	5	10	14
	360	1296	10	25	8
	630	2268	20	75	5
	920	3312	35	150	5
400 x 300	245	882	5	10	14
	480	1728	10	25	8
	840	3024	20	70	8
	1230	4428	35	150	5
500 x 300	305	1098	5	10	14
	600	2160	10	25	8
	1050	3780	20	70	5
	1535	5526	35	150	5
600 x 300	370	1332	5	10	14
	740	2664	10	25	8
	1290	4644	20	75	5
	1850	6660	35	150	5
700 x 300	430	1548	5	10	14
	840	3024	10	25	8
	1470	5292	20	70	5
	2150	7740	35	150	5
800 x 300	490	1764	5	10	14
	980	3528	10	25	8
	1720	6192	20	75	5
	2450	8820	35	150	5
900 x 300	555	1998	5	10	14
	1080	3888	10	25	8
	1890	6804	20	70	5
	2770	9972	35	150	5
1000 x 300	620	2232	5	10	14
	1240	4464	10	25	8
	2150	7740	20	75	5
	3100	11160	35	150	5
400 x 400	325	1170	5	10	14
	640	2304	10	25	8
	1120	4032	20	75	5
	1630	5868	35	150	5
500 x 400	410	1476	5	10	14
	800	2880	10	25	8
	1400	5040	20	75	5
	2040	7344	35	150	5



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		$\Delta p_{st \min}$		$\Delta \dot{V}$ ± %
	l/s	m ³ /h	①	②	
			Pa	Pa	
600 × 400	490	1764	5	10	14
	980	3528	10	25	8
	1720	6192	20	75	5
	2450	8820	35	150	5
700 × 400	570	2052	5	10	14
	1120	4032	10	25	8
	1960	7056	20	75	5
	2850	10260	35	150	5
800 × 400	650	2340	5	10	14
	1300	4680	10	25	8
	2280	8208	20	75	5
	3250	11700	35	150	5
900 × 400	735	2646	5	10	14
	1440	5184	10	25	8
	2520	9072	20	75	5
	3670	13212	35	150	5
1000 × 400	820	2952	5	10	14
	1640	5904	10	25	8
	2850	10260	20	75	5
	4100	14760	35	150	5
500 × 500	510	1836	5	10	14
	1000	3600	10	25	8
	1750	6300	20	75	5
	2540	9144	40	155	5
600 × 500	610	2196	5	10	14
	1200	4320	10	25	8
	2100	7560	20	75	5
	3050	10980	40	155	5



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	$\Delta\dot{V}$ ± %
	l/s	m ³ /h	$\Delta p_{st\ min}$		
			Pa	Pa	
700 x 500	710	2556	5	10	14
	1400	5040	10	25	8
	2450	8820	20	75	5
	3550	12780	40	155	5
800 x 500	810	2916	5	10	14
	1600	5760	10	25	8
	2800	10080	20	75	5
	4050	14580	40	155	5
900 x 500	915	3294	5	10	14
	1800	6480	10	25	8
	3150	11340	20	75	5
	4570	16452	40	155	5
1000 x 500	1020	3672	5	10	14
	2000	7200	10	25	8
	3500	12600	20	75	5
	5100	18360	40	155	5
600 x 600	730	2628	5	10	14
	1440	5184	10	25	8
	2520	9072	20	75	5
	3650	13140	40	155	5
800 x 600	970	3492	5	10	14
	1920	6912	10	25	8
	3360	12096	20	75	5
	4850	17460	40	155	5
1000 x 600	1220	4392	5	10	14
	2400	8640	10	25	8
	4200	15120	20	75	5
	6100	21960	40	155	5



TVT, Sound pressure level at differential pressure 150 Pa

Nominal size	\dot{V}	\dot{V}	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
	l/s	m ³ /h	L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}
			dB (A)			
200 x 100	45	162	43	17	31	19
	85	306	47	26	35	24
	150	540	49	36	38	29
	215	774	49	41	41	33
300 x 100	65	234	44	18	32	20
	120	432	47	27	35	25
	210	756	48	34	38	30
	320	1152	48	40	41	34
400 x 100	85	306	45	20	33	21
	170	612	47	28	37	27
	300	1080	47	35	40	32
	425	1530	48	40	43	36
500 x 100	105	378	46	20	34	22
	200	720	47	28	37	27
	350	1260	47	34	41	32
	535	1926	48	40	44	37



Nominal size	Ḃ	Ḃ	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
			L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}
	l/s	m ³ /h	dB (A)			
600 x 100	130	468	46	22	34	22
	260	936	47	28	38	29
	450	1620	47	35	42	34
	650	2340	48	39	45	37
200 x 200	85	306	45	20	33	21
	160	576	48	28	36	26
	280	1008	48	35	41	32
	415	1494	49	40	43	36
300 x 200	125	450	46	21	34	22
	240	864	47	27	37	27
	420	1512	48	34	41	33
	620	2232	48	39	44	37
400 x 200	165	594	46	22	35	23
	330	1188	46	27	38	29
	580	2088	47	34	43	35
	825	2970	48	39	46	39
500 x 200	205	738	46	22	36	24
	400	1440	46	27	39	30
	700	2520	47	34	44	36
	1035	3726	48	39	47	40
600 x 200	250	900	46	22	36	25
	500	1800	46	27	40	31
	870	1800	47	34	45	37
	1250	4500	47	39	47	41
700 x 200	290	1044	46	22	37	25
	560	2016	46	27	40	31
	980	3528	47	34	45	38
	1450	5220	47	39	48	42
800 x 200	330	1188	46	22	37	26
	660	2376	46	27	41	32
	1160	4176	47	34	46	38
	1650	5940	47	39	49	42
300 x 300	185	666	46	21	35	23
	360	1296	46	26	39	29
	630	2268	47	33	43	35
	920	3312	47	39	46	39
400 x 300	245	882	46	21	36	24
	480	1728	46	27	40	30
	840	3024	46	33	44	37
	1230	4428	47	39	47	41
500 x 300	305	1098	46	22	67	25
	600	2160	46	27	41	31
	1050	3780	47	33	45	38
	1535	5526	47	39	48	42
600 x 300	370	1332	46	22	37	26
	740	2664	46	27	42	32
	1290	4644	47	33	46	39
	1850	6660	47	39	49	42
700 x 300	430	1548	46	22	38	27
	840	3024	46	27	42	33
	1470	5292	46	33	47	40
	2150	7740	47	39	50	43

① TVT ② TVT with secondary silencer TX ③ TVT-D



Nominal size	Ḃ	Ḃ	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
	L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}	dB (A)	
	l/s	m ³ /h				
800 x 300	490	1764	45	22	38	27
	980	3528	46	27	43	34
	1720	6192	46	33	47	40
	2450	8820	47	39	50	44
900 x 300	555	1998	46	22	39	28
	1080	3888	46	27	43	34
	1890	6804	46	33	48	41
	2770	9972	47	39	51	44
1000 x 300	620	2232	45	22	39	28
	1240	4464	46	28	44	35
	2150	7740	46	33	48	41
	3100	11160	47	38	51	45
400 x 400	325	1170	45	21	37	26
	640	2304	46	27	41	31
	1120	4032	46	34	45	37
	1630	5868	47	40	49	42
500 x 400	410	1476	45	21	38	27
	800	2880	46	27	42	32
	1400	5040	46	34	46	38
	2040	7344	47	40	50	43
600 x 400	490	1764	45	21	38	27
	980	3528	46	27	43	33
	1720	6192	46	34	47	40
	2450	8820	47	39	50	44
700 x 400	570	2052	45	22	39	28
	1120	4032	46	27	43	34
	1960	7056	46	33	48	40
	2850	10260	47	39	51	44
800 x 400	650	2340	45	22	39	28
	1300	4680	45	27	44	35
	2280	8208	46	33	48	41
	3250	11700	47	39	51	45
900 x 400	735	2646	45	22	40	29
	1440	5184	46	26	44	35
	2520	9072	46	33	49	41
	3670	13212	47	39	52	46
1000 x 400	820	2952	45	22	40	29
	1640	5904	45	27	44	36
	2850	10260	46	33	49	42
	4100	14760	47	38	52	46
500 x 500	510	1836	45	21	38	27
	1000	3600	46	26	43	33
	1750	6300	46	33	47	39
	2540	9144	47	39	50	44
600 x 500	610	2196	45	21	39	28
	1200	4320	46	26	43	34
	2100	7560	46	33	48	40
	3050	10980	47	39	51	44
700 x 500	710	2556	45	21	39	29
	1400	5040	46	27	44	35
	2450	8820	46	33	48	41
	3550	12780	47	39	52	45



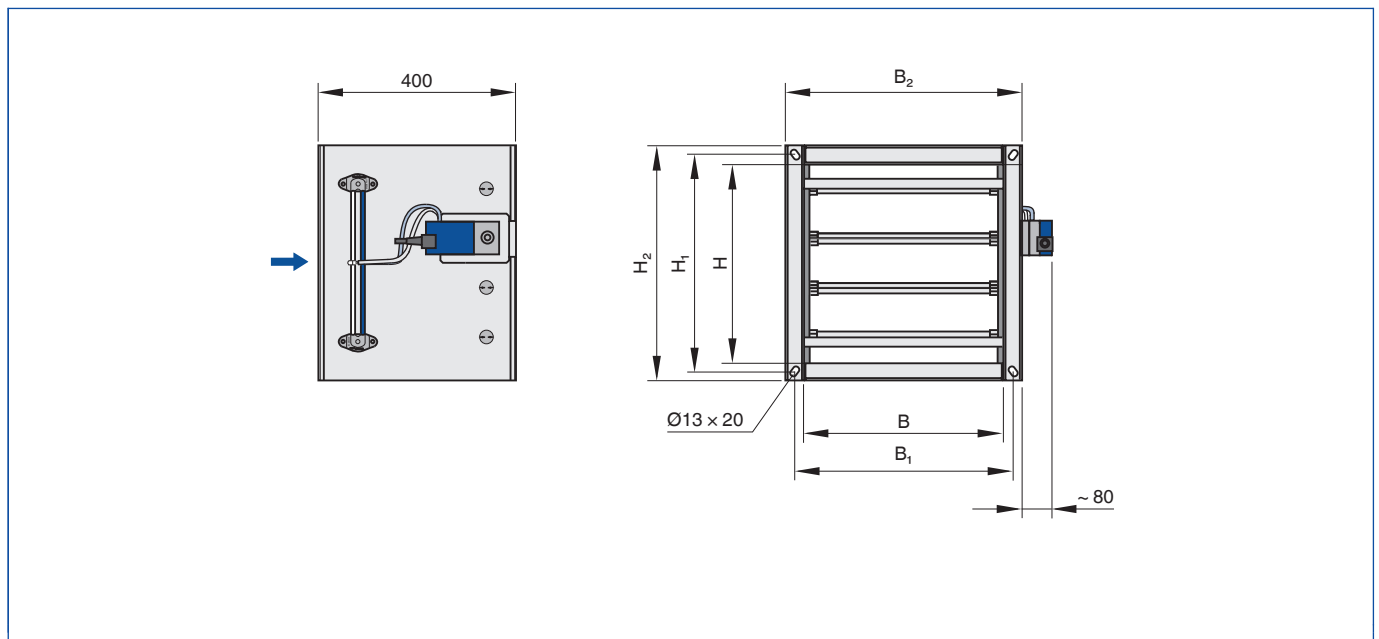
① TVT ② TVT with secondary silencer TX ③ TVT-D



Nominal size	\dot{V}	\dot{V}	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
			L_{PA}	L_{PA1}	L_{PA2}	L_{PA3}
	l/s	m ³ /h	dB (A)			
800 x 500	810	2916	45	22	40	29
	1600	5760	45	27	44	36
	2800	10080	46	33	49	42
	4050	14580	47	39	52	46
900 x 500	915	3294	45	21	40	30
	1800	6480	46	27	45	36
	3150	11340	46	33	50	42
	4570	16452	47	39	53	47
1000 x 500	1020	3672	44	22	41	30
	2000	7200	45	27	45	37
	3500	12600	46	33	50	43
	5100	18360	46	38	53	47
600 x 600	730	2628	45	21	40	28
	1440	5184	45	27	44	35
	2520	9072	46	33	49	41
	3650	13140	46	39	52	45
800 x 600	970	3492	45	22	41	30
	1920	6912	45	27	45	36
	3360	12096	46	33	50	43
	4850	17460	46	39	53	47
1000 x 600	1220	4392	45	22	41	31
	2400	8640	45	27	46	37
	4200	15120	46	33	51	44
	6100	21960	46	38	54	48

① TVT ② TVT with secondary silencer TX ③ TVT-D

TVT



Dimensions [mm] and weight [kg]

Nominal size	B mm	H mm	B ₁ mm	B ₂ mm	H ₁ mm	H ₂ mm	m kg
200 × 100	200	100	234	276	134	176	6
300 × 100	300	100	334	376	134	176	7
400 × 100	400	100	434	476	134	176	8
500 × 100	500	100	534	576	134	176	9
600 × 100	600	100	634	676	134	176	10
200 × 200	200	200	234	276	234	276	9
300 × 200	300	200	334	376	234	276	10
400 × 200	400	200	434	476	234	276	11
500 × 200	500	200	534	576	234	276	12
600 × 200	600	200	634	676	234	276	13
700 × 200	700	200	734	776	234	276	14
800 × 200	800	200	834	876	234	276	15
300 × 300	300	300	334	376	334	376	10
400 × 300	400	300	434	476	334	376	11
500 × 300	500	300	534	576	334	376	12
600 × 300	600	300	634	676	334	376	13
700 × 300	700	300	734	776	334	376	15
800 × 300	800	300	834	876	334	376	16
900 × 300	900	300	934	976	334	376	18
1000 × 300	1000	300	1034	1076	334	376	19

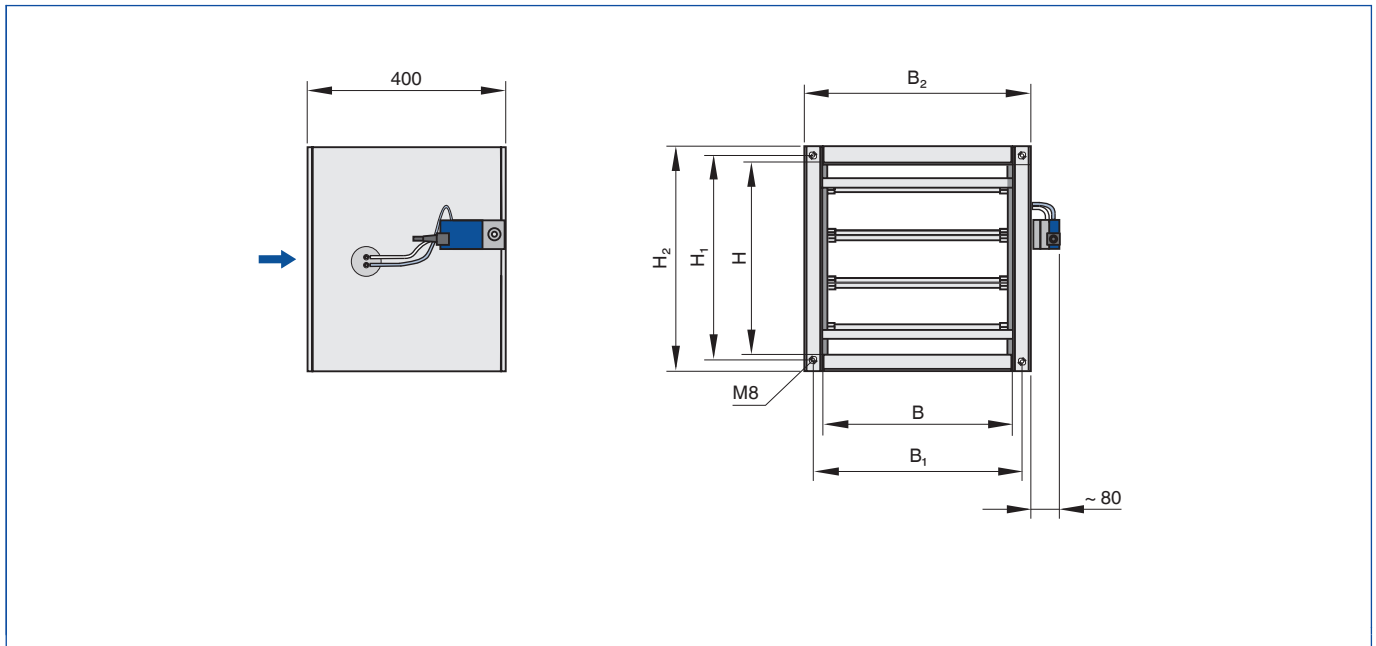


Dimensions [mm] and weight [kg]

Nominal size	B mm	H mm	B ₁ mm	B ₂ mm	H ₁ mm	H ₂ mm	m kg
400 × 400	400	400	434	476	434	476	14
500 × 400	500	400	534	576	434	476	15
600 × 400	600	400	634	676	434	476	16
700 × 400	700	400	734	776	434	476	17
800 × 400	800	400	834	876	434	476	18
900 × 400	900	400	934	976	434	476	21
1000 × 400	1000	400	1034	1076	434	476	20
500 × 500	500	500	534	576	534	576	19
600 × 500	600	500	634	676	534	576	20
700 × 500	700	500	734	776	534	576	22
800 × 500	800	500	834	876	534	576	23
900 × 500	900	500	934	976	534	576	25
1000 × 500	1000	500	1034	1076	534	576	26
600 × 600	600	600	634	676	634	676	19
800 × 600	800	600	834	876	634	676	23
1000 × 600	1000	600	1034	1076	634	676	27



TVT-D



Dimensions [mm] and weight [kg]

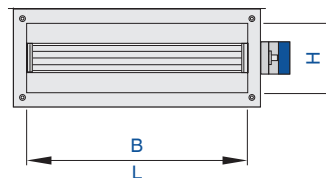
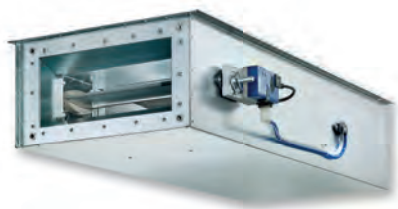
Nominal size	B	H	B ₁	B ₂	H ₁	H ₂	m kg
	mm	mm	mm	mm	mm	mm	
200 × 100	200	100	234	280	134	180	9
300 × 100	300	100	334	380	134	180	11
400 × 100	400	100	434	480	134	180	12
500 × 100	500	100	534	580	134	180	14
600 × 100	600	100	634	680	134	180	15
200 × 200	200	200	234	280	234	280	14
300 × 200	300	200	334	380	234	280	15
400 × 200	400	200	434	480	234	280	17
500 × 200	500	200	534	580	234	280	18
600 × 200	600	200	634	680	234	280	20
700 × 200	700	200	734	780	234	280	21
800 × 200	800	200	834	880	234	280	23
300 × 300	300	300	334	380	334	380	15
400 × 300	400	300	434	480	334	380	17
500 × 300	500	300	534	580	334	380	18
600 × 300	600	300	634	680	334	380	20
700 × 300	700	300	734	780	334	380	22
800 × 300	800	300	834	880	334	380	24
900 × 300	900	300	934	980	334	380	26
1000 × 300	1000	300	1034	1080	334	380	29



Dimensions [mm] and weight [kg]

Nominal size	B mm	H mm	B ₁ mm	B ₂ mm	H ₁ mm	H ₂ mm	m kg
400 x 400	400	400	434	480	434	480	21
500 x 400	500	400	534	580	434	480	23
600 x 400	600	400	634	680	434	480	24
700 x 400	700	400	734	780	434	480	26
800 x 400	800	400	834	880	434	480	27
900 x 400	900	400	934	980	434	480	29
1000 x 400	1000	400	1034	1080	434	480	32
500 x 500	500	500	534	580	534	580	28
600 x 500	600	500	634	680	534	580	30
700 x 500	700	500	734	780	534	580	32
800 x 500	800	500	834	880	534	580	35
900 x 500	900	500	934	980	534	580	37
1000 x 500	1000	500	1034	1080	534	580	39
600 x 600	600	600	634	680	634	680	29
800 x 600	800	600	834	880	634	680	35
1000 x 600	1000	600	1034	1080	634	680	41





For supply air systems with demanding acoustic requirements and low airflow velocities

Order code

TZ-Silenzio - D / 200 / B1B / E 0 / 400 - 1200 / NO

1 2 3 4 5 6 7 8

TZ-Silenzio - D / 200 / Easy

1 2 3 4

1 Type

TZ-Silenzio VAV terminal unit, supply air

2 Acoustic cladding

No entry: none
D With acoustic cladding

3 Nominal size

125, 160, 200, 250, 315

4 Attachments (control component)

Example
Easy Easy controller
BC0 Compact controller
B13 Universal controller

5 Operating mode

E Single
M Master
S Slave
F Constant value
Z Differential pressure control - supply air

6 Signal voltage range

For the actual and setpoint value signals
0 0 - 10 V DC
2 2 - 10 V DC

7 Volume flow rates [m³/h or l/s], differential pressure [Pa]

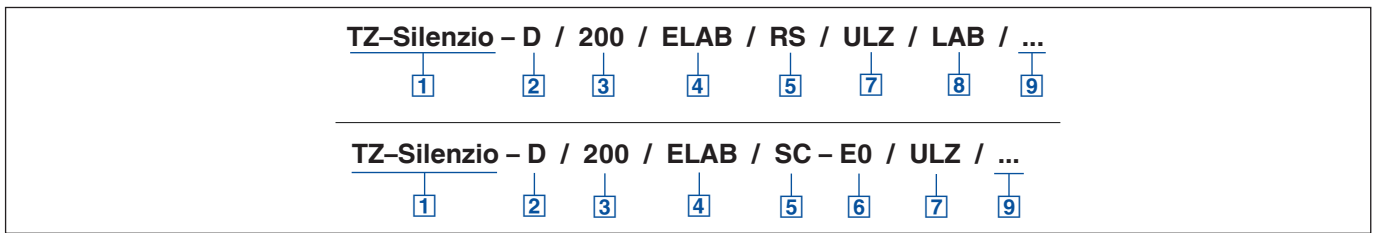
\dot{V}_{\min} - \dot{V}_{\max} for factory setting
 Δp_{\min} for factory setting (operating mode Z)

8 Damper blade position

Only with spring return actuators
NO Power off to OPEN
NC Power off to CLOSE

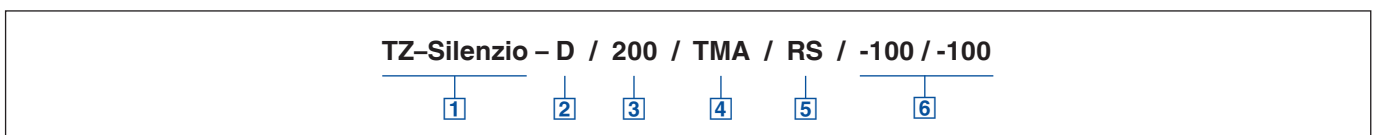


 **Order code**



<p>1 Type TZ-Silenzio VAV terminal unit, supply air</p> <p>2 Acoustic cladding No entry: none D With acoustic cladding</p> <p>3 Nominal size 125, 160, 200, 250, 315</p> <p>4 Attachments (control component) ELAB EASYLAB controller TCU3 with fast-running actuator</p> <p>5 Equipment function RS Room control RS Supply air control (Room Supply) PC Differential pressure control</p> <p>6 External volume flow rate setting Only for single operation E0 Voltage signal 0 - 10 V DC E2 Voltage signal 2 - 10 V DC 2P Switch contacts (provided by others) for 2 switching steps 3P Switch contacts (provided by others) for 3 switching steps F Volume flow rate constant value, without signalling</p>	<p>7 Expansion modules Option 1: Power supply No entry: 24 V AC T EM-TRF for 230 V AC U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)</p> <p>Option 2: Communication interface No entry: none L EM-LON for LonWorks FTT-10A B EM-BAC-MOD-01 for BACnet MS/TP M EM-BAC-MOD-01 for Modbus RTU I EM-IP for BACnet/IP, Modbus/IP and webservice R EM-IP with real time clock</p> <p>Option 3: Automatic zero point correction No entry: none Z EM-AUTOZERO Solenoid valve for automatic zero point correction</p> <p>8 Additional functions Only for room control (equipment function) Room management function has been deactivated LAB Extract air led system (laboratories) CLR Supply air led system (clean rooms) Room management function is active LAB-RMF Extract air led system (LAB) CLR-RMF Supply air led system</p>	<p>9 Operating values [m³/h or l/s, Pa] For equipment function 'room control' with additional function RMF Total room extract air/supply air \dot{V}_1: Standard mode \dot{V}_2: Reduced operation \dot{V}_3: Increased operation \dot{V}_4: Constant room supply air \dot{V}_5: Constant room extract air \dot{V}_6: Supply air/extract air difference $\Delta p_{\text{setpoint}}$: Setpoint pressure (only with differential pressure control) For equipment function 'single operation' E0, E2: $\dot{V}_{\text{min}} / \dot{V}_{\text{max}}$ 2P: \dot{V}_1 / \dot{V}_2 3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$ F: \dot{V}_1</p> <p>Useful additions Room control panel BE-LCD-01 40-character display</p>
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 **Order code**



<p>1 Type TZ-Silenzio VAV terminal unit, supply air</p> <p>2 Acoustic cladding No entry: none D With acoustic cladding</p> <p>3 Nominal size 125, 160, 200, 250, 315</p>	<p>4 Attachments (control component) TMA TCU-LON-II with fast-running actuator TMB TCU-LON-II with fast-running actuator (brushless motor)</p> <p>5 Equipment function RS Room supply air PS Differential pressure control - supply air (Pressure Supply)</p>	<p>6 Operating values [m³/h or l/s, Pa] Depending on equipment function RS: $\Delta \dot{V} / \dot{V}_{\text{constant}}$ PS: $\Delta \dot{V} / \dot{V}_{\text{constant}} / \Delta p_{\text{Soll}}$ The room control volume flow rates are related to the total extract air volume flow rate for the room</p>
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+ Features

Rectangular VAV terminal units for the supply air or extract air control in buildings with variable air volume systems, demanding acoustic requirements and low airflow velocities

- ▶ Highly effective integral attenuator
- ▶ Optimised for airflow velocities of 0.7 - 6 m/s
- ▶ High control accuracy even in case of unfavourable upstream conditions
- ▶ Compact construction with rectangular connections on both ends
- ▶ Electronic control components for different applications (Easy, Compact, Universal, and LABCONTROL)
- ▶ Closed blade air leakage to EN 1751, class 4
- ▶ Casing air leakage to EN 1751, class B

Optional equipment and accessories

- ▶ Acoustic cladding for the reduction of case-radiated noise
- ▶ Secondary silencer Type TS for the reduction of air-regenerated noise
- ▶ Hot water heat exchanger of Type WT for reheating the airflow

Application

- ▶ VARYCONTROL VAV terminal units of Type TZ-Silenzio for the supply air control in variable air volume systems with low airflow velocities
- ▶ Closed-loop volume flow control using an external power supply
- ▶ Integral attenuator for demanding acoustic requirements
- ▶ Shut-off by means of switching (equipment supplied by others)

Variants

- ▶ TZ-Silenzio: Supply air unit
- ▶ TZ-Silenzio-D: Supply air unit with acoustic cladding
- ▶ Units with acoustic cladding and/or secondary silencer Type TS for very demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted

Attachments

- ▶ Easy controller: Compact unit with potentiometers
- ▶ Compact controller: Compact unit consisting of controller, differential pressure transducer and actuator
- ▶ Universal controller: Controller, differential pressure transducer and actuators for special applications
- ▶ LABCONTROL: Control components for air management systems

Useful additions

- ▶ Secondary silencer Type TS
- ▶ Heat exchanger Type WT

Special characteristics

- ▶ Hygiene tested and certified
- ▶ Direct connection of ducting
- ▶ Factory set-up or programming and aerodynamic function testing
- ▶ Volume flow rate can be measured and subsequently adjusted on site; additional adjustment tool may be necessary

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ VDI 2083, air cleanliness class 3, and US standard 209E, class 100
- ▶ Closed blade air leakage to EN 1751, class 4
- ▶ Meets the increased requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class B

Technical data

Nominal sizes	125 - 315
Volume flow rate range	30 - 840 l/s or 108 - 3024 m ³ /h
Volume flow rate control range (unit with dynamic differential pressure measurement)	Approx. 10 to 100% of the nominal volume flow rate
Minimum differential pressure	5 - 65 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		$\Delta p_{st \min}$		$\Delta \dot{V}$ ± %
	l/s	m ³ /h	Pa	Pa	
125	30	108	5	5	8
	70	252	10	20	7
	125	450	35	60	5
	180	648	65	120	5
160	45	162	5	5	8
	110	396	10	20	7
	195	702	30	55	5
	275	990	55	105	5
200	65	234	5	5	8
	150	540	10	20	7
	265	954	30	60	5
	380	1368	55	120	5
250	85	306	5	5	8
	200	720	10	20	7
	345	1242	30	60	5
	495	1782	60	115	5
315	145	522	5	5	8
	335	1206	15	20	7
	590	2124	35	50	5
	840	3024	65	105	5



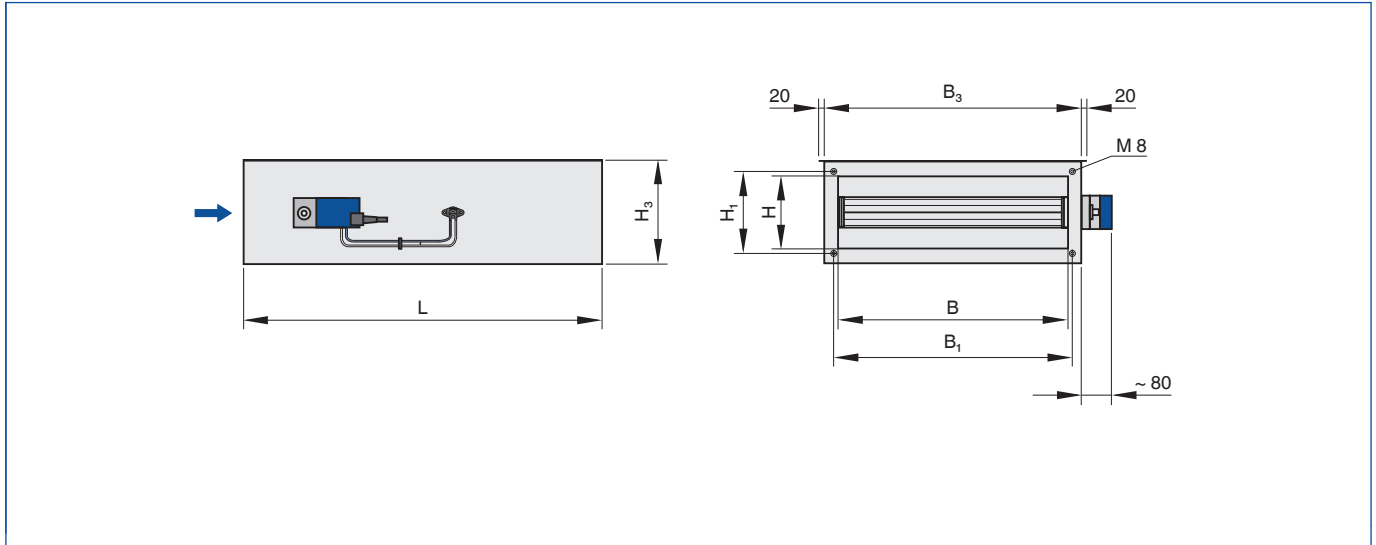
TZ-Silenzio, Sound pressure level at differential pressure 150 Pa

Nominal size	\dot{V}	\dot{V}	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
	l/s	m ³ /h	L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}
125	30	108	15	5	10	8
	70	252	26	16	19	19
	125	450	34	23	26	26
	180	648	39	28	30	31
160	45	162	15	5	13	10
	110	396	27	17	22	21
	195	702	34	23	29	29
	275	990	37	27	34	34
200	65	234	13	1	12	8
	150	540	23	12	22	18
	265	954	29	17	28	26
	380	1368	32	22	33	31
250	85	306	14	3	13	8
	200	720	23	12	23	19
	345	1242	28	17	30	26
	495	1782	32	20	34	31
315	145	522	15	4	17	12
	335	1206	23	11	27	23
	590	2124	28	16	35	31
	840	3024	32	21	39	36

① TZ-Silenzio ② TZ-Silenzio with secondary silencer TS ③ TZ-Silenzio-D



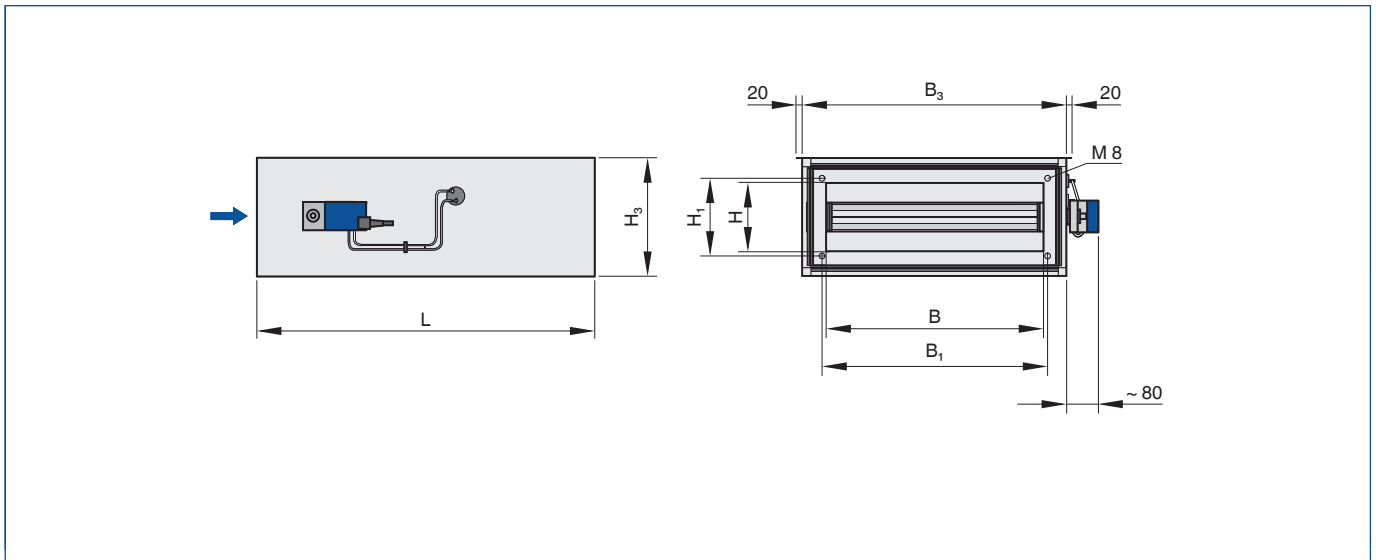
TZ-Silenzio



Dimensions [mm] and weight [kg]

Nominal size	L	B ₃	H ₃	B	B ₁	H	H ₁	m kg
	mm	mm	mm	mm	mm	mm	mm	
125	1035	300	236	198	232	152	186	17
160	1035	410	236	308	342	152	186	21
200	1250	560	281	458	492	210	244	32
250	1250	700	311	598	632	201	235	41
315	1250	900	361	798	832	252	286	54

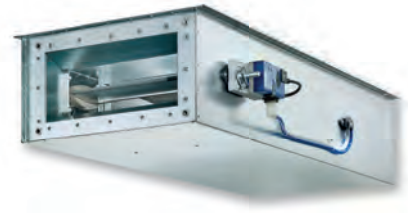
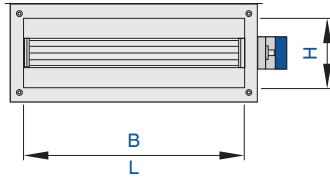
TZ-Silenzio-D



Dimensions [mm] and weight [kg]

Nominal size	L	B ₃	H ₃	B	B ₁	H	H ₁	m kg
	mm	mm	mm	mm	mm	mm	mm	
125	1035	380	316	198	232	152	186	32
160	1035	490	316	308	342	152	186	38
200	1250	640	361	458	492	210	244	64
250	1250	780	391	598	632	201	235	72
315	1250	980	441	798	832	252	286	91





For extract air systems with demanding acoustic requirements and low airflow velocities

 **Order code**

TA-Silenzio - D / 200 / B1B / E 0 / 400 - 1200 / NO							
1	2	3	4	5	6	7	8
TA-Silenzio - D / 200 / Easy							
1	2	3	4				

1 Type

TA-Silenzio VAV terminal unit, extract air

2 Acoustic cladding

No entry: none

D With acoustic cladding

3 Nominal size

125, 160, 200, 250, 315

4 Attachments (control component)

Example

Easy Easy controller

BC0 Compact controller

B13 Universal controller

5 Operating mode

E Single

M Master

S Slave

F Constant value

A Differential pressure control - extract air

6 Signal voltage range

For the actual and setpoint value signals

0 0 - 10 V DC

2 2 - 10 V DC

7 Volume flow rates [m³/h or l/s], differential pressure [Pa]

\dot{V}_{\min} - \dot{V}_{\max} for factory setting

Δp_{\min} for factory setting (operating mode A)

8 Damper blade position

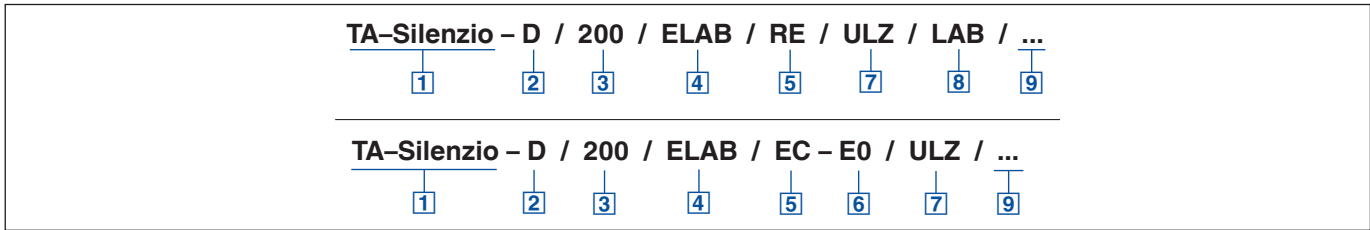
Only with spring return actuators

NO Power off to OPEN

NC Power off to CLOSE

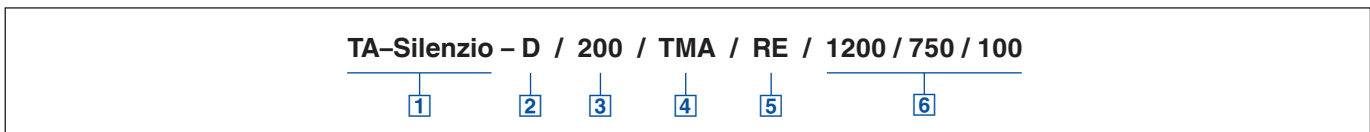


 Order code



<p>1 Type TA-Silenzio VAV terminal unit, extract air</p> <p>2 Acoustic cladding No entry: none D With acoustic cladding</p> <p>3 Nominal size 125, 160, 200, 250, 315</p> <p>4 Attachments (control component) ELAB EASYLAB controller TCU3 with fast-running actuator</p> <p>5 Equipment function Room control RE Extract air control (Room Exhaust) PC Differential pressure control</p> <p>Single operation EC Extract air controller</p> <p>6 External volume flow rate setting Only for single operation E0 Voltage signal 0 - 10 V DC E2 Voltage signal 2 - 10 V DC 2P Switch contacts (provided by others) for 2 switching steps 3P Switch contacts (provided by others) for 3 switching steps F Volume flow rate constant value, without signalling</p>	<p>7 Expansion modules Option 1: Power supply No entry: 24 V AC T EM-TRF for 230 V AC U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)</p> <p>Option 2: Communication interface No entry: none L EM-LON for LonWorks FTT-10A B EM-BAC-MOD-01 for BACnet MS/TP M EM-BAC-MOD-01 for Modbus RTU I EM-IP for BACnet/IP, Modbus/IP and webservice R EM-IP with real time clock</p> <p>Option 3: Automatic zero point correction No entry: none Z EM-AUTOZERO Solenoid valve for automatic zero point correction</p> <p>8 Additional functions Only for room control (equipment function) Room management function has been deactivated LAB Extract air led system (laboratories) CLR Supply air led system (clean rooms) Room management function is active LAB-RMF Extract air led system (LAB) CLR-RMF Supply air led system</p>	<p>9 Operating values [m³/h or l/s, Pa] For equipment function 'room control' with additional function RMF Total room extract air/supply air \dot{V}_1: Standard mode \dot{V}_2: Reduced operation \dot{V}_3: Increased operation \dot{V}_4: Constant room supply air \dot{V}_5: Constant room extract air \dot{V}_6: Supply air/extract air difference $\Delta p_{\text{setpoint}}$: Setpoint pressure (only with differential pressure control) For equipment function 'single operation' E0, E2: $\dot{V}_{\text{min}} / \dot{V}_{\text{max}}$ 2P: \dot{V}_1 / \dot{V}_2 3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$ F: \dot{V}_1</p> <p>Useful additions Room control panel BE-LCD-01 40-character display</p>
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 Order code



<p>1 Type TA-Silenzio VAV terminal unit, extract air</p> <p>2 Acoustic cladding No entry: none D With acoustic cladding</p> <p>3 Nominal size 125, 160, 200, 250, 315</p>	<p>4 Attachments (control component) TMA TCU-LON-II with fast-running actuator TMB TCU-LON-II with fast-running actuator (brushless motor)</p> <p>5 Equipment function RE Room extract air PE Differential pressure control - extract air (Pressure Extract)</p>	<p>6 Operating values [m³/h or l/s, Pa] Depending on equipment function RE: $\dot{V}_{\text{day}} / \dot{V}_{\text{night}} / \dot{V}_{\text{constant}}$ PE: $\dot{V}_{\text{day}} / \dot{V}_{\text{night}} / \dot{V}_{\text{constant}} / \Delta p_{\text{setpoint}}$ The room control volume flow rates are related to the total extract air volume flow rate for the room</p>
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+ Features

- Rectangular VAV terminal units for the extract air control in buildings with variable air volume systems, demanding acoustic requirements and low airflow velocities
- ▶ Highly effective integral attenuator
 - ▶ Optimised for airflow velocities of 0.7 - 6 m/s
 - ▶ High control accuracy even in case of unfavourable upstream conditions
 - ▶ Compact construction with rectangular connections on both ends
 - ▶ Electronic control components for different applications (Easy, Compact, Universal, and LABCONTROL)
 - ▶ Closed blade air leakage to EN 1751, class 4
 - ▶ Casing air leakage to EN 1751, class B
- Optional equipment and accessories
- ▶ Acoustic cladding for the reduction of case-radiated noise
 - ▶ Secondary silencer Type TS for the reduction of air-regenerated noise

Application

- ▶ VARYCONTROL VAV terminal units of Type TA-Silenzio for the extract air flow control in variable air volume systems with low airflow velocities
- ▶ Closed-loop volume flow control using an external power supply
- ▶ Integral attenuator for demanding acoustic requirements
- ▶ Shut-off by means of switching (equipment supplied by others)

Variants

- ▶ TA-Silenzio: Extract air unit
- ▶ TA-Silenzio-D: Extract air unit with acoustic cladding
- ▶ Units with acoustic cladding and/or secondary silencer Type TS for very demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted

Attachments

- ▶ Easy controller: Compact unit with potentiometers
- ▶ Compact controller: Compact unit consisting of controller, differential pressure transducer and actuator
- ▶ Universal controller: Controller, differential pressure transducer and actuators for special applications
- ▶ LABCONTROL: Control components for air management systems

+ Useful additions

- ▶ Secondary silencer Type TS

★ Special features

- ▶ Hygiene tested and certified
- ▶ Direct connection of ducting
- ▶ Factory set-up or programming and aerodynamic function testing
- ▶ Volume flow rate can later be measured and adjusted on site; additional adjustment device may be necessary

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ VDI 2083, air cleanliness class 3, and US standard 209E, class 100
- ▶ Closed blade air leakage to EN 1751, class 4
- ▶ Meets the increased requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class B



Technical data

Nominal sizes	125 - 315
Volume flow rate range	30 - 840 l/s or 108 - 3024 m ³ /h
Volume flow rate control range (unit with dynamic differential pressure measurement)	Approx. 10 to 100% of the nominal volume flow rate
Minimum differential pressure	5 - 65 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		TZ-Si	$\Delta \dot{V}$ ± %
	l/s	m ³ /h	$\Delta p_{st min}$	
			Pa	
125	30	108	5	8
	30	108	5	8
	70	252	20	7
	70	252	10	7
	125	450	60	5
	125	450	35	5
	180	648	120	5
	180	648	65	5
160	45	162	5	8
	45	162	5	8
	110	396	10	7
	110	396	20	7
	195	702	55	5
	195	702	30	5
	275	990	105	5
	275	990	55	5
200	65	234	5	8
	65	234	5	8
	150	540	10	7
	150	540	20	7
	265	954	30	5
	265	954	60	5
	380	1368	120	5
	380	1368	55	5
250	85	306	5	8
	85	306	5	8
	200	720	10	7
	200	720	20	7
	345	1242	60	5
	345	1242	30	5
	495	1782	115	5
	495	1782	60	5
315	145	522	5	8
	145	522	5	8
	335	1206	15	7
	335	1206	20	7
	590	2124	35	5
	590	2124	50	5
	840	3024	65	5
	840	3024	105	5



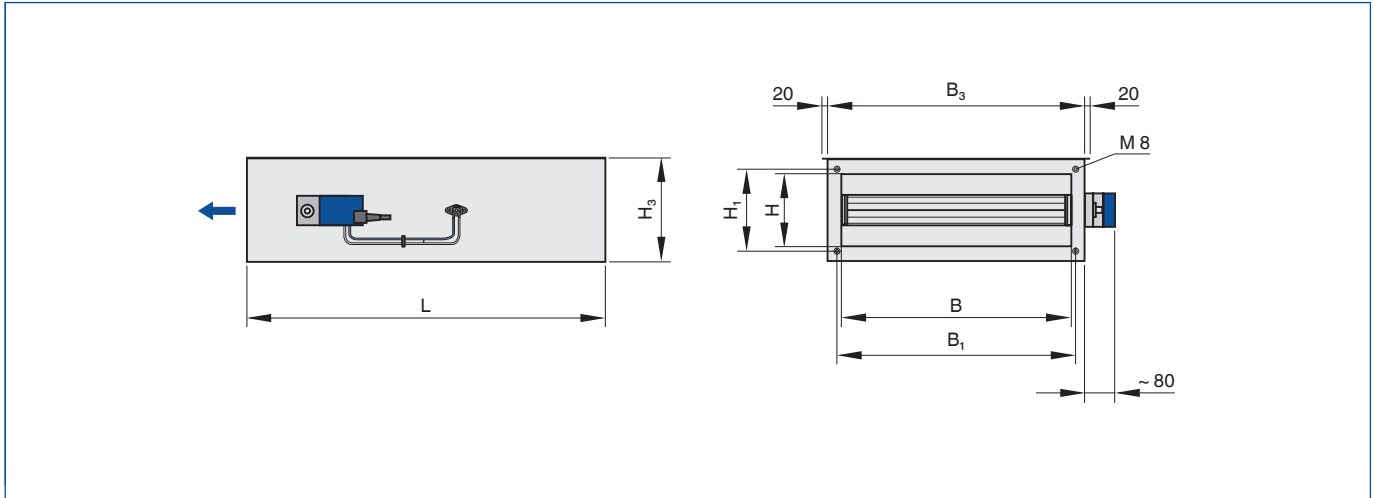
TA-Silenzio, Sound pressure level at differential pressure 150 Pa

Nominal size	\dot{V}	\dot{V}	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
			L_{PA}	L_{PA1}	L_{PA2}	L_{PA3}
	l/s	m ³ /h	dB(A)			
125	30	108	13	3	10	8
	70	252	23	13	19	19
	125	450	30	21	26	26
	180	648	33	26	30	31
160	45	162	14	4	13	10
	110	396	25	14	22	21
	195	702	30	21	29	29
	275	990	33	26	34	34
200	65	234	13	0	12	8
	150	540	22	10	22	18
	265	954	26	16	28	26
	380	1368	29	21	33	31
250	85	306	14	2	13	8
	200	720	22	10	23	19
	345	1242	26	15	30	26
	495	1782	29	19	34	31
315	145	522	16	3	17	12
	335	1206	22	9	27	23
	590	2124	26	14	35	31
	840	3024	29	20	39	36

① TA-Silenzio ② TA-Silenzio with secondary silencer TS ③ TA-Silenzio-D



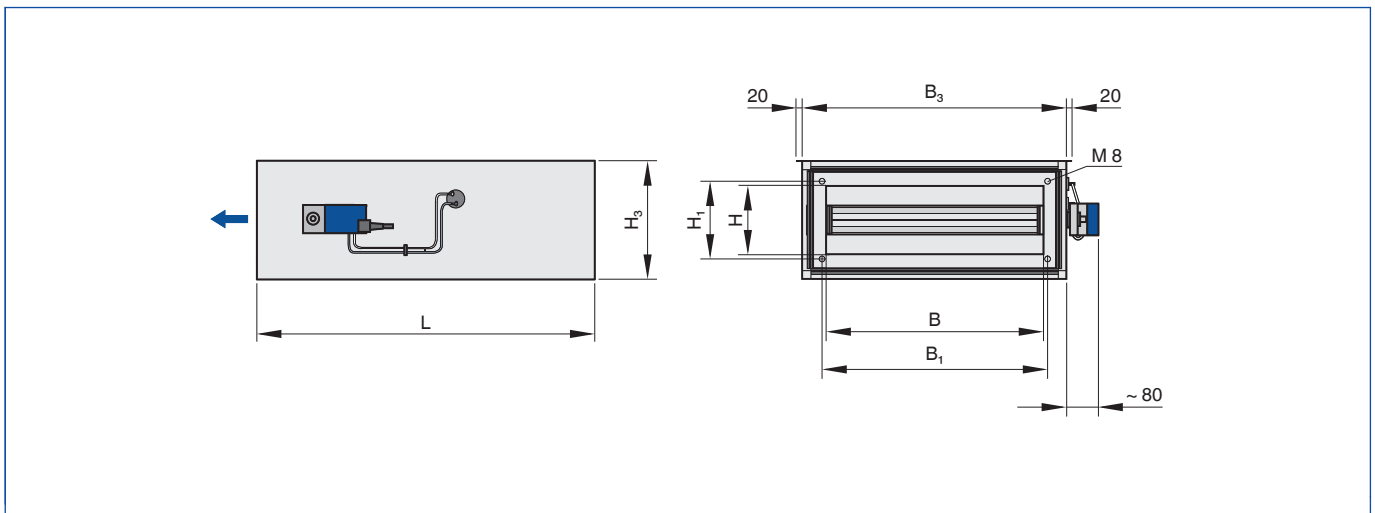
TA-Silenzio



Dimensions [mm] and weight [kg]

Nominal size	L	B ₃	H ₃	B	B ₁	H	H ₁	m
	mm	mm	mm	mm	mm	mm	mm	kg
125	1035	300	236	198	232	152	186	17
160	1035	410	236	308	342	152	186	21
200	1250	560	281	458	492	210	244	32
250	1250	700	311	598	632	201	235	41
315	1250	900	361	798	832	252	286	54

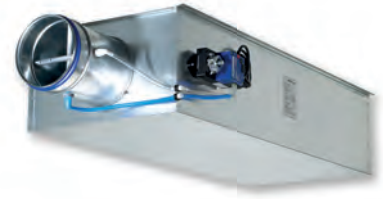
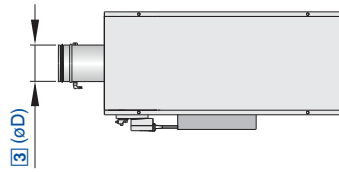
TA-Silenzio-D



Dimensions [mm] and weight [kg]

Nominal size	L	B ₃	H ₃	B	B ₁	H	H ₁	m
	mm	mm	mm	mm	mm	mm	mm	kg
125	1035	380	316	198	232	152	186	32
160	1035	490	316	308	342	152	186	38
200	1250	640	361	458	492	210	244	64
250	1250	780	391	598	632	201	235	72
315	1250	980	441	798	832	252	286	91





For supply air systems with demanding acoustic requirements



Order code

TVZ - D / 160 / D1 / B1B / E 0 / 200 - 900 / NO								
1	2	3	4	5	6	7	8	9
TVZ - D / 160 / D1 / Easy								
1	2	3	4	5				

1 Type

TVZ VAV terminal unit, supply air

2 Acoustic cladding

No entry: none

D With acoustic cladding

3 Nominal size [mm]

125, 160, 200, 250, 315, 400

4 Accessories

No entry: none

D1 Lip seal

5 Attachments (control component)

Example

Easy Easy controller

BC0 Compact controller

B13 Universal controller

6 Operating mode

E Single

M Master

S Slave

F Constant value

Z Differential pressure control - supply air

7 Signal voltage range

For the actual and setpoint value signals

0 0 - 10 V DC

2 2 - 10 V DC

8 Volume flow rates [m³/h or l/s], differential pressure [Pa]

V_{min} - V_{max} for factory setting

Δp_{min} for factory setting (operating mode Z)

9 Damper blade position

Only with spring return actuators

NO Power off to OPEN

NC Power off to CLOSE



 Order code

TVZ - D / 160 / D1 / ELAB / RS / ULZ / LAB / ...

1 2 3 4 5 6 8 9 10

TVZ - D / 160 / D1 / ELAB / SC - E0 / ULZ / ...

1 2 3 4 5 6 7 8 10

1 Type

TVZ VAV terminal unit, supply air

2 Acoustic cladding

D No entry: none
With acoustic cladding

3 Nominal size [mm]

125, 160, 200, 250, 315, 400

4 Accessories

D1 No entry: none
Lip seal

5 Attachments (control component)

ELAB EASYLAB controller TCU3 with fast-running actuator

6 Equipment function

RS Room control
PC Supply air control (Room Supply)
Differential pressure control

SC Single operation
Supply air controller

7 External volume flow rate setting

E0 Only for single operation
Voltage signal 0 - 10 V DC
E2 Voltage signal 2 - 10 V DC
2P Switch contacts (provided by others)
for 2 switching steps
3P Switch contacts (provided by others)
for 3 switching steps

F Volume flow rate constant value,
without signalling

8 Expansion modules

No entry: Power supply
No entry: 24 V AC
T EM-TRF for 230 V AC
U EM-TRF-USV for 230 V AC, provides
uninterruptible power supply (UPS)
Option 2: Communication interface
No entry: none
L EM-LON for LonWorks FTT-10A
B EM-BAC-MOD-01 for BACnet MS/TP
M EM-BAC-MOD-01 for Modbus RTU
I EM-IP for BACnet/IP, Modbus/IP and
webserver
R EM-IP with real time clock
Option 3: Automatic zero point
correction
No entry: none
Z EM-AUTOZERO Solenoid valve for
automatic zero point correction

9 Additional functions

Only for room control (equipment
function)
Room management function has been
deactivated
LAB Extract air led system (laboratories)
CLR Supply air led system (clean rooms)
Room management function is active
LAB-RMF Extract air led system (LAB)

CLR-RMF Supply air led system

10 Operating values [m³/h or l/s, Pa]

For equipment function 'room control'
with additional function RMF
Total room extract air/supply air
 \dot{V}_1 : Standard mode
 \dot{V}_2 : Reduced operation
 \dot{V}_3 : Increased operation
 \dot{V}_4 : Constant room supply air
 \dot{V}_5 : Constant room extract air
 \dot{V}_6 : Supply air/extract air difference
 $\Delta p_{\text{setpoint}}$: Setpoint pressure (only with
differential pressure control)
For equipment function 'single
operation'
 $E0, E2$: $\dot{V}_{\text{min}} / \dot{V}_{\text{max}}$
 $2P$: \dot{V}_1 / \dot{V}_2
 $3P$: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$
 F : \dot{V}_1

Useful additions

Room control panel
BE-LCD-01 40-character display

 Order code

TVZ - D / 160 / D1 / TMA / RS / -100 / -100

1 2 3 4 5 6 7

1 Type

TVZ VAV terminal unit, supply air

2 Acoustic cladding

D No entry: none
With acoustic cladding

3 Nominal size [mm]

125, 160, 200, 250, 315, 400

4 Accessories

D1 No entry: none
Lip seal

5 Attachments (control component)

TMA TCU-LON-II with fast-running actuator
TMB TCU-LON-II with fast-running actuator
(brushless motor)

6 Equipment function

RS Room supply air
PS Differential pressure control - supply air
(Pressure Supply)

7 Operating values [m³/h or l/s, Pa]

Depending on equipment function
RS: $\Delta \dot{V} / \dot{V}_{\text{constant}}$
PS: $\Delta \dot{V} / \dot{V}_{\text{constant}} / \Delta p_{\text{Soll}}$
The room control volume flow rates are
related to the total extract air volume
flow rate for the room



+ Features

- VAV terminal units for the supply air control in buildings with variable air volume systems and demanding acoustic requirements
- ▶ Highly effective integral attenuator
 - ▶ Box style construction for the reduction of the airflow velocity
 - ▶ Electronic control components for different applications (Easy, Compact, Universal, and LABCONTROL)
 - ▶ Suitable for airflow velocities up to 13 m/s
 - ▶ Closed blade air leakage to EN 1751, up to class 4
 - ▶ Casing air leakage to EN 1751, class A

Optional equipment and accessories

- ▶ Acoustic cladding for the reduction of case-radiated noise
- ▶ Secondary silencer Type TS for the reduction of air-regenerated noise
- ▶ Hot water heat exchanger of Type WT for reheating the airflow

Application

- ▶ VARYCONTROL VAV terminal units of Type TVZ for the supply air control in variable air volume systems
- ▶ Closed-loop volume flow control using an external power supply
- ▶ Integral attenuator for demanding acoustic requirements
- ▶ Shut-off by means of switching (equipment supplied by others)

Technical data

Nominal sizes	125 - 400 mm
Volume flow rate range	15 - 1680 l/s or 54 - 6048 m ³ /h
Volume flow rate control range (unit with dynamic differential pressure measurement)	Approx. 10 - 100% of the nominal volume flow rate
Minimum differential pressure	5 - 80 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C

Variants

- ▶ TVZ: Supply air unit
- ▶ TVZ-D: Supply air unit with acoustic cladding
- ▶ Units with acoustic cladding and/or secondary silencer Type TS for very demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted

Attachments

- ▶ Easy controller: Compact unit consisting of controller with potentiometers, differential pressure transducer and actuator
- ▶ Compact controller: Compact unit consisting of controller, differential pressure transducer and actuator
- ▶ Universal controller: Controller, differential pressure transducer and actuators for special applications
- ▶ LABCONTROL: Control components for air management systems

& Accessories

- ▶ Lip seal (factory fitted)

Useful additions

- ▶ Secondary silencer Type TS
- ▶ Heat exchanger Type WT

★ Special characteristics

- ▶ Integral attenuator with at least 26 dB insertion loss at 250 Hz
- ▶ Hygiene tested and certified
- ▶ Factory set-up or programming and aerodynamic function testing
- ▶ Volume flow rate can later be measured and adjusted on site; additional adjustment device may be necessary
- ▶ Inspection access for cleaning to VDI 6022

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ VDI 2083, air cleanliness class 3, and US standard 209E, class 100
- ▶ Closed blade air leakage to EN 1751, class 4 (nominal sizes 125 and 160, class 3).
- ▶ Nominal sizes 125 and 160 meet the general requirements, nominal sizes 200 - 400 meet the increased requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class A



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	$\Delta\dot{V}$ ± %
	l/s	m ³ /h	Pa	Pa	
125	15	54	5	5	19
	60	216	15	25	8
	105	378	45	65	7
	150	540	90	130	5
160	25	90	5	5	19
	100	360	15	20	8
	175	630	40	50	7
	250	900	80	100	5
200	40	144	5	5	19
	160	576	15	20	8
	280	1008	40	50	7
	405	1458	80	100	5
250	60	216	5	5	19
	250	900	15	20	8
	430	1548	40	50	7
	615	2214	80	100	5
315	100	360	5	5	19
	410	1476	15	20	8
	720	2592	40	60	7
	1030	3708	80	120	5
400	170	612	5	5	19
	670	2412	15	20	8
	1175	4230	40	60	7
	1680	6048	80	120	5

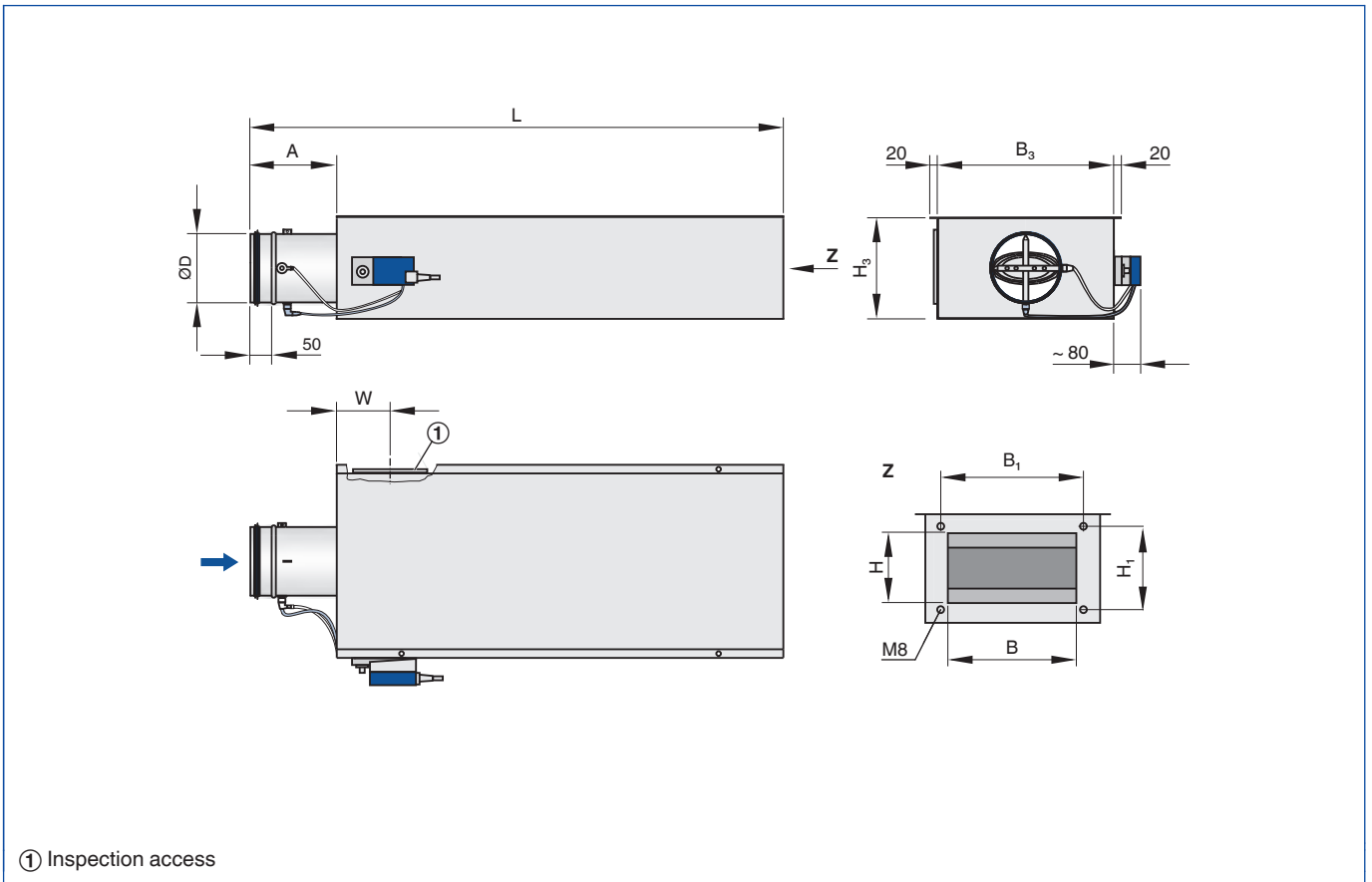
TVZ, Sound pressure level at differential pressure 150 Pa

Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Air-regenerated noise		Case-radiated noise	
			① L _{PA}	② L _{PA1}	① L _{PA2}	③ L _{PA3}
	dB(A)					
125	15	54	17	16	21	<15
	60	216	24	20	24	16
	105	378	29	24	27	19
	150	540	34	29	32	23
160	25	90	18	16	20	<15
	100	360	28	24	25	18
	175	630	35	29	29	21
	250	900	36	30	35	27
200	40	144	16	<15	22	15
	160	576	21	17	27	20
	280	1008	23	17	31	23
	405	1458	31	24	39	31
250	60	216	16	15	22	16
	250	900	17	<15	26	19
	430	1548	22	15	29	22
	615	2214	31	21	37	28
315	105	378	18	15	21	15
	410	1476	21	16	27	19
	720	2592	24	18	33	24
	1030	3708	29	22	38	29
400	170	612	17	<15	25	17
	670	2412	19	15	29	20
	1175	4230	26	20	33	25
	1680	6048	32	27	43	35

① TVZ ② TVZ with secondary silencer TS ③ TVZ-D



TVZ

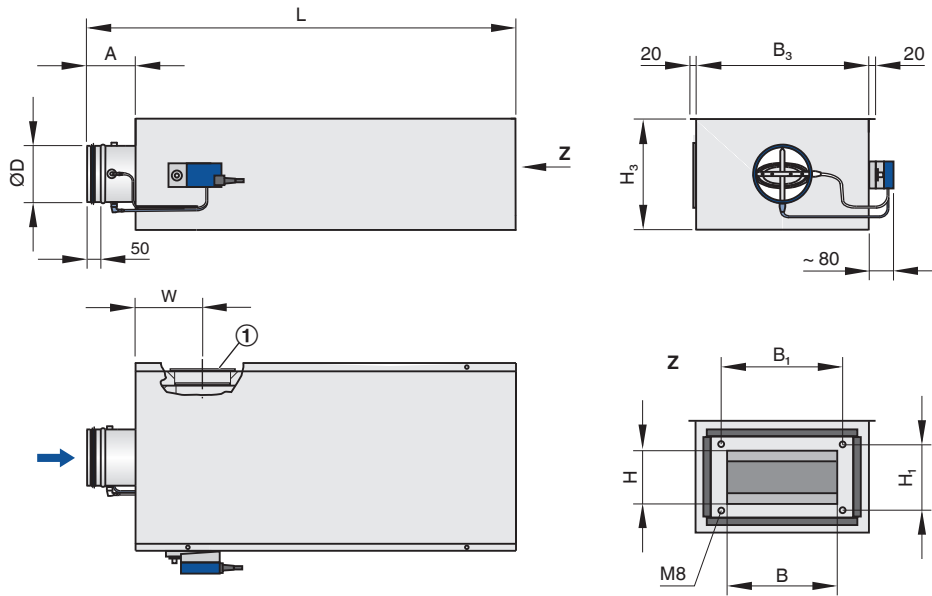


Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	B	B ₁	H	H ₁	A	W	m
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
125	124	1185	300	236	198	232	152	186	150	115	21
160	159	1235	410	236	308	342	152	186	200	115	25
200	199	1520	560	281	458	492	210	244	200	115	33
250	249	1690	700	311	598	632	201	235	250	215	55
315	314	1690	900	361	798	832	252	286	250	215	73
400	399	2070	1000	446	898	932	354	388	250	215	118



TVZ-D

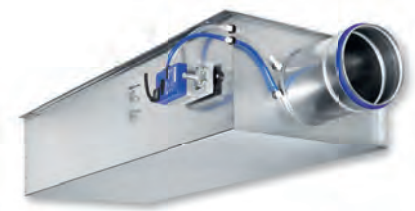
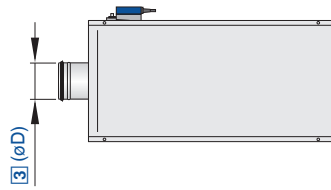


① Inspection access

Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	B	B ₁	H	H ₁	A	W	m
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
125	124	1185	380	316	198	232	152	186	110	155	41
160	159	1235	490	316	308	342	152	186	160	155	50
200	199	1520	640	361	458	492	210	244	160	155	63
250	249	1690	780	391	598	632	201	235	210	255	95
315	314	1690	980	441	798	832	252	286	210	255	133
400	399	2070	1080	526	898	932	354	388	210	255	193





For extract air systems with demanding acoustic requirements



Order code

TVA - D / 160 / D1 / B1B / E 0 / 200 - 900 / NO								
1	2	3	4	5	6	7	8	9
TVA - D / 160 / D1 / Easy								
1	2	3	4	5				

1 Type

TVA VAV terminal unit, extract air

2 Acoustic cladding

No entry: none
D With acoustic cladding

3 Nominal size [mm]

125, 160, 200, 250, 315, 400

4 Accessories

No entry: none
D1 Lip seal

5 Attachments (control component)

Example
Easy Easy controller
BC0 Compact controller
B13 Universal controller

6 Operating mode

E Single
M Master
S Slave
F Constant value
A Differential pressure control - extract air

7 Signal voltage range

For the actual and setpoint value signals
0 0 - 10 V DC
2 2 - 10 V DC

8 Volume flow rates [m³/h or l/s], differential pressure [Pa]

$\dot{V}_{min} - \dot{V}_{max}$ for factory setting
 Δp_{min} for factory setting (operating mode A)

9 Damper blade position

Only with spring return actuators
NO Power off to OPEN
NC Power off to CLOSE



 Order code

TVA - D / 160 / D1 / ELAB / RE / ULZ / LAB / ...

1 2 3 4 5 6 8 9 10

TVA - D / 160 / D1 / ELAB / EC - E0 / ULZ / ...

1 2 3 4 5 6 7 8 10

<p>1 Type TVA VAV terminal unit, extract air</p> <p>2 Acoustic cladding No entry: none D With acoustic cladding</p> <p>3 Nominal size [mm] 125, 160, 200, 250, 315, 400</p> <p>4 Accessories No entry: none D1 Lip seal</p> <p>5 Attachments (control component) ELAB EASYLAB controller TCU3 with fast-running actuator</p> <p>6 Equipment function Room control RE Extract air control (Room Exhaust) PC Differential pressure control</p> <p>Single operation EC Extract air controller</p> <p>7 External volume flow rate setting Only for single operation E0 Voltage signal 0 - 10 V DC E2 Voltage signal 2 - 10 V DC 2P Switch contacts (provided by others) for 2 switching steps 3P Switch contacts (provided by others) for 3 switching steps</p>	<p>F Volume flow rate constant value, without signalling</p> <p>8 Expansion modules Option 1: Power supply No entry: 24 V AC T EM-TRF for 230 V AC U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS) Option 2: Communication interface No entry: none L EM-LON for LonWorks FTT-10A B EM-BAC-MOD-01 for BACnet MS/TP M EM-BAC-MOD-01 for Modbus RTU I EM-IP for BACnet/IP, Modbus/IP and webserver R EM-IP with real time clock Option 3: Automatic zero point correction No entry: none Z EM-AUTOZERO Solenoid valve for automatic zero point correction</p> <p>9 Additional functions 'Only for room control (equipment function) Room management function has been deactivated LAB Extract air led system (laboratories) CLR Supply air led system (clean rooms) Room management function is active LAB-RMF Extract air led system (LAB)</p>	<p>CLR-RMF Supply air led system</p> <p>10 Operating values [m³/h or l/s, Pa] For equipment function 'room control' with additional function RMF Total room extract air/supply air \dot{V}_1: Standard mode \dot{V}_2: Reduced operation \dot{V}_3: Increased operation \dot{V}_4: Constant room supply air \dot{V}_5: Constant room extract air \dot{V}_6: Supply air/extract air difference $\Delta p_{\text{setpoint}}$: Setpoint pressure (only with differential pressure control) For equipment function 'single operation' E0, E2: $\dot{V}_{\text{min}} / \dot{V}_{\text{max}}$ 2P: \dot{V}_1 / \dot{V}_2 3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$ F: \dot{V}_1</p> <p>Useful additions Room control panel BE-LCD-01 40-character display</p>
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 Order code

TVA - D / 160 / D1 / TMA / RE / 1500 / 750 / 100

1 2 3 4 5 6 7

<p>1 Type TVA VAV terminal unit, extract air</p> <p>2 Acoustic cladding No entry: none D With acoustic cladding</p> <p>3 Nominal size [mm] 125, 160, 200, 250, 315, 400</p> <p>4 Accessories No entry: none D1 Lip seal</p>	<p>5 Attachments (control component) TMA TCU-LON-II with fast-running actuator TMB TCU-LON-II with fast-running actuator (brushless motor)</p> <p>6 Equipment function RE Room extract air PE Differential pressure control - extract air (Pressure Extract)</p>	<p>7 Operating values [m³/h or l/s, Pa] Depending on equipment function RE: $\dot{V}_{\text{day}} / \dot{V}_{\text{night}} / \dot{V}_{\text{constant}}$ PE: $\dot{V}_{\text{day}} / \dot{V}_{\text{night}} / \dot{V}_{\text{constant}} / \Delta p_{\text{setpoint}}$ The room control volume flow rates are related to the total extract air volume flow rate for the room</p>
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+ Features

- VAV terminal units for the extract air control in buildings with variable air volume systems and demanding acoustic requirements
- ▶ Highly effective integral attenuator
 - ▶ Box style construction for the reduction of the airflow velocity
 - ▶ Electronic control components for different applications (Easy, Compact, Universal, and LABCONTROL)
 - ▶ Suitable for airflow velocities up to 13 m/s
 - ▶ Closed blade air leakage to EN 1751, class 4
 - ▶ Casing air leakage to EN 1751, class A

- Optional equipment and accessories
- ▶ Acoustic cladding for the reduction of case-radiated noise
 - ▶ Secondary silencer Type TS for the reduction of air-regenerated noise

Application

- ▶ VARYCONTROL VAV terminal units of Type TVA for the extract air flow control in variable air volume systems
- ▶ Closed-loop volume flow control using an external power supply
- ▶ Integral attenuator for demanding acoustic requirements
- ▶ Shut-off by means of switching (equipment supplied by others)

Technical data

Nominal sizes	125 - 400 mm
Volume flow rate range	15 - 1680 l/s or 54 - 6048 m ³ /h
Volume flow rate control range (unit with dynamic differential pressure measurement)	Approx. 10 to 100% of the nominal volume flow rate
Minimum differential pressure	5 - 190 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C

⊗ Variants

- ▶ TVA: Extract air unit
- ▶ TVA-D: Extract air unit with acoustic cladding
- ▶ Units with acoustic cladding and/or secondary silencer Type TS for very demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted

⬡ Attachments

- ▶ Easy controller: Compact unit consisting of controller with potentiometers, differential pressure transducer and actuator
- ▶ Compact controller: Compact unit consisting of controller, differential pressure transducer and actuator
- ▶ Universal controller: Controller, differential pressure transducer and actuators for special applications
- ▶ LABCONTROL: Control components for air management systems

& Accessories

- ▶ Lip seal (factory fitted)

⊕ Useful additions

- ▶ Secondary silencer Type TS

★ Special features

- ▶ Integral attenuator with at least 26 dB insertion loss at 250 Hz
- ▶ Hygiene tested and certified
- ▶ Factory set-up or programming and aerodynamic function testing
- ▶ Volume flow rate can later be measured and adjusted on site; additional adjustment device may be necessary

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ VDI 2083, air cleanliness class 3, and US standard 209E, class 100
- ▶ Closed blade air leakage to EN 1751, class 4 (nominal sizes 125 and 160, class 3).
- ▶ Nominal sizes 125 and 160 meet the general requirements, nominal sizes 200 - 400 meet the increased requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class A



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	$\Delta\dot{V}$ ± %
	l/s	m ³ /h	$\Delta p_{st\ min}$ Pa	Pa	
125	15	54	5	5	19
	60	216	25	35	8
	105	378	75	95	7
	150	540	150	190	5
160	25	90	5	5	19
	100	360	25	30	8
	175	630	75	85	7
	250	900	150	170	5
200	40	144	5	5	19
	160	576	30	35	8
	280	1008	95	105	7
	405	1458	190	210	5
250	60	216	5	5	19
	250	900	25	30	8
	430	1548	75	85	7
	615	2214	150	170	5
315	100	360	5	5	19
	410	1476	30	35	8
	720	2592	90	110	7
	1030	3708	180	220	5
400	170	612	5	5	19
	670	2412	25	35	8
	1175	4230	75	95	7
	1680	6048	150	190	5

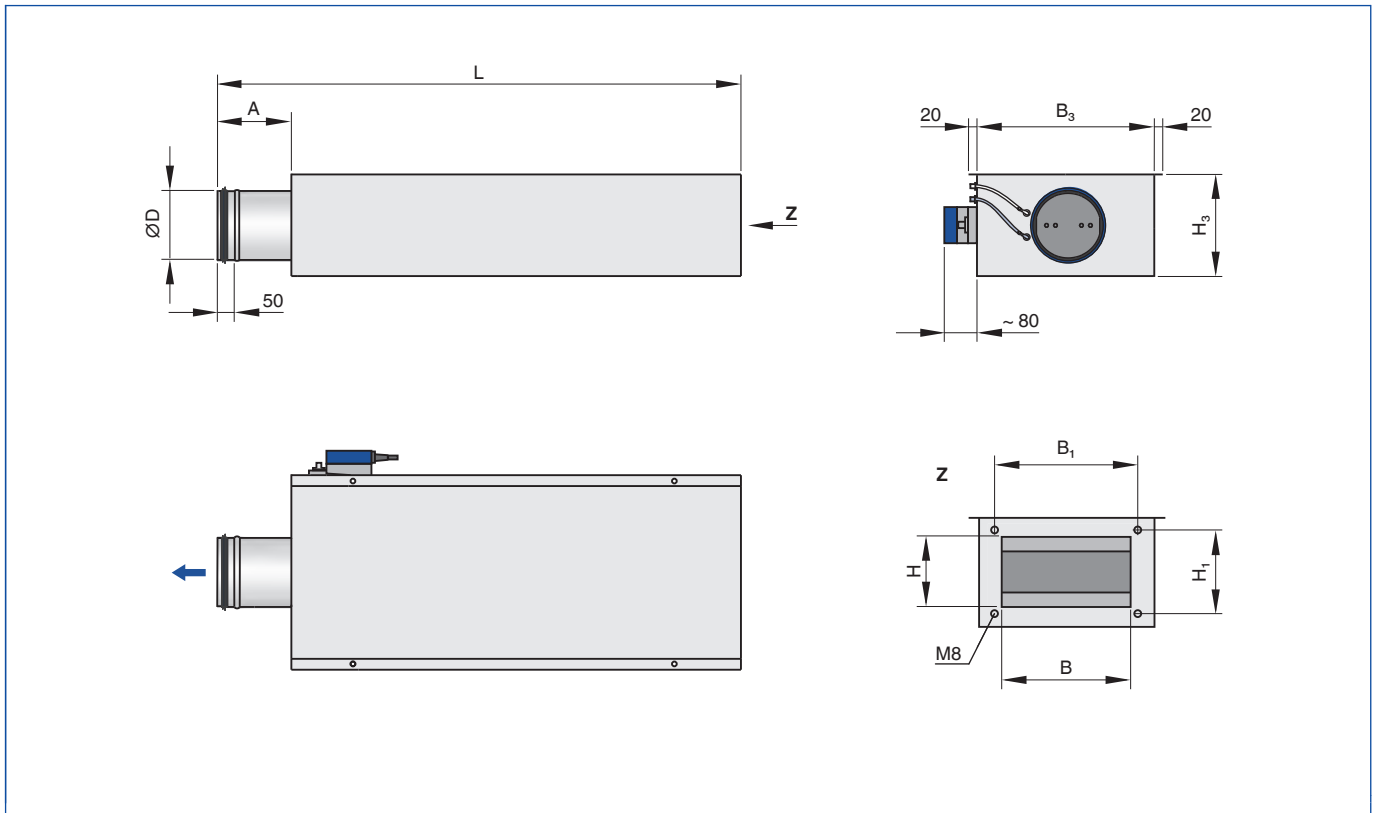
TVA, Sound pressure level at differential pressure 150 Pa

Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Air-regenerated noise		Case-radiated noise	
			① L _{PA}	② L _{PA1}	① L _{PA2}	③ L _{PA3}
	dB(A)					
125	15	54	18	16	15	<15
	60	216	24	21	26	21
	105	378	26	23	30	25
	150	540	25	25	33	27
160	25	90	16	15	15	<15
	100	360	28	23	24	20
	175	630	28	23	29	24
	250	900	23	22	32	27
200	40	144	15	<15	16	<15
	160	576	20	17	24	20
	280	1008	23	18	30	25
	405	1458	26	25	32	27
250	60	216	16	<15	15	<15
	250	900	19	16	25	20
	430	1548	20	18	29	24
	615	2214	27	27	33	28
315	105	378	17	15	15	<15
	410	1476	26	21	28	23
	720	2592	25	22	34	29
	1030	3708	27	27	37	32
400	170	612	16	<15	17	<15
	670	2412	18	<15	32	26
	1175	4230	23	19	37	32
	1680	6048	32	29	42	38

① TVA ② TVA with secondary silencer TS ③ TVA-D



TVA

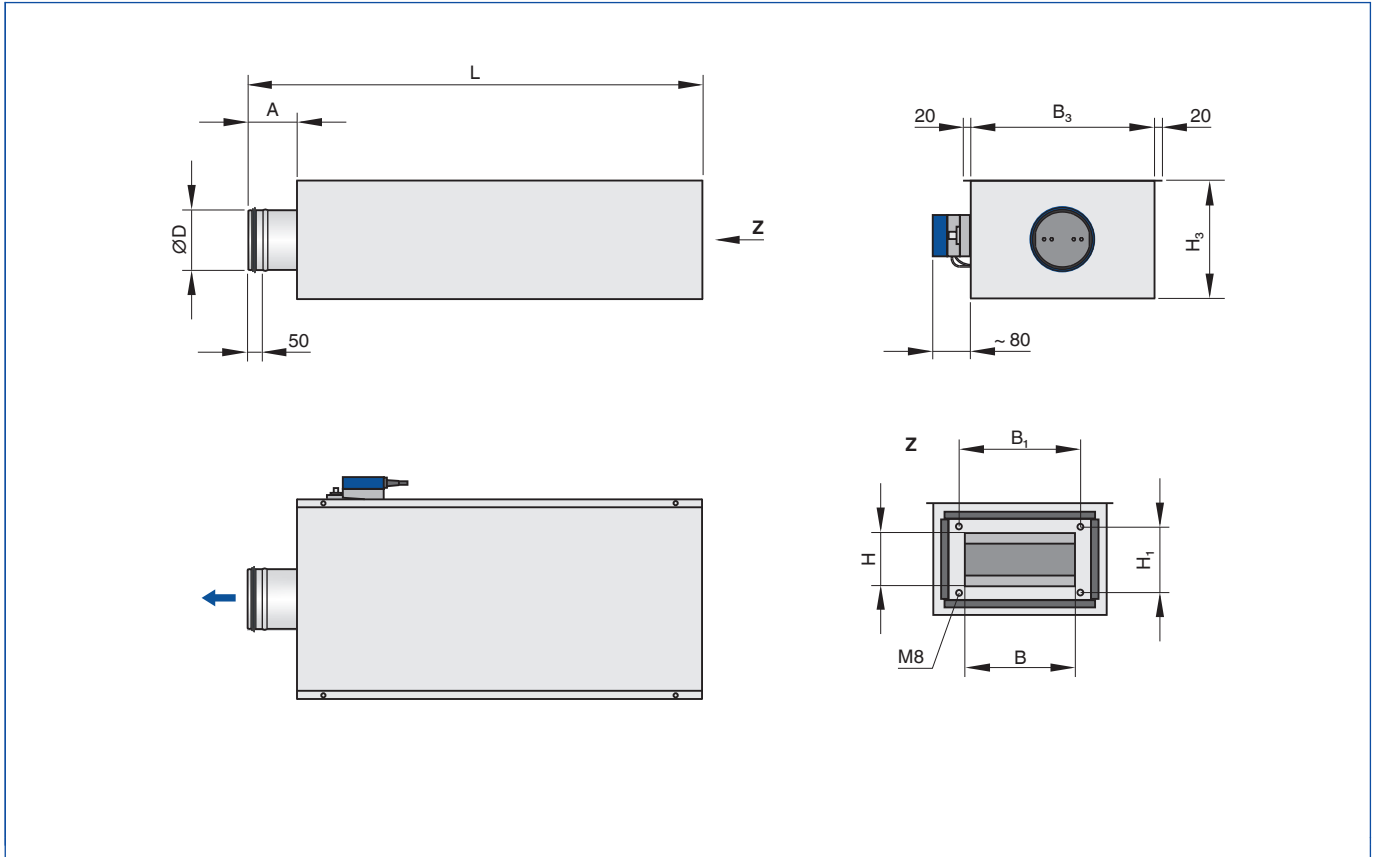


Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	B	B ₁	H	H ₁	A	m
	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
125	124	1220	300	236	198	232	152	186	185	21
160	159	1205	410	236	308	342	152	186	170	25
200	199	1460	560	281	458	492	210	244	138	33
250	249	1540	700	311	598	632	201	235	97	55
315	314	1685	900	361	798	832	252	286	245	73
400	399	1995	1000	446	898	932	354	388	176	118



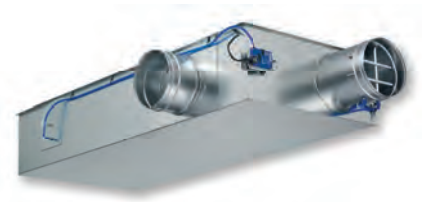
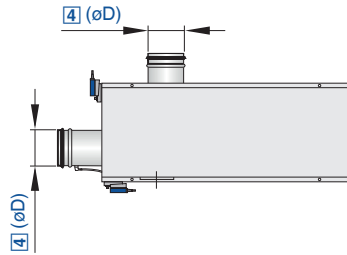
TVA-D



Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	B	B ₁	H	H ₁	A	m
	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
125	124	1220	380	316	198	232	152	186	145	41
160	159	1205	490	316	308	342	152	186	130	50
200	199	1460	640	361	458	492	210	244	98	63
250	249	1540	780	391	598	632	201	235	57	95
315	314	1685	980	441	798	832	252	286	205	133
400	399	1995	1080	526	898	932	354	388	136	193





For dual duct systems

Order code

TVM - S - D / 160 / D2 / B13 / E 0 / 300 - 900 / 0 - 900

- 1** Type
TVM Dual duct terminal unit
- 2** Spigot arrangement
No entry: 90°
S 60° (up to nominal size 200)
- 3** Acoustic cladding
No entry: none
D With acoustic cladding
- 4** Nominal size [mm]
125, 160, 200, 250, 315, 400

- 5** Accessories
No entry: none
D2 Lip seal
- 6** Attachments (control component)
Example
BC0 Compact controller
B13 Universal controller
- 7** Operating mode
E Single
M Master
F Constant value

- 8** Signal voltage range
For the actual and setpoint value signals
0 0 - 10 V DC
2 2 - 10 V DC
- 9** Volume flow rates [m³/h or l/s]
 $\dot{V}_{\text{warm, min}} - \dot{V}_{\text{warm, max}} / \dot{V}_{\text{cold, min}} - \dot{V}_{\text{cold, max}}$
for factory setting

+ Features

- VAV dual duct terminal units for dual duct systems with variable volume flows in buildings with demanding acoustic requirements
- ▶ Individual temperature control for each room or zone
 - ▶ Highly effective integral attenuator
 - ▶ Electronic control components for different applications (Compact and Universal)
 - ▶ Suitable for airflow velocities up to 13 m/s
 - ▶ Closed blade air leakage to EN 1751, up to class 4
 - ▶ Casing air leakage to EN 1751, class A

- Optional equipment and accessories
- ▶ Acoustic cladding for the reduction of case-radiated noise
 - ▶ Secondary silencer Type TS for the reduction of air-regenerated noise

Application

- ▶ VARYCONTROL VAV dual duct terminal units of Type TVM for the supply air control in dual duct variable or constant air volume systems
- ▶ Closed-loop volume flow control using an external power supply
- ▶ For maximum acoustic and thermal comfort
- ▶ Demand-based mixing of cold and warm air
- ▶ Shut-off by means of switching (equipment supplied by others)

◊ Variants

- ▶ TVM-S Dual duct unit, 60° spigot arrangement
- ▶ TVM-S-D Dual duct unit with acoustic cladding, 60° spigot arrangement
- ▶ TVM: Dual duct unit, 90° spigot arrangement
- ▶ TVM-D: Dual duct unit with acoustic cladding, 90° spigot arrangement
- ▶ Units with acoustic cladding and/or secondary silencer Type TS for very demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted

⬡ Attachments

- ▶ Compact controller: Compact unit consisting of controller, differential pressure transducer and actuator
- ▶ Universal controller: Controller, differential pressure transducer and actuators for special applications

& Accessories

- ▶ Lip seals (factory fitted)

⊕ Useful additions

- ▶ Secondary silencer Type TS

★ Special characteristics

- ▶ Integral differential pressure sensor with 3 mm measuring holes (resistant to dust and pollution)
- ▶ Integral attenuator with at least 26 dB insertion loss at 250 Hz
- ▶ Factory set-up or programming and aerodynamic function testing
- ▶ Volume flow rate can later be measured and adjusted on site; additional adjustment device may be necessary
- ▶ Inspection access for cleaning to VDI 6022

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ VDI 2083, air cleanliness class 3, and US standard 209E, class 100
- ▶ Closed blade air leakage to EN 1751, class 4 (nominal sizes 125 and 160, class 3).
- ▶ Nominal sizes 125 and 160 meet the general requirements, nominal sizes 200 - 400 meet the increased requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class A





Technical data

Nominal sizes	125 - 400 mm
Volume flow rate range	45 - 1680 l/s or 162 - 6048 m ³ /h
Volume flow rate control range	Approx. 30 to 100% of the nominal volume flow rate
Minimum differential pressure	120 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	$\Delta\dot{V}$ ± %	$\Delta\dot{V}_{\text{warm}}$
	l/s	m ³ /h	$\Delta p_{\text{st min}}$			
			Pa	Pa		
125	45	162	120	160	8	17
	60	216	120	160	7	15
	100	360	120	160	5	12
	150	540	120	160	5	7
160	75	270	120	140	8	17
	100	360	120	140	7	15
	170	612	120	140	5	12
	250	900	120	140	5	7
200	120	432	120	140	8	17
	180	648	120	140	7	15
	280	1008	120	140	5	12
	405	1458	120	140	5	7
250	185	666	120	145	8	17
	270	972	120	145	7	15
	470	1692	120	145	5	12
	615	2214	120	145	5	7
315	310	1116	120	160	8	17
	420	1512	120	160	7	15
	720	2592	120	160	5	12
	1030	3708	120	160	5	7
400	505	1818	120	160	8	17
	710	2556	120	160	7	15
	1250	4500	120	160	5	12
	1680	6048	120	160	5	7

TVM, Sound pressure level at differential pressure 150 Pa

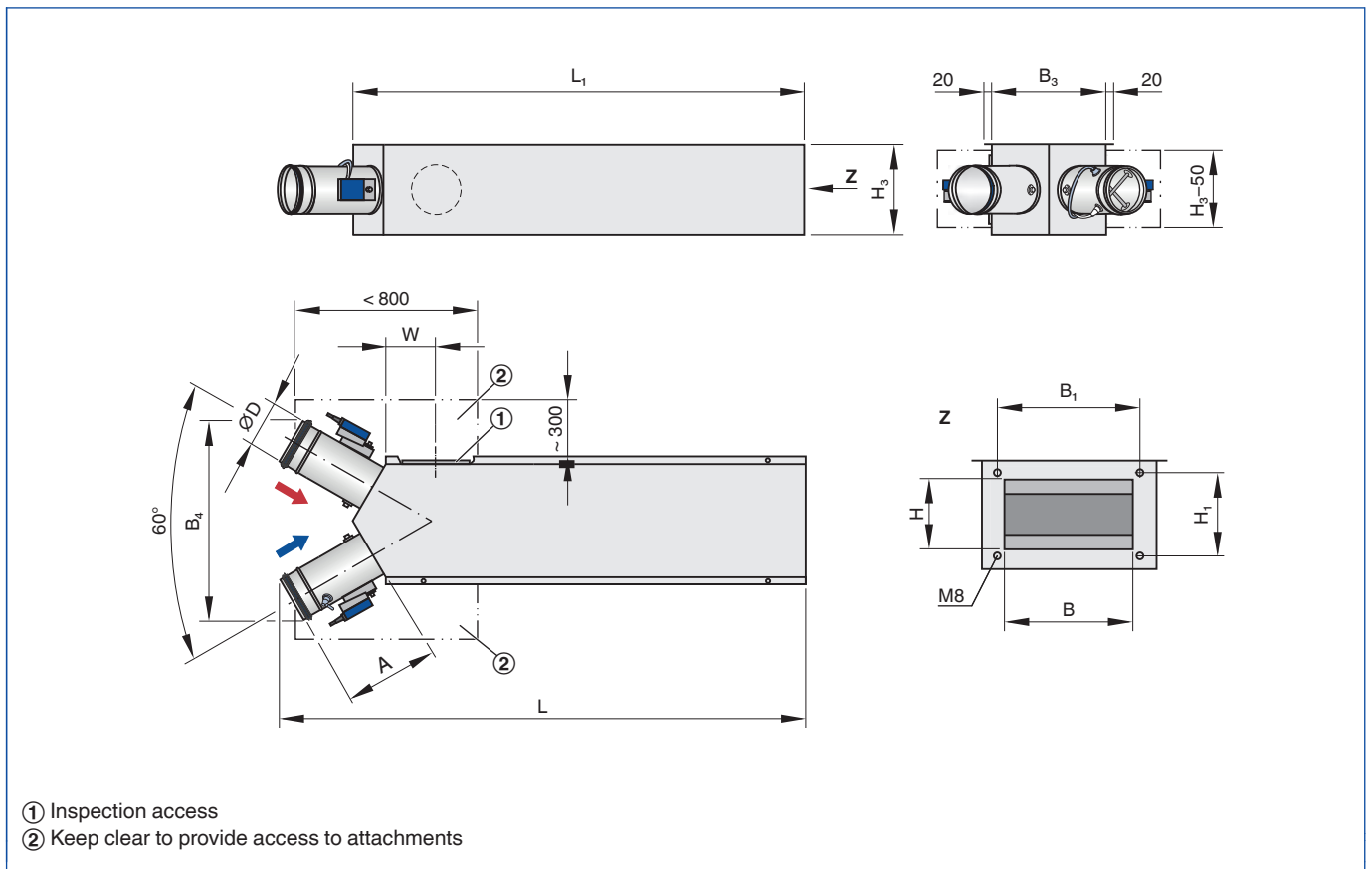
Nominal size	\dot{V}	\dot{V}	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
	l/s	m ³ /h	L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}
dB(A)						
125	45	162	25	15	25	21
	60	216	28	19	28	24
	100	360	34	24	32	29
	150	540	38	29	36	33
160	75	270	25	16	35	26
	100	360	28	19	36	28
	170	612	34	25	39	33
	250	900	37	28	41	37
200	120	432	24	15	30	25
	180	648	28	18	33	28
	280	1008	31	21	36	33
	405	1458	34	25	39	37



Nominal size	Ḃ	Ḃ	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
	l/s	m ³ /h	L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}
	dB(A)					
250	185	666	18	8	25	20
	270	972	23	12	29	24
	470	1692	30	19	34	30
	615	2214	34	24	37	33
315	310	1116	21	8	30	27
	420	1512	24	11	32	30
	720	2592	31	18	35	33
	1030	3708	37	26	38	35
400	505	1818	18	6	28	25
	710	2556	23	9	32	29
	1250	4500	31	16	37	35
	1680	6048	37	21	40	38

① TVM, TVM-S ② TVM, TVM-S with secondary silencer TS ③ TVM-D, TVM-S-D

TVM-S

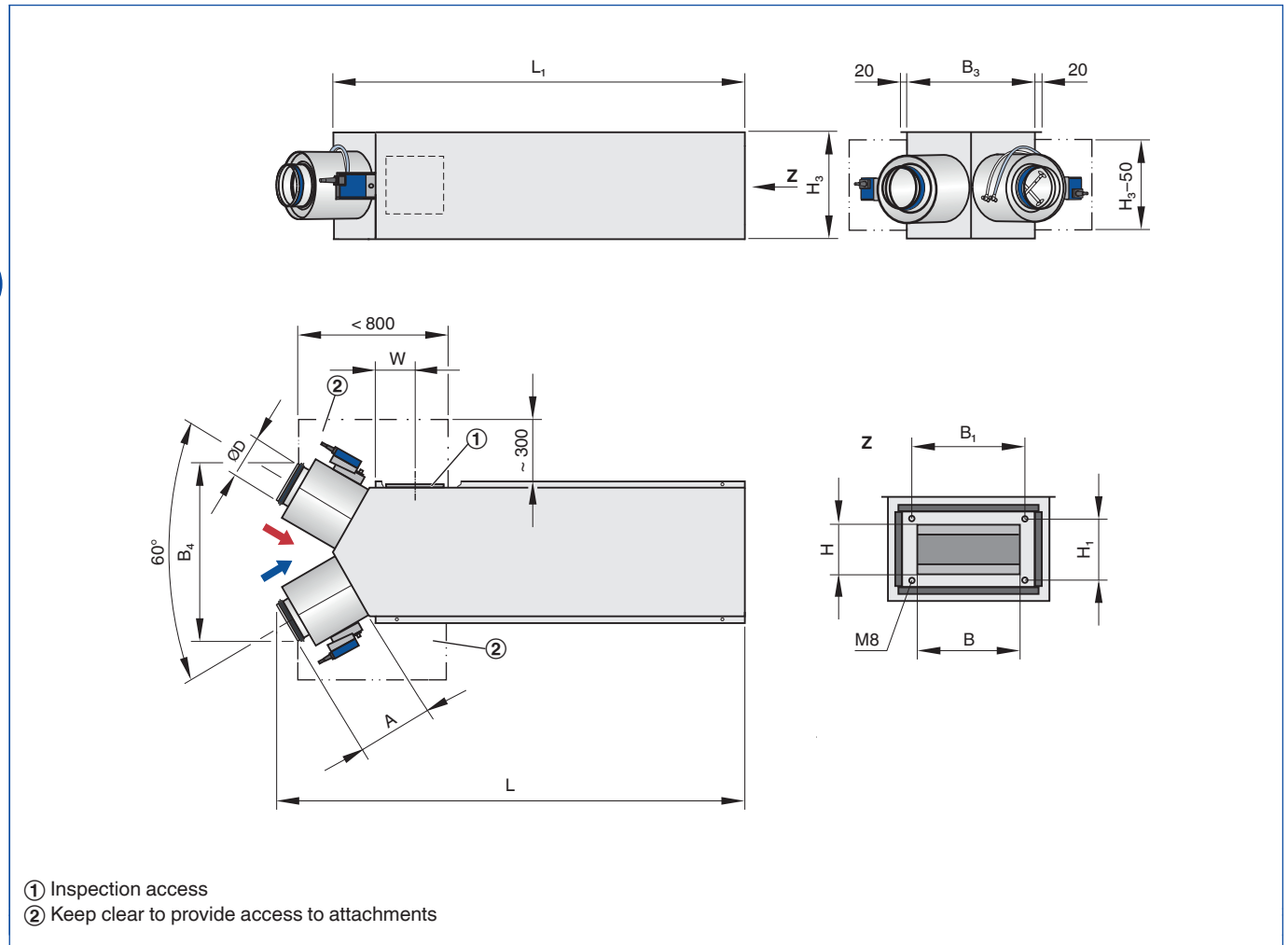


Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	L ₁	B	B ₁	H	H ₁	A	B ₄	W	m
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
125	124	1385	300	236	1190	198	232	152	186	245	525	173	30
160	159	1630	410	236	1360	308	342	152	186	335	690	173	35
200	199	1920	560	281	1660	458	492	210	244	340	800	173	50



TVM-S-D

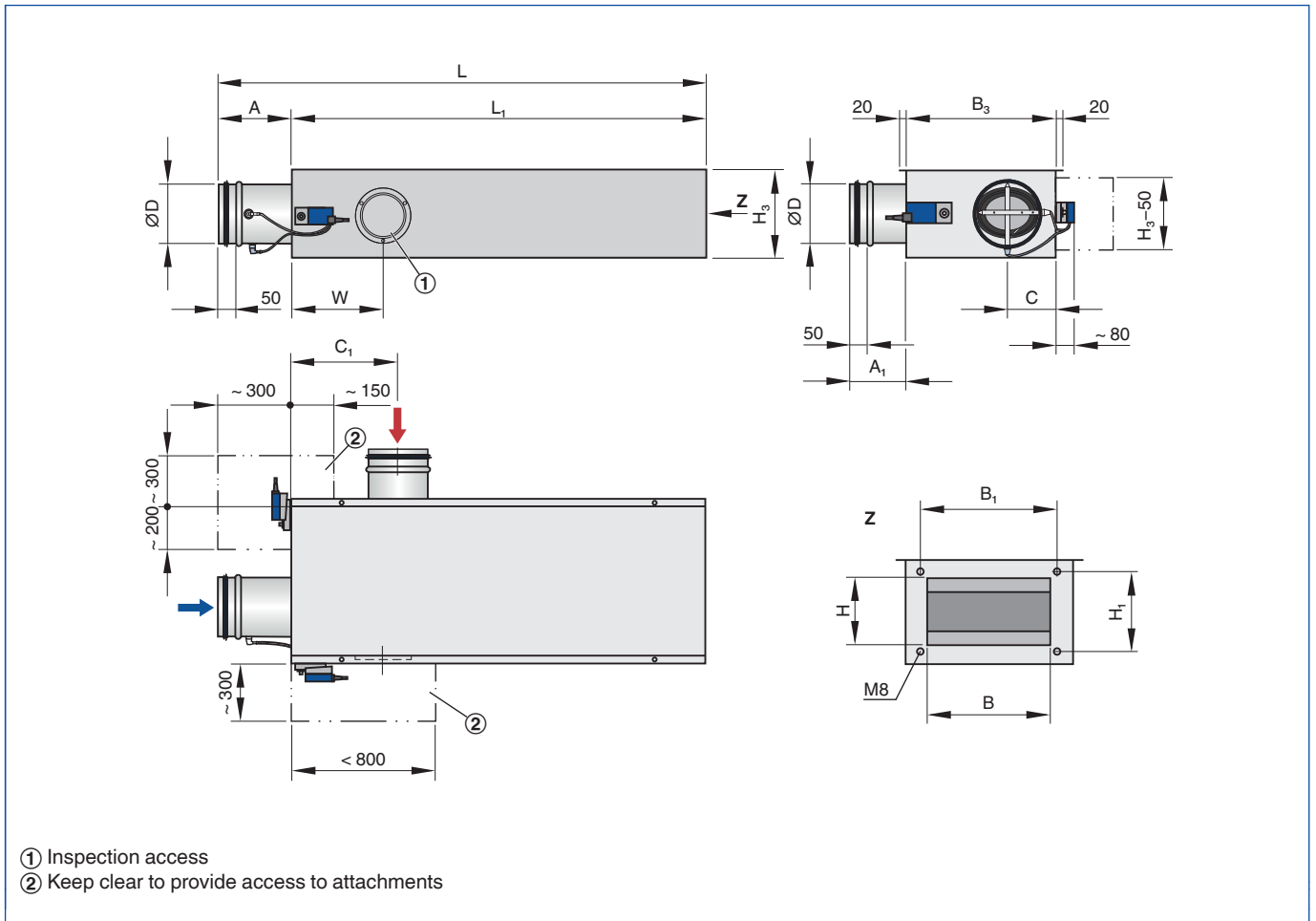


Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	L ₁	B	B ₁	H	H ₁	A	B ₄	W	m
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
125	124	1385	380	316	1215	198	232	152	186	225	525	160	45
160	159	1630	490	316	1410	308	342	152	186	295	690	180	55
200	199	1920	640	361	1710	458	492	210	244	300	800	180	80



TVM

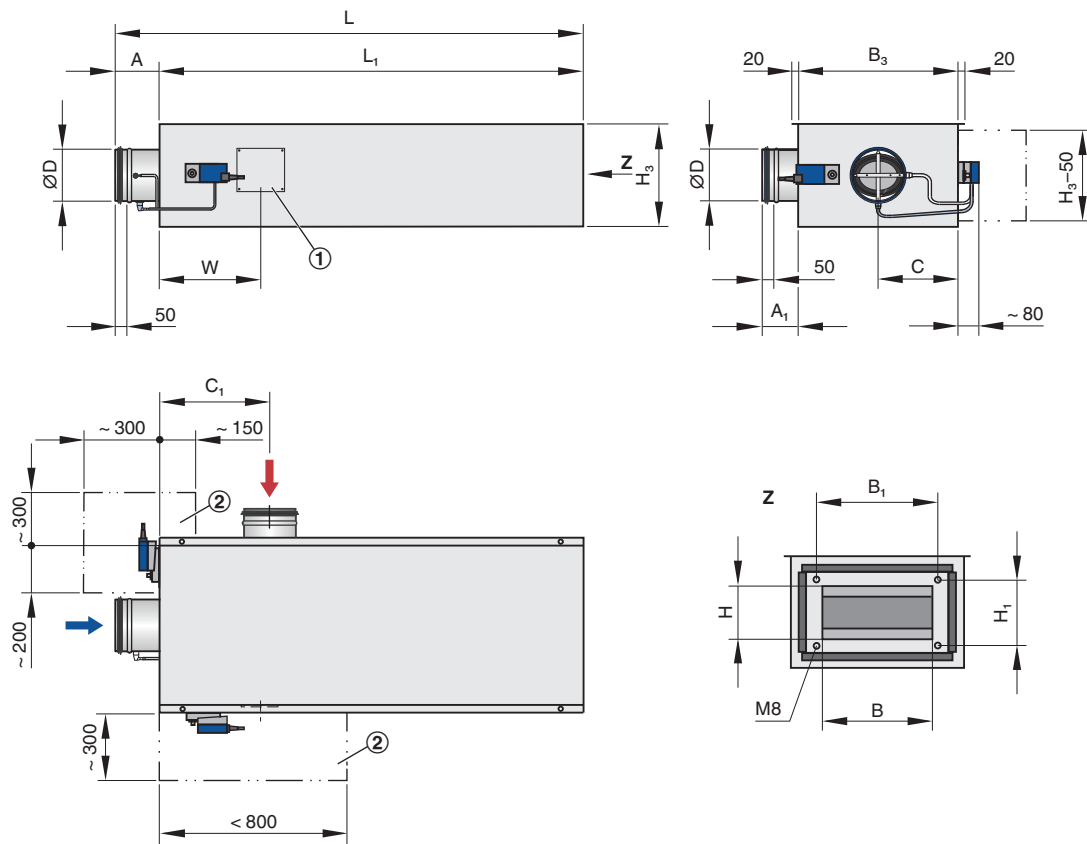


Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	L ₁	B	B ₁	H	H ₁	A	A ₁	C	C ₁	W	m
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
125	124	1355	300	236	1205	198	232	152	186	150	170	125	240	265	28
160	159	1455	410	236	1255	308	342	152	186	200	150	145	295	265	34
200	199	1790	560	281	1590	458	492	210	244	200	125	170	350	265	50
250	249	2015	700	311	1765	598	632	201	235	250	160	200	415	540	65
315	314	2090	900	361	1840	798	832	252	286	250	130	240	535	540	90
400	399	2575	1000	446	2325	898	932	354	388	250	180	290	625	540	130



TVM-D

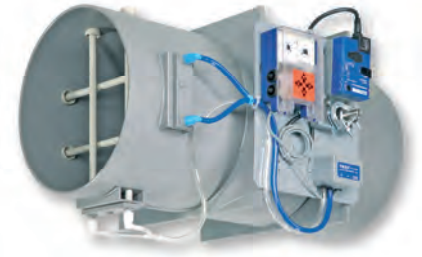
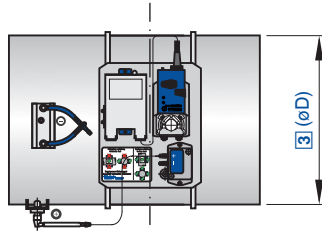


- ① Inspection access
- ② Keep clear to provide access to attachments

Dimensions [mm] and weight [kg]

Nominal size	$\varnothing D$	L	B_3	H_3	L_1	B	B_1	H	H_1	A	A_1	C	C_1	W	m
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
125	124	1355	380	316	1245	198	232	152	186	110	130	165	280	305	42
160	159	1455	490	316	1295	308	342	152	186	160	110	185	335	305	51
200	199	1790	640	361	1630	458	492	210	244	160	85	210	390	305	78
250	249	2015	780	391	1805	598	632	201	235	210	120	240	455	580	105
315	314	2090	980	441	1880	798	832	252	286	210	90	280	575	580	140
400	399	2575	1080	526	2365	898	932	354	388	210	140	330	665	580	200





For contaminated air



Order code

TVRK - FL / 160 / GK / BB3 / E 2 / 200 - 900 / NO

1 2 3 4 5 6 7 8 9

1 Type

TVRK VAV terminal unit, plastic

2 Flange

No entry: none

FL Flanges on both ends

3 Nominal size [mm]

125, 160, 200, 250, 315, 400

4 Accessories

No entry: none

GK Matching flanges for both ends

5 Attachments (control component)

Example

BB3 Universal controller with static differential pressure transducer

6 Operating mode

E Single

M Master

S Slave

F Constant value

Z Differential pressure control - supply air

A Differential pressure control - extract air

7 Signal voltage range

For the actual and setpoint value signals

0 0 - 10 V DC

2 2 - 10 V DC

8 Volume flow rates [m³/h or l/s], differential pressure [Pa]

\dot{V}_{\min} - \dot{V}_{\max} for factory setting

Δp_{\min} for factory setting (operating modes A, Z)

9 Damper blade position

Only with spring return actuators

NO Power off to OPEN

NC Power off to CLOSE



 Order code

TVRK – FL / 160 / GK / ELAB / RE / ULZ / LAB / ...

1 2 3 4 5 6 8 9 10

TVRK – FL / 160 / GK / ELAB / EC – E0 / ULZ / ...

1 2 3 4 5 6 7 8 10

1 Type

TVRK VAV terminal unit, plastic

2 Flange

No entry: none
FL Flanges on both ends

3 Nominal size [mm]

125, 160, 200, 250, 315, 400

4 Accessories

No entry: none
GK Matching flanges for both ends

5 Attachment (control component)

ELAB EASYLAB controller TCU3 with fast-running actuator

6 Equipment function

Room control
RE Extract air control (Room Exhaust)
PC Differential pressure control

Single operation
EC Extract air controller

7 External volume flow rate setting

Only for single operation
E0 Voltage signal 0 - 10 V DC
E2 Voltage signal 2 - 10 V DC
2P Switch contacts (provided by others) for 2 switching steps
3P Switch contacts (provided by others) for 3 switching steps
F Volume flow rate constant value, without signalling

8 Expansion modules

Option 1: Power supply
No entry: 24 V AC
T EM-TRF for 230 V AC
U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communication interface
No entry: none
L EM-LON for LonWorks FTT-10A
B EM-BAC-MOD-01 for BACnet MS/TP
M EM-BAC-MOD-01 for Modbus RTU
I EM-IP for BACnet/IP, Modbus/IP and webservice
R EM-IP with real time clock

Option 3: Automatic zero point correction
No entry: none
Z EM-AUTOZERO Solenoid valve for automatic zero point correction

9 Additional functions

Only for room control (equipment function)
Room management function has been deactivated
LAB Extract air led system (laboratories)
CLR Supply air led system (clean rooms)
Room management function is active
LAB-RMF Extract air led system (LAB)
CLR-RMF Supply air led system

10 Operating values [m³/h or l/s, Pa

For equipment function 'room control' with additional function RMF
Total room extract air/supply air
 \dot{V}_1 : Standard mode
 \dot{V}_2 : Reduced operation
 \dot{V}_3 : Increased operation
 \dot{V}_4 : Constant room supply air
 \dot{V}_5 : Constant room extract air
 \dot{V}_6 : Supply air/extract air difference
 $\Delta p_{\text{setpoint}}$: Setpoint pressure (only with differential pressure control)
For equipment function 'single operation'
 $E0, E2$: $\dot{V}_{\text{min}} / \dot{V}_{\text{max}}$
 $2P$: \dot{V}_1 / \dot{V}_2
 $3P$: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$
 F : \dot{V}_1

Useful additions

Room control panel (only for room control)
BE-LCD-01 40-character display



 **Order code**

TVRK – FL / 160 / GK / ELAB / FH – VS / ULZS / 200 – 900



1 Type

TVRK VAV terminal unit, plastic

2 Flange

No entry: none
FL Flanges on both ends

3 Nominal size [mm]

125, 160, 200, 250, 315, 400

4 Accessories

No entry: none
GK Matching flanges for both ends

5 Attachments (control component)

ELAB EASYLAB controller TCU3 with fast-running actuator

6 Equipment function

With face velocity transducer
FH-VS Face velocity control
With sash distance sensor
FH-DS Linear control strategy
FH-DV Safety-optimised control strategy
With switching steps for switch contacts provided by others
FH-2P 2 switching steps
FH-3P 3 switching steps
Without signalling
FH-F Volume flow rate constant value

7 Expansion modules

Option 1: Supply voltage
No entry: 24 V AC
T EM-TRF for 230 V AC
U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communication interface
No entry: none
L EM-LON for LonWorks FTT-10A
B EM-BAC-MOD-01 for BACnet MS/TP
M EM-BAC-MOD-01 for Modbus RTU
I EM-IP for BACnet/IP, Modbus/IP and webserver
R EM-IP with real time clock

Option 3: Automatic zero point correction
No entry: none
Z EM-AUTOZERO Solenoid valve for automatic zero point correction

Option 4: Lighting
No entry: none
S EM-LIGHT Wired socket for the connection of lighting and for switching the lighting on/off using the control panel (only with EM-TRF or EM-TRF-USV)

8 Operating values [m³/h or l/s]

Depending on the equipment function
VS: $\dot{V}_{\min} - \dot{V}_{\max}$
DS: $\dot{V}_{\min} - \dot{V}_{\max}$
DV: $\dot{V}_{\min} - \dot{V}_{\max}$
2P: \dot{V}_1 / \dot{V}_2
3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$
F: \dot{V}_1

Useful additions

Control panel for fume cupboard controller, for displaying the functions of the control system according to EN 14175
BE-SEG-** OLED display
BE-LCD-01 40-character display



 **Order code**

TVRK – FL / 160 / GK / TMA / RE / 1500 / 750 / 100



1 Type

TVRK VAV terminal unit, plastic

2 Flange

No entry: none
FL Flanges on both ends

3 Nominal size [mm]

125, 160, 200, 250, 315, 400

4 Accessories

No entry: none
GK Matching flanges for both ends

5 Attachments (control component)

TMA TCU-LON-II with fast-running actuator
TMB TCU-LON-II with fast-running actuator (brushless motor)

6 Equipment function

FH Fume cupboard
RE Room extract air
PE Differential pressure control - extract air (Pressure Extract)

7 Operating values [m³/h or l/s, Pa]

Depending on equipment function
FH: $\dot{V}_{\min} - \dot{V}_{\max}$
RE: $\dot{V}_{\text{day}} / \dot{V}_{\text{night}} / \dot{V}_{\text{constant}}$
PE: $\dot{V}_{\text{Tag}} / \dot{V}_{\text{night}} / \dot{V}_{\text{constant}} / \Delta p_{\text{setpoint}}$
The room control volume flow rates (RS, RE, PS, PE) are related to the total extract air volume flow rate for the room

Useful additions

Control panel for fume cupboard controller, for displaying the functions of the control system according to EN 14175
BE-TCU-LON-II Control panel

 **Features**

Plastic circular VAV terminal units for aggressive extract air in variable air volume systems

- ▶ Casing and damper blade made of flame-resistant polypropylene
- ▶ Slide-out differential pressure sensor allows for easy cleaning
- ▶ Suitable for the control of volume flow rate, room pressure or duct pressure
- ▶ Electronic control components for different

applications (Universal and LABCONTROL)

- ▶ Suitable for airflow velocities up to 13 m/s
- ▶ Closed blade air leakage to EN 1751, class 3
- ▶ Casing air leakage to EN 1751, class B

Optional equipment and accessories

- ▶ With flanges on both ends
- ▶ Matching flanges for both ends
- ▶ Plastic secondary silencer Type CAK for the reduction of air-regenerated noise

 **Application**

- ▶ Circular VARYCONTROL VAV terminal units of Type TVRK, made of plastic, preferably for the extract air flow control in variable air volume systems
- ▶ Closed-loop volume flow control using an external power supply
- ▶ Suitable for contaminated air
- ▶ Shut-off by means of switching (equipment supplied by others)



Variants

- ▶ TVRK: VAV terminal unit
- ▶ TVRK-FL: VAV terminal unit with flanges on both ends

Attachments

- ▶ Universal controller: Controller, differential pressure transducer and actuators for special applications
- ▶ LABCONTROL: Control components for air management systems

& Accessories

- ▶ Matching flanges for both ends, including seals

Useful additions

- ▶ Plastic secondary silencer Type CAK for demanding acoustic requirements

★ Special characteristics

- ▶ Integral slide-out differential pressure sensor with 3 mm measuring holes (resistant to dust and pollution)
- ▶ Factory set-up or programming and aerodynamic function testing
- ▶ Volume flow rate can be measured and subsequently adjusted on site; additional adjustment tool may be necessary

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ Closed blade air leakage to EN 1751, class 3
- ▶ Meets the general requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class B

Technical data

Nominal sizes	125 - 400 mm
Volume flow rate range	25 - 1680 l/s or 90 - 6048 m ³ /h
Volume flow rate control range	Approx. 17 to 100% of the nominal volume flow rate
Minimum differential pressure	5 - 90 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C

Volume flow rate ranges and minimum differential pressure values

Nominal size	V̇		①	②	③	④	ΔV̇ ± %
	l/s	m ³ /h	Pa	Pa	Pa	Pa	
125	25	90	5	5	5	5	9
	60	216	15	20	20	20	7
	105	378	45	50	55	60	6
	150	540	90	100	110	115	5
160	40	144	5	5	5	5	9
	80	288	10	10	10	15	8
	145	522	30	30	35	35	7
	250	900	80	90	95	100	5
200	65	234	5	5	5	5	9
	180	648	15	15	20	20	7
	310	1116	45	45	50	50	5
	405	1458	70	75	80	85	5
250	95	342	5	5	5	5	9
	270	972	10	15	15	15	7
	470	1692	30	35	35	40	5
	615	2214	50	55	60	65	5
315	155	558	5	5	5	5	9
	425	1530	5	10	10	10	7
	740	2664	5	25	25	30	6
	1030	3708	5	45	50	50	5
400	255	918	5	5	5	5	9
	715	2574	10	10	10	10	7
	1250	4500	25	25	25	30	6
	1680	6048	40	45	45	50	5



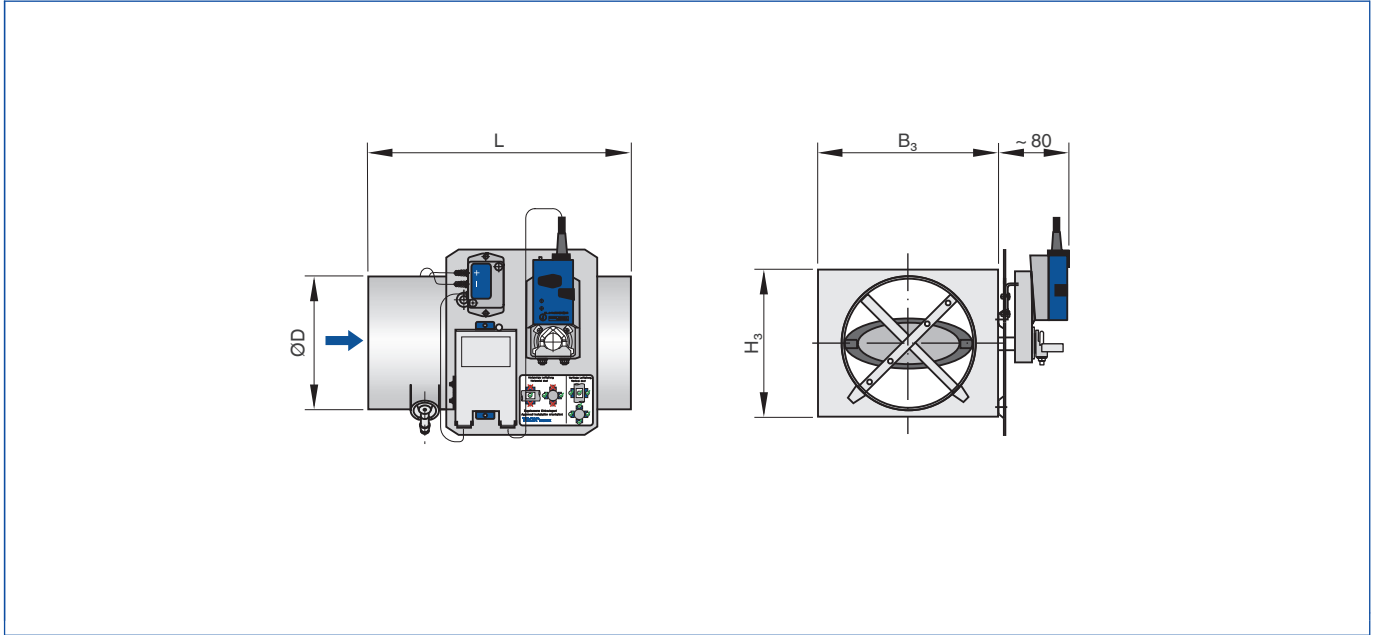
TVRK, Sound pressure level at differential pressure 150 Pa

Nominal size	\dot{V}	\dot{V}	Air-regenerated noise				Case-radiated noise
			①	②	③	④	①
			L_{PA}	L_{PA1}		L_{PA2}	
	l/s	m ³ /h	dB(A)				
125	25	90	34	19	<15	<15	17
	60	216	44	30	25	20	27
	105	378	51	38	32	28	32
	150	540	55	41	35	31	37
160	40	144	36	23	18	<15	21
	80	288	42	31	27	23	28
	145	522	49	37	34	30	33
	250	900	53	41	38	34	40
200	65	234	44	33	28	25	33
	180	648	44	33	28	25	34
	310	1116	43	33	29	26	35
	405	1458	41	33	30	29	35
250	95	342	39	29	23	19	28
	270	972	45	35	31	27	35
	470	1692	44	35	30	27	37
	615	2214	44	35	31	29	39
315	155	558	39	29	24	21	29
	425	1530	46	37	33	29	40
	740	2664	50	41	37	33	45
	1030	3708	53	44	40	37	50
400	255	918	37	29	25	22	30
	715	2574	44	37	33	30	40
	1250	4500	49	42	38	36	46
	1680	6048	51	44	40	38	50

- ① TVRK
- ② TVRK with secondary silencer CAK, insulation thickness 50 mm, length 500 mm
- ③ TVRK with secondary silencer CAK, insulation thickness 50 mm, length 1000 mm
- ④ TVRK with secondary silencer CAK, insulation thickness 50 mm, length 1500 mm



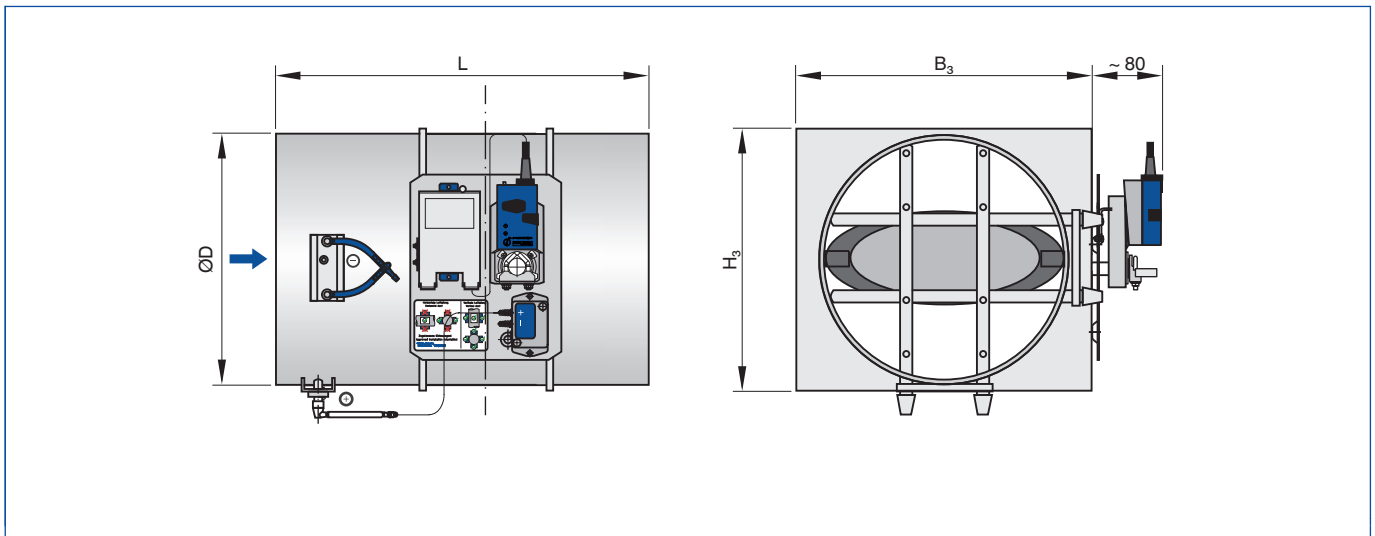
TVRK,
 Nominal sizes 125 - 200



Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	m
	mm	mm	mm	mm	kg
125	125	394	195	145	4.5
160	160	394	230	180	4.8
200	200	394	270	220	5.2

TVRK, nominal sizes 250 - 400

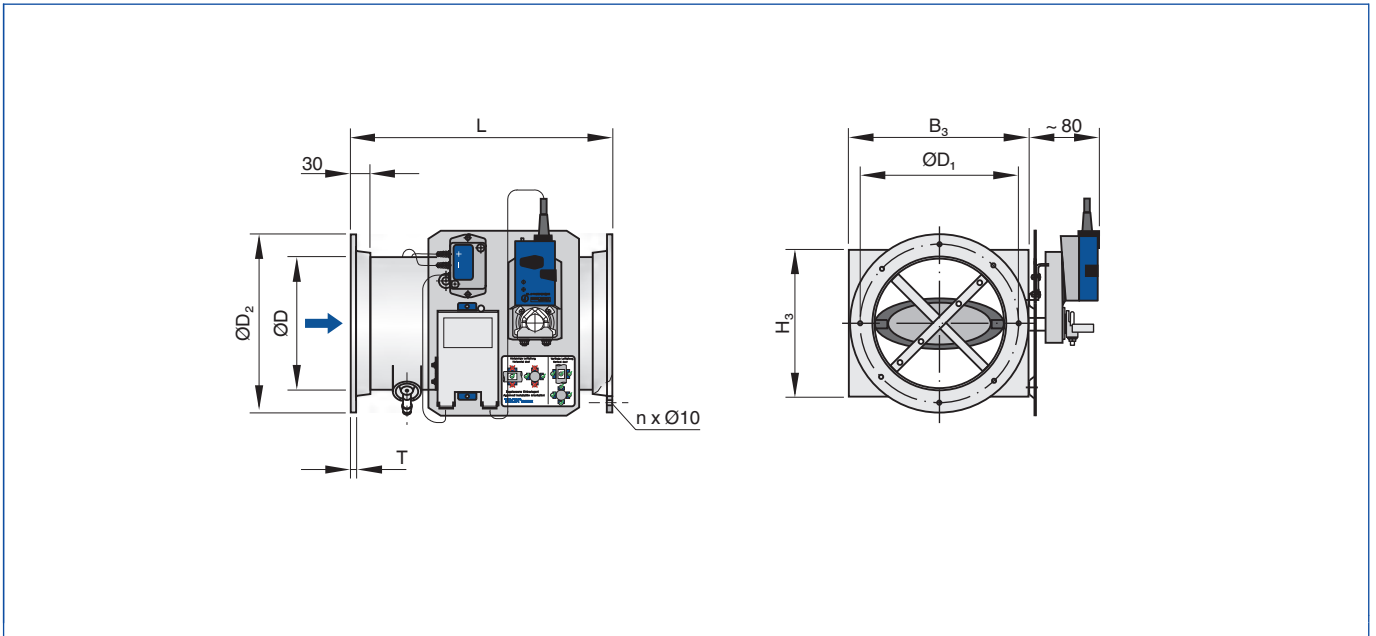


Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	m
	mm	mm	mm	mm	kg
250	250	394	320	270	6.4
315	315	594	385	335	8.5
400	400	594	470	420	10.7



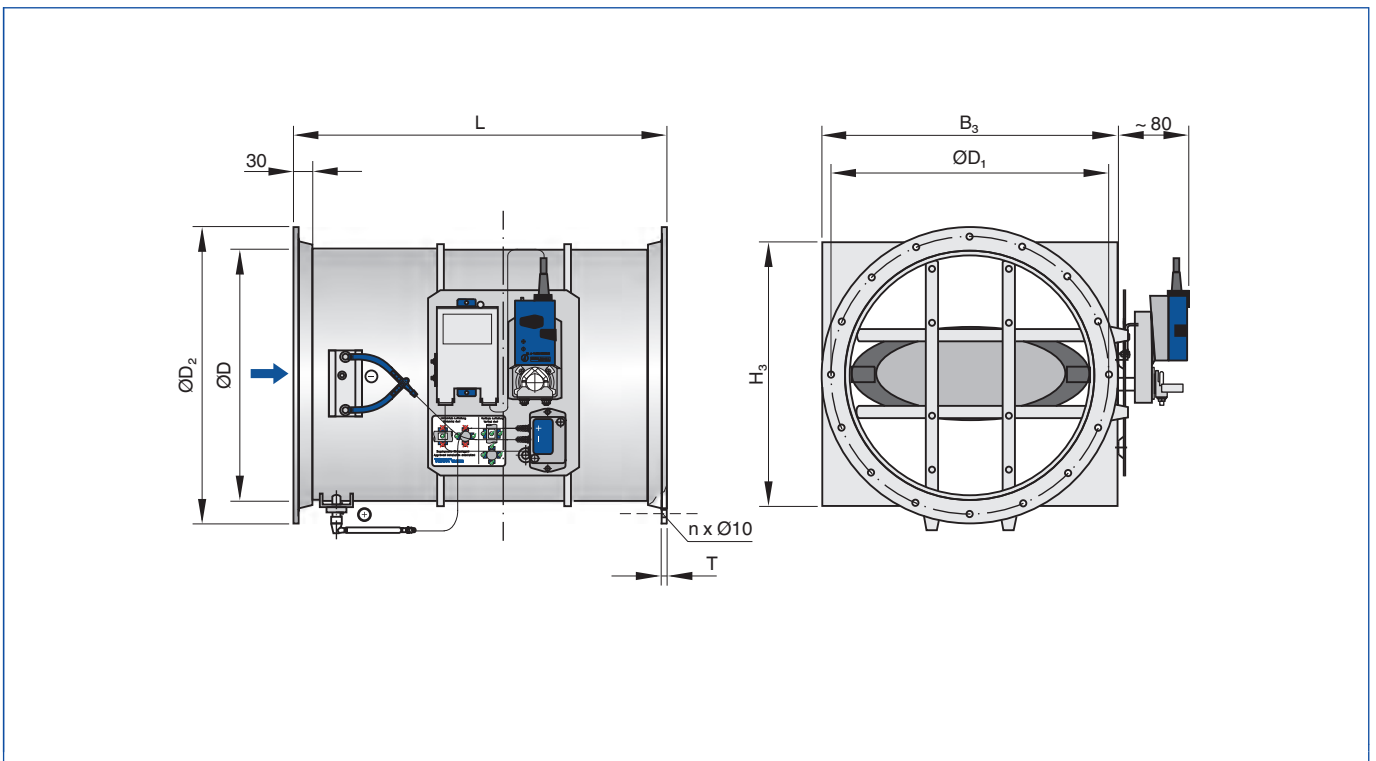
TVRK-FL,
nominal sizes 125 - 200



Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	ØD ₁	ØD ₂	n	T	m
	mm	mm	mm	mm	mm	mm		mm	kg
125	125	400	195	145	165	185	8	8	4.7
160	160	400	230	180	200	230	8	8	5.2
200	200	400	270	270	240	270	8	8	5.7

TVRK-FL, nominal sizes 250 - 400



Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	ØD ₁	ØD ₂	n	T	m
	mm	mm	mm	mm	mm	mm		mm	kg
250	250	400	320	270	290	320	12	8	7.0
315	315	600	385	335	350	395	12	10	9.4
400	400	600	470	420	445	475	16	10	11.9





Optimised for use in laboratories and on fume cupboards

Order code

TVLK – FL / 250 – 100 / GK / BB3 / E0 / 200 – 900

1 2 3 4 5 6 7 8

1 Type
TVLK VAV terminal unit, plastic

2 Flange
No entry: none
FL Flanges on both ends

3 Nominal size
250 - 100 Bluff body 100
250 - 160 Bluff body 160
250 - D08 Nozzle D08
250 - D10 Nozzle D10
250 - D16 Nozzle D16

4 Accessories
No entry: none
GK Matching flanges for both ends

5 Attachments (control component)
BB3 Universal controller with static differential pressure transducer
BP3 Universal controller with MP bus interface and static differential pressure transducer
BPG Universal controller with MP bus interface and static differential pressure transducer, fast-running actuator

6 Operating mode
E Single
M Master
S Slave
F Constant value

7 Signal voltage range
For the actual and setpoint value signals
0 0 - 10 V DC (only BP3 and BPG)
2 2 - 10 V DC

8 Volume flow rates [m³/h or l/s]
 $\dot{V}_{min} - \dot{V}_{max}$ for factory setting

Order code

TVLK – FL / 250 – 100 / GK / ELAB / FH – VS / ULZS / 200 – 900

1 2 3 4 5 6 7 8

1 Type
TVLK VAV terminal unit, plastic

2 Flange
No entry: none
FL Flanges on both ends

3 Nominal size
250 - 100 Bluff body 100
250 - 160 Bluff body 160
250 - D08 Nozzle D08
250 - D10 Nozzle D10
250 - D16 Nozzle D16

4 Accessories
No entry: none
GK Matching flanges for both ends

5 Attachments (control component)
ELAB EASYLAB controller TCU3 with fast-running actuator

6 Equipment function
With face velocity transducer
FH-VS Face velocity control
With sash distance sensor
FH-DS Linear control strategy

FH-DV Safety-optimised control strategy
With switching steps for switch contacts provided by others
FH-2P 2 switching steps
FH-3P 3 switching steps
Without signalling
FH-F Volume flow rate constant value

7 Expansion modules
Option 1: Supply voltage
No entry: 24 V AC
T EM-TRF for 230 V AC
U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communication interface
No entry: none
L EM-LON for LonWorks FTT-10A
B EM-BAC-MOD-01 for BACnet MS/TP
M EM-BAC-MOD-01 for Modbus RTU
I EM-IP for BACnet/IP, Modbus/IP and webserver
R EM-IP with real time clock

Option 3: Automatic zero point correction

No entry: none
Z EM-AUTOZERO Solenoid valve for automatic zero point correction

Option 4: Lighting
No entry: none
S EM-LIGHT Wired socket for the connection of lighting and for switching the lighting on/off using the control panel (only with EM-TRF or EM-TRF-USV)

8 Operating values [m³/h or l/s]
Depending on the equipment function
VS: $\dot{V}_{min} - \dot{V}_{max}$
DS: $\dot{V}_{min} - \dot{V}_{max}$
DV: $\dot{V}_{min} - \dot{V}_{max}$
2P: \dot{V}_1 / \dot{V}_2
3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$
F: \dot{V}_1

Useful additions
Control panel for fume cupboard controller, for displaying the functions of the control system according to EN 14175
BE-SEG-02 OLED display
BE-LCD-01 40-character display



 Order code

TVLK – FL / 250 – 100 / GK / ELAB / EC – E0 / ULZ / ...

1
2
3
4
5
6
7
8
9

1 Type

TVLK VAV terminal unit, plastic

2 Flange

No entry: none
FL Flanges on both ends

3 Nominal size

250 - 100 Bluff body 100
250 - 160 Bluff body 160
250 - D08 Nozzle D08
250 - D10 Nozzle D10
250 - D16 Nozzle D16

4 Accessories

No entry: none
GK Matching flanges for both ends

5 Attachments (control component)

ELAB EASYLAB controller TCU3 with fast-running actuator

6 Equipment function

Single operation
EC Extract air controller

7 External volume flow rate setting

E0 Voltage signal 0 - 10 V DC
E2 Voltage signal 2 - 10 V DC
2P Switch contacts (provided by others) for 2 switching steps
3P Switch contacts (provided by others) for 3 switching steps
F Volume flow rate constant value, without signalling

8 Expansion modules

Option 1: Supply voltage
No entry: 24 V AC
T EM-TRF for 230 V AC
U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communication interface
No entry: none
L EM-LON for LonWorks FTT-10A
B EM-BAC-MOD-01 for BACnet MS/TP
M EM-BAC-MOD-01 for Modbus RTU
I EM-IP for BACnet/IP, Modbus/IP and webservice
R EM-IP with real time clock

Option 3: Automatic zero point correction
No entry: none
Z EM-AUTOZERO Solenoid valve for automatic zero point correction

9 Operating values [m³/h or l/s, Pa]

E0, E2: $\dot{V}_{\min} / \dot{V}_{\max}$
2P: \dot{V}_1 / \dot{V}_2
3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$
F: \dot{V}_1

 Order code

TVLK – FL / 250 – 100 / GK / TMB / FH / 200 – 900

1
2
3
4
5
6
7

1 Type

TVLK VAV terminal unit made of plastic

2 Flange

No entry: none
FL Flanges on both ends

3 Nominal size [mm]

250 - 100 Bluff body 100
250 - 160 Bluff body 160
250 - D08 Nozzle D08
250 - D10 Nozzle D10
250 - D16 Nozzle D16

4 Accessories

No entry: none
GK Matching flanges for both ends

5 Attachments (control component)

TMA TCU-LON-II with fast-running actuator
TMB TCU-LON-II with fast-running actuator (brushless motor)

6 Equipment function

FH Fume cupboard
Face velocity control with face velocity transducer
RE Extract air controller (Room Extract)

7 Operating values [m³/h or l/s]

FH: $\dot{V}_{\min} - \dot{V}_{\max}$
RE: $\dot{V}_{\text{day}} / \dot{V}_{\text{night}} / \dot{V}_{\text{constant}}$

Useful additions

Control panel for fume cupboard controller, for displaying the functions of the control system according to EN 14175

BE-TCU-LON-II Control panel



+ Features

- Plastic circular VAV terminal units for aggressive extract air in laboratories and production facilities
- ▶ Casing and damper blade made of flame-resistant polypropylene
 - ▶ Compact construction, only 400 mm long
 - ▶ High control accuracy even in case of unfavourable upstream conditions
 - ▶ Combination with fast-running actuators (air management systems)
 - ▶ Volume flow rate measurement with bluff body or nozzle
 - ▶ Slide-out sensor tubes allow for easy cleaning
 - ▶ Closed blade air leakage to EN 1751, class 4
 - ▶ Casing air leakage to EN 1751, class C

- Optional equipment and accessories
- ▶ With flanges on both ends
 - ▶ Plastic secondary silencer Type CAK for the reduction of air-regenerated noise

Application

- ▶ Circular LABCONTROL VAV terminal units of Type TVLK, made of plastic, to control the volume flow rate of fume cupboards and fume hoods
- ▶ Suitable for contaminated air
- ▶ Closed-loop volume flow control using an external power supply
- ▶ Shut-off by means of switching (equipment supplied by others)

Variants

- ▶ TVLK: VAV terminal unit
- ▶ TVLK-FL: VAV terminal unit with flanges on both ends

Attachments

- ▶ LABCONTROL: Control components (attachments) for air management systems
- ▶ Universal controller: Controller, differential pressure transducer and actuators for special applications

& Accessories

- ▶ Matching flanges for both ends, including seals

+ Useful additions

- ▶ Plastic secondary silencer Type CAK for demanding acoustic requirements

★ Special characteristics

- ▶ High control accuracy even in case of unfavourable upstream conditions
- ▶ Integral slide-out differential pressure sensor with 3 mm measuring holes (resistant to dust and pollution)
- ▶ No metal parts come into contact with the airflow
- ▶ Factory set-up or programming and aerodynamic function testing
- ▶ Volume flow rate can be measured and subsequently adjusted on site; additional adjustment tool or configuration software may be necessary

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ Closed blade air leakage to EN 1751, class 4
- ▶ Meets the increased requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class C

Technical data

Nominal sizes	250 mm
Volume flow rate range	30 - 515 l/s or 108 - 1854 m ³ /h
Volume flow rate control range	Approx. 15 to 100% of the nominal volume flow rate
Minimum differential pressure	5 - 130 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C

Volume flow rate ranges and minimum differential pressure values

Nominal size	V̇		Δp _{st min}				ΔV̇ ± %
	l/s	m ³ /h	Pa	Pa	Pa	Pa	
250-100	55	198	5	5	5	5	10
	140	504	15	15	15	15	7
	220	792	35	35	35	35	6
	360	1296	85	85	85	90	5
250-160	30	108	5	5	5	5	10
	80	288	25	25	25	25	7
	120	432	50	50	50	50	6
	195	702	130	130	130	130	5
250-D08	95	342	5	5	5	5	10
	210	756	10	10	10	10	7
	315	1134	20	20	20	20	6
	515	1854	45	50	55	55	5
250-D10	55	198	5	5	5	5	10
	140	504	10	10	10	10	7
	220	792	20	20	20	20	6
	360	1296	50	50	55	55	5
250-D16	30	108	5	5	5	5	10
	80	288	15	15	15	15	7
	120	432	30	30	30	30	6
	195	702	70	70	75	75	5



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	③	④	$\Delta\dot{V}$ ± %
	l/s	m ³ /h	Pa	Pa	Pa	Pa	
250-100	65	234	5	5	5	5	10
	180	648	25	25	25	25	7
	290	1044	55	55	55	60	6
	360	1296	85	85	85	90	5
250-160	35	126	5	5	5	5	10
	100	360	35	35	35	35	7
	160	576	90	90	90	90	6
	195	702	130	130	130	130	5
250-D08	95	342	5	5	5	5	10
	210	756	10	10	10	10	7
	315	1134	20	20	20	20	6
	515	1854	45	50	55	55	5
250-D10	65	234	5	5	5	5	10
	180	648	15	15	15	15	7
	290	1044	35	35	35	35	6
	360	1296	50	50	55	55	5
250-D16	35	126	5	5	5	5	10
	100	360	20	20	20	20	7
	160	576	50	50	50	50	6
	195	702	70	70	75	75	5

TVLK with EASYLAB, Sound pressure level at differential pressure 150 Pa

Nominal size	\dot{V}	\dot{V}	Air-regenerated noise				Case-radiated noise
			①	②	③	④	①
	l/s	m ³ /h	L _{PA}	L _{PA1}			L _{PA2}
	dB(A)						
250-100	55	198	40	33	29	26	26
	140	504	46	38	34	31	33
	220	792	47	39	35	31	37
	360	1296	48	39	35	32	42
250-160	30	108	37	32	28	25	22
	80	288	41	35	31	28	29
	120	432	43	37	33	30	32
	195	702	49	42	38	35	40
250-D08	95	342	36	26	23	20	23
	210	756	40	31	27	24	29
	315	1134	41	32	29	26	33
	515	1854	44	34	31	28	38
250-D10	55	198	36	28	24	21	24
	140	504	42	34	30	27	31
	220	792	43	35	31	28	35
	360	1296	45	37	33	29	38
250-D16	30	108	33	28	24	22	21
	80	288	39	33	30	28	28
	120	432	42	36	33	30	31
	195	702	47	42	38	36	38

- ① TVLK
- ② TVLK with circular silencer CAK, insulation thickness 50 mm, length 500 mm
- ③ TVLK with circular silencer CAK, insulation thickness 50 mm, length 1000 mm
- ④ TVLK with circular silencer CAK, insulation thickness 50 mm, length 1500 mm

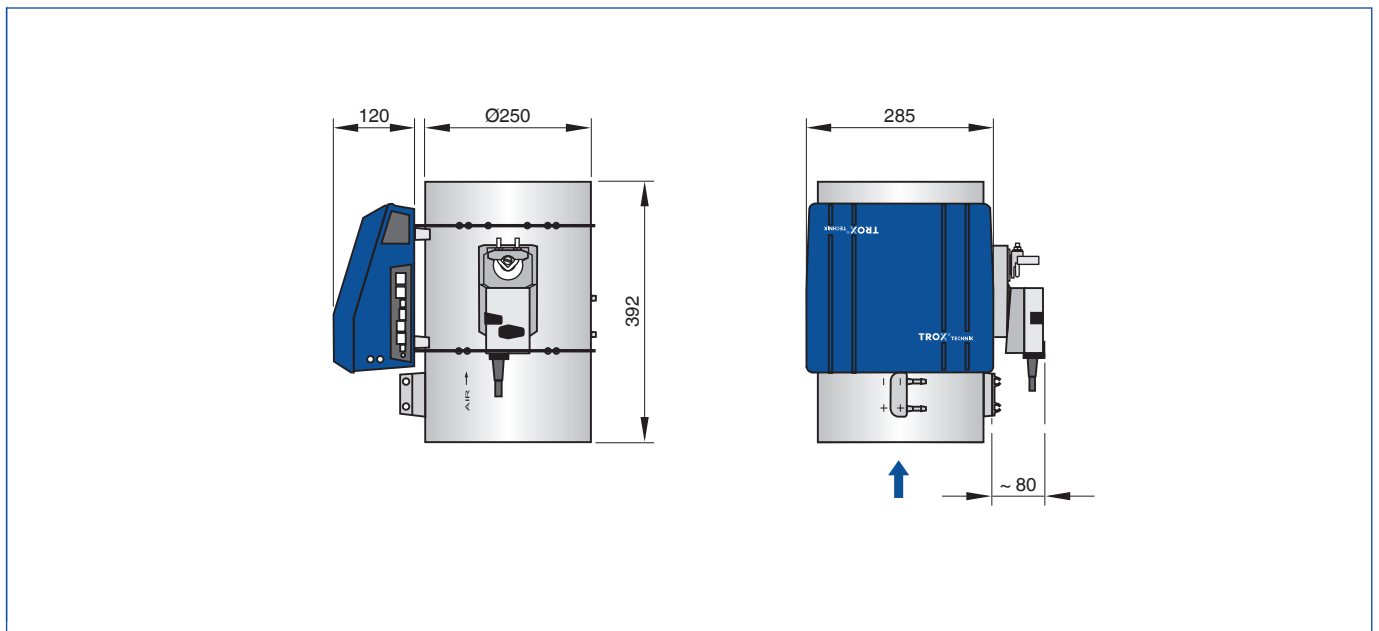


TVLK with VARYCONTROL Universal controller, Sound pressure level at differential pressure 150 Pa

Nominal size	Ḃ	Ḃ	Air-regenerated noise				Case-radiated noise
			①	②	③	④	①
	l/s	m³/h	L _{PA}	L _{PA1}			L _{PA2}
			dB(A)				
250-100	65	234	41	34	30	27	27
	180	648	46	38	34	31	35
	290	1044	47	39	35	31	40
	360	1296	48	39	35	32	42
250-160	35	126	38	33	29	26	23
	100	360	42	36	32	29	30
	160	576	45	37	34	31	34
	195	702	49	42	38	35	40
250-D08	95	342	36	26	23	20	23
	210	756	40	31	27	24	29
	315	1134	41	32	29	26	33
	515	1854	44	34	31	28	38
250-D10	65	234	37	30	26	22	25
	180	648	43	35	31	28	33
	290	1044	44	36	32	29	36
	360	1296	45	37	33	29	38
250-D16	35	126	34	29	25	23	22
	100	360	41	35	32	29	30
	160	576	43	37	34	32	32
	195	702	47	42	38	36	38

- ① TVLK
- ② TVLK with circular silencer CAK, insulation thickness 50 mm, length 500 mm
- ③ TVLK with circular silencer CAK, insulation thickness 50 mm, length 1000 mm
- ④ TVLK with circular silencer CAK, insulation thickness 50 mm, length 1500 mm

TVLK

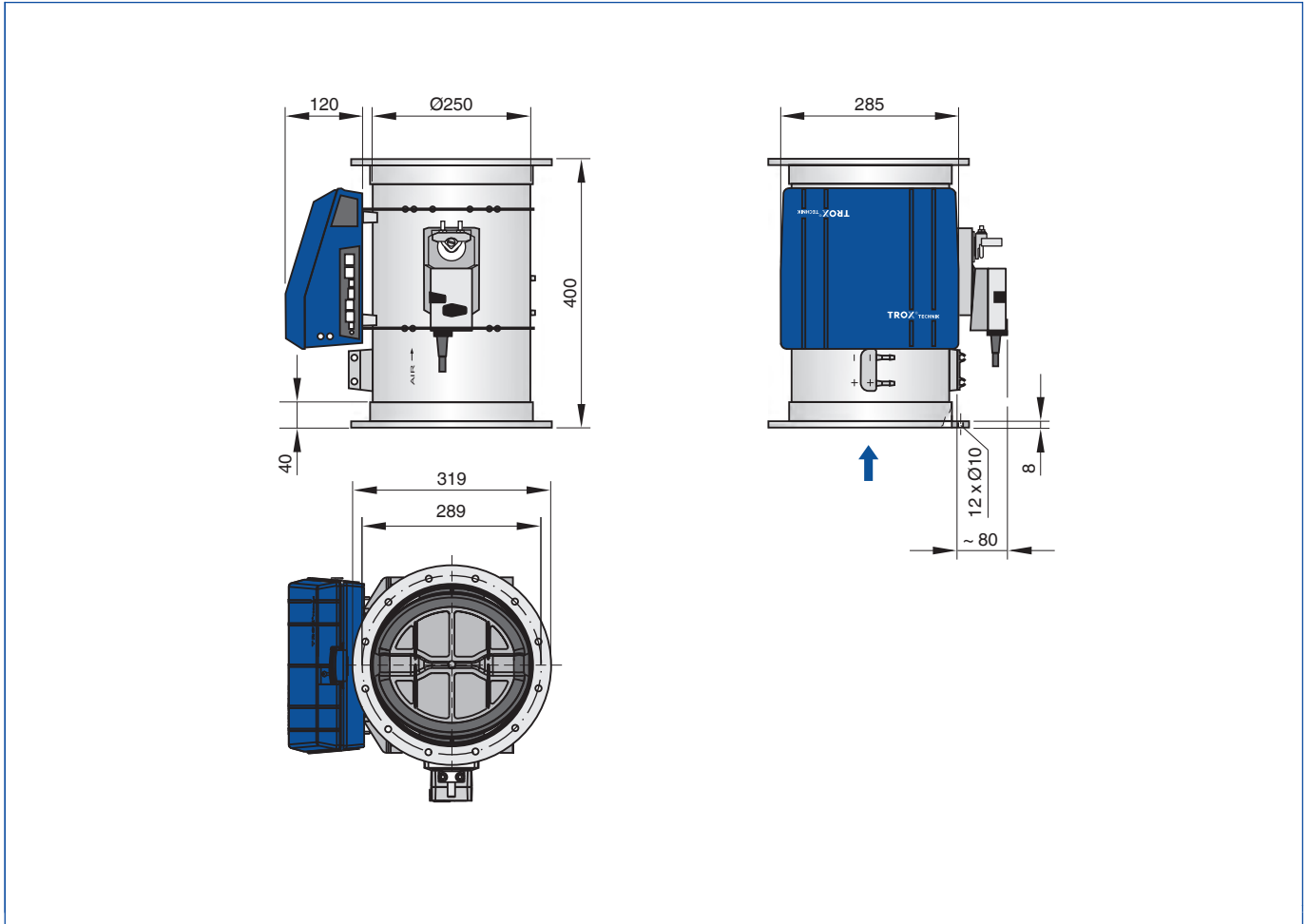


Dimensions [mm] and weight [kg]

Nominal size	m	
	kg	
250	5.1	



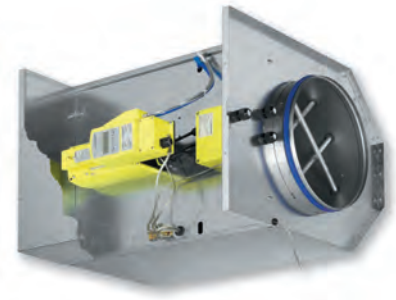
TVLK-FL



Dimensions [mm] and weight [kg]

Nominal size		
		m
		kg
250		5.7





For the control of variable air volume flows in potentially explosive atmospheres (ATEX)

Order code

TVR-Ex - P1 / 125 / S1S / 200 - 400 / NO					
1	2	3	4	5	6

<p>1 Type TVR-Ex VAV terminal unit for use in potentially explosive atmospheres</p> <p>2 Material P1 No entry: galvanised sheet steel Inner duct powder-coated, silver grey (RAL 7001) A2 Inner duct in stainless steel</p> <p>3 Nominal size [mm] 125, 160, 200, 250, 315, 400</p>	<p>4 Attachments (control component) For example S1S Electronic control Integral controller and actuator PG5 Pneumatic control Volume flow controller with actuator PJ5 Pressure and volume flow cascade (±20 Pa)</p>	<p>5 Operating values [m³/h or l/s, Pa] Electronic control $\dot{V}_{min} - \dot{V}_{max}$ Pneumatic control Volume flow rate $\dot{V}_{min} - \dot{V}_{max}$ Pressure and volume flow cascade $\dot{V}_{min} - \dot{V}_{max} / \Delta p_{setpoint}$</p> <p>6 Damper blade position Only for spring return actuators and pneumatic actuators NO Pressure off/power off to OPEN NC Power off/Pressure off to close</p>
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Order code

TVR-Ex - P1 / 160 / TES / EC - E0 / ULZ / ...							
1	2	3	4	5	6	7	8

<p>1 Type TVR-Ex VAV terminal unit for use in potentially explosive atmospheres</p> <p>2 Material P1 No entry: galvanised sheet steel Inner duct powder-coated, silver grey (RAL 7001) A2 Inner duct in stainless steel</p> <p>3 Nominal size [mm] 125, 160, 200, 250, 315, 400</p> <p>4 Attachments (control component) For example Electronic control TES External controller, pressure transducer and actuator</p>	<p>5 Equipment function SC Single operation Supply air controller EC Extract air controller</p> <p>6 External volume flow rate setting E0 Voltage signal 0 - 10 V DC E2 Voltage signal 2 - 10 V DC 2P Switch contacts (provided by others) for 2 switching steps 3P Switch contacts (provided by others) for 3 switching steps F Volume flow rate constant value, without signalling</p>	<p>7 Expansion modules T Option 1: Power supply No entry: 24 V AC EM-TRF for 230 V AC U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)</p> <p>Option 2: Communication interface No entry: none L EM-LON for LonWorks FTT-10A B EM-BAC-MOD-01 for BACnet MS/TP M EM-BAC-MOD-01 for Modbus RTU I EM-IP for BACnet/IP, Modbus/IP and webserver R EM-IP with real time clock</p> <p>8 Operating values [m³/h or l/s, Pa] E0, E2: $\dot{V}_{min} / \dot{V}_{max}$ 2P: \dot{V}_1 / \dot{V}_2 3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$ F: \dot{V}_1</p>
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Technical data

Nominal sizes	125 - 400 mm
Volume flow rate range	15 - 1680 l/s or 54 - 6048 m³/h
Volume flow rate control range	Approx. 15 to 100% of the nominal volume flow rate
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C



Technical data

Supply voltage (AC)	24 V AC ± 10 %, 50/60 Hz
Supply voltage (DC)	24 V DC ± 10 %
Power rating (AC)	20 VA max.
Power rating (DC)	20 W max.
Setpoint value signal input	0 - 10 V DC, R _a > 100 kΩ
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	ATEX to 94/9/EG, EMC to 2004/108/EG, low voltage to 2006/95/EG



Technical data

Operating pressure	1.3 bar ± 0.1 bar
Air consumption - volume flow control	50 l/h
Air consumption - pressure and volume flow cascade	100 l/h
Control pressure	0.2 - 1.0 bar
Maximum pressure	1.5 bar
Compressed air	Compressed air for instruments, free of oil, water and dust
Protection level	IP 42



Features

- Circular VAV terminal units for variable air volume systems, approved and certified for potentially explosive atmospheres (ATEX)
- ▶ ATEX-compliant construction and parts
 - ▶ Approved for all gases, mists and vapours in zones 1 and 2, with electronic control additionally for dusts in zones 21 and 22
 - ▶ Suitable for the control of supply or extract air as well as for differential pressure control
 - ▶ Electronic or pneumatic control components
 - ▶ Closed blade air leakage to EN 1751, up to class 4
 - ▶ Casing air leakage to EN 1751, class C

Optional equipment and accessories

- ▶ Spring return actuator
- ▶ Auxiliary switch with adjustable switching points for capturing the end positions



Application

- ▶ Circular EXCONTROL VAV terminal units of Type TVR-Ex for the precise supply air or extract air flow control in variable air volume systems
- ▶ For use in potentially explosive atmospheres (ATEX)
- ▶ Closed-loop volume flow control using an external power supply
- ▶ Electronic or pneumatic volume flow control
- ▶ Shut-off by means of switching (equipment supplied by others)



EN Classification

- Electronic control: Equipment group II
- ▶ Zones 1 and 2 (atmosphere: gases): II 2 G c II T5/T6
 - ▶ Zones 21 and 22 (atmosphere: dusts): II 2 D c II 80 °C
- Pneumatic control: Equipment group II
- ▶ Zones 1 and 2 (atmosphere: gases): II 2 G c II T5/T6



Construction

- ▶ Galvanised sheet steel
- ▶ P1: Inner duct powder-coated, silver grey (RAL 7001)
- ▶ A2: Inner duct in stainless steel



Attachments

- ▶ Electronic control
- ▶ Pneumatic control



Accessories

- ▶ Actuator with auxiliary switch for capturing the end positions
- ▶ Spring return actuator



Useful additions

- ▶ Secondary silencer Type CA for demanding acoustic requirements



Special features

- ▶ ATEX mark and certification
- ▶ ATEX equipment group II, approved for use in zones 1 and 2; electronic control also for zones 21 and 22
- ▶ Volume flow rate can later be measured and adjusted on site; configuration is possible using personal computer software



ISO Standards and guidelines

- ▶ Directive 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres
- ▶ Closed blade air leakage to EN 1751, class 4 (nominal sizes 125 and 160, class 3).
- ▶ Nominal sizes 125 and 160 meet the general requirements, nominal sizes 200 - 400 meet the increased requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class C



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	③	④	$\Delta\dot{V}$ ± %
	l/s	m ³ /h	Pa	Pa	Pa	Pa	
125	22	79	5	5	5	5	15
	60	216	15	20	20	20	7
	105	378	45	50	55	60	6
	150	540	90	100	110	115	5
160	35	126	5	5	5	5	15
	100	360	15	15	15	15	8
	175	630	35	40	45	45	7
	250	900	70	80	85	95	5
200	60	216	5	5	5	5	15
	160	576	15	15	15	15	7
	280	1008	35	35	40	40	5
	405	1458	65	70	75	80	5
250	90	324	5	5	5	5	15
	245	882	10	10	10	10	7
	430	1548	25	25	30	35	5
	615	2214	45	50	55	65	5
315	145	522	5	5	5	5	15
	410	1476	5	10	10	10	7
	720	2592	15	20	20	20	6
	1030	3708	30	35	40	40	5
400	240	864	5	5	5	5	15
	670	2412	5	5	5	5	7
	1175	4230	15	15	15	15	6
	1680	6048	25	30	30	35	5



Volume flow rate ranges and minimum differential pressure values

Nominal size	\dot{V}		①	②	③	④	$\Delta\dot{V}$ ± %
	l/s	m ³ /h	Pa	Pa	Pa	Pa	
125	15	54	5	5	5	5	15
	40	144	10	10	10	10	10
	70	252	20	25	25	25	7
	100	360	40	45	50	55	5
160	25	90	5	5	5	5	15
	75	270	10	10	10	10	10
	125	450	20	20	25	25	7
	175	630	35	40	45	45	5
200	40	144	5	5	5	5	15
	125	450	10	10	10	10	10
	210	756	20	20	25	25	7
	300	1080	40	40	45	45	5
250	60	216	5	5	5	5	15
	200	720	5	10	10	10	10
	340	1224	15	15	20	20	7
	475	1710	30	30	35	40	5
315	105	378	5	5	5	5	15
	330	1188	5	5	5	5	10
	555	1998	10	10	15	15	7
	775	2790	20	20	25	25	5
400	170	612	5	5	5	5	15
	545	1962	5	5	5	5	10
	920	3312	10	10	10	10	7
	1300	4680	15	20	20	20	5



TVR-Ex, electronic, Sound pressure level at differential pressure 150 Pa

Nominal size	\dot{V}	\dot{V}	Air-regenerated noise				Case-radiated noise
			①	②	③	④	①
	l/s	m ³ /h	L _{PA}	L _{PA1}			L _{PA2}
dB(A)							
125	22	79	36	25	16	<15	16
	60	216	45	36	30	28	25
	105	378	49	40	34	32	31
	150	540	52	41	34	32	35
160	35	126	41	30	22	19	22
	100	360	47	39	34	31	28
	175	630	50	42	37	34	32
	250	900	53	44	39	36	37
200	60	216	41	32	24	22	21
	160	576	47	40	34	33	29
	280	1008	50	44	40	38	32
	405	1458	54	45	39	38	38
250	90	324	38	30	24	22	22
	245	882	47	40	34	32	35
	430	1548	48	42	38	37	37
	615	2214	52	44	38	37	42
315	145	522	43	36	29	26	29
	410	1476	47	42	35	34	39
	720	2592	49	44	39	38	42
	1030	3708	53	48	42	41	46
400	240	864	43	36	29	26	31
	670	2412	44	38	32	30	37
	1175	4230	47	42	36	35	41
	1680	6048	50	44	38	37	46

- ① TVR-Ex
- ② TVR-Ex with secondary silencer CA, insulation thickness 50 mm, length 500 mm
- ③ TVR-Ex with secondary silencer CA, insulation thickness 50 mm, length 1000 mm
- ④ TVR-Ex with secondary silencer CA, insulation thickness 50 mm, length 1500 mm

TVR-Ex, pneumatic, Sound pressure level at differential pressure 150 Pa

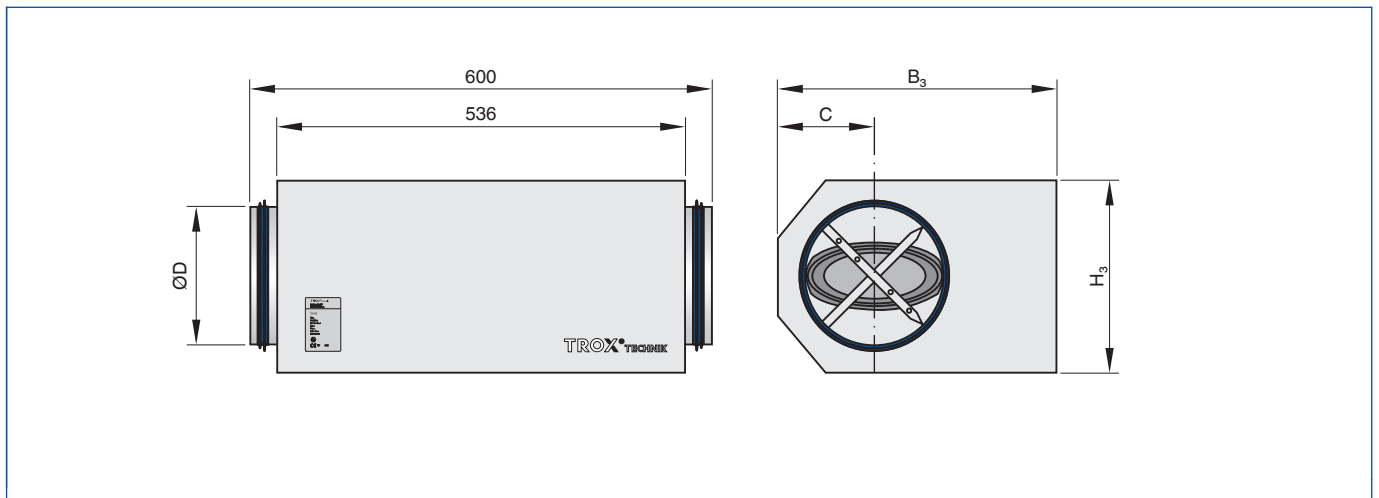
Nominal size	\dot{V}	\dot{V}	Air-regenerated noise				Case-radiated noise
			①	②	③	④	①
	l/s	m ³ /h	L _{PA}	L _{PA1}			L _{PA2}
dB(A)							
125	15	54	33	22	<15	<15	<15
	40	144	39	29	22	19	20
	70	252	46	37	31	29	26
	100	360	49	40	34	32	31
160	25	90	40	28	20	16	20
	75	270	45	35	29	26	25
	125	450	49	41	36	33	29
	175	630	50	42	37	34	32
200	40	144	40	31	23	20	20
	125	450	46	37	31	30	26
	210	756	48	41	36	35	30
	300	1080	51	44	40	38	33
250	60	216	41	32	24	22	21
	200	720	44	36	31	29	30
	340	1224	47	40	35	34	36
	475	1710	49	42	38	37	38



Nominal size	\dot{V}	\dot{V}	Air-regenerated noise				Case-radiated noise
			①	②	③	④	①
			L_{PA}	L_{PA1}		L_{PA2}	
	l/s	m ³ /h	dB(A)				
315	105	378	42	35	28	25	28
	330	1188	45	40	33	31	35
	555	1998	47	42	36	35	40
	775	2790	50	44	39	38	43
400	170	612	43	36	30	26	30
	545	1962	43	37	31	29	35
	920	3312	45	40	34	33	39
	1300	4680	48	42	37	35	43

- ① TVR-Ex
- ② TVR-Ex with secondary silencer CA, insulation thickness 50 mm, length 500 mm
- ③ TVR-Ex with secondary silencer CA, insulation thickness 50 mm, length 1000 mm
- ④ TVR-Ex with secondary silencer CA, insulation thickness 50 mm, length 1500 mm

TVR-Ex



Dimensions [mm] and weight [kg]

Nominal size	ØD mm	B ₃ mm	H ₃ mm	C mm
125	124	372	221	129
160	159	372	221	111
200	199	463	311	182
250	249	463	311	157
315	314	627	461	289
400	399	627	461	246

Dimensions [mm] and weight [kg]

Nominal size	TVR-Ex/.../TEx		TVR-Ex/.../Pxx	
	m		kg	
	kg		kg	
125		17.5		15.5
160		17.5		15.5
200		19.0		17.0
250		19.0		17.0
315		23.0		21.0
400		23.0		21.0



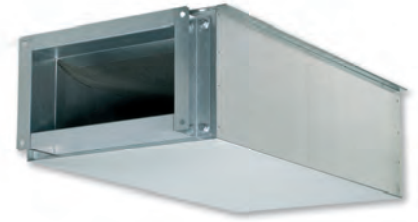
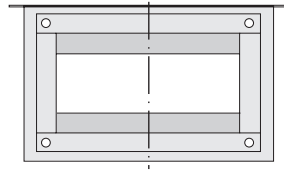
TVR-Ex, EXCONTROL Electric control components

Order code detail	Controlled variable	Controller	Differential pressure transducer	Actuator
Internal controller				
S1S	Volume flow rate	Universal controller (use in areas with potentially explosive atmospheres) Schischek	Static, integral	Actuator
S1F	Volume flow rate	Universal controller (use in areas with potentially explosive atmospheres) Schischek	Static, integral	Spring return actuator
S1X	Volume flow rate	Universal controller (use in areas with potentially explosive atmospheres) Schischek	Static, integral	Actuator with auxiliary switches
S1Y	Volume flow rate	Universal controller (use in areas with potentially explosive atmospheres) Schischek	Static, integral	Spring return actuator with auxiliary switch
External controller				
TES	Volume flow rate	Volume flow rate controller TCU3 (use in areas with potentially explosive atmospheres) TROX/Schischek	Static	Actuator
TEF	Volume flow rate	Volume flow rate controller TCU3 (use in areas with potentially explosive atmospheres) TROX/Schischek	Static	Spring return actuator
TEX	Volume flow rate	Volume flow rate controller TCU3 (use in areas with potentially explosive atmospheres) TROX/Schischek	Static	Actuator with auxiliary switches
TEY	Volume flow rate	Volume flow rate controller TCU3 (use in areas with potentially explosive atmospheres) TROX/Schischek	Static	Spring return actuator with auxiliary switch

TVR-Ex, EXCONTROL Pneumatic control components

Order code detail	Controlled variable	Controller	Differential pressure transducer	Actuator
Volume flow controllers				
PG5	Volume flow rate	Volume flow controller Sauter	Integral	Actuator
Pressure and volume flow cascade				
PJ5	Room pressure	Room pressure controller ± 20 Pa Volume flow controller Sauter	Integral	Actuator
PL5	Room pressure	Room pressure controller ± 50 Pa Volume flow controller Sauter	Integral	Actuator





For the reduction of air-regenerated noise of air terminal units Type TVZ, TVA, TZ-Silenzio, TA-Silenzio or TVM



Order code

TS / 200

1 2

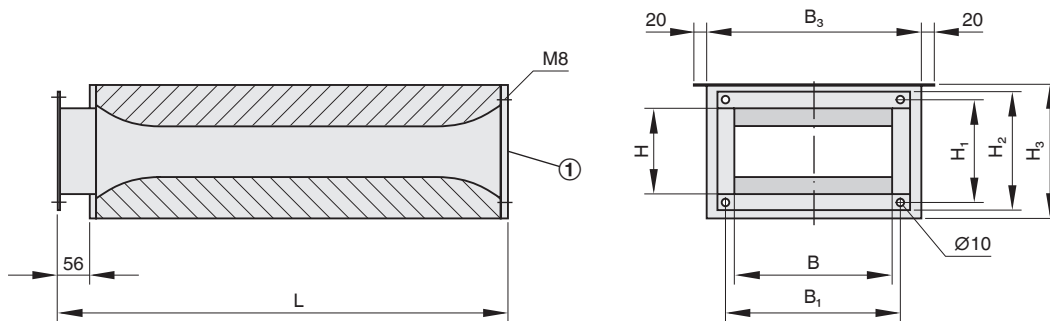
1 Type

TS Secondary silencer

2 Nominal size

125, 160, 200, 250, 315, 400

TS

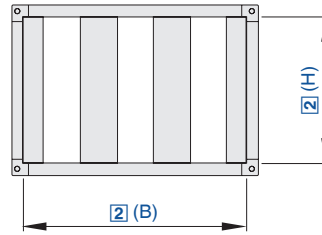


1 End facing the room

Dimensions [mm] and weight [kg]

Nominal size	L mm	B ₃ mm	H ₃ mm	B mm	B ₁ mm	H mm	H ₁ mm	m kg
125	806	300	236	198	232	152	186	10
160	806	410	236	308	342	152	186	15
200	956	560	281	458	492	210	244	22
250	956	700	311	598	632	201	235	37
315	1056	900	361	798	832	252	286	42
400	1306	1000	446	898	932	354	388	50





For the reduction of air-regenerated noise of air terminal units Type TVJ, TVT or EN

Order code

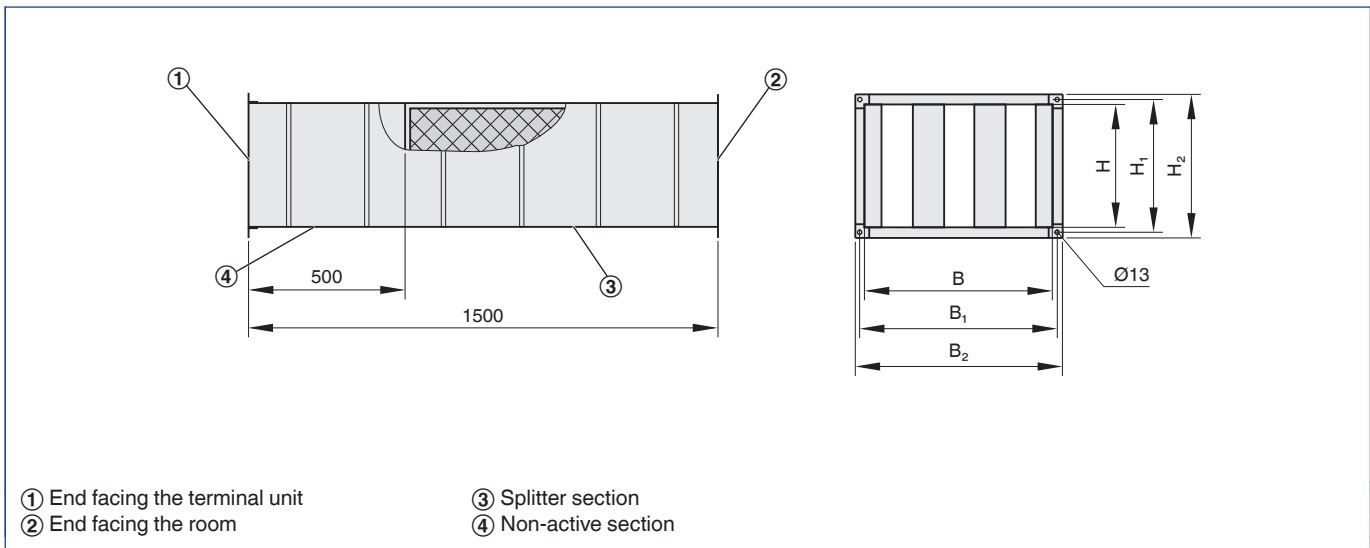
TX / 600x400

1 2

1 Type
 TX Secondary silencer

2 Nominal size [mm]
 B x H

TX



Dimensions [mm] and weight [kg]

Nominal size	B	H	B ₁	B ₂	H ₁	H ₂	m
	mm	mm	mm	mm	mm	mm	kg
200 × 100	200	100	235	260	135	160	10
300 × 100	300	100	335	360	135	160	12
400 × 100	400	100	435	460	135	160	15
500 × 100	500	100	535	560	135	160	17
600 × 100	600	100	635	660	135	160	20
300 × 150	300	150	335	360	185	210	15
200 × 200	200	200	235	260	235	260	16
300 × 200	300	200	335	360	235	260	20
400 × 200	400	200	435	460	235	260	25
500 × 200	500	200	535	560	235	260	29
600 × 200	600	200	635	660	235	260	34
700 × 200	700	200	735	760	235	260	39
800 × 200	800	200	835	860	235	260	44
400 × 250	400	250	435	460	285	310	27
500 × 250	500	250	535	560	285	310	30
600 × 250	600	250	635	660	285	310	36
300 × 300	300	300	335	360	335	360	24
400 × 300	400	300	435	460	335	360	29
500 × 300	500	300	535	560	335	360	34
600 × 300	600	300	635	660	335	360	40
700 × 300	700	300	735	760	335	360	45
800 × 300	800	300	835	860	335	360	50
900 × 300	900	300	935	960	335	360	55
1000 × 300	1000	300	1035	1060	335	360	60



Dimensions [mm] and weight [kg]

Nominal size	B	H	B ₁	B ₂	H ₁	H ₂	m
	mm	mm	mm	mm	mm	mm	kg
400 × 400	400	400	435	460	435	460	34
500 × 400	500	400	535	560	435	460	39
600 × 400	600	400	635	660	435	460	45
700 × 400	700	400	735	760	435	460	50
800 × 400	800	400	835	860	435	460	56
900 × 400	900	400	935	960	435	460	61
1000 × 400	1000	400	1035	1060	435	460	67
500 × 500	500	500	535	560	535	560	45
600 × 500	600	500	635	660	535	560	50
700 × 500	700	500	735	760	535	560	56
800 × 500	800	500	835	860	535	560	62
900 × 500	900	500	935	960	535	560	68
1000 × 500	1000	500	1035	1060	535	560	73
600 × 600	600	600	635	660	635	660	55
800 × 600	800	600	835	860	635	660	67
1000 × 600	1000	600	1035	1060	635	660	80
800 × 800	800	800	835	860	835	860	79
1000 × 800	1000	800	1035	1060	835	860	93
1000 × 1000	1000	1000	1035	1060	1035	1060	107





Quick and easy handling

+ Features

Control components for VAV terminal units, to be mounted on the terminal unit for easy operation

- ▶ Simplified ordering and on-site assignment to rooms as selection is based on the nominal size of the duct
- ▶ Rapid volume flow rate setting without additional device
- ▶ Indicator light simplifies functional checking
- ▶ Proven technology of the Compact volume flow controllers
- ▶ Suitable for constant and variable volume flows as well as for \dot{V}_{\min} / \dot{V}_{\max} switching

+ Application

- ▶ Electronic volume flow controllers of Type Easy are compact, all-in-one control devices for VAV terminal units
- ▶ Dynamic differential pressure transducer, electronic controller, and actuator are fitted together in one casing

- ▶ Suitable for different control tasks depending on how the input for the setpoint value signal is used
- ▶ The output signals of the room temperature controller, central BMS, air quality controller or similar units control the volume flow rate setpoint
- ▶ Override control by means of switches or relays
- ▶ Volume flow rate actual value is available as linear voltage signal

Standard filtration in comfort air conditioning systems allows for use of the controller in the supply air without additional dust protection. Since a partial volume flow is passed through the transducer in order to measure the volume flow rate, please note:

- ▶ With heavy dust levels in the room, suitable extract air filters must be provided.
- ▶ If the air is polluted with fluff or sticky particles, or if it contains aggressive media, Easy controllers cannot be used

+ Construction

- ▶ LMV-D3AL-F for LVC
- ▶ 227V-024T-05-013 for LVC
- ▶ LMV-D3A-F for TVR
- ▶ 227V-024T-05-002 für TVR
- ▶ 227V-024T-15-002 for TVJ, TVT
- ▶ SMV-D3A for TVT
- ▶ LMV-D3A for TZ-Silenzio, TA-Silenzio, TVZ, TVA

+ Signal voltage range

- ▶ 0 - 10 V DC

+ Operating modes

Variable volume flow

- ▶ \dot{V}_{\min} : minimum volume flow rate
- ▶ \dot{V}_{\max} : maximum volume flow rate

Constant value

- ▶ \dot{V}_{\min} : constant volume flow rate
- ▶ \dot{V}_{\max} : 100 %

Easy controllers for VAV terminal units

Part number	Type	Type of VAV terminal unit
M466EU1	LMV-D3AL-F	LVC
M466EU2	227V-024T-05-013	LVC
M466ES1	LMV-D3A-F	TVR
M466DC3	227V-024T-05-002	TVR
A00000053055	227V-024T-15-002	TVJ, TVT
M466ES3	SMV-D3A	TVT
M466ES2	LMV-D3A	TZ-Silenzio, TA-Silenzio, TVZ, TVA





Easy controller LMV-D3AL-F

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	3.5 VA max.
Power rating (DC)	2 W max.
Running time for 90°	120 - 150 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU



Easy controller 227V-024T-05-013

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC \pm 20 %
Power rating (AC)	5 VA max.
Power rating (DC)	3 W max.
Running time for 90°	100 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2014/30/EU





 Easy controllers LMV-D3A and LMV-D3A-F

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	5 VA max.
Power rating (DC)	2.5 W max.
Running time for 90°	110 - 150 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2014/30/EU



 Easy controller 227V-024T-05-002

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC \pm 20 %
Power rating (AC)	5 VA max.
Power rating (DC)	3 W max.
Running time for 90°	100 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2014/30/EU





 **Easy controller SMV-D3A**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	6 VA max.
Power rating (DC)	3 W max.
Running time for 90°	110 - 150 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2014/30/EU





With service interface and bus communication facility

+ Features

- ▶ Compact device for use with VVS terminal units
- ▶ Controller, differential pressure transducer, and actuator are fitted together in one casing
- ▶ Volume flow rates \dot{V}_{\min} und \dot{V}_{\max} are factory set as parameters
- ▶ Ideal for carrying out service from the switch cabinet or control panel
- ▶ Change of parameters using adjustment devices
- ▶ Suitable for constant and variable volume flows as well as for \dot{V}_{\min} - \dot{V}_{\max} -switching
- ▶ Bus communication is possible due to the following interfaces: MP bus, LonWorks, Modbus RTU, KNX

X Application

- ▶ Electronic volume flow controllers of Type Compact are compact, all-in-one control devices for VAV terminal units
- ▶ Dynamic differential pressure transducer, electronic controller, and actuator are fitted together in one casing
- ▶ Suitable for different control tasks depending on how the input for the setpoint value signal is used
- ▶ The output signals (voltage signals or data points) of the room temperature controller, central BMS, air quality controller or similar units control variably control the volume flow
- ▶ Switches or relays allow for local overrides (depending on controller variant)

- ▶ Volume flow rate actual value is available as a linear voltage signal or data point
- ▶ Controller parameters are factory set

Standard filtration in comfort air conditioning systems allows for use of the controller in the supply air without additional dust protection. Since a partial volume flow is passed through the transducer in order to measure the volume flow rate, please note:

- ▶ With heavy dust levels in the room, suitable extract air filters must be provided.
- ▶ If the air is polluted with fluff or sticky particles or contains aggressive media, Compact controllers cannot be used

Compact controllers for VAV terminal units

Order code detail	Part number	Type	Type of VAV terminal unit
BC0	A00000043143	LMV-D3L-MP-F	①
	A00000043141	LMV-D3-MP-F	②
	A00000043140	LMV-D3-MP	④⑥
	A00000043142	NMV-D3-MP	③
	A00000043140	2 × LMV-D3-MP	⑤
BL0	M466ES7	LMV-D3LON	②④
	M466ES8	NMV-D3LON	③
BM0	A00000025995	LMV-D3-MOD	②④
	A00000043588	NMV-D3-MOD	③
	A00000025995	2 × LMV-D3-MOD	⑤
BM0-J6	A00000044861	LMV-D3-MOD-J6	②④
	A00000044862	NMV-D3-MOD-J6	③
	A00000044861	2 × LMV-D3-MOD-J6	⑤
XB0	M466DC1	227V-024-10	②③④
	M466DC1	2 × 227V-024-10	⑤
LN0	M466EG7	GLB181.1E/3	②③④
	M466EG7	2 × GLB181.1E/3	⑤
LK0	A00000043586	GLB181.1E/KN	②③④
	A00000043586	2 × GLB181.1E/KN	⑤

① LVC ② TVR ③ TVJ, TVT ④ TZ-Silenzio, TA-Silenzio, TVZ, TVA ⑤ TVM ⑥ TVR, replacement part for LMV-D3-MP-F





 **Compact controller LMV-D3L-MP-F**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	3.5 VA max.
Power rating (DC)	2 W max.
Torque	5 Nm
Running time for 90°	120 - 150 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU
Weight	0.5 kg



 **Compact controllers LMV-D3-MP and LMV-D3-MP-F**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	4 VA max.
Power rating (DC)	2 W max.
Torque	5 Nm
Running time for 90°	110 - 150 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.5 kg





 **Compact controller NMV-D3-MP**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	5 VA max.
Power rating (DC)	3 W max.
Torque	10 Nm
Running time for 90°	110 - 150 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.7 kg



 **Compact controller LMV-D3LON**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	5.5 VA max.
Power rating (DC)	3 W max.
Torque	5 Nm
Running time for 90°	110 - 150 s
Communication	LonWorks-Transceiver FTT-10A, free topology, twisted pair
Actual value signal output	2 - 10 V DC, max. 0.5 mA
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.5 kg





 **Compact controller NMV-D3LON**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	6 VA max.
Power rating (DC)	3.5 W max.
Torque	10 Nm
Running time for 90°	110 - 150 s
Communication	LonWorks-Transceiver FTT-10A, free topology, twisted pair
Actual value signal output	2 - 10 V DC, max. 0.5 mA
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.7 kg



 **Compact controller LMV-D3-MOD, LMV-D3-MOD-J6**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	4 VA max.
Power rating (DC)	2 W max.
Torque	5 Nm
Running time for 90°	150 s
Communication	Modbus RTU (RS-485), not galvanically isolated
Baud rates	9600, 19200, 38400, 76800, 115200 Bd (factory setting 38400 Bd)
Transmission formats	1-8-N-2, 1-8-N-1, 1-8-E-1, 1-8-O-1 (factory setting 1-8-N-2)
Scheduling Modbus	120 Ω , can be switched
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU
Weight	0.5 kg





 **Compact controller NMV-D3-MOD, NMV-D3-MOD-J6**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	5 VA max.
Power rating (DC)	3 W max.
Torque	5 Nm
Running time for 90°	150 s
Communication	Modbus RTU (RS-485), not galvanically isolated
Baud rates	9600, 19200, 38400, 76800, 115200 Bd (factory setting 38400 Bd)
Transmission formats	1-8-N-2, 1-8-N-1, 1-8-E-1, 1-8-O-1 (factory setting 1-8-N-2)
Scheduling Modbus	120 Ω , can be switched
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU
Weight	0.7 kg



 **Compact controller 227V-024-10**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC \pm 20 %
Power rating (AC)	5.5 VA max.
Power rating (DC)	3 W max.
Torque	10 Nm
Running time for 90°	100 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU
Weight	0.570 kg





Compact controller GLB181.1E/3

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Power rating (AC)	3 VA max.
Torque	10 Nm
Running time for 90°	125 - 150 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100 \text{ k}\Omega$
Actual value signal output	0 - 10 V DC, max. 1 mA
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.6 kg



Compact controller GLB181.1E/KN

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Power rating (AC)	3 VA max.
Torque	10 Nm
Running time for 90°	125 - 150 s
Communication	KNX, TP1-256 (galvanically separated), Busload 5 mA
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU
Weight	0.6 kg





For different actuators

+ Features

Modular control components for VAV terminal units

- ▶ Module selection based on application
- ▶ Actuators with selected actuator forces

Options

- ▶ Actuators with safety function for 'damper blade OPEN' and 'damper blade CLOSED' (spring return actuators)

X Application

- ▶ Electronic volume flow controllers of Type Universal (dynamic) are designed for use with VAV terminal units.
- ▶ Dynamic differential pressure transducer and electronic controller are fitted together in one casing
- ▶ Actuator or spring return actuator is separate
- ▶ The output signals of the room temperature controller, central BMS, air quality controller or similar units control the volume flow rate setpoint
- ▶ Override control by means of switches or relays

- ▶ Volume flow rate actual value is available as linear voltage signal
 - ▶ Controller parameters are factory set
 - ▶ On-site adjusting is not required
- Standard filtration in comfort air conditioning systems allows for use of the controller in the supply air without additional dust protection. Since a partial volume flow is passed through the transducer in order to measure the volume flow rate, please note:
- ▶ With heavy dust levels in the room, suitable extract air filters must be provided.
 - ▶ If the air is polluted with fluff or sticky particles or contains aggressive media, Universal (dynamic) controllers cannot be used

Universal controller, dynamic, for VAV terminal units

Order code detail	Controller		Actuator		Type of VAV terminal unit
	Part number	Type	Part number	Type	
B13	M546GA4	VRD3	M466DJ8	NM24A-V	① ② ④
B11	M546GA4	VRD3	M466DG8	SM24A-V	③
B1B	M546GA4	VRD3	M466DR1	NF24A-V (spring return actuator)	① ② ③ ④
B27	M546GA4	VRD3	M466DJ8	NM24A-V	⑤
XC3	M546ED4	GUAC-D3	A00000051738	361C-024-20-V/ST07 (spring return actuator)	① ② ③ ④

① TVR ② TVJ ③ TVT ④ TZ-Silenzio, TA-Silenzio, TVZ, TVA ⑤ TVM





 **Volume flow controller VRD3**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	without actuator max. 3.5 VA
Power rating (DC)	without actuator max. 2 W
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 40
EC conformity	EMC according to 2014/30/EU
Weight	0.440 kg



 **Actuators NM24A-V and NM24A-V-ST**

Supply voltage	from the controller
Power rating (AC)	6 VA max.
Power rating (DC)	3.5 W max.
Torque	10 Nm
Running time for 90°	150 s
Control signal	from the controller
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.710 kg





 **Actuators SM24A-V and SM24A-V-ST**

Supply voltage	from the controller
Power rating (AC)	6 VA max.
Power rating (DC)	4 W max.
Torque	20 Nm
Running time for 90°	150 s
Control signal	from the controller
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.910 kg



Spring return actuators NF24A-V and NF24A-V-ST

Supply voltage	from the controller
Power rating (AC)	9 VA max.
Power rating (DC)	6.5 W max.
Torque	10 Nm
Running time for 90°	200 - 300 s
Spring return time	< 20 s
Control signal	from the controller
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	1.91 kg





 **Volume flow controller GUAC-D3**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC \pm 20 %
Power rating (AC)	without actuator max. 1.2 VA
Power rating (DC)	without actuator max. 0.6 W
Setpoint value signal input	0 - 10 V DC, $R_a > 100 \text{ k}\Omega$
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU



 **Spring return actuator 381C-024-20-V-004**

Supply voltage	from the controller
Power rating (AC)	10 VA max.
Power rating (DC)	7.5 W max.
Torque	20 Nm
Running time for 90°	150 s
Spring return time	< 15 s
Control signal	from the controller
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54 (cable entry at the bottom)
EC conformity	EMC according to 2014/30/EU
Weight	1.8 kg





For contaminated extract air or for pressure control

+ Features

Modular control components for VAV terminal units, especially for aggressive media in extract air systems

- ▶ Module selection based on application
- ▶ Actuators with selected actuator forces

Options

- ▶ Actuators with safety function for 'damper blade OPEN' and 'damper blade CLOSED' (spring return actuators)

X Application

- ▶ Electronic volume flow controllers of Type Universal (static) are designed for use with VAV terminal units.
- ▶ Volume flow control or differential pressure control based on static differential pressure measurement
- ▶ Dynamic differential pressure transducer and electronic controller can be fitted together in one casing or in separate casings
- ▶ Actuator or spring return actuator is separate
- ▶ The output signals of the room temperature controller, central BMS, air quality controller

- or similar units control the volume flow rate setpoint
- ▶ Override control by means of switches or relays
- ▶ Volume flow rate actual value or differential pressure actual value is available as linear voltage signal
- ▶ Controller parameters are factory set
- ▶ On-site adjusting is not required
- ▶ Please note that in critical cases, material compatibility testing must be carried out on the air terminal unit and the differential pressure transducer, taking into consideration the harmful substances involved and the concentrations in which they occur.

Universal controller, static, for VAV terminal units, volume flow control

Order code detail	Controller		Static differential pressure transducer		Actuator		VAV terminal units
	Part number	Type	Part number	Type	Part number	Type	
BP3	M466EN6	VRP-M	M546EJ1	VFP-300	M466EQ9	NM24A-V-ST	① ② ③ ⑤ ⑥ ⑦ ⑧
BP1	M466EN6	VRP-M	M546EJ1	VFP-300	M466ER0	SM24A-V-ST	④
BPB	M466EN6	VRP-M	M546EJ1	VFP-300	M466DR2	NF24A-V-ST spring return actuator	① ② ③ ④ ⑤ ⑥ ⑦
BPG	M466EN6	VRP-M	M546EJ1	VFP-300	M466EQ2	LMQ24A-SRV-ST fast-running actuator	① ⑥ ⑧
	M466EN6	VRP-M	M546EJ1	VFP-300	M466EQ3	NMQ24A-SRV-ST fast-running actuator	② ③ ④ ⑤ ⑦
BB3	M546EG2	VRP	M546EJ1	VFP-300	M466DJ8	NM24A-V	① ② ③ ⑤ ⑥ ⑦ ⑧
BB1	M546EG2	VRP	M546EJ1	VFP-300	M466DG8	SM24A-V	④
BBB	M546EG2	VRP	M546EJ1	VFP-300	M466DR1	NF24A-V spring return actuator	① ② ③ ④ ⑤ ⑥ ⑦
XD1	M546ED5	GUAC-S3	-	Included with GUAC-S3	M466EL7	227-024-08-V	① ② ③ ④ ⑤ ⑥ ⑦
XD3	M546ED5	GUAC-S3	-	Included with GUAC-S3	A0000005173 8	361C-024-20-V/ ST07 spring return actuator	① ② ③ ④ ⑤ ⑥ ⑦

① TVR, TVZ, TVA up to nominal size 250 ② TVR, TVZ, TVA from nominal size 315 ③ TVJ ④ TVT ⑤ TZ-Silenzio, TA-Silenzio
⑥ TVRK up to nominal size 250 ⑦ TVRK from nominal size 315 ⑧ TVLK



Universal controller, static, for VAV terminal units, volume flow control

Order code detail	Controller		Static differential pressure transducer		Actuator		VAV terminal units
	Part number	Type	Part number	Type	Part number	Type	
BP3	M466EN6	VRP-M	M546EJ1	VFP-300	M466EQ9	NM24A-V-ST	① ② ③ ⑤ ⑥ ⑦ ⑧
BP1	M466EN6	VRP-M	M546EJ1	VFP-300	M466ER0	SM24A-V-ST	④
BPB	M466EN6	VRP-M	M546EJ1	VFP-300	M466DR2	NF24A-V-ST spring return actuator	① ② ③ ④ ⑤ ⑥ ⑦
BPG	M466EN6	VRP-M	M546EJ1	VFP-300	M466EQ2	LMQ24A-SRV-ST fast-running actuator	① ⑥ ⑧
	M466EN6	VRP-M	M546EJ1	VFP-300	M466EQ3	NMQ24A-SRV-ST fast-running actuator	② ③ ④ ⑤ ⑦
BB3	M546EG2	VRP	M546EJ1	VFP-300	M466DJ8	NM24A-V	① ② ③ ⑤ ⑥ ⑦ ⑧
BB1	M546EG2	VRP	M546EJ1	VFP-300	M466DG8	SM24A-V	④
BBB	M546EG2	VRP	M546EJ1	VFP-300	M466DR1	NF24A-V spring return actuator	① ② ③ ④ ⑤ ⑥ ⑦
XD1	M546ED5	GUAC-S3	-	Included with GUAC-S3	M466EL7	227-024-08-V	① ② ③ ④ ⑤ ⑥ ⑦
XD3	M546ED5	GUAC-S3	-	Included with GUAC-S3	A0000005173 8	361C-024-20-V/ ST07 spring return actuator	① ② ③ ④ ⑤ ⑥ ⑦



① TVR, TVZ, TVA up to nominal size 250 ② TVR, TVZ, TVA from nominal size 315 ③ TVJ ④ TVT ⑤ TZ-Silenzio, TA-Silenzio
⑥ TVRK up to nominal size 250 ⑦ TVRK from nominal size 315 ⑧ TVLK



Volume flow and differential pressure controller VRP-M

Supply voltage (AC)	24 V AC ± 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC ± 10 %
Power rating (AC)	including differential pressure transducer, without actuator max. 2.6 VA
Power rating (DC)	including differential pressure transducer, without actuator max. 1.1 VA
Setpoint value signal input	0 - 10 V DC, R _a > 200 kΩ
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU





Volume flow controller VRP

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Power rating (AC)	without actuator max. 2.6 VA
Setpoint value signal input	2 - 10 V DC, $R_a > 100 \text{ k}\Omega$
Actual value signal output	2 - 10 V DC linear, max. 0.5 mA
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU



Differential pressure controller VRP-STP

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Power rating (AC)	including static differential pressure transducer, without actuator max. 2.6 VA
Setpoint value signal input	2 - 10 V DC, $R_a > 100 \text{ k}\Omega$
Actual value signal output	2 - 10 V DC linear, max. 0.5 mA
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU





 **Static differential pressure transducer VFP-300**

Supply voltage	from the controller
Measuring range	0 - 300 Pa
Linearity	± 3 Pa
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU



 **Static differential pressure transducer VFP-100**

Supply voltage	from the controller
Measuring range	0 - 100 Pa
Linearity	± 1 Pa
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU



 **Static differential pressure transducer VFP-600**

Supply voltage	from the controller
Measuring range	0 - 600 Pa
Linearity	± 6 Pa
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU





Actuators NM24A-V and NM24A-V-ST

Supply voltage	from the controller
Power rating (AC)	6 VA max.
Power rating (DC)	3.5 W max.
Torque	10 Nm
Running time for 90°	150 s
Control signal	from the controller
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.710 kg



Actuators SM24A-V and SM24A-V-ST

Supply voltage	from the controller
Power rating (AC)	6 VA max.
Power rating (DC)	4 W max.
Torque	20 Nm
Running time for 90°	150 s
Control signal	from the controller
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.910 kg





Spring return actuators NF24A-V and NF24A-V-ST

Supply voltage	from the controller
Power rating (AC)	9 VA max.
Power rating (DC)	6.5 W max.
Torque	10 Nm
Running time for 90°	200 - 300 s
Spring return time	< 20 s
Control signal	from the controller
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	1.91 kg



Fast-running actuator LMQ24A-SRV-ST

Supply voltage	from controller VRP-M
Power rating (AC)	23 VA max.
Power rating (DC)	13 W max.
Torque	4 Nm
Running time for 90°	2.5 s
Control signal	from controller VRP-M
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.810 kg





Fast-running actuator NMQ24A-SRV-ST

Supply voltage	from controller VRP-M
Power rating (AC)	23 VA max.
Power rating (DC)	13 W max.
Torque	8 Nm
Running time for 90°	4 s
Control signal	from controller VRP-M
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.970 kg



Volume flow controller GUAC-S3

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC \pm 20 %
Power rating (AC)	without actuator max. 1.2 VA
Power rating (DC)	without actuator max. 0.6 W
Setpoint value signal input	0 - 10 V DC, $R_a > 100 \text{ k}\Omega$
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU





Differential pressure controller GUAC-P1

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC \pm 20 %
Power rating (AC)	without actuator max. 1.2 VA
Power rating (DC)	without actuator max. 0.6 W
Measuring range	0 - 100 Pa
Linearity	\pm 1 Pa
Setpoint value signal input	0 - 10 V DC, $R_a > 100 \text{ k}\Omega$
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU



Differential pressure controller GUAC-P6

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC \pm 20 %
Power rating (AC)	without actuator max. 1.2 VA
Power rating (DC)	without actuator max. 0.6 W
Measuring range	0 - 600 Pa
Linearity	\pm 6 Pa
Setpoint value signal input	0 - 10 V DC, $R_a > 100 \text{ k}\Omega$
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU





 **Actuator 227-024-08-V**

Supply voltage	from the controller
Power rating (AC)	3 VA max.
Power rating (DC)	2 W max.
Torque	8 Nm
Running time for 90°	60 - 120 s
Control signal	from the controller
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54 (cable entry at the bottom)
EC conformity	EMC according to 2014/30/EU
Weight	0.530 kg



 **Spring return actuator 361C-024-20-V**

Supply voltage	from the controller
Power rating (AC)	10 VA max.
Power rating (DC)	8 W max.
Torque	20 Nm
Running time for 90°	150 s
Spring return time	< 15 s
Control signal	from the controller
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54 (cable entry at the bottom)
EC conformity	EMC according to 2014/30/EU
Weight	1.8 kg





Rapid replacement without interruption of system operation



Order code

EasySet / 1	
1	2

1 Parts kit

EasySet
CompactSet
UniversalSet

2 Accessories

No entry: none
Special adapters are available for units with 8 x 8 mm square shafts or with short circular shafts

1 For EasySet and CompactSet
2 For UniversalSet



Features

- Control components for VAV terminal units as a replacement for previous types while the VAV terminal unit remains installed
- ▶ Easy alternative to replacing a complete unit
 - ▶ Replacement in case of modernisation
 - ▶ Extended range of functions
 - ▶ Installation without interruption of system operation
 - ▶ For circular ducts of nominal sizes 100 to 400 mm

Retrofit parts kit consists of:

- ▶ Control components Easy, Compact or Universal
- ▶ Differential pressure sensor
- ▶ Accessories



Application

- ▶ RETROFIT parts kits for the replacement or modernisation of control components in existing VAV terminal units
- ▶ Ideal for cases where it is not possible to replace the entire VAV terminal unit
- ▶ Replacement of faulty or dirty electronic or pneumatic units
- ▶ Replacement of faulty units with airflow velocity sensors
- ▶ Conversion of a constant air to a variable air volume system
- ▶ Extension of range of functions to save energy, for more comfort, or for integration with the central BMS
- ▶ No changes to ductwork necessary since the existing unit continues to be used



Variants

- ▶ EasySet
- ▶ CompactSet
- ▶ UniversalSet



Nominal sizes

- ▶ For circular ducts with nominal size 100, 112, 125, 140, 160, 180, 200, 225, 250, 280, 315, 355, or 400



Accessories

- ▶ 1: Special adapter for EasySet and CompactSet
- ▶ 2: Special adapter for UniversalSet











Special features

- ▶ Quick replacement
- ▶ Low modernisation cost, quick return on investment
- ▶ No interruption of system operation
- ▶ Low costs of disposal
- ▶ Electronic compatibility remains unchanged

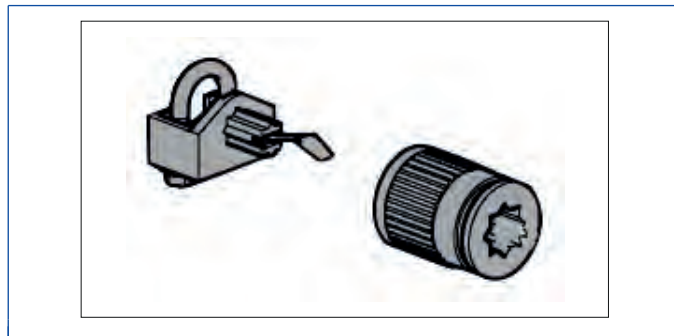


Selection of parts kit

Existing controller	Existing controller	Signal voltage range	RETROFIT solution
VR1		- 0 - 10 V DC	- EasySet - CompactSet - UniversalSet
VR2		- 2 - 10 V DC	- CompactSet - UniversalSet
VRD		- 2 - 10 V DC	- EasySet (only 0 - 10 V DC) - CompactSet - UniversalSet
VRD2		- 0 - 10 V DC - 2 - 10 V DC	- CompactSet - UniversalSet
NMV24-V		- 0 - 10 V DC	- EasySet - CompactSet - UniversalSet
NMV24-D		- 0 - 10 V DC	- EasySet - CompactSet - UniversalSet
NMV-D2		- 0 - 10 V DC - 2 - 10 V DC	- EasySet (only 0 - 10 V DC) - CompactSet - UniversalSet
NMV-D2M		- 0 - 10 V DC - 2 - 10 V DC	- CompactSet - UniversalSet

Nominal size	\dot{V}_{Nom}		\dot{V}_{min}	
	l/s	m ³ /h	l/s	m ³ /h
100	95	342	10	36
112	125	450	13	47
125	155	558	15	54
140	195	702	20	72
160	250	900	25	90
180	315	1134	32	115
200	405	1458	40	144
225	525	1890	53	191
250	615	2214	62	223
280	795	2862	80	288
315	1030	3708	105	378
355	1275	4590	130	468
400	1675	6030	170	612

Special adapter 1 for EasySet and CompactSet



Existing shaft
- 8 mm x 8 mm square shaft (existing actuator KM 24-I)
- Ø 8 to 12 mm circular shaft

Special adapter 2 for UniversalSet



Existing shaft
- 8 mm x 8 mm square shaft (existing actuator KM 24-I)





Easy controllers LMV-D3A and LMV-D3A-F

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	5 VA max.
Power rating (DC)	2.5 W max.
Running time for 90°	110 - 150 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2014/30/EU



Compact controllers LMV-D3-MP and LMV-D3-MP-F

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	4 VA max.
Power rating (DC)	2 W max.
Torque	5 Nm
Running time for 90°	110 - 150 s
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.5 kg





Volume flow controller VRD3

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	without actuator max. 3.5 VA
Power rating (DC)	without actuator max. 2 W
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 40
EC conformity	EMC according to 2014/30/EU
Weight	0.440 kg



Actuators NM24A-V and NM24A-V-ST

Supply voltage	from the controller
Power rating (AC)	6 VA max.
Power rating (DC)	3.5 W max.
Torque	10 Nm
Running time for 90°	150 s
Control signal	from the controller
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU
Weight	0.710 kg





For the individual temperature control in rooms



Order code

RC / B1

1 **2**

1 Type

RC Room temperature controller

2 Type

B1 CR24-B1
B2 CR24-B2

B3 CR24-B3
M1 ETN-24-VAV-277V-P
M2 Remote control for M1



Features

Lower operating costs due to intelligent sensor technology

- ▶ Temperature range 10 - 45 °C
- ▶ For variable air volume systems and 2-pipe or 4-pipe air water systems
- ▶ With integral temperature sensor

Optional equipment

- ▶ Room occupant can select the operating mode
- ▶ Remote control for RC/M1



Application

- ▶ Room temperature controller
- ▶ Ideally suited for the control of VAV terminal units using Easy, Compact, or Universal controllers
- ▶ Comfortable room temperature control
- ▶ Low energy consumption due to demand-based operating modes
- ▶ Cooling and/or heating
- ▶ Device versions with different output sequences for many different ventilation and air conditioning systems, including air-water systems.



Variants

- ▶ B1: Room temperature controller with one analog output for cooling or heating (changeover)
- ▶ B2: Room temperature controller with two analog outputs for cooling or heating (3 point)
- ▶ B3: Room temperature controller with three analog outputs for cooling or heating (0 - 10 V DC and 3 point)
- ▶ M1: Room temperature controller with two analog outputs for cooling or heating (0 - 10 V DC)





Application

Room temperature controller CR24-B1 with one output, for room applications

- ▶ Cooling or heating (changeover)
- ▶ Analog output 0 - 10 V DC for the control of VAV terminal units with Easy, Compact or Universal controllers

Room temperature controller CR24-B1

Supply voltage	24 V AC \pm 20 %, 50/60 Hz
Power rating	3 VA
External temperature sensor	NTC, 5 k Ω , 10 - 45 °C
External setpoint changes	0 - 10 V DC corresponding to 0 - 10 K
Output for variable volume flow	0 - 10 V DC, 5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
EC conformity	EMC according to 2004/108/EG
Dimensions (B x H x T)	84 x 99 x 32 mm
Weight	0.105 kg



Application

Room temperature controller CR24-B2 with two outputs, for room applications

- ▶ Cooling and heating
- ▶ Analog output 0 - 10 V DC for the control of VAV terminal units with Easy, Compact or Universal controllers
- ▶ 3-point output for heating

Room temperature controller CR24-B2

Supply voltage	24 V AC \pm 20 %, 50/60 Hz
Power rating	3 VA
External temperature sensor	NTC, 5 k Ω , 10 - 45 °C
External setpoint changes	0 - 10 V DC corresponding to 0 - 10 K
Output for variable volume flow	0 - 10 V DC, 5 mA max.
Output for heating valve	3-point, 24 V AC, max. 0.5 A, 10 VA, optimised for actuators with a running time of approx. 150 s
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
EC conformity	EMC according to 2004/108/EG
Dimensions (B x H x T)	84 x 99 x 32 mm
Weight	0.105 kg





Application

Room temperature controller CR24-B3 with three outputs, for room applications

- ▶ Cooling and heating
- ▶ Analog output 0 - 10 V DC for the control of VAV terminal units with Easy, Compact or Universal controllers
- ▶ Analog output 0 - 10 V DC cooling or heating (changeover)
- ▶ 3-point output for heating



Room temperature controller CR24-B3

Supply voltage	24 V AC ± 20 %, 50/60 Hz
Power rating	3 VA
External temperature sensor	NTC, 5 kΩ, 10 - 45 °C
External setpoint changes	0 - 10 V DC corresponding to 0 - 10 K
Output for variable volume flow	0 - 10 V DC, 5 mA max.
Output for heating/cooling	0 - 10 V DC, 5 mA max.
Output for heating valve	3-point, 24 V AC, max. 0.5 A, 10 VA, optimised for actuators with a running time of approx. 150 s
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
EC conformity	EMC according to 2004/108/EG
Dimensions (B x H x T)	84 x 99 x 32 mm
Weight	0.105 kg



Application

Room temperature controller ETN-24-VAV-227V-P with two outputs, for room applications

- ▶ Cooling and heating
- ▶ Analog output 0 - 10 V DC for the control of VAV terminal units with Easy, Compact or Universal controllers (cooling operation)
- ▶ Analog output 0 - 10 V DC controlling the reheating



Room temperature controller ETN-24-VAV-227-P

Supply voltage	24 V AC, 50/60 Hz
Power rating	1.2 VA
External temperature sensor	Thermistor 50 kΩ at 45 °C
Analog outputs for cooling operation, heating operation	0 - 10 V DC, max. 5 mA
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
EC conformity	EMC according to 2004/108/EC
Dimensions (B x H x T)	92 x 80 x 22 mm
Weight	0.136 kg





For service and commissioning



Order code

AT - VAV - B

1

2

1 Type

AT-VAV Adjustment devices for VAV terminal units

2 Variants

B ZTH-EU for TROX/Belimo volume flow controllers

G

GUIV-A for TROX/Gruner volume flow controllers

S

AST20 for Siemens volume flow controllers



Application

▶ Adjustment devices for VAV terminal units, used to facilitate service and commissioning

- ▶ Read actual values and setpoint values
- ▶ Read and change parameters
- ▶ Read and set operating modes
- ▶ Functional test



Application

- ▶ Adjustment device ZTH-EU for VAV terminal units with TROX/Belimo volume flow controllers, used to facilitate service and commissioning
- ▶ Read actual values and setpoint values
- ▶ Read and change \dot{V}_{\min} and \dot{V}_{\max}
- ▶ Read and change signal voltage ranges

- ▶ Read and change the operating mode
- ▶ Reset parameters to the factory settings
- ▶ MP bus test
- ▶ Measure and display the supply voltage
- ▶ Integral ZIP-USB interface to connect the device to a notebook on which the Belimo PC tool is installed.





X Application

- ▶ Adjustment device GUIV-A for VAV terminal units with TROX/Gruner volume flow controllers, used to facilitate service and commissioning
- ▶ Read actual values and setpoint values
- ▶ Read and change \dot{V}_{\min} and \dot{V}_{\max}

- ▶ Read and change signal voltage ranges
- ▶ Read and change the operating mode
- ▶ Reset parameters to the factory settings
- ▶ Integral interface (replaces GUIV-S) for the connection to a notebook with Gruner VAV Tool Software installed



X Application

- ▶ Adjustment device Type AST10 for VAV terminal units with Siemens volume flow controllers, used to facilitate service and commissioning

- ▶ Read actual values and setpoint values
- ▶ Read and change \dot{V}_{\min} and \dot{V}_{\max}
- ▶ Read and change the operating mode
- ▶ Reset parameters to the factory settings



CONSTANT VOLUME FLOW CONTROL - CONSTANTFLOW

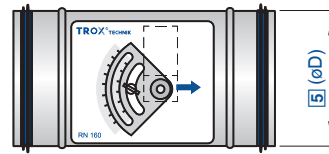
	Type					
	RN	EN	VFL	VFC	RN-Ex	EN-Ex
Type of system						
Supply air	●	●	●	●	●	●
Extract air	●	●	●	●	●	●
Duct connection, fan end						
Circular	●		●	●	●	
Rectangular		●				●
Volume flow rate range						
Up to [m ³ /h]	5040	12100	900	1330	5040	12100
Up to [l/s]	1400	3360	250	370	1400	3360
Air quality						
Filtered	●	●	●	●	●	●
Office extract air	●	●	●	●	●	●
Polluted	○	○	○	○	○	○
Contaminated	○	○	○	○	○	○
Control function						
Constant	●	●	●	●	●	●
Variable	○	○		○		
Min/Max	○	○		○		
Acoustic requirements						
High < 40 dB(A)	○	○		○	○	○
Low < 50 dB (A)	●	●	●	●	●	●
Special areas						
Areas with explosive atmospheres					●	●
Explanation						
● - Standard						
○ - Optional						
Possible under certain conditions: Robust unit variant and/or specific actuator or a useful additional product						




List of abbreviations

$\varnothing D$ [mm]	Outer diameter of the spigot
$\varnothing D_1$ [mm]	Pitch circle diameter of flanges
$\varnothing D_2$ [mm]	Outer diameter of flanges
$\varnothing D_4$ [mm]	Inside diameter of the screw holes of flanges
L [mm]	Length of unit including connecting spigot
L_1 [mm]	Length of casing or acoustic cladding
B [mm]	Duct width
B_1 [mm]	Screw hole pitch of flange (horizontal)
B_2 [mm]	Outside dimension of flange (width)
B_3 [mm]	Width of device
H [mm]	Duct height
H_1 [mm]	Screw hole pitch of flange (vertical)
H_2 [mm]	Outside dimension of flange (height)
H_3 [mm]	Unit height
n []	Number of flange screw holes
T [mm]	Flange thickness
m [kg]	Unit weight including the minimum required attachments for manual adjustment
f_m [Hz]	Octave band centre frequency
L_{PA} [dB(A)]	A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit, system attenuation taken into account
L_{PA1} [dB(A)]	A-weighted sound pressure level of air-regenerated noise of the VAV terminal unit with secondary silencer, system attenuation taken into account
L_{PA2} [dB(A)]	A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit, system attenuation taken into account
L_{PA3} [dB(A)]	A-weighted sound pressure level of case-regenerated noise of the VAV terminal unit with acoustic cladding, system attenuation taken into account
v_{nom} [m ³ /h] and [l/s]	Nominal volume flow rate (100 %)
\dot{V} [m ³ /h] and [l/s]	Volume flow rate
$\Delta \dot{V}$ [± %]	Volume flow rate tolerance from setpoint value
Δp_{st} [Pa]	Static differential pressure
$\Delta p_{st min}$ [Pa]	Static differential pressure, minimum
Galvanised sheet steel	External parts, e.g. mounting brackets or covers, are usually made of galvanised sheet steel
Powder-coated surface (P1)	External parts, e.g. mounting brackets or covers, are usually made of galvanised sheet steel
Stainless steel (A2)	External parts, e.g. mounting brackets or covers, are usually made of galvanised sheet steel





For the precise control of constant volume flow rates

Order code

RN-S - P1 / 100 / D2

1 **2** **3** **4**

1 Type
RN-S Volume flow controller

2 Material
No entry: galvanised sheet steel
P1 Powder-coated (RAL 7001), silver grey
A2 Stainless steel

3 Nominal size [mm]
80, 100, 125

4 Accessories
No entry: none
D2 Lip seals on both ends

Order code

RN - D - P1 - FL / 160 / G2 / B50 / 300 - 800

1 **2** **3** **4** **5** **6** **7** **8**

1 Type
RN Volume flow controller

2 Acoustic cladding
No entry: none
D With acoustic cladding

3 Material
No entry: galvanised sheet steel
P1 Powder-coated (RAL 7001), silver grey
A2 Stainless steel

4 Flange
No entry: none
FL Flanges on both ends

5 Nominal size [mm]
80, 100, 125, 160, 200, 250, 315, 400

6 Accessories
No entry: none
D2 Lip seals on both ends
G2 Matching flanges for both ends

7 Actuator
No entry: without
For example
B50 24 V AC/DC, 3-point
B52 24 V AC/DC, 3-point, with auxiliary switch
B70 24 V AC/DC, modulating 2 - 10 V DC

8 Volume flow rates [m³/h or l/s]
only actuators **7**
 $V_{\min} - V_{\max}$ for factory setting



+ Features

- Circular self-powered volume flow controllers for the control of supply air or extract air in constant air volume systems
- ▶ Volume flow rate can be set using an external scale, no tools required
 - ▶ High control accuracy
 - ▶ No on-site test measurements required for commissioning
 - ▶ Suitable for airflow velocities of up to 12 m/s
 - ▶ Any installation orientation; maintenance-free
 - ▶ Casing air leakage to EN 1751, class C

Optional equipment and accessories

- ▶ Acoustic cladding for the reduction of case-radiated noise
- ▶ Secondary silencer Type CA, CS or CF for the reduction of air-regenerated noise
- ▶ Hot water heat exchanger Type WL and electric air heater Type EL for reheating the airflow
- ▶ Actuator for switching between setpoint values

Application

- ▶ Circular CONSTANTFLOW CAV controllers of Type RN for the precise supply air or extract air flow control in constant air volume systems
- ▶ Mechanical self-powered volume flow control without external power supply
- ▶ Simplified project handling with orders based on nominal size
- ▶ Volume flow rate setpoint can be set on external scale
- ▶ Switching between \dot{V}_{min} and \dot{V}_{max} using optional actuator

◊ Variants

- ▶ RN-S: Compact-height volume flow controller
- ▶ RN: Volume flow controller
- ▶ RN-D: Volume flow controller with acoustic cladding
- ▶ RN-FL: Volume flow controller with flanges on both ends
- ▶ RN-D-FL: Volume flow controller with acoustic cladding and flanges on both ends
- ▶ Units with acoustic cladding and/or a secondary silencer Type CA, CS or CF for demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted

+ Construction

- ▶ Galvanised sheet steel
- ▶ P1: Powder-coated, silver grey (RAL 7001)
- ▶ A2: Stainless steel

⊕ Attachments

- ▶ Min/Max actuators: Actuators for switching between minimum and maximum volume flow rate setpoint values
- ▶ Modulating actuators: Actuators for the stepless adjustment of volume flow rates or to switch between minimum and maximum volume flow rate setpoint values
- ▶ Retrofit kits: Actuators and installation accessories
- ▶ Variant RN-S cannot be combined with an actuator

& Accessories

- ▶ Lip seals on both ends (factory fitted)
- ▶ Matching flanges for both ends

⊕ Useful additions

- ▶ Secondary silencer Type CA, CS or CF
- ▶ Heat exchanger Type WL
- ▶ Electric air heater Type EL

★ Special features

- ▶ Volume flow rate can be set using an external scale; no tools required
- ▶ High volume flow rate control accuracy
- ▶ Any installation orientation

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ Casing air leakage to EN 1751, class C

Technical data

Nominal sizes	80 - 400 mm
Volume flow rate range	11 - 1400 l/s or 40 - 5040 m ³ /h
Volume flow rate control range	Approx. 25 to 100 % of the nominal volume flow rate
Scale accuracy	± 4 %
Minimum differential pressure	50 Pa (nominal size 80: 100 Pa)
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C

RN, Sound pressure level at differential pressure 150 Pa

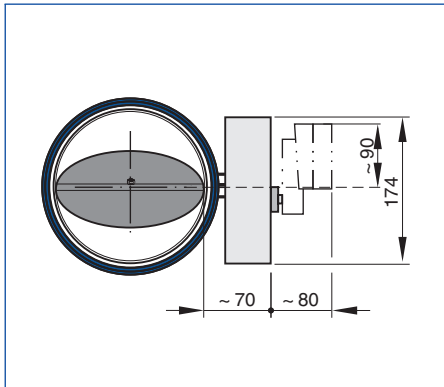
Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Air-regenerated noise				Case-radiated noise	
			①	②	③	④	①	⑤
			L _{PA}	L _{PA1}			L _{PA2}	L _{PA3}
			dB(A)					
80	11	40	37	24	17	15	22	<15
	20	72	39	27	19	17	24	<15
	40	144	47	34	24	22	31	<15
	45	162	48	35	25	24	32	<15
100	22	79	37	24	17	15	22	<15
	40	144	40	29	22	20	21	<15
	70	252	47	35	27	26	29	<15
	90	324	50	38	30	29	33	<15
125	35	126	37	27	21	18	15	<15
	60	216	43	34	27	25	19	<15
	115	414	50	41	35	33	27	<15
	140	504	52	44	39	37	30	<15



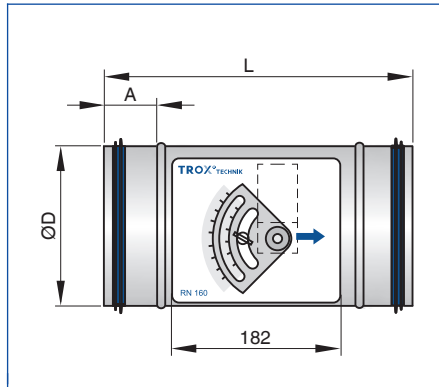
Nominal size	\dot{V}	\dot{V}	Air-regenerated noise				Case-radiated noise	
			①	②	③	④	①	⑤
	l/s	m ³ /h	L _{PA}	L _{PA1}		L _{PA2}	L _{PA3}	
dB(A)								
160	60	216	40	32	26	24	29	<15
	105	378	45	37	32	29	33	<15
	190	684	49	41	35	33	39	<15
	240	864	50	41	36	34	41	16
200	90	324	40	31	24	22	28	<15
	160	576	43	35	28	26	32	<15
	300	1080	48	40	33	32	40	17
	360	1296	49	41	35	33	42	20
250	145	522	41	32	24	22	29	15
	255	918	42	34	28	26	33	<15
	470	1692	46	39	33	31	40	19
	580	2088	48	41	35	34	43	22
315	230	828	39	33	26	23	30	<15
	400	1440	42	35	29	27	35	<15
	750	2700	44	38	32	31	40	19
	920	3312	46	41	35	34	43	23
400	350	1260	46	39	33	29	45	<15
	610	2196	48	42	36	32	49	18
	1130	4068	50	44	38	35	54	24
	1400	5040	51	45	40	37	56	27

- ① RN
- ② RN with secondary silencer CS/CF, insulation thickness 50 mm, length 500 mm
- ③ RN with secondary silencer CS/CF, insulation thickness 50 mm, length 1000 mm
- ④ RN with secondary silencer CS/CF, insulation thickness 50 mm, length 1500 mm
- ⑤ RN-D

RN



RN

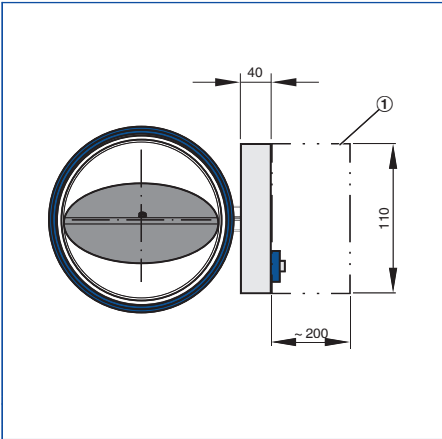


Dimensions [mm] and weight [kg]

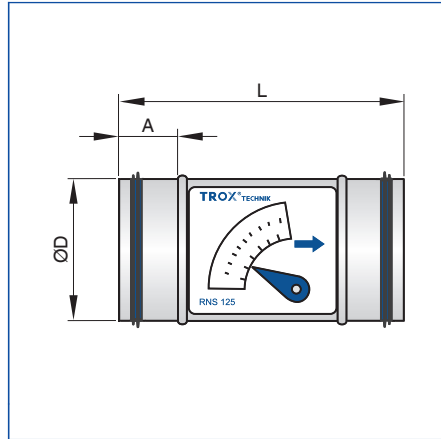
Nominal size	ØD	L	A	m
	mm			
80	79	310	50	1.4
100	99	310	50	1.8
125	124	310	50	2.0
160	159	310	50	2.5
200	199	310	50	3.0
250	249	400	50	3.5
315	314	400	50	4.8
400	399	400	50	5.7



RN



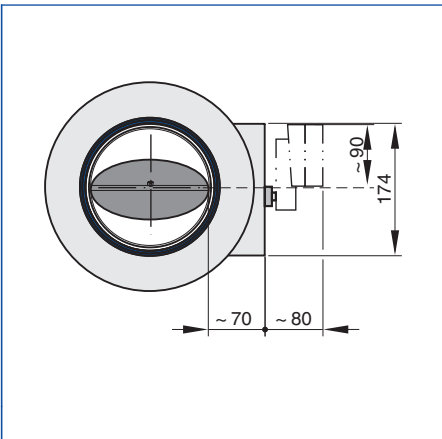
RN



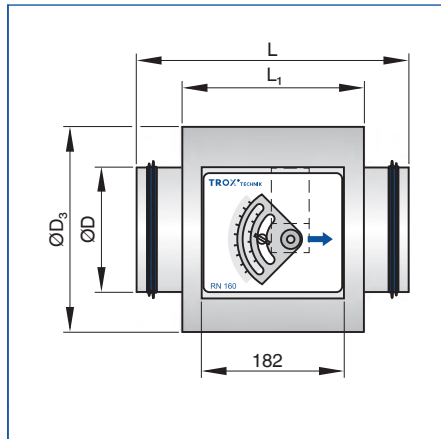
Dimensions [mm] and weight [kg]

Nominal size	ØD	L	A	m
	mm	mm	mm	kg
80	79	250	30	1.4
100	99	250	50	1.8
125	124	250	50	2.0

RN-D



RN-D

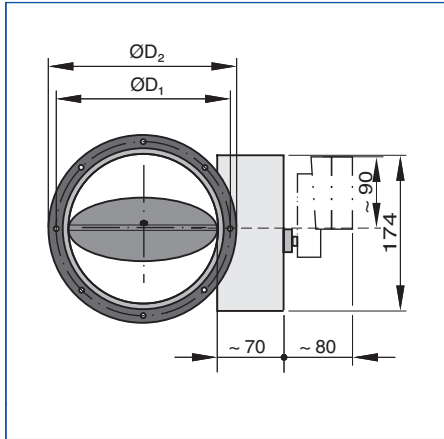


Dimensions [mm] and weight [kg]

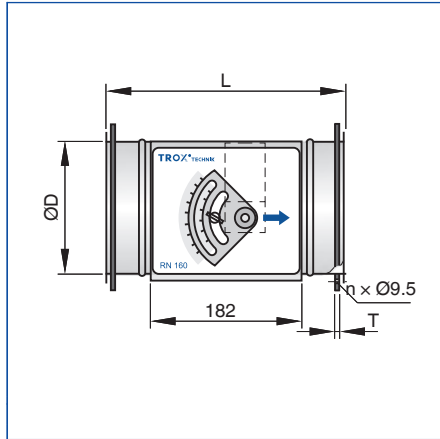
Nominal size	ØD	L	ØD ₃	L ₁	m
	mm	mm	mm	mm	kg
80	79	310	181	232	2.2
100	99	310	200	232	3.6
125	124	310	220	232	4.0
160	159	310	262	232	5.0
200	199	310	300	232	6.0
250	249	400	356	312	7.3
315	314	400	418	312	9.8
400	399	400	500	312	11.8



RN-D



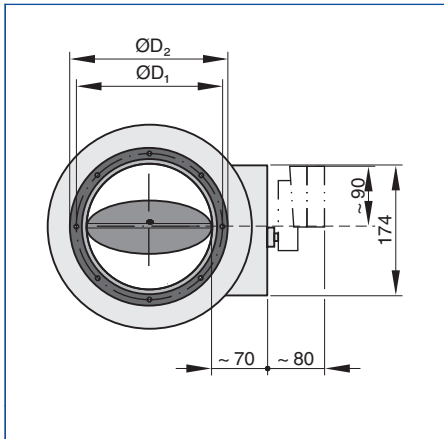
RN-D



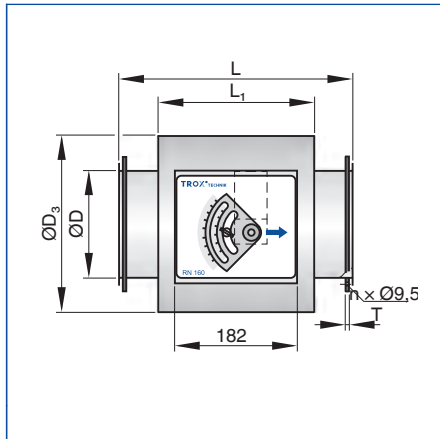
Dimensions [mm] and weight [kg]

Nominal size	ØD	L	ØD ₁	ØD ₂	n	T	m
	mm	mm	mm	mm			
100	99	290	132	152	4	4	2.4
125	124	290	157	177	4	4	2.7
160	159	290	192	212	6	4	3.5
200	199	290	233	253	6	4	4.4
250	249	380	283	303	6	4	5.3
315	314	380	352	378	8	4	7.3
400	399	380	438	464	8	4	9.6

RN-D



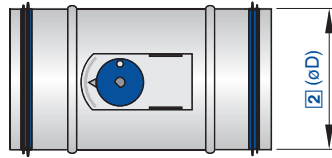
RN-D



Dimensions [mm] and weight [kg]

Nominal size	ØD	L	ØD ₁	ØD ₂	ØD ₃	L ₁	n	T	m
	mm	mm	mm	mm	mm	mm			
100	99	370	132	152	200	232	4	4	4.2
125	124	370	157	177	220	232	4	4	4.7
160	159	370	192	212	262	232	6	4	6.0
200	199	370	233	253	300	232	6	4	7.4
250	249	460	283	303	356	312	6	4	9.1
315	314	460	352	378	418	312	8	4	12.3
400	399	460	438	464	500	312	8	4	15.7





For low airflow velocities

Order code

VFC / 100 / E01

1 2 3

1 Type
VFC Volume flow controller

2 Nominal size [mm]
80, 100, 125, 160, 200, 250

3 Actuator
No entry: manual operation
For example
E01 24 V AC/DC, 3-point, potentiometer
E03 24 V AC/DC, modulating, 2 - 10 V DC, potentiometer
M01 24 V AC/DC, 3-point, mechanical stops

+ Features

Circular mechanical self-powered volume flow controllers for the control of supply air or extract air in constant air volume systems with low airflow velocities

- ▶ Suitable for airflow velocities from 0.8 m/s
- ▶ Very simple commissioning
- ▶ Volume flow rate can be set using a rotary knob and a scale on the outside of the casing
- ▶ Simple retrofit of an actuator for variable volume flows
- ▶ Any installation orientation; maintenance-free
- ▶ Casing air leakage to EN 1751, class C

Optional equipment and accessories

- ▶ Secondary silencer Type CA, CS or CF for the reduction of air-regenerated noise
- ▶ Hot water heat exchanger Type WL and electric air heater Type EL for reheating the airflow
- ▶ Actuator for variable volume flows or for $\dot{V}_{min} / \dot{V}_{max}$ switching

X Application

- ▶ Circular CAV controllers of Type VFC for the precise supply air or extract air flow control in constant air volume systems
- ▶ Mechanical self-powered volume flow control without external power supply
- ▶ For low airflow velocities
- ▶ Simplified project handling with orders based on nominal size

⊕ Attachments

- ▶ Min/Max actuators: Actuators for switching between minimum and maximum volume flow rate setpoint values
- ▶ Modulating actuators: Actuators for the stepless adjustment of volume flow rates

+ Useful additions

- ▶ Secondary silencer Type CA, CS or CF
- ▶ Heat exchanger Type WL
- ▶ Electric air heater Type EL

★ Special features

- ▶ Volume flow rate can be set using an external scale; no tools required
- ▶ Simple retrofit of an actuator is possible
- ▶ Correct operation even under unfavourable upstream or downstream conditions (1.5 D straight section required upstream)
- ▶ Any installation orientation
- ▶ Aerodynamic function testing of each unit on a special test rig prior to shipping

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ Casing air leakage to EN 1751, class C

Technical data

Nominal sizes	80 - 250 mm
Volume flow rate range	6 - 370 l/s or 22 - 1332 m ³ /h
Volume flow rate control range	Approx. 10 to 100 % of the nominal volume flow rate
Volume flow rate accuracy	approx. ± 10 % of the nominal volume flow rate
Minimum differential pressure	30 Pa
Maximum differential pressure	500 Pa
Operating temperature	10 - 50 °C

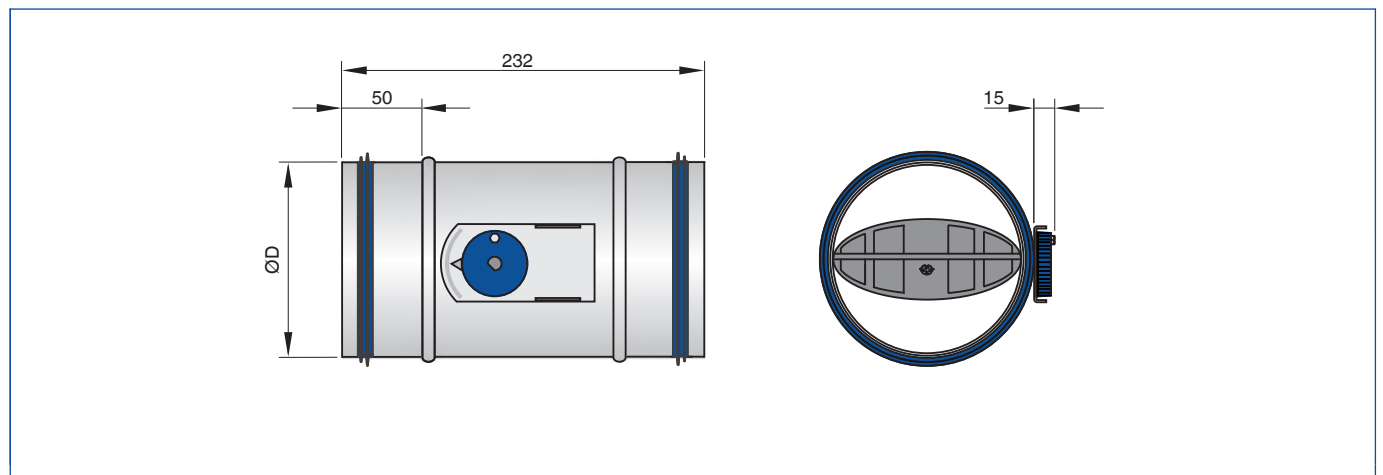


VFC, Sound pressure level at differential pressure 50 Pa

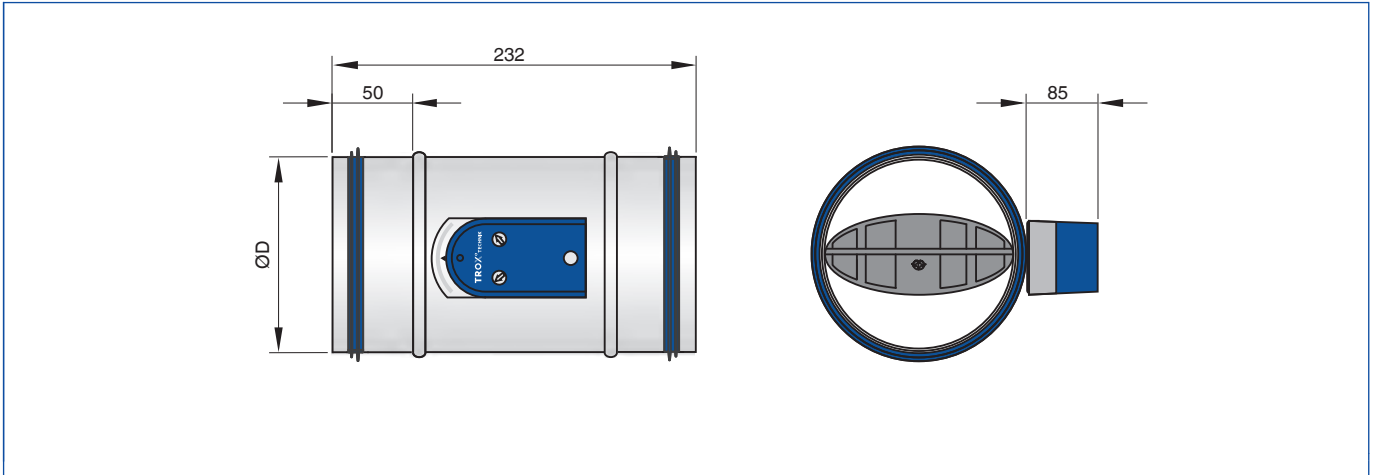
Nominal size	\dot{V}	\dot{V}	Air-regenerated noise				Case-radiated noise
			①	②	③	④	①
			L_{PA}	L_{PA1}			L_{PA2}
	l/s	m ³ /h	dB(A)				
80	6	22	25	<15	<15	<15	<15
	10	36	28	16	<15	<15	<15
	20	72	33	21	<15	<15	<15
	42	151	39	27	18	16	17
100	6	22	29	15	<15	<15	<15
	15	54	33	20	<15	<15	15
	30	108	37	26	18	17	18
	65	234	41	33	26	25	21
125	10	36	22	<15	<15	<15	<15
	20	72	27	16	<15	<15	<15
	45	162	34	25	18	16	<15
	100	360	41	34	29	27	16
160	18	65	25	16	<15	<15	<15
	45	162	32	24	18	16	18
	85	306	36	29	24	22	22
	185	666	41	35	30	28	27
200	25	90	27	16	<15	<15	<15
	60	216	31	22	16	<15	18
	120	432	35	27	21	19	22
	250	900	37	30	25	24	26
250	37	133	31	21	<15	<15	18
	100	360	35	25	18	16	22
	185	666	36	28	21	19	25
	370	1332	37	29	23	22	29

- ① VFC
- ② VFC with secondary silencer CS/CF, insulation thickness 50 mm, length 500 mm
- ③ VFC with secondary silencer CS/CF, insulation thickness 50 mm, length 1000 mm
- ④ VFC with secondary silencer CS/CF, insulation thickness 50 mm, length 1500 mm

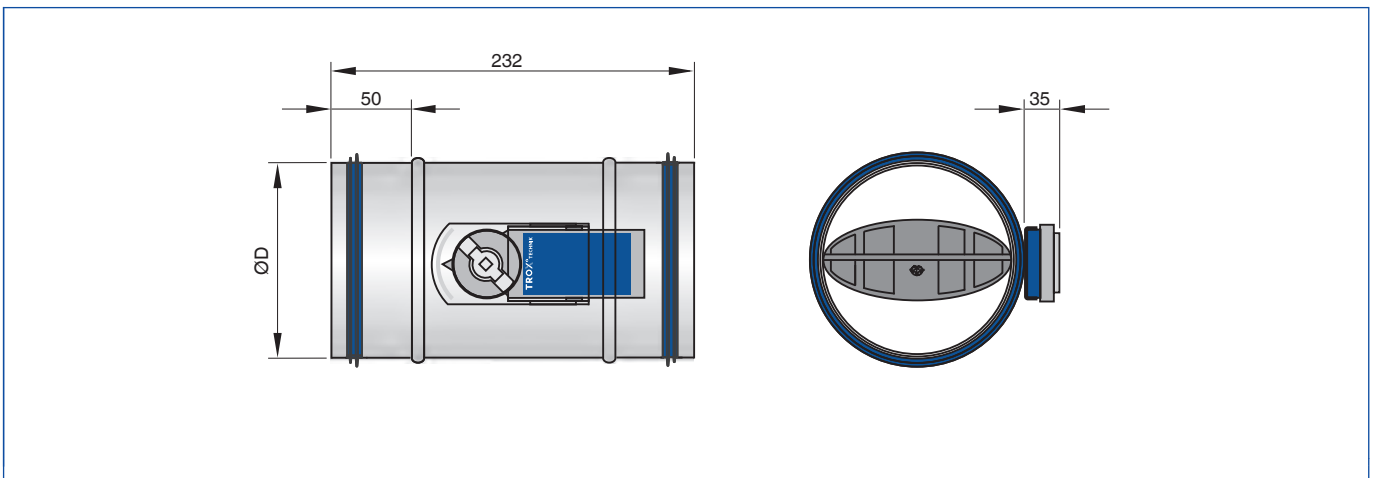
VFC



VFC/.../E0*



VFC/.../M0*

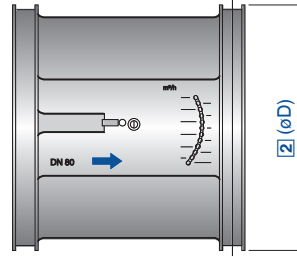


Dimensions [mm] and weight [kg]

Nominal size	VFC	VFC/.../E0*	VFC/.../M0*	ØD mm
	kg	kg	kg	
80	0.5	0.8	0.7	79
100	0.6	0.9	0.8	99
125	0.7	1.0	0.9	124

Nominal size	VFC	VFC/.../E0*	VFC/.../M0*	ØD mm
	kg	kg	kg	
160	0.8	1.1	1.0	159
200	1.0	1.3	1.2	199
250	1.3	1.6	1.5	249





Volume flow limiter for insertion into ducting

Order code

VFL / 100	
1	2

1 Type
VFL Volume flow limiter

2 Nominal size [mm]
80, 100, 125, 150, 160, 200, 250

+ Features

- Circular, mechanical self-powered controllers for insertion into ducting, for the quick and easy balancing of constant volume flow rates in ventilation and air conditioning systems
- ▶ Unique damper blade edge for acoustic optimisation
 - ▶ Simple and quick commissioning on site
 - ▶ Range of volume flow rate setpoints for each nominal size
 - ▶ Precise and simple setting of volume flow rates using a scale
 - ▶ Best accuracy among controllers for insertion
 - ▶ Suitable for low airflow velocities from 0.8 m/s
 - ▶ Any installation orientation; maintenance-free

Application

- ▶ Circular volume flow limiters of Type VFL for the simple balancing of volume flow rates in air conditioning systems
- ▶ Mechanical self-powered volume flow limiter without external power supply
- ▶ Simplified project handling with orders based on nominal size
- ▶ Set the required volume flow rate using a scale

★ Special features

- ▶ Mechanical self-powered
- ▶ Low-friction bellows
- ▶ For circular ducts
- ▶ Lip seal for tight and secure fit
- ▶ Aerodynamically tested and factory set to a reference volume flow rate
- ▶ Sticker showing volume flow rates (in l/s, m³/h and cfm) that can be set each limiter

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022

Technical data

Nominal sizes	80 - 250 mm
Volume flow rate range	4 - 212 l/s or 14 - 764 m ³ /h
Volume flow rate control range	< 20 - 100 % of the nominal volume flow rate
Volume flow rate accuracy	approx. ± 10 % of the nominal volume flow rate
Minimum differential pressure	30 Pa
Maximum differential pressure	300 Pa
Operating temperature	10 - 50 °C

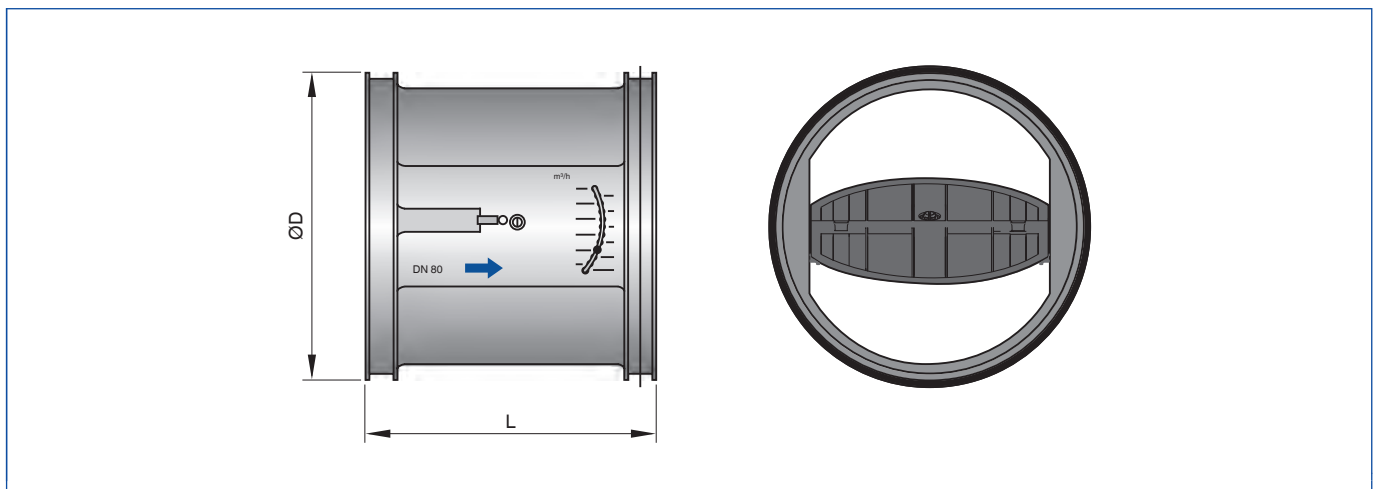


VFL, Sound pressure level at differential pressure 50 Pa

Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Air-regenerated noise	
			L_{PA} dB (A)	
80	4	14		30
	6	22		30
	14	50		32
	20	73		33
	23	82		34
100	5	18		31
	11	39		33
	16	58		35
	26	92		36
	34	122		37
125	11	39		36
	19	69		37
	27	98		37
	42	150		38
	54	195		39
150	14	50		32
	29	105		32
	44	160		33
	57	205		33
	74	265		34
160	16	58		26
	28	102		29
	49	175		32
	67	242		34
	90	323		36
200	26	94		23
	70	253		27
	109	391		30
	134	481		31
	147	529		31
250	44	159		23
	94	337		26
	144	519		28
	175	632		28
	212	764		28



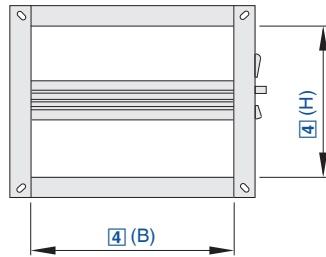
VFL



Dimensions [mm] and weight [kg]

Nominal size	ØD	L	m
	mm	mm	kg
80	78	86	0.10
100	98	100	0.15
125	122	118	0.25
160	156	148	0.40
200	196	175	0.50
250	246	220	0.70





For the precise control of normal and high constant volume flows

Order code

EN - D - P1 / 400x200 / B50 / 800 - 3000



<p>1 Type EN Volume flow controller</p> <p>2 Acoustic cladding No entry: none D With acoustic cladding</p> <p>3 Material No entry: galvanised sheet steel P1 Powder-coated (RAL 7001), silver grey</p>	<p>4 Nominal size [mm] B × H</p> <p>5 Actuator No entry: without For example B50 24 V AC/DC, 3-point B52 24 V AC/DC, 3-point, with auxiliary switch B70 24 V AC/DC, modulating, 2 - 10 V DC</p>	<p>6 Volume flow rates [m³/h or l/s] only actuators 7 $\dot{V}_{\min} - \dot{V}_{\max}$ for factory setting</p>
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+ Features

- Rectangular self-powered volume flow controllers for the control of supply air or extract air in constant air volume systems
- ▶ Suitable for volume flow rates up to 12,096 m³/h or 3,360 l/s
 - ▶ Volume flow rate can be set using an external scale, no tools required
 - ▶ High control accuracy
 - ▶ No on-site test measurements required for commissioning
 - ▶ Suitable for airflow velocities of up to 8 m/s
 - ▶ Casing air leakage to EN 1751, up to class C

- Optional equipment and accessories
- ▶ Acoustic cladding for the reduction of case-radiated noise
 - ▶ Secondary silencer Type TX for the reduction of air-regenerated noise
 - ▶ Hot water heat exchanger of Type WT for reheating the airflow
 - ▶ Actuator for switching between setpoint values

X Application

- ▶ Rectangular CONSTANTFLOW CAV controllers of Type EN for the precise supply air or extract air flow control in constant air volume systems
- ▶ Mechanical self-powered volume flow control without external power supply
- ▶ Simplified project handling with orders based on nominal size

◊ Variants

- ▶ EN: Volume flow controller
- ▶ EN-D: Volume flow controller with acoustic cladding
- ▶ Units with acoustic cladding and/or secondary silencer Type TX for demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted

+ Construction

- ▶ Galvanised sheet steel
- ▶ P1: Powder-coated, silver grey (RAL 7001)

⬢ Attachments

- ▶ Min/Max actuators: Actuators for switching between minimum and maximum volume flow rate setpoint values
- ▶ Modulating actuators: Actuators for the stepless adjustment of volume flow rates or to switch between minimum and maximum volume flow rate setpoint values
- ▶ Retrofit kits: Actuators and installation accessories
- ▶ EN with actuator only up to H = 300 mm

+ Useful additions

- ▶ Secondary silencer Type TX
- ▶ Heat exchanger Type WT

★ Special characteristics

- ▶ Volume flow rate can be set using an external scale; no tools required
- ▶ High volume flow rate control accuracy
- ▶ Any installation orientation
- ▶ Correct operation even under unfavourable upstream conditions (1.5 B straight section required upstream)

ISO Standards and guidelines

- ▶ Casing air leakage to EN 1751, class C (B + H ≤ 400, class B)





Technical data

Nominal sizes	200 × 100 to 600 × 600 mm
Volume flow rate range	40 - 3360 l/s or 144 - 12096 m ³ /h
Volume flow rate control range	Approx. 25 to 100 % of the nominal volume flow rate
Scale accuracy	± 4 %
Minimum differential pressure	50 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C



EN, Sound pressure level at differential pressure 150 Pa

Nominal size	V̇ l/s	V̇ m ³ /h	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
			L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}
dB(A)						
200 × 100	40	144	35	19	21	<15
	80	288	41	28	28	21
	120	432	44	34	33	26
	160	576	46	38	35	30
300 × 100	65	234	38	22	24	16
	130	468	44	30	32	24
	195	702	45	35	36	29
	260	936	47	38	39	32
300 × 150	105	378	41	24	28	19
	210	756	44	31	34	26
	315	1134	46	35	39	32
	420	1512	47	38	41	35
300 × 200	130	468	45	24	31	21
	260	936	46	29	35	26
	390	1404	46	33	38	29
	520	1872	47	35	40	32
400 × 200	210	756	42	23	30	20
	420	1512	43	27	35	26
	630	2268	44	31	38	30
	840	3024	44	33	40	33
500 × 200	230	828	40	21	28	18
	460	1656	40	26	33	24
	690	2484	41	29	36	28
	920	3312	42	31	38	31
600 × 200	255	918	38	20	27	17
	510	1836	39	24	31	23
	765	2754	39	28	35	27
	1020	3672	40	31	37	31
400 × 250	220	792	44	23	32	22
	440	1584	45	28	37	27
	660	2376	45	31	39	30
	880	3168	45	34	41	33
500 × 250	300	1080	41	21	31	21
	600	2160	42	26	36	27
	900	3240	43	30	39	30
	1200	4320	43	33	41	33
600 × 250	320	1152	40	20	30	20
	640	2304	40	25	34	25
	960	3456	41	28	37	29
	1280	4608	42	31	39	32
400 × 300	315	1134	45	25	53	25
	630	2268	46	29	40	30
	945	3402	47	34	43	34
	1260	4536	47	36	45	36

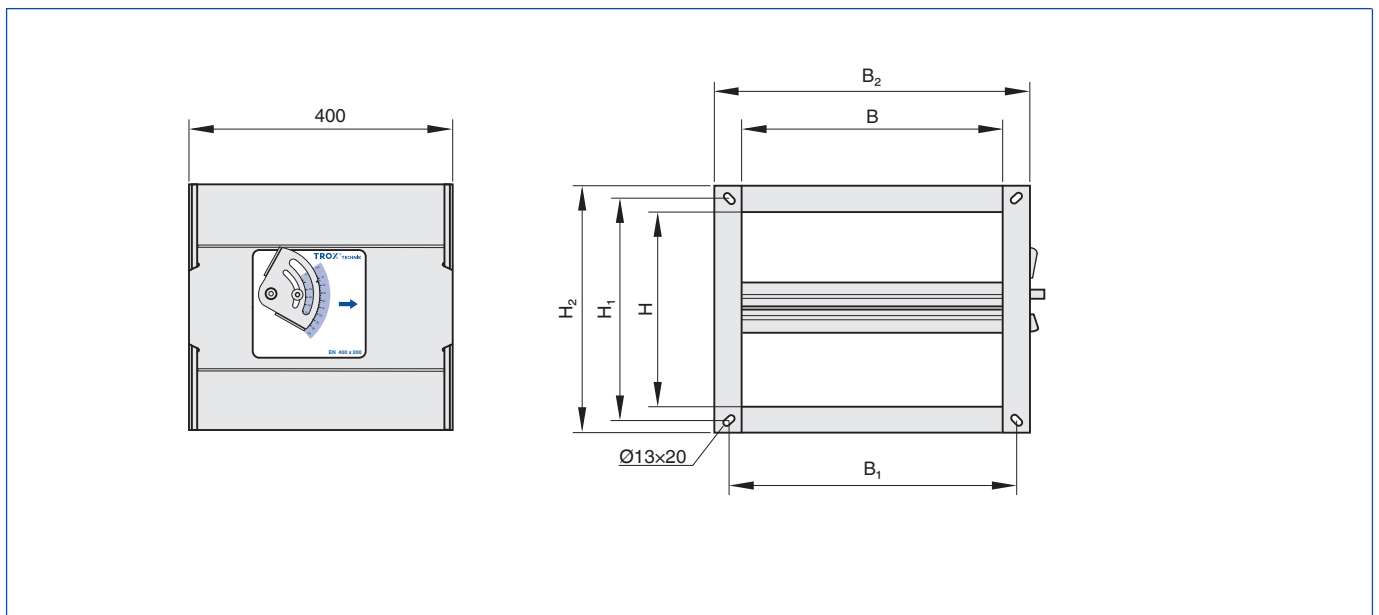


Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
			L _{PA}	L _{PA1}	L _{PA2}	L _{PA3}
dB(A)						
500 x 300	375	1350	43	22	34	23
	750	2700	44	28	38	29
	1125	4050	44	31	41	32
	1500	5400	45	33	43	35
600 x 300	420	1512	41	21	33	22
	840	3024	42	26	37	28
	1260	4536	42	30	40	31
	1680	6048	43	32	42	34
400 x 400	420	1512	47	27	39	29
	840	3024	49	32	44	34
	1260	4536	49	36	47	37
	1680	6048	50	38	49	40
500 x 400	460	1656	45	24	37	27
	920	3312	46	29	42	32
	1380	4968	47	33	44	35
	1840	6624	47	35	46	37
600 x 400	510	1836	43	22	36	25
	1020	3672	44	27	40	30
	1530	5508	44	31	43	33
	2040	7344	45	33	45	36
500 x 500	600	2160	47	26	40	30
	1200	4320	48	31	45	35
	1800	6480	49	35	48	39
	2400	8640	49	37	50	41
600 x 500	640	2304	45	24	39	28
	1280	4608	46	29	43	33
	1920	6912	46	32	46	36
	2560	9216	46	35	48	39
600 x 600	840	3024	46	26	41	31
	1680	6048	47	30	46	36
	2520	9072	48	35	49	39
	3360	12096	48	37	51	42



① EN ② EN with secondary silencer TX ③ EN-D

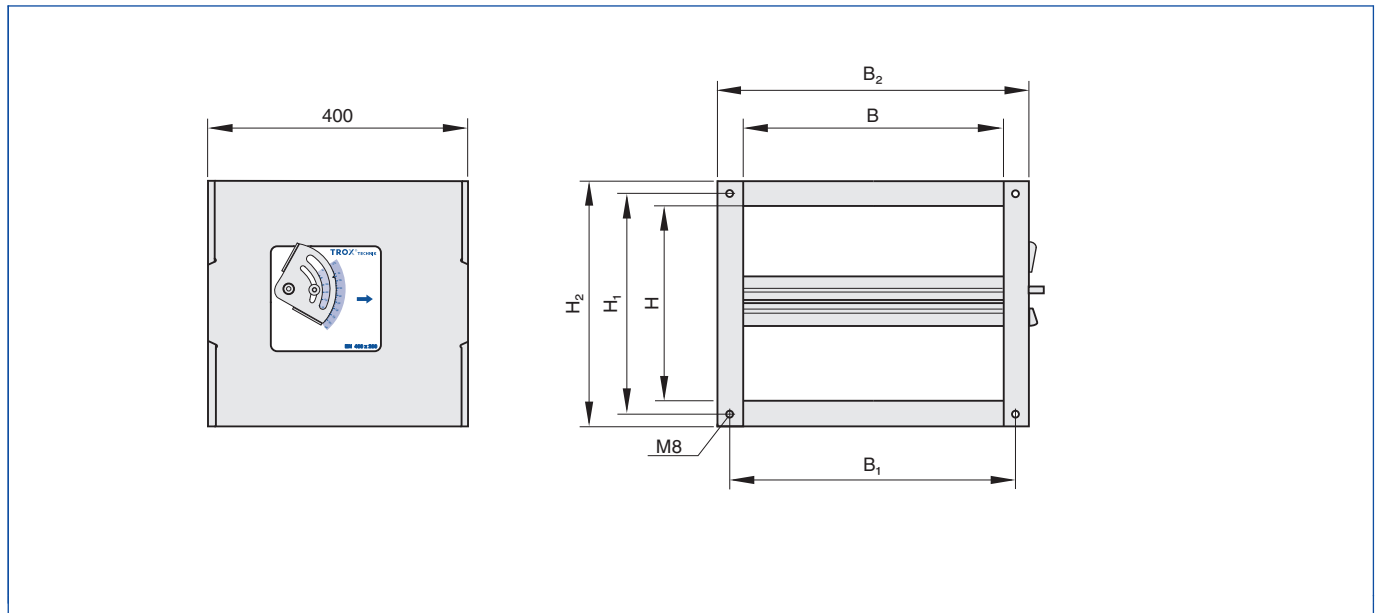
EN



Dimensions [mm] and weight [kg]

Nominal size	Nominal width	Nominal height	B ₁	B ₂	H ₁	H ₂	m kg
	mm	mm	mm	mm	mm	mm	
200 × 100	200	100	234	276	134	176	5
300 × 100	300	100	334	376	134	176	6
300 × 150	300	150	334	376	184	226	7
300 × 200	300	200	334	376	234	276	7
400 × 200	400	200	434	476	234	276	9
400 × 250	400	250	434	476	284	326	10
400 × 300	400	300	434	476	334	376	12
400 × 400	400	400	434	476	434	476	18
500 × 200	500	200	534	576	234	276	11
500 × 250	500	250	534	576	284	326	12
500 × 300	500	300	534	576	334	376	13
500 × 400	500	400	534	576	434	476	18
500 × 500	500	500	534	576	534	576	19
600 × 200	600	200	634	676	234	276	13
600 × 250	600	250	634	676	284	326	14
600 × 300	600	300	634	676	334	376	15
600 × 400	600	400	634	676	434	476	18
600 × 500	600	500	634	676	534	576	19
600 × 600	600	600	634	676	634	676	20

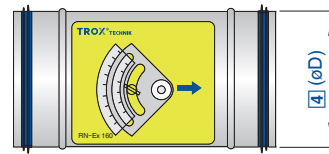
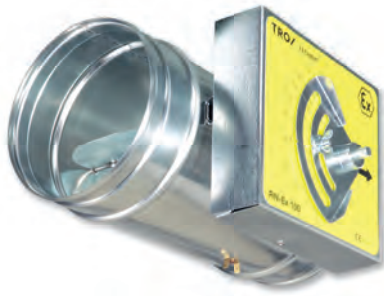
EN-D



Dimensions [mm] and weight [kg]

Nominal size	Nominal width	Nominal height	B ₁	B ₂	H ₁	H ₂	m kg
	mm	mm	mm	mm	mm	mm	
200 x 100	200	100	234	280	134	180	8
300 x 100	300	100	334	380	134	180	10
300 x 150	300	150	334	380	184	230	11
300 x 200	300	200	334	380	234	280	12
400 x 200	400	200	434	480	234	280	15
400 x 250	400	250	434	480	284	330	17
400 x 300	400	300	434	480	334	380	18
400 x 400	400	400	434	480	434	480	26
500 x 200	500	200	534	580	234	280	17
500 x 250	500	250	534	580	284	330	18
500 x 300	500	300	534	580	334	380	19
500 x 400	500	400	534	580	434	480	26
500 x 500	500	500	534	580	534	580	28
600 x 200	600	200	634	680	234	280	20
600 x 250	600	250	634	680	284	330	22
600 x 300	600	300	634	680	334	380	22
600 x 400	600	400	634	680	434	480	26
600 x 500	600	500	634	680	534	580	29
600 x 600	600	600	634	680	634	680	30





For the precise control of constant volume flows in potentially explosive atmospheres (ATEX)

Order code

RN - Ex - D - P1 / 160 / D2

1 2 3 4 5

1 Type

RN-Ex Volume flow controller for potentially explosive atmospheres

2 Acoustic cladding

D No entry: none
With acoustic cladding

3 Material

No entry: galvanised sheet steel
P1 Powder-coated (RAL 7001), silver grey
A2 Stainless steel

4 Nominal size [mm]

80, 100, 125, 160, 200, 250, 315, 400

5 Accessories

No entry: none
D2 Lip seals on both ends

+ Features

Circular, mechanical self-powered volume flow controllers for the control of supply air or extract air in constant air volume systems, approved and certified for potentially explosive atmospheres (ATEX)

- ▶ ATEX-compliant construction
- ▶ Approved for gases, mists, vapours and dusts in zones 1, 2, 21 and 22
- ▶ Volume flow rate can be set using an external scale, no tools required
- ▶ No on-site test measurements required for commissioning
- ▶ Suitable for airflow velocities of up to 12 m/s
- ▶ Any installation orientation
- ▶ Casing air leakage to EN 1751, class C

Optional equipment and accessories

- ▶ Acoustic cladding for the reduction of case-radiated noise
- ▶ Secondary silencer Type CA for the reduction of air-regenerated noise

Y Application

- ▶ Circular EXCONTROL CAV controllers of Type RN-Ex for the precise supply air or extract air flow control in constant air volume systems
- ▶ For use in potentially explosive atmospheres (ATEX)
- ▶ Mechanical self-powered volume flow control without external power supply
- ▶ Simplified project handling with orders based on nominal size

EN Classification

According to type examination certificate TUEV 05 ATEX 7159 X

- ▶ Zones 1 and 2 (atmosphere: gases): II 2 G c II T5 / T6
- ▶ Zones 21 and 22 (atmosphere: dusts): II 2 D c II T 80 °C

◊ Variants

- ▶ RN-Ex: Volume flow controller
- ▶ RN-Ex-D: Volume flow controller with acoustic cladding
- ▶ Units with acoustic cladding and/or Type CA secondary silencers for demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted

+ Construction

- ▶ Galvanised sheet steel
- ▶ P1: Powder-coated, silver grey (RAL 7001)
- ▶ A2: Stainless steel

& Accessories

- ▶ Lip seals on both ends (factory fitted)

+ Useful additions

- ▶ Secondary silencer Type CA

★ Special features

- ▶ ATEX mark and certification
- ▶ ATEX equipment group II, approved for zones 1, 2, 21 and 22
- ▶ Volume flow rate can be set using an external scale; no tools required
- ▶ High volume flow rate control accuracy
- ▶ Any installation orientation
- ▶ Correct operation even under unfavourable upstream or downstream conditions (1.5 D straight section required upstream)

ISO Standards and guidelines

- ▶ Directive 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres
- ▶ Hygiene conforms to VDI 6022
- ▶ Casing air leakage to EN 1751, class C





Technical data

Nominal sizes	80 - 400 mm
Volume flow rate range	11 - 1400 l/s or 40 - 5040 m ³ /h
Volume flow rate control range	Approx. 25 to 100 % of the nominal volume flow rate
Scale accuracy	± 4 %
Minimum differential pressure	50 Pa (nominal size 80: 100 Pa)
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C

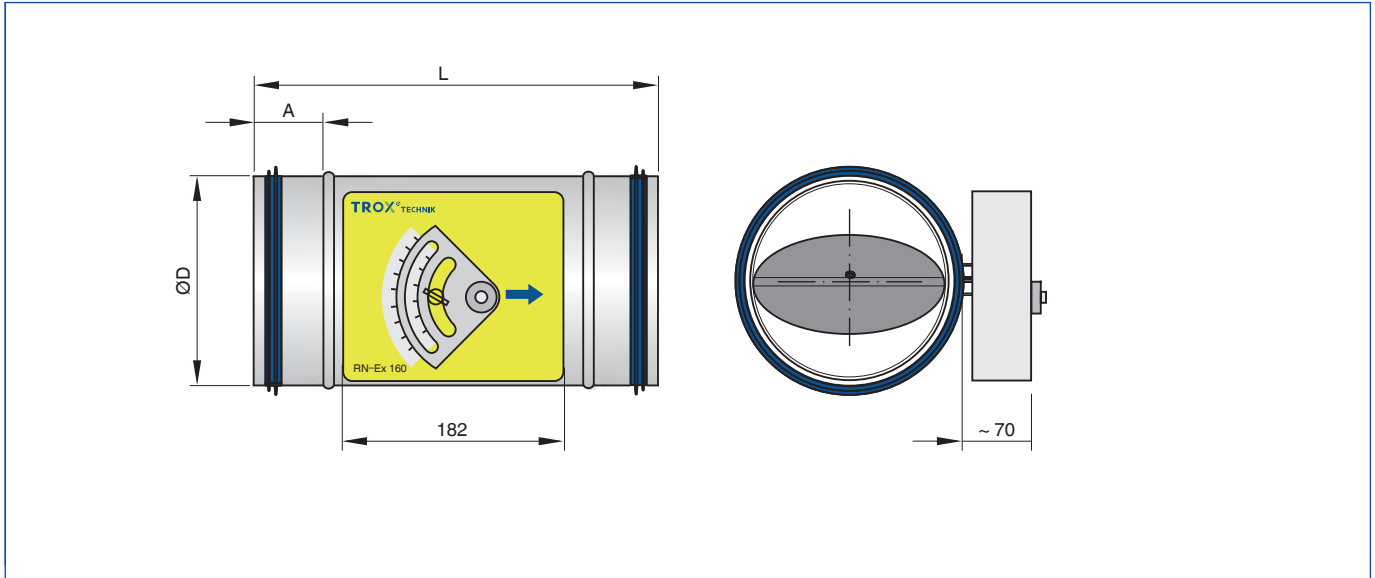
RN-Ex, Sound pressure level at differential pressure 150 Pa

Nominal size	Ḃ l/s	Ḃ m ³ /h	Air-regenerated noise				Case-radiated noise	
			①	②	③	④	①	⑤
			L _{PA}	L _{PA1}			L _{PA2}	L _{PA3}
			dB(A)					
80	11	40	37	24	17	15	22	<15
	20	72	39	27	19	17	24	<15
	40	144	47	34	24	22	31	<15
	45	162	48	35	25	24	32	<15
100	22	79	37	24	17	15	22	<15
	40	144	40	47	22	20	21	<15
	70	252	47	47	27	26	29	<15
	90	324	50	50	30	29	33	<15
125	35	126	37	27	21	18	15	<15
	60	216	43	34	27	25	19	<15
	115	414	50	41	35	33	27	<15
	140	504	52	44	39	37	30	<15
160	60	216	40	32	26	24	29	<15
	105	378	45	37	32	29	33	<15
	190	684	49	41	35	33	39	<15
	240	864	50	41	36	34	41	16
200	90	324	40	31	24	22	28	<15
	160	576	43	35	28	26	32	<15
	300	1080	48	40	33	32	40	17
	360	1296	49	41	35	33	42	20
250	145	522	41	32	24	22	29	15
	255	918	42	34	28	26	33	<15
	470	1692	46	39	33	31	40	19
	580	2088	48	41	35	34	43	22
315	230	828	39	33	26	23	30	<15
	400	1440	42	35	29	27	35	<15
	750	2700	44	38	32	31	40	19
	920	3312	46	41	35	34	43	23
400	350	1260	46	39	33	29	45	<15
	610	2196	48	42	36	32	49	18
	1130	4068	50	44	38	35	54	24
	1400	5040	51	45	40	37	56	27

- ① RN-Ex
- ② RN-Ex with secondary silencer CS/CF, insulation thickness 50 mm, length 500 mm
- ③ RN-Ex with secondary silencer CS/CF, insulation thickness 50 mm, length 1000 mm
- ④ RN-Ex with secondary silencer CS/CF, insulation thickness 50 mm, length 1500 mm
- ⑤ RN-Ex-D



RN-Ex

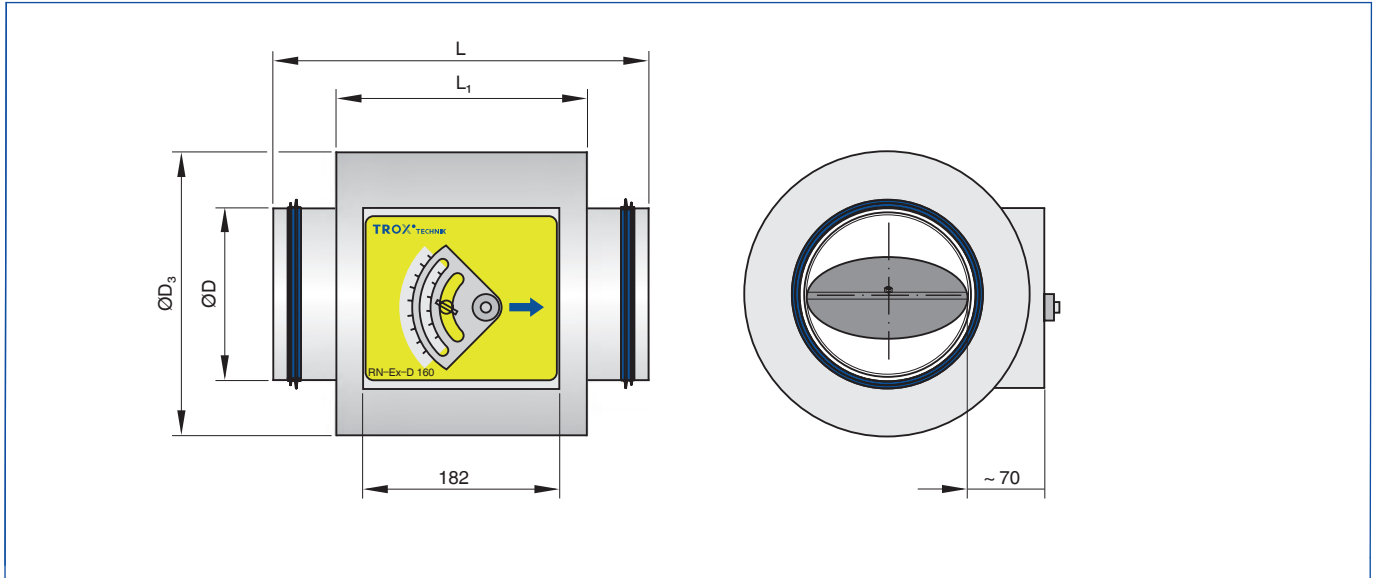


Dimensions [mm] and weight [kg]

Nominal size	ØD	L		A		m	
		mm		mm		kg	
80	79		310		50		1.4
100	99		310		50		1.8
125	124		310		50		2.0
160	159		310		50		2.5
200	199		310		50		3.0
250	249		400		50		3.5
315	314		400		50		4.8
400	399		400		50		5.7



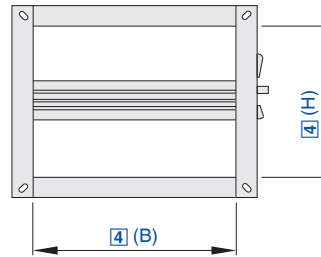
RN-Ex-DRN-Ex-D



Dimensions [mm] and weight [kg]

Nominal size	ØD mm	L mm	ØD ₃ mm	L ₁ mm	m kg
80	79	310	181	232	2.2
100	99	310	200	232	3.6
125	124	310	220	232	4.0
160	159	310	262	232	5.0
200	199	310	300	232	6.0
250	249	400	356	312	7.3
315	314	400	418	312	9.8
400	399	400	500	312	11.8





For the precise control of normal and high constant volume flows in potentially explosive atmospheres (ATEX)

Order code

EN - Ex - D - P1 / 400x200

1 2 3 4

1 Type

EN-Ex Volume flow controller for potentially explosive atmospheres

3 Material

No entry: galvanised sheet steel
P1 Powder-coated (RAL 7001), silver grey

2 Acoustic cladding

No entry: none
D With acoustic cladding

4 Nominal size [mm]

B × H

+ Features

Rectangular, mechanical self-powered volume flow controllers for the control of supply air or extract air in constant air volume systems, approved and certified for potentially explosive atmospheres (ATEX)

- ▶ ATEX-compliant construction
- ▶ Approved for gases, mists, vapours and dusts in zones 1, 2, 21 and 22
- ▶ Suitable for volume flow rates up to 12,096 m³/h or 3,360 l/s
- ▶ Volume flow rate can be set using an external scale, no tools required
- ▶ High control accuracy
- ▶ No on-site test measurements required for commissioning
- ▶ Suitable for airflow velocities up to 8 m/s
- ▶ Casing air leakage to EN 1751, up to class C

Optional equipment and accessories

- ▶ Acoustic cladding for the reduction of case-radiated noise
- ▶ Secondary silencer Type TX for the reduction of air-regenerated noise

X Application

- ▶ Rectangular EXCONTROL CAV controllers of Type EN-Ex for the precise supply air or extract air flow control in constant air volume systems
- ▶ For use in potentially explosive atmospheres (ATEX)
- ▶ Mechanical self-powered volume flow control without external power supply
- ▶ Simplified project handling with orders based on nominal size

EN Classification

According to type examination certificate TUEV 05 ATEX 7159 X

- ▶ Zones 1 and 2 (atmosphere: gases): II 2 G c II T5/T6
- ▶ Zones 21 and 22 (atmosphere: dusts): II 2 D c II T 80 °C

◇ Variants

- ▶ EN-Ex: Volume flow controller
- ▶ EN-Ex-D: Volume flow controller with acoustic cladding
- ▶ Units with acoustic cladding and/or secondary silencer Type TX for demanding acoustic requirements
- ▶ Acoustic cladding cannot be retrofitted

+ Construction

- ▶ Galvanised sheet steel
- ▶ P1: Powder-coated, silver grey (RAL 7001)

+ Useful additions

- ▶ Secondary silencer Type TX

★ Special features

- ▶ ATEX mark and certification
- ▶ ATEX equipment group II, approved for zones 1, 2, 21 and 22
- ▶ Volume flow rate can be set using an external scale; no tools required
- ▶ High volume flow rate control accuracy
- ▶ Any installation orientation

ISO Standards and guidelines

- ▶ Directive 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres
- ▶ Casing air leakage to EN 1751, class C (B + H ≤ 400, class B)

Technical data

Nominal sizes	200 × 100 to 600 × 600 mm
Volume flow rate range	40 - 3360 l/s or 144 - 12096 m ³ /h
Volume flow rate control range	Approx. 25 to 100 % of the nominal volume flow rate
Scale accuracy	± 4 %
Minimum differential pressure	50 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C



EN-Ex, Sound pressure level at differential pressure 150 Pa

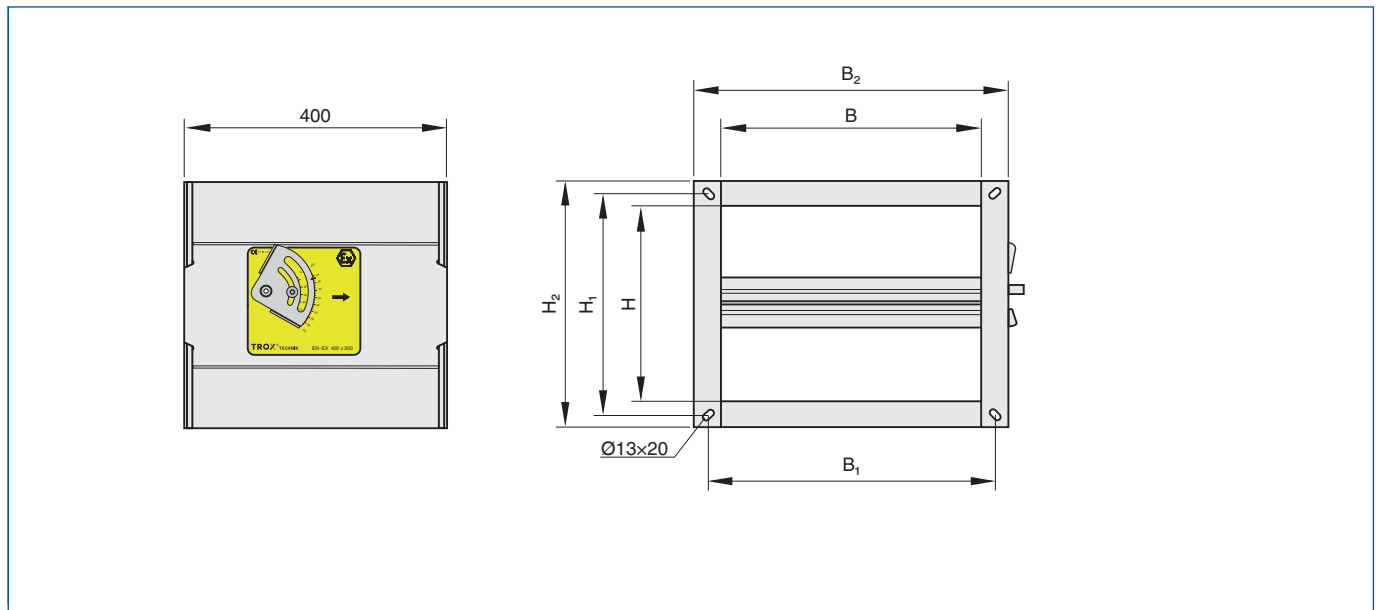
Nominal size	Ḃ	Ḃ	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
	LPA	LPA1	LPA2	LPA3	dB(A)	
	l/s	m ³ /h				
200 x 100	40	144	35	19	21	<15
	80	288	41	28	28	21
	120	432	44	34	33	26
	160	576	46	38	35	30
300 x 100	65	234	38	22	24	16
	130	468	44	30	32	24
	195	702	45	35	36	29
	260	936	47	38	39	32
300 x 150	105	378	41	24	28	19
	210	756	44	31	34	26
	315	1134	46	35	39	32
	420	1512	47	38	41	35
300 x 200	130	468	45	24	31	21
	260	936	46	29	35	26
	390	1404	46	33	38	29
	520	1872	47	35	40	32
400 x 200	210	756	42	23	30	20
	420	1512	43	27	35	26
	630	2268	44	31	38	30
	840	3024	44	33	40	33
500 x 200	230	828	40	21	28	18
	460	1656	40	26	33	24
	690	2484	41	29	36	28
	920	3312	42	31	38	31
600 x 200	255	918	38	20	27	17
	510	1836	39	24	31	23
	765	2754	39	28	35	27
	1020	3672	40	31	37	31
400 x 250	220	792	44	23	32	22
	440	1584	45	28	37	27
	660	2376	45	31	39	30
	880	3168	45	34	41	33
500 x 250	300	1080	41	21	31	21
	600	2160	42	26	36	27
	900	3240	43	30	39	30
	1200	4320	43	33	41	33
600 x 250	320	1152	40	20	30	20
	640	2304	40	25	34	25
	960	3456	41	28	37	29
	1280	4608	42	31	39	32
400 x 300	315	1134	45	25	53	25
	630	2268	46	29	40	30
	945	3402	47	34	43	34
	1260	4536	47	36	45	36
500 x 300	375	1350	43	22	34	23
	750	2700	44	28	38	29
	1125	4050	44	31	41	32
	1500	5400	45	33	43	35
600 x 300	420	1512	41	21	33	22
	840	3024	42	26	37	28
	1260	4536	42	30	40	31
	1680	6048	43	32	42	34



Nominal size	\dot{V}	\dot{V}	Air-regenerated noise		Case-radiated noise	
			①	②	①	③
	l/s	m ³ /h	LPA	LPA1	LPA2	LPA3
	dB(A)					
400 × 400	420	1512	47	27	39	29
	840	3024	49	32	44	34
	1260	4536	49	36	47	37
	1680	6048	50	38	49	40
500 × 400	460	1656	45	24	37	27
	920	3312	46	29	42	32
	1380	4968	47	33	44	35
	1840	6624	47	35	46	37
600 × 400	510	1836	43	22	36	25
	1020	3672	44	27	40	30
	1530	5508	44	31	43	33
	2040	7344	45	33	45	36
500 × 500	600	2160	47	26	40	30
	1200	4320	48	31	45	35
	1800	6480	49	35	48	39
	2400	8640	49	37	50	41
600 × 500	640	2304	45	24	39	28
	1280	4608	46	29	43	33
	1920	6912	46	32	46	36
	2560	9216	46	35	48	39
600 × 600	840	3024	46	26	41	31
	1680	6048	47	30	46	36
	2520	9072	48	35	49	39
	3360	12096	48	37	51	42

① EN ② EN with secondary silencer TX ③ EN-D

EN-Ex

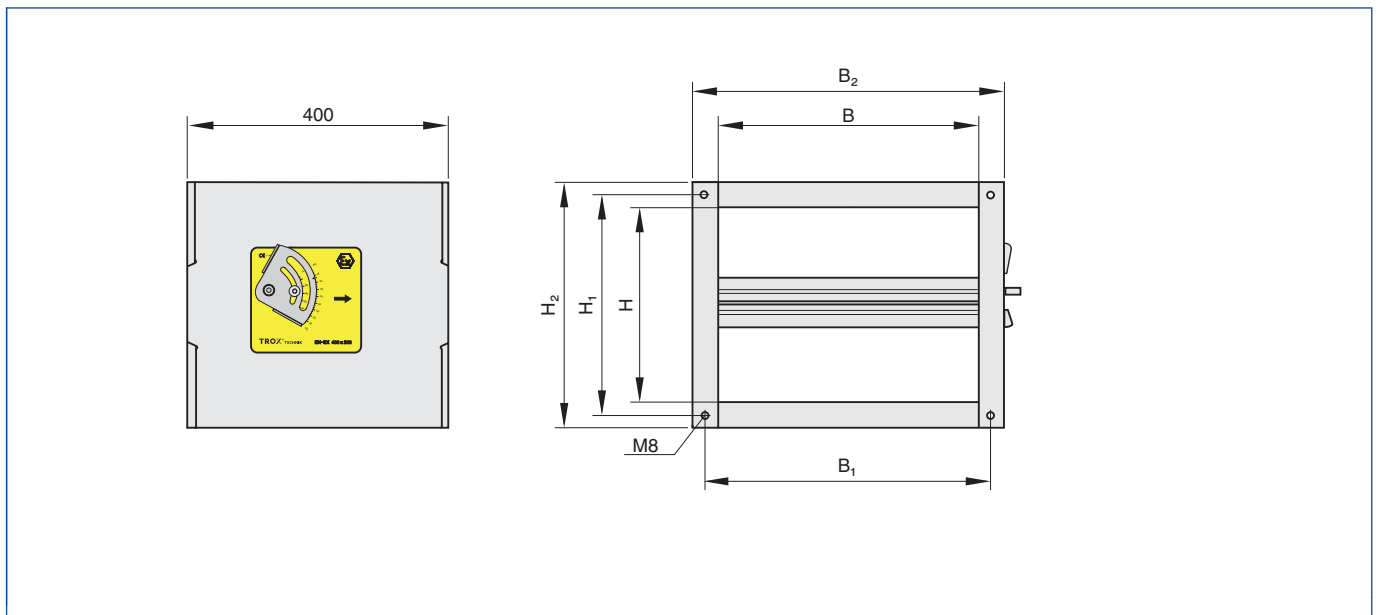


Dimensions [mm] and weight [kg]

Nominal size	Nominal width	Nominal height	B ₁	B ₂	H ₁	H ₂	m kg
	mm	mm	mm	mm	mm	mm	
200 × 100	200	100	234	276	134	176	5
300 × 100	300	100	334	376	134	176	6
300 × 150	300	150	334	376	184	226	7
300 × 200	300	200	334	376	234	276	7
400 × 200	400	200	434	476	234	276	9
400 × 250	400	250	434	476	284	326	10
400 × 300	400	300	434	476	334	376	12
400 × 400	400	400	434	476	434	476	18
500 × 200	500	200	534	576	234	276	11
500 × 250	500	250	534	576	284	326	12
500 × 300	500	300	534	576	334	376	13
500 × 400	500	400	534	576	434	476	18
500 × 500	500	500	534	576	534	576	19
600 × 200	600	200	634	676	234	276	13
600 × 250	600	250	634	676	284	326	14
600 × 300	600	300	634	676	334	376	15
600 × 400	600	400	634	676	434	476	18
600 × 500	600	500	634	676	534	576	19
600 × 600	600	600	634	676	634	676	20



EN-Ex-D



Dimensions [mm] and weight [kg]

Nominal size	Nominal width	Nominal height	B ₁	B ₂	H ₁	H ₂	m
	mm	mm	mm	mm	mm	mm	kg
200 × 100	200	100	234	280	134	180	8
300 × 100	300	100	334	380	134	180	10
300 × 150	300	150	334	380	184	230	11
300 × 200	300	200	334	380	234	280	12
400 × 200	400	200	434	480	234	280	15
400 × 250	400	250	434	480	284	330	17
400 × 300	400	300	434	480	334	380	18
400 × 400	400	400	434	480	434	480	26
500 × 200	500	200	534	580	234	280	17
500 × 250	500	250	534	580	284	330	18
500 × 300	500	300	534	580	334	380	19
500 × 400	500	400	534	580	434	480	26
500 × 500	500	500	534	580	534	580	28
600 × 200	600	200	634	680	234	280	20
600 × 250	600	250	634	680	284	330	22
600 × 300	600	300	634	680	334	380	22
600 × 400	600	400	634	680	434	480	26
600 × 500	600	500	634	680	534	580	29
600 × 600	600	600	634	680	634	680	30





For constant volume flows with $\dot{V}_{min}/\dot{V}_{max}$ switching in air conditioning systems

+ Features

Actuators for mechanical self-powered CAV controllers Type EN, RN, or VFC, and for flow adjustment dampers Type VFR

- ▶ Switching between two volume flow setpoint values, e.g. for daytime and night-time operation

- ▶ Supply voltage 24 V AC/DC or 230 V AC
- ▶ Control input signal: 1-wire control or 2-wire control (3-point)
- ▶ Potentiometer or mechanical stops
- ▶ Positive lock connection with CAV controller
- ▶ Retrofit possible

Application

- ▶ Actuators for min/max switching
- ▶ Switching between volume flow setpoint values of mechanical self-powered CAV controllers Type RN, EN or VFC
- ▶ Change of the damper blade positions of flow adjustment dampers Type VFR

Actuators for volume flow controllers Type RN or EN

Order code detail	Actuator			Auxiliary switch	
	Part number	Type	Supply voltage	Part number	Type
B50	M466DT4	LM24A-F	24 V	-	-
B52	M466DT4	LM24A-F	24 V	M536AI3	S2A
B60	M466DT5	LM230A-F	230 V	-	-
B62	M466DT5	LM230A-F	230 V	M536AI3	S2A

Actuators for volume flow controllers Type VFC and for flow adjustment dampers Type VFR

Order code detail	Part number	Type	Setpoint setting	Supply voltage
E01	M466EP6	224-024-02-001	Potentiometer	24 V
M01	M466EP4	CM24-F	Mechanical stops	24 V
E02	M466EP8	224-230-02-002	Potentiometer	230 V
M02	M466EP5	CM230-F	Mechanical stops	230 V





 **Actuators LM24A and LM24A-F**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC \pm 20 %
Power consumption - load	1 W
Power consumption - idle	0.2 W
Power rating	1.5 VA
Torque	5 Nm
Running time for 90°	150 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 x 0.75 mm ² , 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.5 kg



 **Actuator LM230A and LM230A-F**

Supply voltage	100 - 240 V AC -15 % +10 %, 50/60 Hz
Power consumption - load	1.5 W
Power consumption - idle	0.5 W
Power rating	3.5 VA
Torque	5 Nm
Running time for 90°	150 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 x 0.75 mm ² , 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.5 kg





Auxiliary switch S2A

Type of contact	2 changeover contacts ¹⁾
Max. switching voltage (AC)	250 V AC
Max. switching current (AC)	3 A (resistive load); 0.5 A (inductive load)
Max. switching voltage (DC)	110 V DC
Max. switching current (DC)	0.5 A (resistive load); 0.2 A (inductive load)
Connecting cable	6 × 0.75 mm ² , 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.250 kg

¹⁾ If both auxiliary switches are used the switching voltages must be the same



Actuator 224-24-02-001

Supply voltage (AC)	24 V AC ± 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC ± 20 %
Power rating (AC)	3 VA max.
Power rating (DC)	2 W max.
Torque	1 Nm
Running time for 90°	20 - 60 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm ² , 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC to 2014/30/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.300 kg





 **Actuator 224-230-02-002**

Supply voltage	230 V AC, 50/60 Hz
Power rating	3 VA
Torque	1 Nm
Running time for 90°	20 - 60 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm ² , 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 42
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.300 kg



 **Actuator CM24-F**

Supply voltage (AC)	24 V AC ± 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC ± 20 %
Power rating (AC)	1 VA max.
Power rating (DC)	0.5 W max.
Torque	2 Nm
Running time for 90°	75 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm ² , 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.185 kg





 **Actuator CM230-F**

Supply voltage	100 to 240 V AC -15 % +10 %, 50/60 Hz
Power rating	3 VA
Torque	2 Nm
Running time for 90°	75 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm ² , 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.185 kg





For variable volume flows in air conditioning systems

+ Features

Actuators for mechanical self-powered CAV controllers Type EN, RN, or VFC, and for flow adjustment dampers Type VFR

- ▶ Setpoint value adjustment
- ▶ Supply voltage 24 V AC/DC

- ▶ Control input signal: Voltage signal 0 - 10 V DC or 2 - 10 V DC
- ▶ Potentiometer or mechanical stops
- ▶ Positive lock connection with CAV controller or flow adjustment damper
- ▶ Retrofit possible

Application

- ▶ Actuators for variable adjustment
- ▶ Variable adjustment of volume flow setpoint values of mechanical self-powered CAV controllers Type EN, RN or VFC
- ▶ Setting of various damper blade positions of flow adjustment dampers Type VFR

Actuators for volume flow controllers Type RN or EN

Order code detail	Actuator			Auxiliary switch	
	Part number	Type	Supply voltage	Part number	Type
B70	M466DT6	LM24A-SR-F	24 V AC/DC		
B72	M466DT6	LM24A-SR-F	24 V AC/DC	M536AI3	S2A

Actuators for volume flow controllers Type VFC and for flow adjustment dampers Type VFR

Order code detail	Part number	Type	Setpoint setting	Supply voltage
E03	M466EP7	224C-024-02-003	Potentiometer	24 V AC/DC





Actuators LM24A-SR and LM24A-SR-F

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC \pm 20 %
Power consumption - load	1 W
Power consumption - idle	0.4 W
Power rating	2 VA
Torque	5 Nm
Running time for 90°	150 s
Position feedback	2 - 10 V DC, 1 mA
Control signal	2 - 10 V DC, $R_a > 100 \text{ k}\Omega$
Connecting cable	4 \times 0.75 mm ² , 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.5 kg



Auxiliary switch S2A

Type of contact	2 changeover contacts ¹⁾
Max. switching voltage (AC)	250 V AC
Max. switching current (AC)	3 A (resistive load); 0.5 A (inductive load)
Max. switching voltage (DC)	110 V DC
Max. switching current (DC)	0.5 A (resistive load); 0.2 A (inductive load)
Connecting cable	6 \times 0.75 mm ² , 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.250 kg

¹⁾ If both auxiliary switches are used the switching voltages must be the same





Actuator 224C-024-02-003

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC \pm 20 %
Power rating (AC)	3 VA
Power rating (DC)	2 W
Torque	5 Nm
Running time for 90°	20 - 60 s
Control signal	0 - 10 V DC, $R_a > 100 \text{ k}\Omega$
Connecting cable	3 \times 0.75 mm ² , 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.5 kg





For variable volume flows in air conditioning systems

Order code

NR-VAV – E01



1 Type	NR-VAV Retrofit kit	S2 attachment B70 Retrofit auxiliary switch, identical to attachment B*2	E03 identical to attachment E02 Retrofit actuator for variable adjustment, identical to attachment E03
2 Variant	For Types EN and RN	ENMAT Retrofit installation accessories for EN RNMAT Retrofit installation accessories for RN	M01 Retrofit actuator for min/max switching, identical to attachment M01
B50	Retrofit actuator for min/max switching, identical to attachment B50		M02 Retrofit actuator for min/max switching, identical to attachment M02
B60	Retrofit actuator for min/max switching, identical to attachment B60	E01 For Types VFC and VFR Retrofit actuator for min/max switching, identical to attachment E01	
B70	Retrofit actuator for variable adjustment, identical to	E02 Retrofit actuator for min/max switching,	

Actuators for volume flow controllers Type RN or EN

Part number	Construction	Supply voltage	Type	Identical to attachment
NR-VAV-B50	Min/Max switching, mechanical stops	24 V AC/DC	LM24A-F	B50
NR-VAV-B60	Min/Max switching, mechanical stops	230 V AC	LM230A-F	B60
NR-VAV-B70	Variable adjustment, mechanical stops	24 V AC/DC	LM24A-SR-F	B70
NR-VAV-S2	Auxiliary switch		S2A	Included with B*2
NR-VAV-RNMAT	Installation accessories for RN			
NR-VAV-ENMAT	Installation accessories for EN			

Installation accessories for CAV controllers Type EN or RN are to be ordered separately

Actuators for volume flow controllers Type VFC and for flow adjustment dampers Type VFR

Part number	Construction	Supply voltage	Type	Identical to attachment
NR-VAV-E01	Min/Max switching, potentiometer	24 V AC/DC	224-024-02-001	E01
NR-VAV-E02	Min/Max switching, potentiometer	230 V AC	224-230-02-002	E02
NR-VAV-E03	Variable adjustment, potentiometer	24 V AC/DC	224C-024-02-003	E03
NR-VAV-M01	Min/Max switching, mechanical stops	24 V AC/DC	CM24-F	M01
NR-VAV-M02	Min/Max switching, mechanical stops	230 V AC	CM230-F	M02



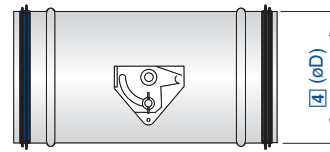
SHUT-OFF DEVICES

	Type			
	AK	AK-Ex	AKK	VFR
Type of system				
Supply air	●	●	●	●
Extract air	●	●	●	●
Duct connection				
Circular	●	●	●	●
Rectangular				
Volume flow rate range				
Up to [m ³ /h]	5435	5435	5435	1745
Up to [l/s]	1510	1510	1510	485
Air quality				
Filtered	●	●	●	●
Office extract air	●	●	●	●
Polluted	○	○	●	
Contaminated	○	○	●	
Shut-off				
Manually	●		●	
Electric/pneumatic actuator	○	●	○	
Safe position	○	○	○	
Restriction				
Manually				●
Electric actuator				○
Special areas				
Areas with explosive atmospheres		●		
Explanation				
● - Standard				
○ - Optional Possible under certain conditions: Robust unit variant and/or specific actuator				


List of abbreviations

$\varnothing D$ [mm]	Shut-off and flow adjustment dampers made of stainless steel: Outer diameter of the connecting spigot
$\varnothing D_1$ [mm]	Pitch circle diameter of flanges
$\varnothing D_2$ [mm]	Outer diameter of flanges
$\varnothing D_4$ [mm]	Inside diameter of the screw holes of flanges
L [mm]	Length of unit including connecting spigot
L_1 [mm]	Length of casing or acoustic cladding
n []	Number of flange screw holes
T [mm]	Flange thickness
m [kg]	Unit weight including the minimum required attachments
L_{PA} [dB(A)]	A-weighted sound pressure level of air-regenerated noise of the shut-off or flow adjustment damper, system attenuation taken into account
\dot{V} [m ³ /h] and [l/s]	Volume flow rate
Δp_{st} [Pa]	Static differential pressure





For low-leakage shut-off

Order code

AK – P1 – FL / 160 / G2 / BP0 / NO

1 2 3 4 5 6 7

1 Type

AK Shut-off damper

2 Material

No entry: galvanised sheet steel
P1 Powder-coated, silver grey (RAL 7001)
A2 Stainless steel

3 Construction

No entry: none
FL Flanges on both ends

4 Nominal size [mm]

100, 125, 160, 200, 250, 315, 400

5 Accessories

No entry: none
D2 Lip seals on both ends
G2 Matching flanges for both ends

6 Actuator

No entry: manual operation
For example
B20 24 V AC/DC, modulating 2 - 10 V DC
B30 24 V AC/DC, 3-point
B32 24 V AC/DC, 3-point, with auxiliary switch
TN0 Pneumatic 0.2 - 1 bar

7 Damper blade position

Only for spring return actuators and pneumatic actuators
NO Pressure off/power off to OPEN
NC Power off/Pressure off to close

+ Features

Circular shut-off dampers for shutting off volume flows in ventilation ducts of air conditioning systems

- ▶ Maintenance-free damper blade mechanism
- ▶ Closed blade air leakage to EN 1751, up to class 4
- ▶ Casing air leakage to EN 1751, class C

Optional equipment and accessories

- ▶ Electric actuator
- ▶ Spring return actuator
- ▶ Pneumatic actuator
- ▶ Auxiliary switch with adjustable switching points for capturing the end positions

X Application

- ▶ Circular shut-off dampers Type AK for shutting off or restricting the airflow in ventilation ducts of air conditioning systems

Technical data

Nominal sizes	100 - 400 mm
Acceptable static differential pressure	1500 Pa
Operating temperature	10 - 50 °C

◇ Variants

- ▶ AK: Shut-off damper
- ▶ AK-FL: Shut-off damper with flanges on both ends

+ Construction

- ▶ Galvanised sheet steel
- ▶ P1: Powder-coated, silver grey (RAL 7001)
- ▶ A2: Stainless steel

⬡ Attachments

- ▶ Open/Close actuators: For the opening and closing of shut-off dampers in air conditioning systems
- ▶ Auxiliary switch for capturing the end positions

& Accessories

- ▶ Lip seals on both ends (factory fitted)
- ▶ Matching flanges for both ends

★ Special features

- ▶ Damper blade can be actuated manually, electrically or pneumatically
- ▶ Low-leakage shut-off
- ▶ Safety function provided by optional spring return actuator

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ Closed blade air leakage to EN 1751, class 4 (nominal sizes 100, 125 and 160, class 3)
- ▶ Nominal sizes 100, 125, and 160 meet the general requirements, nominal sizes 200 - 400 meet the increased requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class C

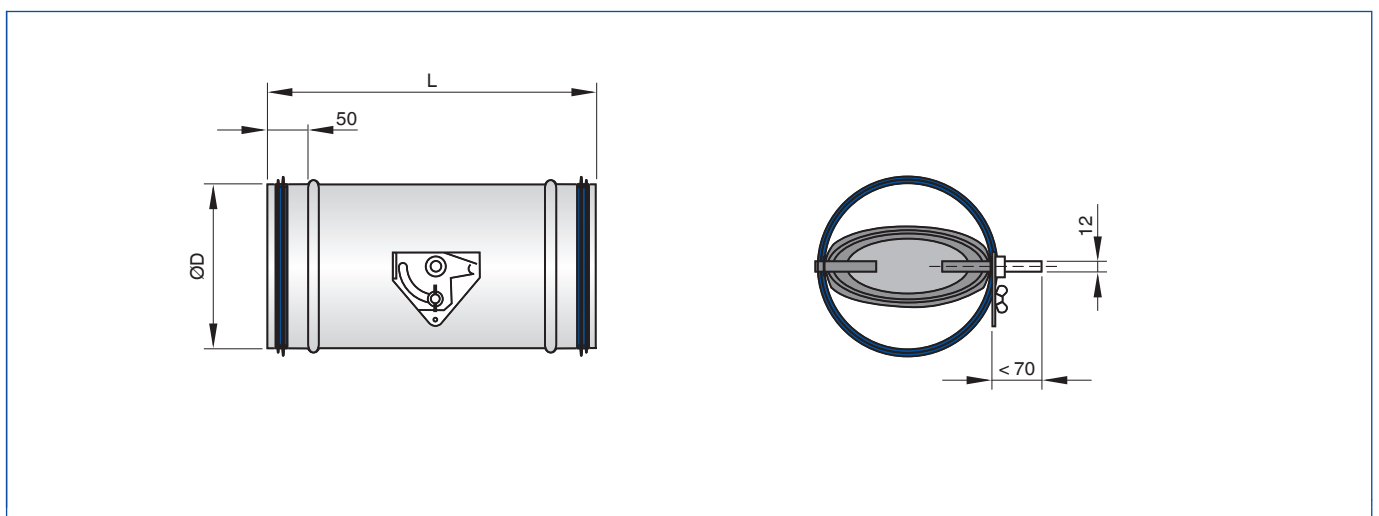


Quick sizing: Static differential pressure and sound pressure levels with open damper blade

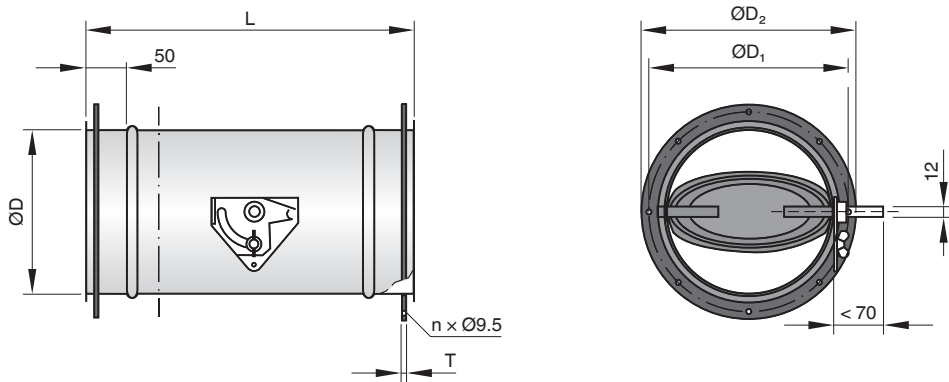
Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Differential pressure	Air-regenerated noise
			Δp_{st}	L_{PA}
			Pa	dB(A)
100	10	36	5	<15
	40	144	10	27
	65	234	25	38
	95	342	55	49
125	15	54	5	<15
	60	216	10	24
	105	378	25	36
	150	540	50	45
160	25	90	5	<15
	100	360	10	22
	175	630	20	33
	250	900	45	41
200	40	144	5	<15
	160	576	10	21
	280	1008	20	31
	405	1458	40	39
250	60	216	<5	<15
	250	900	5	19
	430	1548	15	29
	615	2214	30	38
315	100	360	<5	<15
	410	1476	5	21
	720	2592	15	34
	1030	3708	25	43
400	170	612	<5	<15
	670	2412	5	34
	1175	4230	10	50
	1680	6048	15	61



AK



AK-FL



Dimensions [mm] and weight [kg]

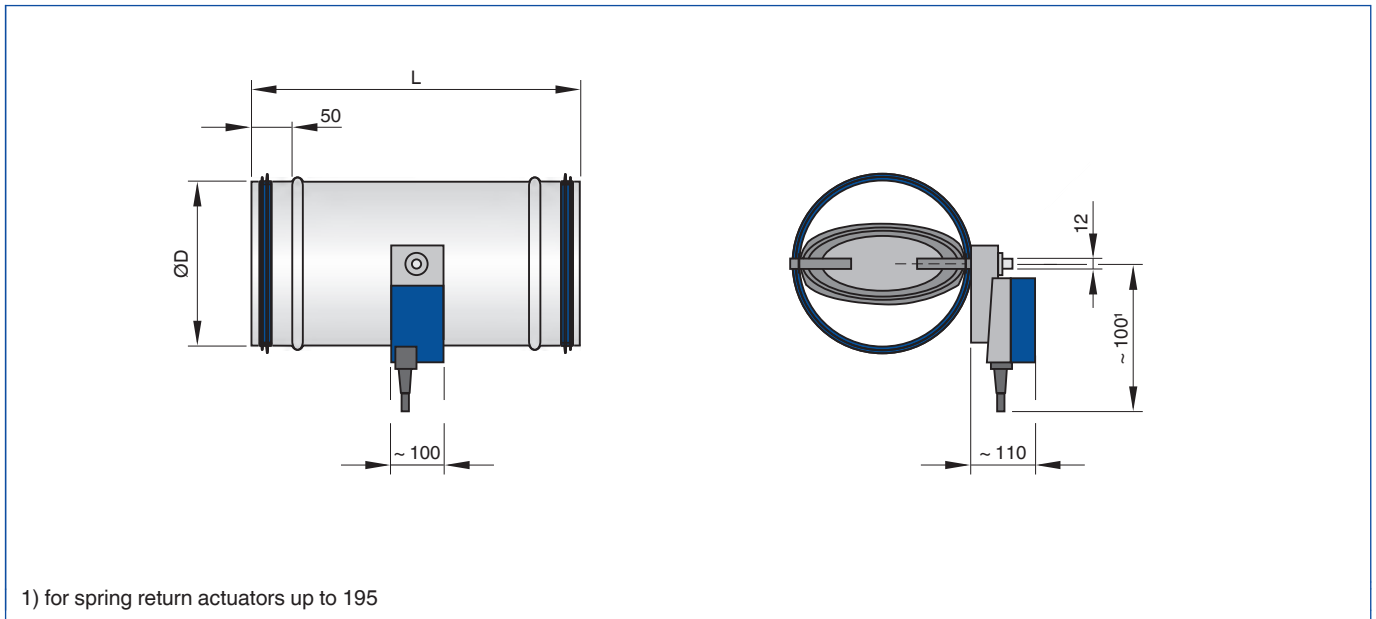
Nominal size	AK		AK-FL		ØD mm
	L mm	m kg	L mm	m kg	
100	250	1.1	230	1.8	99
125	250	1.4	230	2.0	124
160	250	1.8	230	3.0	159
200	250	2.5	230	3.9	199
250	250	3.5	230	5.2	249
315	400	5.1	380	8.2	314
400	400	7.1	380	11.0	399

Flange dimensions

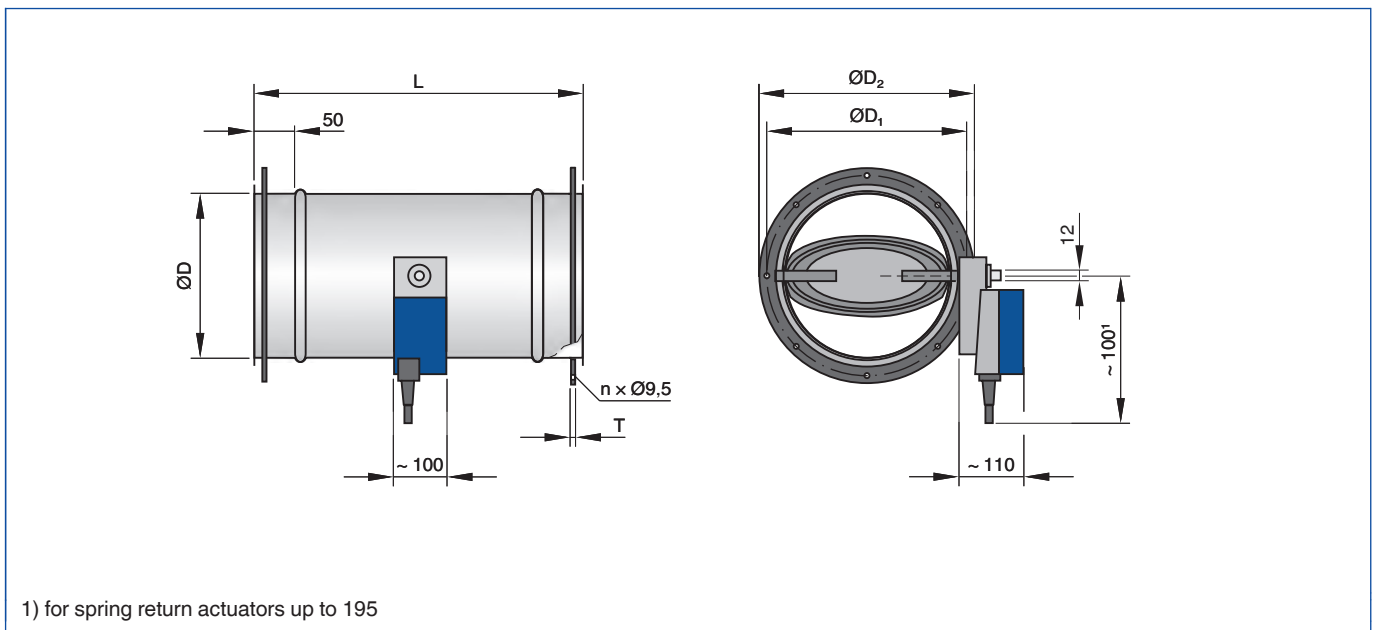
Nominal size	AK-FL		n	T mm
	ØD ₁ mm	ØD ₂ mm		
100	132	152	4	4
125	157	177	4	4
160	192	212	6	4
200	233	253	6	4
250	283	303	6	4
315	352	378	8	4
400	438	464	8	4



AK/.../B (electric actuators)**



AK-FL/.../B (electric actuators)**



Dimensions [mm] and weight [kg]

Nominal size	AK/.../B**		AK-FL/.../B**		ØD mm
	L mm	m kg	L mm	m kg	
100	250	2.6	230	3.2	99
125	250	2.9	230	3.5	124
160	250	3.3	230	4.4	159
200	250	4.0	230	5.4	199
250	250	5.0	230	6.7	249
315	400	6.6	380	9.7	314
400	400	8.6	380	12.5	399

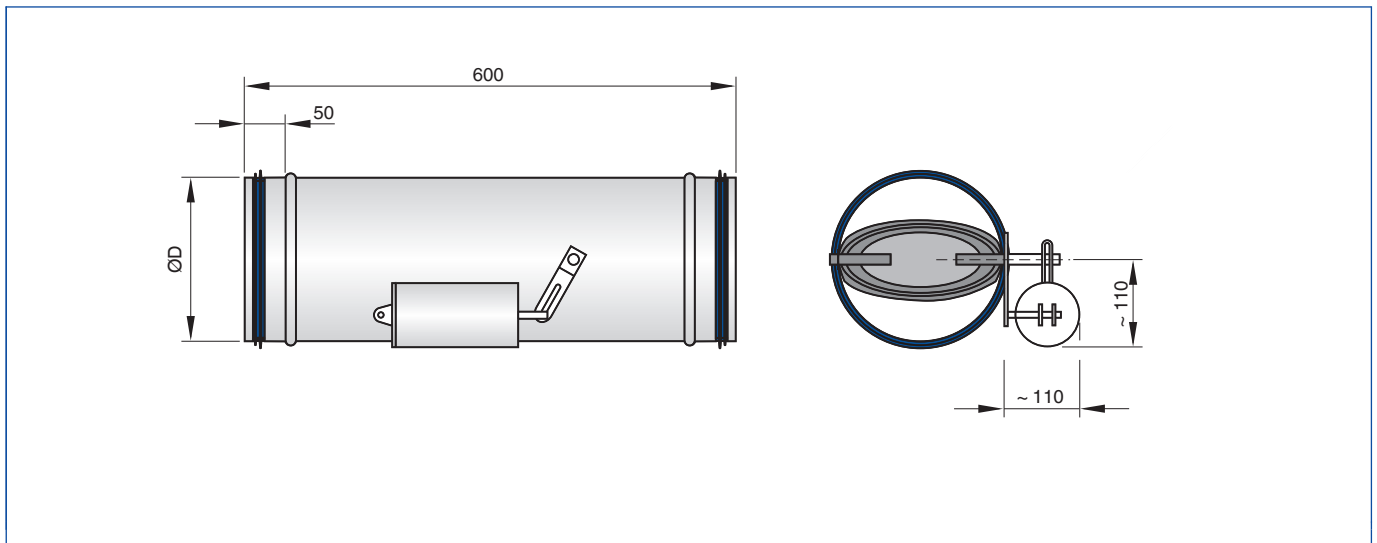


Flange dimensions

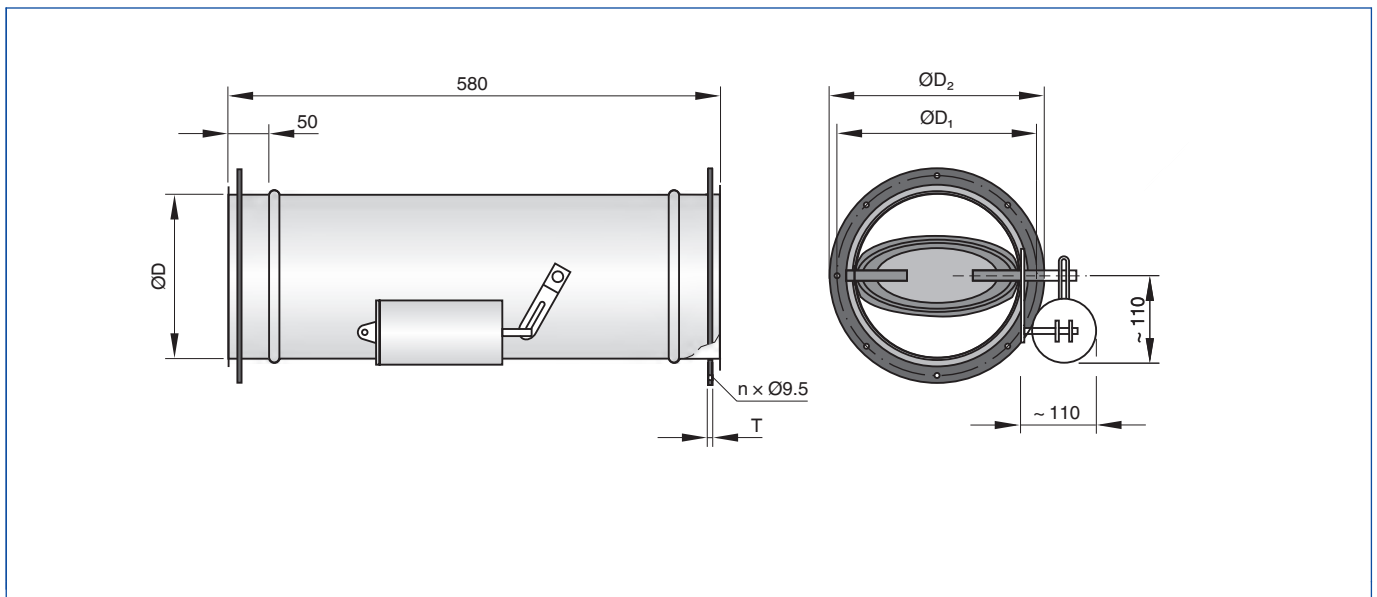
Nominal size	AK-FL		n	T
	ØD_1 mm	ØD_2 mm		
100	132	152	4	4
125	157	177	4	4
160	192	212	6	4
200	233	253	6	4
250	283	303	6	4
315	352	378	8	4
400	438	464	8	4



AK.../TN0 (pneumatic drive)



AK-FL.../TN0 (pneumatic drive)



Dimensions [mm] and weight [kg]

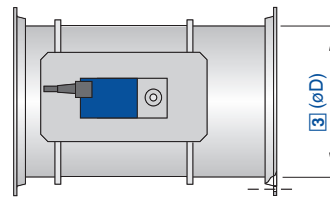
Nominal size	AK/.../TN0		AK-FL/.../TN0		ØD mm
	L	m	L	m	
	mm	kg	mm	kg	
100	600	3.3	580	3.9	99
125	600	3.6	580	4.2	124
160	600	4.2	580	5.3	159
200	600	5.1	580	6.5	199
250	600	6.1	580	7.8	249
315	600	7.2	580	10.3	314
400	600	9.4	580	13.3	399



Flange dimensions

Nominal size	AK-FL		n	T mm
	ØD ₁	ØD ₂		
	mm	mm		
100	132	152	4	4
125	157	177	4	4
160	192	212	6	4
200	233	253	6	4
250	283	303	6	4
315	352	378	8	4
400	438	464	8	4





For contaminated air

Order code

AKK – FL / 160 / GK / BP0 / NO

1 **2** **3** **4** **5** **6**

1 Type

AKK Shut-off damper, plastic

2 Flange

No entry: none

FL Flanges on both ends

3 Nominal size [mm]

125, 160, 200, 250, 315, 400

4 Accessories

No entry: none

GK Matching flanges for both ends

5 Actuator

No entry: manual operation

For example

B20 24 V AC/DC, modulating 2 - 10 V DC

B30 24 V AC/DC, 3-point

B32 24 V AC/DC, 3-point, with auxiliary switch

TN0 Pneumatic 0.2 - 1 bar

6 Damper blade position

Only for spring return actuators and pneumatic actuators

NO Pressure off/power off to OPEN

NC Power off/Pressure off to close

+ Features

Plastic circular shut-off dampers for shutting off aggressive media volume flows in air conditioning systems

- ▶ Maintenance-free damper blade mechanism
- ▶ Closed blade air leakage to EN 1751, class 3
- ▶ Casing air leakage to EN 1751, class B

Optional equipment and accessories

- ▶ Electric actuator
- ▶ Spring return actuator
- ▶ Pneumatic actuator
- ▶ Auxiliary switch with adjustable switching points for capturing the end positions

X Application

- ▶ Plastic circular shut-off dampers Type AKK for shutting off or restricting the airflow in ventilation ducts of air conditioning systems
- ▶ Suitable for contaminated air

Technical data

Nominal sizes	125 - 400 mm
Acceptable static differential pressure	1500 Pa
Operating temperature	10 - 50 °C

◇ Variants

- ▶ AKK: Shut-off damper
- ▶ AKK-FL: Shut-off damper with flanges on both ends

⬡ Attachments

- ▶ Open/Close actuators: For the opening and closing of shut-off dampers in air conditioning systems
- ▶ Auxiliary switch for capturing the end positions

& Accessories

- ▶ Matching flanges for both ends, including seals

★ Special features

- ▶ Damper blade can be actuated manually, electrically or pneumatically
- ▶ Low-leakage shut-off
- ▶ Safety function provided by optional spring return actuator

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ Closed blade air leakage to EN 1751, class 3
- ▶ Meets the general requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class B

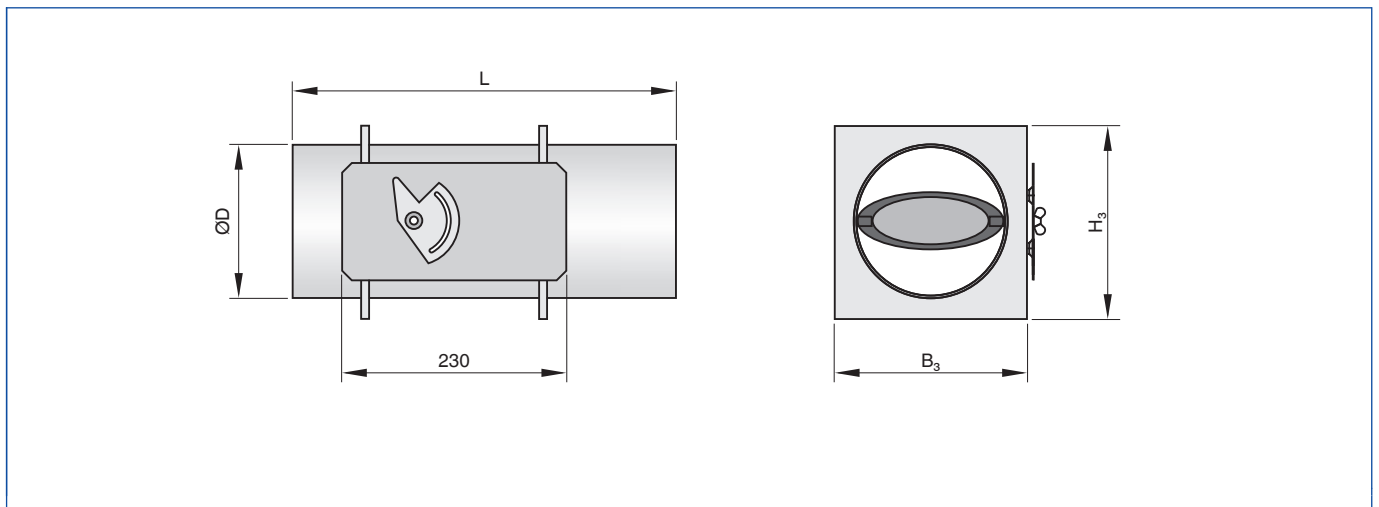


Quick sizing: Static differential pressure and sound pressure levels with open damper blade

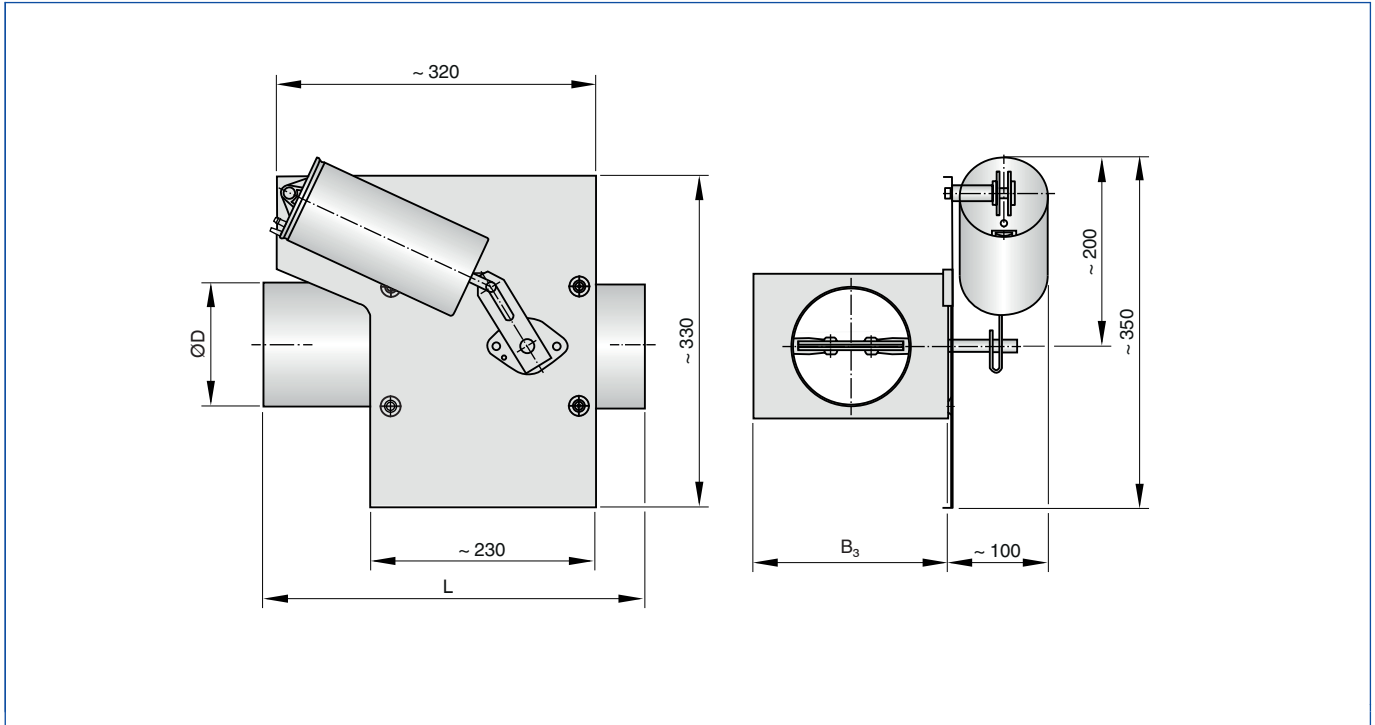
Nominal size	\dot{V}	\dot{V}	Differential pressure	Air-regenerated noise
			Δp_{st}	L_{PA}
	l/s	m ³ /h	Pa	dB(A)
125	15	54	5	<15
	60	216	10	24
125	105	378	25	36
	150	540	50	45
160	25	90	5	<15
	100	360	10	22
	175	630	20	33
	250	900	45	41
200	40	144	5	<15
	160	576	10	21
	280	1008	20	31
	405	1458	40	39
250	60	216	<5	<15
	250	900	5	19
	430	1548	15	29
	615	2214	30	38
315	100	360	<5	<15
	410	1476	5	21
	720	2592	15	34
	1030	3708	25	43
400	170	612	<5	<15
	670	2412	5	34
	1175	4230	10	50
	1680	6048	15	61



AKK



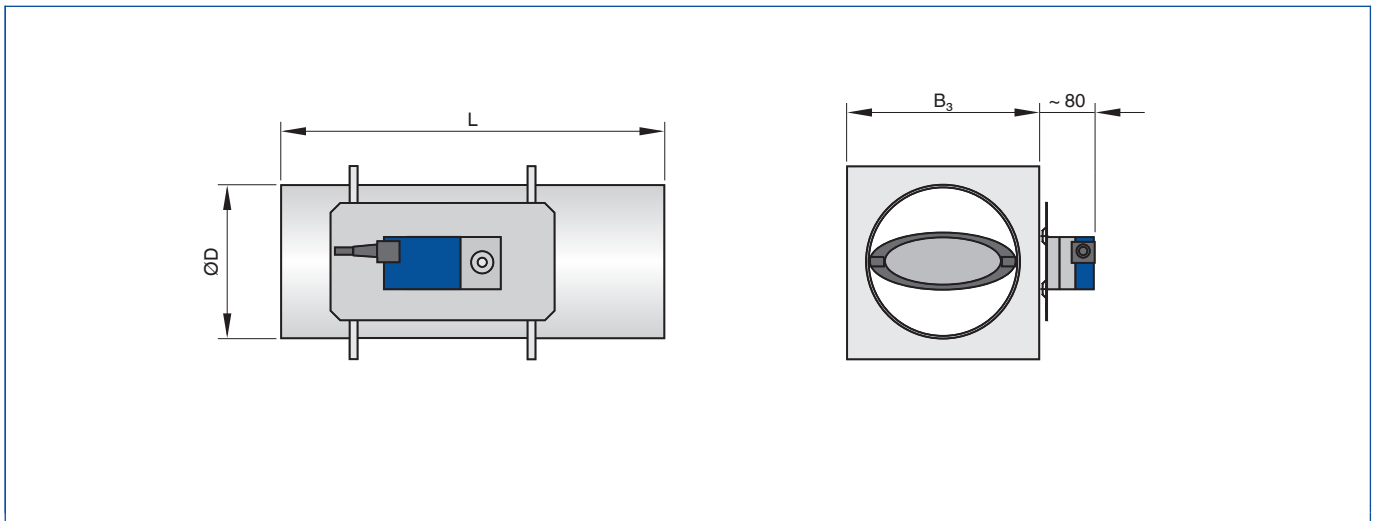
AKK/.../TN0 (pneumatic actuator)



Dimensions [mm] and weight [kg]

Nominal size	AKK	AKK/.../TN0		ØD mm	L mm	B ₃ mm	H ₃ mm
	kg	m	kg				
125	1.2		2.9	125	394	195	145
160	1.5		3.2	160	394	230	180
200	1.9		3.6	200	394	270	220
250	3.1		4.8	250	594	320	270
315	5.0		6.7	315	594	385	335
400	7.2		8.9	400	594	470	420

AKK/.../B** (electric actuators)

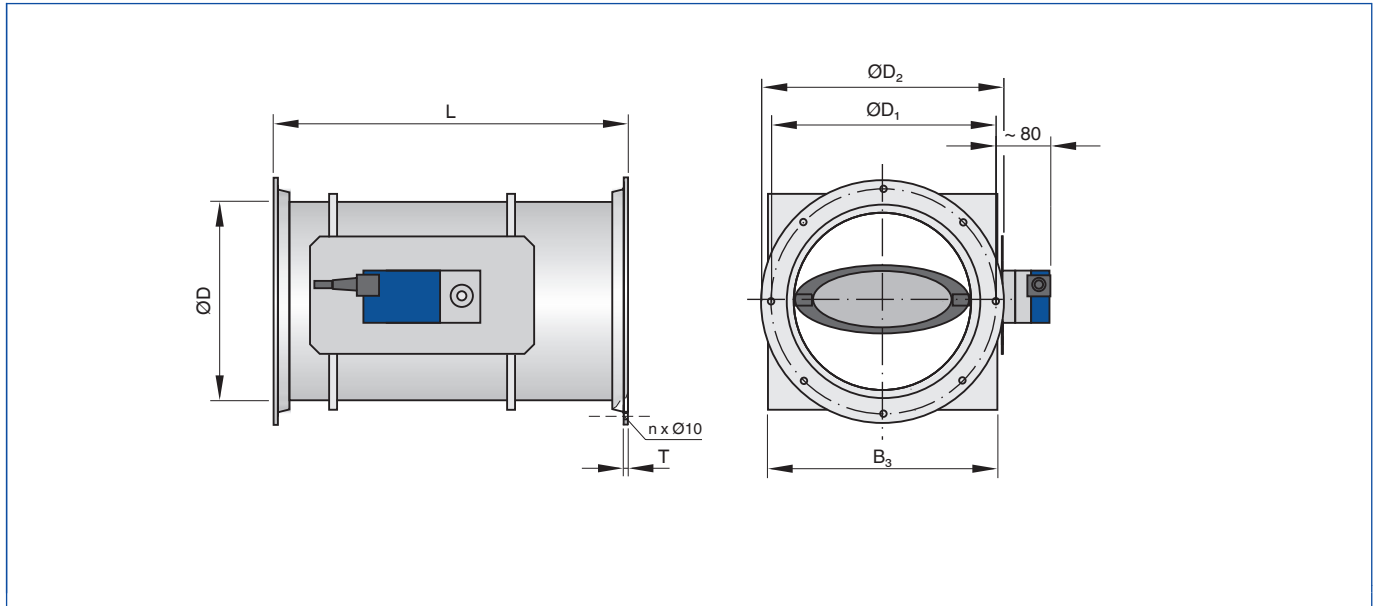


Dimensions [mm] and weight [kg]

Nominal size	AKK/.../B**		ØD mm	L mm	B ₃ mm	H ₃ mm
	m	kg				
125	3.1	3.1	125	394	195	145
160	3.4	3.4	160	394	230	180
200	3.8	3.8	200	394	270	220
250	5.0	5.0	250	594	320	270
315	6.9	6.9	315	594	385	335
400	9.1	9.1	400	594	470	420



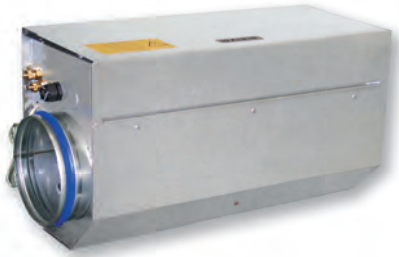
AKK-FL



Dimensions [mm] and weight [kg]

Nominal size	AKK-FL	AKK-FL/.../B**	AKK-FL/.../TN0	ØD mm	L mm	B ₃ mm	H ₃ mm	ØD ₁ mm	ØD ₂ mm	n	T mm
	kg	kg	kg								
125	1.5	3.4	3.2	125	400	195	145	165	185	8	8
160	1.9	3.8	3.6	160	400	230	180	200	230	8	8
200	2.4	4.3	4.1	200	400	270	220	240	270	8	8
250	3.7	5.6	5.4	250	600	320	270	290	320	12	8
315	6.0	7.9	7.7	315	600	385	335	350	395	12	10
400	8.5	10.4	10.2	400	600	470	420	445	475	16	10





For low-leakage shut-off of volume flows in potentially explosive atmospheres (ATEX)

Order code

AK-EX – P1 / 125 / T0F / NO

1 2 3 4 5

1 Type

AK-EX Shut-off damper for potentially explosive atmospheres

2 Material

No entry: galvanised sheet steel
P1 Inner duct powder-coated, silver grey (RAL 7001)
A2 Inner duct in stainless steel

3 Nominal size [mm]

125, 160, 200, 250, 315, 400

4 Actuator

Electronic
T0S Actuator
T0F Spring return actuator
TOX Actuator with auxiliary switch
TOY Spring return actuator with auxiliary switch

Pneumatic
P50 Actuator

5 Damper blade position

Only for spring return actuators and pneumatic actuators
NO Pressure off/power off to OPEN
NC Power off/Pressure off to close

+ Features

Circular shut-off dampers for shutting off ducts, approved and certified for potentially explosive atmospheres (ATEX)

- ▶ ATEX-compliant construction and parts
- ▶ Approved for all gases, mists and vapours in zones 1 and 2, with electric actuator additionally for dusts in zones 21 and 22
- ▶ Suitable for supply air and extract air
- ▶ Electric or pneumatic actuator
- ▶ Any installation orientation
- ▶ Closed blade air leakage to EN 1751, up to class 4
- ▶ Casing air leakage to EN 1751, class C

Optional equipment and accessories

- ▶ Spring return actuator
- ▶ Auxiliary switch with adjustable switching points for capturing the end positions

X Application

- ▶ Circular EXCONTROL shut-off dampers Type AK-Ex for shutting off or restricting the airflow in ventilation ducts of air conditioning systems
- ▶ For use in potentially explosive atmospheres (ATEX)
- ▶ Input signal to control shut-off damper blade is to be provided by others

EN Classification

Electronic control: Equipment group II
▶ Zones 1 and 2 (atmosphere: gases): II 2 G c II T5/T6
▶ Zones 21 and 22 (atmosphere: dusts): II 2 D c II 80 °C

Pneumatic control: Equipment group II

- ▶ Zones 1 and 2 (atmosphere: gases): II 2 G c II T5/T6

+ Construction

- ▶ Galvanised sheet steel
- ▶ P1: Inner duct powder-coated, silver grey (RAL 7001)
- ▶ A2: Inner duct in stainless steel

⬡ Attachments

- ▶ Electronic actuator:
- ▶ Auxiliary switch for capturing the end positions
- ▶ Pneumatic actuator

★ Special features

- ▶ ATEX mark and certification
- ▶ ATEX equipment group II, approved for use in zones 1 and 2; electric actuator also for zones 21 and 22

ISO Standards and guidelines

- ▶ Directive 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres
- ▶ Closed blade air leakage to EN 1751, class 4 (nominal sizes 100 and 160, class 3)
- ▶ Nominal sizes 125 and 160 meet the general requirements, nominal sizes 200 - 400 meet the increased requirements of DIN 1946, part 4, with regard to the acceptable closed blade air leakage
- ▶ Casing air leakage to EN 1751, class C

Technical data

Nominal sizes	125 - 400 mm
Acceptable static differential pressure	1500 Pa
Operating temperature	10 - 50 °C

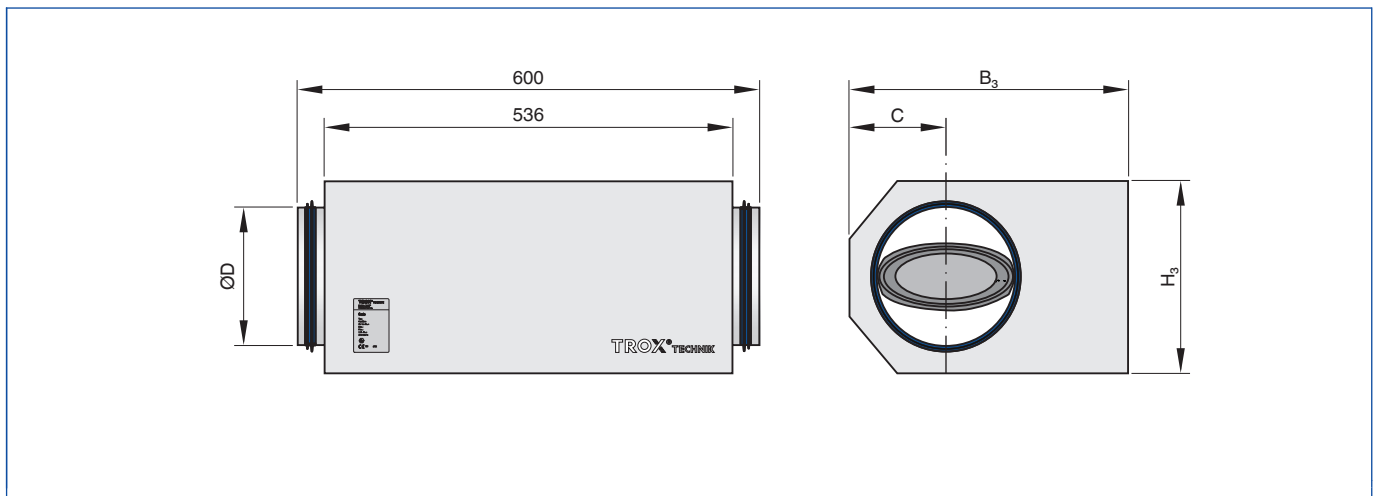


Quick sizing: Static differential pressure and sound pressure levels with open damper blade

Nominal size	\dot{V}	\dot{V}	Differential pressure	Air-regenerated noise
	l/s	m ³ /h	Δp_{st}	L _{PA}
			Pa	dB(A)
125	49	177	5	20
	74	265	12	28
	98	353	21	34
	147	530	46	45
160	80	290	4	18
	121	434	10	26
	161	579	17	32
	241	869	39	40
200	126	452	4	17
	188	679	8	24
	251	905	14	29
	377	1357	32	37
250	196	707	3	16
	295	1060	6	22
	393	1414	11	28
	589	2121	25	37
315	312	1122	2	16
	468	1683	4	24
	623	2244	8	30
	935	3367	18	41
400	503	1810	1	26
	754	2714	3	37
	1005	3619	5	45
	1508	5429	10	58



AK-Ex



Dimensions [mm]

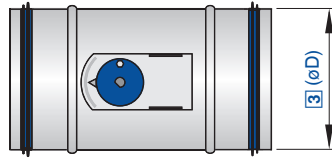
Nominal size	ØD	B ₃	H ₃	C
	mm	mm	mm	mm
125	124	372	221	129
160	159	372	221	111
200	199	463	311	182
250	249	463	311	157
315	314	627	461	289
400	399	627	461	246



Weight [kg]

Nominal size	AK-Ex/.../T0*		AK-Ex/.../P.	
	m		m	
	kg	kg	kg	kg
125	16.5	16.5	15.0	15.0
160	16.5	16.5	15.0	15.0
200	18.0	18.0	16.5	16.5
250	18.0	18.0	16.5	16.5
315	22.0	22.0	20.5	20.5
400	22.0	22.0	20.5	20.5

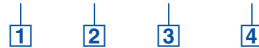




For the reliable balancing of volume flow rates

Order code

VFR - A2 / 160 / E01



1 Type

VFR Flow adjustment damper

2 Material

No entry: galvanised sheet steel
A2 Stainless steel

3 Nominal size [mm]

80, 100, 125, 140, 150, 160, 180, 200, 224, 250

4 Actuator

No entry: manual operation
For example
E01 24 V AC/DC, 3-point, potentiometer
E03 24 V AC/DC, modulating, 0 - 10 V DC, potentiometer
M01 24 V AC/DC, 3-point, mechanical stops

+ Features

Circular flow adjustment dampers for the adjustment of volume flow rates and pressures in supply air and extract air systems

- ▶ Each flow adjustment damper carries a diagram with setting values that ensure rapid commissioning on site
- ▶ Suitable for duct pressures up to 1000 Pa.
- ▶ Volume flow rate can be set using a rotary knob and a scale on the outside of the casing
- ▶ Simple retrofit of an actuator
- ▶ Casing air leakage to EN 1751, class C

Optional equipment and accessories

- ▶ Actuator with potentiometer
- ▶ Actuator with mechanical stops

Application

- ▶ Circular flow adjustment dampers Type VFR for the simple balancing of volume flow rates and pressures in air conditioning systems
- ▶ Stepless adjustment of the volume flow rate using a rotary knob with position indicator
- ▶ Simple retrofit of an actuator
- ▶ At the minimum setting (closed position 0) a system pressure dependent leakage flow rate occurs

+ Construction

- ▶ Galvanised sheet steel
- ▶ A2: Stainless steel

Attachments

- ▶ Min/Max actuators: Actuators for switching between minimum and maximum volume flow rate setpoint values
- ▶ Modulating actuators: Actuators for the stepless adjustment of volume flow rates

★ Special features

- ▶ Diagram with setting values on each flow adjustment damper
- ▶ Simple retrofit of an actuator is possible

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ Casing air leakage to EN 1751, class C

Technical data

Nominal sizes	80 - 250 mm
Volume flow rate range	20 - 485 l/s or 72 - 1746 m³/h
Minimum differential pressure	20 Pa
Maximum differential pressure	1000 Pa
Operating temperature	10 - 50 °C

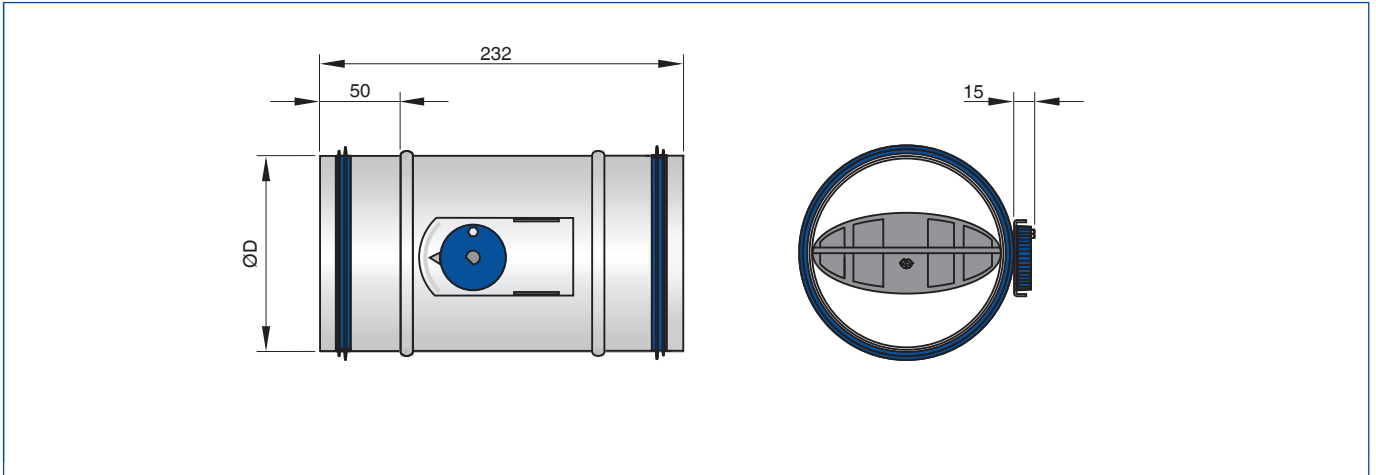


Quick sizing: Sound pressure level

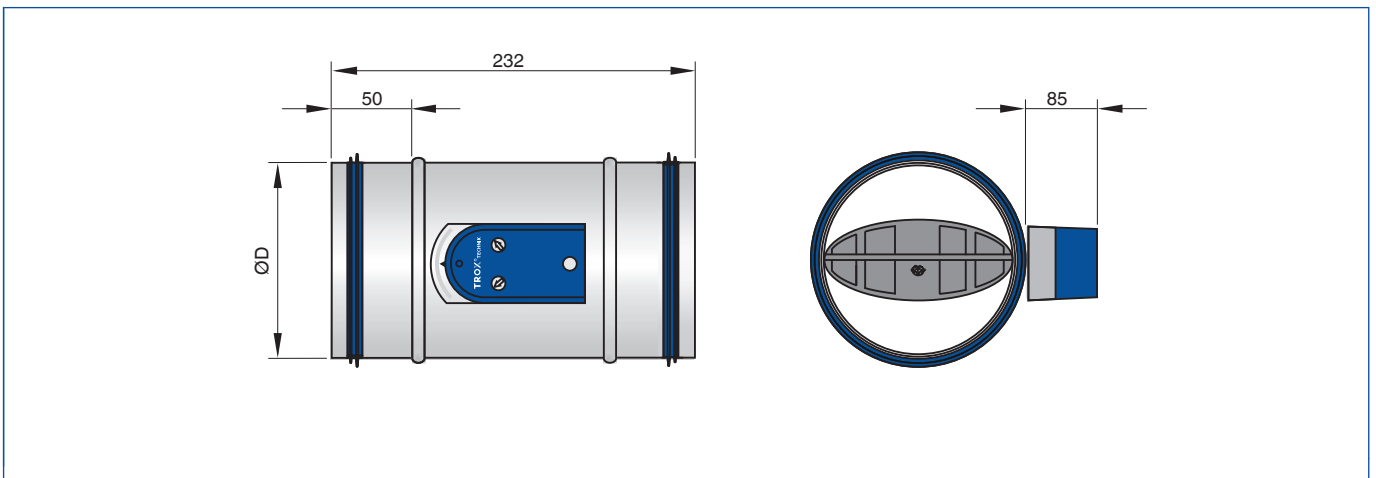
Nominal size	Volume flow rate l/s	Volume flow rate m³/h	Δp_{st} [Pa]						
			10	20	30	50	80	100	200
			L_{PA}						
			dB(A)						
80	20	72	25	28	30	32	35	36	41
	30	108	30	33	35	37	40	41	45
	40	144	33	36	38	41	43	45	49
	50	180	36	40	42	44	47	48	53
100	30	109	27	29	31	34	36	38	44
	45	163	32	35	37	39	42	43	48
	60	217	36	39	41	44	46	48	52
	75	272	40	43	45	48	50	52	56
125	50	180	28	31	33	36	39	41	47
	70	252	33	36	38	41	44	46	51
	95	342	37	41	43	46	49	50	55
	120	432	41	45	47	50	53	54	59
140	60	215	25	29	31	34	38	40	47
	90	323	31	34	37	40	44	45	51
	120	431	35	39	42	45	48	50	56
	150	538	39	43	45	49	52	54	59
150	70	252	26	30	32	36	39	41	48
	105	378	31	35	37	41	44	46	52
	140	504	35	39	42	45	48	50	56
	170	619	37	42	44	48	51	53	58
160	80	612	27	30	33	36	39	41	48
	120	432	33	37	39	42	45	47	53
	155	558	38	41	44	47	50	51	57
	195	702	41	45	47	50	53	54	59
180	100	358	25	29	32	35	39	41	48
	150	540	31	35	38	41	45	47	53
	200	720	35	39	42	45	48	50	56
	250	900	38	42	45	48	51	53	59
200	125	450	26	30	33	37	41	43	51
	185	665	32	36	39	42	46	48	55
	245	882	36	40	43	47	50	52	59
	310	1116	39	44	46	50	54	56	62
224	155	557	24	28	31	35	39	41	47
	230	828	28	32	35	39	42	44	50
	310	1115	32	36	38	42	45	47	53
	385	1386	34	38	41	44	48	49	55
250	195	702	24	28	32	36	41	43	52
	290	1043	28	33	36	40	45	47	56
	385	1386	31	36	40	44	49	51	59
	485	1746	34	39	43	47	52	54	62



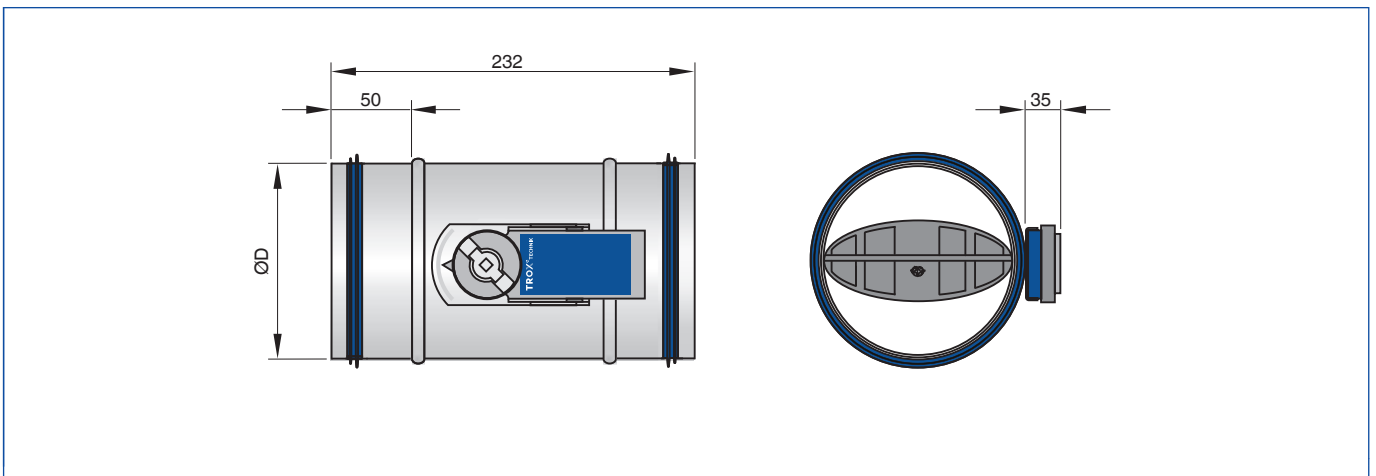
VFR



VFR/.../E0*



VFR/.../M0*



Dimensions [mm] and weight [kg]

	VFR	VFR/.../E0*	VFR/.../M0*	
Nominal size	m			ØD
	kg	kg	kg	mm
80	0.5	0.8	0.7	79
100	0.6	0.9	0.8	99
125	0.7	1.0	0.9	124
140	0.8	1.1	1.0	139
150	0.8	1.1	1.0	149



	VFR	VFR/.../E0*	VFR/.../M0*	
Nominal size	m			ØD
	kg	kg	kg	mm
160	0.8	1.1	1.0	159
180	0.9	1.2	1.1	179
200	1.0	1.3	1.2	199
224	1.2	1.4	1.4	223
250	1.3	1.6	1.5	249





For the opening and closing of shut-off dampers in air conditioning systems

+ Features

Actuators for Type AK or AKK shut-off dampers

- ▶ Change of the damper blade position for two different operating situations

- ▶ Supply voltage 24 V AC/DC or 230 V AC or operating pressure 1 bar
- ▶ Control input signal: 1-wire control or 2-wire control (3-point)
- ▶ Mechanical stops
- ▶ Retrofit possible

Application

- ▶ Actuators for opening and closing
- ▶ Opening and closing of Type AK or AKK shut-off dampers

Actuators for Type AK or AKK shut-off dampers

Order code detail	Actuator			Auxiliary switch	
	Part number	Type	Supply voltage	Part number	Type
B30	M466DU5	LM24A	24 V	-	-
B32	M466DU5	LM24A	24 V	M536AI3	S2A
B40	M466DU4	LM230A	230 V	-	-
B42	M466DU4	LM230A	230 V	M536AI3	S2A
BP0	M466ET0	NF24A spring return actuator	24 V	-	-
BP2	M466ET2	NF24A-S2 spring return actuator	24 V		integrated
BR0	M466ET1	NFA spring return actuator	24 - 240 V AC 24 - 125 V DC	-	-
BR2	M466ET3	NFA-S2 spring return actuator	24 - 240 V AC 24 - 125 V DC		integrated
TN0	B555DC2	Pneumatic control	0.2 - 1 bar	-	-



Actuators LM24A and LM24A-F

Supply voltage (AC)	24 V AC ± 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC ± 20 %
Power consumption - load	1 W
Power consumption - idle	0.2 W
Power rating	1.5 VA
Torque	5 Nm
Running time for 90°	150 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm ² , 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.5 kg





 **Actuator LM230A and LM230A-F**

Supply voltage	100 - 240 V AC -15 % +10 %, 50/60 Hz
Power consumption - load	1.5 W
Power consumption - idle	0.5 W
Power rating	3.5 VA
Torque	5 Nm
Running time for 90°	150 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm ² , 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.5 kg



 **Auxiliary switch S2A**

Type of contact	2 changeover contacts ¹⁾
Max. switching voltage (AC)	250 V AC
Max. switching current (AC)	3 A (resistive load); 0.5 A (inductive load)
Max. switching voltage (DC)	110 V DC
Max. switching current (DC)	0.5 A (resistive load); 0.2 A (inductive load)
Connecting cable	6 × 0.75 mm ² , 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.250 kg

¹⁾ If both auxiliary switches are used the switching voltages must be the same





Spring return actuator NF24A

Supply voltage (AC)	24 V AC ± 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC -10 %, +20 %
Power consumption - load	6 W
Power consumption - idle	2.5 W
Power rating	8.5 VA
Torque	10 Nm
Motor running time for 90°	< 75 s
Spring return time	20 s (for < -20 °C up to 60 s)
Control input signal	Supply voltage on/off
Connecting cable	2 × 0.75 mm ² , 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	1.8 kg



Spring return actuator NF24A-S2

Supply voltage (AC)	24 V AC ± 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC -10 %, +20 %
Power consumption - load	6 W
Power consumption - idle	2.5 W
Power rating	8.5 VA
Torque	10 Nm
Motor running time for 90°	< 75 s
Spring return time	20 s (for < -20 °C up to 60 s)
Control input signal	Supply voltage on/off
Auxiliary switch: type of contact	2 changeover contacts ¹⁾
Max. switching voltage (AC)	250 V AC
Max. switching current (AC)	3 A (resistive load); 0.5 A (inductive load)
Max. switching voltage (DC)	110 V DC
Max. switching current (DC)	0.5 A (resistive load); 0.2 A (inductive load)
Connecting cable - actuator	2 × 0.75 mm ² , 1 m long
Connecting cable - auxiliary switch	6 × 0.75 mm ² , 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	2.0 kg

¹⁾ If both auxiliary switches are used the switching voltages must be the same





 **Spring return actuator NFA**

Supply voltage (AC)	24 - 240 V AC -20 % +10 %, 50/60 Hz
Supply voltage (DC)	24 - 125 V DC \pm 10 %
Power consumption - load	6 W
Power consumption - idle	2.5 W
Power rating	9.5 VA
Torque	10 Nm
Motor running time for 90°	< 75 s
Spring return time	20 s (for < -20 °C up to 60 s)
Control input signal	Supply voltage on/off
Connecting cable	2 x 0.75 mm ² , 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	2.0 kg





Spring return actuator NFA-S2

Supply voltage (AC)	24 - 240 V AC -20 % +10 %, 50/60 Hz
Supply voltage (DC)	24 - 125 V DC ±10 %
Power consumption - load	6 W
Power consumption - idle	2.5 W
Power rating	9.5 VA
Torque	10 Nm
Motor running time for 90°	< 75 s
Spring return time	20 s (for < -20 °C up to 60 s)
Control input signal	Supply voltage on/off
Auxiliary switch: type of contact	2 changeover contacts ¹⁾
Max. switching voltage (AC)	250 V AC
Max. switching current (AC)	3 A (resistive load); 0.5 A (inductive load)
Max. switching voltage (DC)	110 V DC
Max. switching current (DC)	0.5 A (resistive load); 0.2 A (inductive load)
Connecting cable - actuator	2 × 0.75 mm ² , 1 m long
Connecting cable - auxiliary switch	6 × 0.75 mm ² , 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	2.2 kg

¹⁾ If both auxiliary switches are used the switching voltages must be the same



Pneumatic actuator B555DC2

Control pressure	0.2 - 1.0 bar
Maximum pressure	2.0 bar
Compressed air	Compressed air for instruments, free of oil, water and dust
Weight	0.840 kg





For moving the damper blades of shut-off dampers to any position

+ Features

Modulating actuators for Type AK or AKK shut-off dampers

- ▶ Various damper blade positions
- ▶ Supply voltage 24 V AC/DC
- ▶ Control input signal: Voltage signal 2 - 10 V
- ▶ Mechanical stops
- ▶ Retrofit possible

X Application

- ▶ Actuators for variable adjustment
- ▶ For moving the damper blades of Type AK and AKK shut-off dampers to any position

Actuators for the variable adjustment of shut-off dampers

Order code detail	Actuator		Supply voltage
	Part number	Type	
B20	M466DT6 with M536AJ4	LM24A-SR	24 V



Actuators LM24A-SR and LM24A-SR-F

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC \pm 20 %
Power consumption - load	1 W
Power consumption - idle	0.4 W
Power rating	2 VA
Torque	5 Nm
Running time for 90°	150 s
Position feedback	2 - 10 V DC, 1 mA
Control signal	2 - 10 V DC, $R_a > 100 \text{ k}\Omega$
Connecting cable	4 \times 0.75 mm ² , 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, RoHS to 2011/65/EU
Operating temperature	-30 to 50 °C
Weight	0.5 kg



VOLUME FLOW RATE MEASURING UNITS

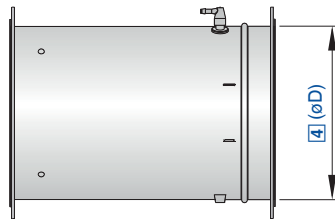
	Type			
	VMR	VME	VMRK	VMLK
Type of system				
Supply air	●	●	●	●
Extract air	●	●	●	●
Duct connection				
Circular	●		●	●
Rectangular		●		
Volume flow rate range				
Up to [m³/h]	6048	36360	6048	1854
Up to [l/s]	1680	10100	1680	515
Air quality				
Filtered	●	●	●	●
Office extract air	●	●	●	●
Polluted	○	○	●	●
Contaminated	○	○	●	●
Volume flow rate measurement				
Manually	●	●	●	
Automatically	○	○	○	●
Special areas				
Labs, clean rooms, operating theatres (EASYLAB, TCU-LON II)	●	●	●	●
Explanation				
● - Standard				
○ - Optional Possible under certain conditions: Robust unit variant and/or specific differential pressure transducer				





List of abbreviations

$\varnothing D$ [mm]	VAV terminal units made of stainless steel: Outer diameter of the spigot
$\varnothing D_1$ [mm]	Pitch circle diameter of flanges
$\varnothing D_2$ [mm]	Outer diameter of flanges
$\varnothing D_4$ [mm]	Inside diameter of the screw holes of flanges
L [mm]	Length of unit including connecting spigot
L_1 [mm]	Length of casing or acoustic cladding
B [mm]	Duct width
B_1 [mm]	Screw hole pitch of flange (horizontal)
B_2 [mm]	Outside dimension of flange (width)
B_3 [mm]	Width of device
H [mm]	Duct height
H_1 [mm]	Screw hole pitch of flange (vertical)
H_2 [mm]	Outside dimension of flange (height)
H_3 [mm]	Unit height
n []	Number of flange screw holes
T [mm]	Flange thickness
m [kg]	Weight including attachments for the automatic differential pressure measurement
\dot{V}_{nom} [m ³ /h] and [l/s]	Nominal volume flow rate (100 %)
\dot{V}_{min} [m ³ /h] and [l/s]	Volume flow rate
$\Delta \dot{V}$ [± %]	Volume flow rate accuracy
K value [m ³ /h] and [l/s]	Unit-related constant for air density 1.2 kg/m ³
Δp_w [Pa]	Effective pressure
Δp_{st} [%]	Static differential pressure in relation to the measured effective pressure



For the measurement of volume flow rates in ducts

Order code

VMR – P1 – FL / 160 / G2 / B10 / E0

1 2 3 4 5 6 7

1 Type VMR Circular volume flow rate measuring unit	4 Nominal size [mm] 100, 125, 160, 200, 250, 315, 400	6 Attachments (differential pressure transducer) No entry: none B10 Dynamic differential pressure transducer BB0 Static differential pressure transducer
2 Material No entry: galvanised sheet steel P1 Powder-coated (RAL 7001), silver grey A2 Stainless steel	5 Accessories No entry: none D2 Lip seals on both ends G2 Matching flanges for both ends	7 Signal voltage range For the actual value signal Only for attachment B10 E0 0 - 10 V E2 2 - 10 V
3 Flange No entry: none FL Flanges on both ends		

Order code

VMR – P1 – FL / 160 / G2 / ELAB / EC – E0 / ULZ

1 2 3 4 5 6 7 8 9

1 Type VMR Circular volume flow rate measuring unit	6 Attachments (control component) ELAB EASYLAB TCU3	B EM-BAC-MOD-01 for BACnet MS/TP M EM-BAC-MOD-01 for Modbus RTU I EM-IP for BACnet/IP, Modbus/IP and webserver R EM-IP with real time clock
2 Material No entry: galvanised sheet steel P1 Powder-coated, silver grey (RAL 7001) A2 Stainless steel	7 Equipment function SC Supply air recording EC Extract air recording	Option 3: Automatic zero point correction No entry: none Z EM-AUTOZERO Solenoid valve for automatic zero point correction
3 Flange No entry: none FL Flanges on both ends	8 Voltage range for the actual value signal E0 Voltage signal 0 - 10 V DC E2 Voltage signal 2 - 10 V DC	
4 Nominal size [mm] 100, 125, 160, 200, 250, 315, 400	9 Module expansions Option 1: Power supply No entry: 24 V AC T EM-TRF for 230 V AC U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)	
5 Accessories No entry: none D2 Lip seals on both ends G2 Matching flanges for both ends	Option 2: Communication interface No entry: none L EM-LON for LonWorks FTT-10A	



 Order code

VMR – P1 – FL / 160 / G2 / ELAB / FH – VS / ULZS / ...

1 2 3 4 5 6 7 8 9

1 Type

VMR Circular volume flow rate measuring unit

2 Material

No entry: galvanised sheet steel
P1 Powder-coated, silver grey (RAL 7001)
A2 Stainless steel

3 Flange

No entry: none
FL Flanges on both ends

4 Nominal size [mm]

100, 125, 160, 200, 250, 315, 400

5 Accessories

No entry: none
D2 Lip seals on both ends
G2 Matching flanges for both ends

6 Attachments (control component)

ELAB EASYLAB controller TCU3

7 Equipment function

With face velocity transducer
FH-VS Face velocity control
With sash distance sensor
FH-DS Linear control strategy
FH-DV Safety-optimised control strategy
With switching steps for on-site switch contacts
FH-2P 2 switching steps
FH-3P 3 switching steps
Without signalling
FH-F Volume flow rate constant value

8 Expansion modules

Option 1: Supply voltage
No entry: 24 V AC
T EM-TRF for 230 V AC
U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communication interface
No entry: none
L EM-LON for LonWorks FTT-10A
B EM-BAC-MOD-01 for BACnet MS/TP
M EM-BAC-MOD-01 for Modbus RTU
I EM-IP for BACnet/IP, Modbus/IP and webserver
R EM-IP with real time clock

Option 3: Automatic zero point correction

No entry: none
Z EM-AUTOZERO Solenoid valve for automatic zero point correction

Option 4: Lighting
No entry: none
S EM-LIGHT Wired socket for the connection of lighting and for switching the lighting on/off using the control panel (only with EM-TRF or EM-TRF-USV)

9 Operating values [m³/h or l/s]

Depending on the equipment function
VS: $\dot{V}_{\min} - \dot{V}_{\max}$
DS: $\dot{V}_{\min} - \dot{V}_{\max}$
DV: $\dot{V}_{\min} - \dot{V}_{\max}$
2P: \dot{V}_1 / \dot{V}_2
3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$
F: \dot{V}_1

Useful additions

Control panel for fume cupboard controller, for displaying the functions of the control system according to EN 14175

BE-SEG-** 2-character display
BE-LCD-01 40-character display

+ Features

Circular volume flow rate measuring units for the recording or monitoring of volume flow rates

- ▶ Manual volume flow rate measuring
- ▶ Permanent volume flow rate measuring
- ▶ Recording of measured values for other controllers or for the LABCONTROL air management system
- ▶ Pressure transducer for the automatic recording of measured values, factory assembled and complete with wiring and tubing
- ▶ Casing air leakage to EN 15727, class C

Optional equipment and accessories

- ▶ With flanges on both ends
- ▶ Lip seal
- ▶ Dynamic or static differential pressure transducers

Application

- ▶ Circular volume flow rate measuring units
Type VMR for the manual recording or automatic measuring of volume flow rates
- ▶ Simplified commissioning, approval and maintenance
- ▶ Suitable for permanent installation because of low differential pressure
- ▶ Optional static differential pressure transducer for systems with polluted air

Variants

- ▶ VMR: Volume flow rate measuring unit
- ▶ VMR-FL: Volume flow rate measuring unit with flanges on both ends

+ Construction

- ▶ Galvanised sheet steel
- ▶ P1: Powder-coated, silver grey (RAL 7001)
- ▶ A2: Stainless steel

Attachments

- ▶ Dynamic differential pressure transducer
- ▶ Static differential pressure transducer
- ▶ LABCONTROL: Components for air management systems

& Accessories

- ▶ Lip seals on both ends (factory fitted)
- ▶ Matching flanges for both ends

★ Special characteristics

- ▶ Measurement accuracy $\pm 5\%$
- ▶ Low differential pressure of only about 10 - 26 % of the measured effective pressure

ISO Standards and guidelines

- ▶ Hygiene conforms to VDI 6022
- ▶ Casing air leakage to EN 15727, class C

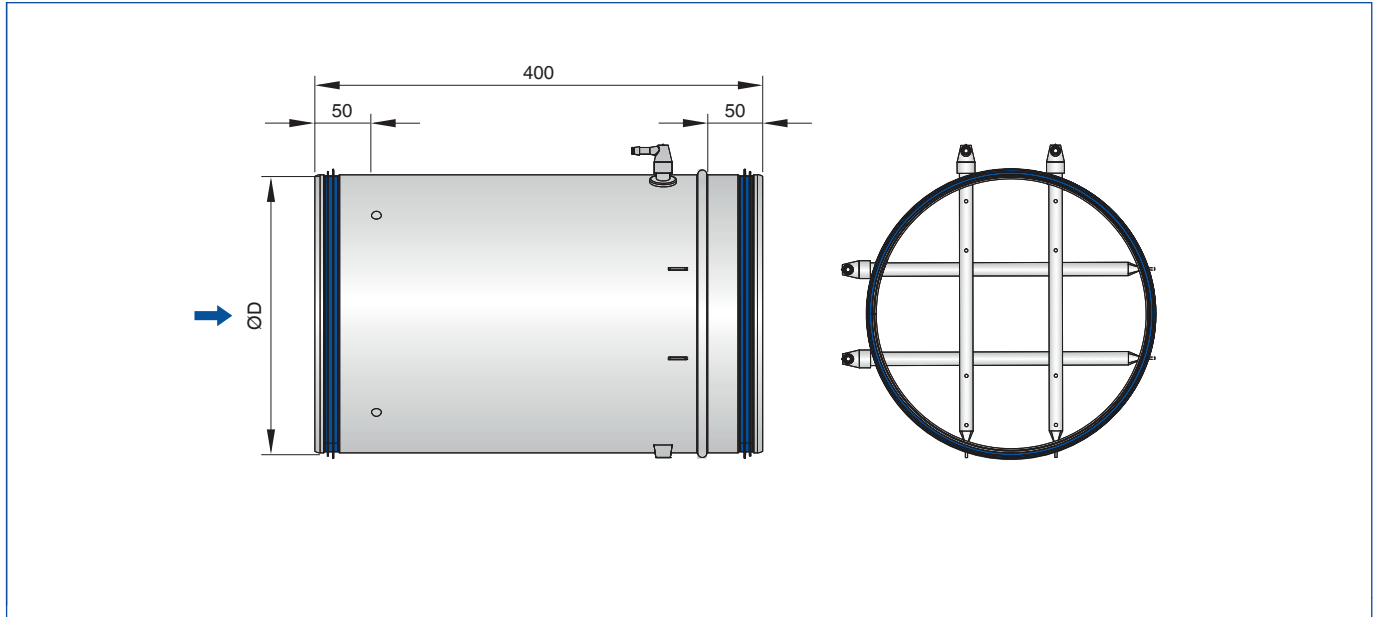
Technical data

Nominal sizes	100 - 400 mm
Volume flow rate range	10 - 1680 l/s or 36 - 6048 m³/h
Measurement accuracy	$\pm 5\%$ of the measured value
Effective pressure range	approx. 5 - 250 Pa
Measuring unit differential pressure (pressure loss)	10 - 26 % of the measured effective pressure
Operating temperature	10 - 50 °C



Nominal size	\dot{V}_{Nom}		\dot{V}_{min}		C value		Δp_{st}	$\Delta \dot{V}$
	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	%	± %
100	95	342	10	36	6.1	22	26	5
125	150	540	15	54	9.7	35	24	5
160	250	900	25	90	15.9	57	22	5
200	405	1458	40	144	25.5	92	19	5
250	615	2214	60	216	39.0	140	17	5
315	1030	3708	105	378	65.0	234	15	5
400	1680	6048	170	612	106.0	382	10	5

VMR

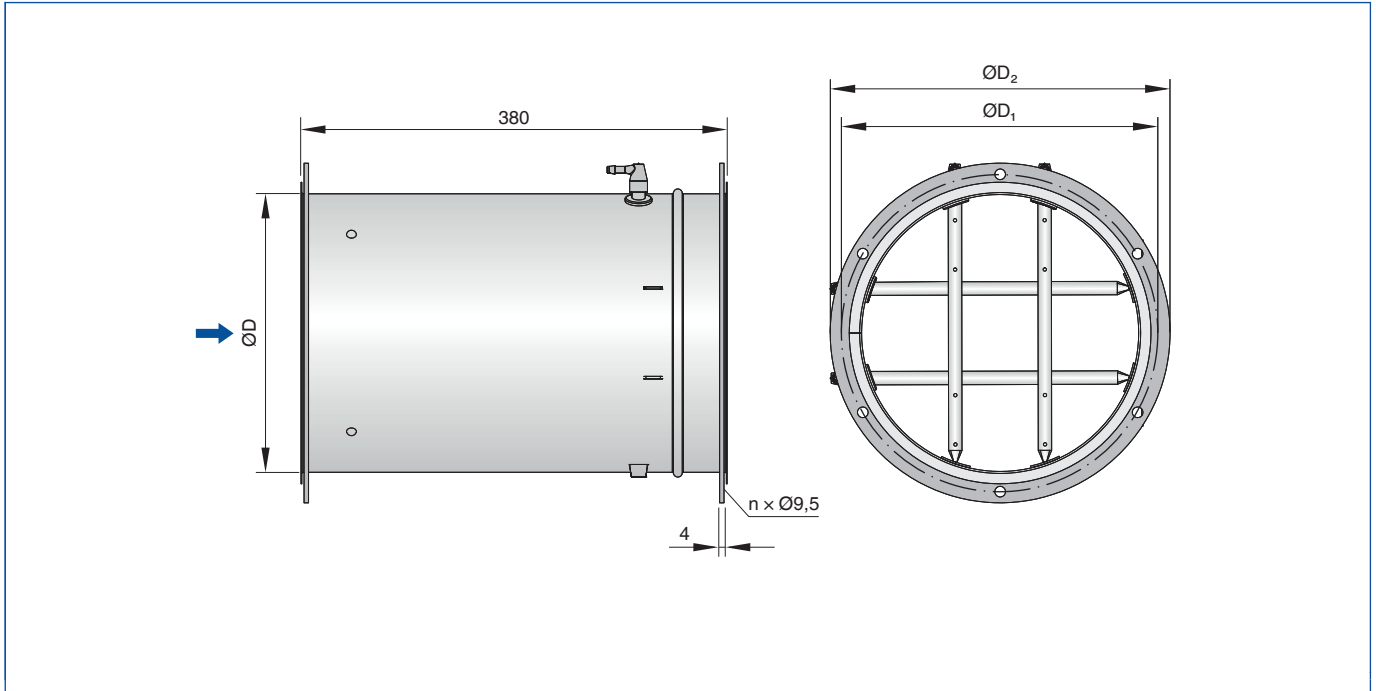


Dimensions [mm] and weight [kg]

Nominal size	VMR	
	ØD mm	m kg
100	99	0.8
125	124	1.0
160	159	1.4
200	199	1.7
250	249	2.1
315	314	2.7
400	399	3.4



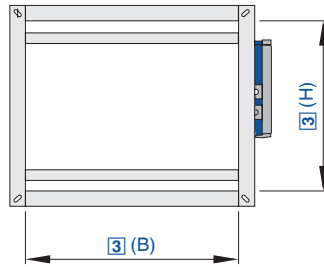
VMR-FL



Dimensions [mm] and weight [kg]

Nominal size	ØD	ØD ₁	ØD ₂	n	T	m
	mm	mm	mm		mm	
100	99	132	152	4	4	1.2
125	124	157	177	4	4	1.5
160	159	192	212	6	4	2.1
200	199	233	253	6	4	2.7
250	249	283	303	6	4	3.3
315	314	352	378	8	4	4.5
400	399	438	464	8	4	5.7





For the measurement of volume flow rates in ducts

Order code

VME – P1 / 600x400 / B10 / E0

1
 2
 3
 4
 5

<p>1 Type VME Rectangular volume flow rate measuring unit</p> <p>2 Material No entry: galvanised sheet steel P1 Powder-coated (RAL 7001), silver grey</p>	<p>3 Nominal size [mm] B × H</p> <p>4 Attachments (differential pressure transducer) No entry: none B10 Dynamic differential pressure transducer BB0 Static differential pressure transducer</p>	<p>5 Signal voltage range For the actual value signal Only for attachment B10 E0 0 - 10 V E2 2 - 10 V</p>
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Order code

VME – P1 / 600x400 / ELAB / EC – E0 / ULZ

1
 2
 3
 4
 5
 6
 7

<p>1 Type VME Rectangular volume flow rate measuring unit</p> <p>2 Material No entry: galvanised sheet steel P1 Powder-coated (RAL 7001), silver grey</p> <p>3 Nominal size [mm] B × H</p> <p>4 Attachments ELAB EASYLAB controller TCU3</p>	<p>5 Equipment function SC Supply air recording EC Extract air recording</p> <p>6 Voltage range for the actual value signal E0 Voltage signal 0 - 10 V DC E2 Voltage signal 2 - 10 V DC</p> <p>7 Module expansions Option 1: Power supply No entry: 24 V AC T EM-TRF for 230 V AC U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)</p>	<p>Option 2: Communication interface No entry: none L EM-LON for LonWorks FTT-10A B EM-BAC-MOD-01 for BACnet MS/TP M EM-BAC-MOD-01 for Modbus RTU I EM-IP for BACnet/IP, Modbus/IP and webserver R EM-IP with real time clock</p> <p>Option 3: Automatic zero point correction No entry: none Z EM-AUTOZERO Solenoid valve for automatic zero point correction</p>
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- + Features**
- Rectangular volume flow rate measuring units for the recording or monitoring of volume flow rates
- ▶ Manual volume flow rate measuring
 - ▶ Permanent volume flow rate measuring
 - ▶ Recording of measured values for other controllers or for the LABCONTROL air management system
 - ▶ Suitable for airflow velocities of up to 10 m/s
 - ▶ Pressure transducer for the automatic recording of measured values, factory assembled and complete with wiring and tubing
 - ▶ Casing air leakage to EN 15727, up to class C

- Application**
- ▶ Rectangular volume flow rate measuring units Type VME for the manual recording or automatic measuring of volume flow rates
 - ▶ Simplified commissioning, approval and maintenance
 - ▶ Suitable for permanent installation because of low differential pressure

- + Construction**
- ▶ Galvanised sheet steel
 - ▶ P1: Powder-coated, silver grey (RAL 7001)

- Attachments**
- ▶ Dynamic differential pressure transducer
 - ▶ Static differential pressure transducer
 - ▶ LABCONTROL: Components for air management systems

- ★ Special features**
- ▶ Measurement accuracy ± 5 % even with unfavourable upstream conditions
 - ▶ Effective pressure range: approx. 8 - 200 Pa
 - ▶ Low differential pressure of only about 17 - 32 % of the measured effective pressure

- ISO Standards and guidelines**
- ▶ Casing air leakage to EN 15727, class C (B + H) ≤ 400, class B)





Technical data

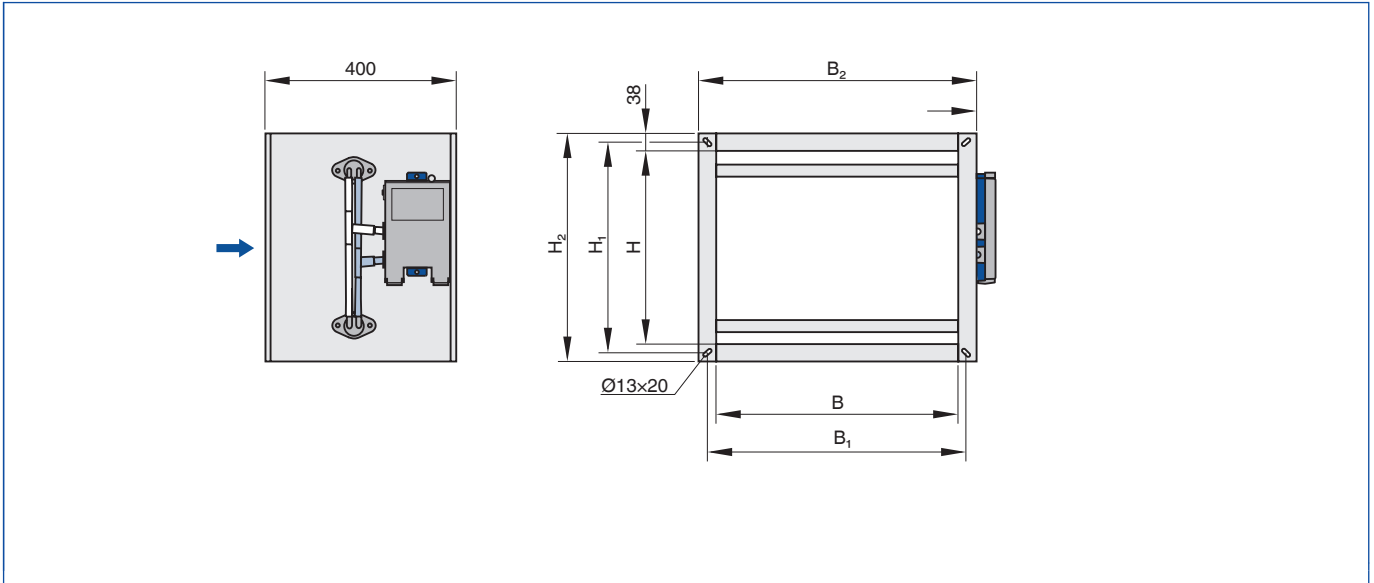
Nominal sizes	200 x 100 - 1000 x 1000
Volume flow rate range	45 - 10100 l/s or 162 - 36360 m ³ /h
Measurement accuracy	± 5 % of the measured value
Effective pressure range	Approx. 5 - 250 Pa
Measuring unit differential pressure (pressure loss)	17 - 32 % of the measured effective pressure
Operating temperature	10 - 50 °C



Nominal size	\dot{V}_{Nom}		\dot{V}_{min}		C value		Δp_{st}	$\Delta \dot{V}$
	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	%	± %
200 x 100	215	774	45	162	14.8	53	19	5
300 x 100	320	1152	65	234	21.2	76	18	5
400 x 100	425	1530	85	306	28.8	104	18	5
500 x 100	535	1926	105	378	35.0	126	17	5
600 x 100	650	2340	130	468	44.0	158	18	5
200 x 200	415	1494	85	306	30.0	108	21	5
300 x 200	620	2232	125	450	45.0	162	21	5
400 x 200	825	2970	165	594	60.0	216	21	5
500 x 200	1035	3726	205	738	75.0	270	21	5
600 x 200	1250	4500	250	900	90.0	324	21	5
700 x 200	1450	5220	290	1044	107.0	385	22	5
800 x 200	1650	5940	330	1188	120.0	432	21	5
300 x 300	920	3312	185	666	75.0	270	23	5
400 x 300	1230	4428	245	882	100.0	360	23	5
500 x 300	1535	5526	305	1098	137.0	493	28	5
600 x 300	1850	6660	370	1332	147.0	529	22	5
700 x 300	2150	7740	430	1548	174.0	626	23	5
800 x 300	2450	8820	490	1764	207.0	745	25	5
900 x 300	2770	9972	555	1998	228.0	821	24	5
1000 x 300	3100	11160	620	2232	254.0	914	24	5
400 x 400	1630	5868	325	1170	146.0	526	28	5
500 x 400	2040	7344	410	1476	183.0	659	28	5
600 x 400	2450	8820	490	1764	212.0	763	26	5
700 x 400	2850	10260	570	2052	239.0	860	25	5
800 x 400	3250	11700	650	2340	281.0	1012	26	5
900 x 400	3670	13212	735	2646	320.0	1152	27	5
1000 x 400	4100	14760	820	2952	359.0	1292	27	5
500 x 500	2540	9144	510	1836	207.0	745	27	5
600 x 500	3050	10980	610	2196	234.0	842	24	5
700 x 500	3550	12780	710	2556	284.0	1022	26	5
800 x 500	4050	14580	810	2916	318.0	1145	25	5
900 x 500	4570	16452	915	3294	361.0	1300	25	5
1000 x 500	5100	18360	1020	3672	409.0	1472	26	5
600 x 600	3650	13140	730	2628	297.0	1069	26	5
800 x 600	4850	17460	970	3492	396.0	1426	27	5
1000 x 600	6100	21960	1220	4392	508.0	1829	28	5
800 x 800	6500	23400	1300	4680	543.0	1955	28	5
1000 x 800	8100	29160	1620	5832	681.0	2452	28	5
1000 x 1000	10100	36360	2020	7272	904.0	3254	32	5



VME



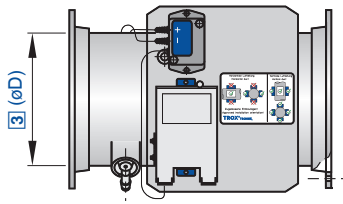
Dimensions [mm] and weight [kg]

Nominal size	Nominal width	Nominal height	B ₁	B ₂	H ₁	H ₂	m kg
	mm	mm	mm	mm	mm	mm	
200 × 100	200	100	234	276	134	176	5.0
300 × 100	300	100	334	376	134	176	6.0
400 × 100	400	100	434	476	134	176	7.0
500 × 100	500	100	534	576	134	176	8.0
600 × 100	600	100	634	676	134	176	10.0
200 × 200	200	200	234	276	234	276	6.0
300 × 200	300	200	334	376	234	276	7.0
400 × 200	400	200	434	476	234	276	8.5
500 × 200	500	200	534	576	234	276	10.0
600 × 200	600	200	634	676	234	276	11.0
700 × 200	700	200	734	776	234	276	12.5
800 × 200	800	200	834	876	234	276	13.5
300 × 300	300	300	334	376	334	376	8.0
400 × 300	400	300	434	476	334	376	9.5
500 × 300	500	300	534	576	334	376	11.0
600 × 300	600	300	634	676	334	376	12.0
700 × 300	700	300	734	776	334	376	13.5
800 × 300	800	300	834	876	334	376	14.5
900 × 300	900	300	934	976	334	376	16.0
1000 × 300	1000	300	1034	1076	334	376	17.0



Nominal size	Nominal width	Nominal height	B ₁	B ₂	H ₁	H ₂	m
	mm	mm	mm	mm	mm	mm	kg
400 × 400	400	400	434	476	434	476	10.5
500 × 400	500	400	534	576	434	476	11.5
600 × 400	600	400	634	676	434	476	13.0
700 × 400	700	400	734	776	434	476	14.5
800 × 400	800	400	834	876	434	476	15.5
900 × 400	900	400	934	976	434	476	17.0
1000 × 400	1000	400	1034	1076	434	476	18.0
500 × 500	500	500	534	576	534	576	14.0
600 × 500	600	500	634	676	534	576	16.0
700 × 500	700	500	734	776	534	576	17.5
800 × 500	800	500	834	876	534	576	19.5
900 × 500	900	500	934	976	534	576	23.0
1000 × 500	1000	500	1034	1076	534	576	20.5
600 × 600	600	600	634	676	634	676	17.0
800 × 600	800	600	834	876	634	676	20.0
1000 × 600	1000	600	1034	1076	634	676	23.0
800 × 800	800	800	834	876	834	876	22.0
1000 × 800	1000	800	1034	1076	834	876	25.0
1000 × 1000	1000	1000	1034	1076	1034	1076	27.0





For the measurement of volume flow rates in ducts with contaminated air

Order code

VMRK – FL / 160 / GK / BBO

1 2 3 4 5

1 Type VMRK Volume flow rate measuring unit, plastic	3 Nominal size [mm] 125, 160, 200, 250, 315, 400	5 Attachments (differential pressure transducer) No entry: none BBO Static differential pressure transducer
2 Flange No entry: none FL Flanges on both ends	4 Accessories No entry: none GK Matching flanges for both ends vb nm..	

Order code

VMRK – FL / 160 / GK / ELAB / EC – E0 / ULZ

1 2 3 4 5 6 7 8

1 Type VMRK Volume flow rate measuring unit, plastic	6 Equipment function EC Extract air recording	B EM-BAC-MOD-01 for BACnet MS/TP M EM-BAC-MOD-01 for Modbus RTU I EM-IP for BACnet/IP, Modbus/IP and webservice R EM-IP with real time clock
2 Flange No entry: none FL Flanges on both ends	7 Voltage range for the actual value signal E0 Voltage signal 0 - 10 V DC E2 Voltage signal 2 - 10 V DC	Z EM-AUTOZERO Solenoid valve for automatic zero point correction
3 Nominal size [mm] 125, 160, 200, 250, 315, 400	8 Module expansions Option 1: Power supply No entry: 24 V AC T EM-TRF for 230 V AC U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)	Option 3: Automatic zero point correction No entry: none
4 Accessories No entry: none GK Matching flanges for both ends	Option 2: Communication interface No entry: none L EM-LON for LonWorks FTT-10A	
5 Attachments ELAB EASYLAB TCU3		



 **Order code**

VMRK – FL / 160 / GK / ELAB / FH – VS / ULZS / 200 – 800

1 2 3 4 5 6 7 8

1 Type

VMRK Volume flow rate measuring unit, plastic

2 Flange

FL No entry: none
Flanges on both ends

3 Nominal size [mm]

125, 160, 200, 250, 315, 400

4 Accessories

GK No entry: none
Matching flanges for both ends

5 Attachments (control component)

ELAB EASYLAB controller TCU3

6 Equipment function

With face velocity transducer
FH-VS Face velocity control
With sash distance sensor
FH-DS Linear control strategy
FH-DV Safety-optimised control strategy
With switching steps for on-site switch contacts
FH-2P 2 switching steps
FH-3P 3 switching steps
Without signalling
FH-F Volume flow rate constant value

7 Expansion modules

Option 1: Supply voltage
No entry: 24 V AC
T EM-TRF for 230 V AC
U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communication interface
No entry: none
L EM-LON for LonWorks FTT-10A
B EM-BAC-MOD-01 for BACnet MS/TP
M EM-BAC-MOD-01 for Modbus RTU
I EM-IP for BACnet/IP, Modbus/IP and webserver
R EM-IP with real time clock

Option 3: Automatic zero point correction
No entry: none
Z EM-AUTOZERO Solenoid valve for automatic zero point correction

Option 4: Lighting
No entry: none
S EM-LIGHT Wired socket for the connection of lighting and for switching the lighting on/off using the control panel (only with EM-TRF or EM-TRF-USV)

8 Operating values [m³/h or l/s]

Depending on the equipment function
VS: $\dot{V}_{\min} - \dot{V}_{\max}$
DS: $\dot{V}_{\min} - \dot{V}_{\max}$
DV: $\dot{V}_{\min} - \dot{V}_{\max}$
2P: \dot{V}_1 / \dot{V}_2
3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$
F: \dot{V}_1

Useful additions

Control panel for fume cupboard controller, for displaying the functions of the control system according to EN 14175

BE-SEG-** 2-character display
BE-LCD-01 40-character display

+ **Features**

Plastic circular volume flow rate measuring units for the recording or monitoring of volume flow rates

- ▶ Manual volume flow rate measuring
- ▶ Permanent volume flow rate measuring
- ▶ Recording of measured values for other controllers or for the LABCONTROL air management system
- ▶ Pressure transducer for the automatic recording of measured values, factory assembled and complete with wiring and tubing
- ▶ Casing made of flame-resistant polypropylene (PPs)
- ▶ Casing air leakage to EN 15727, class C

Optional equipment and accessories

- ▶ With flanges on both ends

X **Application**

- ▶ Plastic circular volume flow rate measuring units Type VMRK for the manual or automatic measuring of volume flow rates
- ▶ Suitable for contaminated air
- ▶ Simplified commissioning, approval and maintenance
- ▶ Suitable for permanent installation because of low differential pressure

◇ **Variants**

- ▶ VMRK: Volume flow rate measuring unit
- ▶ VMRK-FL: Volume flow rate measuring unit with flanges on both ends

⬡ **Attachments**

- ▶ Static differential pressure transducer
- ▶ LABCONTROL components for air management systems

& **Accessories**

- ▶ Matching flanges for both ends, including seals

★ **Special features**

- ▶ Measurement accuracy $\pm 5\%$ even with unfavourable upstream conditions
- ▶ Effective pressure range: approx. 5 - 250 Pa
- ▶ Low differential pressure of only about 15 - 24 % of the measured effective pressure

ISO **Standards and guidelines**

- ▶ Hygiene conforms to VDI 6022
- ▶ Casing air leakage to EN 15727, class C

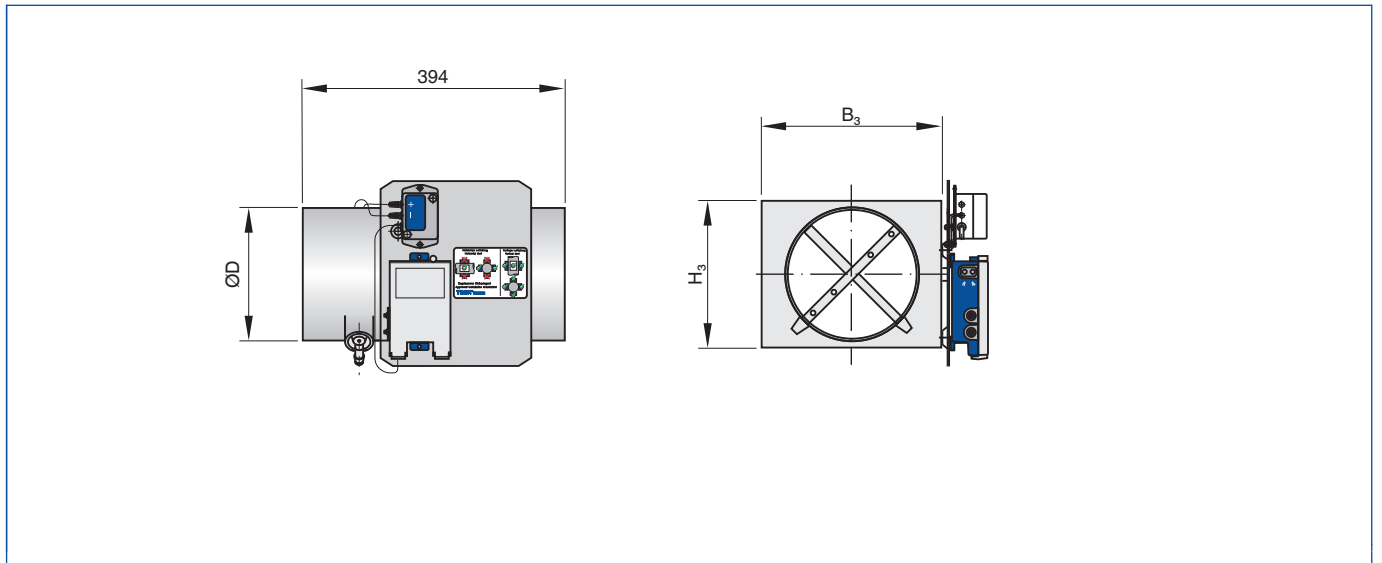
📈 **Technical data**

Nominal sizes	125 - 400 mm
Volume flow rate range	25 - 1680 l/s or 90 - 6048 m ³ /h
Measurement accuracy	$\pm 5\%$ of the measured value
Effective pressure range	approx. 5 - 250 Pa
Measuring unit differential pressure (pressure loss)	15 - 24 % of the measured effective pressure
Operating temperature	10 - 50 °C

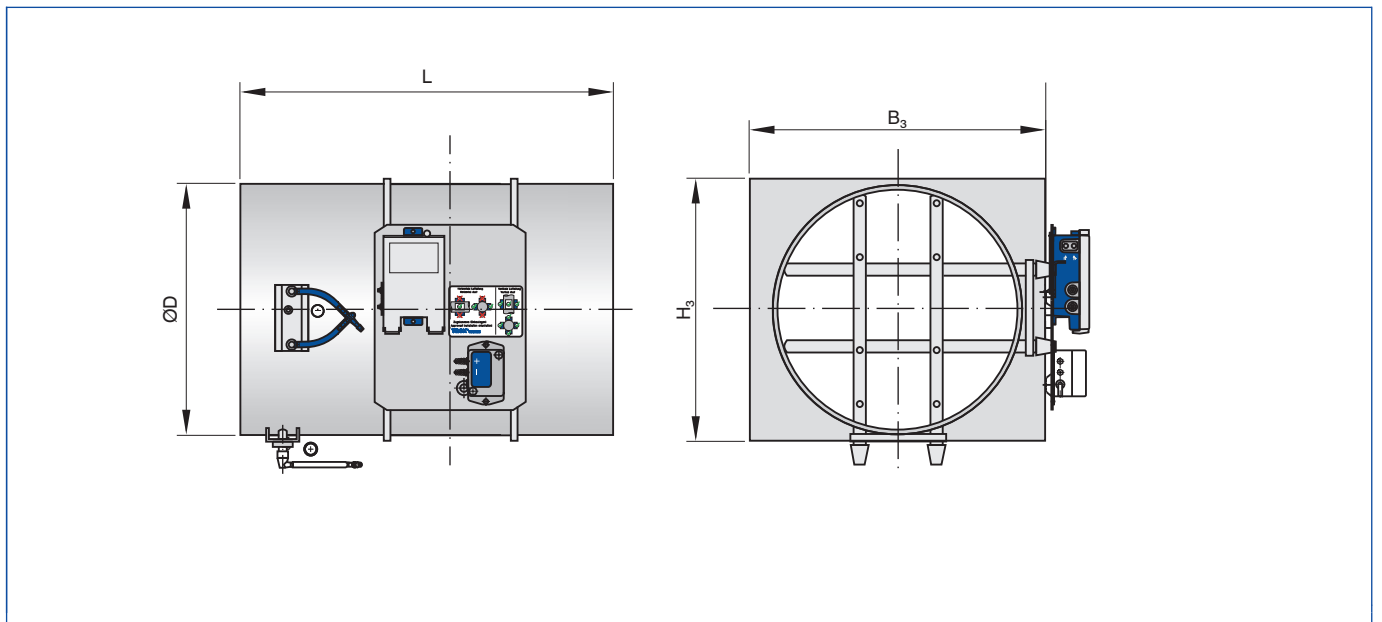


Nominal size	\dot{V}_{Nom}		\dot{V}_{min}		C value		Δp_{st}	$\Delta \dot{V}$
	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	%	± %
125	150	540	25	90	8.6	31	24	5
160	250	900	40	144	15.1	54	22	5
200	405	1458	65	234	24.3	87	19	5
250	615	2214	95	342	38.0	137	17	5
315	1030	3708	155	558	62.0	223	15	5
400	1680	6048	255	918	102.7	370	15	5

VMRK nominal sizes 125 - 200



VMRK nominal sizes 250 - 400

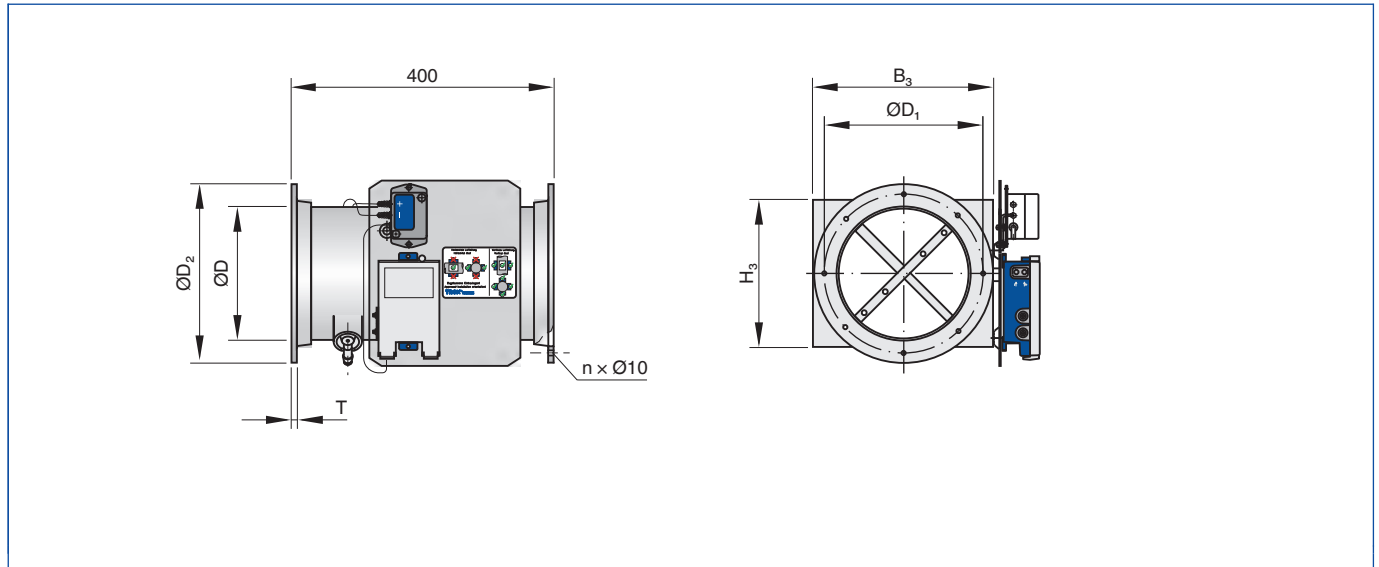


Dimensions [mm] and weight [kg]

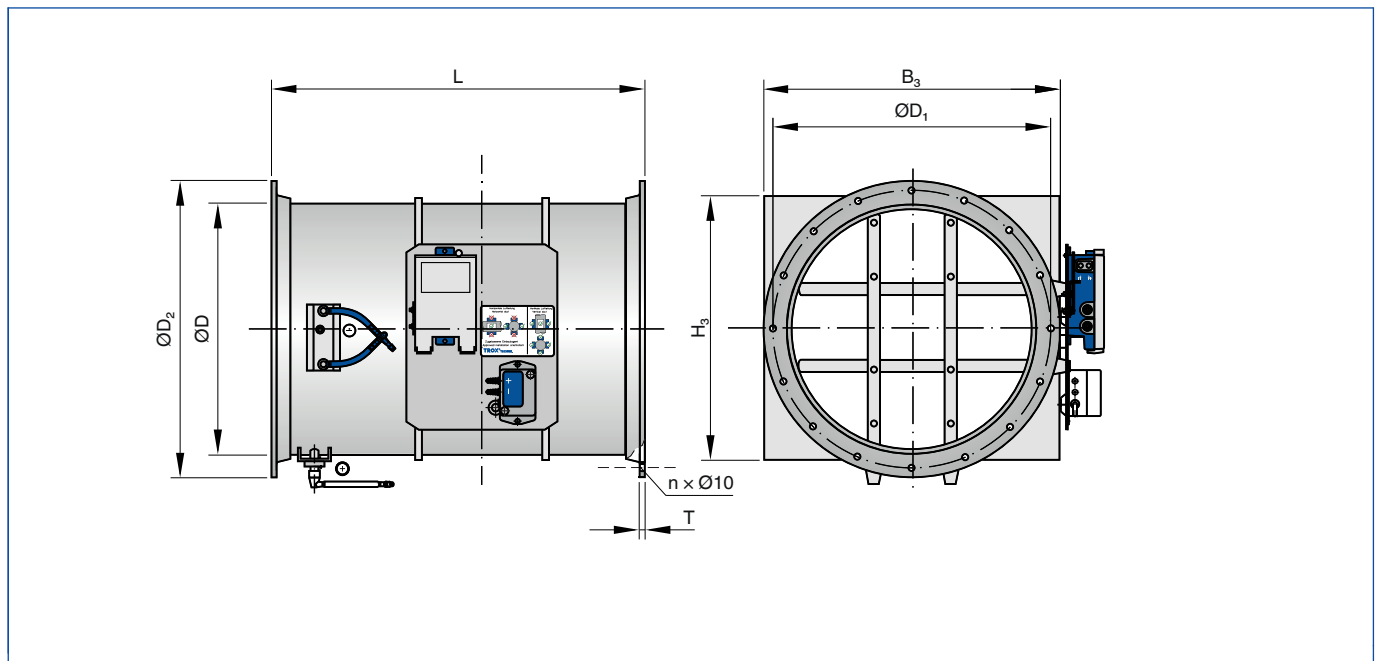
Nominal size	ØD	L	B ₃	H ₃	m
			mm	mm	kg
125	125	394	195	145	2.0
160	160		230	180	2.2
200	200		270	220	2.5
250	250	594	320	270	3.5
315	315		385	335	5.1
400	400		470	420	6.9



VMRK-FL nominal sizes 125 - 200



VMRK-FL nominal sizes 250 - 400



Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	ØD ₁	ØD ₂	n	T	m
					mm	mm		mm	kg
125	125	400	195	145	165	185	8	8	2.2
160	160		230	180	200	230	8	8	2.6
200	200		270	220	240	270	8	8	3.0
250	250	600	320	270	290	320	12	8	4.4
315	315		385	335	350	395	12	10	6.1
400	400		470	420	445	475	16	10	8.2





For the measurement of volume flow rates in ducts with contaminated air from laboratories

Order code

VMLK – FL / 250 – 100 / GK / ELAB / EC – E0 / ULZ

1 2 3 4 5 6 7 8

1 Type

VMLK Volume flow rate measuring unit, plastic

2 Flange

No entry: none
FL Flanges on both ends

3 Nominal size [mm]

250 - 100 Bluff body 100
250 - 160 Bluff body 160
250 - D08 Nozzle D08
250 - D10 Nozzle D10
250 - D16 Nozzle D16

4 Accessories

No entry: none
GK Matching flanges for both ends

5 Attachments

ELAB EASYLAB TCU3

6 Equipment function

EC Extract air recording

7 Voltage range for the actual value signal

E0 Voltage signal 0 - 10 V DC
E2 Voltage signal 2 - 10 V DC

8 Module expansions

Option 1: Power supply
No entry: 24 V AC
T EM-TRF for 230 V AC

U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communication interface
No entry: none

L EM-LON for LonWorks FTT-10A

B EM-BAC-MOD-01 for BACnet MS/TP

M EM-BAC-MOD-01 for Modbus RTU

I EM-IP for BACnet/IP, Modbus/IP and webserver

R EM-IP with real time clock

Option 3: Automatic zero point correction
No entry: none

Z EM-AUTOZERO Solenoid valve for automatic zero point correction

Order code

VMLK – FL / 250 – 100 / GK / ELAB / EC – E0 / ULZ

1 2 3 4 5 6 7 8

1 Type

VMLK Volume flow rate measuring unit, plastic

2 Flange

No entry: none
FL Flanges on both ends

3 Nominal size [mm]

250 - 100 Bluff body 100
250 - 160 Bluff body 160
250 - D08 Nozzle D08
250 - D10 Nozzle D10
250 - D16 Nozzle D16

4 Accessories

No entry: none
GK Matching flanges for both ends

5 Attachments

ELAB EASYLAB TCU3

6 Equipment function

EC Extract air recording

7 Voltage range for the actual value signal

E0 Voltage signal 0 - 10 V DC
E2 Voltage signal 2 - 10 V DC

8 Module expansions

Option 1: Power supply
No entry: 24 V AC
T EM-TRF for 230 V AC

U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communication interface
No entry: none

L EM-LON for LonWorks FTT-10A

B EM-BAC-MOD-01 for BACnet MS/TP

M EM-BAC-MOD-01 for Modbus RTU

I EM-IP for BACnet/IP, Modbus/IP and webserver

R EM-IP with real time clock

Option 3: Automatic zero point correction
No entry: none

Z EM-AUTOZERO Solenoid valve for automatic zero point correction



+ Features

Plastic circular volume flow rate measuring units for the recording or monitoring of volume flow rates

- ▶ Permanent volume flow rate measuring
- ▶ Recording of measured values and use for slave controllers
- ▶ For combination with LABCONTROL control components
- ▶ Volume flow rate control for fume cupboards by signalling to frequency converters
- ▶ Measurement accuracy $\pm 5\%$ even with unfavourable upstream conditions
- ▶ Casing made of flame-resistant polypropylene (PPs)
- ▶ Casing air leakage to EN 15727, class C

Optional equipment and accessories

- ▶ With flanges on both ends

Application

- ▶ Circular LABCONTROL volume flow rate measuring units Type VMLK for the automatic measurement of volume flow rates from fume cupboards and fume hoods
- ▶ Suitable for contaminated air
- ▶ Volume flow rate control for fume cupboards by signalling to frequency converters
- ▶ Simplified commissioning, approval and maintenance
- ▶ Suitable for permanent installation because of low differential pressure

Variants

- ▶ VMLK: Volume flow rate measuring unit
- ▶ VMLK-FL: Volume flow rate measuring unit with flanges on both ends

Attachments

- ▶ LABCONTROL: Control components for air management systems

& Accessories

- ▶ Matching flanges for both ends, including seals

★ Special features

- ▶ High measurement accuracy with any upstream conditions
- ▶ Effective pressure range: approx. 5 - 250 Pa

ISO Standards and guidelines

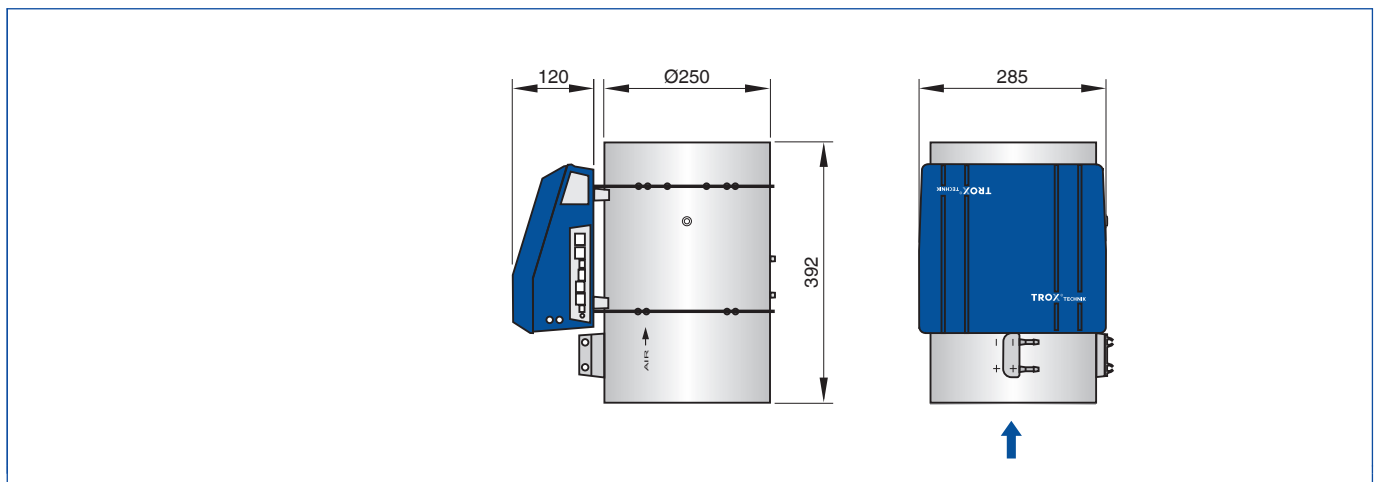
- ▶ Hygiene conforms to VDI 6022
- ▶ Casing air leakage to EN 15727, class C

Technical data

Nominal sizes	250 mm
Volume flow rate range	30 - 515 l/s or 108 - 1854 m ³ /h
Measurement accuracy	$\pm 5\%$ of the measured value
Effective pressure range	approx. 5 - 250 Pa
Measuring unit differential pressure (pressure loss)	19 - 65 % of the measured effective pressure
Operating temperature	10 - 50 °C

Nominal size	\dot{V}_{Nom}		\dot{V}_{min}		C value		Δp_{st}	$\Delta \dot{V}$
	l/s	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	%	$\pm \%$
250 - 100	360	1296	55	198	25.0	90	43	5
250 - 160	195	702	30	108	13.3	48	65	5
250 - D08	515	1854	95	342	34.0	122	19	5
250 - D10	360	1296	55	198	24.3	87	23	5
250 - D16	195	702	30	108	13.8	50	37	5

VMLK

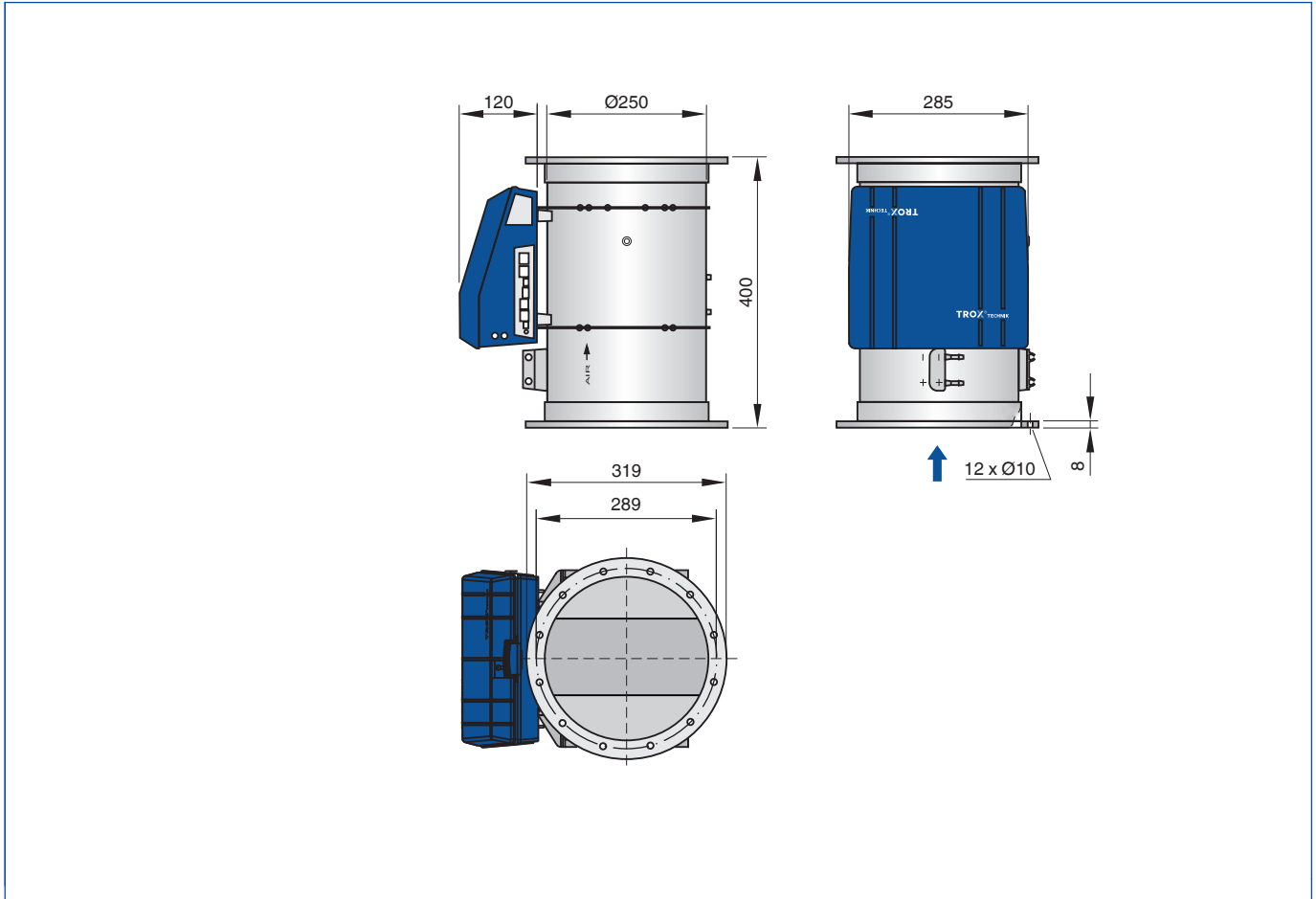


Dimensions [mm] and weight [kg]

Nominal size	250 - 100, 250 - 160		250 - D08, 250 - D10, 250 - D16	
	m			
	kg		kg	
250	2.1		2.6	



VMLK-FL



Dimensions [mm] and weight [kg]

Nominal size	250 - 100, 250 - 160	250 - D10, 250 - D16, 250 - D08	
	kg	m	kg
250	2.6		3.1





For the dynamic measurement of effective and differential pressures

Dynamic differential pressure transducers for volume flow rate measuring units

Order code detail	Attachment	Controller	Volume flow rate measuring unit
	Part number	Type	
B10	M546GA4	VRD3	VMR, VME



 **Volume flow controller VRD3**

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC $-10/+20$ %
Power rating (AC)	without actuator max. 3.5 VA
Power rating (DC)	without actuator max. 2 W
Setpoint value signal input	0 - 10 V DC, $R_a > 100$ k Ω
Actual value signal output	0 - 10 V DC, 0.5 mA max.
IEC protection class	III (protective extra-low voltage)
Protection level	IP 40
EC conformity	EMC according to 2014/30/EU
Weight	0.440 kg





For the static effective and differential pressure measurement

Static differential pressure transducers for volume flow rate measuring units

Order code detail	Controller		Static differential pressure transducer		Volume flow rate measuring unit
	Part number	Type	Part number	Type	
BB0	M546EG2	VRP	M546EJ1	VFP-300	VMR, VME, VMRK



Volume flow controller VRP

Supply voltage (AC)	24 V AC \pm 20 %, 50/60 Hz
Power rating (AC)	without actuator max. 2.6 VA
Setpoint value signal input	2 - 10 V DC, $R_a > 100 \text{ k}\Omega$
Actual value signal output	2 - 10 V DC linear, max. 0.5 mA
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU





 **Static differential pressure transducer VFP-300**

Supply voltage	from the controller
Measuring range	0 - 300 Pa
Linearity	± 3 Pa
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC according to 2014/30/EU



HEAT EXCHANGERS AND AIR HEATERS

	Type		
	WT	WL	EL
Function			
Heating	●	●	●
Cooling			
Energy transfer medium			
Hot water	●	●	
Electric current			●
Duct connection			
Circular		●	●
Rectangular	●		
Can be used with VAV terminal unit Type			
TVR		●	●
TVZ	●		
TZ-Silenzio	●		
TVJ	●		
TVT	●		
RN		●	●
EN	●		
VFC		●	●
Explanation			
● - Standard			





List of abbreviations

\varnothing [mm]	VAV terminal units made of stainless steel: Outer diameter of the spigot
L [mm]	Length of unit including connecting spigot
L_1 [mm]	Length of casing or acoustic cladding
B [mm]	Duct width
B_1 [mm]	Screw hole pitch of flange (horizontal)
B_2 [mm]	Outside dimension of flange (width)
B_3 [mm]	Width of device
H [mm]	Duct height
H_1 [mm]	Screw hole pitch of flange (vertical)
H_2 [mm]	Outside dimension of flange (height)
H_3 [mm]	Unit height
R ["]	Diameter of connecting threaded pipes
m [kg]	Unit weight including the minimum required attachments (e.g. Compact controller)
\dot{V} [m ³ /h] and [l/s]	Volume flow rate
Δp_{st} [Pa]	Static differential pressure
Δp_v [kPa]	Water-side differential pressure
\dot{Q} [kW]	Thermal output
\dot{m}_w [kg/h]	Water flow rate
PWW [°C]	Pumped hot water heating system, flow temperature/return temperature
t_e [°C]	Inlet airflow temperature
t_a [°C]	Outlet airflow temperature





For the reheating of airflows in circular ducting

 Order code

WL / 160

1 2

1 Type

WL Hot water heat exchanger for VAV terminal units TVR and CAV controllers RN and VFC

2 Nominal size [mm]

100, 125, 160, 200, 250, 315, 400

+ Features

Circular hot water heat exchanger for the reheating of airflows, suitable for VAV terminal units Type TVR and mechanical self-powered CAV controllers Type RN or VFC

- ▶ For hot water up to 100 °C
- ▶ Copper tubes arranged in two rows, with aluminium fins
- ▶ Installation in horizontal or vertical ducts independent of airflow direction
- ▶ Suitable for circular ducts to EN 1506 or EN 13180
- ▶ With lip seal and inspection access
- ▶ Maximum water-side operating pressure is 8 bar
- ▶ Casing air leakage to EN 15727, class C

/ Application

- ▶ Hot water heat exchanger Type WT for reheating the airflow in circular ducting
- ▶ For VAV terminal units Type TVR and for CAV controllers Type RN or VFC
- ▶ For hot water up to 100 °C

ISO Standards and guidelines

- ▶ Casing air leakage to EN 15727, class C

Technical data

Nominal sizes	100 - 400 mm
Volume flow rate range	10 - 750 l/s or 36 - 2700 m ³ /h
Thermal output	0.25 - 18 kW
Maximum hot water temperature	100 °C
Maximum water-side operating pressure	10 bar
Water-side differential pressure	0.3 - 12 kPa
Static differential pressure	5 - 80 Pa



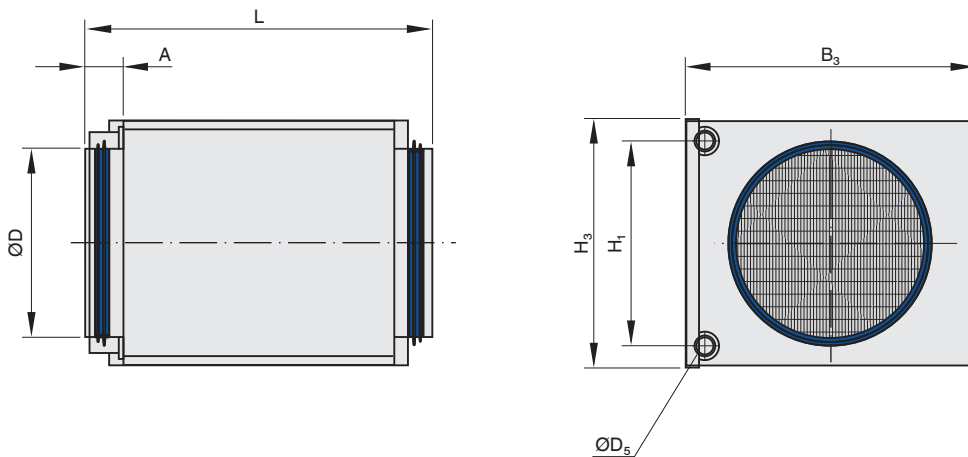
WL for TVR, RN and VFC

Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Δp_{st} Pa	PWW 50/40, $t_e = 16\text{ }^\circ\text{C}$				PWW 70/55, $t_e = 16\text{ }^\circ\text{C}$			
				\dot{Q} kW	t_a °C	\dot{m}_w kg/h	Δp_v kPa	\dot{Q} kW	t_a °C	\dot{m}_w kg/h	Δp_v kPa
100	10	36	5	0.25	36.1	21	0.3	0.40	48.5	23	0.5
	20	72	10	0.38	31.3	33	0.4	0.62	41.2	36	0.6
	30	108	15	0.47	28.8	41	0.5	0.79	37.5	46	0.7
	40	144	25	0.55	27.2	48	0.6	0.95	35.2	55	0.8
	45	162	30	0.58	26.5	51	0.7	1.02	34.4	59	1.0
125	18	65	5	0.36	32.0	31	0.3	0.58	42.2	34	0.5
	35	126	20	0.51	27.9	44	0.5	0.87	36.2	51	0.8
	50	180	40	0.62	26.0	53	1.0	1.09	33.8	64	1.0
	65	234	60	0.70	24.8	61	1.2	1.30	32.3	76	1.3
	75	270	80	0.76	24.2	66	1.5	1.44	31.6	84	1.5
160	28	101	5	0.69	36.1	60	1.0	1.17	49.9	68	1.0
	50	180	10	1.05	33.1	91	2.0	1.83	45.8	107	3.0
	70	252	15	1.35	31.7	117	4.0	2.32	43.0	135	4.0
	95	342	25	1.70	30.6	147	5.0	2.85	40.4	166	6.0
	115	414	35	1.94	29.7	168	7.0	3.23	38.8	188	7.0
200	45	162	5	0.97	33.6	84	2.0	1.69	46.5	98	2.0
	80	288	20	1.49	31.2	129	4.0	2.54	41.8	148	5.0
	115	414	35	1.94	29.7	168	7.0	3.23	38.8	188	7.0
	150	540	55	2.29	28.4	199	9.0	3.37	36.8	223	10.0
	180	648	80	2.57	27.6	223	11.0	4.30	35.4	251	12.0
250	70	252	5	1.53	33.8	133	1.0	2.67	47.0	155	1.0
	125	450	15	2.35	31.3	203	2.0	4.14	43.0	242	3.0
	180	648	25	3.10	30.0	269	3.0	5.29	39.9	308	4.0
	235	846	40	3.76	29.0	326	5.0	6.29	37.8	367	5.0
	290	1044	60	4.29	28.1	372	6.0	7.20	36.2	420	7.0
315	115	414	5	2.50	33.7	217	1.0	4.41	47.2	257	1.0
	200	720	15	3.82	31.5	331	2.0	6.66	43.1	388	3.0
	285	1026	25	5.02	30.4	436	4.0	8.45	40.1	493	4.0
	375	1350	40	6.05	29.1	525	5.0	10.11	37.9	589	6.0
	460	1656	60	6.89	28.2	597	7.0	11.52	36.4	672	7.0
400	185	666	5	4.02	33.7	348	2.0	7.08	47.2	413	2.0
	325	1170	15	6.24	31.6	542	3.0	10.55	42.4	615	4.0
	465	1674	30	8.06	30.1	699	5.0	13.40	39.5	781	6.0
	605	2178	50	9.54	28.8	827	7.0	15.89	37.4	927	8.0
	750	2700	75	10.92	27.9	947	9.0	18.22	35.8	1062	10.0

\dot{Q} : Thermal capacity
 PWW: Pumped warm water heating system, flow temperature/return temperature
 t_e : Inlet airflow temperature
 t_a : Outlet airflow temperature
 \dot{m}_w : Water flow rate
 Δp_v : Water-side differential pressure
 Δp_{st} : Static differential pressure



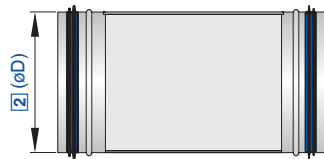
WL



Dimensions [mm] and weight [kg]

Nominal size	ØD	L	B ₃	H ₃	H ₁	A	ØD ₅	m
	mm	mm	mm	mm	mm	mm	mm	kg
100	99	336	251	188	137	30	10	3.7
125	124	346	251	188	137	35	10	3.5
160	159	386	326	263	212	40	10	5.4
200	199	386	326	263	212	40	10	5.3
250	249	386	411	338	250	40	22	7.7
315	314	386	486	413	325	40	22	9.9
400	399	386	557	489	400	55	22	13.1





For the electric reheating of airflows in circular ducting

Order code

EL / 160

1 2

1 Type	2 Nominal size [mm]
EL Electric air heater for VAV terminal units Type TVR and for CAV controllers Type RN or VFC	100, 125, 160, 200, 250, 315, 400

+ Features

- ▶ Circular electric air heater for the heating of airflows, suitable for VAV terminal units Type TVR and mechanical self-powered CAV controllers Type RN or VFC
- ▶ Outlet airflow temperature max. 50 °C
- ▶ Smooth surface stainless steel heating element 1.4301
- ▶ Integral overheating protection with temperature monitor (auto reset) and thermal cut-out (manual reset)
- ▶ Installation in horizontal or vertical ducts independent of airflow direction
- ▶ Suitable for circular ducts to EN 1506 or EN 13180
- ▶ With lip seal
- ▶ Protection level IP 43
- ▶ Casing air leakage to EN 15727, up to class D

Application

- ▶ Electric air heater Type EL for reheating the airflow in circular ducting
- ▶ For VAV terminal units Type TVR and for CAV controllers Type RN or VFC

ISO Standards and guidelines

- ▶ Casing air leakage to EN 15727, class D

Technical data

Nominal sizes	100 - 400 mm
Volume flow rate range	12 - 750 l/s or 43 - 2700 m ³ /h
Thermal output	0.4 - 9 kW
Minimum airflow velocity	1.5 m/s
Maximum outlet airflow temperature	50 °C
Max. operating temperature	40 °C
Static differential pressure	5 - 75 Pa
Supply voltage for nominal sizes 100 - 200	230 V AC, 1-phase
Supply voltage for nominal size 250	400 V AC, 2-phase
Supply voltage for nominal sizes 315, 400	400 V AC, 3-phase
Protection level	IP 43
EC conformity	EMC to 2004/108/EU, low voltage to 2006/95/EU



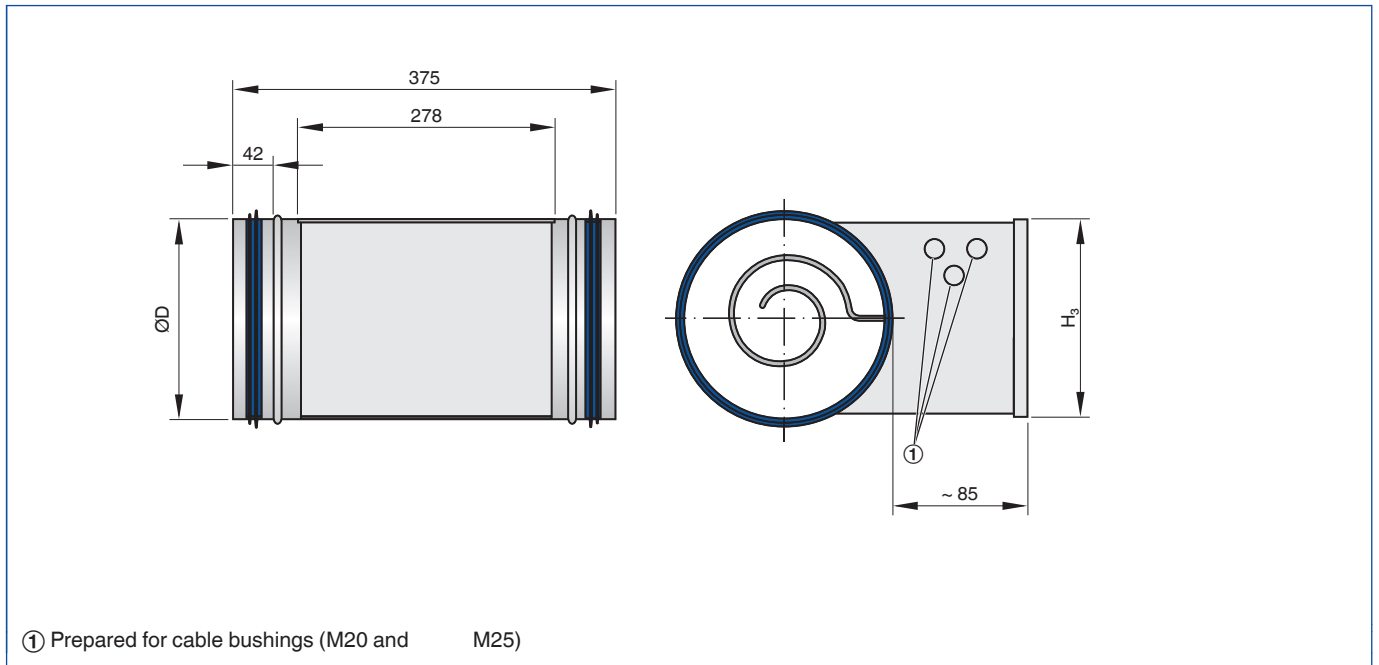
EL for TVR, RN and VFC

Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Δp_{st} Pa	$t_e = 16\text{ °C}$	
				\dot{Q} kW	t_a °C
100	12	43	5	0.40	41.8
	20	72	10	0.40	31.4
	30	108	15	0.40	26.3
	40	144	25	0.40	23.7
	45	162	30	0.40	22.9
125	20	72	5	0.88	50.0
	35	126	20	0.90	35.8
	50	180	40	0.90	29.9
	65	234	60	0.90	26.7
	75	270	80	0.90	25.3
160	30	108	5	1.20	46.9
	50	180	10	1.20	34.5
	70	252	15	1.20	29.2
	95	342	25	1.20	25.7
	115	414	35	1.20	24.1
200	50	180	5	2.10	48.4
	80	288	20	2.10	36.3
	115	414	35	2.10	30.1
	150	540	55	2.10	26.8
	180	648	80	2.10	25.0
250	75	275	5	3.00	46.9
	125	450	15	3.00	34.5
	180	648	25	3.00	28.9
	235	846	40	3.00	25.9
	290	1044	60	3.00	24.0
315	115	414	5	5.07	50.0
	200	720	15	6.00	39.1
	285	1026	25	6.00	32.2
	375	1350	40	6.00	28.3
	460	1656	60	6.00	26.1
400	190	684	5	8.37	50.0
	325	1170	15	9.00	37.4
	465	1674	30	9.00	30.9
	605	2178	50	9.00	27.5
	750	2700	75	9.00	25.3

\dot{Q} : Thermal capacity
 t_e : Inlet airflow temperature
 t_a : Outlet airflow temperature



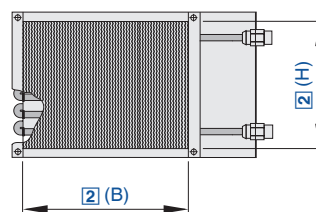
EL



Dimensions [mm] and weight [kg]

Nominal size	ØD	H ₃	m
	mm	mm	
100	99	116	2.0
125	124	141	2.5
160	159	176	2.9
200	199	216	3.7
250	249	266	4.5
315	314	331	6.7
400	399	416	8.1





For the reheating of airflows in rectangular ducting

Order code

WT / 160

1 2

1 Type

WT Hot water heat exchanger for VAV terminal units TZ-Silenzio and TVZ

2 Nominal size

125, 160, 200, 250, 315, 400

Order code

WT / 400×200

1 2

1 Type

WT Hot water heat exchanger for CAV controllers EN and for VAV terminal units TVJ and TVT

2 Nominal size [mm]

B × H

+ Features

Rectangular hot water heat exchanger for the reheating of airflows, suitable for VAV terminal units Type TVR, TZ-Silenzio, TVJ or TVT, and mechanical self-powered CAV controllers Type EN

- ▶ For hot water up to 100 °C
- ▶ Horizontal water connection
- ▶ Copper tubes arranged in two rows, with aluminium fins
- ▶ Maximum water-side operating pressure is 16 bar
- ▶ Casing air leakage to EN 15727, up to class D

Application

- ▶ Hot water heat exchanger Type WT for reheating the airflow in rectangular ducting
- ▶ For VAV terminal units TZ-Silenzio, TVZ, TVJ, and TVT, and for CAV controllers EN
- ▶ For hot water up to 100 °C

ISO Standards and guidelines

- ▶ Casing air leakage to EN 15727, class D (H ≤ 400 mm, class C)

Technical data

Nominal sizes for TZ-Silenzio and TVZ	125 - 400 mm
Nominal sizes for TVJ, TVT and EN	200 × 100 to 1000 × 1000 mm
Volume flow rate range	15 - 6000 l/s or 55 - 21600 m ³ /h
Thermal output	0.4 - 117 kW
Maximum hot water temperature	100 °C
Maximum water-side operating pressure	16 bar
Water-side differential pressure	0.1 - 25 kPa
Static differential pressure	25 - 170 Pa



WT for TZ-Silenzio and TVZ

Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Δp_{st} Pa	PWW 50/40, $t_e = 16^\circ\text{C}$				PWW 70/55, $t_e = 16^\circ\text{C}$			
				\dot{Q} kW	t_a °C	\dot{m}_w kg/h	Δp_v kPa	\dot{Q} kW	t_a °C	\dot{m}_w kg/h	Δp_v kPa
				125	15	54	5	0.40	37.8	34	0.2
	35	126	10	0.77	34.3	66	0.7	1.24	45.5	71	0.8
	60	216	25	1.12	31.5	96	1.5	1.80	40.9	103	1.6
	95	342	55	1.49	29.1	128	2.5	2.41	37.0	138	2.7
	150	540	120	1.95	26.8	168	4.1	3.14	33.4	180	4.5
160	25	90	5	0.65	37.6	56	0.1	1.05	51.0	60	0.1
	65	234	15	1.36	33.4	117	0.5	2.20	44.0	126	0.6
	100	360	25	1.82	31.1	157	0.9	2.93	40.3	168	1.0
	170	612	70	2.53	28.3	217	1.7	4.07	35.9	233	1.9
	250	900	140	3.16	26.5	271	2.6	5.08	32.9	291	2.8
200	40	144	5	1.07	38.3	92	0.1	1.74	52.1	100	0.1
	110	396	10	2.41	34.2	207	0.4	3.89	45.3	223	0.4
	180	648	25	3.39	31.6	291	0.8	5.46	41.2	313	0.8
	280	1008	50	4.48	29.3	385	1.3	7.22	37.4	414	1.4
	405	1458	100	5.58	27.4	480	1.9	8.98	34.4	515	2.1
250	60	216	5	1.58	37.9	136	0.2	2.56	51.4	147	0.2
	170	612	15	3.55	33.3	305	0.9	5.72	43.9	328	1.0
	280	1008	30	4.96	30.7	426	1.8	7.98	39.7	458	1.9
	470	1692	75	6.80	28.0	585	3.2	10.95	35.3	628	3.5
	615	2214	125	7.94	26.7	683	4.3	12.77	33.2	732	4.6
315	105	378	5	2.75	37.7	236	0.5	4.44	51.1	255	0.5
	265	954	10	5.64	33.7	485	1.8	9.10	44.5	522	1.9
	420	1512	25	7.72	31.3	664	3.1	12.44	40.6	713	3.4
	720	2592	65	10.79	28.4	928	5.8	17.37	36.0	996	6.3
	1025	3690	125	13.23	26.7	1138	8.5	21.29	33.2	1221	9.2
400	170	612	5	4.43	37.6	381	0.7	7.17	51.0	411	0.7
	445	1602	15	9.30	33.3	800	2.5	15.00	44.0	860	2.8
	710	2556	30	12.73	30.9	1094	4.5	20.51	40.0	1176	4.9
	1250	4500	80	18.00	28.0	1548	8.6	28.97	35.2	1661	9.4
	1680	6048	135	21.32	26.5	1833	11.8	34.30	32.9	1966	12.8

\dot{Q} : Thermal capacity
PWW: Pumped warm water heating system, flow temperature/return temperature
 t_e : Inlet airflow temperature
 t_a : Outlet airflow temperature
 \dot{m}_w : Water flow rate
 Δp_v : Water-side differential pressure
 Δp_{st} : Static differential pressure

WT for TVJ, TVT and EN

Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Δp_{st} Pa	PWW 50/40, $t_e = 16^\circ\text{C}$				PWW 70/55, $t_e = 16^\circ\text{C}$			
				\dot{Q} kW	t_a °C	\dot{m}_w kg/h	Δp_v kPa	\dot{Q} kW	t_a °C	\dot{m}_w kg/h	Δp_v kPa
				200 x 100	40	144	25	0.75	31.5	64	0.5
	80	288	80	1.15	27.9	99	1.1	1.85	35.2	106	1.2
	120	432	170	1.45	26.0	124	1.7	2.33	32.1	133	1.9
300 x 100	60	216	25	1.12	31.5	97	1.3	1.81	41.0	104	1.4
	120	432	80	1.72	27.9	148	2.9	2.78	35.2	159	3.2
	180	648	170	2.17	26.0	187	4.5	3.49	32.1	200	4.9
400 x 100	80	288	25	1.50	31.5	129	2.7	2.41	41.0	138	2.9
	160	576	80	2.30	27.9	198	5.9	3.70	35.2	212	6.4
	240	864	170	2.89	26.0	249	9.1	4.65	32.1	267	9.8
500 x 100	100	360	25	1.87	31.5	161	4.7	3.02	41.0	173	5.1
	200	720	80	2.87	27.9	247	10.3	4.62	35.2	265	11.1
	300	1080	170	3.62	26.0	311	15.8	5.82	32.1	333	17.0



Nominal size	\dot{V}	\dot{V}	Δp_{st}	PWW 50/40, $t_e = 16\text{ }^\circ\text{C}$				PWW 70/55, $t_e = 16\text{ }^\circ\text{C}$			
				\dot{Q}	t_a	\dot{m}_w	Δp_v	\dot{Q}	t_a	\dot{m}_w	Δp_v
	l/s	m ³ /h	Pa	kW	°C	kg/h	kPa	kW	°C	kg/h	kPa
600 x 100	120	432	25	2.25	31.5	193	1.5	3.62	41.0	207	1.6
	240	864	80	3.45	27.9	296	3.3	5.55	35.2	318	3.6
	360	1296	170	4.34	26.0	373	5.0	6.98	32.1	400	5.5
300 x 150	90	324	25	1.68	31.5	145	4.0	2.71	41.0	156	4.3
	180	648	80	2.59	27.9	222	8.7	4.16	35.2	239	9.5
	270	972	170	3.25	26.0	280	13.4	5.24	32.1	300	14.5
200 x 200	80	288	25	1.50	31.5	129	3.2	2.41	41.0	138	3.5
	160	576	80	2.30	27.9	198	7.2	3.70	35.2	212	7.8
	240	864	170	2.89	26.0	249	11.1	4.65	32.1	267	12.1
300 x 200	120	432	25	2.25	31.5	193	1.6	3.62	41.0	207	1.8
	240	864	80	3.45	27.9	296	3.6	5.55	35.2	318	4.0
	360	1296	170	4.34	26.0	373	5.6	6.98	32.1	400	6.1
400 x 200	160	576	25	2.99	31.5	257	3.2	4.82	41.0	277	3.5
	320	1152	80	4.60	27.9	395	7.2	7.40	35.2	424	7.8
	480	1728	170	5.79	26.0	498	11.0	9.31	32.1	534	12.1
500 x 200	200	720	25	3.74	31.5	322	5.5	6.03	41.0	346	6.0
	400	1440	80	5.75	27.9	494	12.3	9.25	35.2	530	13.4
	600	2160	170	7.23	26.0	622	18.8	11.63	32.1	667	20.5
600 x 200	240	864	25	4.49	31.5	386	1.5	7.24	41.0	415	1.6
	480	1728	80	6.90	27.9	593	3.3	11.10	35.2	636	3.6
	720	2592	170	8.68	26.0	746	5.0	13.96	32.1	800	5.5
700 x 200	280	1008	25	8.44	41.0	484	2.3	8.44	41.0	484	2.3
	560	2016	80	12.95	35.2	742	5.2	12.95	35.2	742	5.2
	840	3024	170	16.29	32.1	934	7.9	16.29	32.1	934	7.9
800 x 200	320	1152	25	9.65	41.0	553	3.2	9.65	41.0	553	3.2
	640	2304	80	14.80	35.2	848	7.1	14.80	35.2	848	7.1
	960	3456	170	18.61	32.1	1067	10.9	18.61	32.1	1067	10.9
400 x 250	200	720	25	3.74	31.5	322	5.7	6.03	41.0	346	6.3
	400	1440	80	5.75	27.9	494	12.8	9.25	35.2	530	13.9
	600	2160	170	7.23	26.0	622	19.6	11.63	32.1	667	21.4
500 x 250	250	900	25	4.68	31.5	402	3.6	7.54	41.0	432	3.9
	500	1800	80	7.18	27.9	618	8.0	11.56	35.2	663	8.7
	750	2700	170	9.04	26.0	777	12.2	14.54	32.1	834	13.3
600 x 250	300	1080	25	5.61	31.5	483	5.6	9.04	41.0	519	6.1
	600	2160	80	8.62	27.9	741	12.4	13.87	35.2	795	13.4
	900	3240	170	10.85	26.0	933	19.0	17.45	32.1	1000	20.6
300 x 300	180	648	25	3.37	31.5	290	4.6	5.43	41.0	311	5.1
	360	1296	80	5.17	27.9	445	10.3	8.32	35.2	477	11.3
	540	1944	170	6.51	26.0	560	15.9	10.47	32.1	600	17.4
400 x 300	240	864	25	4.49	31.5	386	3.2	7.24	41.0	415	3.5
	480	1728	80	6.90	27.9	593	7.2	11.10	35.2	636	7.8
	720	2592	170	8.68	26.0	746	11.0	13.96	32.1	800	12.1
500 x 300	300	1080	25	5.61	31.5	483	2.6	9.04	41.0	519	2.9
	600	2160	80	8.62	27.9	741	5.9	13.87	35.2	795	6.4
	900	3240	170	10.85	26.0	933	9.0	17.45	32.1	1000	9.8
600 x 300	360	1296	25	6.73	31.5	579	4.1	10.85	41.0	622	4.5
	720	2592	80	10.34	27.9	889	9.1	16.65	35.2	954	9.9
	1080	3888	170	13.02	26.0	1119	14.0	20.94	32.1	1201	15.2
700 x 300	420	1512	25	7.86	31.5	676	6.0	12.66	41.0	726	6.5
	840	3024	80	12.07	27.9	1038	13.3	19.42	35.2	1114	14.4
	1260	4536	170	15.19	26.0	1306	20.3	24.43	32.1	1401	22.1
800 x 300	480	1728	25	8.98	31.5	772	3.0	14.47	41.0	830	3.2
	960	3456	80	13.79	27.9	1186	6.6	22.20	35.2	1273	7.1
	1440	5184	170	17.36	26.0	1493	10.0	27.92	32.1	1601	10.9





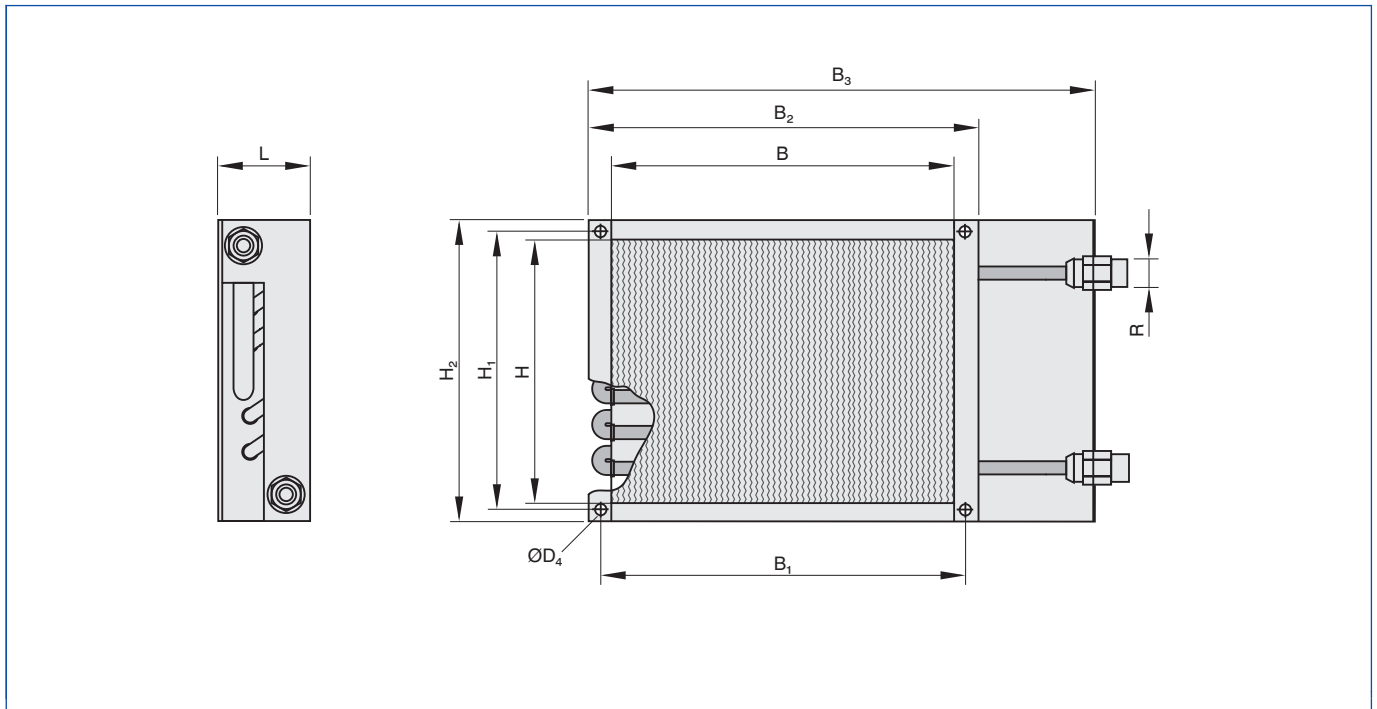
Nominal size	\dot{V}	\dot{V}	Δp_{st}	PWV 50/40, $t_e = 16\text{ }^\circ\text{C}$				PWV 70/55, $t_e = 16\text{ }^\circ\text{C}$			
				\dot{Q}	t_a	\dot{m}_w	Δp_v	\dot{Q}	t_a	\dot{m}_w	Δp_v
	l/s	m ³ /h	Pa	kW	°C	kg/h	kPa	kW	°C	kg/h	kPa
900 x 300	540	1944	25	10.10	31.5	869	3.9	16.28	41.0	933	4.3
	1080	3888	80	15.51	27.9	1334	8.7	24.97	35.2	1432	9.5
	1620	5832	170	19.52	26.0	1679	13.4	31.41	32.1	1801	14.5
1000 x 300	600	2160	25	11.22	31.5	965	5.1	18.09	41.0	1037	5.5
	1200	4320	80	17.24	27.9	1482	11.3	27.75	35.2	1591	12.2
	1800	6480	170	21.69	26.0	1866	17.3	34.90	32.1	2001	18.7
400 x 400	320	1152	25	5.99	31.5	515	3.2	9.65	41.0	553	3.5
	640	2304	80	9.19	27.9	791	7.2	14.80	35.2	848	7.8
	960	3456	170	11.57	26.0	995	11.0	18.61	32.1	1067	12.1
500 x 400	400	1440	25	7.48	31.5	643	5.5	12.06	41.0	691	6.0
	800	2880	80	11.49	27.9	988	12.3	18.50	35.2	1061	13.4
	1200	4320	170	14.46	26.0	1244	18.8	23.27	32.1	1334	20.5
600 x 400	480	1728	25	9.98	31.5	772	2.9	14.47	41.0	830	3.2
	960	3456	80	13.79	27.9	1186	6.5	22.20	35.2	1273	7.1
	1440	5184	170	17.36	26.0	1493	9.9	27.92	32.1	1601	10.8
700 x 400	560	2016	25	10.47	31.5	901	6.8	16.88	41.0	968	7.3
	1120	4032	80	16.09	27.9	1384	15.0	25.90	35.2	1485	16.2
	1680	6048	170	20.25	26.0	1741	22.9	32.57	32.1	1868	24.9
800 x 400	640	2304	25	11.97	31.5	1029	5.9	19.29	41.0	1106	6.4
	1280	4608	80	18.39	27.9	1581	13.0	29.60	35.2	1697	14.1
	1920	6912	170	23.14	26.0	1990	19.9	37.23	32.1	2134	21.6
900 x 400	720	2592	25	13.47	31.5	1158	3.9	21.71	41.0	1244	4.3
	1440	5184	80	20.69	27.9	1779	8.7	33.30	35.2	1909	9.5
	2160	7776	170	26.03	26.0	2239	13.4	41.88	32.1	2401	14.5
1000 x 400	800	2880	25	14.96	31.5	1287	5.1	24.12	41.0	1383	5.5
	1600	5760	80	22.98	27.9	1977	11.3	36.99	35.2	2121	12.2
	2400	8640	170	28.93	26.0	2488	17.3	46.53	32.1	2668	18.7
500 x 500	500	1800	25	9.35	31.5	804	5.5	15.07	41.0	864	6.0
	1000	3600	80	14.36	27.9	1235	12.3	23.12	35.2	1326	13.4
	1500	5400	170	18.08	26.0	1555	18.8	29.08	32.1	1667	20.5
600 x 500	600	2160	25	11.22	31.5	965	5.6	18.09	41.0	1037	6.1
	1200	4320	80	17.24	27.9	1482	12.4	27.75	35.2	1591	13.4
	1800	6480	170	21.69	26.0	1866	19.0	34.90	32.1	2001	20.6
700 x 500	700	2520	25	13.09	31.5	1126	3.8	21.10	41.0	1210	4.1
	1400	5040	80	20.11	27.9	1729	8.3	32.37	35.2	1856	9.1
	2100	7560	170	25.31	26.0	2177	12.8	40.72	32.1	2334	13.9
800 x 500	800	2880	25	14.96	31.5	1287	5.2	24.12	41.0	1383	5.7
	1600	5760	80	22.98	27.9	1977	11.5	36.99	35.2	2121	12.5
	2400	8640	170	28.93	26.0	2488	17.7	46.53	32.1	2668	19.2
900 x 500	900	3240	25	16.83	31.5	1448	7.0	27.13	41.0	1556	7.6
	1800	6480	80	52.86	27.9	2224	15.4	41.62	35.2	2386	16.7
	2700	9720	170	32.54	26.0	2799	23.6	52.35	32.1	3001	25.5
1000 x 500	1000	3600	25	18.70	31.5	1609	5.1	30.15	41.0	1728	5.5
	2000	7200	80	28.73	27.9	2471	11.3	46.24	35.2	2651	12.2
	3000	10800	170	36.16	26.0	3109	17.3	58.17	32.1	3335	18.7
600 x 600	720	2592	25	13.47	31.5	1158	4.1	21.71	41.0	1244	4.5
	1440	5184	80	20.69	27.9	1779	9.1	33.30	35.2	1909	9.9
	2160	7776	170	26.03	26.0	2239	14.0	41.88	32.1	2401	15.2
800 x 600	960	3456	25	17.96	31.5	1544	5.9	28.94	41.0	1659	6.4
	1920	6912	80	27.58	27.9	2372	13.0	44.39	35.2	2545	14.1
	2880	10368	170	34.71	26.0	2985	19.9	55.84	32.1	3202	21.6
1000 x 600	1200	4320	25	22.45	31.5	1930	5.1	36.18	41.0	2074	5.5
	2400	8640	80	34.47	27.9	2965	11.3	55.49	35.2	3182	12.2
	3600	12960	170	43.39	26.0	3731	17.3	69.80	32.1	4002	18.7



Nominal size	\dot{V} l/s	\dot{V} m ³ /h	Δp_{st} Pa	PWW 50/40, $t_e = 16\text{ }^\circ\text{C}$				PWW 70/55, $t_e = 16\text{ }^\circ\text{C}$			
				\dot{Q} kW	t_a °C	\dot{m}_w kg/h	Δp_v kPa	\dot{Q} kW	t_a °C	\dot{m}_w kg/h	Δp_v kPa
800 x 800	1280	4608	25	23.94	31.5	2059	5.9	38.59	41.0	2212	6.4
	2560	9216	80	36.77	27.9	3162	13.0	59.19	35.2	3394	14.1
	3840	13824	170	46.28	26.0	3980	19.9	74.45	32.1	4269	21.6
1000 x 800	1600	5760	25	29.93	31.5	2574	5.1	48.23	41.0	2765	5.5
	3200	11520	80	45.97	27.9	3953	11.3	73.99	35.2	4242	12.2
	4800	17280	170	57.85	26.0	4975	17.3	93.07	32.1	5336	18.7
1000 x 1000	2000	7200	25	37.41	31.5	3217	5.1	60.29	41.0	3457	5.5
	4000	14400	80	57.46	27.9	4941	11.3	92.49	35.2	5303	12.2
	6000	21600	170	72.31	26.0	6219	17.3	116.33	32.1	6670	18.7

- \dot{Q} : Thermal output
PWW: Pumped hot water heating system, flow temperature/return temperature
 t_g : Inlet airflow temperature
 t_a : Outlet airflow temperature
 \dot{m}_w : Water flow rate
 Δp_v : Water-side differential pressure
 Δp_{st} : Static differential pressure

WT



Dimensions [mm] and weight [kg]

Nominal size	L	B	H	B ₁	B ₂	B ₃	H ₁	H ₂	ØD ₄	R	m
				mm	mm	mm	mm	mm	mm	"	kg
125	70	198	152	232	258	336	186	212	10	½	2.4
160		308		342	368	446	186	212	10	½	3.3
200		458	210	492	518	596	244	263	10	½	4.8
250		598	201	632	658	736	235	263	10	½	6.0
315		798	252	832	868	936	286	314	10	½	8.7
400		898	354	932	958	1036	388	416	10	½	12.7



Dimensions [mm] and weight [kg]

Nominal size	L	B	H	B ₁	B ₂	B ₃	H ₁	H ₂	ØD ₄	R	m
				mm	mm	mm	mm	mm	mm	mm	"
200 × 100	80	200	100	234	276	338	134	176	13	½	1.3
300 × 100		300		334	376	438	134	176	13	½	1.7
400 × 100		400		434	476	538	134	176	13	½	2.1
500 × 100		500		534	576	638	134	176	13	½	2.5
600 × 100		600		634	676	738	134	176	13	½	2.9
300 × 150		300		300	150	334	376	438	184	210	13
200 × 200	200	200	200	234	276	338	234	276	13	½	1.9
300 × 200		300		334	376	438	234	276	13	½	2.5
400 × 200		400		434	476	538	234	276	13	½	3.0
500 × 200		500		534	576	638	234	276	13	½	4.0
600 × 200		600		634	676	738	234	276	13	½	5.0
700 × 200		700		734	776	838	234	276	13	½	6.0
800 × 200	800	834	876	938	234	276	13	½	7.0		
400 × 250	250	400	250	434	476	538	284	310	13	½	3.9
500 × 250		500		534	576	638	284	310	13	½	4.9
600 × 250		600		634	676	738	284	310	13	½	5.8

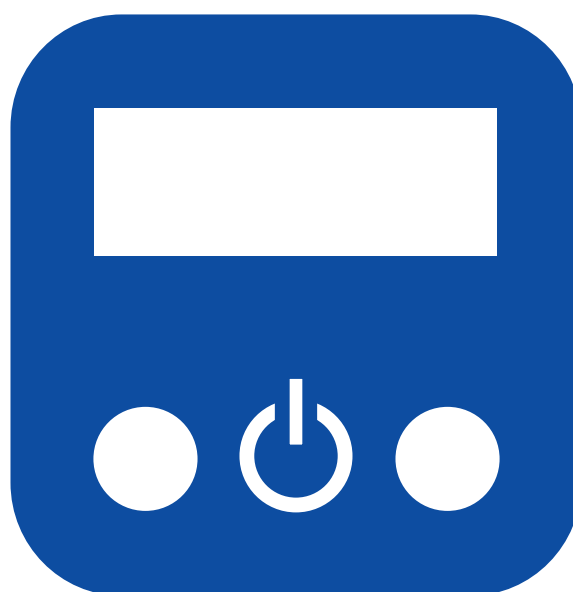


Nominal size	L	B	H	B ₁	B ₂	B ₃	H ₁	H ₂	ØD ₄	R	m
		mm	mm	mm	mm	mm	mm	mm	mm	mm	"
300 × 300	80	300	300	334	376	438	334	376	13	½	3.2
400 × 300		400	300	434	476	538	334	376	13	½	4.5
500 × 300		500	300	534	576	638	334	376	13	½	5.8
600 × 300		600	300	634	676	738	334	376	13	½	6.5
700 × 300		700	300	734	776	838	334	376	13	½	7.2
800 × 300		800	300	834	876	938	334	376	13	½	7.9
900 × 300		900	300	934	976	1038	334	376	13	½	8.5
1000 × 300		1000	300	1034	1076	1138	334	376	13	½	9.2
400 × 400		400	400	434	476	538	434	476	13	½	6.5
500 × 400		500	400	534	576	638	434	476	13	½	7.3
600 × 400		600	400	634	676	738	434	476	13	½	8.1
700 × 400		700	400	734	776	838	434	476	13	½	8.9
800 × 400		800	400	834	876	938	434	476	13	½	9.7
900 × 400		900	400	934	976	1038	434	476	13	½	10.5
1000 × 400	1000	400	1034	1076	1138	434	476	13	½	11.2	
500 × 500	100	500	500	534	576	638	534	576	13	½	8.7
600 × 500		600	500	634	676	738	534	576	13	½	9.6
700 × 500		700	500	734	776	838	534	576	13	½	10.5
800 × 500		800	500	834	876	938	534	576	13	½	11.4
900 × 500		900	500	934	976	1038	534	576	13	½	12.3
1000 × 500		1000	500	1034	1076	1138	534	576	13	1	13.2
600 × 600		600	600	634	676	738	634	676	13	½	11.1
800 × 600		800	600	834	876	938	634	676	13	½	13.9
1000 × 600		1000	600	1034	1076	1138	634	676	13	1	15.9
800 × 800		800	800	834	876	938	834	876	13	1	17.7
1000 × 800	1000	800	1034	1076	1138	834	876	13	1 ¼	20.2	
1000 × 1000	1000	1000	1034	1076	1138	1034	1076	13	1 ¼	27.9	





Control systems



4 Control systems

4.1 Controller



EASYPAC controllers for the most demanding control engineering tasks

EASYPAC TCU3

521



Adapter module for the expansion of the EASYPAC system

TAM

524

4.2 Monitoring system



For the monitoring of volume flows

FMS

526

4.3 Expansion modules



LonWorks interface for EASYPAC controllers and adapter modules

EM-LON

528



BACnet and Modbus interface for EASYPAC controllers and adapter modules

EM-BAC-MOD

529



BACnet/IP interface, Modbus/IP interface, and webserver for EASYPAC controllers and TAM adapter modules

EM-IP

531



For the connection of EASYPAC to the 230 V mains

EM-TRF

533



For the connection of EASYPAC to the 230 V mains and for uninterruptible power supply

EM-TRF-USV

534



Automatic zero point correction for EASYPAC

EM-AUTOZERO

536



For the simple connection of lighting to an EASYLAB fume cupboard controller

EM-LIGHT 537

4.4 Sensors



For fume cupboard controllers EASYLAB and TCU-LON-II

VS-TRD 538



For EASYLAB fume cupboard controllers

DS-TRD 539



For the differential pressure recording and control in combination with EASYLAB

Differential pressure transducer 540

4.5 Control panels



For EASYLAB fume cupboard controllers or room controllers, with text display

BE-LCD 542



For EASYLAB fume cupboard controllers and FMS monitoring systems

BE-SEG 543

4.6 Configuration software



For the commissioning and diagnosis of EASYLAB components and FMS

EasyConnect 544

4.7 Master units



Zone master module for up to 25 zone modules, with integral webserver and interfaces to higher-level systems

X-AIR-ZMAS 546

4.8 Zone modules



Zone modules for single room control

X-AIR-ZMO 548

4.9 Control panels



Control panels for X-AIRCONTROL zone modules

X-AIR-CP

550

4.10 Sensors



Sensors for X-AIRCONTROL zone modules and other equipment

X-SENS

552

The system

Intelligent solutions for control and monitoring

The TROX room air management system is designed for the easy interconnection (plug and play) of all controllers; it only requires a communication cable. Continuous data exchange among the controllers is then ensured. The system can easily be connected to the central BMS using the standard communication interfaces LonWorks, BACnet, or Modbus; IP-based communication with Ethernet is also possible.

Fume cupboard control

Fume cupboard control in a laboratory is a principal issue since people working in a lab must be protected. Gases or aerosols, which may be the product of some chemical reaction, should be removed at the source. Contaminated air must be diluted, cleaned, filtered and removed from a building on the shortest possible way such that the environment is not also contaminated.

Rapid response.

- Rapid response times ensure that no outbreak of hazardous substances can occur, e.g. in fume cupboards with variable, demand-based extract air. This is why EASYLAB controllers, which have been developed for the ventilation of laboratories, act within only 3 s, while the reaction time is only milliseconds. These values comply with EN 14175 for fume cupboards and have been verified and certified by a test institute. For comparison: The action time of standard controllers is usually 120 s. For slave control loops, these rapid response times, which are necessary to meet the room air conditioning requirements of DIN 1946, part 7, put control components under a lot of strain. This is why EASYLAB uses on the room supply air and extract air sides the same quick controllers as those used for fume cupboards.

Room balancing

From the point of view of an air conditioning system, the fume cupboards in a lab are rooms within a room; this complicates communication and the maintenance of setpoints. A reliable air management system is important because volume flow rate balances in various room scenarios must be controlled quickly and precisely as volume flow rates in fume cupboards and other extraction units may suddenly change. This requires that the actual volume flow rates are not only precisely measured, but also rapidly transmitted such that the setpoint values can be achieved.

Room balancing.

- In a lab, the extract air consumers such as fume cupboards, fume hoods or extraction units determine how much supply air is required. EASYLAB adds all extract air values and controls the supply air based on an absolute difference between supply air and extract air, which prevents contaminated air from leaving the lab.

Efficient interplay of fan speed and damper blade position.

- Ideally, air conditioning systems should include variable volume flow control and speed-controlled fans such that they can adjust efficiently to changes of usage. EASYLAB and fast actuators ensure that the damper blades of TROX volume flow rate controllers react swiftly to any changes and maintain the required air balance, e.g. by reducing the supply air flow rate. The correct and quick functioning of EASYLAB requires that there is always a sufficient pressure in the duct system. This can be achieved efficiently and safely in two ways:

1. Measurement of the duct pressure where an undersupply occurs first: maintaining the duct pressure setpoint value. The point where an undersupply occurs first is, however, difficult to find since it tends to wander in the duct system with changing operating conditions.
2. Evaluation of the combined damper blade positions of all VAV terminal units: It is

possible with sophisticated logic to vary the speed of supply air and extract air fans in such a way that the dampers work with the blades in the position that results in the least pressure loss (almost completely open). The logic is part of the X-CUBE control package. This ensures that the 'accelerator' (high fan speed) and the 'brake' (damper blade almost closed) are not actuated at the same time.

Room pressure control

TROX EASYLAB ensures the fast and precise control of volume flow rates in a room. Short response times and precise control are basic requisites for the perfect room air management. EASYLAB controllers are the brains of our air management systems; due to their modular structure they can be adapted to each individual project. The controllers include plug and play communication, which allows for the fast, clean and easy integration of all components into the air management system.

The software has been designed for lab control; it is very precise and ensures that the required room pressure values are maintained.

Specialist consultants and HVAC contractors benefit from the flexible EASYLAB control system, which is also easy to install:

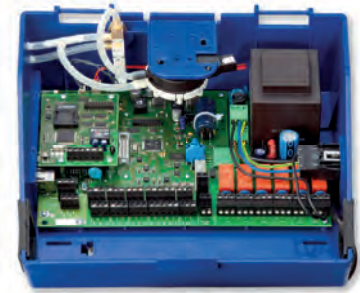
- Easy integration of room controllers using a standard communication cable; no addressing required
- Flow rate balancing with defined air transfer
- Room pressure control
- Automatic volume flow rate balancing including all supply air and extract air controllers
- Diversity control
- Optimised extract air balancing
- The minimum discharge velocity on air terminal devices is maintained
- Uninterruptible power supply



CONTROLLER

Area of application	Control equipment						Monitoring
	EASYLAB system			TCU-LON-II system			FMS
	Fume cupboard control	Room balancing	Room pressure control	Fume cupboard control	Room balancing	Room pressure control	Fume cupboard monitoring
Hardware components							
Adapter module (TAM)		●					
Expansion module, 230 V	Options	Options	Options				90 - 250 V AC always
Expansion module, 230 V, UPS	Options	Options	Options				
LonWorks interface	Options	Options	Options	●	●	●	
Solenoid valve (expansion)	Options	Options	Options	●	●	●	
Fume cupboard lighting (expansion)	Options						●
Control panel with OLED display	●						Options
Control panel with 40-character display	●	●	●				
Control panel - TCU-LON-II standard				●			●
Functions							
Volume flow rate monitoring	●	●	●	●	●	●	●
Face velocity monitoring	●			●			FMS-2
Sash monitoring (EN 14175)	●			●			●
Room pressure monitoring			●			●	
Constant volume flow control	●	●		●	●		
Variable volume flow control	●	●		●	●		
Constant volume flow rate difference		●	●		●	●	
Room pressure control			●			●	
Room management function		●	●				
Explanation							
● - Standard							





EASYLAB controllers for the most demanding control engineering tasks

Order code

TVLK – FL / 250 – 100 / GK / ELAB / FH – VS / ULZS / 200 – 900

1 2 3 4 5 6 7 8

1 Type

TVLK VAV terminal unit, plastic

2 Flange

No entry: none

FL Flanges on both ends

3 Nominal size

250 - 100 Bluff body 100

250 - 160 Bluff body 160

250 - D08 Nozzle D08

250 - D10 Nozzle D10

250 - D16 Nozzle D16

4 Accessories

No entry: none

GK Matching flanges for both ends

5 Attachments (control component)

ELAB EASYLAB controller TCU3 with fast-running actuator

6 Equipment function

With face velocity transducer

FH-VS Face velocity control

With sash distance sensor

FH-DS Linear control strategy

FH-DV Safety-optimised control strategy

With switching steps for switch contacts provided by others

FH-2P 2 switching steps

FH-3P 3 switching steps

Without signalling

FH-F Volume flow rate constant value

7 Expansion modules

Option 1: Supply voltage

No entry: 24 V AC

T EM-TRF for 230 V AC

U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communication interface

No entry: none

L EM-LON for LonWorks FTT-10A

B EM-BAC-MOD-01 for BACnet MS/TP

M EM-BAC-MOD-01 for Modbus RTU

I EM-IP for BACnet/IP, Modbus/IP and webservice

R EM-IP with real time clock

Option 3: Automatic zero point correction

No entry: none

Z EM-AUTOZERO Solenoid valve for automatic zero point correction

Option 4: Lighting

No entry: none

S EM-LIGHT Wired socket for the connection of lighting and for switching the lighting on/off using the control panel (only with EM-TRF or EM-TRF-USV)

8 Operating values [m³/h or l/s]

Depending on the equipment function

VS: $\dot{V}_{\min} - \dot{V}_{\max}$

DS: $\dot{V}_{\min} - \dot{V}_{\max}$

DV: $\dot{V}_{\min} - \dot{V}_{\max}$

2P: \dot{V}_1 / \dot{V}_2

3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$

F: \dot{V}_1

Useful additions

Control panel for fume cupboard controller, for displaying the functions of the control system according to EN 14175

BE-SEG-02 OLED display

BE-LCD-01 40-character display



 Order code

TVR - D - ... - FL / 160 / G2 / ELAB / RS / ULZ / LAB / ...

1 2 3 4 5 6 7 8 10 11 12

TVR - D - ... - FL / 160 / G2 / ELAB / EC - E0 / ULZ / ...

1 2 3 4 5 6 7 8 9 10 12

1 Type

TVR VAV terminal unit

2 Acoustic cladding

D No entry: none
With acoustic cladding

3 Material

P1 No entry: galvanised sheet steel
Powder-coated (RAL 7001), silver grey
A2 Stainless steel

4 Flange

FL No entry: none
Both ends (not for TVR-D-P1)

5 Nominal size [mm]

D_N

6 Accessories

No entry: none
D2 Lip seals on both ends
G2 Matching flanges for both ends

7 Attachments (control component)

ELAB EASYLAB controller TCU3 with fast-running actuator

8 Equipment function

Room control
RS Supply air control (Room Supply)
RE Extract air control (Room Exhaust)
PC Differential pressure control

Single operation
SC Supply air controller
EC Extract air controller

9 External volume flow rate setting

Only for single operation
E0 Voltage signal 0 - 10 V DC
E2 Voltage signal 2 - 10 V DC
2P Switch contacts (provided by others) for 2 switching steps
3P Switch contacts (provided by others) for 3 switching steps
F Volume flow rate constant value, without signalling

10 Expansion modules

Option 1: Power supply
No entry: 24 V AC
T EM-TRF for 230 V AC
U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)
Option 2: Communication interface
No entry: none
L EM-LON for LonWorks FTT-10A
B EM-BAC-MOD-01 for BACnet MS/TP
M EM-BAC-MOD-01 for Modbus RTU
I EM-IP for BACnet/IP, Modbus/IP and webserver
R EM-IP with real time clock
Option 3: Automatic zero point correction
No entry: none
Z EM-AUTOZERO with solenoid valve

11 Additional functions

Only for room control (equipment function)
Room management function has been deactivated
LAB Extract air led system (laboratories)
CLR Supply air led system (clean rooms)
Room management function is active
LAB-RMF Extract air led system (LAB)
CLR-RMF Supply air led system

12 Operating values [m^3/h or l/s , Pa]

For equipment function 'room control' with additional function RMF
Total room extract air/supply air
 \dot{V}_1 : Standard mode
 \dot{V}_2 : Reduced operation
 \dot{V}_3 : Increased operation
 \dot{V}_4 : Constant room supply air
 \dot{V}_5 : Constant room extract air
 \dot{V}_6 : Supply air/extract air difference
 $\Delta p_{\text{setpoint}}$: Setpoint pressure (only with differential pressure control)
For equipment function 'single operation'
E0, E2: $\dot{V}_{\min} / \dot{V}_{\max}$
2P: \dot{V}_1 / \dot{V}_2
3P: $\dot{V}_1 / \dot{V}_2 / \dot{V}_3$
F: \dot{V}_1

Useful additions

Room control panel
BE-LCD-01 40-character display

+ Features

Electronic controller that offers plug and play communication for demanding control tasks, yet simple wiring and commissioning

- ▶ Maximum control comfort for laboratories, clean rooms, hospital wards, and offices
- ▶ Perfect system for complete room solutions from a single source
- ▶ Demand-based and quick-response control for fume cupboards, and of supply air, extract air and pressure
- ▶ Interactive configuration software with commissioning wizard and Bluetooth adapter
- ▶ Plug-in communication cable for easy wiring
- ▶ Adaptable control panels and many special functions allow for individual operating modes and control strategies
- ▶ Fume cupboard control and monitoring according to EN 14175

Expansion options

- ▶ Connection to the mains (230 V)
- ▶ Expansion modules with LonWorks, BACnet

or Modbus standard interfaces to the central BMS

- ▶ Automatic zero point correction for long-term stability and reduced maintenance
- ▶ Control panels for fume cupboards and for room control

X Application

- ▶ Electronic controller Type EASYLAB TCU3 for the control of volume flow rates in fume cupboards and for the control of supply and extract air in laboratories; can also be used as an attachment for air terminal units
- ▶ For use in laboratories, clean rooms in the pharmaceutical and semiconductor industries, operating theatres, intensive care units, and offices with very demanding control requirements
- ▶ Fast and stable control of the volume flow rate for fume cupboards, and of room supply air and room extract air
- ▶ Fume cupboard control tested to EN 14175, part 6, for fume cupboards of all brands
- ▶ Controllers can be used individually or combined with other controllers for a

complete room solution

- ▶ System solution for the volume flow control in rooms (room balance)
- ▶ For extract air led areas such as laboratories
- ▶ For supply air led areas such as clean rooms
- ▶ Numerous options for the integration of additional volume flows into the room balance
- ▶ Room pressure control or duct pressure control as cascade of differential pressure and volume flow rate
- ▶ Interface to the central BMS, voltage signals 0 - 10 V or with expansion modules for LonWorks, BACnet, Modbus



Equipment functions

Fume cupboard control

- ▶ FH-VS: Face velocity transducer - face velocity control
- ▶ FH-DS: Sash distance sensor - linear control strategy
- ▶ FH-DV: Sash distance sensor - safety-optimised control strategy
- ▶ FH-2P: 2 switching steps for on-site switch contacts
- ▶ FH-3P: 3 switching steps for on-site switch contacts
- ▶ FH-F: Volume flow rate constant value

Extract air controller / supply air controller

External volume flow rate setting

- ▶ EC/SC-E0: Volume flow rate default setting 0 - 10 V DC
- ▶ EC/SC-E2: Volume flow rate default setting 2 - 10 V DC

Without signalling

With switching steps for on-site switch contacts

- ▶ EC/SC-2P: 2 switching steps
- ▶ EC/SC-3P: 3 switching steps
- ▶ EC/SC-F: Volume flow rate constant value

Room control

Extract air led system for laboratories

- ▶ RS/LAB: Supply air control
- ▶ RE/LAB: Extract air control
- ▶ PC/LAB: Differential pressure control (supply air)

Supply air led system for clean rooms

- ▶ RS/CLR: Supply air control
- ▶ RE/CLR: Extract air control
- ▶ PC/CLR: Differential pressure control (extract air)

Attachments

Expansion modules are factory mounted or can be fitted at a later stage

- ▶ T: EM-TRF, power supply unit for connecting the controller to the 230 V AC mains voltage
- ▶ U: EM-TRF-USV, power supply unit for connecting the controller to the 230 V AC mains voltage and to ensure uninterrupted power supply
- ▶ Z: EM-AUTOZERO, automatic zero point correction for long-term stable volume flow rate measurement and hence reduced maintenance.
- ▶ L: EM-LON, LonWorks FTT-10A interface
- ▶ B: EM-BAC-MOD-01, interface configured for BACnet MS/TP
- ▶ M: EM-BAC-MOD-01, interface configured for Modbus RTU
- ▶ S: EM-LIGHT, wired socket (230 V) for the connection of lighting and for switching the lighting on/off using the control panel
- ▶ EM-IP: BACnet-IP, Modbus-IP, webserverinterface

Useful additions

- ▶ BE-SEG-**: Control panel for fume cupboard control
- ▶ BE-LCD-01: Control panel for fume cupboard control and room control
- ▶ TAM: Adapter module as an interface between fume cupboard control and room control, and to the central BMS
- ▶ Differential pressure transducers: Static differential pressure transducers for room pressure control or duct pressure control
- ▶ EasyConnect: Configuration software for the commissioning and diagnosis of EASYLAB components

Special characteristics

- ▶ Plug and play communication system with automatic controller identification, no component addressing required
- ▶ Modular system for functional expansion
- ▶ Connections and status displays on the outside of the controller casing
- ▶ Project-specific adjustments are possible using adaptable control panel for fume cupboard and room
- ▶ Project-specific adjustments can be achieved with configurable special functions, monitoring, and alarm signalling
- ▶ Permanent function monitoring of the system and the connected sensors
- ▶ Very simple commissioning, configuration changes and diagnosis
- ▶ Centralised configuring and permanent signalling of room settings (room management function) on the TAM when combined with fume cupboards
- ▶ EasyConnect configuration software enables interactive navigation (also wireless)
- ▶ Factory tested and configured with project-specific parameters



Technical data

Supply voltage	24 V AC ± 15 %; 230 V AC as option; 50/60 Hz
Power rating	35 VA fume cupboard controller with control panel; 29 VA room controller; 33 VA room controller with room control panel; max. 40 VA with all expansion modules
Micro fuse	2 A, slow blow, 250 V
Actuator	Fast-running high-precision actuator, running time for 90° is 3 s
Operating temperature	10 - 50 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2014/30/EU
Weight	1.4 kg

Technical data

Recovery time	500 ms
2 interfaces for communication line	Network cable SF-UTP, 300 m max.; up to 24 devices
2 interfaces for control panels	Network cable SF-UTP, 40 m max.
6 digital inputs	for volt-free switch contacts; can be configured as make or break contacts
6 digital outputs	Relay with make/break contact, 250 V, 8 A; switch-on current 12 A
5 analog inputs	0 - 10 V, input resistance > 100 kΩ, characteristic can be configured
4 analog outputs	0 - 10 V, 10 mA max., characteristic can be configured





Adapter module for the expansion of the EASYLAB system

Order code

TAM / TL / LAB / ...

1 2 3 4

1 Type

TAM Adapter module

2 Expansion modules

Option 1: Supply voltage

No entry: 24 V AC

T EM-TRF for 230 V AC

U EM-TRF-USV for 230 V AC, provides uninterruptible power supply (UPS)

Option 2: Communication interface

No entry: none

L EM-LON for LonWorks-FTT-10A

B EM-BAC-MOD-01 for BACnet MS/TP

M EM-BAC-MOD-01 for Modbus RTU

I EM-IP for BACnet/IP, Modbus/IP and webservice

R EM-IP with real time clock

3 Operating mode

LAB Extract air led system (laboratories)

LAB-RMF Extract air led system with active room management function (laboratories)

CLR Supply air led system (clean room)

CLR-RMF Supply air led system with active room management function

4 Operating values [m³/h or l/s, Pa]

Only with operating mode LAB-RMF or CLR-RMF

V1 Total room extract air/supply air - standard mode

V2 Total room extract air/supply air - reduced operation

V3 Total room extract air/supply air - increased operation

V4 Constant supply air

V5 Constant extract air

V6 Supply air/extract air difference

Δp_{sol} Setpoint pressure (only with differential pressure control)

Useful additions:

Control panel for fume cupboard controller, for displaying the functions of the control system according to EN 14175

BE-TCU-LON-II 40-character display

+ Features

Adapter module as an interface between fume cupboard control and room control, and to the central BMS

- ▶ Plug and play communication with up to 23 EASYLAB controllers, fume cupboard controllers, or room controllers
- ▶ Additional data points for the integration of other variable and constant volume flow rates into the room balance, e.g. controllers or fume hoods
- ▶ Can be set up as room interface to the central BMS
- ▶ Connection of a room control panel for the signalling and use of room functions
- ▶ Used when fume cupboards are used in a room

Expansion options

- ▶ Connection to the mains (230 V)
- ▶ Expansion modules with LonWorks, BACnet or Modbus standard interfaces to the central BMS
- ▶ Room control panels for operating mode default setting

Application

- ▶ Adapter module Type TAM for the expansion of the EASYLAB system, in particular for the integration of fume cupboards
- ▶ Interface between fume cupboard control and room control
- ▶ Interface to the central BMS, voltage signals 0 - 10 V or with expansion modules for LonWorks, BACnet, Modbus
- ▶ Very simple commissioning: automatic controller identification, no component addressing required (plug and play communication), configuration software with interactive menu navigation and extended diagnostic functions
- ▶ Project-specific configuration using expansion modules and room control panels
- ▶ Numerous options for the integration of additional volume flows into the room balance
- ▶ Room management function (RMF) can be activated
- ▶ For use in laboratories, clean rooms in the pharmaceutical and semiconductor industries, operating theatres, intensive care units, and offices with very demanding control requirements

Operating modes

- ▶ **LAB**: extract air led system for laboratories
- ▶ **CLR**: supply air led system for clean rooms
- ▶ **LAB/CLR-RMF**: System with active room management function

Attachments

Expansion modules are factory mounted or can be fitted at a later stage

- ▶ **T**: EM-TRF, power supply unit for connecting the controller to the 230 V AC mains voltage
- ▶ **U**: EM-TRF-USV, power supply unit for connecting the controller to the 230 V AC mains voltage and to ensure uninterrupted power supply
- ▶ **L**: EM-LON, LonWorks FTT-10A interface
- ▶ **B**: EM-BAC-MOD-01, interface configured for BACnet MS/TP
- ▶ **M**: EM-BAC-MOD-01, interface configured for Modbus RTU



 **Useful additions**

- ▶ BE-LCD-01: Control panel for fume cupboard control and room control (only for operating mode ...-RMF)
- ▶ Differential pressure transducers: Static differential pressure transducers for room pressure control or duct pressure control
- ▶ EasyConnect: Configuration software for the commissioning and diagnosis of EASYLAB components

 **Special characteristics**

- ▶ Plug and play communication with automatic controller identification, no component addressing required
- ▶ Modular system for functional expansion
- ▶ Connections and status displays on the outside of the controller casing
- ▶ Project-specific adjustments using adaptable room control panels
- ▶ Project-specific adjustments can be achieved with configurable special functions, monitoring, and alarm signalling
- ▶ Permanent function monitoring of the system

- ▶ Very simple commissioning, configuration changes and diagnosis
- ▶ Centralised configuring and permanent signalling of room settings (room management function)
- ▶ EasyConnect configuration software enables interactive navigation (also wireless)
- ▶ Factory tested and configured with project-specific parameters

 **Technical data**

Supply voltage	24 V AC ± 15 %; 230 V AC as option; 50/60 Hz
Power rating	35 VA fume cupboard controller with control panel; 29 VA room controller; 33 VA room controller with room control panel; max. 40 VA with all expansion modules
Micro fuse	2 A, slow blow, 250 V
Actuator	Fast-running high-precision actuator, running time for 90° is 3 s
Operating temperature	10 - 50 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2014/30/EU
Weight	1.4 kg



 **Technical data**

Recovery time	500 ms
2 interfaces for communication line	Network cable SF-UTP, 300 m max.; up to 24 devices
2 interfaces for control panels	Network cable SF-UTP, 40 m max.
6 digital outputs	Relay with make/break contact, 250 V, 8 A; switch-on current 12 A
6 digital inputs	for volt-free switch contacts; can be configured as make or break contacts
5 analog inputs	0 - 10 V, input resistance > 100 kΩ, characteristic can be configured
4 analog outputs	0 - 10 V, 10 mA max., characteristic can be configured





For the monitoring of volume flows

Order code

FMS - 1 / SGVD

1 2 3

1 Type

FMS Monitoring system

2 Variant

- 1 Monitoring system with integral diaphragm pressure transducer and measuring probe
- 2 Monitoring system for external 0 (2) to 10 V DC signals

3 Accessories

- S** Option 1: Lighting
No entry: none
EM-LIGHT-F
- G** Option 2: Mating connector for the EM-LIGHT module
No entry: none
EM-CPL

- V** Option 3: Combined insulation piece and wire clamping bracket for digital output DO1, fan activation
No entry: none
EM-VENT
- D** Option 4: Differential pressure transducer for monitoring a supportive flow
No entry: none
EM-DDT

+ Features

Electronic, self-powered monitoring system for fume cupboards

- ▶ Easy installation, expansion and commissioning due to plug connections
- ▶ Sockets for the most important connections are located on the outside of the casing
- ▶ Monitoring hardware can be expanded with modules
- ▶ Adaptable control panels for fume cupboards
- ▶ Innovative operation to support bespoke project requirements
- ▶ Control input signal for fans
- ▶ Configurable monitoring functions and alarm signalling
- ▶ Easy installation due to interactive EasyConnect configuration software
- ▶ Power supply unit for supply voltage 90 - 250 V AC
- ▶ 2 control panels can be connected, e.g. for fume cupboards with sash windows on two sides

Expansion options

- ▶ Expansion modules, to be mounted into or onto the base casing
- ▶ Easy installation and electric connection of the monitoring system
- ▶ Expansion modules can be factory mounted or fitted at a later stage
- ▶ Optional monitoring of supportive flow in fume cupboards

X Application

- ▶ Monitoring system type FMS for the electronic, self-powered monitoring of volume flow rate or face velocity in fume cupboards, fume hoods and similar components.
- ▶ Easy and safe to use, providing maximum energy efficiency and data transparency
- ▶ For use within enclosed rooms
- ▶ Simple solution for fume cupboards with a constant volume flow rate

Equipment functions

- ▶ Differential pressure monitoring
- ▶ Volume flow rate monitoring
- ▶ Face velocity monitoring
- ▶ Monitoring of supportive flow fans, and of volume flow or differential pressure signals from external units or devices
- ▶ Optical and acoustic alarms as well as alarm signalling to higher-level systems (central BMS) with BE-SEG-02 or BE-SEG-03
- ▶ Complete configuration, commissioning and diagnosis with interactive software for personal computers; the computer can be connected either directly to the unit or to the room control panel
- ▶ For use in laboratories, clean rooms in the pharmaceutical and semiconductor industries, operating theatres, intensive care units and offices
- ▶ For new installations, retrofit and refurbishment projects
- ▶ Monitoring of the sash window opening to EN 14175

◊ Variants

- ▶ FMS-1: Monitoring system with integral diaphragm pressure transducer and measuring probe
- ▶ FMS-2: Monitoring system for external signals of 0 (2) to 10 V DC, e.g. from a face velocity transducer, volume flow controller or external differential pressure transducer

◻ Attachments

Expansion modules are factory mounted or can be fitted at a later stage

- ▶ **S**: EM-LIGHT-F - The monitoring system allows for switching a light on/off using the control panel. This expansion module is a wired socket for the connection of lighting. Maximum switch rating: 230 V AC 500 W.
- ▶ **G**: EM-CPL - Mating connector for the EM-LIGHT module. If EM-LIGHT is installed, a mating connector can be supplied to allow for plugging in the lighting.
- ▶ **V**: EM-VENT - Combined insulation piece and wire clamping bracket for digital output DO1, fan activation. The monitoring system can be used to activate or deactivate a fan. In case of 230 V AC power supply, this combined insulation piece and wire clamping bracket is provided.
- ▶ **D**: EM-DDT - Differential pressure transducer for monitoring a supportive flow. This expansion module may be used as an additional differential pressure transducer to monitor a supportive flow fan.



Optional transducers for FMS-2

- ▶ VS-TRD: Face velocity transducer
- ▶ PT699: Differential pressure transducer, -100 to 100 Pa



Special characteristics

- ▶ Extremely fast actual value measurement
- ▶ Monitoring of the differential pressure or volume flow rate; face velocity monitoring as an option (only with the optional face velocity transducer VS-TRD)
- ▶ Monitoring and signalling of the maximum sash opening according to EN 14175;

acoustic signalling can be switched off or the duration can be limited

- ▶ Connection of one or two adaptable EASYLAB control panels Type BE-SEG-03 or BE-SEG-02; suitable also for fume cupboards with sash windows on two sides
- ▶ Operating mode default setting by an external unit or device using digital inputs
- ▶ Monitoring functions: Monitoring value 1, monitoring value 2, deactivate monitoring function
- ▶ Alarms and alarm signalling are configurable, e.g. suppressing alarms for certain operating modes



Technical data

Supply voltage	90 - 250 V AC
Power rating	Up to 13.5 V A (with maximum equipment)
Recovery time	<500 ms
Operating temperature	10 to 50 °C for operation, -10 to 70 °C for storage
Acceptable humidity	<90 % non-condensing
Switch rating of relay outputs	R1: 240 V AC 6 A, R2: 240 V AC 2 A, R3+4: 50 V 2 A
IEC protection class	II (protective insulation)
Protection level	IP 20
EC conformity	EMC to 2014/30/EU, low voltage to 2006/95/EC
Weight	0.5 kg
Dimensions (L x B x H)	159 x 136 x 65 mm





LonWorks interface for EASYLAB controllers and adapter modules

Order code

ELAB / ...L... / ...

Order code

EM - LON

+ Features

Expansion module for EASYLAB fume cupboard controllers, room controllers, extract air controllers, supply air controllers, and adapter modules, for the integration of rooms or individual volume flow controllers with the central BMS

- ▶ LonWorks FTT-10A interface
- ▶ Communication only using standard network variables (SNVT)
- ▶ The expansion module is fitted into the casing with the EASYLAB base component
- ▶ Easy retrofitting
- ▶ Double-stack terminal blocks for the LonWorks network
- ▶ Service pin push button and corresponding indicator light

Interface to central BMS

- ▶ When used on a controller with active room management function (RMF) the module provides also data points for the entire room, e.g. for total volume flows or

consolidated alarms

- ▶ When used on a single controller: data points for volume flow rate, alarm, damper blade position, or others
- ▶ Centralised operating mode default setting, e.g. night-time operation

Application

- ▶ Expansion module Type EM-LON for the EASYLAB system
- ▶ LonWorks FTT-10A interface to the central BMS
- ▶ Data points for individual controllers or for the room
- ▶ Room interface: Default setting of room operating modes within the EASYLAB system, increase or reduction of the air change rate, readout of the actual room operating values or evaluated damper blade positions, consolidated alarms
- ▶ Controller interface: Operating mode default setting for a single fume cupboard controller, readout of individual operating values such as volume flow rates for single

controllers, or individual alarms

- ▶ Can be used with fume cupboard, supply air, extract air or differential pressure controller EASYLAB TCU3 and with adapter module TAM
- ▶ For use in laboratories, clean rooms in the pharmaceutical and semiconductor industries, operating theatres, intensive care units, and offices with very demanding control requirements
- ▶ Factory mounted or for retrofitting into the EASYLAB base component casing

★ Special characteristics

- ▶ LonWorks free topology network with an arbitrary number of branches (star, line, and arbitrary combinations)
- ▶ Communication only using standard network variables (SNVT)
- ▶ Data interface for an EASYLAB controller or for an EASYLAB room with different functional profiles
- ▶ System integration (binding) into the LonWorks network is required

Technical data

Supply voltage	5 V DC from controller or adapter module
Communication interface	LonWorks-Transceiver FTT-10A, free topology, twisted pair
Connection to LonWorks network	6 terminals for cable cross sections of 0.12 - 1.5 mm ² (LON A, LON B and screen, two of each)
Operating temperature	0 - 50 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC to 2004/108/EU, low voltage to 2006/95/EU
Dimensions (B × H × T)	78 × 65 × 100 mm





BACnet and Modbus interface for EASYLAB controllers and adapter modules

 **Order code**

ELAB / ...B... / ...
ELAB / ...M... / ...



Expansion module

B EM-BAC-MOD for BACnet MS/TP **M** EM-BAC-MOD for Modbus RTU

 **Order code**

EM – BAC – MOD

 **Features**

Expansion module for EASYLAB fume cupboard controllers, room controllers, extract air controllers, supply air controllers, and adapter modules, for the integration of rooms or individual volume flow controllers with the central BMS

- ▶ Switching between BACnet MS/TP and Modbus RTU
- ▶ BACnet Standardised Device Profile (Annex L)
- ▶ Modbus interface with individual data registers
- ▶ Native BACnet interface by integrating the expansion module with EASYLAB components
- ▶ Easy retrofitting
- ▶ Double-stack terminal blocks for the EIA-485 bus
- ▶ Equipment address and data transfer parameters can be defined

Interface to central BMS

- ▶ When used on a controller with active room management function (RMF) the module provides also data points for the entire room, e.g. for total volume flows or consolidated alarms
- ▶ When used on a single controller: data points for volume flow rate, alarm, damper blade position, or others
- ▶ Centralised operating mode default setting, e.g. night-time operation

 **Application**

- ▶ Expansion module Type EM-BAC-MOD for the EASYLAB system
- ▶ BACnet-MS/TP or Modbus RTU interface to the central BMS
- ▶ Data points for individual controllers or for the room
- ▶ Room interface: Default setting of room operating modes within the EASYLAB system, increase or reduction of the air change rate, readout of the actual room operating values or evaluated damper blade positions, consolidated alarms
- ▶ Controller interface: Operating mode default setting for a single fume cupboard controller, readout of individual operating values such as volume flow rates for single controllers, or individual alarms
- ▶ Can be used with fume cupboard, supply air, extract air or differential pressure controller EASYLAB TCU3 and with adapter module TAM
- ▶ For use in laboratories, clean rooms in the pharmaceutical and semiconductor industries, operating theatres, intensive care units, and offices with very demanding control requirements
- ▶ Factory mounted or for retrofitting into the EASYLAB base component casing

 **Special characteristics**

- ▶ Ready for installation, can be easily connected to the main PCB
- ▶ Interface for EIA-485 networks BACnet MS/TP and Modbus RTU
- ▶ BACnet Protocol Revision 12.0
- ▶ Only standard BACnet objects or Modbus registers are used for communication
- ▶ Data interface for an EASYLAB controller or for an EASYLAB room with different functional profiles
- ▶ Hardware switch to enter network addresses and communication parameters (no communication software required)





Technical data

Supply voltage	5 V DC from controller or adapter module
Communication interface	EIA-485 standard
Protocol	BACnet MS/TP standard rev. 12 or Modbus RTU
Data transmission speeds	BACnet: 9600, 19200, 38400, 76800 Bd, Modbus: 9600, 19200, 38400, 57600 Bd
Parity checks for data transmission security	None, odd, even
Configurable network addresses	01 ... 99
Operating temperature	0 - 50 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2004/108/EC
Dimensions (B x H x T)	78 x 65 x 100 mm





BACnet/IP interface, Modbus/IP interface, and webserver for EASYLAB controllers and TAM adapter modules

Order code

ELAB / ...I... / ...
ELAB / ...R... / ...



Expansion module

<p>I EM-IP: EM-IP for BACnet- / Modbus-IP</p>	<p>R and Webserver EM-IP + RTC: EM-IP for BACnet- /</p>	<p>Modbus-IP and Webserver and real time clock</p>
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Order code

EM – IP
EM – RTC

Features

Expansion module for EASYLAB fume cupboard controllers, room controllers and TAM adapter modules, for the integration of rooms or individual volume flow controllers with the central BMS, and for accessing the above mentioned devices using the integral webserver.

- ▶ Change between BACnet/IP and Modbus/IP using the integral webserver
- ▶ BACnet Application Specific Controller (B-ASC) according to Annex L
- ▶ Trend logging, alarming and scheduling for selected data points
- ▶ BACnet/IP (Annex J based on IPv4)
- ▶ BACnet/IP interface by integrating the expansion module with EASYLAB components
- ▶ Modbus interface with individual data registers
- ▶ Modbus/IP (according to IEC 61158)
- ▶ Easy retrofitting
- ▶ Two RJ45 10/100 Mbit Ethernet connections (daisy chain is possible)
- ▶ Multi functional Reset push button
- ▶ Power and status indicator lights
- ▶ MicroSD card as persistent data store for firmware, trend logging, alarming, scheduling and help files
- ▶ Real time clock expansion module (RTC) (optional)

Application

- ▶ Expansion module Type EM-IP for the EASYLAB system
- ▶ BACnet/IP or Modbus/IP interface to the central BMS
- ▶ Integral webserver for configuring EM-IP
- ▶ Display of the principal device data on the web UI
- ▶ BACnet trend logging, alarming and scheduling for selected data points
- ▶ Data points for individual controllers or for the room
- ▶ Room interface: Default setting of room operating modes within the EASYLAB system, increase or reduction of the air change rate, readout of the actual room operating values or evaluated damper blade positions, consolidated alarms, volume flow rates and alarms for all EASYLAB controllers in a room
- ▶ Controller interface: Operating mode default setting for a single fume cupboard controller, readout of individual operating values such as volume flow rates for single controllers, or individual alarms
- ▶ Can be used with fume cupboard, supply air, extract air or differential pressure controller EASYLAB TCU3 and with adapter module TAM
- ▶ For use in laboratories, clean rooms in the pharmaceutical and semiconductor industries, operating theatres, intensive care units, and offices with very demanding control requirements
- ▶ Factory mounted or for retrofitting into the EASYLAB base component casing

Special characteristics

- ▶ Ready for installation, can be easily connected to the main PCB
- ▶ Interface for IP-based networks BACnet/IP and Modbus/IP
- ▶ BACnet Application Specific Controller (B-ASC) according to Annex L
- ▶ Connection for access to BACnet/IP network, Modbus/IP network or integral webserver
- ▶ BACnet/IP Protocol Revision 7.0
- ▶ Only standard BACnet objects or Modbus registers are used for communication
- ▶ Data interface for an EASYLAB controller or for an EASYLAB room with different functional profiles
- ▶ Multi functional Reset push button
- ▶ All settings for alarming, trend logging, event logging, notifications and scheduling can be accessed and changed using the integral webserver (no configuration software required)
- ▶ 2 GB microSD card for firmware, trend logging, event logging and alarming
- ▶ With BACnet Broadcast Management Device (BBMD) function
- ▶ Foreign devices are supported
- ▶ Firmware is updated using the webserver





Technical data

Dimensions (B × H × T)	65 × 15 × 90 mm
Supply voltage (from the controller TCU3 or adapter module TAM)	5 V DC
Acceptable temperature range for storage	-10 to 70 °C
Acceptable temperature range for operation	10 - 50 °C
Maximum humidity, non-condensing, for storage and operation	<90 %
Protection level	IP 20
Persistent data store for firmware, logging objects and help files	2 GB microSD card



BACnet PICS (extract)

Date	2011-07-20
Vendor name/Vendor identifier	TROX GmbH/329
Product name/Model no.	EM-IP/EM-IP
Application/Firmware Revision	1.0/1.0
BACnet Protocol Revision	7
Standardized Device Profile	BACnet Application Specific Controller (B-ASC)
Interoperability Building Blocks Supported	DS-RP-B, DS-WP-B, DS-RPM-B, DS-WPM-B, DS-COVU-B, AE-NI- B, AE-ACK-B, AE-ASUM-B, AE-ESUM-B, AE-INFO-B, AE-EL-I-B, SCHEDWS-I-B, T-VMT-I-B, T-ATR-B, DM-DDB-A, DM-DDB-B, DM-DOB_B, DM-DCC-B, DM-TS-B, DMUTC- B, DM-RD-B, DM-LM-B, DM-R-B
Segmentation Capability	No
Data Link Layer Options	TCP-IP 10/100 Mbit
Device Address Binding	No
Network Security Options	No
Character Sets Supported	ISO 10646 (UTF-8)





For the connection of EASYLAB to the 230 V mains



Order code

ELAB / ... / T... / ...



Order code

EM-TRF



Features

- Expansion module for the direct connection of EASYLAB controllers Type TCU3 and adapter modules Type TAM to the 230 V mains
- ▶ Double-stack terminal blocks for 230 V supply voltage connection
 - ▶ Electric plug connection to the main PCB
 - ▶ The expansion module is fitted into the casing with the EASYLAB base component



Application

- ▶ Expansion module Type EM-TRF for the EASYLAB system
- ▶ For the connection of EASYLAB base components (controller TCU3 or adapter module TAM) to the 230 V AC supply voltage (mains)
- ▶ Power supply for the base component and the connected modules
- ▶ Factory mounted or for retrofitting into the EASYLAB base component casing



Special characteristics

- ▶ Ready for installation, can be easily connected to the main PCB
- ▶ Double-stack terminal blocks for 230 V AC supply voltage connection
- ▶ Simple electrical connection of expansion module and EASYLAB main PCB using a connection plug
- ▶ Simple wiring of switch-operated fume cupboard lighting in combination with the EM-LIGHT expansion module



Technical data

Supply voltage	230 V AC ± 10 %, 50/60 Hz
Power consumption	up to 40 VA for a controller with all expansion modules; up to 35 VA for a fume cupboard controller with control panel; up to 33 VA for a room controller with control panel; up to 29 VA for a room controller without control panel; up to 9 VA for an EASYLAB adapter module TAM
Primary fuse	50 mA slow blow, 250 V
Double-stack terminal blocks	Cable cross-section up to 2.5 mm ²
Operating temperature	0 - 50 °C
IEC protection class	I (protective earth)
Protection level	IP 20
EC conformity	EMC to 2004/108/EU, low voltage to 2006/95/EU
Weight	1.3 kg





For the connection of EASYLAB to the 230 V mains and for uninterruptible power supply

 Order code

ELAB / ... / U... / ...

 Order code

EM-TRF

Features

Expansion module for the direct connection of EASYLAB controllers Type TCU3 and adapter modules Type TAM to the 230 V mains, including uninterruptible power supply

- ▶ Double-stack terminal blocks for 230 V supply voltage connection
- ▶ Electric plug connection to the main PCB
- ▶ The expansion module is fitted into the casing with the EASYLAB base component
- ▶ Uninterruptible power supply for the connected modules
- ▶ Integral battery charging electronics with charge status indicator
- ▶ Power failure is signalled to the EASYLAB control panels
- ▶ Controller action in case of a power failure can be defined

Application

- ▶ Expansion module Type EM-TRF-USV for the EASYLAB system
- ▶ For the connection of EASYLAB base components (controller TCU3 or adapter module TAM) to the 230 V AC supply voltage (mains)
- ▶ Power supply for the base component and the connected modules
- ▶ Battery pack ensures uninterrupted power supply even in case of a mains power failure
- ▶ Control and/or alarm signalling even in case of a power failure
- ▶ Factory mounted or for retrofitting into the EASYLAB base component casing

Useful additions

- ▶ EasyConnect: Configuration software for the commissioning and diagnosis of EASYLAB components

Special characteristics

- ▶ Ready for installation, can be easily connected to the main PCB
- ▶ Double-stack terminal blocks for 230 V AC supply voltage connection
- ▶ Simple electrical connection of expansion module and EASYLAB main PCB using a connection plug
- ▶ Simple wiring of switch-operated fume cupboard lighting in combination with the EM-LIGHT expansion module
- ▶ Intelligent charge control with trickle charging, deep discharge protection, and reverse voltage protection
- ▶ Operating state indicator light
- ▶ Controlled response in case of a power failure can be defined (EASYLAB TCU3 with expansion module EM-TRF-USV)
- ▶ In case of a power failure: Optical signal on the control panel; configurable alarm signalling





Technical data

Supply voltage	230 V AC \pm 10 %, 50/60 Hz
Primary fuse	50 mA slow blow, 250 V
Power consumption	up to 40 VA for a controller with all expansion modules; up to 35 VA for a fume cupboard controller with control panel; up to 33 VA for a room controller with control panel; up to 29 VA for a room controller without control panel; up to 9 VA for an EASYLAB adapter module TAM
Operation in case of a power failure	One controller (TCU3 or TAM) with control panel, standard operation will be maintained for approx. 4.5 h, defined damper blade positions and power failure signalling will be maintained for approx. 6 h
Battery pack charging	1500 mAh
Battery life	up to 4 years; when stored without trickle charging, 6 months
Double-stack terminal blocks	Cable cross-section up to 2.5 mm ²
Operating temperature	0 - 50 °C
IEC protection class	I (protective earth)
Protection level	IP 20
EC conformity	EMC to 2004/108/EU, low voltage to 2006/95/EU
Weight	2.4 kg (including 1.1 kg for battery pack)





Automatic zero point correction for EASYLAB

 Order code

ELAB / ...Z... / ...

 Order code

EM – AUTOZERO

 **Features**

- Expansion module for EASYLAB controllers that offers automatic zero point correction for long-term stable volume flow rate measurement and reduced maintenance
- ▶ Particularly recommended for the volume flow or differential pressure measurement in sensitive areas
 - ▶ EASYLAB controller automatically identifies and uses the expansion module
 - ▶ The expansion module is fitted into the casing with the EASYLAB base component
 - ▶ Easy retrofitting
 - ▶ No additional configuration effort

 **Application**

- ▶ Expansion module Type EM-AUTOZERO for the EASYLAB system
- ▶ EM-AUTOZERO, automatic zero point correction for long-term stable volume flow rate measurement and reduced maintenance.
- ▶ Can be used with fume cupboard, supply air, extract air or differential pressure controller EASYLAB TCU3
- ▶ For use in laboratories, clean rooms in the pharmaceutical and semiconductor industries, operating theatres, intensive care units, and offices with very demanding control requirements

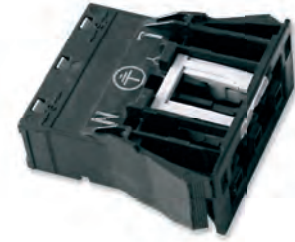
 **Special characteristics**

- ▶ Long-term stable volume flow rate measurement and reduced maintenance
- ▶ Automatic zero point correction as soon as the supply voltage is applied
- ▶ Cyclical zero point correction during operation (every 8 hours)
- ▶ No additional configuration effort
- ▶ The EASYLAB controller identifies the expansion module automatically

 **Technical data**

Supply voltage	24 V DC from the controller TCU3
Power rating	1.8 W
Maximum pressure	10 bar
Operating temperature	0 - 50 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2004/108/EC
Weight	0.100 kg





For the simple connection of lighting to an EASYLAB fume cupboard controller



Order code

ELAB / ... / ...S / ...



Order code

EM – LIGHT



Features

- Expansion module with a wired socket for the connection of lighting and for switching the lighting on/off using the control panel
 - ▶ Lighting can be switched on/off using an EASYLAB control panel
 - ▶ Socket for the connection of fume cupboard or room lighting (230 V)
 - ▶ Only in connection with expansion module EM-TRF or EM-TRF-USV
 - ▶ Socket on the outside of the controller casing
 - ▶ Plug-in connection for the lighting, e.g. fume cupboard lighting



Application

- ▶ Expansion module Type EM-LIGHT for the EASYLAB system
- ▶ Simple connection of lighting (230 V) to a wired socket on the controller casing
- ▶ Control of fume cupboard lighting using the control panel
- ▶ For fume cupboard controllers EASYLAB TCU3 with expansion module EM-TRF or EM-TRF-USV
- ▶ Use for fume cupboards



Special characteristics

- ▶ Control of fume cupboard lighting using the control panel
- ▶ Simple connection of lighting to a wired socket on the controller casing
- ▶ Socket is on the outside of the casing; the casing need not be opened
- ▶ Plug-in connection cable of the fume cupboard lighting is simply connected to the socket



Useful additions

- ▶ EasyConnect: Configuration software for the commissioning and diagnosis of EASYLAB components



Technical data

Supply voltage	230 V AC, connection to EM-TRF or EM-TRF-USV
Maximum switching current	8 A; switch-on current 12 A max.
Operating temperature	0 - 50 °C
IEC protection class	I (protective earth)
Protection level	IP 20





For fume cupboard controllers EASYLAB and TCU-LON-II

 Order code

ELAB / FH - VS / ...
TM* / FH / ...

 Order code

VS - TRD

Features

Face velocity transducer for the variable, demand-based control of extract air flows in fume cupboards

- ▶ Non-contact measurement of the face velocity, hence not subject to wear
- ▶ For fume cupboards with vertical and horizontal sashes
- ▶ Automatic detection of thermal loads
- ▶ Simple installation into a drilled hole in the dome of the fume cupboard, also for multiple fume cupboards in a row
- ▶ Plug-in cable
- ▶ Measuring range 0 - 1 m/s

Additional application of the transducer

- ▶ For monitoring the face velocity with monitoring devices FMS-2

Application

- ▶ Face velocity transducer Type VS-TRD for the LABCONTROL system

Technical data

Supply voltage	24 V AC/DC from the controller
Measuring range	0 - 1 m/s
Actual value signal output	2 - 10 V DC
Operating temperature	15 - 40 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2004/108/EC

- ▶ For the demand-based control of variable volume flows in fume cupboards
- ▶ Connection to an EASYLAB controller TCU3, to a controller TCU-LON-II, or to monitoring system FMS-2
- ▶ Consideration of all sashes of a fume cupboard
- ▶ For fume cupboards with vertical and horizontal sashes, also for fume cupboards with sashes on two sides
- ▶ Increased safety for people working in labs
- ▶ For use in laboratories and in clean rooms in the pharmaceutical and semiconductor industries

Useful additions

- ▶ CAB-TRD: 5 m plug-in extension cable for face velocity transducer VS-TRD
- ▶ EasyConnect: Configuration software for the commissioning and diagnosis of EASYLAB components
- ▶ MConnect: Configuration software for the commissioning and diagnosis of the Type TFM/TPM monitoring devices and TCU-LON-II

Special characteristics

- ▶ Demand-based fume cupboard control depending on the sash distance
- ▶ Recording of the face velocity at vertical and horizontal sashes as well as for both sashes on a fume cupboard
- ▶ Non-contact measurement of the face velocity, hence not subject to wear
- ▶ Constant face velocity (typically 0.5 m/s) within the set volume flow rate range due to cascade control of face velocity and volume flow
- ▶ Detection and safe dissipation of thermal loads due to automatic volume flow increase

Standards and guidelines

- ▶ Type certification: Volume flow control system for fume cupboards to EN 14175





For EASYLAB fume cupboard controllers

Order code

ELAB / FH – DS / ...
ELAB / FH – DV / ...



Order code

DS – TRD

Features

Sash distance sensor for the variable, demand-based control of extract air flows in fume cupboards

- ▶ Sash distance measurement
- ▶ For fume cupboards with vertical sashes only; also for walk-in fume cupboards
- ▶ Ideal for rooms with high airflow velocities or levels of turbulence
- ▶ Multiple possibilities to couple the sensor with the sash movement
- ▶ Measuring range 0 - 1750 mm or 350 - 2100 mm

Application

- ▶ Sash distance sensor Type DS-TRD for fume cupboard controllers EASYLAB TCU3
- ▶ For the demand-based control of variable volume flows in fume cupboards, based on the sash distance
- ▶ For linear control (FH-DS) and safety-optimised control (FH-DV) by the EASYLAB controller
- ▶ For fume cupboards with vertical sashes only; also for walk-in fume cupboards
- ▶ Ideal for rooms with high airflow velocities or levels of turbulence (measurement of the sash distance, the volume flow rate measurement is therefore not affected)
- ▶ For use in laboratories and in clean rooms in the pharmaceutical and semiconductor industries

Special characteristics

- ▶ Suitable for sashes with 1750 mm maximum opening
- ▶ Suitable for EASYLAB controller TCU3
- ▶ Can be used with different control strategies (FH-DS and FH-DV)
- ▶ Ideal for rooms with high airflow velocities or levels of turbulence
- ▶ Replaces a separate contact for sash distance monitoring according to EN 14175

Standards and guidelines

- ▶ Type certification: Volume flow control system for fume cupboards to EN 14175
- ▶ Alarm function to EN 14175 if the sash distance limit is exceeded

Useful additions

- ▶ EasyConnect: Configuration software for the commissioning and diagnosis of EASYLAB components

Technical data

Supply voltage	12 V DC from the controller
Measuring range	0 - 1750 mm or 350 - 2100 mm
Measurement accuracy	± 0.25 % of the reading
Actual value signal output	0 - 10 V DC, 0.5 mA max.
Operating temperature	-20 to 40 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 40
EC conformity	EMC according to 2004/108/EC





For the differential pressure recording and control in combination with EASYLAB

 Order code

PT – GB604

1 Type

PT Differential pressure transducer

2 Variants

699 Measuring range ± 50 or ± 100 Pa
699-LCD Measuring range ± 50 or ± 100 Pa,
with pressure display

GB604 Measuring range ± 100 Pa

GB604-CAL Measuring range ± 100 Pa, with
calibration result

+ Features

Differential pressure transducers based on the static measurement principle for the room or duct pressure control in combination with EASYLAB controllers TCU3 or LABCONTROL controllers TCU-LON-II

- ▶ Suitable for air and non-aggressive media
- ▶ For use in laboratories, clean rooms in the pharmaceutical and semiconductor industries, operating theatres, intensive care units, and offices with very demanding control requirements
- ▶ Constructions with calibration certificate to meet GMP requirements

Y Application

- ▶ Differential pressure transducer for the LABCONTROL system
- ▶ For the room or duct pressure control in combination with EASYLAB controllers TCU3 or with TCU-LON-II
- ▶ For the room and duct pressure monitoring in combination with monitoring systems TPM
- ▶ For use in laboratories, clean rooms in the pharmaceutical and semiconductor industries, operating theatres, intensive care units, and offices with very demanding control requirements

◊ Variants

- ▶ 699: Measuring range ± 50 or ± 100 Pa
- ▶ 699-LCD: Measuring range ± 50 or ± 100 Pa, with differential pressure display
- ▶ GB404: Measuring range ± 100 Pa
- ▶ GB604-CAL: Measuring range ± 100 Pa, with calibration certificate to meet GMP requirements (Good Manufacturing Practice)
- ▶ Choose a sufficient measuring range above/below the setpoint pressure

 Static differential pressure transducer 699

Supply voltage	24 V AC $\pm 15\%$ or 13.5 - 33 V DC
Power rating	1 VA
Output signal	0 - 10 V DC, 1 mA max.
Media	non-aggressive gases
Measuring range	± 50 Pa factory set, can be changed to ± 100 Pa
Measurement accuracy	$\pm 2\%$ of full scale
Overload protection	for negative pressure measurement: -400 Pa at P1, for positive pressure measurement 10000 Pa at P1
Connections for tubes	$\varnothing 6.2$ mm (for flexible tubes 6 mm)
Operating temperature	0 - 70 °C (non-condensing)
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54 (with cover)
EC conformity	EMC according to 2004/108/EC
Dimensions (B x H x T)	92 x 75 x 48 mm
Weight	0.1 kg

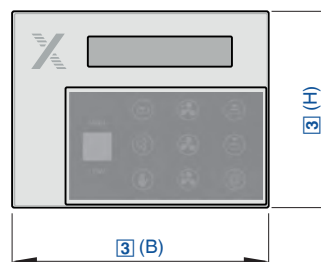




Static differential pressure transducer GB604

Supply voltage	24 V AC, 24 V DC \pm 10 % (switching is possible)
Power rating	1.8 VA
Output signal	0 - 10 V DC; 2 mA max.
Media	non-aggressive gases
Measuring range	\pm 100 Pa
Measurement accuracy	\pm 0.5 % of full scale
Maximum operating pressure	70 kPa
Connections for tubes	for flexible tubes 4 mm
Operating temperature	-20 to 65 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2004/108/EC
Dimensions (B x H x T)	122 x 120 x 58 mm
Weight	0.3 kg





For EASYLAB fume cupboard controllers or room controllers, with text display

 Order code

BE - LCD

1

1 Type

BE-LCD Control panel with 40-character display

+ Features

Control panels to be used with fume cupboard controllers or room controllers, for displaying operating values, activating functions and signalling operating states

- ▶ Signalling of safety-related functions for fume cupboards according to EN 14175 or of operating states for rooms
- ▶ Display of actual values, setpoint values and status messages
- ▶ Wireless communication with Bluetooth module
- ▶ 40-character text display
- ▶ Push buttons for the operating mode default setting and for specific functions
- ▶ Project-specific range of functions with configurable push buttons
- ▶ Integral service socket for configuration and diagnosis
- ▶ Casing suitable for flush mounting to fume cupboard side frame, or for surface mounting on a wall

X Application

- ▶ Control panels Type BE-LCD for displaying and operating the aerodynamic functions of fume cupboards or rooms
- ▶ Display of actual values, setpoint values, and operating states either as text or on the status display
- ▶ Optical and acoustic alarms
- ▶ Operating mode default setting
- ▶ Operation of lighting, automatic sash device or blinds without additional installation or wiring

Control panel for fume cupboard control

- ▶ Status display to EN 14175
- ▶ Connection to fume cupboard controller EASYLAB TCU3

Room control panel

- ▶ Status display for the volume flow rate or differential pressure control of a room
- ▶ Connection to room controller EASYLAB TCU3 or TAM with active room management function

+ Useful additions

- ▶ EasyConnect: Configuration software for the commissioning and diagnosis of EASYLAB components

★ Special characteristics

- ▶ Large three-colour status display
- ▶ Push buttons and functions can be configured individually
- ▶ Easy to use - available function buttons are visible, unavailable function buttons are not visible
- ▶ Excellent operating reliability as a result of continuous self monitoring of the communication between controller and control panel
- ▶ Pluggable adapter which can provide four different viewing angles
- ▶ Mounting on side frame or wall

Technical data

Supply voltage	24 V DC from the controller TCU3 or adapter module TAM
Connecting cable	Approx. 5 m standard network patch cable, SF-UTP, extendable to 40 m
Operating temperature	10 - 50 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC according to 2004/108/EC
Dimensions	145 × 111 × 23 mm
Weight	0.280 kg





For EASYLAB fume cupboard controllers and FMS monitoring systems

Order code

BE - SEG - 02

1 2

1 Type

BE-SEG Control panel for EASYLAB controller TCU3 or fume cupboard monitoring system FMS

2 Variant

02 For all EASYLAB controllers and for monitoring system FMS with OLED display

03

For fume cupboard monitoring system FMS

Features

- Control panels to be used for displaying operating values, activating functions and signalling operating states
- ▶ Signalling of the safety-related functions of fume cupboards according to EN 14175
 - ▶ Display of actual values, setpoint values and status messages
 - ▶ OLED display for face velocity, volume flow rate and system information
 - ▶ Push buttons for the operating mode default setting and for specific functions
 - ▶ Project-specific range of functions with configurable push buttons
 - ▶ Two control panels can be used simultaneously for each fume cupboard controller
 - ▶ Integral service socket for configuration and diagnosis
 - ▶ Casing suitable for flush mounting or surface mounting to the fume cupboard side frame

Optional equipment and accessories

- ▶ Two construction variants with different ranges of functions
- ▶ Indication of power supply failure for fume cupboard controllers with expansion module EM-TRF-USV
- ▶ Wireless communication with Bluetooth module BlueCON

Application

- ▶ Control panels Type BE-SEG for displaying and operating the aerodynamic functions of fume cupboards
- ▶ Status display to EN 14175
- ▶ Optical and acoustic alarms
- ▶ Operating mode default setting
- ▶ Operation of fume cupboard lighting
- ▶ Connection to fume cupboard controller EASYLAB TCU3 and to fume cupboard monitoring system FMS

BE-SEG-02

- ▶ Display of actual values, setpoint values and operating states
- ▶ Operation of automatic sash devices

Variants

- ▶ BE-SEG-02: Control panel for fume cupboard control and monitoring
- ▶ BE-SEG-03: Control panel for fume cupboard monitoring

Useful additions

- ▶ EasyConnect: Configuration software for the commissioning and diagnosis of EASYLAB components

Special characteristics

- ▶ Optical and acoustic signalling of the safety-related functions of fume cupboards according to EN 14175
- ▶ Large three-colour status display
- ▶ Push buttons and functions can be configured individually
- ▶ Easy to use - available function buttons are visible, unavailable function buttons are not visible
- ▶ Excellent operating reliability as a result of continuous self monitoring of the communication between controller and control panel
- ▶ Two control panels can be used for each fume cupboard controller (BE-SEG-02 only) or monitoring system, e.g. for fume cupboards with sash windows on two sides

Technical data

Supply voltage	24 V DC from the controller TCU3
Connecting cable	Approx. 5 m standard network patch cable, SF-UTP, extendable to 40 m
Operating temperature	0 - 50 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 41 for surface mounting, IP 42 for flush mounting
Dimensions	23 × 306.4 × 6.4 (without wire clamping bracket)
EC conformity	EMC according to 2004/108/EC
Weight	0.130 kg





For the commissioning and diagnosis of EASYLAB components and FMS



Order code

EasyConnect – CAB

1

2

1 Software

EasyConnect Configuration software

2 Interface adapter

CAB USB-RS485 and connecting cable
(cable connection)

BC Bluetooth adapter module BlueCON
(wireless communication)

+ Features

Software for the configuration and diagnosis of controllers Type TCU3, adapter modules TAM and monitoring system FMS

- ▶ Display of actual operating values
- ▶ Interactive navigation
- ▶ Extensive diagnosis and diagram functions
- ▶ Creation of configuration protocols and backup files
- ▶ The software automatically recognises the controller type and displays the corresponding operating values and parameters
- ▶ Selection of dialogue language and of unit of measure for the volume flow rate
- ▶ Connecting cable and USB adapter are included in the supply package

Optional equipment and accessories

- ▶ Bluetooth adapter module BlueCON for wireless communication

Application

- ▶ EasyConnect configuration software for EASYLAB controllers TCU3, adapter modules TAM, and monitoring systems FMS
- ▶ Used to change the configuration of fume cupboard controllers, supply air or extract air controllers, differential pressure controllers, and adapter modules
- ▶ Extensive functions for configuration and commissioning
- ▶ Functions for test and fault diagnosis
- ▶ Documentation of configuration settings

◊ Variants

- ▶ CAB: Configuration software with connecting cable and USB RS485 (cable connection)
- ▶ BC: Configuration software with Bluetooth adapter module BlueCON (wireless communication)

★ Special characteristics

- ▶ Display of actual operating values
- ▶ Interactive navigation
- ▶ Extensive diagnosis and diagram functions
- ▶ Creation of configuration protocols and backup files
- ▶ Selection of dialogue language and of unit of measure for the volume flow rate
- ▶ Connecting cable and USB adapter are included in the supply package
- ▶ Optional Bluetooth adapter module BlueCON for wireless communication



X AIRCONTROL



The system

Increasing requirements on the energy efficiency of ventilation and air conditioning systems as well as EU regulations can be fulfilled with intelligent control engineering solutions.

X-AIRCONTROL is a control system that uses information from sensors and actuating elements to optimise ventilation and air conditioning systems.

It calculates what all is required to achieve a comfortable room climate, and controls fans, pumps and valves accordingly.

X-AIRCONTROL is a modular system that can be used to optimise individual functions or a whole range of functions for a project.

- Evaluate the damper blade positions of all air terminal units
- Optimise fan control (optimiser function)
- Evaluate the heating and cooling required for a zone
- Calculate the supply air temperature setpoint value for the air handling unit
- Configure the system, display the system configuration and manage alarms – all this from a central point



Zone master module for up to 25 zone modules, with integral webserver and interfaces to higher-level systems

Order code

X-AIR-ZMAS

1

1 Type

X-AIR-ZMAS

X-AIRCONTROL zone

master module

+ Features

X-AIRCONTROL zone master module for the control of zone modules and as an interface to higher-level systems such as air handling units and central BMS

- ▶ Optimisation of control functions to achieve a comfortable and energy-efficient operation of ventilation and air conditioning systems
- ▶ One zone master module and up to 25 zone modules form a segment
- ▶ Up to five cascading master modules form a section with up to 125 zone modules
- ▶ Communication between master modules, and between master and zone modules, is by plug and play
- ▶ Web server for configuration and operation; user interface optimised also for mobile devices
- ▶ Modbus TCP and BACnet IP interfaces to higher-level systems such as the central BMS
- ▶ Modbus RTU interface to air handling units Type X-CUBE compact
- ▶ Connection of signals, e.g. outdoor air temperature and fire alarm
- ▶ Output of signals, e.g. requests and alarms

X Application

- ▶ X-AIRCONTROL zone master module Type X-AIR-ZMAS, for the provision of control signals to zone modules and as an interface to higher-level systems
- ▶ Centralised parameter setting for, and operation and monitoring of, zone modules
- ▶ For use in office buildings, hotels, residential buildings and others
- ▶ One zone master module can be used to control a segment of up to 25 zone modules
- ▶ Up to five cascading master modules form a section with up to 125 zone modules

- ▶ For the connection of up to 25 zone modules to air handling units Type X-CUBE compact (only 4 zone modules if no master module is used)
- ▶ Communication between master modules, and between master and zone modules, is by plug and play
- ▶ Web server for configuration and operation; user interface optimised also for mobile devices
- ▶ Modbus TCP and BACnet IP interfaces to higher-level systems such as the central BMS
- ▶ Optimum number of data points allows for easy administration in higher-level systems
- ▶ Plug and play interface to air handling units Type X-CUBE compact
- ▶ Connection of signals, e.g. outdoor air temperature and fire alarm
- ▶ Output of signals such as operating states, requests and alarms
- ▶ Demand-based activation of the supply or extract air fan, depending on the damper blade positions or pressures in the supply or extract air system
- ▶ Pressure control or limitation in the supply air and extract air systems
- ▶ Energy-efficient operation of the air handling unit as a consequence of demand-based default settings (fan speed, supply air temperature setpoint); the default settings result from the evaluation of parameters sent by zone modules (e.g. damper blade positions, required heating, required cooling)
- ▶ Temperature setpoint shifting based on the outdoor air temperature (summer and winter compensation)
- ▶ Central alarm management; configuration display for all rooms in a section, e.g. display of actual and setpoint values
- ▶ Central device for firmware updates for a section

+ Useful additions

- ▶ Zone modules X-AIR-ZMO-MOD, X-AIR-ZMO-MP, X-AIR-ZMO-ANA
- ▶ Temperature sensor X-SENS-TEMP-PT1000

★ Special characteristics

- ▶ Plug and play system which automatically detects master and zone modules
- ▶ Energy-efficient operation of the air handling unit (fan speed, supply air temperature setpoint) as a consequence of the evaluation of parameters sent by zone modules
- ▶ Web server for configuration and operation; user interface optimised also for mobile devices
- ▶ Modbus TCP and BACnet IP interfaces to higher-level systems such as the central BMS; central signalling of higher-level data
- ▶ For the connection of up to 25 zone modules to air handling units Type X-CUBE compact (only 4 zone modules if no master module is used)
- ▶ Plug connections or plug-in screw terminals



 **Technical data**

Supply voltage	24 V AC ± 15 %
Power rating	5 VA without peripheral systems
SD card slot	Up to 8 GB (SDHC)
SD card	2 GB
Operating temperature	0 - 50 °C
Max. humidity	10 - 90% rh, no condensation
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC to 2014/30/EU, ROHS 2011/65/EU
Installation location	Switch cabinet, wall or ceiling
Fixing	With screws or on a mounting rail
Dimensions	156 × 110 × 58 mm
Weight	430 g



 **Technical data**

6 digital inputs	Volt-free
2 digital outputs (DO1, DO2)	2 relays, NO, 5 A, 230 V max.
3 digital outputs (DO3, DO4, DO5)	3 relays, 1x NO, 2x NC, 5 A, 30 V max.
2 inputs for temperature sensors	PT1000 temperature sensors
3 analogue outputs	0 - 10 V DC
All digital and analogue inputs and outputs	Plug-in screw terminals
1 interface to higher-level systems	Ethernet, 10/100 Mbit/s, network cable SF-UTP, at least cat. 5e, 100 m max., structured wiring
2 interfaces for zone modules	Modbus, AWG 26/6 C data cable, RJ12 plug (6P6C), 100 m max. (module to module)
2 interfaces for cascading zone master modules	Modbus, AWG 26/6 C data cable, RJ12 plug (6P6C), 100 m max. (module to module)
1 interface for air handling unit	Modbus RTU, data cable AWG 26/6 C, RJ12 plug (6P6C), 100 m max. (30 m to X-CUBE compact)





Zone modules for single room control

 Order code

X-AIR-ZMO – MOD

1

2

1 Type

X-AIR-ZMO X-AIRCONTROL zone module

2 Variant

MOD Zone module with Modbus RTU interface

MP Zone module with MP bus interface

ANA Zone module with analogue interface

COVER Cover for zone modules

+ Features

X-AIRCONTROL zone modules for single room control, with interfaces to a control panel and to a zone master module

- ▶ Single room control system for the demand-based control of temperature, air quality and humidity, and for detecting room occupancy
- ▶ Connection of a room temperature sensor, motion detector, VOC or CO₂ sensor as well as of a window contact, frost protection sensor or dew point sensor
- ▶ Connection of air terminal units for supply air and extract air
- ▶ Connection of a heating valve and a cooling valve
- ▶ Connection of a room control panel
- ▶ Single room control system can be expanded by centralised functions if a zone master is used

Optional equipment and accessories

- ▶ VAV terminal units for supply and extract air
- ▶ Valves with actuator for heating and cooling
- ▶ Control panels with setpoint value adjuster or touch screen
- ▶ Sensors

X Application

- ▶ Type X-AIR-ZMO zone modules for single room control, i.e. for the demand-based control of temperature, air quality and humidity, and for detecting occupancy
- ▶ For use in office buildings, hotels, residential buildings and others
- ▶ Optimum number of data points for communication with the zone master
- ▶ Connection of a room temperature sensor, motion detector, VOC or CO₂ sensor as well as of a window contact, frost protection sensor or dew point sensor
- ▶ Connection of air terminal units for supply and extract air
- ▶ Connection of a heating valve and a cooling valve
- ▶ Connection of a room control panel
- ▶ Single room control system can be expanded by centralised functions if a zone master is used
- ▶ One zone master module and up to 25 zone modules form a segment
- ▶ Plug and play communication between the master module and the zone modules

◊ Variants

- ▶ X-AIR-ZMO-MOD: Modbus RTU is used for the communication with air terminal units and valves
- ▶ X-AIR-ZMO-MP: An MP bus is used for the communication with air terminal units and valves
- ▶ X-AIR-ZMO-ANA: Analogue signals are used for activating air terminal units and valves

⚙ Useful additions

- ▶ X-AIR-ZMO-COVER cover for zone modules
- ▶ X-AIR-ZMAS zone master module
- ▶ X-AIR-CP-2T, X-AIR-CP-TS control panels
- ▶ X-SENS-... sensors

★ Special characteristics

- ▶ Plug and play system; master modules, zone modules and sensors are automatically detected if they have a Modbus interface
- ▶ RJ12 connections at the outside or plug-in screw terminals
- ▶ Activation of air terminal units and valve actuators
- ▶ Display for status information





Technical data

Supply voltage	24 V AC ± 15 %
Power rating	2 VA without peripheral systems
Operating temperature	0 - 50 °C
Max. humidity	10 - 90% rh, no condensation
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
EC conformity	EMC to 2014/30/EU, ROHS 2011/65/EU
Installation location	Switch cabinet, wall or ceiling
Fixing	With screws or on a mounting rail
Dimensions	156 × 90 × 45 mm
Weight	270 g



X-AIR-ZMO-MOD

2 digital inputs	Volt-free
2 digital outputs	2 relays, NO, 5 A, 230 V max.
1 input for a temperature sensor	PT1000 temperature sensor, RJ12 socket (together with air quality sensor)
1 analogue input	0 - 10 V DC, for setpoint value adjuster ±5 K max.
1 analogue input	0 - 10 V DC, for air quality sensor, RJ12 socket (together with temperature sensor)
Digital and analogue inputs and outputs	Plug-in screw terminals, 1.5 mm ² , except for temperature and air quality sensors
2 interfaces for zone modules	Modbus, AWG 26/6 C data cable, RJ12 plug (6P6C), 100 m max. (module to module)
3 interfaces for actuators	Modbus, AWG 26/6 C data cable, RJ12 plug (6P6C), 30 m max. (total length per interface), with splitter (X-SENS-SPLITTER) up to 2 actuators on one interface; up to 5 actuators in total
1 interface, sensors and room control panel	Modbus, AWG 26/6 C data cable, RJ12 plug (6P6C), 30 m max. (total length)



X-AIR-ZMO-MP

2 digital inputs	Volt-free
1 input for a temperature sensor	PT1000 temperature sensor
1 analogue input	0 - 10 V DC, for setpoint value adjuster ±5 K max.
2 analogue inputs	0 - 10 V DC, for air quality sensor and humidity sensor
All digital and analogue inputs and outputs	Plug-in screw terminals, 1.5 mm ²
2 interfaces for zone modules	Modbus, AWG 26/6 C data cable, RJ12 plug (6P6C), 100 m max. (module to module)
4 interfaces for actuators	MP bus, including 24 V DC supply voltage, plug-in screw terminals, 1.5 mm ² , 30 m max. (total length per interface), 1 or 2 actuators per interface, up to 5 actuators in total
1 interface, sensors and room control panel	Modbus, AWG 26/6 C data cable, RJ12 plug (6P6C), 30 m max. (total length)



X-AIR-ZMO-ANA

2 digital inputs	Volt-free
2 inputs for temperature sensors	PT1000 temperature sensors
1 analogue input	0 - 10 V DC, for setpoint value adjuster ±5 K max.
2 analogue inputs	0 - 10 V DC, for air quality sensor and humidity sensor
4 analogue outputs	0 - 10 V DC, air terminal units and valve actuators
All digital and analogue inputs and outputs	Plug-in screw terminals, 1.5 mm ²
2 interfaces for zone modules	Modbus, AWG 26/6 C data cable, RJ12 plug (6P6C), 100 m max. (module to module)
1 interface, sensors and room control panel	Modbus, AWG 26/6 C data cable, RJ12 plug (6P6C), 30 m max. (total length)





Control panels for X-AIRCONTROL zone modules

Order code

X-AIR-CP – 2T

1

2

1 Type

X-AIR-CP X-AIRCONTROL control panel

2 Variant

2T Control panel with temperature sensor and 2" touch screen

TS

Control panel with temperature sensor and setpoint value adjuster

+ Features

Control panels for adapting the room temperature setpoint and for measuring the room temperature

- ▶ Integral room temperature sensor
- ▶ Easy configuration of zone modules for stand-alone solutions

Optional equipment and accessories

- ▶ Setpoint value adjuster: For adjusting the room temperature setpoint by ± 5 K
- ▶ Colour touch screen: Display of actual values and setpoint values, date and time, operating mode default and room temperature setpoint; integral real-time clock for defining simple schedules

X Application

- ▶ Type X-AIR-CP control panels for use with X-AIR-ZMO zone modules
- ▶ Integral room temperature sensor
- ▶ Control panel for setting the room temperature setpoint

◊ Variants

- ▶ X-AIR-CP-2T: Colour touch screen
- ▶ X-AIR-CP-TS: Setpoint value adjuster

+ Useful additions

- ▶ X-AIR-ZMO zone modules

★ Special characteristics

- ▶ Ideal addition to X-AIRCONTROL zone modules
- ▶ Easy expansion of the range of functions

X-AIR-CP-2T

Supply voltage	24 V DC \pm 10%, from the zone module
Power rating	0.775 W without external sensors
Rating in Standby mode	0.5 W
External input 1, CO ₂ sensor	0 - 10 V DC correspond to 0 - 2000 ppm, including power supply to sensors; screw terminals 1 mm ² max.
External input 2, humidity sensor	0 - 10 V DC correspond to 0 - 100% relative humidity, including power supply to sensors; screw terminals 1 mm ² max.
Interface to zone module	Modbus, AWG 26/6 C data cable, RJ12 plug (6P6C), 30 m max.
Operating temperature	- 10 to 40 °C
Max. humidity	0 - 95% rh, no condensation
IEC protection class	III (protective extra-low voltage)
Protection level	IP 21
EC conformity	EMC to 2014/30/EU, ROHS 2011/65/EU
Installation location	Wall installation on a \varnothing 60 mm junction box
Dimensions	82 × 82 × 41 mm
Weight	76 g





X-AIR-CP-TS

Supply voltage	10 V DC, from the zone module
Temperature sensor	PT1000
Setpoint value adjuster	10 kΩ
Interface to zone module	Modbus, screw terminals, 1.5 mm ² max., 30 m max.
Operating temperature	- 10 to 50 °C
Max. humidity	0 - 95% rh, no condensation
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
EC conformity	EMC to 2014/30/EU, ROHS 2011/65/EU
Installation location	Wall installation on a Ø60 mm junction box
Dimensions	82 × 84 × 28 mm
Weight	74 g





Sensors for X-AIRCONTROL zone modules and other equipment

Order code

X-SENS – VOC

1 2

1 Type

X-SENS Sensor

2 Variant

TEMP-RH-EXH Combined temperature and humidity sensor for extract air

TEMP-PT1000 Duct temperature sensor (PT1000)

VOC Air quality sensor (VOC)

CO2-RH Combined CO₂ and humidity sensor

DEWP Dew point monitor

PIR-SM180° motion detector

PIR-FM360° motion detector

SPLITTER Four-way splitter for the connection of four sensors or control panels (Modbus)

+ Features

Components for the measurement and recording of various quantities and conditions in systems for single room control and centralised control - such as X-AIRCONTROL

- ▶ Combined temperature and humidity sensor
- ▶ Dew point monitor
- ▶ Air quality sensor
- ▶ Motion detector
- ▶ Splitter

Application

- ▶ Type X-SENS sensors for use with X-AIRCONTROL and other control systems
- ▶ Can be connected to X-AIR-ZMO zone modules and X-AIR-ZMAS master modules
- ▶ Duct temperature sensor for supply and extract air
- ▶ Combined temperature and humidity sensor for extract air ducts
- ▶ Air quality sensor used as a duct sensor for measuring the concentration of volatile organic compounds (VOC)
- ▶ Air quality sensor for measuring the CO₂ content in the room air and, when used as a room sensor, for measuring the humidity
- ▶ Dew point monitor for chilled ceilings etc.
- ▶ Motion detector (occupancy)
- ▶ Four-way splitter for the connection of four sensors or control panels (Modbus)

◊ Variants

- ▶ **TEMP-RH-EXH**: Combined temperature and humidity sensor for extract air
- ▶ **TEMP-PT1000**: Duct temperature sensor (PT1000)
- ▶ **VOC**: Air quality sensor (VOC)
- ▶ **CO2-RH**: Combined CO₂ and humidity sensor
- ▶ **DEWP**: Dew point monitor
- ▶ **PIR-SM**: 180° motion detector
- ▶ **PIR-FM**: 360° motion detector
- ▶ **SPLITTER**: Four-way splitter for the connection of four sensors or control panels (Modbus)

X-SENS-TEMP-RH-EXH

Supply voltage	24 V DC ± 25%, from the zone module
Power rating	0.22 W
	Temperature measurement
Measuring range	-40 to 120 °C
Measurement error	0.25 K (15 - 40 °C)
	Humidity measurement
Measuring range	0 - 100% rh
Measurement error	<5% rh, <2% rh (10 - 90% rh)
Long term drift	0.5% rh per year
Installed length	50 - 250 mm
Operating temperature	- 20 to 50 °C
Max. humidity	5 - 95% rh, no condensation
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54 (sensor head IP 32)
Connecting cable	7 m, with RJ12 plug
Installation location	Circular and rectangular ducts
Weight	250 g





X-SENS-TEMP-PT1000

Sensor	PT1000
Resistance	1000 Ω at 0 °C
Measurement error	0.5 K (-40 to 15 °C) 0.725 K (40 to 85 °C)
Installed length	116 mm
Operating temperature	- 40 to 100 °C
Max. humidity	5 - 95% rh, no condensation
IEC protection class	III (protective extra-low voltage)
Protection level	IP 32
Connecting cable	4 m, bare wire ends
Installation location	Circular and rectangular ducts
Weight	250 g



X-SENS-VOC

Supply voltage	24 V DC ± 25%, from the zone module
Power rating	0.46 W
Measuring range	450 - 2000 ppm
Measurement error	<150 ppm
Start-up time	15 min
Response time	5 min
Installed length	65 - 105 mm
Operating temperature	0 - 50 °C
Max. humidity	5 - 95% rh, no condensation
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54 (sensor head IP 20)
Connecting cable	7 m, with RJ12 plug
Installation location	Circular and rectangular ducts
Weight	175 g



X-SENS-CO2-RH

Supply voltage	24 V AC/DC, from the zone module
Power rating	1.2 W
	CO ₂ measurement
Measuring range	0 - 2000 ppm
Measurement error	±30 ppm
Start-up time	10 min
	Humidity measurement
Measuring range	0 - 100% rh
Measurement error	3% rh (20 - 80% rh)
Long term drift	<10% rh per year
Operating temperature	0 - 50 °C
Max. humidity	5 - 95% rh, no condensation
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
Colour	RAL 9010, pure white
Installation location	Wall installation
Dimensions	80 × 105 × 23.5 mm
Weight	69 g





X-SENS-PIR-SM

Supply voltage	24 V AC/DC \pm 10%, from the zone module
Sensor	PIR (passive infrared)
Operational range	180°
Detection range	8 m; 4 m with people sitting
Installation, distance from floor	1.1 to 2.2 m (4 m max.)
Operating temperature	- 25 to 55 °C
Max. humidity	5 - 95% rh, no condensation
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
Connection	Screw terminals
Colour	RAL 9010, pure white
Installation location	Wall installation on a \varnothing 60 mm junction box
Dimensions	88 x 88 x 64 mm
Weight	98 g



X-SENS-PIR-FM

Supply voltage	24 V AC/DC \pm 10%, from the zone module
Sensor	PIR (passive infrared)
Operational range	360°
Detection range	8 m; 4 m with people sitting
Installation, distance from floor	2.5 to 3.0 m (10 m max.)
Operating temperature	- 25 to 55 °C
Max. humidity	5 - 95% rh, no condensation
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
Connection	Screw terminals
Colour	RAL 9010, pure white
Installation location	Wall installation
Dimensions	98 mm, 48 mm protruding beyond the surface
Weight	104 g



X-SENS-DEWPT

Supply voltage	24 V AC/DC \pm 20%, from the zone module
Power rating	1.0 VA
Switching point	92 \pm 4% rh at 25 °C
Hysteresis	5% rh
Response time	3 minutes max.
Exposure to condensation	30 minutes max.
Switch output	Volt-free contact, 230 V AC max., 1 A max.
Operating temperature	0 - 50 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 30
Installation location	Casing suitable for installation on a wall or ceiling, sensor casing suitable for chilled surfaces
Weight	85 g

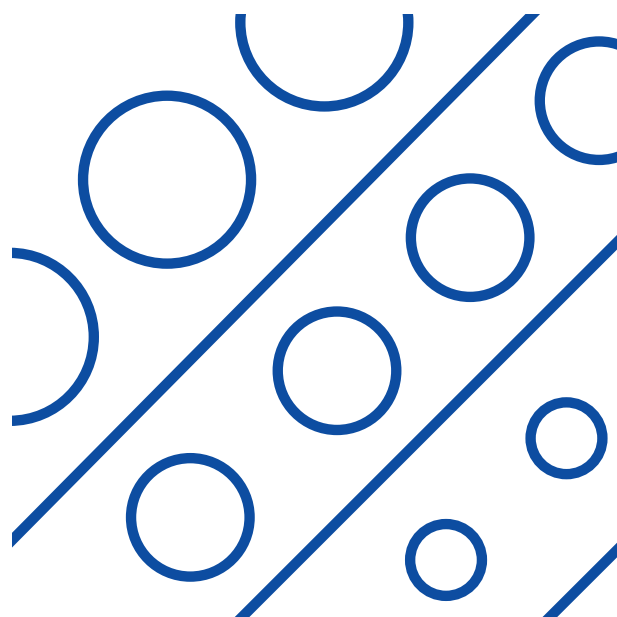


X-SENS-SPLITTER

Operating temperature	0 to 50 °C
IEC protection class	III (protective extra-low voltage)
Protection level	IP 20
Connection	4 RJ12 sockets and 8 spring-loaded terminals, 1.5 mm ²
Installation location	Switch cabinet, wall or ceiling
Fixing	On a mounting rail
Dimensions	46 x 78 x 45
Weight	60 g



Filter elements and filter units



5 Filter elements and filter units

5.1 Automatic roll filter



For large volume flow rates with a high dust concentration

FMC

559

5.2 Roll media



For high dust concentrations or as a prefilter for fine dust filters

FMR

561

5.3 Cut-to-size-pads



For high dust concentrations or as a prefilter for fine dust filters

FMP

562

5.4 Z-Ine-filters



For high dust concentrations or as a prefilter for fine dust filters

ZL

564

5.5 Pocket filters made of non-woven chemical fibres



Prefilters in ventilation systems

PFC

567

5.6 Pocket filters made of non-woven synthetic fibres



Prefilters or final filters in ventilation systems

PFS

569

5.7 Pocket filters made of nanowave medium



Prefilters or final filters in ventilation systems

PFN

571

5.8 Pocket filters made of nonwoven glass fibres



Prefilters or final filters in ventilation systems PFG 573

5.9 Filter inserts



Compact construction for large volume flow rates MFI 577

5.10 Filter elements



Very compact, for modular installation MFE 580

5.11 Filter cells



For large volume flow rates and long filter life MFC 582

5.12 Panel filter



For the most demanding requirements of air cleanliness and sterility MFP 584

5.13 Filter cartridges



Compact construction for special applications MFCA 602

5.14 Filter panels for clean room technology



For the most demanding requirements on the purity of indoor air, workstations, and devices MFPCR 603

5.15 Filter panels with hood



For the most critical requirements in clean room areas FHD 609

5.16 Activated carbon filters



For the adsorption of gaseous odorous substances and contaminants

ACFI

612



For the adsorption of gaseous odorous substances and contaminants

ACFC

613



For the adsorption of gaseous odorous substances and contaminants

ACF

615



For large volume flow rates with a high dust concentration

Order code

FMC – Coarse – 40 % – G02 – CAS / 1850

1 2 3 4 5 6

1 Type

FMC Automatic roll filter media

2 Classification

Coarse Gravimetric separation efficiency according to ISO 16890

3 Efficiency [%]

according to ISO 16890

4 Media type

G02 Glass fibre medium, 50 mm thick

C21 Chemical fibre medium, 8 mm thick

5 Construction

CAS Filter medium in a cassette

CASN Filter medium in a cassette, neutral

RFMS Filter medium on cardboard tube

(Schirp)

RFMA Filter medium on steel spool (AAF)

RFMD Filter medium on cardboard tube (Delbag)

6 Nominal size [mm]

B

+

Features

- Automatic roll filter media for the separation of coarse emissions in supply and extract air
- Filter class Coarse 40 % (coarse dust filter)
- In cassettes or on steel spools for automatic roll filter units
- Tested to ISO 16890

X

Application

- Automatic roll filter media type FMC for the separation of coarse dust in ventilation systems

Technical data

Gravimetric separation efficiency according to ISO 16890	Coarse 40 %	Coarse 35 %
Filter thickness	50 mm	8 mm
Nominal face velocity	3.1 m/s	2.5 m/s
Initial differential pressure at nominal volume flow rate	80 Pa	80 Pa
Max. operating temperature	100 °C	100 °C

Automatic roller filter media in a cassette for TROX-o-mat

6	2 3	4	5
480	Coarse 40 %	G02	CAS/CASN
650	Coarse 40 %	G02	CAS/CASN
950	Coarse 40 %	G02	CAS/CASN
1250	Coarse 40 %	G02	CAS/CASN
1550	Coarse 40 %	G02	CAS/CASN
1850	Coarse 40 %	G02	CAS/CASN
2150	Coarse 40 %	G02	CAS/CASN
480	Coarse 35 %	C21	CAS
650	Coarse 35 %	C21	CAS
950	Coarse 35 %	C21	CAS
1250	Coarse 35 %	C21	CAS
1550	Coarse 35 %	C21	CAS
1850	Coarse 35 %	C21	CAS
2150	Coarse 35 %	C21	CAS



Automatic roll filter media on cardboard tube or steel spool for automatic roll filter units from other manufacturers

6	2 3	4	5
836	Coarse 40 %	G02	RFMS
1141	Coarse 40 %	G02	RFMS
1446	Coarse 40 %	G02	RFMS
1751	Coarse 40 %	G02	RFMS
2056	Coarse 40 %	G02	RFMS
836	Coarse 40 %	G02	RFMA
1141	Coarse 40 %	G02	RFMA
1446	Coarse 40 %	G02	RFMA
1751	Coarse 40 %	G02	RFMA
2056	Coarse 40 %	G02	RFMA
836	Coarse 35 %	C21	RFMA
1141	Coarse 35 %	C21	RFMA
1446	Coarse 35 %	C21	RFMA
1751	Coarse 35 %	C21	RFMA
2056	Coarse 35 %	C21	RFMA
810	Coarse 35 %	C21	RFMD
1110	Coarse 35 %	C21	RFMD
1410	Coarse 35 %	C21	RFMD
1710	Coarse 35 %	C21	RFMD
2010	Coarse 35 %	C21	RFMD





For high dust concentrations or as a prefilter for fine dust filters

Order code

FMR – Coarse – 40% – G02 / 2000 x 20000

1 2 3 4 5

1 Type

FMR Roll media

2 Classification

Coarse Gravimetric separation efficiency according to ISO 16890
ePM10 Fractional efficiency ePM10 according to ISO 16890

3 Efficiency [%]

according to ISO 16890

4 Media type

G02 Glass fibre medium, 50 mm thick
C03 Chemical fibre medium, 14 mm thick
C04 Chemical fibre medium, 15 mm thick
C11 Chemical fibre medium, 22 mm thick
C15 Chemical fibre medium, 22 mm thick
C06 Chemical fibre medium, 18 mm thick

5 Nominal size [mm]

B x L

+ Features

Filter media for the separation of coarse and fine dust in supply and extract air for simple applications

- Filter classes Coarse (coarse dust filter) and ePM10 (fine dust filter)
- Tested to ISO 16890

Application

- Roll media type FMR for the separation of coarse and fine dust in ventilation systems

Technical data

Gravimetric separation efficiency according to ISO 16890	Coarse 40 %	Coarse 55 %	Coarse 50 %	Coarse 60 %	Coarse 55 %	–
Fractional efficiency according to ISO 16890	–	–	–	–	–	ePM10 55 %
Filter thickness	50 mm	14 mm	15 mm	22 mm	22 mm	18 mm
Nominal face velocity	1,5 m/s	1,5 m/s	1,5 m/s	1,5 m/s	1,5 m/s	0,9 m/s
Initial differential pressure at nominal volume flow rate	60 Pa	30 Pa	40 Pa	50 Pa	50 Pa	90 Pa
Maximum operating temperature	100 °C	100 °C	100 °C	100 °C	100 °C	100 °C

Roll media in standard sizes

5	5	2 3		4
B	L			
2000	20000	Coarse 40 %		G02
		Coarse 55 %		C03
		Coarse 50 %		C04
		Coarse 60 %		C11
		Coarse 55 %		C15
		ePM10 55 %		C06





For high dust concentrations or as a prefilter for fine dust filters

Order code

FMP – Coarse – 60 % – C11 / ROL x 1000 x 20000

1 **2** **3** **4** **5** **6**

1 Type

FMP Filter medium

2 Classification

Coarse Gravimetric separation efficiency according to ISO 16890
ePM10 Fractional efficiency ePM10 according to ISO 16890

3 Efficiency [%]

according to ISO 16890

4 Media type

G02 Glass fibre medium, 50 mm thick
C03 Chemical fibre medium, 14 mm thick
C04 Chemical fibre medium, 15 mm thick
C11 Chemical fibre medium, 22 mm thick
C15 Chemical fibre medium, 22 mm thick
C06 Chemical fibre medium, 18 mm thick

5 Construction

ROL Filter media as roll media
ROLS Filter media as roll special
PAD Cut-to-size filter pads

6 Nominal size [mm]

B x L

+ **Features**

Filter media for the separation of coarse and fine dust in supply and extract air for simple applications

- ▶ Filter classes Coarse (coarse dust filter) and ePM10 (fine dust filter)
- ▶ Roll media or cut-to-size pads
- ▶ Tested to ISO 16890

X **Application**

- ▶ Filter media type FMP for the separation of coarse and fine dust in ventilation systems

Technical data

	Coarse 40 %	Coarse 55 %	Coarse 50 %	Coarse 60 %	Coarse 55 %	–
Gravimetric separation efficiency according to ISO 16890	Coarse 40 %	Coarse 55 %	Coarse 50 %	Coarse 60 %	Coarse 55 %	–
Fractional efficiency according to ISO 16890	–	–	–	–	–	ePM10 55 %
Filter thickness	50 mm	14 mm	15 mm	22 mm	22 mm	18 mm
Nominal face velocity	2.5 m/s	1.5 m/s	1.5 m/s	1.5 m/s	1.5 m/s	0.9 m/s
Initial differential pressure at nominal volume flow rate	60 Pa	30 Pa	40 Pa	50 Pa	50 Pa	90 Pa
Max. operating temperature	100 °C	100 °C	100 °C	100 °C	100 °C	100 °C

Cut-to-size filter pads in standard sizes

6	6	2 3	4	5	Quantity
B	L				
630	630	Coarse 40 %	G02	PAD	20 pieces
630	630	Coarse 50 %	C04	PAD	15 pieces
630	630	Coarse 60 %	C11	PAD	15 pieces
630	630	ePM10 55 %	C06	PAD	15 pieces



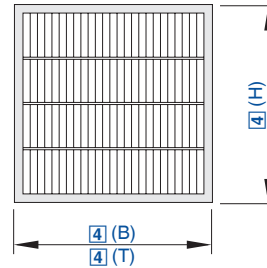
Cut-to-size filter pads in special sizes

6	2 3	4	5
per m ²	Coarse 40 %	G02	PAD
	Coarse 55 %	C03	PAD
	Coarse 50 %	C04	PAD
	Coarse 60 %	C11	PAD
	Coarse 55 %	C15	PAD
	ePM10 55 %	C06	PAD

Filter medium as roll media in special sizes

6	6	2 3	4	5
B	L			
200 - 500 to 1000 to 2000	20000	Coarse 40 %	G02	ROL
		Coarse 40 %	G02	ROL
		Coarse 40 %	G02	ROL
		Coarse 55 %	C03	ROL
		Coarse 55 %	C03	ROL
		Coarse 55 %	C03	ROL
		Coarse 50 %	C04	ROL
		Coarse 50 %	C04	ROL
		Coarse 50 %	C04	ROL
		Coarse 60 %	C11	ROL
		Coarse 60 %	C11	ROL
		Coarse 60 %	C11	ROL
		Coarse 55 %	C15	ROL
		Coarse 55 %	C15	ROL
		Coarse 55 %	C15	ROL
		ePM10 55 %	C06	ROL
		ePM10 55 %	C06	ROL
		ePM10 55 %	C06	ROL





For high dust concentrations or as a prefilter for fine dust filters

Order code

ZL – Coarse – 90% – PLA / 592 x 592 x 47

1 2 3 4 5

1 Type

ZL Z-line filter

2 Classification

Coarse Gravimetric separation efficiency according to ISO 16890

ePM10 Fractional efficiency ePM10 according to ISO 16890

3 Efficiency [%]

according to ISO 16890

4 Construction

NWO Frame made of non-woven fibres

PLA Frame made of plastic

PLAF Frame made of plastic with 25 mm flange

GAL Frame made of galvanised steel

ALU Solid aluminium frame

5 Nominal size [mm]

B x H x T

Features

Z-line filters for the separation of coarse and fine dust, used as the first stage in ventilation and air handling units or as prefilters for high-quality filter stages

- ▶ Filter classes Coarse (coarse dust filter) and ePM10 (fine dust filter)
- ▶ Large filter area due to folding
- ▶ Low differential pressures at high volume flow rates
- ▶ Moisture-resistant frame made of non-woven fibres or plastic
- ▶ Tested to ISO 16890

Application

- ▶ Z-line filter type ZL for the separation of coarse and fine dust in ventilation systems
- ▶ Coarse dust filter: Prefilter in ventilation systems
- ▶ Fine dust filter: Prefilter or final filter in ventilation systems

Useful additions

- ▶ Standard cell frame (SCF-B)

Special characteristics

- ▶ High dust holding capacity at low initial differential pressure
- ▶ Long filter life
- ▶ Quick fitting and removal
- ▶ Low weight and small transport volume
- ▶ Can be easily and safely disposed of in municipal refuse incineration plants as emissions are low in harmful substances

Technical data

Gravimetric separation efficiency according to ISO 16890	Coarse 90 %	–
Fractional efficiency according to ISO 16890	–	ePM10 50 %
Nominal face velocity	2.5 m/s	2.5 m/s
Initial differential pressure at nominal volume flow rate for T = 48 mm	50 Pa	90 Pa
Initial differential pressure at nominal volume flow rate for T = 96 mm	35 Pa	70 Pa
Max. operating temperature	80 °C	80 °C
Maximum relative humidity	100 %	100 %



Dimensions [mm] and weight [kg]

⑤	⑤		② ③	②		③	④	⑤
	B	H		T	l/s	m³/h	Pa	m²
394	495	47	Coarse 90 %	488	1755	50	0.7	0.5
495	495	47	Coarse 90 %	613	2205	50	0.9	0.6
290	595	47	Coarse 90 %	432	1555	50	0.7	0.4
595	595	47	Coarse 90 %	885	3185	50	1.4	0.8
394	622	47	Coarse 90 %	613	2205	50	0.9	0.6
495	622	47	Coarse 90 %	769	2770	50	1.2	0.7
394	495	92	Coarse 90 %	488	1755	35	1.5	0.9
495	495	92	Coarse 90 %	613	2205	35	1.9	1.1
290	595	92	Coarse 90 %	432	1555	35	1.3	0.8
595	595	92	Coarse 90 %	885	3185	35	2.7	1.5
394	622	92	Coarse 90 %	613	2205	35	1.9	1.1
495	622	92	Coarse 90 %	769	2770	35	2.4	1.3
394	495	47	ePM10 50 %	488	1755	90	0.7	0.5
495	495	47	ePM10 50 %	613	2205	90	0.9	0.6
290	595	47	ePM10 50 %	432	1555	90	0.7	0.4
595	595	47	ePM10 50 %	885	3185	90	1.4	0.8
394	622	47	ePM10 50 %	613	2205	90	0.9	0.6
495	622	47	ePM10 50 %	769	2770	90	1.2	0.7
394	495	92	ePM10 50 %	488	1755	70	1.5	0.9
495	495	92	ePM10 50 %	613	2205	70	1.9	1.1
290	595	92	ePM10 50 %	432	1555	70	1.3	0.8
595	595	92	ePM10 50 %	885	3185	70	2.7	1.5
394	622	92	ePM10 50 %	613	2205	70	1.9	1.1
495	622	92	ePM10 50 %	769	2770	70	2.4	1.3

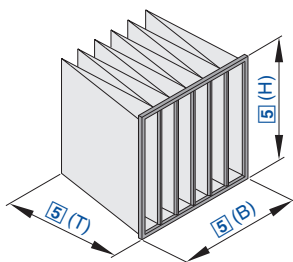


② Nominal volume flow rate ③ Initial differential pressure ④ Filter area ⑤ Weight



	Specifications			
	PFC	PFS	PFN	PFG
Filter classes				
Coarse	●			
ePM10		●	●	●
ePM2,5		●		
ePM1		●	●	●
Construction				
PLA	●	●	●	●
GAL	●	●	●	●
Frame depth				
20	●	●	●	●
25	●	●	●	●
Certification				
EN 779	●	●	●	●
VDI 6022		●	●	●
Eurovent	●	●	●	●
Material				
Chemical fibres	●			
Synthetic fibres		●		
Nanowave			●	
Glass fibres				●
Number of pockets				
3	●	●	●	●
4		●	●	●
5	●	●	●	●
6	●	●	●	●
7		●	●	●
8		●	●	●
9				
10			●	
Explanation				
● - Standard				
○ - Optional				





Prefilters in ventilation systems

Order code

PFC – Coarse – 55% – PLA – 25 / 592 x 592 x 600 x 6

1 **2** **3** **4** **5** **6** **7**

1 Type

PFC Pocket filter made of non-woven chemical fibres

3 Efficiency [%]

according to ISO 16890

5 Nominal size [mm]

20 (only with GAL)
25

2 Classification

Coarse Gravimetric separation efficiency according to ISO 16890

4 Construction

PLA Frame made of plastic
GAL Frame made of galvanised steel

6 Nominal size [mm]

B x H x T

7 Number of pockets

3, 5, 6

Features

- ▶ Pocket filters for the separation of coarse dust
- ▶ Filter class Coarse 55 %
- ▶ Performance data tested to ISO 16890
- ▶ Non-woven chemical fibres, welded
- ▶ Enlarged filter area due to filter pockets
- ▶ Low initial differential pressure and high dust holding capacity
- ▶ Different numbers of pockets and pocket depths
- ▶ Quick installation and filter changing times due to easy, safe handling
- ▶ Fitting into standard cell frames for filter walls (type SIF) or into universal casings (type UCA) for duct installation

Application

- ▶ Pocket filter made of non-woven chemical fibres type PFC for the separation of coarse dust
- ▶ Coarse dust filter: Prefilter in ventilation systems for the separation of coarse dust

Useful additions

- ▶ Filter wall (SIF)
- ▶ Universal casing (UCA)

Optional equipment and accessories

- ▶ Front frame made of plastic or galvanised sheet steel

Technical data

Gravimetric separation efficiency according to ISO 16890	Coarse 55 %
Fractional efficiency according to ISO 16890	-
Initial differential pressure at nominal volume flow rate for T = 360 mm	35 Pa
Initial differential pressure at nominal volume flow rate for T = 600 mm	30 Pa
Recommended final differential pressure	250 - 350 Pa
Max. operating temperature for frames made of plastic	60 °C
Max. operating temperature for frames made of galvanised sheet steel	90 °C

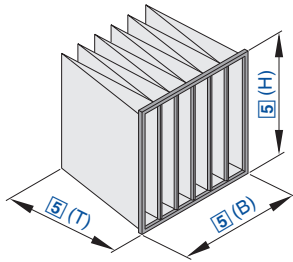


Dimensions [mm] and weight [kg]

⑥	⑥		⑦	② ③	③		④	⑤	⑥
	B	H			T	l/s			
592	592	360	6	Coarse 55 %	944	3400	35	2.7	0.8
490	592	360	5	Coarse 55 %	778	2800	35	2.2	0.7
287	592	360	3	Coarse 55 %	472	1700	35	1.3	0.5
592	490	360	6	Coarse 55 %	778	2800	35	2.2	0.7
592	287	360	6	Coarse 55 %	472	1700	35	1.3	0.5
287	287	360	3	Coarse 55 %	236	850	35	0.7	0.3
592	892	360	6	Coarse 55 %	1417	5100	35	4.1	1.1
490	892	360	5	Coarse 55 %	1167	4200	35	3.4	1.0
287	892	360	3	Coarse 55 %	708	2550	35	2.0	0.7
592	592	600	6	Coarse 55 %	944	3400	30	4.4	1.3
490	592	600	5	Coarse 55 %	778	2800	30	3.7	1.2
287	592	600	3	Coarse 55 %	472	1700	30	2.2	0.8
592	490	600	6	Coarse 55 %	778	2800	30	3.6	1.1
592	287	600	6	Coarse 55 %	472	1700	30	2.1	0.8
287	287	600	3	Coarse 55 %	236	850	30	1.1	0.5
592	892	600	6	Coarse 55 %	1417	5100	30	6.6	2.0
490	892	600	5	Coarse 55 %	1167	4200	30	5.5	1.7
287	892	600	3	Coarse 55 %	708	2550	30	3.3	1.1

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight





Prefilters or final filters in ventilation systems

Order code

PFS – ePM1 – 60 % – PLA – 25 / 592 x 592 x 600 x 8

1 2 3 4 5 6 7

1 Type

PFS Pocket filters made of non-woven synthetic fibres

ePM1 Fractional efficiency ePM1 according to ISO 16890

5 Frame depth [mm]
20 (Only with GAL)
25

2 Classification

ePM10 Fractional efficiency ePM10 according to ISO 16890

3 Efficiency [%]
according to ISO 16890

6 Nominal size [mm]
B x H x T

ePM2,5 Fractional efficiency ePM2,5 according to ISO 16890

4 Construction

PLA Frame made of plastic
GAL Frame made of galvanised steel

7 Number of pockets
3, 4, 5, 6, 7, 8

+

Features

- ▶ Pocket filters for the separation of fine dust
- ▶ Filter classes ePM10 and ePM1
- ▶ Performance data tested to ISO 16890
- ▶ Eurovent certification for fine dust filters
- ▶ Meets the hygiene requirements of VDI 6022
- ▶ Non-woven synthetic fibres, welded
- ▶ Enlarged filter area due to filter pockets
- ▶ Low initial differential pressure and high dust holding capacity

- ▶ Different numbers of pockets and pocket depths
- ▶ Quick installation and filter changing times due to easy, safe handling
- ▶ Fitting into standard cell frames for filter walls (type SIF) or into universal casings (type UCA) for duct installation

Optional equipment and accessories

- ▶ Front frame made of plastic or galvanised sheet steel

X

Application

- ▶ Pocket filter made of non-woven synthetic fibres type PFS for the separation of fine dust
- ▶ Fine dust filter: Prefilter or final filter in ventilation systems

+

Useful additions

- ▶ Filter wall (SIF)
- ▶ Universal casing (UCA)

Technical data

Fractional efficiency according to ISO 16890	ePM10 60 %	ePM10 75 %	ePM1 60 %
Initial diefferential pressure at nominal flow rate	50 Pa	70 Pa	125 Pa
Recommended final differential pressure	250 - 350 Pa	250 - 350 Pa	250 - 350 Pa
Max. operating temperature for frames made of plastic	60 °C	60 °C	60 °C
Max. operating temperature for frames made of galvanised sheet steel	90 °C	90 °C	90 °C

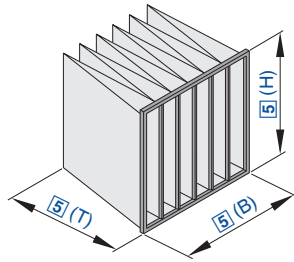


Dimensions [mm] and weight [kg]

⑥			⑦	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
592	592	600	6	ePM10 60 %	944	3400	50	4.4	1.5
490	592	600	5	ePM10 60 %	778	2800	50	3.7	1.3
287	592	600	3	ePM10 60 %	472	1700	50	2.2	0.9
592	490	600	6	ePM10 60 %	778	2800	50	3.6	1.4
592	287	600	6	ePM10 60 %	472	1700	50	2.1	0.9
287	287	600	3	ePM10 60 %	236	850	50	1.1	0.5
592	892	600	6	ePM10 60 %	1417	5100	50	6.6	2.0
490	892	600	5	ePM10 60 %	1167	4200	50	5.5	1.6
287	892	600	3	ePM10 60 %	708	2550	50	3.3	1.1
592	592	600	6	ePM10 75 %	944	3400	70	4.4	1.5
490	592	600	5	ePM10 75 %	778	2800	70	3.7	1.3
287	592	600	3	ePM10 75 %	472	1700	70	2.2	0.9
592	490	600	6	ePM10 75 %	778	2800	70	3.6	1.4
592	287	600	6	ePM10 75 %	472	1700	70	2.1	0.9
287	287	600	3	ePM10 75 %	236	850	70	1.1	0.5
592	892	600	6	ePM10 75 %	1417	5100	70	6.6	2.0
490	892	600	5	ePM10 75 %	1167	4200	70	5.5	1.6
287	892	600	3	ePM10 75 %	708	2550	70	3.3	1.1
592	592	600	8	ePM1 60 %	944	3400	125	5.9	2.0
490	592	600	7	ePM1 60 %	778	2800	125	5.1	1.7
287	592	600	4	ePM1 60 %	472	1700	125	2.9	1.1
592	490	600	8	ePM1 60 %	778	2800	125	4.9	1.7
592	287	600	8	ePM1 60 %	472	1700	125	2.8	1.1
287	287	600	4	ePM1 60 %	236	850	125	1.4	0.6
592	892	600	8	ePM1 60 %	1417	5100	125	8.8	2.4
490	892	600	7	ePM1 60 %	1167	4200	125	7.7	2.2
287	892	600	4	ePM1 60 %	708	2550	125	4.4	1.4

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight





Prefilters or final filters in ventilation systems

Order code

PFN – ePM1 – 90 % – PLA – 25 / 592 x 592 x 600 x 10

1 2 3 4 5 6 7

- 1 Type**
PFN Pocket filters made of NanoWave® medium
- 2 Classification**
ePM10 Fractional efficiency ePM10 according to ISO 16890
ePM1 Fractional efficiency ePM1 according to ISO 16890

- 3 Efficiency [%]**
according to ISO 16890
- 4 Construction**
PLA Frame made of plastic
GAL Frame made of galvanised steel
- 5 Frame depth [mm]**
20 (Only with GAL)
25

- 6 Nominal size [mm]**
B x H x T
- 7 Number of pockets**
3, 4, 5, 6, 7, 8, 10

+ Features

- ▶ Pocket filters for the separation of fine dust
- ▶ Filter classes ePM10 and ePM1
- ▶ Performance data tested to ISO 16890
- ▶ Eurovent certification for fine dust filters
- ▶ Meets the hygiene requirements of VDI 6022
- ▶ High energy efficiency class according to Eurovent
- ▶ NanoWave® medium, sewn
- ▶ Enlarged filter area due to filter pockets
- ▶ Different numbers of pockets and pocket depths

- ▶ NanoWave® medium with extremely low initial differential pressure and highest possible dust holding capacity, ideal airflow conditions due to trapezoidal filter pockets
- ▶ Quick installation and filter changing times due to easy, safe handling
- ▶ Fitting into standard cell frames for filter walls (type SIF) or into universal casings (type UCA) for duct installation

Optional equipment and accessories

- ▶ Front frame made of plastic or galvanised sheet steel

+ Application

- ▶ Pocket filter made of NanoWave® medium type PFN for the separation of fine dust
- ▶ Fine dust filter: Prefilter or final filter in ventilation systems

+ Useful additions

- ▶ Filter wall (SIF)
- ▶ Universal casing (UCA)

Technical data

	ePM10 65 %	ePM1 65 %	ePM1 90 %
Fractional efficiency according to ISO 16890	ePM10 65 %	ePM1 65 %	ePM1 90 %
Initial differential pressure at nominal volume flow rate	60 Pa	80 Pa	130 Pa
Recommended final differential pressure	250 - 350 Pa	250 - 350 Pa	250 - 350 Pa
Max. operating temperature for frames made of plastic	60 °C	60 °C	60 °C
Max. operating temperature for frames made of galvanised sheet steel	90 °C	90 °C	90 °C

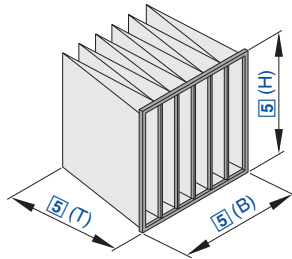


Dimensions [mm] and weight [kg]

⑥	⑥		⑦	② ③	③		④	⑤	⑥
	B	H			T	l/s			
592	592	600	6	ePM10 65 %	944	3400	60	4.4	1.5
490	592	600	5	ePM10 65 %	778	2800	60	3.7	1.3
287	592	600	3	ePM10 65 %	472	1700	60	2.2	0.9
592	490	600	6	ePM10 65 %	778	2800	60	3.6	1.4
592	287	600	6	ePM10 65 %	472	1700	60	2.1	0.9
287	287	600	3	ePM10 65 %	236	850	60	1.1	0.5
592	892	600	6	ePM10 65 %	1417	5100	60	6.6	2.0
490	892	600	5	ePM10 65 %	1167	4200	60	5.5	1.6
287	892	600	3	ePM10 65 %	708	2550	60	3.3	1.1
592	592	600	8	ePM1 65 %	944	3400	80	5.9	2.0
490	592	600	7	ePM1 65 %	778	2800	80	5.1	1.7
287	592	600	4	ePM1 65 %	472	1700	80	2.9	1.1
592	490	600	8	ePM1 65 %	778	2800	80	4.9	1.7
592	287	600	8	ePM1 65 %	472	1700	80	2.8	1.1
287	287	600	4	ePM1 65 %	236	850	80	1.4	0.6
592	892	600	8	ePM1 65 %	1417	5100	80	8.8	2.4
490	892	600	7	ePM1 65 %	1167	4200	80	7.7	2.2
287	892	600	4	ePM1 65 %	708	2550	80	4.4	1.4
592	592	600	10	ePM1 90 %	944	3400	130	7.3	2.2
490	592	600	8	ePM1 90 %	778	2800	130	5.9	1.8
287	592	600	5	ePM1 90 %	472	1700	130	3.7	1.2
592	490	600	10	ePM1 90 %	778	2800	130	6.1	1.9
592	287	600	10	ePM1 90 %	472	1700	130	3.6	1.3
287	287	600	5	ePM1 90 %	236	850	130	1.8	0.7
592	892	600	10	ePM1 90 %	1417	5100	130	11.1	2.6
490	892	600	8	ePM1 90 %	1167	4200	130	8.8	2.3
287	892	600	5	ePM1 90 %	708	2550	130	5.5	1.5

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight





Prefilters or final filters in ventilation systems

Order code

PFG – ePM1 – 90 % – PLA – 25 / 592 x 592 x 600 x 8

1 2 3 4 5 6 7

- 1 Type**
PFG Pocket filters made of non-woven glass fibres
- 2 Classification**
ePM10 Fractional efficiency ePM10 according to ISO 16890
ePM1 Fractional efficiency ePM1 according to ISO 16890

- 3 Efficiency [%]**
according to ISO 16890
- 4 Construction**
PLA Frame made of plastic
GAL Frame made of galvanised steel

- 5 Frame depth [mm]**
20 (Only with GAL)
25
- 6 Nominal size [mm]**
B x H x T
- 7 Number of pockets**
3, 4, 5, 6, 7, 8

+ Features

- ▶ Pocket filters for the separation of fine dust
- ▶ Filter classes ePM10 and ePM1
- ▶ Performance data tested to ISO 16890
- ▶ Eurovent certification for fine dust filters
- ▶ Meets the hygiene requirements of VDI 6022
- ▶ High energy efficiency class according to Eurovent
- ▶ Non-woven glass fibres, sewn
- ▶ Enlarged filter area due to filter pockets
- ▶ Different numbers of pockets and pocket depths

- ▶ Low initial differential pressure and high dust holding capacity, ideal airflow conditions due to trapezoidal filter pockets
- ▶ Quick installation and filter changing times due to easy, safe handling
- ▶ Fitting into standard cell frames for filter walls (type SIF) or into universal casings (type UCA) for duct installation

- Optional equipment and accessories
- ▶ Front frame made of plastic or galvanised sheet steel

Application

- ▶ Pocket filter made of non-woven glass fibres type PFG for the separation of fine dust
- ▶ Fine dust filter: Prefilter or final filter in ventilation systems

+ Useful additions

- ▶ Filter wall (SIF)
- ▶ Universal casing (UCA)

Technical data

Fractional efficiency according to ISO 16890	ePM10 60 %	ePM10 75 %	ePM1 75%	ePM1 90%
Initial differential pressure at nominal volume flow rate	50 Pa	70 Pa	100 Pa	140 Pa
Recommended final differential pressure	250 - 350 Pa	250 - 350 Pa	250 - 350 Pa	250 - 350 Pa
Max. operating temperature for frames made of plastic	60 °C	60 °C	60 °C	60 °C
Max. operating temperature for frames made of galvanised sheet steel	90 °C	90 °C	90 °C	90 °C



Dimensions [mm] and weight [kg]

⑥	⑥		⑦	② ③	③		④	⑤	⑥
	B	H			T	l/s			
592	592	600	6	ePM10 60 %	944	3400	50	4.4	1.5
490	592	600	5	ePM10 60 %	778	2800	50	3.7	1.3
287	592	600	3	ePM10 60 %	472	1700	50	2.2	0.9
592	490	600	6	ePM10 60 %	778	2800	50	3.6	1.4
592	287	600	6	ePM10 60 %	472	1700	50	2.1	0.9
287	287	600	3	ePM10 60 %	236	850	50	1.1	0.5
592	892	600	6	ePM10 60 %	1417	5100	50	6.6	2.0
490	892	600	5	ePM10 60 %	1167	4200	50	5.5	1.6
287	892	600	3	ePM10 60 %	708	2550	50	3.3	1.1
592	592	600	6	ePM10 75 %	944	3400	70	4.4	1.5
490	592	600	5	ePM10 75 %	778	2800	70	3.7	1.3
287	592	600	3	ePM10 75 %	472	1700	70	2.2	0.9
592	490	600	6	ePM10 75 %	778	2800	70	3.6	1.4
592	287	600	6	ePM10 75 %	472	1700	70	2.1	0.9
287	287	600	3	ePM10 75 %	236	850	70	1.1	0.5
592	892	600	6	ePM10 75 %	1417	5100	70	6.6	2.0
490	892	600	5	ePM10 75 %	1167	4200	70	5.5	1.6
287	892	600	3	ePM10 75 %	708	2550	70	3.3	1.1
592	592	600	8	ePM1 75 %	944	3400	100	5.9	2.0
490	592	600	7	ePM1 75 %	778	2800	100	5.1	1.7
287	592	600	4	ePM1 75 %	472	1700	100	2.9	1.1
592	490	600	8	ePM1 75 %	778	2800	100	4.9	1.7
592	287	600	8	ePM1 75 %	472	1700	100	2.8	1.1
287	287	600	4	ePM1 75 %	236	850	100	1.4	0.6
592	892	600	8	ePM1 75 %	1417	5100	100	8.8	2.4
490	892	600	7	ePM1 75 %	1167	4200	100	7.7	2.2
287	892	600	4	ePM1 75 %	708	2550	100	4.4	1.4
592	592	600	8	ePM1 90 %	944	3400	140	5.9	2.0
490	592	600	7	ePM1 90 %	778	2800	140	5.1	1.7
287	592	600	4	ePM1 90 %	472	1700	140	2.9	1.1
592	490	600	8	ePM1 90 %	778	2800	140	4.9	1.7
592	287	600	8	ePM1 90 %	472	1700	140	2.8	1.1
287	287	600	4	ePM1 90 %	236	850	140	1.4	0.6
592	892	600	8	ePM1 90 %	1417	5100	140	8.8	2.4
490	892	600	7	ePM1 90 %	1167	4200	140	7.7	2.2
287	892	600	4	ePM1 90 %	708	2550	140	4.4	1.4

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



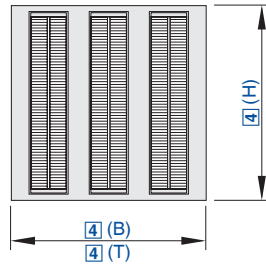


	Specifications			Specifications			
	MFI	MFE	MFC	MFP	MFCA	MFPCR	FHD
Filter classes							
ISO Coarse							
ePM10	●		●	●			
ePM2,5							
ePM1	●	●	●	●			
E10	●						
E11	●	●	●	●	●		●
H13	●	●	●	●	●		●
H14	●		●	●		●	●
U15						●	●
U16						●	
Construction							
PLA	●			●			
SPC	●						
GAL			●	●			
AL					●		
MDFF				●			
MDF			●	●			
STA			●	●			
ALB						●	
ALC						●	
ALG						●	
ALN				●			
ALZ				●			
ALY				●			
ALU				●			
ALV				●			
D							●
R							●
V							●
Options							
Number of filter packs	●		●				
FNU	●		●	●			
FND	●		●	●			●
OT	●		●	●		●	●
OTC	●		●	●			●
HMS			●				
FNB			●	●			
TGU			●	●			
CSU			●	●		●	
CSD			●	●		●	
CSB			●	●		●	
WS			●	●			●
FT				●		●	
PU				●		●	
PD				●		●	●
PB				●		●	
GSU				●			
ST				●			●
D							●
SD							●
SPD							●
APD							●



	Specifications			Specifications			
	MFI	MFE	MFC	MFP	MFCA	MFPCR	FHD
Useful additions							
Filter wall (SIF)							
Mounting frame (MF)							
Universal casing (UCA)							
KSF, KSFS			●				
KSFSSP			●	●			
DCA			●				
TFC							
TFW							
TFM							
TFP							
Explanation							
● - Standard							
○ - Optional							





Compact construction for large volume flow rates

Order code

MFI – ePM1 – 85 % – SPC / 592 x 592 x 292 x 6 / PD / FND / OT

1 2 3 4 5 6 7 8 9

1 Type

MFI Mini Pleat Filter insert

2 Classification

ePM10 Fractional efficiency ePM10 according to ISO 16890
ePM1 Fractional efficiency ePM1 according to ISO 16890
E10, E11 Particulate filter according to EN 1822
H13, H14 Particulate filter according to EN 1822

3 Efficiency [%]

according to ISO 16890 (only ePM10, ePM1)

4 Construction

PLA-ECO Frame made of plastic, optimized energy efficiency
PLA Frame made of plastic
GAL Frame made of galvanised steel
SPC Frame made of galvanised steel, powder coated RAL 9010

5 Nominal size [mm]

B x H x T

6 Number of filter packs

6, 8

7 Protection grid

No entry: none

PD Protection grid downstream side (only E11, H13, H14)

8 Seal

No entry: none
FNU Flat section seal on the upstream side
FND Flat section seal on the downstream side

9 Testing

No entry: no leakage test
OT Oil mist test (only for filter classes H13, H14)
OTC Oil mist test with certificate (only for filter classes H13, H14)



Features

- Prefilters or final filters for the separation of fine dust, or particulate filters for the most critical requirements in ventilation systems
- Filter classes ePM10 and ePM1, E10, E11, H13, H14
- Performance data to ISO 16890 or EN 1822
- Eurovent certification for fine dust filters
- Meets the hygiene requirements of VDI 6022
- High energy efficiency class according to Eurovent
- Filter media for special requirements, glass fibre papers, with spacers made of hot-melt adhesive or textile threads
- Low initial differential pressure due to ideal pleat position and largest possible filter area
- Compact depth construction
- Fitting into standard cell frames for filter walls (type SIF), into mounting frames (type MF), or into universal casings (type UCA) for duct installation



Application

- Mini Pleat filter insert type MFI for the separation of fine dust and suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply and extract air in ventilation systems with large volume flow rates and the requirement for long filter life
- Fine dust filter: Prefilter or final filter for the separation of fine dust in ventilation systems.
- Particulate filter: Main or final filter used for the most critical requirements of air cleanliness and sterility in areas such as industry, research, medicine, pharmaceuticals, and nuclear engineering



Useful additions

- Filter wall (SIF)
- Mounting frame (MF)
- Universal casing (UCA)



Special characteristics

- Leakage test is standard for all particulate filters of classes H13, H14

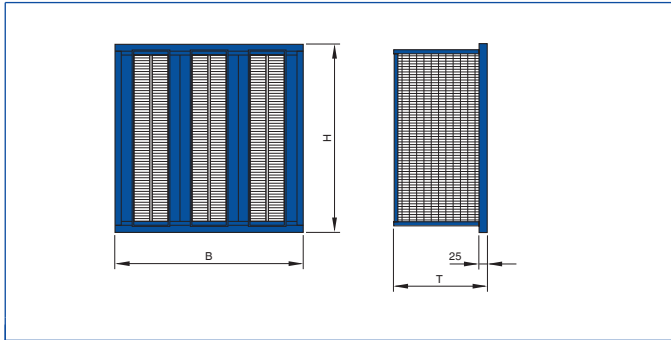


Technical data

Fractional efficiency according to ISO 16890	ePM10 80 %	ePM1 65 %	ePM1 85 %	–	–	–	–
Filter class according to EN1822	–	–	–	E10	E11	H13	H14
Initial differential pressure at nominal volume flow rate	90 Pa	110 Pa	140 Pa	160 Pa	160 Pa	265 Pa	300 Pa
Recommended final differential pressure	450 Pa	450 Pa	450 Pa	450 Pa	450 Pa	600 Pa	600 Pa
Max. operating temperature	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Maximum relative humidity	100 %	100 %	100 %	100 %	100 %	100 %	100 %



MFI-...-PLA-...

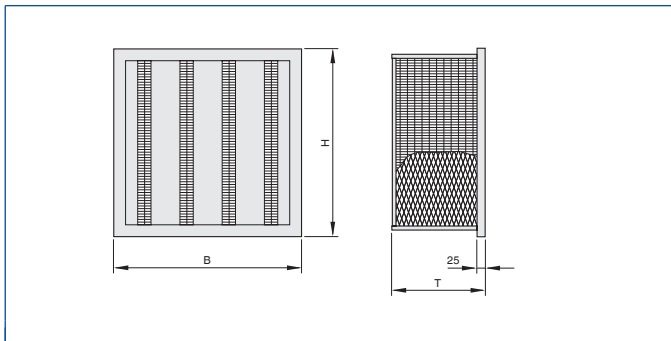


Dimensions [mm] and weight [kg]

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
592	287	292	6	ePM10 80 %	590	2125	90	7.6	3
592	490	292	6	ePM10 80 %	983	3540	90	13.7	4
592	592	292	6	ePM10 80 %	1181	4250	90	16.8	5
592	287	292	6	ePM1 65 %	590	2125	110	7.6	3
592	490	292	6	ePM1 65 %	983	3540	110	13.7	4
592	592	292	6	ePM1 65 %	1181	4250	110	16.8	5
592	287	292	6	ePM1 85 %	590	2125	140	7.6	3
592	490	292	6	ePM1 85 %	983	3540	140	13.7	4
592	592	292	6	ePM1 85 %	1181	4250	140	16.8	5

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFI-...-SPC-...



Dimensions [mm] and weight [kg]

⑤			⑤	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
592	287	292	6	ePM10 80 %	590	2125	90	7.7	4
592	490	292	6	ePM10 80 %	983	3540	90	14.2	6
592	592	292	6	ePM10 80 %	1181	4250	90	17.5	7
592	287	292	6	ePM1 65 %	590	2125	110	7.7	4
592	490	292	6	ePM1 65 %	983	3540	110	14.2	6
592	592	292	6	ePM1 65 %	1181	4250	110	17.5	7
592	287	292	6	ePM1 85 %	590	2125	140	7.7	4
592	490	292	6	ePM1 85 %	983	3540	140	14.2	6
592	592	292	6	ePM1 85 %	1181	4250	140	17.5	7

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

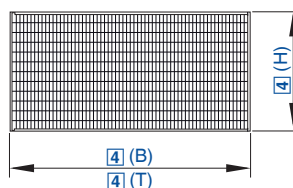
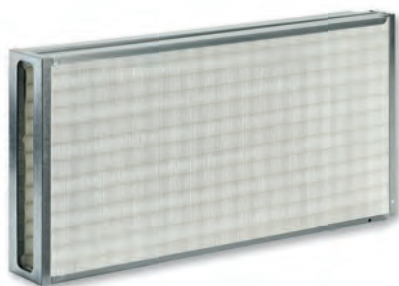


Dimensions [mm] and weight [kg]

⑤ B	⑤		⑥	② ③	③		④	⑤	⑥
	H	T			l/s	m³/h	Pa	m²	kg
592	287	292	6	E10	590	2125	160	7.7	4
592	490	292	6	E10	983	3540	160	14.2	6
592	592	292	6	E10	1181	4250	160	17.5	7
592	287	292	8	E11	417	1500	160	13.6	7
592	490	292	8	E11	694	2500	160	25.0	10
592	592	292	8	E11	833	3000	160	30.6	12
592	287	292	8	H13	417	1500	265	13.6	7
592	490	292	8	H13	694	2500	265	25.0	10
592	592	292	8	H13	833	3000	265	30.6	12
592	287	292	8	H14	417	1500	300	13.6	7
592	490	292	8	H14	694	2500	300	25.0	10
592	592	292	8	H14	833	3000	300	30.6	12

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight





Very compact, for modular installation

Order code

MFE – ePM1 – 90 % – GAL / 600 x 65 x 202

1 2 3 4 5

1 Type

MFE Mini Pleat filter element

E11 Particulate filter according to EN 1822
H13 Particulate filter according to EN 1822

3 Construction

GAL Frame made of galvanised steel
AL Frame made of aluminium

2 Classification

ePM1 Fractional efficiency ePM1 according to ISO 16890

3 Efficiency [%]
according to ISO 16890 (only ePM1)

4 Nominal size [mm]

B x H x T

+ Features

- Prefilters or final filters for the separation of fine dust, or particulate filters for the most critical requirements in ventilation systems
 - Filter classes ePM1, E11, H13
 - Performance data to ISO 16890 or EN 1822
 - Eurovent certification for fine dust filters
 - Filter media for special requirements, made of glass fibre papers, with spacers made of textile threads
 - Low initial differential pressure due to ideal pleat position and largest possible filter area

Application

- Mini Pleat filter element type MFE for the separation of fine dust and suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply and extract air in ventilation systems with large volume flow rates and the requirement for long filter life
- Fine dust filter: Prefilter or final filter for the separation of fine dust in ventilation systems.
- Particulate filter: Main or final filter used for the most critical requirements of air cleanliness and sterility in areas such as industry, research, medicine, pharmaceuticals, and nuclear engineering

& Accessories

- Adhesive tape for sealing off the filter elements, width: 19 mm, length: 55 m
- Order number: ACC-AT
- One roll suffices for about 50 filter elements of size 600 x 65 x 202 mm, for about 100 filter elements of size 86.5 x 202 x 600 mm, or for about 70 filter elements of size 86.5 x 303 x 600 mm

★ Special characteristics

- Leakage test, standard for all particulate filters of filter class H13

Technical data

Fractional efficiency according to ISO 16890	ePM1 90 %	–	–
Filter class according to EN1822	–	E11	H13
Initial differential pressure at nominal volume flow rate for nominal size 600 x 65 x 202 mm	50 Pa	140 Pa	160 Pa
Recommended final differential pressure for nominal size 600 x 65 x 202 mm	250 Pa	400 Pa	400 Pa
Initial differential pressure at nominal volume flow rate for nominal sizes 86.5 x 202 / 303 x 600 mm	120 Pa	190 Pa	220 Pa
Recommended final differential pressure for nominal sizes 86.5 x 202 / 303 x 600 mm	300 Pa	600 Pa	600 Pa
Max. operating temperature	100 °C	100 °C	100 °C
Maximum relative humidity	100 %	100 %	100 %

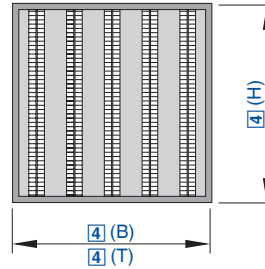


Dimensions [mm] and weight [kg]

⑤ B	⑤		② ③	②		③	④	⑤
	H	T		l/s	m ³ /h	Pa	m ²	kg
600	65	202	ePM1 90 %	56	200	50	3.4	1
86.5	202	600	ePM1 90 %	56	200	120	3.4	1
86.5	303	600	ePM1 90 %	83	300	120	5.1	2
600	65	202	E11	56	200	140	3.6	1
86.5	202	600	E11	56	200	190	3.6	1
86.5	303	600	E11	83	300	190	5.4	2
600	65	202	H13	56	200	160	3.6	1
86.5	202	600	H13	56	200	220	3.6	1
86.5	303	600	H13	83	300	220	5.4	2

② Nominal volume flow rate ③ Initial differential pressure ④ Filter area ⑤ Weight





For large volume flow rates and long filter life

Order code

MFC – ePM1 – 90 % – GAL / 610 x 610 x 292 x 10 / HMS / FNU / OT

1 2 3 4 5 6 7 8 9

1 Type

MFC Mini Pleat filter cell

2 Classification

ePM10 Fractional efficiency ePM10 according to ISO 16890

ePM1 Fractional efficiency ePM1 according to ISO 16890

E11 Particulate filter according to EN 1822

H13 Particulate filter according to EN 1822

H14 Particulate filter according to EN 1822

3 Efficiency [%]

according to ISO 16890 (only ePM10, ePM1)

4 Construction

MDF Frame made of MDF

GAL Frame made of galvanised steel

STA Frame made of stainless steel

5 Nominal size [mm]

B x H x T

6 Number of filter packs

3, 5, 6, 10, 12

7 No entry: standard

HMS Increased filter area

8 Seal

WS Without seal

FNU Flat seal on the upstream side

FND Flat seal on the downstream side

FNB Flat seal on both sides

TGU Test groove seal on the upstream side

CSU Continuous seal on the upstream side

CSD Continuous seal on the downstream side

CSB Continuous seal on both sides

9 Testing

No entry: no leakage test

OT Oil mist test (only for filter classes H13, H14)

OTC Oil mist test with certificate (only for filter classes H13, H14)

Features

Prefilters or final filters for the separation of fine dust, or particulate filters for the most critical requirements in ventilation systems

- ▶ Filter classes ePM10, ePM1, E11, H13, H14
- ▶ Performance data to ISO 16890 or EN 1822
- ▶ Eurovent certification for fine dust filters
- ▶ Filter media for special requirements, made of glass fibre papers, with spacers made of textile threads
- ▶ Low initial differential pressure due to ideal pleat position and largest possible filter area
- ▶ Compact depth construction
- ▶ Fitting into ducted particulate filters (types KSF, KSFS) and duct casings for particulate filters (type DCA)

Application

- ▶ Mini Pleat filter cell type MFC for the separation of fine dust and suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply and extract air in ventilation systems with large volume flow rates and the requirement for long filter life
- ▶ Fine dust filter: Prefilter or final filter for the separation of fine dust in ventilation systems.
- ▶ Particulate filter: Main or final filter used for the most critical requirements of air cleanliness and sterility in areas such as industry, research, medicine, pharmaceuticals, and nuclear engineering

Useful additions

- ▶ Ducted particulate filter, available as one unit (KSF, KSFS) or as a filter unit system (KSFSSP)
- ▶ Duct casing for particulate filters (DCA)

Special characteristics

- ▶ Leakage test is standard for all particulate filters of classes H13, H14

Technical data

Fractional efficiency according to ISO 16890	ePM10 70 %	ePM1 60 %	ePM1 90 %	–	–	–
Filter class according to EN1822	–	–	–	E11	H13	H14
Initial differential pressure at nominal volume flow rate	90 Pa	110 Pa	140 Pa	125 Pa	250 Pa	250 Pa
Recommended final differential pressure	450 Pa	450 Pa	450 Pa	300 Pa	600 Pa	600 Pa
Max. operating temperature	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Maximum relative humidity	100 %	100 %	100 %	100 %	100 %	100 %



Mini Pleat filter cells MFC-...-MDF-...

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	kg
305	610	292	3	ePM10 70 %	590	2125	90	9.2	8
610	610	292	6	ePM10 70 %	1181	4250	90	18.4	15
305	610	292	3	ePM1 60 %	590	2125	110	9.2	8
610	610	292	6	ePM1 60 %	1181	4250	110	18.4	15
305	610	292	3	ePM1 90 %	590	2125	140	9.2	8
610	610	292	6	ePM1 90 %	1181	4250	140	18.4	15
305	610	292	3	E11	306	1100	125	10.1	8
305	610	292	5	E11	417	1500	125	16.1	9
610	610	292	6	E11	611	2200	125	20.2	15
610	610	292	10	E11	833	3000	125	32.2	18
762	610	292	12	E11	1042	3750	125	38.6	22
203	610	292	3	H13	242	870	250	9.7	7
305	610	292	3	H13	306	1100	250	10.1	8
305	610	292	5	H13	417	1500	250	16.1	9
610	610	292	6	H13	611	2200	250	20.2	15
610	610	292	10	H13	833	3000	250	32.2	18
762	610	292	12	H13	1042	3750	250	38.6	22
305	610	292	5	H14	367	1320	250	16.1	9
610	610	292	10	H14	733	2640	250	32.2	18
762	610	292	12	H14	881	3170	250	38.6	22

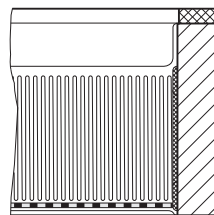
③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

Mini Pleat filter cells MFC-...-GAL/STA...

⑤			⑥	② ③	⑦	④		⑤	⑥	⑦
B	H	T				l/s	m³/h	Pa	m²	kg
305	610	292	3	ePM10 70 %		590	2125	90	9.8	9
610	610	292	6	ePM10 70 %		1181	4250	90	19.5	15
305	610	292	3	ePM1 60 %		590	2125	110	9.8	9
610	610	292	6	ePM1 60 %		1181	4250	110	19.5	15
305	610	292	3	ePM1 90 %		590	2125	140	9.8	9
610	610	292	6	ePM1 90 %		1181	4250	140	19.5	15
305	610	292	3	E11		347	1250	125	10.7	8
305	610	292	5	E11		472	1700	125	17.6	9
610	610	292	6	E11		694	2500	125	21.5	15
610	610	292	10	E11		944	3400	125	35.1	18
762	610	292	12	E11		1181	4250	125	42.1	22
203	610	292	3	H13		347	1250	250	10.7	7
305	610	292	5	H13		472	1700	250	17.6	9
610	610	292	6	H13		694	2500	250	21.5	15
610	610	292	10	H13		944	3400	250	35.1	18
762	610	292	12	H13		1181	4250	250	42.1	22
203	610	292	3	H13	HMS	320	1150	250	11.0	8
305	610	292	5	H13	HMS	556	2000	250	18.1	10
610	610	292	10	H13	HMS	1111	4000	250	36.2	19
762	610	292	12	H13	HMS	1389	5000	250	43.4	23
305	610	292	5	H14		417	1500	250	17.6	9
610	610	292	10	H14		833	3000	250	35.1	15
762	610	292	12	H14		1000	3600	250	42.1	22

④ Nominal volume flow rate ⑤ Initial differential pressure ⑥ Filter area ⑦ Weight





For the most demanding requirements of air cleanliness and sterility

Order code

MFP – ePM1 – 90 % – GAL / 610 x 610 x 78 x 50 / PD / FNU / OT

1 2 3 4 5 6 7 8 9

1 Type

MFP Mini Pleat filter panel

2 Classification

ePM10 Fractional efficiency ePM10 according to ISO 16890

ePM1 Fractional efficiency ePM1 according to ISO 16890

E11 Particulate filter according to EN 1822

H13 Particulate filter according to EN 1822

H14 Particulate filter according to EN 1822

3 Efficiency [%]

according to ISO 16890 (only ePM10, ePM1)

4 Construction

PLA Frame made of plastic

MDF Frame made of MDF, with header frame

MDF Frame made of MDF

GAL Frame made of galvanised steel

STA Frame made of stainless steel

ALN

Frame made of extruded aluminium sections (depth 30 mm)

ALZ

Frame made of extruded aluminium sections (depth 78 mm)

ALY

Frame made of extruded aluminium sections (depth 150 mm)

ALU

Frame made of extruded aluminium sections (depth 91 mm)

ALV

Frame made of extruded aluminium sections (depth 85 mm)

5 Nominal size [mm]

B × H × T

6 Pleat depth [mm]

FT

7 Protection grid

No entry: none

PU

Protection grid on the upstream side

PD

Protection grid on the downstream side

PB

Protection grid on both sides

8 Seal

WS Without seal

FNU Flat section seal on the upstream side

FND Flat seal on the downstream side

FNB Flat seal on both sides

TGU Test groove seal on the upstream side

CSU Continuous seal on the upstream side

CSD Continuous seal on the downstream side

CSB Continuous seal on both sides

GPU Fluid seal (only for ALU/ALV)

9 Testing

No entry: no leakage test

OT Oil mist test (only for filter classes H13, H14)

OTC Oil mist test with certificate (only for filter classes H13, H14)

ST Scan test (only for filter classes H13, H14)

+ Features

Prefilters or final filters for the separation of fine dust and suspended particles. Used for industrial, research, medical, pharmaceutical, and nuclear engineering applications.

- ▶ Filter classes ePM10, ePM1, E11, H13, H14
- ▶ Performance data tested to ISO 16890 or EN 1822
- ▶ Meets hygiene requirements according to VDI 6022
- ▶ Eurovent certification for fine dust filters
- ▶ Filter media for special requirements, glass fibre papers with spacers made of thermoplastic hot-melt adhesive
- ▶ Low initial differential pressure due to ideal pleat position and largest possible filter area
- ▶ Perfect adjustment to individual requirements due to different pleat depths, filter frame made of various materials
- ▶ Automatic filter scan test for all filters from filter class H14
- ▶ Fitting into ceiling mounted or wall mounted particulate filters (types TFC, TFW, TFM, TFP), ducted particulate filters (types KSF, KSFS), duct casings for particulate filters (type DCA), or operating theatre ceilings

Application

- ▶ Mini Pleat filter panel type MFP for the separation of fine dust and suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply and extract air in ventilation systems with large volume flow rates and the requirement for long filter life
- ▶ Fine dust filter: Prefilter or final filter for the separation of fine dust in ventilation systems.
- ▶ Particulate filter: Main or final filter used for the most critical requirements of air cleanliness and sterility in areas such as industry, research, medicine, pharmaceuticals, and nuclear engineering

Useful additions

- ▶ Filter wall (SIF)
- ▶ Universal casing (UCA)
- ▶ Ducted particulate filter, available as one unit (KSF, KSFS) or as a filter unit system (KSFSSP)
- ▶ Duct casing for particulate filters (DCA)
- ▶ Ceiling mounted particulate filter (TFC)
- ▶ Wall mounted particulate filter (TFW)
- ▶ Particulate filter module (TFM)
- ▶ Pharmaceutical clean room terminal filter (TFP)

★ Special characteristics

- ▶ Leakage test is standard for all particulate filters of classes H13, H14

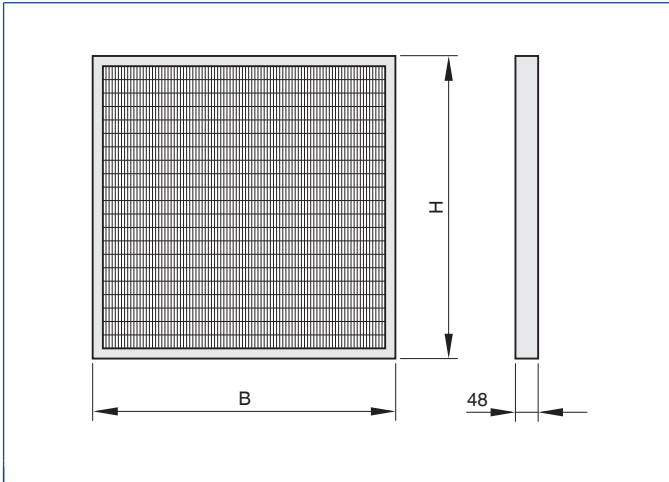




Technical data

Fractional efficiency according to ISO 16890	ePM10 75 %	ePM1 60 %	ePM1 90 %	–	–	–
Filter class according to EN1822	–	–	–	E11	H13	H14
Initial differential pressure at nominal volume flow rate	90 Pa	110 Pa	150 Pa	125 Pa	250 Pa	120/140 Pa
Recommended final differential pressure	450 Pa	450 Pa	450 Pa	300 Pa	600 Pa	600 Pa
Max. operating temperature	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C
Maximum relative humidity	100 %	100 %	100 %	100 %	100 %	100 %

MFP-...-PLA



Dimensions [mm] and weight [kg]

B	H		T	⑥	② ③	③		④	⑤	⑥
						l/s	m ³ /h	Pa	m ²	kg
287	287	48	40	ePM10 75 %	139	500	90	1.7	1	
287	592	48	40	ePM10 75 %	306	1100	90	3.5	1	
490	592	48	40	ePM10 75 %	564	2030	90	6.2	2	
592	592	48	40	ePM10 75 %	694	2500	90	7.5	2	
287	287	48	40	ePM1 60 %	139	500	110	1.7	1	
287	592	48	40	ePM1 60 %	306	1100	110	3.5	1	
490	592	48	40	ePM1 60 %	564	2030	110	6.2	2	
592	592	48	40	ePM1 60 %	694	2500	110	7.5	2	
287	287	48	40	ePM1 90 %	139	500	150	1.7	1	
287	592	48	40	ePM1 90 %	306	1100	150	3.5	1	
490	592	48	40	ePM1 90 %	564	2030	150	6.2	2	
592	592	48	40	ePM1 90 %	694	2500	150	7.5	2	

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



Dimensions [mm] and weight [kg]

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
287	287	96	80	ePM10 75 %	186	670	90	2.4	1
287	592	96	80	ePM10 75 %	417	1500	90	5.0	2
490	592	96	80	ePM10 75 %	769	2770	90	8.8	3
592	592	96	80	ePM10 75 %	944	3400	90	10.7	4
287	287	96	80	ePM1 65 %	186	670	110	2.4	1
287	592	96	80	ePM1 65 %	417	1500	110	5.0	2
490	592	96	80	ePM1 65 %	769	2770	110	8.8	3
592	592	96	80	ePM1 65 %	944	3400	110	10.7	4
287	287	96	80	ePM1 90 %	186	670	150	2.4	1
287	592	96	80	ePM1 90 %	417	1500	150	5.0	2
490	592	96	80	ePM1 90 %	769	2770	150	8.8	3
592	592	96	80	ePM1 90 %	944	3400	150	10.7	4

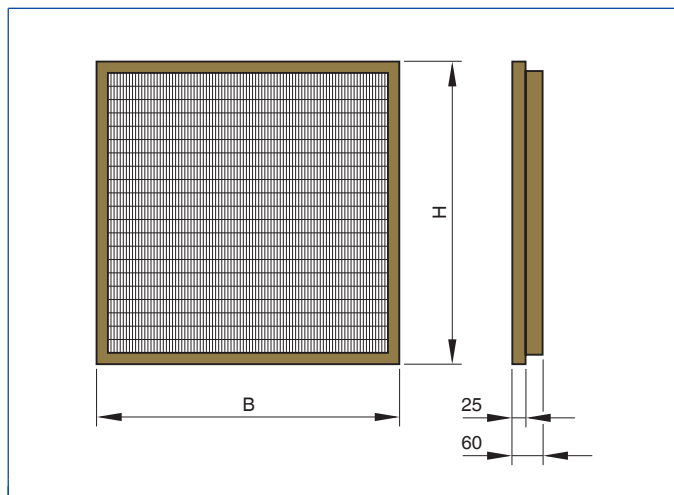
③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

Dimensions [mm] and weight [kg]

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
287	287	150	120	ePM10 80 %	150	540	90	2.2	1
287	592	150	120	ePM10 80 %	378	1360	90	5.1	3
490	592	150	120	ePM10 80 %	756	2720	90	9.6	4
592	592	150	120	ePM10 80 %	944	3400	90	11.8	5
287	287	150	120	ePM1 70 %	150	540	110	2.2	1
287	592	150	120	ePM1 70 %	378	1360	110	5.1	3
490	592	150	120	ePM1 70 %	756	2720	110	9.6	4
592	592	150	120	ePM1 70 %	944	3400	110	11.8	5
287	287	150	120	ePM1 90 %	150	540	150	2.2	1
287	592	150	120	ePM1 90 %	378	1360	150	5.1	3
490	592	150	120	ePM1 90 %	756	2720	150	9.6	4
592	592	150	120	ePM1 90 %	944	3400	150	11.8	5

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFP-...-MDFF

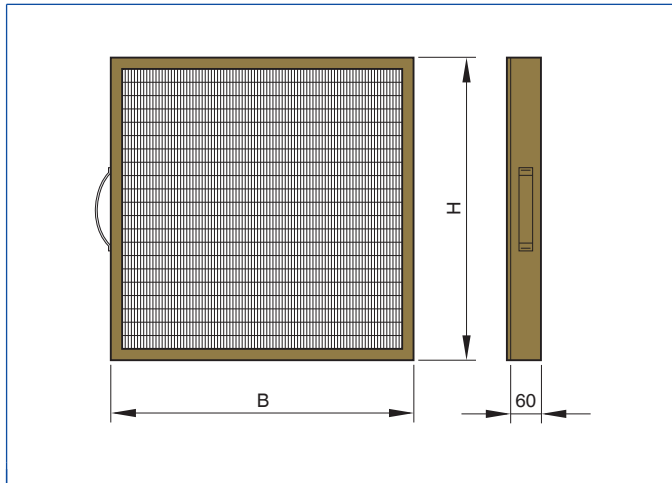


Dimensions [mm] and weight [kg]

⑤		⑤		⑤	② ③	③		④	⑤	⑥
B	H	T	l/s			m ³ /h	Pa	m ²	kg	
287	592	60	50	ePM10 75 %	303	1090	90	3.2	2	
592	592	60	50	ePM10 75 %	694	2500	90	7.3	4	
287	592	60	50	ePM1 60 %	303	1090	110	3.2	2	
592	592	60	50	ePM1 60 %	694	2500	110	7.3	4	
287	592	60	50	ePM1 90 %	303	1090	150	3.2	2	
592	592	60	50	ePM1 90 %	694	2500	150	7.3	4	

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFP-...-MDF

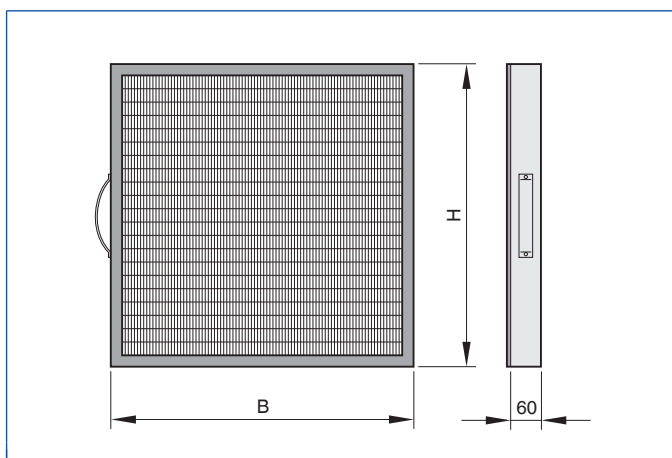


Dimensions [mm] and weight [kg]

⑤		⑤		⑥	② ③	③		④	⑤	⑥
B	H	T	l/s			m ³ /h	Pa	m ²	kg	
305	610	60	50	ePM10 75 %	389	1400	90	3.8	2	
610	610	60	50	ePM10 75 %	833	3000	90	8.2	3	
762	610	60	50	ePM10 75 %	1056	3800	90	10.3	4	
305	610	60	50	ePM1 60 %	389	1400	110	3.8	2	
610	610	60	50	ePM1 60 %	833	3000	110	8.2	3	
762	610	60	50	ePM1 60 %	1056	3800	110	10.3	4	
305	610	60	50	ePM1 90 %	389	1400	150	3.8	2	
610	610	60	50	ePM1 90 %	833	3000	150	8.2	3	
762	610	60	50	ePM1 90 %	1056	3800	150	10.3	4	

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFP-...-GAL/STA

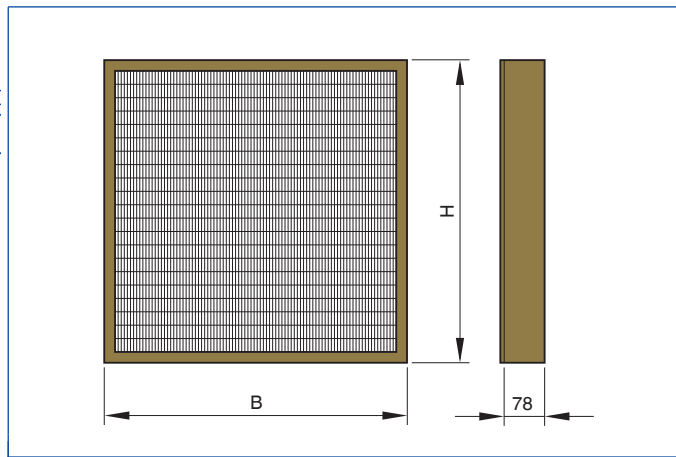


Dimensions [mm] and weight [kg]

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	kg
305	610	60	50	ePM10 75 %	389	1400	90	4.5	3
610	610	60	50	ePM10 75 %	833	3000	90	9.1	3
762	610	60	50	ePM10 75 %	1056	3800	90	11.4	4
305	610	60	50	ePM1 60 %	389	1400	110	4.5	3
610	610	60	50	ePM1 60 %	833	3000	110	9.1	3
762	610	60	50	ePM1 60 %	1056	3800	110	11.4	4
305	610	60	50	ePM1 90 %	389	1400	150	4.5	3
610	610	60	50	ePM1 90 %	833	3000	150	9.1	3
762	610	60	50	ePM1 90 %	1056	3800	150	11.4	4

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFP-...-MDF



Dimensions [mm] and weight [kg]

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	kg
305	305	78	50	ePM10 75 %	182	655	90	1.8	2
345	345	78	50	ePM10 75 %	240	865	90	2.3	2
435	435	78	50	ePM10 75 %	401	1445	90	3.9	2
457	457	78	50	ePM10 75 %	447	1610	90	4.4	3
535	535	78	50	ePM10 75 %	629	2265	90	6.2	3
575	575	78	50	ePM10 75 %	735	2645	90	7.2	3
305	610	78	50	ePM10 75 %	389	1400	90	3.8	3
610	610	78	50	ePM10 75 %	833	3000	90	8.2	4
305	305	78	50	ePM1 60 %	182	655	110	1.8	2
345	345	78	50	ePM1 60 %	240	865	110	2.3	2
435	435	78	50	ePM1 60 %	401	1445	110	3.9	2
457	457	78	50	ePM1 60 %	447	1610	110	4.4	3
535	535	78	50	ePM1 60 %	629	2265	110	6.2	3
575	575	78	50	ePM1 60 %	735	2645	110	7.2	3
305	610	78	50	ePM1 60 %	389	1400	110	3.8	3
610	610	78	50	ePM1 60 %	833	3000	110	8.2	4
305	305	78	50	ePM1 90 %	182	655	150	1.8	2
345	345	78	50	ePM1 90 %	240	865	150	2.3	2
435	435	78	50	ePM1 90 %	401	1445	150	3.9	2
457	457	78	50	ePM1 90 %	447	1610	150	4.4	3
535	535	78	50	ePM1 90 %	629	2265	150	6.2	3
575	575	78	50	ePM1 90 %	735	2645	150	7.2	3
305	610	78	50	ePM1 90 %	389	1400	150	3.8	3
610	610	78	50	ePM1 90 %	833	3000	150	8.2	4

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



Dimensions [mm] and weight [kg]

⑤			⑤	② ③	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	kg
203	203	78	50	E11	28	100	125	0.7	1
305	305	78	50	E11	72	260	125	1.9	2
345	345	78	50	E11	96	345	125	2.5	2
435	435	78	50	E11	160	575	125	4.2	2
457	457	78	50	E11	178	640	125	4.7	3
535	535	78	50	E11	250	900	125	6.6	3
835	535	78	50	E11	400	1440	125	10.7	4
1135	535	78	50	E11	551	1985	125	14.7	5
557	557	78	50	E11	272	980	125	7.2	3
575	575	78	50	E11	292	1050	125	7.8	3
305	610	78	50	E11	154	555	125	4.1	3
457	610	78	50	E11	242	870	125	6.4	3
610	610	78	50	E11	331	1190	125	8.8	4
762	610	78	50	E11	418	1505	125	11.1	4
915	610	78	50	E11	507	1825	125	13.5	5
1220	610	78	50	E11	683	2460	125	18.2	6
203	203	78	50	H13	28	100	250	0.7	1
305	305	78	50	H13	72	260	250	1.9	2
345	345	78	50	H13	96	345	250	2.5	2
435	435	78	50	H13	160	575	250	4.2	2
457	457	78	50	H13	178	640	250	4.7	3
535	535	78	50	H13	250	900	250	6.6	3
835	535	78	50	H13	400	1440	250	10.7	4
1135	535	78	50	H13	551	1985	250	14.7	5
557	557	78	50	H13	272	980	250	7.2	3
575	575	78	50	H13	292	1050	250	7.8	3
305	610	78	50	H13	154	555	250	4.1	3
457	610	78	50	H13	242	870	250	6.4	3
610	610	78	50	H13	331	1190	250	8.8	4
762	610	78	50	H13	418	1505	250	11.1	4
915	610	78	50	H13	507	1825	250	13.5	5
1220	610	78	50	H13	683	2460	250	18.2	6



③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

Dimensions [mm] and weight [kg]

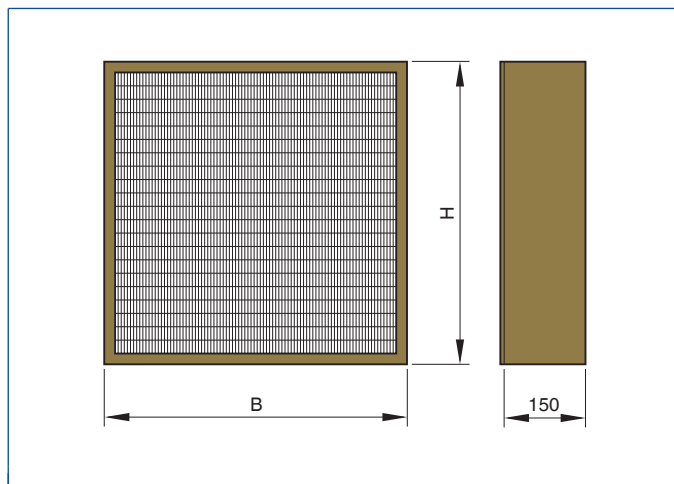
⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	kg
203	203	78	50	H14	14	50	120	0.8	1
305	305	78	50	H14	36	130	120	2.1	2
345	345	78	50	H14	49	175	120	2.8	2
435	435	78	50	H14	81	290	120	4.7	2
457	457	78	50	H14	90	325	120	5.2	3
535	535	78	50	H14	126	455	120	7.4	3
835	535	78	50	H14	203	730	120	11.8	4
1135	535	78	50	H14	281	1010	120	16.3	5
557	557	78	50	H14	139	500	120	8.0	3
575	575	78	50	H14	149	535	120	8.6	3
305	610	78	50	H14	78	280	120	4.6	3
457	610	78	50	H14	124	445	120	7.2	3
610	610	78	50	H14	168	605	120	9.8	4
762	610	78	50	H14	213	765	120	12.4	4
915	610	78	50	H14	258	930	120	15.0	5
1220	610	78	50	H14	347	1250	120	20.2	6
203	203	78	68	H13	35	125	250	1.0	1
305	305	78	68	H13	90	325	250	2.5	2



⑤		⑤		⑥	② ③	③		④	⑤	⑥
B	H	T	l/s			m ³ /h	Pa	m ²	kg	
345	345	78	68	H13	119	430	250	3.3	2	
435	435	78	68	H13	201	725	250	5.5	2	
457	457	78	68	H13	224	805	250	6.2	3	
535	535	78	68	H13	314	1130	250	8.7	3	
835	535	78	68	H13	504	1815	250	14.0	4	
1135	535	78	68	H13	694	2500	250	19.2	5	
557	557	78	68	H13	343	1235	250	9.5	3	
575	575	78	68	H13	367	1320	250	10.2	3	
305	610	78	68	H13	194	700	250	5.4	3	
457	610	78	68	H13	306	1100	250	8.4	3	
610	610	78	68	H13	417	1500	250	11.5	4	
762	610	78	68	H13	528	1900	250	14.6	4	
915	610	78	68	H13	639	2300	250	17.7	5	
1220	610	78	68	H13	861	3100	250	23.8	6	
203	203	78	68	H14	18	65	120	1.1	1	
305	305	78	68	H14	46	165	120	2.8	2	
345	345	78	68	H14	60	215	120	3.7	2	
435	435	78	68	H14	101	365	120	6.2	2	
457	457	78	68	H14	113	405	120	6.9	3	
535	535	78	68	H14	158	570	120	9.7	3	
835	535	78	68	H14	251	905	120	15.6	4	
1135	535	78	68	H14	350	1260	120	21.4	5	
557	557	78	68	H14	172	620	120	10.6	3	
575	575	78	68	H14	185	665	120	11.3	3	
305	610	78	68	H14	97	350	120	6.0	3	
457	610	78	68	H14	154	555	120	9.4	3	
610	610	78	68	H14	210	755	120	12.9	4	
762	610	78	68	H14	265	955	120	16.3	4	
915	610	78	68	H14	322	1160	120	19.7	5	
1220	610	78	68	H14	433	1560	120	26.6	6	

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFP-...-MDF



Dimensions [mm] and weight [kg]

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
203	203	150	50	E11	28	100	125	0.7	1
305	305	150	50	E11	72	260	125	1.9	3
345	345	150	50	E11	96	345	125	2.5	4
435	435	150	50	E11	160	575	125	4.2	5
457	457	150	50	E11	178	640	125	4.7	5
535	535	150	50	E11	250	900	125	6.6	7
575	575	150	50	E11	292	1050	125	7.8	7
305	610	150	50	E11	154	555	125	4.1	5
457	610	150	50	E11	242	870	125	6.4	6
610	610	150	50	E11	331	1190	125	8.8	8
762	610	150	50	E11	418	1505	125	11.1	9
915	610	150	50	E11	507	1825	125	13.5	10
1220	610	150	50	E11	683	2460	125	18.2	13
203	203	150	50	H13	28	100	250	0.7	1
305	305	150	50	H13	72	260	250	1.9	3
345	345	150	50	H13	96	345	250	2.5	4
435	435	150	50	H13	160	575	250	4.2	5
457	457	150	50	H13	178	640	250	4.7	5
535	535	150	50	H13	250	900	250	6.6	7
575	575	150	50	H13	292	1050	250	7.8	7
305	610	150	50	H13	154	555	250	4.1	5
457	610	150	50	H13	242	870	250	6.4	6
610	610	150	50	H13	331	1190	250	8.8	8
762	610	150	50	H13	418	1505	250	11.1	9
915	610	150	50	H13	507	1825	250	13.5	10
1220	610	150	50	H13	683	2460	250	18.2	13

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

Dimensions [mm] and weight [kg]

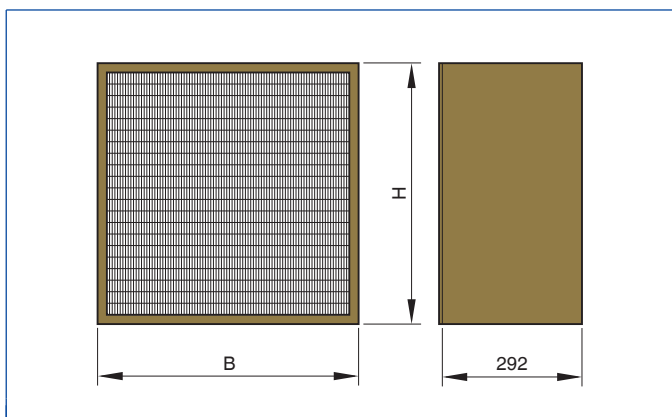
⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
203	203	150	68	H13	35	125	250	1.0	1
305	305	150	68	H13	90	325	250	2.5	3
345	345	150	68	H13	119	430	250	3.3	4
435	435	150	68	H13	201	725	250	5.5	5
457	457	150	68	H13	224	805	250	6.2	6
535	535	150	68	H13	314	1130	250	8.7	7
575	575	150	68	H13	367	1320	250	10.2	8
305	610	150	68	H13	194	700	250	5.4	5
457	610	150	68	H13	306	1100	250	8.4	6
610	610	150	68	H13	417	1500	250	11.5	8
762	610	150	68	H13	528	1900	250	14.6	10
915	610	150	68	H13	639	2300	250	17.7	11
1220	610	150	68	H13	861	3100	250	23.8	14
203	203	150	120	H13	49	175	250	1.5	2
305	305	150	120	H13	128	460	250	3.9	4
345	345	150	120	H13	168	605	250	5.2	5
435	435	150	120	H13	281	1010	250	8.7	5
457	457	150	120	H13	313	1125	250	9.6	6
535	535	150	120	H13	440	1585	250	13.6	7
575	575	150	120	H13	514	1850	250	15.9	8
305	610	150	120	H13	272	980	250	8.4	6
457	610	150	120	H13	428	1540	250	13.2	7
610	610	150	120	H13	583	2100	250	18.0	9
762	610	150	120	H13	739	2660	250	22.8	10



⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h			
915	610	150	120	H13	894	3220	250	27.6	12
1220	610	150	120	H13	1206	4340	250	37.2	15
203	203	150	120	H14	26	95	140	1.5	2
305	305	150	120	H14	69	250	140	3.9	4
345	345	150	120	H14	92	330	140	5.2	5
435	435	150	120	H14	154	555	140	8.7	5
457	457	150	120	H14	171	615	140	9.6	6
535	535	150	120	H14	242	870	140	13.6	7
575	575	150	120	H14	282	1015	140	15.9	8
305	610	150	120	H14	149	535	140	8.4	6
457	610	150	120	H14	233	840	140	13.2	7
610	610	150	120	H14	319	1150	140	18.0	9
762	610	150	120	H14	404	1455	140	22.8	10
915	610	150	120	H14	490	1765	140	27.6	12
1220	610	150	120	H14	660	2375	140	37.2	15

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFP...-MDF



Dimensions [mm] and weight [kg]

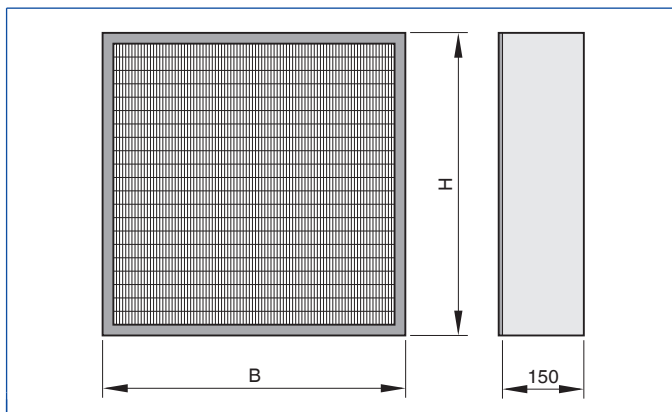
⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h			
305	305	292	150	E11	128	460	125	4.5	6
457	457	292	150	E11	314	1130	125	11.0	10
305	610	292	150	E11	272	980	125	9.6	9
457	610	292	150	E11	428	1540	125	15.0	11
610	610	292	150	E11	583	2100	125	20.5	14
762	610	292	150	E11	739	2660	125	26.0	17
915	610	292	150	E11	875	3150	125	30.8	20
1220	610	292	150	E11	1186	4270	125	41.8	27
305	305	292	120	H13	128	460	250	3.9	6
457	457	292	120	H13	314	1130	250	9.6	10
305	610	292	120	H13	272	980	250	8.4	9
457	610	292	120	H13	428	1540	250	13.2	11
610	610	292	120	H13	583	2100	250	18.0	14
762	610	292	120	H13	739	2660	250	22.8	17
915	610	292	120	H13	875	3150	250	27.0	20
1220	610	292	120	H13	1186	4270	250	36.6	27
305	305	292	180	H13	151	545	250	4.8	7
457	457	292	180	H13	372	1340	250	12.0	11
305	610	292	180	H13	324	1165	250	10.4	10
457	610	292	180	H13	508	1830	250	16.3	12
610	610	292	180	H13	694	2500	250	22.3	15



⑤	⑤		⑥	② ③	③		④	⑤	⑥
	B	H			T	l/s			
762	610	292	180	H13	879	3165	250	28.2	19
915	610	292	180	H13	1042	3750	250	33.5	22
1220	610	292	180	H13	1413	5085	250	45.3	30
305	305	292	180	H14	90	325	140	4.8	7
457	457	292	180	H14	224	805	140	12.0	11
305	610	292	180	H14	194	700	140	10.4	10
457	610	292	180	H14	306	1100	140	16.3	12
610	610	292	180	H14	417	1500	140	22.3	15
762	610	292	180	H14	528	1900	140	28.2	19
915	610	292	180	H14	625	2250	140	33.5	22
1220	610	292	180	H14	847	3050	140	45.3	30

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFP-...-GAL/STA



Dimensions [mm] and weight [kg]

⑤	⑤		⑥	② ③	③		④	⑤	⑥
	B	H			T	l/s			
305	305	150	50	E11	79	285	125	2.4	3
345	345	150	50	E11	104	375	125	3.1	4
435	435	150	50	E11	174	625	125	5.0	5
457	457	150	50	E11	194	700	125	5.5	5
535	535	150	50	E11	272	980	125	7.6	7
575	575	150	50	E11	318	1145	125	8.7	7
305	610	150	50	E11	168	605	125	4.9	5
457	610	150	50	E11	264	950	125	7.4	6
610	610	150	50	E11	361	1300	125	9.8	8
762	610	150	50	E11	457	1645	125	12.3	9
915	610	150	50	E11	554	1995	125	14.8	11
1220	610	150	50	E11	746	2685	125	19.7	13
305	305	150	50	H13	79	285	250	2.4	3
345	345	150	50	H13	104	375	250	3.1	4
435	435	150	50	H13	174	625	250	5.0	5
457	457	150	50	H13	194	700	250	5.5	5
535	535	150	50	H13	272	980	250	7.6	7
575	575	150	50	H13	318	1145	250	8.7	7
305	610	150	50	H13	168	605	250	4.9	5
457	610	150	50	H13	264	950	250	7.4	6
610	610	150	50	H13	361	1300	250	9.8	8
762	610	150	50	H13	457	1645	250	12.3	9
915	610	150	50	H13	554	1995	250	14.8	11
1220	610	150	50	H13	746	2685	250	19.7	13

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



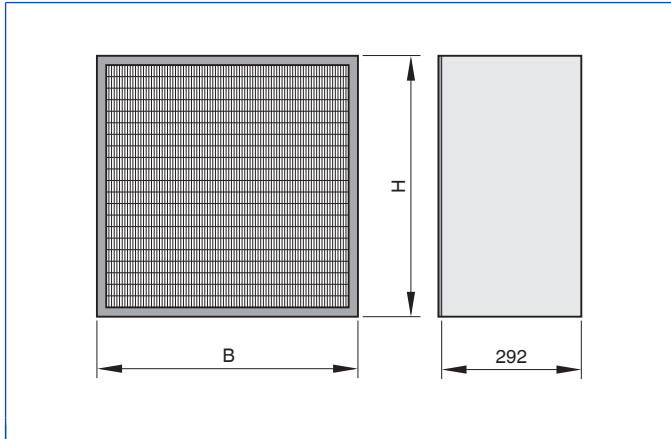
Dimensions [mm] and weight [kg]

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h			
305	305	150	68	H13	100	360	250	3.2	4
345	345	150	68	H13	132	475	250	4.1	5
435	435	150	68	H13	221	795	250	6.5	5
457	457	150	68	H13	246	885	250	7.2	6
535	535	150	68	H13	346	1245	250	9.9	7
575	575	150	68	H13	404	1455	250	11.4	8
305	610	150	68	H13	214	770	250	6.4	5
457	610	150	68	H13	336	1210	250	9.6	6
610	610	150	68	H13	458	1650	250	12.9	8
762	610	150	68	H13	581	2090	250	16.1	10
915	610	150	68	H13	703	2530	250	19.4	11
1220	610	150	68	H13	947	3410	250	25.9	14
305	305	150	120	H13	140	505	250	4.9	4
345	345	150	120	H13	185	665	250	6.3	5
435	435	150	120	H13	310	1115	250	10.2	5
457	457	150	120	H13	344	1240	250	11.2	6
535	535	150	120	H13	485	1745	250	15.4	7
575	575	150	120	H13	565	2035	250	17.9	8
305	610	150	120	H13	300	1080	250	10.0	6
457	610	150	120	H13	469	1690	250	15.1	7
610	610	150	120	H13	642	2310	250	20.1	9
762	610	150	120	H13	813	2925	250	25.2	10
915	610	150	120	H13	983	3540	250	30.3	12
1220	610	150	120	H13	1326	4775	250	40.4	14
305	305	150	120	H14	76	275	140	4.9	4
345	345	150	120	H14	101	365	140	6.3	5
435	435	150	120	H14	169	610	140	10.2	5
457	457	150	120	H14	189	680	140	11.2	6
535	535	150	120	H14	265	955	140	15.4	7
575	575	150	120	H14	310	1115	140	17.9	8
305	610	150	120	H14	164	590	140	10.0	6
457	610	150	120	H14	257	925	140	15.1	7
610	610	150	120	H14	351	1265	140	20.1	9
762	610	150	120	H14	444	1600	140	25.2	10
915	610	150	120	H14	539	1940	140	30.3	12
1220	610	150	120	H14	726	2615	140	40.4	14

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



MFP-...-GAL/STA



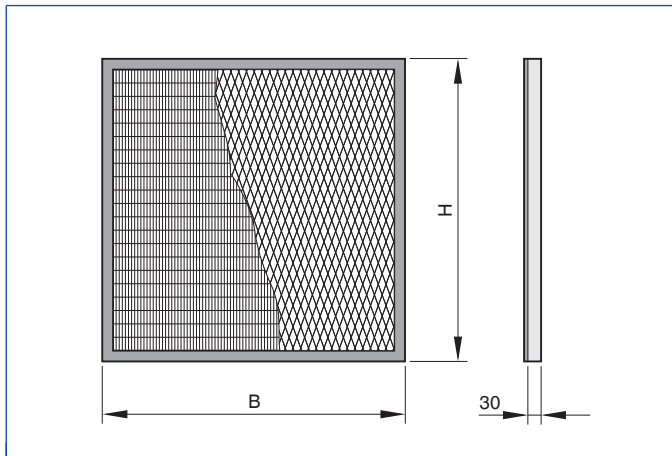
Dimensions [mm] and weight [kg]

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
305	305	292	150	E11	140	505	125	5.6	7
457	457	292	150	E11	344	1240	125	12.8	11
305	610	292	150	E11	300	1080	125	11.4	10
457	610	292	150	E11	469	1690	125	17.2	12
610	610	292	150	E11	642	2310	125	23.0	15
762	610	292	150	E11	813	2925	125	28.7	19
305	305	292	120	H13	140	505	250	4.9	7
457	457	292	120	H13	344	1240	250	11.2	11
305	610	292	120	H13	300	1080	250	10.0	10
457	610	292	120	H13	469	1690	250	15.1	12
610	610	292	120	H13	642	2310	250	20.1	15
762	610	292	120	H13	813	2925	250	25.2	19
305	305	292	180	H13	167	600	250	6.1	7
457	457	292	180	H13	410	1475	250	13.9	11
305	610	292	180	H13	357	1285	250	12.4	10
457	610	292	180	H13	560	2015	250	18.7	13
610	610	292	180	H13	764	2750	250	25.0	16
762	610	292	180	H13	967	3480	250	31.2	20
305	305	292	180	H14	100	360	140	6.1	7
457	457	292	180	H14	246	885	140	13.9	11
305	610	292	180	H14	214	770	140	12.4	10
457	610	292	180	H14	336	1210	140	18.7	13
610	610	292	180	H14	458	1650	140	25.0	16
762	610	292	180	H14	581	2090	140	31.2	20

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



MFP...-ALN

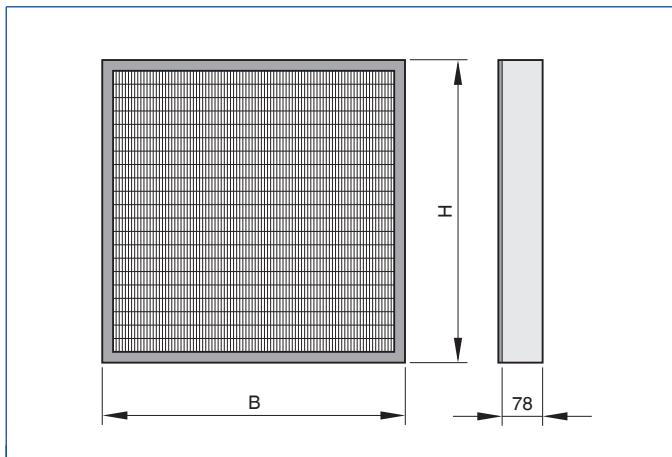


Dimensions [mm] and weight [kg]

⑤		⑤		⑥	② ③	③		④	⑤	⑥
B	H	T	l/s			m ³ /h				
610	610	30	20	E11	149	535	125	5.1	3	
762	610	30	20	E11	189	680	125	6.4	3	
915	610	30	20	E11	228	820	125	7.7	4	
1220	610	30	20	E11	308	1110	125	10.3	5	
610	610	30	20	H13	149	535	250	5.1	3	
762	610	30	20	H13	189	680	250	6.4	3	
915	610	30	20	H13	228	820	250	7.7	4	
1220	610	30	20	H13	308	1110	250	10.3	5	

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFP...-ALZ



Dimensions [mm] and weight [kg]

⑤		⑤		⑥	② ③	③		④	⑤	⑥
B	H	T	l/s			m ³ /h				
305	305	78	50	ePM10 75 %	182	655	90	2.2	2	
345	345	78	50	ePM10 75 %	240	865	90	2.9	2	
435	435	78	50	ePM10 75 %	401	1445	90	4.6	2	
457	457	78	50	ePM10 75 %	447	1610	90	5.1	3	
535	535	78	50	ePM10 75 %	629	2265	90	7.0	3	
575	575	78	50	ePM10 75 %	735	2645	90	8.1	3	
305	610	78	50	ePM10 75 %	389	1400	90	4.5	3	
610	610	78	50	ePM10 75 %	833	3000	90	9.2	4	



⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	kg
305	305	78	50	ePM1 60 %	182	655	110	2.2	2
345	345	78	50	ePM1 60 %	240	865	110	2.9	2
435	435	78	50	ePM1 60 %	401	1445	110	4.6	2
457	457	78	50	ePM1 60 %	447	1610	110	5.1	3
535	535	78	50	ePM1 60 %	629	2265	110	7.0	4
575	575	78	50	ePM1 60 %	735	2645	110	8.1	3
305	610	78	50	ePM1 60 %	389	1400	110	4.5	3
610	610	78	50	ePM1 60 %	833	3000	110	9.2	4
305	305	78	50	ePM1 90 %	182	655	150	2.2	2
345	345	78	50	ePM1 90 %	240	865	150	2.9	2
435	435	78	50	ePM1 90 %	401	1445	150	4.6	2
457	457	78	50	ePM1 90 %	447	1610	150	5.1	3
535	535	78	50	ePM1 90 %	629	2265	150	7.0	3
575	575	78	50	ePM1 90 %	735	2645	150	8.1	3
305	610	78	50	ePM1 90 %	389	1400	150	4.5	3
610	610	78	50	ePM1 90 %	833	3000	150	9.2	4

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



Dimensions [mm] and weight [kg]

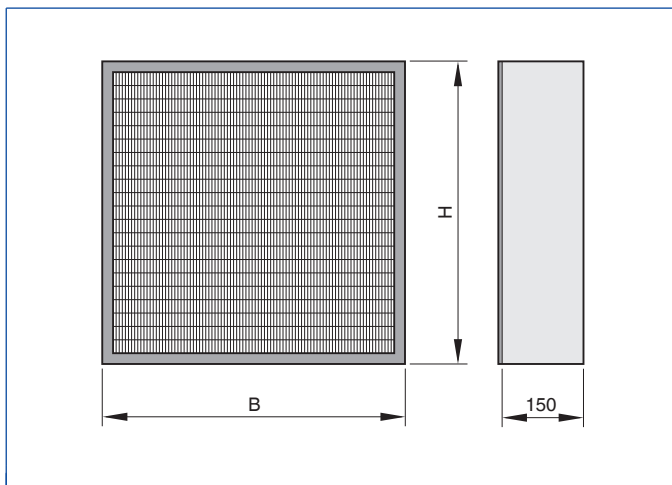
⑤			⑥	② ③	③ ePM1 90 %		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	kg
305	305	78	50	E11	72	260	125	2.4	2
345	345	78	50	E11	96	345	125	3.1	2
435	435	78	50	E11	160	575	125	5.0	2
457	457	78	50	E11	178	640	125	5.5	3
535	535	78	50	E11	250	900	125	7.6	3
835	535	78	50	E11	400	1440	125	11.9	4
1135	535	78	50	E11	551	1985	125	16.2	5
557	557	78	50	E11	272	980	125	8.2	3
575	575	78	50	E11	292	1050	125	8.8	3
305	610	78	50	E11	154	555	125	4.9	3
457	610	78	50	E11	242	870	125	7.4	3
610	610	78	50	E11	331	1190	125	9.9	4
762	610	78	50	E11	418	1505	125	12.4	4
915	610	78	50	E11	507	1825	125	14.9	5
1220	610	78	50	E11	683	2460	125	19.8	6
305	305	78	50	H13	72	260	250	2.4	2
345	345	78	50	H13	96	345	250	3.1	2
435	435	78	50	H13	160	575	250	5.0	2
457	457	78	50	H13	178	640	250	5.5	3
535	535	78	50	H13	250	900	250	7.6	3
835	535	78	50	H13	400	1440	250	11.9	4
1135	535	78	50	H13	551	1985	250	16.2	5
557	557	78	50	H13	272	980	250	8.2	3
575	575	78	50	H13	292	1050	250	8.8	3
305	610	78	50	H13	154	555	250	4.9	3
457	610	78	50	H13	242	870	250	7.4	3
610	610	78	50	H13	331	1190	250	9.9	4
762	610	78	50	H13	418	1505	250	12.4	4
915	610	78	50	H13	507	1825	250	14.9	5
1220	610	78	50	H13	683	2460	250	19.8	6
305	305	78	50	H14	36	130	120	2.7	2
345	345	78	50	H14	49	175	120	3.5	2
435	435	78	50	H14	81	290	120	5.5	2
457	457	78	50	H14	90	325	120	6.1	3
535	535	78	50	H14	126	455	120	8.4	3



⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	kg
835	535	78	50	H14	203	730	120	13.2	4
1135	535	78	50	H14	281	1010	120	17.9	5
557	557	78	50	H14	139	500	120	9.1	3
575	575	78	50	H14	149	535	120	9.7	3
305	610	78	50	H14	78	280	120	5.5	3
457	610	78	50	H14	124	445	120	8.2	3
610	610	78	50	H14	168	605	120	11.0	4
762	610	78	50	H14	213	765	120	13.7	4
915	610	78	50	H14	258	930	120	16.5	5
1220	610	78	50	H14	342	1230	120	22.0	6

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFP...-ALY



Dimensions [mm] and weight [kg]

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	kg
305	305	150	50	E11	72	260	125	2.1	3
345	345	150	50	E11	96	345	125	2.8	4
435	435	150	50	E11	160	575	125	4.5	5
457	457	150	50	E11	178	640	125	5.0	5
535	535	150	50	E11	250	900	125	7.0	6
575	575	150	50	E11	292	1050	125	8.2	7
305	610	150	50	E11	154	555	125	4.4	5
457	610	150	50	E11	242	870	125	6.8	6
610	610	150	50	E11	331	1190	125	9.2	8
762	610	150	50	E11	418	1505	125	11.6	9
915	610	150	50	E11	507	1825	125	14.0	11
1220	610	150	50	E11	683	2460	125	18.9	13
305	305	150	50	H13	72	260	250	2.1	3
345	345	150	50	H13	96	345	250	2.8	4
435	435	150	50	H13	160	575	250	4.5	5
457	457	150	50	H13	178	640	250	5.0	5
535	535	150	50	H13	250	900	250	7.0	6
575	575	150	50	H13	292	1050	250	8.2	7
305	610	150	50	H13	154	555	250	4.4	5
457	610	150	50	H13	242	870	250	6.8	6
610	610	150	50	H13	331	1190	250	9.2	8
762	610	150	50	H13	418	1505	250	11.6	9



⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	kg
915	610	150	50	H13	507	1825	250	14.0	11
1220	610	150	50	H13	683	2460	250	18.9	13
305	305	150	68	H13	90	325	250	2.8	4
345	345	150	68	H13	119	430	250	3.6	5
435	435	150	68	H13	201	725	250	5.9	5
457	457	150	68	H13	224	805	250	6.6	6
535	535	150	68	H13	314	1130	250	9.2	7
575	575	150	68	H13	367	1320	250	10.7	8
305	610	150	68	H13	194	700	250	5.8	5
457	610	150	68	H13	306	1100	250	8.9	6
610	610	150	68	H13	417	1500	250	12.1	8
762	610	150	68	H13	528	1900	250	15.2	10
915	610	150	68	H13	639	2300	250	18.4	11
1220	610	150	68	H13	861	3100	250	24.7	14

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

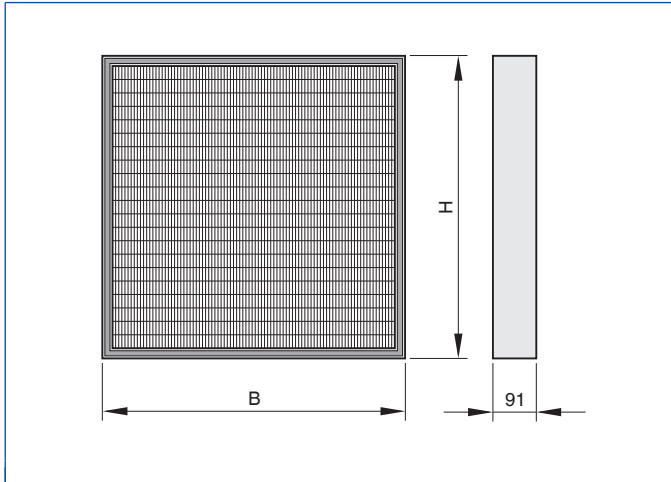
Dimensions [mm] and weight [kg]

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m³/h	Pa	m²	kg
305	305	150	120	H13	128	460	250	4.3	4
345	345	150	120	H13	168	605	250	5.7	5
435	435	150	120	H13	281	1010	250	9.3	5
457	457	150	120	H13	313	1125	250	10.3	6
535	535	150	120	H13	440	1585	250	14.4	7
575	575	150	120	H13	514	1850	250	16.7	8
305	610	150	120	H13	272	980	250	9.1	6
457	610	150	120	H13	428	1540	250	14.0	7
610	610	150	120	H13	583	2100	250	18.9	9
762	610	150	120	H13	739	2660	250	23.8	11
915	610	150	120	H13	894	3220	250	28.7	12
1220	610	150	120	H13	1206	4340	250	38.6	15
305	305	150	120	H14	69	250	140	4.3	4
345	345	150	120	H14	92	330	140	5.7	5
435	435	150	120	H14	154	555	140	9.3	5
457	457	150	120	H14	171	615	140	10.3	6
535	535	150	120	H14	242	870	140	14.4	7
575	575	150	120	H14	282	1015	140	16.7	8
305	610	150	120	H14	149	535	140	9.1	6
457	610	150	120	H14	233	840	140	14.0	7
610	610	150	120	H14	319	1150	140	18.9	9
762	610	150	120	H14	404	1455	140	23.8	11
915	610	150	120	H14	490	1765	140	28.7	12
1220	610	150	120	H14	660	2375	140	38.6	15

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



MFP-...-ALU

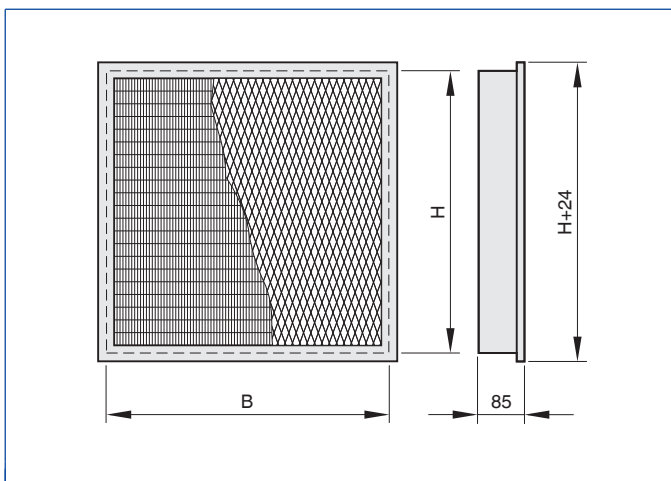


Dimensions [mm] and weight [kg]

⑤			⑥	② ③	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
305	305	91	50	H13	72	260	250	2.4	2
345	345	91	50	H13	96	345	250	3.1	2
435	435	91	50	H13	160	575	250	5.0	2
457	457	91	50	H13	178	640	250	5.5	3
535	535	91	50	H13	250	900	250	7.6	3
835	535	91	50	H13	400	1440	250	11.9	4
1135	535	91	50	H13	551	1985	250	16.2	5
575	575	91	50	H13	292	1050	250	8.8	3
610	610	91	50	H13	331	1190	250	9.9	4
305	305	91	50	H14	36	130	120	2.7	2
345	345	91	50	H14	49	175	120	3.5	2
435	435	91	50	H14	81	290	120	5.5	2
457	457	91	50	H14	90	325	120	6.1	3
535	535	91	50	H14	126	455	120	8.4	3
835	535	91	50	H14	203	730	120	13.2	4
1135	535	91	50	H14	281	1010	120	17.9	5
575	575	91	50	H14	149	535	120	9.7	3
610	610	91	50	H14	168	605	120	11.0	4

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFP-...-ALV

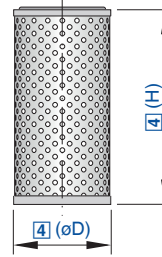


Dimensions [mm] and weight [kg]

⑤	⑤		⑥	② ③	③		④	⑤	⑥
	B	H			T	l/s			
295	295	85	50	E11	67	240	125	2.3	3
395	395	85	50	E11	128	460	125	4.1	4
495	495	85	50	E11	211	760	125	6.5	5
520	520	85	50	E11	235	845	125	7.2	6
295	295	85	50	H13	67	240	250	2.3	3
395	395	85	50	H13	128	460	250	4.1	4
495	495	85	50	H13	211	760	250	6.5	5
520	520	85	50	H13	235	845	250	7.2	6
295	295	85	68	H14	42	150	120	3.3	3
395	395	85	68	H14	81	290	120	6.0	4
495	495	85	68	H14	133	480	120	9.5	5
520	520	85	68	H14	147	530	120	10.5	6

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight





Compact construction for special applications

Order code

MFCA – H13 – AL / 175 × 280

1 2 3 4

1 Type

MFCA Mini Pleat filter cartridge

3 Construction

AL Casing made of aluminium

2 Filter class

E11 Particulate filter according to EN 1822

H13 Particulate filter according to EN 1822

4 Nominal size [mm]

D × H

+ Features

- Final filters for the separation of suspended particles to meet the highest requirements
- ▶ Filter classes E11, H13
 - ▶ Performance data tested to EN 1822
 - ▶ Filter media for special requirements, glass fibre papers with spacers made of thermoplastic hot-melt adhesive
 - ▶ Low initial differential pressure due to ideal pleat position and largest possible filter area

Application

- ▶ Mini Pleat filter cartridge type MFCA for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply and extract air in ventilation systems
- ▶ Particulate filter: Main or final filter used for the most critical requirements of air cleanliness and sterility in areas such as industry, research, medicine, pharmaceuticals, and nuclear engineering

★ Special characteristics

- ▶ Leakage test, standard for all particulate filters of filter class H13

Technical data

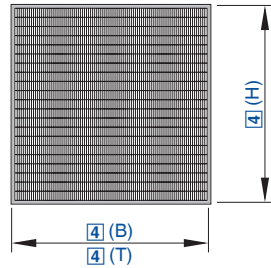
	E11	H13
Filter class according to EN1822	E11	H13
Initial differential pressure at nominal volume flow rate	100 Pa	200 Pa
Recommended final differential pressure	450 Pa	600 Pa
Max. operating temperature	80 °C	80 °C
Maximum relative humidity	100 %	100 %

Dimensions [mm] and weight [kg]

D	H	2	2		3	4	5
			l/s	m ³ /h	Pa	m ²	kg
175	177	E11	36	130	100	1.3	1
175	227	E11	47	170	100	1.7	1
175	280	E11	56	200	100	2.1	1
175	177	H13	36	130	200	1.3	1
175	227	H13	47	170	200	1.7	1
175	280	H13	56	200	200	2.1	1

2 Nominal volume flow rate 3 Initial differential pressure 4 Filter area 5 Weight





For the most demanding requirements on the purity of indoor air, workstations, and devices

Order code

MFPCR – H14 – ALC / 1220 x 610 x 78 x 58 / PD / CSU / ST



<p>1 Type MFPCR Mini Pleat filter panel for clean room technology</p> <p>2 Filter class H14 Particulate filter according to EN 1822 U15 Particulate filter according to EN 1822 U16 Particulate filter according to EN 1822</p> <p>3 Construction ALB Frame made of extruded aluminium sections (depth 69 mm) ALC Frame made of extruded aluminium sections (depth 78 mm) ALG Frame made of extruded aluminium sections (depth 90 mm)</p>	<p>4 Nominal size [mm] B × H × T</p> <p>5 Pleat depth [mm] FT</p> <p>6 Protection grid No entry: none PU Protection grid on the upstream side PD Protection grid on the downstream side PB Protection grid on both sides</p> <p>7 Seal CSU Continuous seal on the upstream side CSD Continuous seal on the downstream side CSB Continuous seal on both sides</p>	<p>8 Testing ST Scan test OT Oil mist test (only for filter class H14)</p>
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Features

- HEPA and ULPA filters as high-efficiency particulate filters for the separation of suspended particles in clean room systems. Used for industrial, research, medical, pharmaceutical, and nuclear engineering applications.
- ▶ Filter classes H14, U15, U16
 - ▶ Performance data tested to EN 1822
 - ▶ Meets the hygiene requirements of VDI 6022
 - ▶ Filter media for special requirements, glass fibre papers with spacers made of thermoplastic hot-melt adhesive
 - ▶ Perfect adjustment to individual requirements due to variable pleat depths
 - ▶ Low initial differential pressure due to ideal

- pleat position and largest possible filter area
- ▶ Automatic filter scan test
 - ▶ Fitting into filter fan units, clean room workbenches, or operating theatre ceilings

Application

- ▶ Mini Pleat filter panel type MFPCR for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply and extract air in clean room systems with controlled air cleanliness and airflow
- ▶ Particulate filter: Final filter for the most critical requirements of air cleanliness and sterility in areas such as industry, research, medicine, pharmaceuticals, and nuclear engineering

Special characteristics

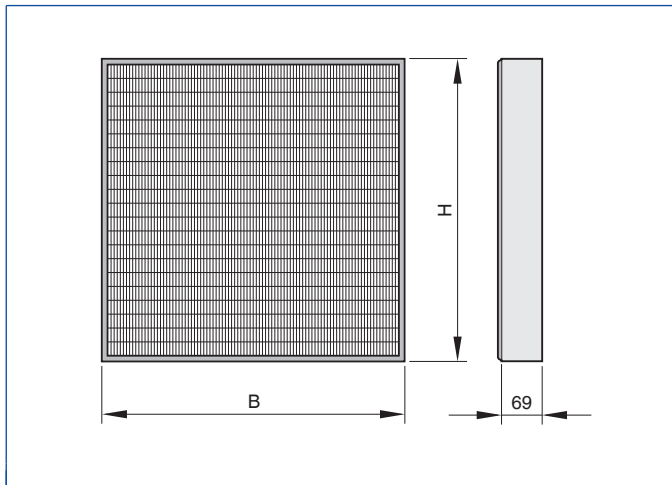
- ▶ Ideal pleat geometry of the filter medium
- ▶ Low initial differential pressure at high filtration performance
- ▶ Low-turbulence airflow on the downstream side
- ▶ Filter scan test ensures leak-free construction as well as compliance with the stated efficiency and differential pressure

Technical data

Filter class according to EN1822	H14	U15	U16
Nominal face velocity	0.45 m/s	0.45 m/s	0.45 m/s
Initial differential pressure at nominal face velocity for frame ALB	110 Pa	130 Pa	–
Initial differential pressure at nominal face velocity for frame ALC	95 Pa	115 Pa	140 Pa
Initial differential pressure at nominal face velocity for frame ALG	85 Pa	100 Pa	120 Pa
Max. operating temperature	80 °C	80 °C	80 °C
Maximum relative humidity	100 %	100 %	100 %



MFPCR-...-ALB



Dimensions [mm] and weight [kg]

④			⑤	②	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
305	305	69	50	H14	42	150	110	2.8	1
457	457	69	50	H14	94	340	110	6.3	2
305	610	69	50	H14	83	300	110	5.7	2
457	610	69	50	H14	125	450	110	8.5	3
610	610	69	50	H14	168	605	110	11.2	4
762	610	69	50	H14	210	755	110	14.0	4
915	610	69	50	H14	251	905	110	16.8	5
1220	610	69	50	H14	335	1205	110	22.3	6
1525	610	69	50	H14	418	1505	110	27.8	8
1830	610	69	50	H14	503	1810	110	33.3	9
762	762	69	50	H14	261	940	110	17.5	5
915	762	69	50	H14	314	1130	110	21.0	5
1220	762	69	50	H14	418	1505	110	27.9	7
1525	762	69	50	H14	522	1880	110	34.8	9
1830	762	69	50	H14	628	2260	110	41.7	10
915	915	69	50	H14	376	1355	110	25.2	6
1220	915	69	50	H14	501	1805	110	33.5	8
1525	915	69	50	H14	628	2260	110	41.9	10
1830	915	69	50	H14	753	2710	110	50.2	12

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

Dimensions [mm] and weight [kg]

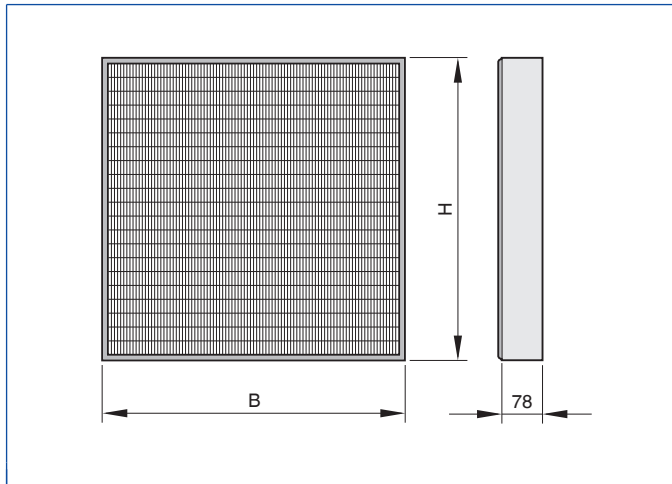
④			⑤	②	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
305	305	69	50	U15	42	150	130	2.8	1
457	457	69	50	U15	94	340	130	6.3	2
305	610	69	50	U15	83	300	130	5.7	2
457	610	69	50	U15	125	450	130	8.5	3
610	610	69	50	U15	168	605	130	11.2	4
762	610	69	50	U15	210	755	130	14.0	4
915	610	69	50	U15	251	905	130	16.8	5
1220	610	69	50	U15	335	1205	130	22.3	6
1525	610	69	50	U15	418	1505	130	27.8	8
1830	610	69	50	U15	503	1810	130	33.3	9
762	762	69	50	U15	261	940	130	17.5	5
915	762	69	50	U15	314	1130	130	21.0	5



④			⑤	②	③		④	⑤	⑥
B	H	T			l/s	m ³ /h			
1220	762	69	50	U15	418	1505	130	27.9	7
1525	762	69	50	U15	522	1880	130	34.8	9
1830	762	69	50	U15	628	2260	130	41.7	10
915	915	69	50	U15	376	1355	130	25.2	6
1220	915	69	50	U15	501	1805	130	33.5	8
1525	915	69	50	U15	628	2260	130	41.9	10
1830	915	69	50	U15	753	2710	130	50.2	12

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

MFPCR-...-ALC



Dimensions [mm] and weight [kg]

④			⑤	②	③		④	⑤	⑥
B	H	T			l/s	m ³ /h			
305	305	78	58	H14	42	150	95	3.3	2
457	457	78	58	H14	94	340	95	7.3	3
305	610	78	58	H14	83	300	95	6.6	3
457	610	78	58	H14	125	450	95	9.8	3
610	610	78	58	H14	168	605	95	13.0	4
762	610	78	58	H14	210	755	95	16.2	5
915	610	78	58	H14	251	905	95	19.4	5
1220	610	78	58	H14	335	1205	95	25.9	7
1525	610	78	58	H14	418	1505	95	32.3	9
1830	610	78	58	H14	503	1810	95	38.7	10
762	762	78	58	H14	261	940	95	20.3	5
915	762	78	58	H14	314	1130	95	24.3	6
1220	762	78	58	H14	418	1505	95	32.4	8
1525	762	78	58	H14	522	1880	95	40.4	10
1830	762	78	58	H14	628	2260	95	48.4	12
915	915	78	58	H14	376	1355	95	29.3	7
1220	915	78	58	H14	501	1805	95	38.9	9
1525	915	78	58	H14	628	2260	95	48.6	12
1830	915	78	58	H14	753	2710	95	58.2	14

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



Dimensions [mm] and weight [kg]

④			⑤	②	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
305	305	78	58	U15	42	150	115	3.3	2
457	457	78	58	U15	94	340	115	7.3	3
305	610	78	58	U15	83	300	115	6.6	3
457	610	78	58	U15	125	450	115	9.8	3
610	610	78	58	U15	168	605	115	13.0	4
762	610	78	58	U15	210	755	115	16.2	5
915	610	78	58	U15	251	905	115	19.4	5
1220	610	78	58	U15	335	1205	115	25.9	7
1525	610	78	58	U15	418	1505	115	32.3	9
1830	610	78	58	U15	503	1810	115	38.7	10
762	762	78	58	U15	261	940	115	20.3	5
915	762	78	58	U15	314	1130	115	24.3	6
1220	762	78	58	U15	418	1505	115	32.4	8
1525	762	78	58	U15	522	1880	115	40.4	10
1830	762	78	58	U15	628	2260	115	48.4	12
915	915	78	58	U15	376	1355	115	29.3	7
1220	915	78	58	U15	501	1805	115	38.9	9
1525	915	78	58	U15	628	2260	115	48.6	12
1830	915	78	58	U15	753	2710	115	58.2	14

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

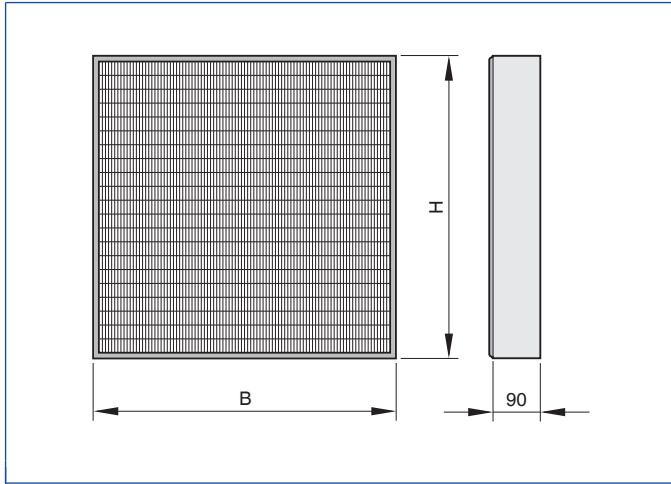
Dimensions [mm] and weight [kg]

④			⑤	②	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
305	305	78	58	U16	42	150	140	3.3	2
457	457	78	58	U16	94	340	140	7.3	3
305	610	78	58	U16	83	300	140	6.6	3
457	610	78	58	U16	125	450	140	9.8	3
610	610	78	58	U16	168	605	140	13.0	4
762	610	78	58	U16	210	755	140	16.2	5
915	610	78	58	U16	251	905	140	19.4	5
1220	610	78	58	U16	335	1205	140	25.9	7
1525	610	78	58	U16	418	1505	140	32.3	9
1830	610	78	58	U16	503	1810	140	38.7	10
762	762	78	58	U16	261	940	140	20.3	5
915	762	78	58	U16	314	1130	140	24.3	6
1220	762	78	58	U16	418	1505	140	32.4	8
1525	762	78	58	U16	522	1880	140	40.4	10
1830	762	78	58	U16	628	2260	140	48.4	12
915	915	78	58	U16	376	1355	140	29.3	7
1220	915	78	58	U16	501	1805	140	38.9	9
1525	915	78	58	U16	628	2260	140	48.6	12
1830	915	78	58	U16	753	2710	140	58.2	14

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



MFPCR-...-ALG



Dimensions [mm] and weight [kg]

④		④		⑤	②	③		④	⑤	⑥
B	H	T	l/s			m ³ /h	Pa	m ²	kg	
305	305	90	70	H14	42	150	85	3.8	2	
457	457	90	70	H14	94	340	85	8.6	3	
305	610	90	70	H14	83	300	85	7.7	3	
457	610	90	70	H14	125	450	85	11.5	3	
610	610	90	70	H14	168	605	85	15.2	5	
762	610	90	70	H14	210	755	85	18.9	5	
915	610	90	70	H14	251	905	85	22.7	6	
1220	610	90	70	H14	335	1205	85	30.2	8	
1525	610	90	70	H14	418	1505	85	37.6	10	
1830	610	90	70	H14	503	1810	85	45.1	12	
762	762	90	70	H14	261	940	85	23.7	6	
915	762	90	70	H14	314	1130	85	28.4	7	
1220	762	90	70	H14	418	1505	85	37.8	9	
1525	762	90	70	H14	522	1880	85	47.1	12	
1830	762	90	70	H14	628	2260	85	56.5	14	
915	915	90	70	H14	376	1355	85	34.1	8	
1220	915	90	70	H14	501	1805	85	45.4	10	
1525	915	90	70	H14	628	2260	85	56.6	14	
1830	915	90	70	H14	753	2710	85	67.9	16	

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



Dimensions [mm] and weight [kg]

④	④		⑤	②	③		④	⑤	⑥
	B	H			T	l/s			
305	305	90	70	U15	42	150	100	3.8	2
457	457	90	70	U15	94	340	100	8.6	3
305	610	90	70	U15	83	300	100	7.7	3
457	610	90	70	U15	125	450	100	11.5	3
610	610	90	70	U15	168	605	100	15.2	5
762	610	90	70	U15	210	755	100	18.9	5
915	610	90	70	U15	251	905	100	22.7	6
1220	610	90	70	U15	335	1205	100	30.2	8
1525	610	90	70	U15	418	1505	100	37.6	10
1830	610	90	70	U15	503	1810	100	45.1	12
762	762	90	70	U15	261	940	100	23.7	6
915	762	90	70	U15	314	1130	100	28.4	7
1220	762	90	70	U15	418	1505	100	37.8	9
1525	762	90	70	U15	522	1880	100	47.1	12
1830	762	90	70	U15	628	2260	100	56.5	14
915	915	90	70	U15	376	1355	100	34.1	8
1220	915	90	70	U15	501	1805	100	45.4	10
1525	915	90	70	U15	628	2260	100	56.6	14
1830	915	90	70	U15	753	2710	100	67.9	16

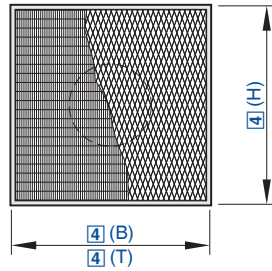
③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight

Dimensions [mm] and weight [kg]

④	④		⑤	②	③		④	⑤	⑥
	B	H			T	l/s			
305	305	90	70	U16	42	150	120	3.8	2
457	457	90	70	U16	94	340	120	8.6	3
305	610	90	70	U16	83	300	120	7.7	3
457	610	90	70	U16	125	450	120	11.5	3
610	610	90	70	U16	168	605	120	15.2	5
762	610	90	70	U16	210	755	120	18.9	5
915	610	90	70	U16	251	905	120	22.7	6
1220	610	90	70	U16	335	1205	120	30.2	8
1525	610	90	70	U16	418	1505	120	37.6	10
1830	610	90	70	U16	503	1810	120	45.1	12
762	762	90	70	U16	261	940	120	23.7	6
915	762	90	70	U16	314	1130	120	28.4	7
1220	762	90	70	U16	418	1505	120	37.8	9
1525	762	90	70	U16	522	1880	120	47.1	12
1830	762	90	70	U16	628	2260	120	56.5	14
915	915	90	70	U16	376	1355	120	34.1	8
1220	915	90	70	U16	501	1805	120	45.4	10
1525	915	90	70	U16	628	2260	120	56.6	14
1830	915	90	70	U16	753	2710	120	67.9	16

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight





For the most critical requirements in clean room areas

Order code

FHD – H13 – D / 1220 × 610 × 140 × 313 / PD / FND / ST



1 Type

FHD Mini Pleat filter panel with hood

2 Filter class

- E11** Particulate filter according to EN 1822
- H13** Particulate filter according to EN 1822
- H14** Particulate filter according to EN 1822
- U15** Particulate filter according to EN 1822

3 Construction

- No entry: without centre mullion, spigot with fixed baffle plate
- D** Centre mullion with pressure measurement point on the downstream side, spigot with fixed baffle plate
- R** Centre mullion with pressure measurement point on the downstream side, spigot with adjustable baffle plate for volume flow rate balancing
- V** Centre mullion with pressure measurement point on the downstream side, spigot with damper blade for volume flow rate balancing

4 Nominal size [mm]

B × H × T

5 Spigot diameter [mm]

D

6 Protection grid

- PD** Protection grid on the downstream side
- SD** Stainless steel protection grid on the downstream side
- SPD** Perforated stainless steel face plate on the downstream side
- APD** Perforated aluminium face plate on the downstream side

7 Seal

- WS** Without seal
- FND** Flat section seal on the downstream side

8 Testing

- No entry: no leakage test
- OT** Oil mist test (only for filter classes H13, H14)
- OTC** Oil mist test with certificate (only for filter classes H13, H14)
- ST** Scan test (only for filter classes H13, H14, U15)

Features

- Final filters for the separation of suspended particles, suitable for industrial, research, medical, and pharmaceutical applications
- Filter classes E11, H13, H14, U15
- Performance data factory tested to EN 1822
- Filter media for special requirements, glass fibre papers with spacers made of thermoplastic hot-melt adhesive
- Low initial differential pressure due to ideal pleat position and largest possible filter area
- Perfect adjustment to individual requirements due to different constructions
- Filter hood available in various sizes and the usual grid sizes

- ▶ Automatic filter scan test for all filters from filter class H14

Optional equipment and accessories

- ▶ Mechanism for volume flow rate setting

Application

- ▶ Mini Pleat filter panel with hood, type FHD, for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply and extract air in clean room systems with controlled air cleanliness and airflow
- ▶ Particulate filters: Final filters for the most critical requirements of air cleanliness and sterility in areas such as industry, research,

medicine, pharmaceuticals, and nuclear engineering

Special characteristics

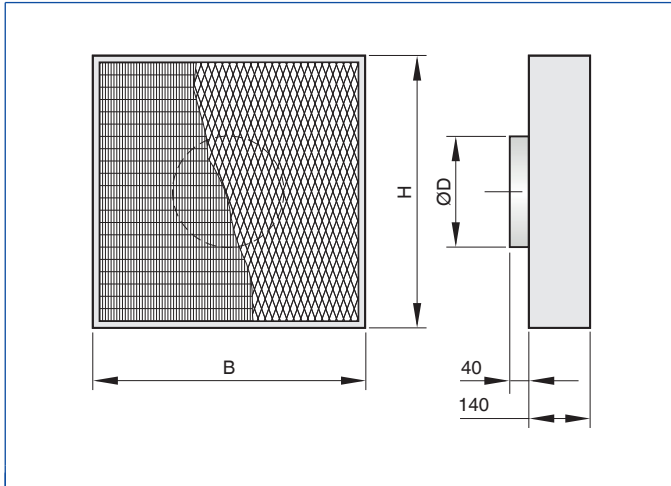
- ▶ Ideal pleat geometry of the filter medium
- ▶ Low-turbulence airflow on the downstream side
- ▶ Leakage test, standard for all particulate filters of classes H13, H14, U15

Technical data

Filter class according to EN1822	E11	H13	H14	U15
Nominal face velocity	0.82 m/s	0.82 m/s	0.45 m/s	0.45 m/s
Initial differential pressure at nominal volume flow rate	125 Pa	250 Pa	125 Pa	145 Pa
Recommended final differential pressure	300 Pa	600 Pa	300 Pa	300 Pa
Max. operating temperature	80 °C	80 °C	80 °C	80 °C
Maximum relative humidity	100 %	100 %	100 %	100 %



FHD-...



Dimensions [mm] and weight [kg]

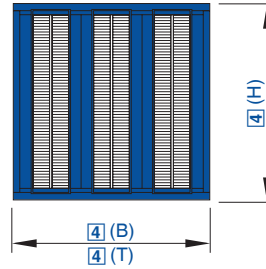
④			②	⑤	③		④	⑤	⑥
B	H	T			l/s	m ³ /h	Pa	m ²	kg
305	305	140	E11	148	76	275	125	2.8	4.0
457	457	140	E11	198	172	620	125	6.2	6.0
305	610	140	E11	198	153	550	125	5.7	5.5
610	610	140	E11	248	306	1100	125	11.1	8.1
915	610	140	E11	248	458	1650	125	16.6	11.1
1220	610	140	E11	313	611	2200	125	22.1	14.0
305	305	140	H13	148	76	275	250	2.8	4.0
457	457	140	H13	198	172	620	250	6.2	6.0
305	610	140	H13	198	153	550	250	5.7	5.5
610	610	140	H13	248	306	1100	250	11.1	8.1
915	610	140	H13	248	458	1650	250	16.6	11.1
1220	610	140	H13	313	611	2200	250	22.1	14.0
305	305	140	H14	148	42	150	125	2.8	4.0
457	457	140	H14	198	94	340	125	6.2	6.0
305	610	140	H14	198	83	300	125	5.7	5.5
610	610	140	H14	248	168	605	125	11.1	8.1
915	610	140	H14	248	250	900	125	16.6	11.1
1220	610	140	H14	313	333	1200	125	22.1	14.0
305	305	140	U15	148	42	150	145	2.8	4.0
457	457	140	U15	198	94	340	145	6.2	6.0
305	610	140	U15	198	83	300	145	5.7	5.5
610	610	140	U15	248	168	605	145	11.1	8.1
915	610	140	U15	248	250	900	145	16.6	11.1
1220	610	140	U15	313	333	1200	145	22.1	14.0

③ Nominal volume flow rate ④ Initial differential pressure ⑤ Filter area ⑥ Weight



	Specifications		Specifications
	ACFI	ACFC	ACF
Construction			
PLA	●	●	
GAL		●	
STA		●	
Useful additions			
Filter wall (SIF)	●		
Universal casing (UCA)	●	●	
Mounting plates (MP)		●	
KSF, KSFS			●
KSFSSP			●
DCA			●
Explanation			
● - Standard			
○ - Optional			





For the adsorption of gaseous odorous substances and contaminants

Order code

ACFI – PF – PLA / 592 × 592 × 292 / FNU

1 2 3 4 5

1 Type

ACFI Activated carbon filter insert

2 Variant

No entry: no prefilter
PF With prefilter ePM1 65 % according to ISO 16890

3 Construction

PLA Frame made of plastic

4 Nominal size [mm]

B × H × T

5 Seal

No entry: none
FNU Flat section seal on the upstream side
FND Flat seal on the downstream side

+ Features

- To improve the indoor air quality in offices, hotels, and airports
- ▶ Available with different carbon types for various areas of application and operating conditions
 - ▶ Available with ePM1 prefilter made of non-woven fibres
 - ▶ Compact depth construction
 - ▶ Various constructions for different applications
 - ▶ Fitting into standard cell frames for filter walls (type SIF)
 - ▶ Fitting into universal casings (type UCA) for duct installation

X Application

- ▶ Filter insert type ACFI for the adsorption of gaseous odorous substances and contaminants and for the adsorption of hydrocarbons and traces of inorganic compounds from supply or recirculated air

+ Useful additions

- ▶ Filter wall (SIF)
- ▶ Universal casing (UCA)

★ Special characteristics

- ▶ Upon request, filter inserts can be provided with other carbon types for special applications and operating conditions, e.g. for the adsorption of sulphur and chlorine compounds.

📊 Technical data

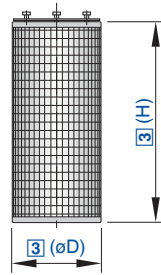
Differential pressure at nominal volume flow rate without prefilter	65 Pa
Differential pressure at nominal volume flow rate with prefilter	100 Pa
Max. operating temperature	30 °C
Maximum relative humidity	60 %

Dimensions [mm] and weight [kg]

④			②	②		③	④
B	H	T		l/s	m ³ /h	Pa	kg
592	287	292	-	472	1700	65	4
592	490	292	-	778	2800	65	6
592	592	292	-	944	3400	65	6
592	287	292	PF	472	1700	100	4
592	490	292	PF	778	2800	100	6
592	592	292	PF	944	3400	100	6

② Nominal volume flow rate ③ Differential pressure ④ Weight





For the adsorption of gaseous odorous substances and contaminants

Order code

ACFC – PLA / 145 × 450		
1	2	3

1 Type
ACFC Activated carbon filter cartridge

2 Construction
PLA Casing made of plastic
GAL Casing made of galvanised steel
STA Casing made of stainless steel

3 Nominal size [mm]
D × H

+ Features

- To improve the indoor air quality in offices, hotels, and airports
- ▶ Available with different carbon types for various areas of application and operating conditions
 - ▶ Cylinder made of perforated sheet steel, stainless steel, or plastic, available in different lengths
 - ▶ Plastic cylinders are completely corrosion-resistant; cartridges are completely incinerable and hence easily disposed of
 - ▶ Easy fitting and secure sealing due to triple

- ▶ bayonet fixing
- ▶ Fitting into mounting plates (type MP) for filter walls
- ▶ Fitting into universal casings (type UCA) for duct installation

X Application

- ▶ Filter cartridge type ACFC for the adsorption of gaseous odorous substances and contaminants and for the adsorption of hydrocarbons and traces of inorganic compounds from supply or recirculated air

+ Useful additions

- ▶ Mounting plates (MP)
- ▶ Universal casing (UCA)

★ Special characteristics

- ▶ Cylinder with profiled base and cover plates
- ▶ Upon request, filter cartridges can be provided with other carbon types for special applications and operating conditions, e.g. for the adsorption of sulphur and chlorine compounds

Technical data

CTC (carbon tetrachloride adsorption)	> 60 %	ASTM D3467
Toluene adsorption	> 14 %	-
Water content	< 3 %	ASTM D2867
Ash content	~ 8 %	ASTM D2866
Compacted dry density	480 - 500 g/l	ASTM D2854
BET surface	> 1100 m ² /g	BET-N2
Hardness	> 99 %	ASTM D3802
Iodine number	> 99 mg/g	ASTM D4607
Ignition point	> 375 °C	ASTM D3466
Pellet diameter	3 mm	-
Max. operating temperature	50 °C	-
Maximum relative humidity	70 %	-

ACFC-PLA

Nominal size	Nominal size	①		②	③	④	⑤	⑥
		D	H	Pa	s	l	mm	~ kg
		l/s	m ³ /h					
145	450	42	150	50	0,1	4,3	26	3
145	600	56	200	75	0,1	5,7	26	3

① Nominal volume flow rate ② Differential pressure ③ Contact time ④ Activated carbon volume ⑤ Layer thickness ⑥ Weight



ACFC-GAL/STA

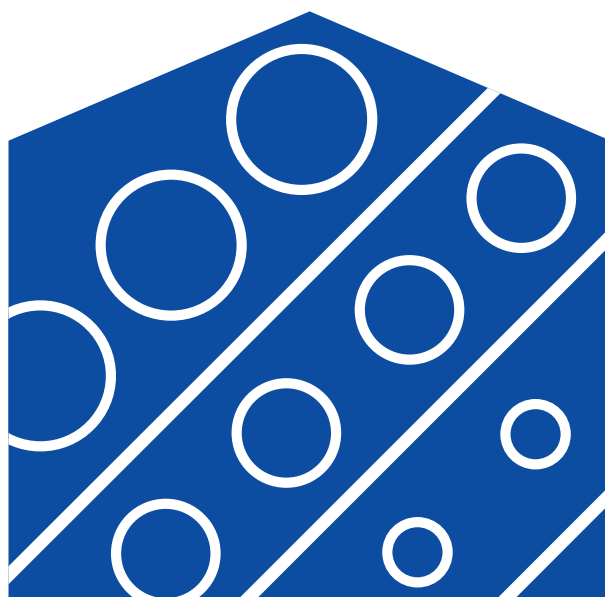
Nominal size	Nominal size	①		②	③	④	⑤	⑥
D	H	l/s	m ³ /h	Pa	s	l	mm	~ kg
145	450	42	150	45	0,1	4,3	26	4
145	600	56	200	60	0,1	5,7	26	5

① Nominal volume flow rate ② Differential pressure ③ Contact time ④ Activated carbon volume ⑤ Layer thickness ⑥ Weight (approx.)





Filter units and filter elements



6 Filter units and filter elements

6.1 Standard cell frames



Fitting of filter elements for the separation of coarse and fine dust

SCF

620

6.2 Filter wall



Fitting of filter elements for the separation of coarse and fine dust

SIF

624

6.3 Mounting frame



Fitting of filter elements for the separation of suspended particles

MF

627

6.4 Mounting plate



For the fitting of filter cartridges for the adsorption of gaseous odorous substances and contaminants

MP

628

6.5 Universal casings



Fitting of filter elements for the separation of coarse and fine dust or gaseous substances

UCA

629

6.6 Ducted particulate filters



Fitting of filter elements for the separation of suspended particles

KSF

635

6.7 Ducted particulate filters for critical requirements



Fitting of filter elements for the separation of suspended particles in areas with critical requirements

KSFS

637

6.8 Spigots



For filter unit systems with horizontal air entry and outlet

KSFSSP

639

6.9 Duct casings for particulate filters



Fitting of filter elements for the separation of suspended particles in areas with standard requirements

DCA

641

6.10 Ceiling mounted particulate filters



For critical air cleanliness and critical hygiene requirements, suitable for ceiling installation

TFC

642

6.11 Wall mounted particulate filter



For critical air cleanliness and critical hygiene requirements, suitable for wall installation

TFW

648

6.12 Particulate filter modules for ceilings



For critical air cleanliness and critical hygiene requirements, suitable for ceiling installation

TFM

650

6.13 Pharmaceutical clean room terminal filters



For critical air cleanliness and very critical hygiene requirements, suitable for ceiling installation

TFP

652

6.14 Pressure measuring devices



For the display, monitoring and control of differential pressures

MD

656



For the display, monitoring and control of differential pressures

MD-APC

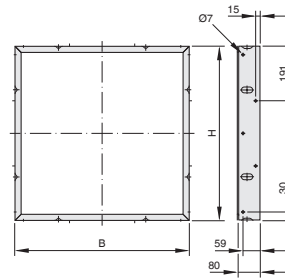
657



For the display, monitoring and control of differential pressures

MD-DPC-24

657



Fitting of filter elements for the separation of coarse and fine dust

Order code

SCF – B – 25 – GAL / 610 × 610 × 80 / CS

1 2 3 4 5 6

1 Type

SCF Standard cell frame

3 Tensioning depth [mm]

25, 48, 96

6 Seal

No entry: none
CS Continuous seal
PS Profiled seal
(SCF-A, SCF-D only)

2 Variant

With quick release fastener
D Frame without perimeter groove
E Frame with perimeter groove

4 Material

GAL Galvanised steel
STA Stainless steel

5 Nominal size [mm]

B × H × T

With spring clip
A Frame without perimeter groove
B Frame with perimeter groove
C Frame with perimeter groove, support grid, and tensioning frame

Features

- Standard cell frames for pocket filters, Mini Pleat filter inserts, activated carbon filter inserts, Mini Pleat filter panels with plastic frames, Z-line filters, and cut-to-size filter pads. For installation in air handling units or for mounting a filter wall in ventilation systems
- ▶ Highly variable since parts of various sizes can be combined
 - ▶ Robust construction; cell frame available with and without groove
 - ▶ Perfect compensation of tolerances due to perimeter groove in standard cell frame
 - ▶ Cell frames with a groove provide various tensioning options depending on the filter frame depth
 - ▶ Standard cell frames for cut-to-size filter pads with support grid and press-in frame
 - ▶ Easy handling and secure sealing due to four special clamping elements and a foamed, closed-cell, silicone-free continuous seal
 - ▶ Meets the hygiene requirements of VDI 6022

Optional equipment and accessories

- ▶ Stainless steel construction
- ▶ Profiled seal (replaceable)

Application

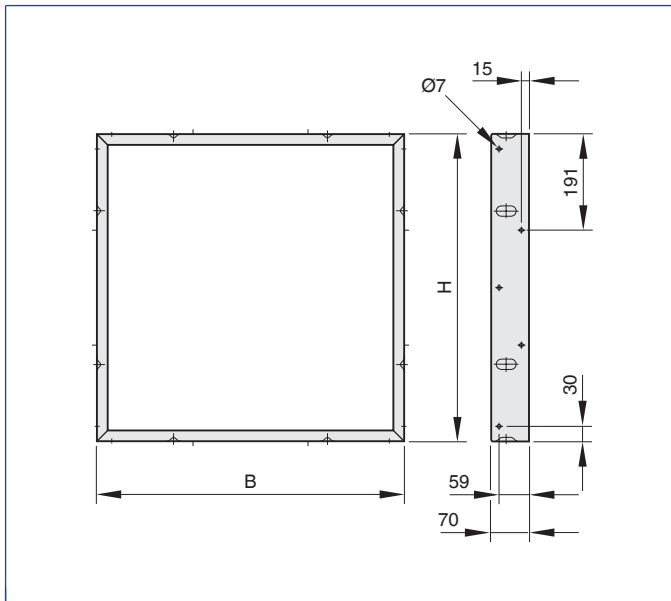
- ▶ Standard cell frame type SCF as a base element for mounting a filter wall in ventilation systems
- ▶ Fitting of filter elements for the separation of coarse and fine dust
- ▶ Fitting of filter elements for the adsorption of gaseous odorous substances and contaminants
- ▶ Standard cell frame for pocket filters, Mini Pleat filter inserts, activated carbon filter inserts, Mini Pleat filter panels with plastic frames, Z-line filters, and cut-to-size filter pads.

Useful additions

- ▶ Suitable filter elements to be ordered separately
- ▶ Pocket filters made of non-woven chemical fibres (PFC)
- ▶ Pocket filters made of non-woven synthetic fibres (PFS)
- ▶ Pocket filters made of NanoWave® medium (PFN)
- ▶ Pocket filters made of non-woven glass fibres (PFG)
- ▶ Mini Pleat filter inserts (MFI)
- ▶ Activated carbon filter inserts (ACFI)
- ▶ Mini Pleat filter panels (MFP, construction PLA)
- ▶ Z-line filters (ZL)
- ▶ Cut-to-size filter pads (FMP, media type G02, C04, C11, C06, construction PAD)



SCF-A

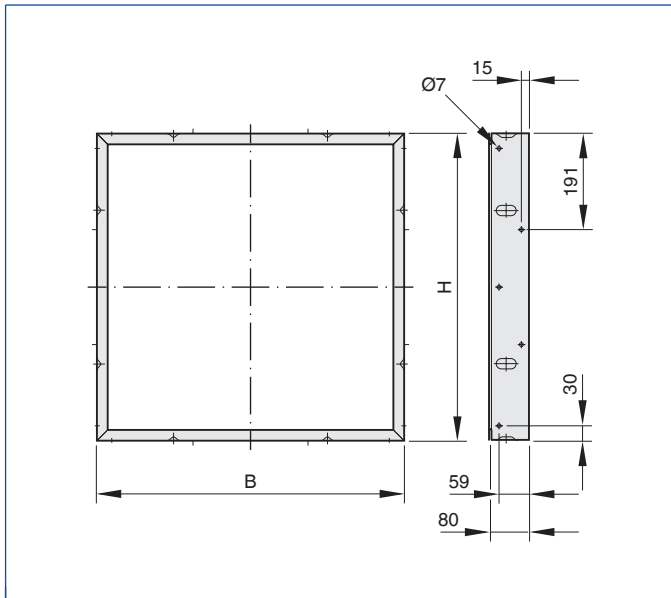


Dimensions [mm] and weight [kg]

⑤			③	②
B	H	T	mm	kg
305	305	70	25	0.9
305	610	70	25	1.3
508	610	70	25	1.6
610	610	70	25	1.8
305	910	70	25	1.8
508	910	70	25	2.1
610	910	70	25	2.2

② Weight (approx.)

SCF-B/SCF-C



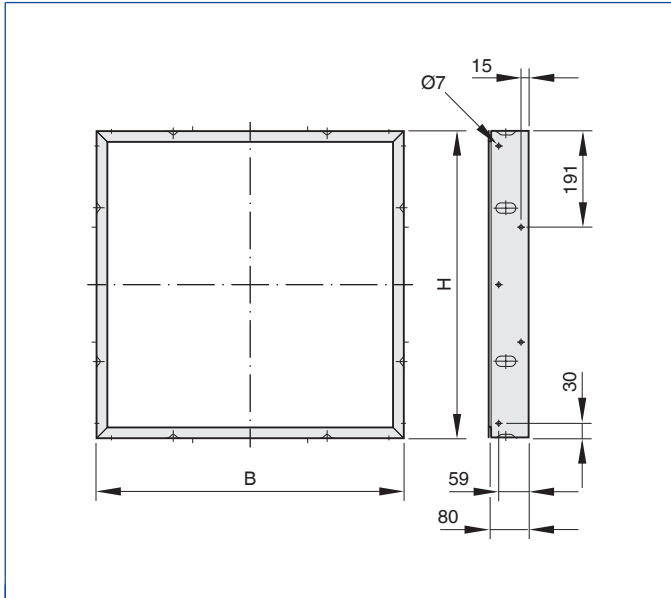
Dimensions [mm] and weight [kg]

⑤			③	②
B	H	T	mm	kg
305	305	80	25	1.2
305	610	80	25	1.9
508	610	80	25	2.4
610	610	80	25	2.5
305	910	80	25	2.5
508	910	80	25	3.0
610	910	80	25	3.2

② Weight (approx.)



SCF-B/SCF-C

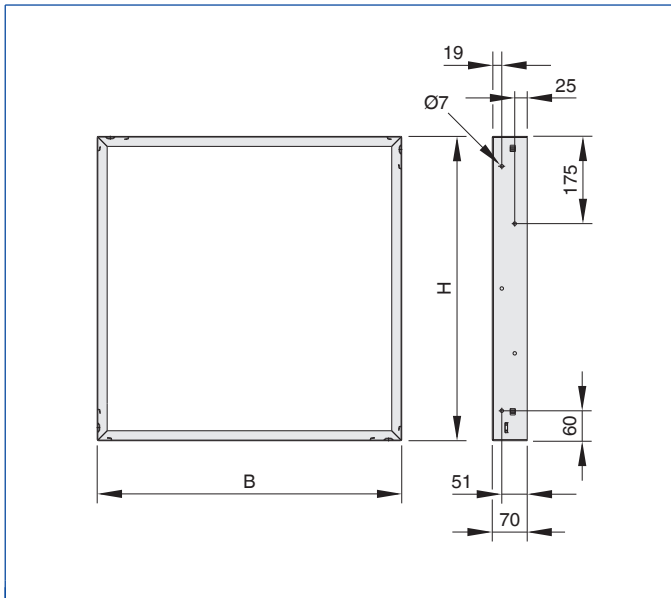


Dimensions [mm] and weight [kg]

⑤			③	②
B	H	T	mm	kg
305	610	80	25	3.0
610	610	80	25	4.1

② Weight (approx.)

SCF-D



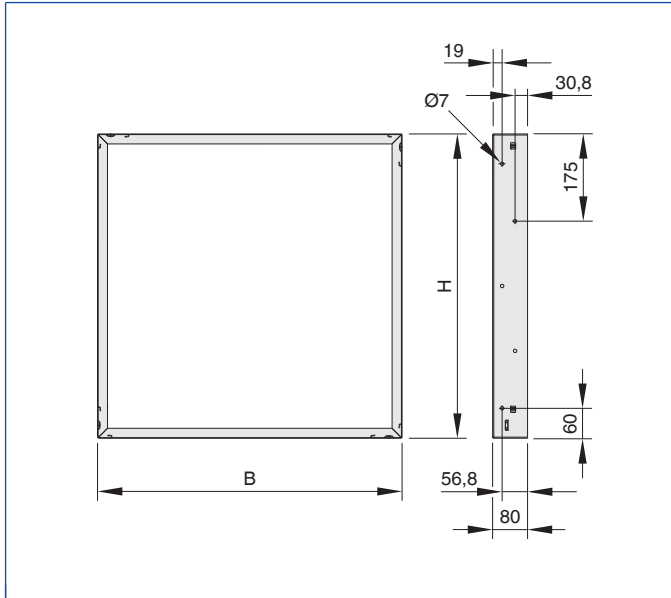
Dimensions [mm] and weight [kg]

⑤			③	②
B	H	T	mm	kg
305	305	70	25	0.9
305	610	70	25	1.3
508	610	70	25	1.6
610	610	70	25	1.8
305	910	70	25	1.8
508	910	70	25	2.1
610	910	70	25	2.2

② Weight (approx.)



SCF-E

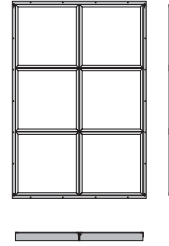


Dimensions [mm] and weight [kg]

B	H	T	⑤	③	②
			mm		kg
305	305	80	25		1.2
305	610	80	25		1.9
508	610	80	25		2.4
610	610	80	25		2.5
305	910	80	25		2.5
508	910	80	25		3.0
610	910	80	25		3.2

② Weight (approx.)





Fitting of filter elements for the separation of coarse and fine dust

Order code

SIF – B – 25 – GAL / 2,5 x 2

1 2 3 4 5 6

1 Type	5 Number of cell frames - horizontally	6 Number of cell frames - vertically
SIF Filter wall	1	1
	1.5	1.5
2 Variant	2	2
B Frame with perimeter groove and spring clips	2.5	2.5
E Frame with perimeter groove and quick release fasteners	3	3
	3.5	3.5
3 Tensioning depth [mm]	4	4
25	4.5	4.5
	5	5
4 Material	5.5	
GAL Galvanised steel	6	
STA Stainless steel		

Features

- Standard cell frames for pocket filters, Mini Pleat filter inserts, activated carbon filter inserts, Mini Pleat filter panels with plastic frames. For installation into ventilation systems
- ▶ Highly variable since parts of various sizes can be combined
 - ▶ Robust construction
 - ▶ Perfect compensation of tolerances due to perimeter groove in standard cell frame
 - ▶ Cell frames with a groove provide various tensioning options depending on the filter frame depth
 - ▶ Easy handling and secure sealing due to four special clamping elements and a foamed, closed-cell, silicone-free continuous seal
 - ▶ Meets the hygiene requirements of VDI 6022

- Optional equipment and accessories
- ▶ Stainless steel construction

Application

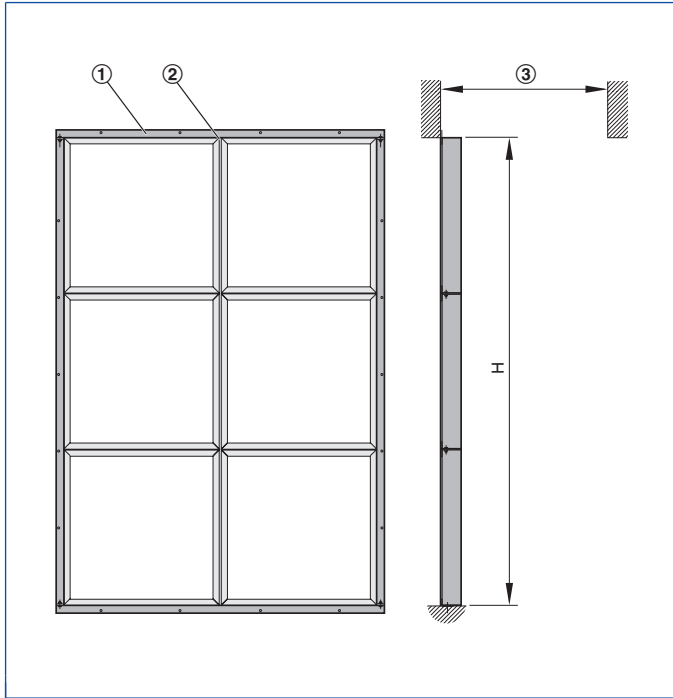
- ▶ Filter wall type SIF for ventilation systems
- ▶ Fitting of filter elements for the separation of coarse and fine dust
- ▶ Fitting of filter elements for the adsorption of gaseous odorous substances and contaminants
- ▶ Filter wall for pocket filters, Mini Pleat filter inserts, activated carbon filter inserts, Mini Pleat filter panels with plastic frames

Useful additions

- ▶ Suitable filter elements to be ordered separately
- ▶ Pocket filters made of non-woven chemical fibres (PFC)
- ▶ Pocket filters made of non-woven synthetic fibres (PFS)
- ▶ Pocket filters made of NanoWave® medium (PFN)
- ▶ Pocket filters made of non-woven glass fibres (PFG)
- ▶ Mini Pleat filter inserts (MFI)
- ▶ Activated carbon filter inserts (ACFI)
- ▶ Mini Pleat filter panels (MFP, construction PLA)



SIF



Dimensions [mm] and weight [kg]

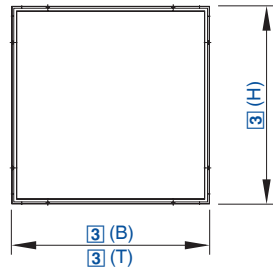
B	H	⑤		②			③
		horizontal	vertical	592 × 592	287 × 592	592 × 287	kg
610	610	1	1	1	0	0	5
	915	1	1.5	1	0	1	8
	1220	1	2	2	0	0	10
	1525	1	2.5	2	0	1	11
	1830	1	3	3	0	0	13
	2135	1	3.5	3	0	1	16
	2440	1	4	4	0	0	17
919	610	1.5	1	1	1	0	8
	1220	1.5	2	2	2	0	15
	1830	1.5	3	3	3	0	23
	2440	1.5	4	4	4	0	29
1225	610	2	1	2	0	0	10
	915	2	1.5	2	0	2	15
	1220	2	2	4	0	0	18
	1525	2	2.5	4	0	2	22
	1830	2	3	6	0	0	25
	2135	2	3.5	6	0	2	29
	2440	2	4	8	0	0	33
	2745	2	4.5	8	0	2	40
3050	2	5	10	0	0	43	
1535	610	2.5	1	2	1	0	11
	1220	2.5	2	4	2	0	24
	1830	2.5	3	6	3	0	34
	2440	2.5	4	8	4	0	44
	3050	2.5	5	10	5	0	61
1840	610	3	1	3	0	0	13
	915	3	1.5	3	0	3	23
	1220	3	2	6	0	0	26
	1525	3	2.5	6	0	3	33
	1830	3	3	9	0	0	37
	2135	3	3.5	9	0	3	44
	2440	3	4	12	0	0	48



B	H	⑤	⑥	②			③	
		horizontal	vertical	592 × 592	287 × 592	592 × 287	kg	
1840	2745	3	4.5	12	0	3	60	
	3050	3	5	15	0	0	64	
2145	610	3.5	1	3	1	0	16	
	1220	3.5	2	6	2	0	32	
	1830	3.5	3	9	3	0	46	
	2440	3.5	4	12	4	0	60	
	3050	3.5	5	15	5	0	83	
	2450	610	4	1	4	0	0	17
915		4	1.5	4	0	4	30	
1220		4	2	8	0	0	35	
1525		4	2.5	8	0	4	44	
1830		4	3	12	0	0	49	
2135		4	3.5	12	0	4	58	
2440		4	4	16	0	0	63	
2745		4	4.5	16	0	4	81	
3050		4	5	20	0	0	87	
2763		610	4.5	1	4	1	0	19
		1220	4.5	2	8	2	0	40
	1830	4.5	3	12	3	0	58	
	2440	4.5	4	16	4	0	75	
	3050	4.5	5	20	5	0	104	
	3068	610	5	1	5	0	0	21
915		5	1.5	5	0	5	37	
1220		5	2	10	0	0	43	
1525		5	2.5	10	0	5	55	
1830		5	3	15	0	0	60	
2135		5	3.5	15	0	5	73	
2440		5	4	20	0	0	79	
2745		5	4.5	20	0	5	101	
3050		5	5	25	0	0	108	
3377		1220	5.5	2	10	2	0	49
	1830	5.5	3	15	3	0	70	
	2440	5.5	4	20	4	0	90	
	3050	5.5	5	25	5	0	126	
3683	1220	6	2	12	0	0	51	
	1525	6	2.5	12	0	6	66	
	1830	6	3	18	0	0	73	
	2135	6	3.5	18	0	6	87	
	2440	6	4	24	0	0	94	
	2745	6	4.5	24	0	6	121	
3050	6	5	30	0	0	130		

② No. of filter elements ③ Weight





Fitting of filter elements for the separation of suspended particles



Order code

MF – GAL / 610 × 610 × 90

1 2 3

1 Type

MF Mounting frame

2 Material

GAL Galvanised steel
STA Stainless steel

3 Nominal size [mm]

B × H × T



Features

Mounting frames for Mini Pleat filter inserts. For installation in air handling units or for mounting a filter wall in ventilation systems

- ▶ Highly variable since parts of various sizes can be combined
- ▶ Easy handling due to four clamping screws that ensure a secure sealing between the mounting frame and the filter element
- ▶ Meets the hygiene requirements of VDI 6022



Application

- ▶ Mounting frame type MF as a base element for mounting a filter wall in air handling units and ventilation systems
- ▶ Fitting of filter elements for the separation of fine dust and suspended particles



Useful additions

- ▶ Suitable filter elements to be ordered separately
- ▶ Mini Pleat filter inserts (MFI, variant SPC)



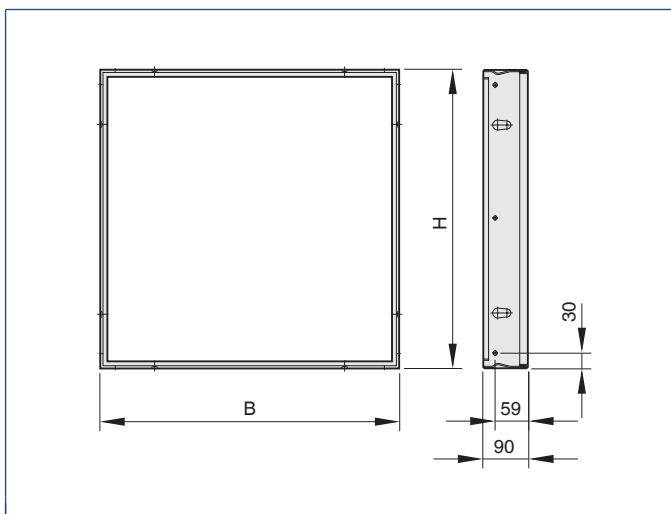
Optional equipment and accessories

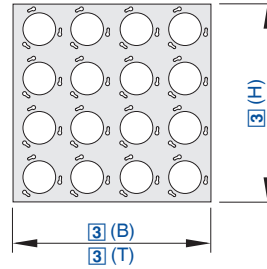
- ▶ Stainless steel construction

Dimensions [mm] and weight [kg]

3			1
B	H	T	kg
305	610	90	3.1
508	610	90	3.7
610	610	90	4.0

① Weight





For the fitting of filter cartridges for the adsorption of gaseous odorous substances and contaminants

Order code

MP – GAL / 610 × 610 × 80

1 2 3

1 Type
MP Mounting plate

2 Material
GAL Galvanised steel
STA Stainless steel

3 Nominal size [mm]
B × H × T



+ Features

Mounting plates for activated carbon filter cartridges. For installation in air handling units or for mounting a filter wall in ventilation systems

- ▶ Highly variable since parts of various sizes can be combined
- ▶ Easy change of the activated carbon filter cartridges due to the bayonet fixing
- ▶ Meets the hygiene requirements of VDI 6022

Optional equipment and accessories

- ▶ Stainless steel construction



Application

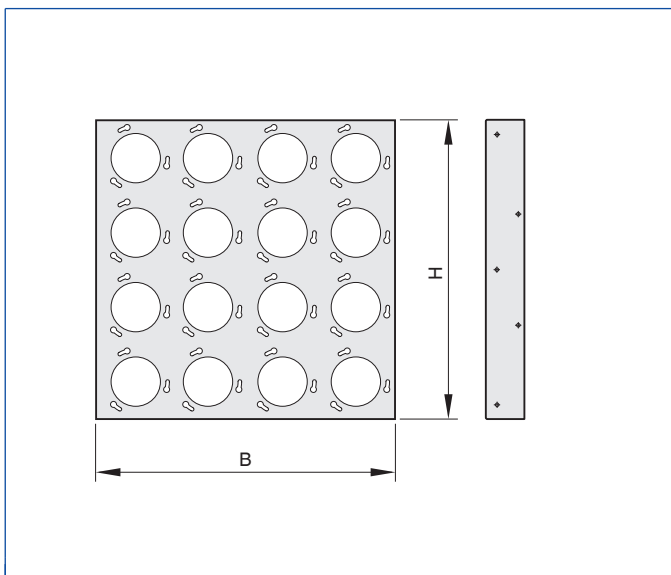
- ▶ Mounting plate type MP as a base element for mounting a filter wall in air handling units and ventilation systems
- ▶ Fitting of activated carbon filter cartridges for the adsorption of gaseous odorous substances and contaminants, hydrocarbons, and traces of inorganic compounds



Useful additions

- ▶ Suitable filter elements to be ordered separately
- ▶ Activated carbon filter cartridges (ACFC)

MP

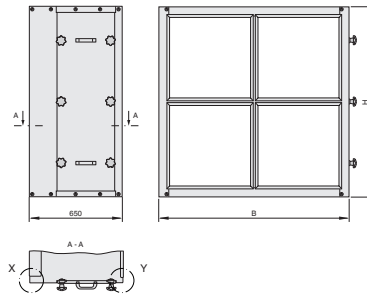


Dimensions [mm] and weight [kg]

3			1	2
B	H	T	1	kg
305	305	80	4	0.8
305	610	80	8	1.6
610	610	80	16	3.2

① No. of cartridges ② Weight





Fitting of filter elements for the separation of coarse and fine dust or gaseous substances

Order code

UCA – 1SPF – GAL / 1325 × 1630 × 650 / R

- 1
- 2
- 3
- 4
- 5

1 Type

UCA Universal casing

2 Variant

- 1SPF** One stage for particulate filters
- 2SPF** Two stages for particulate filters
- 1SAF** One stage for activated carbon filters
- 2SAF** Two stages for activated carbon filters and particulate filters

3 Material

GAL Galvanised steel
STA Stainless steel

4 Nominal size [mm]

B × H × T

5 Service door

R On the right (in direction of airflow)
L On the left (in direction of airflow)



+ Features

Universal casings for pocket filters, Mini Pleat filter inserts, activated carbon filter inserts, activated carbon filter cartridges or Mini Pleat filter panels with plastic frame. One-stage or two-stage construction for installation into the ductwork of ventilation systems.

- ▶ Highly variable due to different dimensions and space-saving, compact casing sizes
- ▶ Fitting of particulate filters and/or activated carbon filters in one casing depending on application
- ▶ Easy filter change through the side service door with handles and quick release clamps
- ▶ Location of the service door on the left or right when viewed in the direction of airflow
- ▶ Easy handling and secure sealing when fitting the filter elements due to four clamping elements and the continuous

closed-cell foam seal of the standard cell frame mounted in the universal casing

- ▶ Quick installation without any requirement for additional attachments since the casing frame is used as connecting frame
- ▶ Delivery as fully assembled unit

Optional equipment and accessories

- ▶ Stainless steel construction

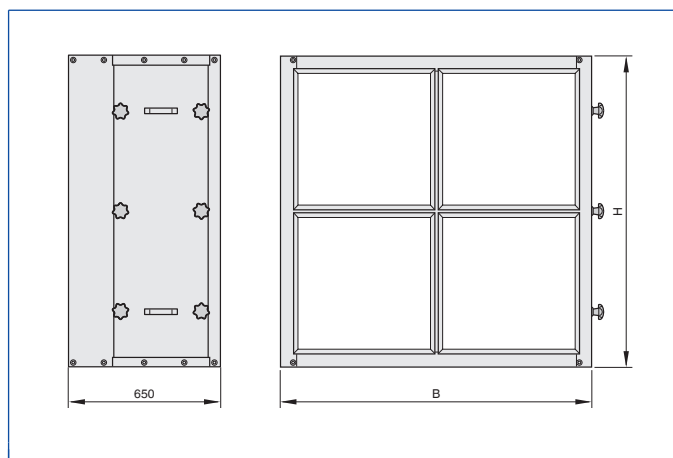
X Application

- ▶ Universal casing type UCA for installation into the ductwork of ventilation systems
- ▶ Fitting of filter elements for the separation of coarse dust and fine dust and for the adsorption of gaseous odorous substances and contaminants

+ Useful additions

- ▶ Suitable filter elements to be ordered separately
- ▶ Pocket filters made of non-woven chemical fibres (PFC)
- ▶ Pocket filters made of non-woven synthetic fibres (PFS)
- ▶ Pocket filters made of NanoWave® medium (PFN)
- ▶ Pocket filters made of non-woven glass fibres (PFG)
- ▶ Mini Pleat filter inserts (MFI)
- ▶ Activated carbon filter inserts (ACFI)
- ▶ Activated carbon filter cartridges (ACFC)
- ▶ Mini Pleat filter panels (MFP, construction PLA)

UCA-1SPF



Dimensions [mm] and weight [kg]

④	④		①		②				③	
	B	H	T	horizontal	vertical	592 × 592	287 × 592	592 × 287	287 × 287 ²⁾	kg
405	710	650		0.5	1	0	1	0	0	25
710	710	650		1	1	1	0	0	0	31
710	1015	650		1	1.5	1	0	1	0	42
710	1325	650		1	2	2	0	0	0	49
710	1630	650		1	2.5	2	0	1	0	58
710	1940	650		1	3	3	0	0	0	68
710	2245	650		1	3.5	3	0	1	0	73
710	2555	650		1	4	4	0	0	0	86
1015	710	650		1.5	1	1	1	0	0	38
1015	1015	650		1.5	1.5	1	1	1	1	51
1015	1325	650		1.5	2	2	2	0	0	60
1015	1630	650		1.5	2.5	2	2	1	1	70
1015	1940	650		1.5	3	3	3	0	0	83
1015	2245	650		1.5	3.5	3	3	1	1	90
1015	2555	650		1.5	4	4	4	0	0	105
1325	710	650		2	1	2	0	0	0	43
1325	1015	650		2	1.5	2	0	2	0	58
1325	1325	650		2	2	4	0	0	0	66
1325	1630	650		2	2.5	4	0	2	0	78
1325	1940	650		2	3	6	0	0	0	89
1325	2245	650		2	3.5	6	0	2	0	97
1325	2555	650		2	4	8	0	0	0	112
1630	710	650		2.5	1	2	1	0	0	50
1630	1015	650		2.5	1.5	2	1	2	1	67
1630	1325	650		2.5	2	4	2	0	0	77
1630	1630	650		2.5	2.5	4	2	2	1	91
1630	1940	650		2.5	3	6	3	0	0	104
1630	2245	650		2.5	3.5	6	3	2	1	113
1630	2555	650		2.5	4	8	4	0	0	131
1940	710	650		3	1	3	0	0	0	60
1940	1015	650		3	1.5	3	0	0	3	74
1940	1325	650		3	2	6	0	0	0	83
1940	1630	650		3	2.5	6	0	0	3	99
1940	1940	650		3	3	9	0	0	0	111
1940	2245	650		3	3.5	9	0	0	3	122
1940	2555	650		3	4	12	0	0	0	138
2245	710	650		3.5	1	3	1	0	0	63
2245	1015	650		3.5	1.5	3	1	3	1	84
2245	1325	650		3.5	2	6	2	0	0	94
2245	1630	650		3.5	2.5	6	2	3	1	114
2245	1940	650		3.5	3	9	3	0	0	125
2245	2245 ¹⁾	650		3.5	3.5	9	3	3	1	140
2245	2555 ¹⁾	650		3.5	4	12	4	0	0	157
2555	710	650		4	1	4	0	0	0	68
2555	1015	650		4	1.5	4	0	4	0	91
2555	1325	650		4	2	8	0	0	0	100
2555	1630	650		4	2.5	8	0	4	0	122
2555	1940	650		4	3	12	0	0	0	132
2555	2245 ¹⁾	650		4	3.5	12	0	4	0	146
2555	2555 ¹⁾	650		4	4	16	0	0	0	164

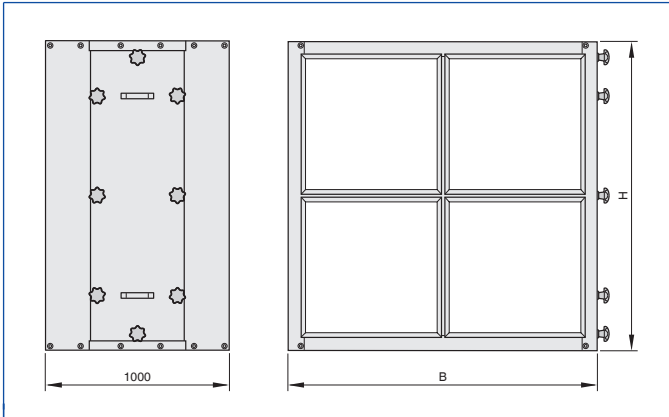
¹⁾ Delivered disassembled as compact package

²⁾ Only available as pocket filters

① No. of cell frames ② No. of filter elements ③ Weight



UCA-2SPF



Dimensions [mm] and weight [kg]

④	④		①		②				③	
	B	H	T	horizontal	vertical	592 × 592	287 × 592	592 × 287	287 × 287 ²⁾	kg
405	710	1000		0.5	1	0	2	0	0	36
710	710	1000		1	1	2	0	0	0	46
710	1015	1000		1	1.5	2	0	2	0	63
710	1325	1000		1	2	4	0	0	0	74
710	1630	1000		1	2.5	4	0	2	0	88
710	1940	1000		1	3	6	0	0	0	99
710	2245	1000		1	3.5	6	0	2	0	113
710	2555	1000		1	4	8	0	0	0	124
1015	710	1000		1.5	1	2	2	0	0	54
1015	1015	1000		1.5	1.5	2	2	2	2	74
1015	1325	1000		1.5	2	4	4	0	0	86
1015	1630	1000		1.5	2.5	4	4	2	2	102
1015	1940	1000		1.5	3	6	6	0	0	114
1015	2245	1000		1.5	3.5	6	6	2	2	131
1015	2555	1000		1.5	4	8	8	0	0	143
1325	710	1000		2	1	4	0	0	0	63
1325	1015	1000		2	1.5	4	0	4	0	85
1325	1325	1000		2	2	8	0	0	0	96
1325	1630	1000		2	2.5	8	0	4	0	113
1325	1940	1000		2	3	12	0	0	0	126
1325	2245	1000		2	3.5	12	0	4	0	144
1325	2555	1000		2	4	16	0	0	0	156
1630	710	1000		2.5	1	4	2	0	0	78
1630	1015	1000		2.5	1.5	4	2	4	2	103
1630	1325	1000		2.5	2	8	4	0	0	116
1630	1630	1000		2.5	2.5	8	4	4	2	136
1630	1940	1000		2.5	3	12	6	0	0	149
1630	2245	1000		2.5	3.5	12	6	4	2	166
1630	2555	1000		2.5	4	16	8	0	0	183
1940	710	1000		3	1	6	0	0	0	90
1940	1015	1000		3	1.5	6	...	6	0	118
1940	1325	1000		3	2	12	0	0	0	132
1940	1630	1000		3	2.5	12	...	6	0	155
1940	1940	1000		3	3	18	0	0	0	167
1940	2245	1000		3	3.5	18	...	6	0	188
1940	2555	1000		3	4	24	0	0	0	202
2245	710	1000		3.5	1	6	2	0	0	102
2245	1015	1000		3.5	1.5	6	2	6	2	133
2245	1325	1000		3.5	2	12	4	0	0	148
2245	1630	1000		3.5	2.5	12	4	6	2	171



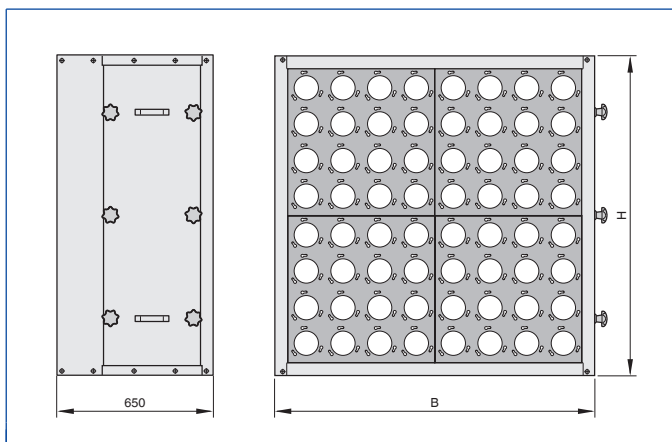
④	④		①		②				③	
	B	H	T	horizontal	vertical	592 × 592	287 × 592	592 × 287	287 × 287 ²⁾	kg
2245	1940	1000		3.5	3	18	6	0	0	186
2245	2245 ¹⁾	1000		3.5	3.5	18	6	6	2	210
2245	2555 ¹⁾	1000		3.5	4	24	8	0	0	225
2555	710	1000		4	1	8	0	0	0	112
2555	1015	1000		4	1.5	8	0	8	0	144
2555	1325	1000		4	2	16	0	0	0	159
2555	1630	1000		4	2.5	16	0	8	0	180
2555	1940	1000		4	3	24	0	0	0	199
2555	2245 ¹⁾	1000		4	3.5	24	0	8	0	224
2555	2555 ¹⁾	1000		4	4	32	0	0	0	239

¹⁾ Delivered disassembled as compact package

²⁾ Only available as pocket filters

① No. of cell frames ② No. of filter elements ③ Weight

UCA-1SAF



Dimensions [mm] and weight [kg]

④	④		①		②	③
	B	H	horizontal	vertical		kg
405	710	650	0.5	1	8	28
710	710	650	1	1	16	35
710	1015	650	1	1.5	24	47
710	1325	650	1	2	32	57
710	1630	650	1	2.5	40	66
710	1940	650	1	3	48	78
710	2245	650	1	3.5	56	84
710	2555	650	1	4	64	100
1015	710	650	1.5	1	24	43
1015	1015	650	1.5	1.5	36	59
1015	1325	650	1.5	2	48	69
1015	1630	650	1.5	2.5	60	82
1015	1940	650	1.5	3	72	96
1015	2245	650	1.5	3.5	84	105
1015	2555	650	1.5	4	96	122
1325	710	650	2	1	32	51
1325	1015	650	2	1.5	48	68
1325	1325	650	2	2	64	80
1325	1630	650	2	2.5	80	94
1325	1940	650	2	3	96	108
1325	2245	650	2	3.5	112	118
1325	2555	650	2	4	128	136



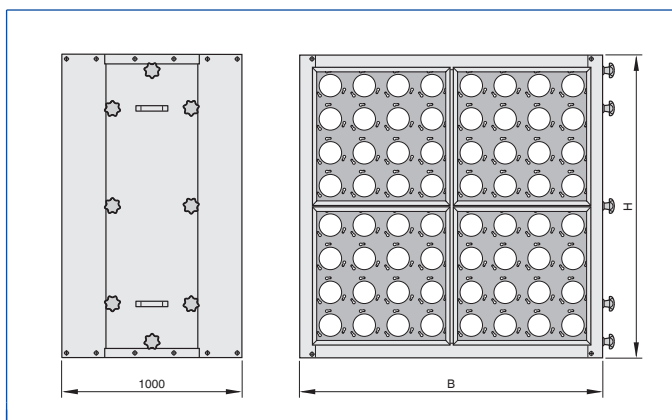
④		①		②	③	
B	H	T	kg			
1630	710	650	horizontal 2.5	vertical 1	40	60
1630	1015	650	horizontal 2.5	vertical 1.5	60	80
1630	1325	650	horizontal 2.5	vertical 2	80	93
1630	1630	650	horizontal 2.5	vertical 2.5	100	110
1630	1940	650	horizontal 2.5	vertical 3	120	126
1630	2245	650	horizontal 2.5	vertical 3.5	140	137
1630	2555	650	horizontal 2.5	vertical 4	160	159
1940	710	650	horizontal 3	vertical 1	48	69
1940	1015	650	horizontal 3	vertical 1.5	72	89
1940	1325	650	horizontal 3	vertical 2	96	102
1940	1630	650	horizontal 3	vertical 2.5	120	121
1940	1940	650	horizontal 3	vertical 3	144	137
1940	2245	650	horizontal 3	vertical 3.5	168	151
1940	2555	650	horizontal 3	vertical 4	192	172
2245	710	650	horizontal 3.5	vertical 1	56	75
2245	1015	650	horizontal 3.5	vertical 1.5	84	100
2245	1325	650	horizontal 3.5	vertical 2	112	116
2245	1630	650	horizontal 3.5	vertical 2.5	140	135
2245	1940	650	horizontal 3.5	vertical 3	168	156
2245	2245 ¹⁾	650	horizontal 3.5	vertical 3.5	196	175
2245	2555 ¹⁾	650	horizontal 3.5	vertical 4	224	196
2555	710	650	horizontal 4	vertical 1	64	82
2555	1015	650	horizontal 4	vertical 1.5	96	109
2555	1325	650	horizontal 4	vertical 2	128	125
2555	1630	650	horizontal 4	vertical 2.5	160	149
2555	1940	650	horizontal 4	vertical 3	192	167
2555	2245 ¹⁾	650	horizontal 4	vertical 3.5	224	185
2555	2555 ¹⁾	650	horizontal 4	vertical 4	256	209



¹⁾ Delivered disassembled as compact package

① No. mounting plates ② No. of cartridges ③ Weight

UCA-2SAF



Dimensions [mm] and weight [kg]

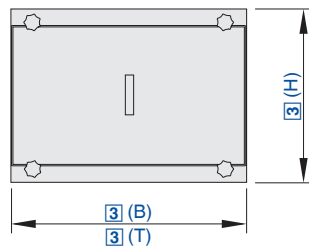
④	④		①		②	③				④
	B	H	T	horizontal		vertical	592 x 592	287 x 592	592 x 287	
405	710	1000	0.5	1	8	0	1	0	0	41
710	710	1000	1	1	16	1	0	0	0	51
710	1015	1000	1	1.5	24	1	0	1	0	69
710	1325	1000	1	2	32	2	0	0	0	81
710	1630	1000	1	2.5	40	2	0	1	0	97
710	1940	1000	1	3	48	3	0	0	0	112
710	2245	1000	1	3.5	56	3	0	1	0	125
710	2555	1000	1	4	64	4	0	0	0	137
1015	710	1000	1.5	1	24	1	1	0	0	63
1015	1015	1000	1.5	1.5	36	1	1	1	1	83
1015	1325	1000	1.5	2	48	2	2	0	0	97
1015	1630	1000	1.5	2.5	60	2	2	1	1	115
1015	1940	1000	1.5	3	72	3	3	0	0	131
1015	2245	1000	1.5	3.5	84	3	3	1	1	149
1015	2555	1000	1.5	4	96	4	4	0	0	163
1325	710	1000	2	1	32	2	0	0	0	73
1325	1015	1000	2	1.5	48	2	0	2	0	95
1325	1325	1000	2	2	64	4	0	0	0	110
1325	1630	1000	2	2.5	80	4	0	2	0	129
1325	1940	1000	2	3	96	6	0	0	0	145
1325	2245	1000	2	3.5	112	6	0	2	0	166
1325	2555	1000	2	4	128	8	0	0	0	181
1630	710	1000	2.5	1	40	2	1	0	0	89
1630	1015	1000	2.5	1.5	60	2	1	2	1	116
1630	1325	1000	2.5	2	80	4	2	0	0	132
1630	1630	1000	2.5	2.5	100	4	2	2	1	155
1630	1940	1000	2.5	3	120	6	3	0	0	173
1630	2245	1000	2.5	3.5	140	6	3	2	1	194
1630	2555	1000	2.5	4	160	8	4	0	0	215
1940	710	1000	3	1	48	3	0	0	0	103
1940	1015	1000	3	1.5	72	3	0	3	0	133
1940	1325	1000	3	2	96	6	0	0	0	151
1940	1630	1000	3	2.5	120	6	0	3	0	176
1940	1940	1000	3	3	144	9	0	0	0	195
1940	2245	1000	3	3.5	168	9	0	3	0	210
1940	2555	1000	3	4	192	12	0	0	0	237
2245	710	1000	3.5	1	56	3	1	0	0	116
2245	1015	1000	3.5	1.5	84	3	1	3	1	149
2245	1325	1000	3.5	2	112	6	2	0	0	169
2245	1630	1000	3.5	2.5	140	6	2	3	1	193
2245	1940	1000	3.5	3	168	9	3	0	0	218
2245	2245 ¹⁾	1000	3.5	3.5	196	9	3	3	1	145
2245	2555 ¹⁾	1000	3.5	4	224	12	4	0	0	265
2555	710	1000	4	1	64	4	0	0	0	127
2555	1015	1000	4	1.5	96	4	0	4	0	162
2555	1325	1000	4	2	128	8	0	0	0	183
2555	1630	1000	4	2.5	160	8	0	4	0	203
2555	1940	1000	4	3	192	12	0	0	0	234
2555	2245 ¹⁾	1000	4	3.5	224	12	0	4	0	264
2555	2555 ¹⁾	1000	4	4	256	16	0	0	0	284

¹⁾ Delivered disassembled as compact package

²⁾ Only available as pocket filters

① No. mounting plates / No. of cell frames ② No. of cartridges ③ No. of filter elements ④ Weight





Fitting of filter elements for the separation of suspended particles

Order code

KSF – SPC / 710 × 520 × 710

1 2 3

1 Type
KSF Ducted particulate filters

2 Material
SPC Steel, powder-coated RAL 9010 (pure white)
STA Stainless steel

3 Nominal size [mm]
B × H × T

+ Features

- Ducted particulate filter for Mini Pleat filter panels, Mini Pleat filter cells, and activated carbon filter cells. For installation into the ductwork of ventilation systems
- ▶ Duct casings made of sheet steel with decontaminable powder coating RAL 9010
 - ▶ Robust, welded casing construction with perimeter connecting flanges with pre-drilled holes
 - ▶ Casing with indentations to ensure the precise fitting of the filter elements
 - ▶ Secure sealing between the casing and filter element due to turnbuckles
 - ▶ Robust cover plate with profiled seal, four clamping screws, and a handle for air-tight closure
 - ▶ Horizontal or vertical installation orientation

- Optional equipment and accessories
- ▶ Stainless steel construction

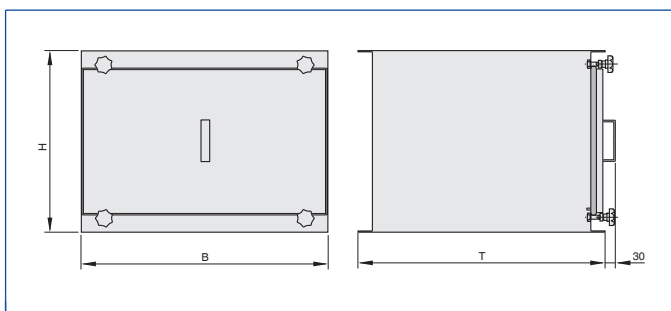
Application

- ▶ Ducted particulate filter type KSF for installation into the ductwork of ventilation systems
- ▶ Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air
- ▶ Fitting of activated carbon filter cells for the separation of gaseous odorous substances and contaminants from the supply and extract air

+ Useful additions

- ▶ Suitable filter elements to be ordered separately
- ▶ Mini Pleat filter panels (MFP)
- ▶ Mini Pleat filter cells (MFC)
- ▶ Activated carbon filter cells (ACF)

KSF

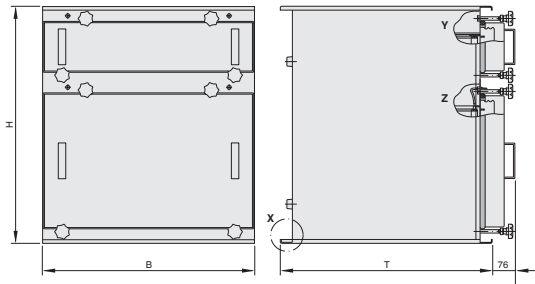


Dimensions [mm] and weight [kg]

③			①	②
B	H	T	B x H x T	kg
405	378	405	305 x 305 x 150	16
		710	305 x 610 x 150	19
710	520	405	305 x 610 x 150	19
		710	610 x 610 x 150	24
		862	762 x 610 x 150	27
405	520	405	305 x 305 x 292	18
		710	305 x 610 x 292	21
710	520	405	305 x 610 x 292	21
710		710	610 x 610 x 292	28
		862	762 x 610 x 292	30

① Filter size ② Weight





Fitting of filter elements for the separation of suspended particles in areas with critical requirements

Order code

KSFS – PM – SPC / 710 × 794 × 710 / MD

1 2 3 4 5

1 Type

KSFS Ducted particulate filter for critical requirements

3 Material

SPC Steel, powder-coated RAL 9010 (pure white)
STA Stainless steel

5 Service board

No entry: none
MD Casing with service board

2 Variant

M Casing without prefilter
PM Casing with prefilter

4 Nominal size [mm]

B × H × T



+ Features

Ducted particulate filters for Mini Pleat filter panels, Mini Pleat filter cells, and activated carbon filter cells. For installation into the ductwork of ventilation systems. Used in medicine, biology, pharmaceuticals, and sensitive technical areas.

- ▶ Ducted particulate filter made of sheet steel with decontaminable powder coating RAL 9010 and clamping mechanism made of stainless steel
- ▶ Robust, welded construction with doubled-edged perimeter flanges with pre-drilled holes ensures secure sealing
- ▶ One-stage or two-stage casing, for the fitting of fine dust filters as prefilter stage and of particulate filters as second filter stage
- ▶ Secure sealing and convenient handling due to tensioning lever for a consistent contact pressure and hence the sealing integrity between the casing and filter element
- ▶ With sealing integrity test facility for filter elements

Optional equipment and accessories

- ▶ Optional double-groove service board for contamination-free filter change ('safe change')
- ▶ Plastic service bag with cord ring for contamination-free filter change

Application

- ▶ Ducted particulate filter type KSFS for critical requirements
- ▶ Casing for duct installation
- ▶ Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air
- ▶ Fitting of activated carbon filter cells for the separation of gaseous odorous substances and contaminants from the supply and extract air

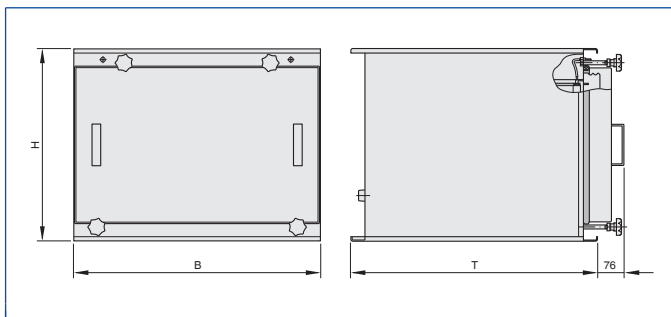
& Accessories

- ▶ Plastic service bag with cord ring

+ Useful additions

- ▶ Suitable filter elements to be ordered separately
- ▶ Mini Pleat filter panels (MFP)
- ▶ Mini Pleat filter cells (MFC)
- ▶ Activated carbon filter cells (ACF)
- ▶ Other filter elements upon request
- ▶ Spigot (KSFSSP)

KSFS-M

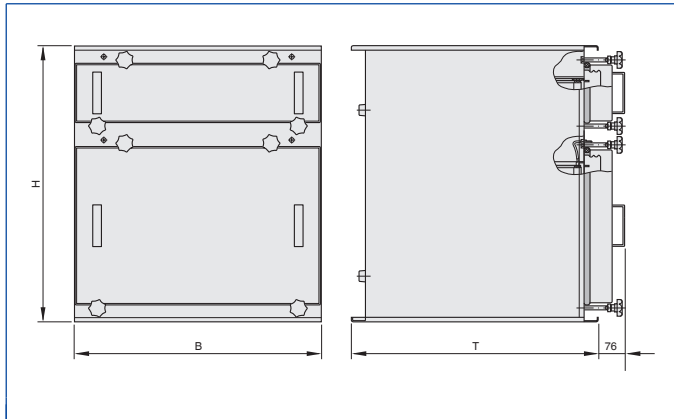


Dimensions [mm] and weight [kg]

④			①	②
B	H	T	B × H × T	kg
710	411	405	305 × 610 × 150	40
710	411	710	610 × 610 × 150	50
710	553	405	305 × 610 × 292	55
710	553	710	610 × 610 × 292	65
710	553	862	762 × 610 × 292	70

① Filter size ② Weight

KSFS-PM

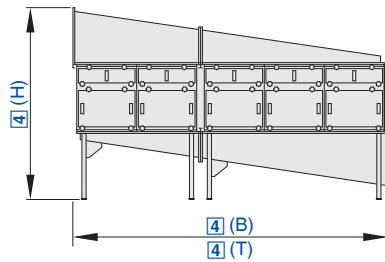


Dimensions [mm] and weight [kg]

④			①	②	③
B	H	T	B × H × T		kg
710	652	405	305 × 610 × 60	305 × 610 × 150	60
710	652	710	610 × 610 × 60	610 × 610 × 150	70
710	794	405	305 × 610 × 60	305 × 610 × 292	70
710	794	710	610 × 610 × 60	610 × 610 × 292	85
710	794	862	762 × 610 × 60	762 × 610 × 292	95

① Prefilter size ② Main filter size ③ Weight





For filter unit systems with horizontal air entry and outlet

Order code

KSFSSP – PM – SPC / 710 × 794 × 710 × 4 / MD / TLBR / SPP

1 2 3 4 5 6 7 8

1 Type

KSFSSP Spigot

2 Construction

M Casing without prefilter
PM Casing with prefilter

3 Material

SPC Steel, powder-coated RAL 9010 (pure white)
STA Stainless steel

4 Nominal size of KSFS [mm]

B × H × T

5 Number of casings

1, 2, 3, 4, 5, 6

6 Service board

No entry: none
MD Casing with service board

7 Spigot arrangement

TLBR Air entry at top left, air outlet at bottom right
TRBL Air entry at top right, air outlet at bottom left
TRBR Air entry at top right, air outlet at bottom right
TLBL Air entry at top left, air outlet at bottom left

8 Standard construction

SPM Casing and spigot factory assembled
SPP Casing and spigot separate



+ Features

Spigot for assembling filter unit systems in ductwork

- ▶ Spigots made of sheet steel with decontaminable powder coating RAL 9010
- ▶ Air deflection plates in the air outlet spigot ensure a uniform airflow through the system, reduce the total differential pressure, and lower energy costs
- ▶ For filter unit systems of up to 6 filter casings in a row
- ▶ Leakage test for the entire filter unit system

Optional equipment and accessories

- ▶ Stainless steel construction

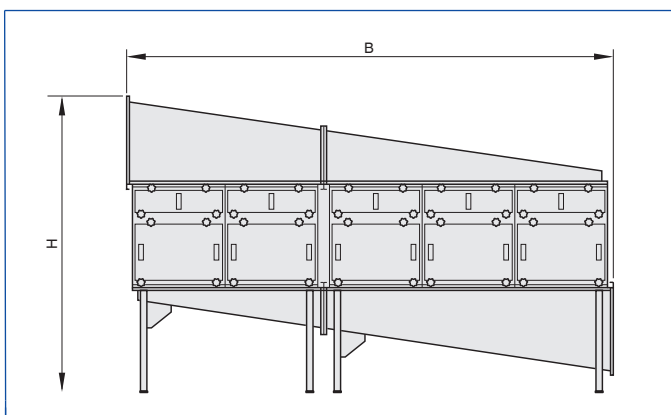
Application

- ▶ Spigot type KSFSSP for assembling a filter unit system with ducted particulate filters type KSFS for critical requirements

+ Useful additions

- ▶ Suitable filter elements to be ordered separately
- ▶ Mini Pleat filter panels (MFP)
- ▶ Mini Pleat filter cells (MFC)
- ▶ Activated carbon filter cells (ACF)
- ▶ Other filter elements upon request
- ▶ Ducted particulate filter (KSFS)

KSFSSP



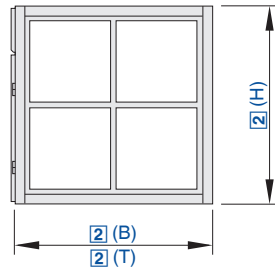
Dimensions [mm] and weight [kg]

5	Casing depth T	Total width B	Total height in combination with				Weight
	KSFS	KSFSSP	KSFS-M		KSFS-PM		
			H = 411	H = 553	H = 652	H = 794	
mm						kg	
1	710	800	1456	1598	1697	1839	45
2	710	1510	1571	1713	1812	1954	60
3	710	2220	1656	1798	1897	2039	80
4	710	3020	1756	1898	1997	2139	120
5	710	3730	1886	2028	2127	2269	145
6	710	4440	1966	2108	2207	2349	180

Dimensions [mm] and weight [kg]

5	Casing depth T	Total width B	Total height in combination with		Weight
	KSFS	KSFSSP	KSFS-M	KSFS-PM	
			H = 553	H = 794	
mm					kg
1	862	800	1598	1839	50
2	862	1510	1713	1954	65
3	862	2220	1798	2039	85
4	862	3020	1898	2139	125
5	862	3730	2028	2269	155
6	862	4440	2108	2349	190





Fitting of filter elements for the separation of suspended particles in areas with standard requirements

Order code

DCA / 1428 x 1428 x 654 / R

1 2 3

- 1 Type**
DCA Duct casing for particulate filters
- 2 Nominal size [mm]**
B x H x T
- 3 Service door**
R On the right (in direction of airflow)
L On the left (in direction of airflow)

+ Features

- Duct casing for Mini Pleat filter panels, Mini Pleat filter cells, and activated carbon filter cells. For installation into the ductwork of ventilation systems
- ▶ Highly variable due to different dimensions and space-saving, compact casing sizes
- ▶ With side service door for easy filter change
- ▶ Easy handling and secure sealing due to clamping mechanism
- ▶ Clamping mechanism for easy filter change and secure, air-tight assembly
- ▶ Quick installation without any requirement for additional attachments since the casing frame is used as connecting frame
- ▶ Delivery as fully assembled unit

- Optional equipment and accessories
- ▶ Clamping screw with star grip for the service door

Application

- ▶ Duct casing for particulate filters type DCA for installation into the ductwork of ventilation systems
- ▶ Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air
- ▶ Fitting of activated carbon filter cells for the separation of gaseous odorous substances and contaminants from the supply and extract air

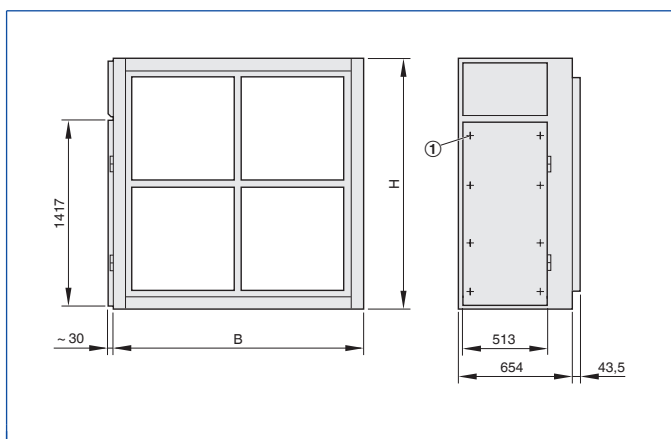
& Accessories

- ▶ Clamping screws with star grips for the service door

+ Useful additions

- ▶ Suitable filter elements to be ordered separately
- ▶ Mini Pleat filter panels (MFP)
- ▶ Mini Pleat filter cells (MFC)
- ▶ Activated carbon filter cells (ACF)
- ▶ Other filter elements upon request

DCA

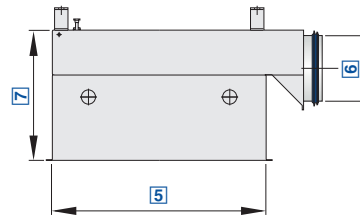


Dimensions [mm] and weight [kg]

2			1			2
B	H	T	horizontal	vertical	total	kg
804	804	654	1	1	1	40
804	1428	654	1	2	2	55
804	2052	654	1	3	3	70
1428	804	654	2	1	2	55
1428	1428	654	2	2	4	70
1428	2052	654	2	3	6	90
1428	2676	654	2	4	8	110
2052	804	654	3	1	3	70
2052	1428	654	3	2	6	90
2052	2052	654	3	3	9	110
2052	2676	654	3	4	12	135
2676	804	654	4	1	4	85
2676	1428	654	4	2	8	110
2676	2052	654	4	3	12	135

1 No. of filter elements 610 x 610 x 292 2 Weight





For critical air cleanliness and critical hygiene requirements, suitable for ceiling installation

Order code

TFC – SC – SPC – VDW / 600 x 24 x 248 x 344 / M / 2 / S / F

1 2 3 4 5 6 7 8 9 10 11

1 Type

TFC Ceiling mounted particulate filter

2 Variant

Side entry circular spigot,

SC

- SC00H** Shut-off damper, manually adjustable
- SCTN0** Shut-off damper with pneumatic actuator
- SCBR0** Shut-off damper with electric actuator, 24 - 240 V AC
- SCVFL** With volume flow limiter

TC Top entry circular spigot

SR Side entry rectangular spigot

3 Casing material

SPC Steel, powder-coated RAL 9010 (pure white)

STA Stainless steel

4 Air terminal device

No entry: none

- ADLQ**
- DLQ**
- FD**
- TDF**
- FDF**
- DLQLF**
- DLQL**
- VDW**
- PCD**
- AIRNAMIC**

5 Nominal size [mm]

ADLQ, DLQ, FD, TDF, FDF, DLQLF,

DLQL

400, 500, 600, 625, 680

VDW

400 x 16, 500 x 24, 600 x 24, 625 x 24

625 x 48, 680 x 24, 680 x 54

PCD

600, 625

AIRNAMIC

600, 625

6 Spigot diameter [mm]

D

7 Casing height [mm]

G1

8 Damper blade

No entry: none

M

Damper blade for volume flow rate balancing (only for TFC-SC and TFC-TC)

9 Fixing points

2 Installation subframe with 2 fixing points

4 Installation subframe with 4 fixing points (not for SC00H)

10 Suspension/measurement points

T Top

S Side

11 Flange width [mm]

No entry: standard

F 10 - 55 mm

+ Features

Ceiling mounted particulate filters as final filter stage with Mini Pleat filter panels for the separation of suspended particles. Used in medicine, biology, pharmaceuticals, and sensitive technical areas.

- ▶ Easy, time-saving and secure filter change, can be completed by one person due to special press-in frame
- ▶ Robust, welded construction
- ▶ Compact construction, suitable for low ceilings, integration with all clean room ceiling systems of various manufacturers
- ▶ Various diffusers to ideally meet individual requirements
- ▶ Horizontal (circular, rectangular) or vertical (circular) connection

- ▶ Choice of air-tight shut-off damper or volume flow limiter for horizontal connection
- ▶ Equipment for differential pressure measurement, sealing integrity testing, and particle sampling for measurement
- ▶ For air cleanliness classes 5 to 8 according to ISO 14644-1
- ▶ Meets the hygiene requirements of VDI 6022

X Application

- ▶ Particulate filter air terminal device type TFC for ceiling installation as final filter stage and for air distribution
- ▶ Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air

EN Classification

- ▶ Variants SC, TC, and SR conform to hygiene requirements

+ Useful additions

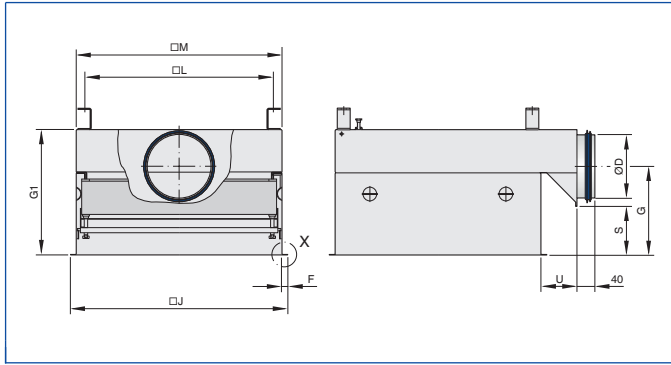
- ▶ Mini Pleat filter panels (MFP)
- ▶ Suitable filter elements to be ordered separately

★ Special characteristics

- ▶ Compact construction
- ▶ Easy operation
- ▶ High operational reliability



TFC-SC



Dimensions [mm] and weight [kg]

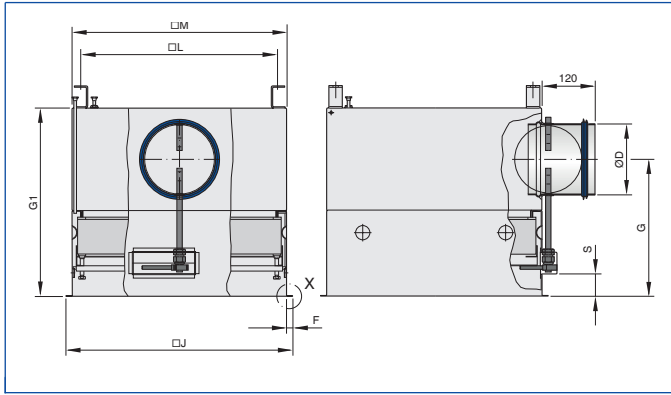
5	5 VDW	Filter size	Ø D	G1	K	M	J	L	F	U	S	G	kg
		B x H x T											
400	400 x 16	345 x 345 x 78/91	158	299	398	371	388	330	10	135	69	189	17
400	400 x 16	345 x 345 x 78/91	198	299	398	371	388	330	10	135	69	189	17
400	400 x 16	345 x 345 x 150	158	371	398	371	388	330	10	135	141	261	17
400	400 x 16	345 x 345 x 150	198	371	398	371	388	330	10	135	141	261	17
500	500 x 24	435 x 435 x 78/91	158	294	498	461	488	420	15	135	64	184	21
500	500 x 24	435 x 435 x 78/91	198	294	498	461	488	420	15	135	64	184	21
500	500 x 24	435 x 435 x 150	158	366	498	461	488	420	15	135	136	256	21
500	500 x 24	435 x 435 x 150	198	366	498	461	488	420	15	135	136	256	21
600	600 x 24	535 x 535 x 78/91	248	344	598	561	588	520	15	135	64	209	22
600	600 x 24	535 x 535 x 78/91	313	409	598	561	588	520	15	135	64	242	22
600	600 x 24	535 x 535 x 150	248	416	598	561	588	520	15	135	136	281	22
600	600 x 24	535 x 535 x 150	313	481	598	561	588	520	15	135	136	314	22
625	625 x 24	575 x 575 x 78/91	248	349	623	601	618	560	10	135	69	214	23
625	625 x 24	575 x 575 x 78/91	313	414	623	601	618	560	10	135	69	247	23
625	625 x 48	575 x 575 x 78/91	248	349	623	601	618	560	10	135	69	214	23
625	625 x 48	575 x 575 x 78/91	313	414	623	601	618	560	10	135	69	247	23
625	625 x 24	575 x 575 x 150	248	421	623	601	618	560	10	135	141	286	23
625	625 x 24	575 x 575 x 150	313	486	623	601	618	560	10	135	141	319	23
625	625 x 48	575 x 575 x 150	248	421	623	601	618	560	10	135	141	286	23
625	625 x 48	575 x 575 x 150	313	486	623	601	618	560	10	135	141	319	23
680	680 x 24	610 x 610 x 78/91	248	344	676	636	663	595	15	135	64	209	24
680	680 x 24	610 x 610 x 78/91	313	409	676	636	663	595	15	135	64	242	24
680	680 x 54	610 x 610 x 78/91	248	344	676	636	663	595	15	135	64	209	24
680	680 x 54	610 x 610 x 78/91	313	409	676	636	663	595	15	135	64	242	24
680	680 x 24	610 x 610 x 150	248	416	676	636	663	595	15	135	136	281	24
680	680 x 24	610 x 610 x 150	313	481	676	636	663	595	15	135	136	314	24
680	680 x 54	610 x 610 x 150	248	416	676	636	663	595	15	135	136	281	24
680	680 x 54	610 x 610 x 150	313	481	676	636	663	595	15	135	136	314	24

G1, S, G + 40 mm for diffusers DLQL and PCD

Ø D Spigot diameter G1 Casing height K Overall dimension of diffuser face plate M Overall dimension of casing J Overall dimension of flange L Top suspension, distance between holes F Flange width U Casing extension S Distance from casing flange to damper operator cover G Dimension from flange face to centre line of spigot kg Weight



TFC-SC00H



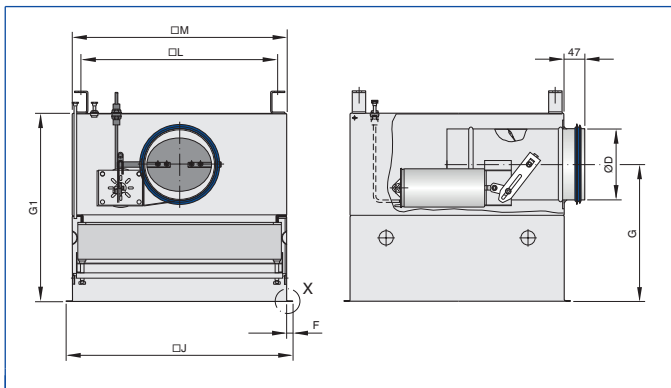
Dimensions [mm] and weight [kg]

5	5 VDW	Filter size	Ø D	G1	K	M	J	L	F	S	G	kg
		B x H x T										
400	400 x 16	345 x 345 x 78/91	125	428	398	371	388	330	10	54	313	27
500	500 x 24	435 x 435 x 78/91	160	423	498	461	488	420	15	49	308	31
600	600 x 24	535 x 535 x 78/91	200	423	598	561	588	520	15	49	308	32
625	625 x 24	575 x 575 x 78/91	200	428	623	601	618	560	10	54	313	33
625	625 x 48	575 x 575 x 78/91	200	428	623	601	618	560	10	54	313	33
680	680 x 24	610 x 610 x 78/91	200	423	676	636	663	595	15	49	308	35
680	680 x 54	610 x 610 x 78/91	200	423	676	636	663	595	15	49	308	35

G1, S, G + 40 mm for diffusers DLQL and PCD

Ø D Spigot diameter G1 Casing height K Overall dimension of diffuser face plate M Overall dimension of casing J Overall dimension of flange L Top suspension, distance between holes F Flange width S Distance from casing flange to damper operator cover G Dimension from flange face to centre line of spigot kg Weight

TFC-SCTN0



Dimensions [mm] and weight [kg]

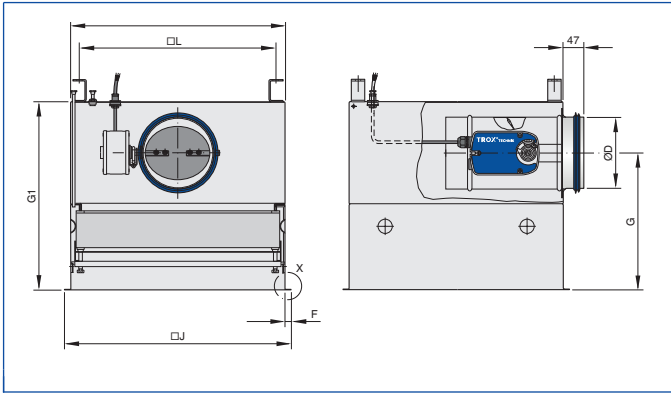
5	5 VDW	Filter size	Ø D	G1	K	M	J	L	F	G	kg
		B x H x T									
400	400 x 16	345 x 345 x 78/91	125	428	398	371	388	330	10	313	29
500	500 x 24	435 x 435 x 78/91	160	423	498	461	488	420	15	308	33
600	600 x 24	535 x 535 x 78/91	200	423	598	561	588	520	15	308	34
625	625 x 24	575 x 575 x 78/91	200	428	623	601	618	560	10	313	35
625	625 x 48	575 x 575 x 78/91	200	428	623	601	618	560	10	313	35
680	680 x 24	610 x 610 x 78/91	200	423	676	636	663	595	15	308	37
680	680 x 54	610 x 610 x 78/91	200	423	676	636	663	595	15	308	37

G1, S, G + 40 mm for diffusers DLQL and PCD

Ø D Spigot diameter G1 Casing height K Overall dimension of diffuser face plate M Overall dimension of casing J Overall dimension of flange L Top suspension, distance between holes F Flange width G Dimension from flange face to centre line of spigot kg Weight



TFC-SCBR0



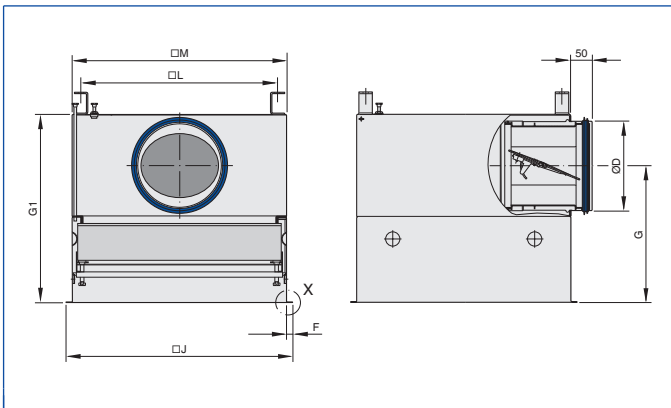
Dimensions [mm] and weight [kg]

5	5 VDW	Filter size	Ø D	G1	K	M	J	L	F	G	kg
		B x H x T									
400	400 x 16	345 x 345 x 78/91	125	428	398	371	388	330	10	313	29
500	500 x 24	435 x 435 x 78/91	160	423	498	461	488	420	15	308	33
600	600 x 24	535 x 535 x 78/91	200	423	598	561	588	520	15	308	34
625	625 x 24	575 x 575 x 78/91	200	428	623	601	618	560	10	313	35
625	625 x 48	575 x 575 x 78/91	200	428	623	601	618	560	10	313	35
680	680 x 24	610 x 610 x 78/91	200	423	676	636	663	595	15	308	37
680	680 x 54	610 x 610 x 78/91	200	423	676	636	663	595	15	308	37

G1, S, G + 40 mm for diffusers DLQL and PCD

Ø D Spigot diameter G1 Casing height K Overall dimension of diffuser face plate M Overall dimension of casing J Overall dimension of flange L Top suspension, distance between holes F Flange width G Dimension from flange face to centre line of spigot kg Weight

TFC-SCVFL



Dimensions [mm] and weight [kg]

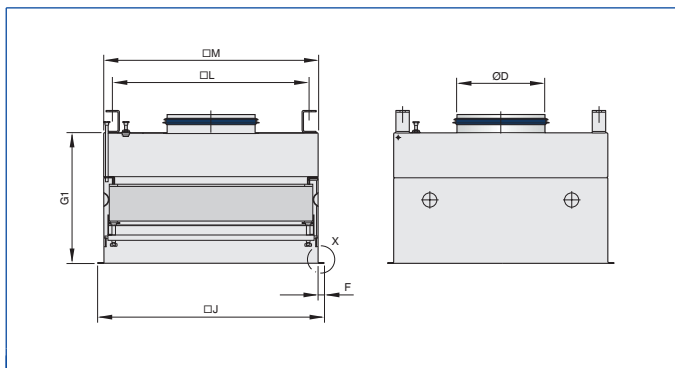
5	5 VDW	Filter size	Ø D	G1	K	M	J	L	F	G	kg
		B x H x T									
400	400 x 16	345 x 345 x 78/91	160	428	398	371	388	330	10	313	28
500	500 x 24	435 x 435 x 78/91	200	423	498	461	488	420	15	308	32
600	600 x 24	535 x 535 x 78/91	250	473	598	561	588	520	15	333	33
625	625 x 24	575 x 575 x 78/91	250	478	623	601	618	560	10	338	34
625	625 x 48	575 x 575 x 78/91	250	478	623	601	618	560	10	338	34
680	680 x 24	610 x 610 x 78/91	250	473	676	636	663	595	15	333	36
680	680 x 54	610 x 610 x 78/91	250	473	676	636	663	595	15	333	36

G1, S, G + 40 mm for diffusers DLQL and PCD

Ø D Spigot diameter G1 Casing height K Overall dimension of diffuser face plate M Overall dimension of casing J Overall dimension of flange L Top suspension, distance between holes F Flange width G Dimension from flange face to centre line of spigot kg Weight



TFC-TC



Dimensions [mm] and weight [kg]

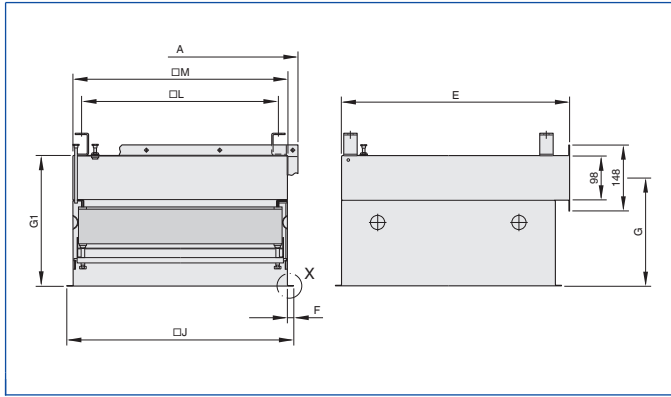
5	5 VDW	Filter size	Ø D	G1	K	M	J	L	F	kg
		B x H x T								
400	400 x 16	345 x 345 x 78/91	158	299	398	371	388	330	10	17
400	400 x 16	345 x 345 x 78/91	198	299	398	371	388	330	10	17
400	400 x 16	345 x 345 x 150	158	371	398	371	388	330	10	17
400	400 x 16	345 x 345 x 150	198	371	398	371	388	330	10	17
500	500 x 24	435 x 435 x 78/91	158	294	498	461	488	420	15	21
500	500 x 24	435 x 435 x 78/91	198	294	498	461	488	420	15	21
500	500 x 24	435 x 435 x 150	158	366	498	461	488	420	15	21
500	500 x 24	435 x 435 x 150	198	366	498	461	488	420	15	21
600	600 x 24	535 x 535 x 78/91	248	294	598	561	588	520	15	22
600	600 x 24	535 x 535 x 78/91	313	294	598	561	588	520	15	22
600	600 x 24	535 x 535 x 150	248	366	598	561	588	520	15	22
600	600 x 24	535 x 535 x 150	313	366	598	561	588	520	15	22
625	625 x 24	575 x 575 x 78/91	248	299	623	601	618	560	10	23
625	625 x 24	575 x 575 x 78/91	313	299	623	601	618	560	10	23
625	625 x 48	575 x 575 x 78/91	248	299	623	601	618	560	10	23
625	625 x 48	575 x 575 x 78/91	313	299	623	601	618	560	10	23
625	625 x 24	575 x 575 x 150	248	371	623	601	618	560	10	23
625	625 x 24	575 x 575 x 150	313	371	623	601	618	560	10	23
625	625 x 48	575 x 575 x 150	248	371	623	601	618	560	10	23
625	625 x 48	575 x 575 x 150	313	371	623	601	618	560	10	23
680	680 x 24	610 x 610 x 78/91	248	294	676	636	663	595	15	23
680	680 x 24	610 x 610 x 78/91	313	294	676	636	663	595	15	23
680	680 x 54	610 x 610 x 78/91	248	294	676	636	663	595	15	23
680	680 x 54	610 x 610 x 78/91	313	294	676	636	663	595	15	23
680	680 x 24	610 x 610 x 150	248	366	676	636	663	595	15	23
680	680 x 24	610 x 610 x 150	313	366	676	636	663	595	15	23
680	680 x 54	610 x 610 x 150	248	366	676	636	663	595	15	23
680	680 x 54	610 x 610 x 150	313	366	676	636	663	595	15	23

G1, S, G + 40 mm for diffusers DLQL and PCD

Ø D Spigot diameter G1 Casing height K Overall dimension of diffuser face plate M Overall dimension of casing J Overall dimension of flange L Top suspension, distance between holes F Flange width kg Weight



TFC-SR



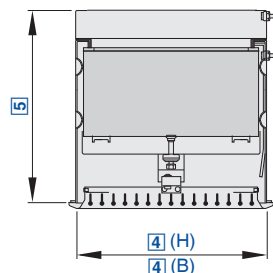
Dimensions [mm] and weight [kg]

5	5 VDW	Filter size	G1	K	M	J	L	A	n x t	E	F	G	kg
		B x H x T											
400	400 x 16	345 x 345 x 78/91	299	398	371	388	330	418	3 x 131	401	10	249	17
400	400 x 16	345 x 345 x 150	371	398	371	388	330	418	3 x 131	401	10	321	17
500	500 x 24	435 x 435 x 78/91	294	498	461	488	420	508	3 x 161	491	15	244	21
500	500 x 24	435 x 435 x 150	366	498	461	488	420	508	3 x 161	491	15	316	21
600	600 x 24	535 x 535 x 78/91	294	598	561	588	520	608	4 x 146	591	15	244	22
600	600 x 24	535 x 535 x 150	366	598	561	588	520	608	4 x 146	591	15	316	22
625	625 x 24	575 x 575 x 78/91	299	623	601	618	560	648	4 x 156	631	10	249	23
625	625 x 48	575 x 575 x 78/91	299	623	601	618	560	648	4 x 156	631	10	249	23
625	625 x 24	575 x 575 x 150	371	623	601	618	560	648	4 x 156	631	10	321	23
625	625 x 48	575 x 575 x 150	371	623	601	618	560	648	4 x 156	631	10	321	23
680	680 x 24	610 x 610 x 78/91	294	676	636	663	595	683	4 x 165	666	15	244	23
680	680 x 54	610 x 610 x 78/91	294	676	636	663	595	683	4 x 165	666	15	244	23
680	680 x 24	610 x 610 x 150	366	676	636	663	595	683	4 x 165	666	15	316	23
680	680 x 54	610 x 610 x 150	366	676	636	663	595	683	4 x 165	666	15	316	23

G1, S, G + 40 mm for diffusers DLQL and PCD

G1 Casing height K Overall dimension of diffuser face plate M Overall dimension of casing J Overall dimension of flange L Top suspension, distance between holes A Overall width of connecting flange n x t Number of flange screw holes x distance between holes E Overall width of casing including circular spigot F Flange width G Dimension from flange face to centre line of spigot kg Weight





For critical air cleanliness and critical hygiene requirements, suitable for wall installation

Order code

TFW – SPC – ASL / 662 x 325 x 476

1 2 3 4 5

1 Type

TFW Wall mounted particulate filter

3 Air terminal device

No entry: none

4 Nominal size [mm]

ASL

662 x 325

SL

680 x 325

5 Casing depth [mm]

G

2 Casing material

SPC Steel, powder-coated RAL 9010 (pure white)

+ Features

Wall mounted particulate filters as final filter stage with Mini Pleat filter panels for the separation of suspended particles. Used in medicine, biology, pharmaceuticals, and sensitive technical areas.

- ▶ Easy, time-saving and secure filter change, can be completed by one person due to special press-in frame
- ▶ For air cleanliness classes 5 to 8 according to ISO 14644-1
- ▶ Different constructions for filter elements with different frame depths
- ▶ Casing with indentations to ensure the precise fitting of the filter elements
- ▶ Equipment for differential pressure measurement, sealing integrity testing, and particle sampling for measurement
- ▶ Meets the hygiene requirements of VDI 6022

X Application

- ▶ Particulate filter type TFW for wall installation as final filter stage and for air distribution
- ▶ Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air

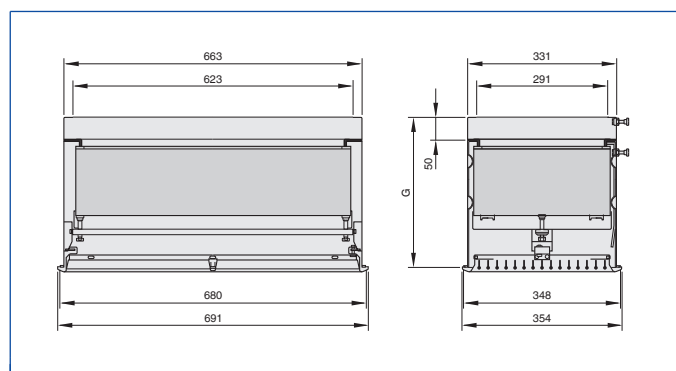
+ Useful additions

- ▶ Mini Pleat filter panels (MFP)
- ▶ Suitable filter elements to be ordered separately

★ Special characteristics

- ▶ Compact construction
- ▶ Easy connection to ducts
- ▶ High operational reliability

TFW



Wall mounted particulate filter with ventilation grille ASL

④	④	②	⑤	④
L	H	B x H x T	G	kg
662	325	305 x 610 x 78	262	10
662	325	305 x 610 x 150	334	11
662	325	305 x 610 x 292	476	12

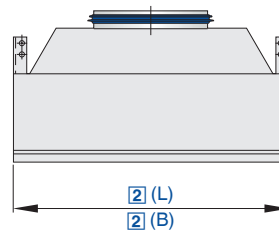
② Filter size ④ Weight

Wall mounted particulate filter with ventilation grille SL

④	④	②	⑤	④
L	H	B x H x T	G	kg
680	325	305 x 610 x 78	262	10
680	325	305 x 610 x 150	334	11
680	325	305 x 610 x 292	476	12

② Filter size ④ Weight





For critical air cleanliness and critical hygiene requirements, suitable for ceiling installation

 **Order code**

TFM / 600 × 900	
1	2

1 Type
TFM Particulate filter module

2 Nominal size [mm]
600 × 600
600 × 900
600 × 1200



+ **Features**

Particulate filter modules as final filter stage with Mini Pleat filter panels for the separation of suspended particles. Use in laboratories, medical areas, or production rooms in the pharmaceutical and food industry.

- ▶ Individual casings can be combined to ceiling sections
- ▶ For air cleanliness classes 5 to 8 according to ISO 14644-1
- ▶ Easy, time-saving, and secure filter change due to special press-in frame
- ▶ With sealing integrity test facility for filter elements

- ▶ Equipment for differential pressure measurement
- ▶ Meets the hygiene requirements of VDI 6022

X **Application**

- ▶ Particulate filter module type TFM for ceiling installation as final filter stage and for air distribution in clean room technology
- ▶ Individual casings can be combined to ceiling sections
- ▶ Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air

+ **Useful additions**

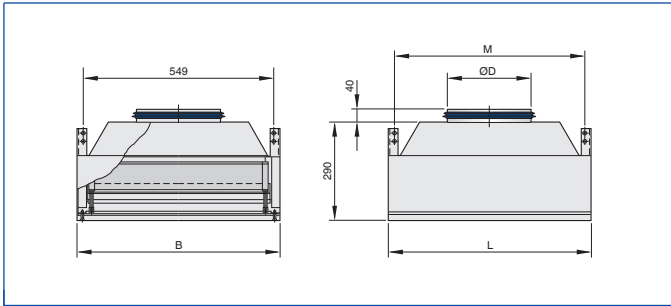
- ▶ Mini Pleat filter panels (MFP)
- ▶ Suitable filter elements to be ordered separately

★ **Special characteristics**

- ▶ Compact construction
- ▶ Extremely easy operation
- ▶ High operational reliability
- ▶ Individual casings can be combined to ceiling sections



TFM

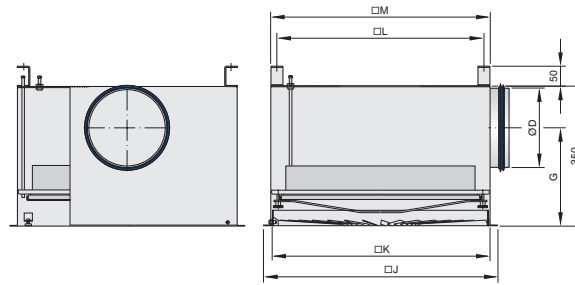


Dimensions [mm] and weight [kg]

2	2	Filter size	①	②	③
B	L	B × H × T	M	ØD	kg
600	600	535 × 535 × 78	549	248	22
600	900	835 × 535 × 78	849	313	27
600	1200	1135 × 535 × 78	1149	348	32

① Top suspension, distance between holes ② Spigot diameter ③ Weight





For critical air cleanliness and very critical hygiene requirements, suitable for ceiling installation

Order code

TFP – SC-S – FD / 600 × 198 × 330

1 2 3 4 5 6

1 Type

TFP Pharmaceutical clean room terminal filter

2 Construction

- TC-S** Top entry circular spigot, hanging brackets at the top on the side
- TC-FC** Top entry circular spigot, with supports for mounting in false ceilings
- SC-S** Side entry circular spigot, hanging brackets at the top on the side

- SC-FC** Side entry circular spigot, with supports for mounting in false ceilings
- SCR-S** Side entry circular spigot removable, hanging brackets on the top at the side
- SCR-FC** Side entry circular spigot removable, with supports for mounting in false ceilings

4 Nominal size [mm]
400, 500, 600, 625

5 Spigot diameter [mm]
D

6 Casing height [mm]
G1

3 Air terminal device
FD
TDF

+ Features

- Pharmaceutical clean room terminal filters as final filter stage with Mini Pleat filter panels for the separation of suspended particles. Used in highly sensitive areas in pharmaceuticals, medicine, and biology
- ▶ Mini Pleat filter panels with downstream fluid seals meet the highest hygiene requirements
 - ▶ Easy, time-saving, and secure filter change
 - ▶ Diffuser face is held in place by magnets and can be hinged down to facilitate cleaning and validation; filter change without tool
 - ▶ Robust, welded construction
 - ▶ Compact construction, suitable for low ceilings
 - ▶ Various diffuser face plates to ideally meet individual requirements

Application

- ▶ Pharmaceutical clean room terminal filter type TFP for ceiling installation as final filter stage and for air distribution in sensitive areas of the pharmaceutical industry
- ▶ Fitting of filter elements for the separation of suspended particles such as aerosols, toxic dusts, viruses and bacteria from the supply or extract air

+ Useful additions

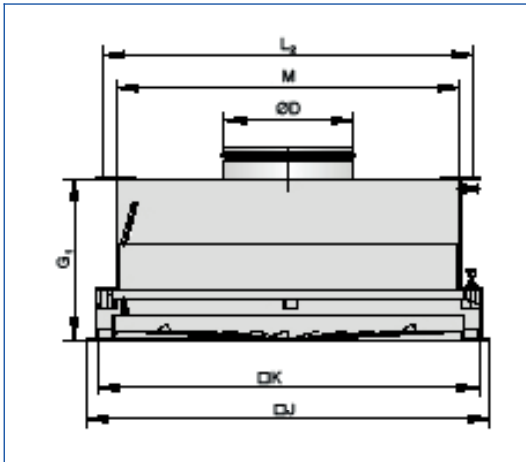
- ▶ Mini Pleat filter panels (MFP)
- ▶ Suitable filter elements to be ordered separately

★ Special characteristics

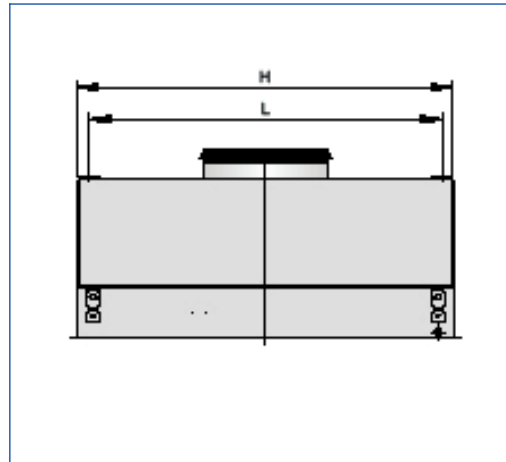
- ▶ Compact construction
- ▶ Flush ceiling installation
- ▶ Removable spigot for installation into closed ceilings
- ▶ Diffuser face plate can be hinged down



Dimension drawing, frontal view TFP-TC-S



Dimension drawing, side viewing TFP-TC-S



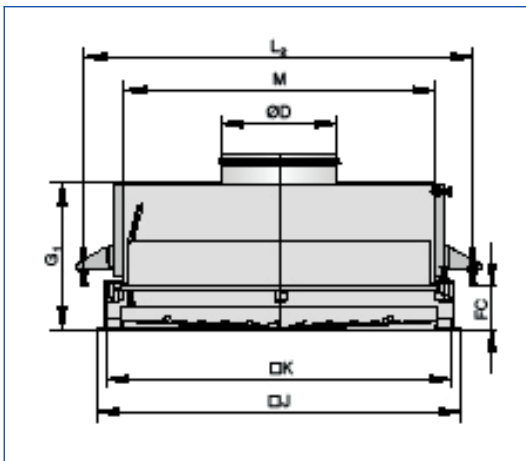
Dimensions [mm] and weight [kg]

④	Filter size	①	②	③	④	④	⑤	⑥	⑥	⑦
	B x H x T	⑤	⑥	K	H	M	J	L	L2	~ kg
400	295 x 295 x 85	158	250	365	371	308	398	335	348	10
500	395 x 395 x 85	198	250	465	471	408	498	435	448	15
600	495 x 495 x 85	198	250	565	571	508	598	535	548	21
625	520 x 520 x 85	198	250	590	596	533	623	560	573	23

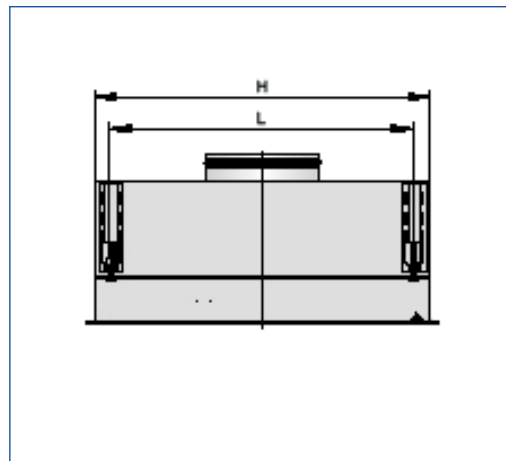
- ① Spigot diameter
- ② Casing height
- ③ Overall dimension of air terminal device
- ④ Overall dimension of casing
- ⑤ Overall dimension of flange
- ⑥ Top suspension, distance between holes
- ⑦ Weight



Dimension drawing, frontal view TFP-TC-FC



Dimension drawing, side view TFP-TC-FC



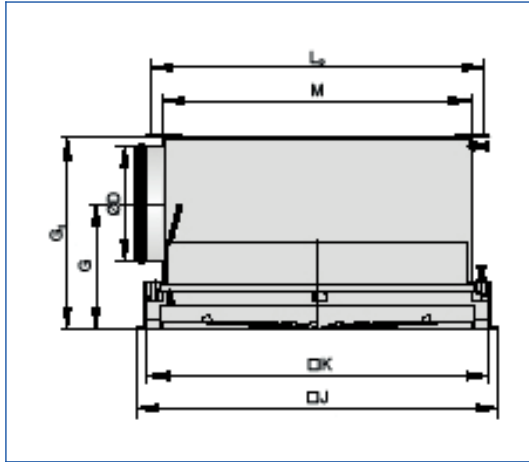
Dimensions [mm] and weight [kg]

④	Filter size	①	②	③	④	④	⑤	⑥	⑥	⑦	⑧
	B x H x T	⑤	⑥	K	H	M	J	L	L2	FC	~ kg
400	295 x 295 x 85	158	250	365	371	308	398	314	442	75 - 175	12
500	395 x 395 x 85	198	250	465	471	408	498	414	542	75 - 175	17
600	495 x 495 x 85	198	250	565	571	508	598	514	642	75 - 175	23
625	520 x 520 x 85	198	250	590	596	533	623	539	667	75 - 175	25

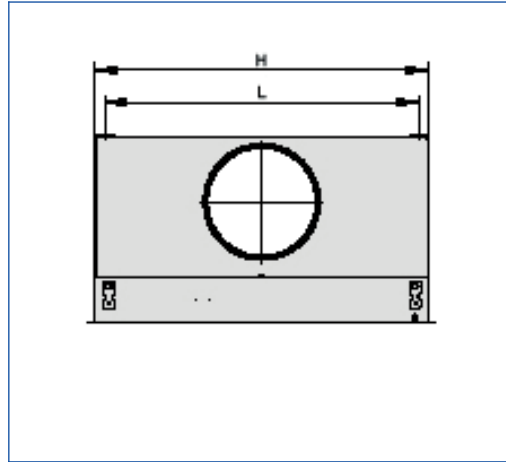
- ① Spigot diameter
- ② Casing height
- ③ Overall dimension of air terminal device
- ④ Overall dimension of casing
- ⑤ Overall dimension of flange
- ⑥ Top suspension, distance between holes
- ⑦ Dimensions of suspended ceiling
- ⑧ Weight



Dimension drawing, frontal view TFP-SC-S



Dimension drawing, side view TFP-SC-S

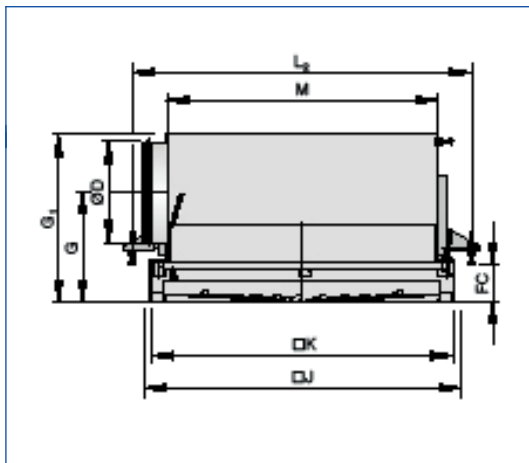


Dimensions [mm] and weight [kg]

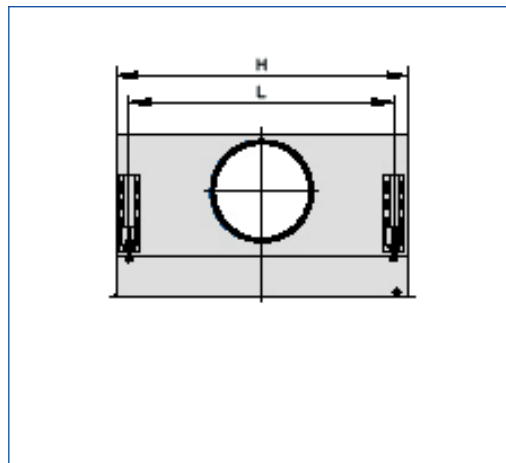
④	Filter size	①	②	③	④	④	⑤	⑥	⑥	⑦	⑧
	B x H x T	⑤	⑥	K	H	M	J	L	L2	G	~ kg
400	295 x 295 x 85	158	330	365	371	308	398	335	348	265	11
500	395 x 395 x 85	198	330	465	471	408	498	435	448	245	16
600	495 x 495 x 85	198	330	565	571	508	598	535	548	245	22
625	520 x 520 x 85	198	330	590	596	533	623	560	573	245	24

- ① Spigot diameter ② Casing height ③ Overall dimension of air terminal device
④ Overall dimension of casing ⑤ Overall dimension of flange ⑥ Top suspension, distance between holes
⑦ Dimension from flange face to centre line of spigot ⑧ Weight

Dimension drawing, frontal view TFP-SC-FC



Dimension drawing, side view TFP-SC-FC



Dimensions [mm] and weight [kg]

④	Filter size	①	②	③	④	④	⑤	⑥	⑥	⑦	⑦	⑧
	B x H x T	⑤	⑥	K	H	M	J	L	L2	G	FC	~ kg
400	295 x 295 x 85	158	330	365	371	308	398	314	442	215	75 - 175	12
500	395 x 395 x 85	198	330	465	471	408	498	414	542	215	75 - 175	17
600	495 x 495 x 85	198	330	565	571	508	598	514	642	215	75 - 175	23
625	520 x 520 x 85	198	330	590	596	533	623	539	667	215	75 - 175	25

- ① Spigot diameter ② Casing height ③ Overall dimension of air terminal device
④ Overall dimension of casing ⑤ Overall dimension of flange ⑥ Top suspension, distance between holes
⑦ Dimension from flange face to centre line of spigot ⑧ Weight





For the display, monitoring and control of differential pressures

Order code

MD - DPC / 24

1 Type
MD Measuring device

2 Variant
UT U-tube manometer
APC Analogue pressure monitor
DPC Digital pressure monitor

3 Supply voltage
24 24 V AC/DC \pm 15 %, 50/60Hz



Measuring devices, Variant MD-UT



X Application
 ▶ U-tube manometer, variant UT, used to display
 ▶ differential pressures of gaseous media

D Variants
 ▶ UT: U-tube manometer

+ Construction
 ▶ U-tube manometer, analogue construction

Nominal sizes [mm]
 ▶ Casing dimensions (B x H): 45 x 180 mm

+ Useful additions
 ▶ Manometer liquid, to be ordered separately

★ Special characteristics
 ▶ Compact construction
 ▶ Easy to use

Construction features
 ▶ Plastic, with adjustable scale

Materials and surfaces
 ▶ Measuring tube made of acrylic glass
 ▶ Liquid for manometer: Water or a liquid with low
 evaporation rate, to be ordered separately

Maintenance
 ▶ Maintenance-free as construction and materials
 ▶ are not subject to wear



Measuring devices, Variant MD-APC



Application

- ▶ Pressure monitor, variant APC, inclined tube manometer with 2 measuring ranges and used to display the differential pressures of gaseous media



Variants

- ▶ APC: Analogue pressure monitor



Construction

- ▶ Analogue construction: Inclined tube manometer with liquid

Nominal sizes [mm]

- ▶ Casing dimensions (B x H x T): 230 x 113 x 38 mm



Useful additions

- ▶ Manometer liquid, to be ordered separately
- ▶ Flexible measuring tube, 9 x 1.5 mm



Special characteristics

- ▶ Compact construction
- ▶ Easy to use
- ▶ Variant APC: display of 2 measuring ranges depending on installation orientation

Construction features

- ▶ Rigid plastic casing
- ▶ 2 different measuring ranges (depending on installation orientation)

Materials and surfaces

- ▶ Measuring tube made of acrylic glass, with liquid (supplied separately)

Maintenance

- ▶ Top up liquid; liquid to be ordered separately



Measuring device, Variant MD-DPC-24



Application

- ▶ Digital pressure monitor, variant DPC, used to display the differential pressures of gaseous media



Variants

- ▶ DPC: Digital pressure monitor



Construction

- ▶ Supply voltage DPC/24: 24 V AC/DC ± 15%, 50/60 Hz

Nominal sizes [mm]

- ▶ Casing dimensions (B x H x T): 91 x 75 x 38 mm



Useful additions

- ▶ DIN rail power supply unit for 230 V AC



Special characteristics

- ▶ Compact construction
- ▶ Easy to use
- ▶ Variant DPC: measurement to DIN 1946-4 and VDI 3803
- ▶ Variant DPC can be integrated with the central BMS

Construction features

- ▶ 4-digit LCD
- ▶ Infinitely variable setpoint adjustment
- ▶ Optical signal when the setpoint is reached
- ▶ Volt-free switch output with changeover contact
- ▶ Transducer output, adjustable – 0-10 V DC, 0-20 mA; or 2-10 V DC, 4-20 mA

Materials and surfaces

- ▶ Casing made of ABS plastic

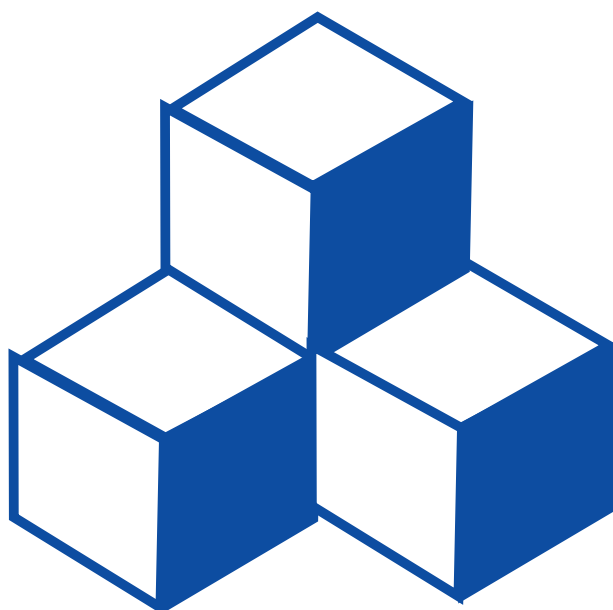
Maintenance

- ▶ Maintenance-free as construction and materials are not subject to wear





AIR HANDLING UNITS



7 AIR HANDLING UNITS

7.1 Units



The innovative air handling unit. By TROX.

X-CUBE

662



Air distribution technology for clean rooms - clever, flexible solutions

X-CUBE-CROFCU

663



X-CUBE compact with rotary heat exchanger

X-CUBE-COMPACT

664

7.2 Accessories



Weather-resistant roof for outdoor installation of units

XCC-RO

667



Weatherproof roof for the outdoor installation of XCC-HM or XCC-HCM (accessory), which is attached to the X-CUBE compact with a flange.

XCC-ROM-HM

668



Heating coil (pumped warm water system) for rectangular ducts, with integral capillary tube for frost protection

XCC-HD

669



PWW heating coil module as encased unit

XCC-HM

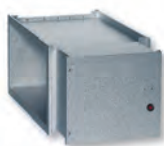
670



Heating coil/cooling coil module (pumped warm water/pumped chilled water system) as encased unit

XCC-HCM

671



Electric duct air heater for rectangular ducts

XCC-EHD

672

	<p>Controls module for the integration of functional modules</p>	<p>XCC-CB</p>	<p>673</p>
	<p>Room control panels for room installation</p>	<p>XCC-CD</p>	<p>674</p>
	<p>Sensor for duct and room installation</p>	<p>XCC-S</p>	<p>675</p>
	<p>Parts kit for pressure-based control</p>	<p>XCC-CPC</p>	<p>676</p>
	<p>Valve assembly for the hydraulic connection of heating and/or cooling coils</p>	<p>XCC-V</p>	<p>677</p>
	<p>Circulator pump for the hydraulic connection of heating coils</p>	<p>XCC-P</p>	<p>678</p>
	<p>Set of wire rope slings (steel) for easy transport</p>	<p>XCC-LE</p>	<p>679</p>

X-CUBE

Configurable air handling unit for conditioning room and process air.



- High energy efficiency



- Unparalleled hygiene



- Intuitive operation and seamless integration with modern building management systems



- Integral refrigeration system with type certification



- High-efficiency run around coil system with TROX hydraulic unit



- Easy installation and maintenance



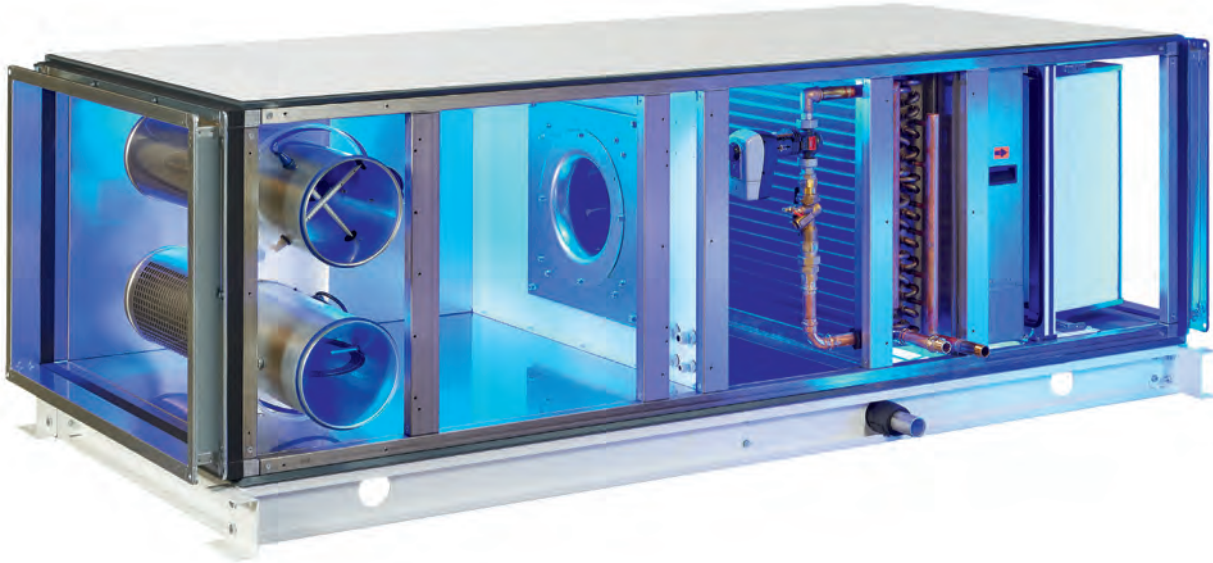
- Also available as a weatherproof construction variant with pitched roof and drip edge



For more information please visit www.trox-x-cube.de



X-CUBE CROFCU



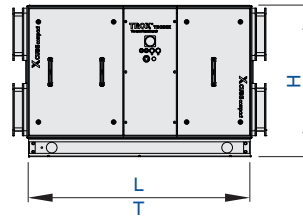
Air distribution for clean rooms. Clever and flexible.

X-CUBE CROFCU is a compact ventilation unit that ensures and maintains the essential conditions for all classes of clean rooms. The secondary unit for use with central ventilation and air conditioning systems is typically installed in false ceilings. It dissipates high thermal loads and requires only a low fresh air volume flow rate. The primary air system (patent pending) allows for the direct removal of exhaust air while fresh air is supplied to the room.

Suitable for all clean room strategies

- Pumped chilled water cooling system with room temperature control
- Increased flexibility if several units are connected
- Energy-efficient plug fan with EC motor
- Addition of fresh air from 50 m³/h to 2000 m³/h.
- Monitoring of filters downstream
- Control of airlocks for people and material
- Contamination check by means of pressure zone control
- Space saving due to smaller ducts
- Simple and quick commissioning due to plug and play





X-CUBE compact with rotary heat exchanger

Order code

X-CUBE-C - R - R / 1300

1 2 3

1 Type
X-CUBE-C Compact air handling unit

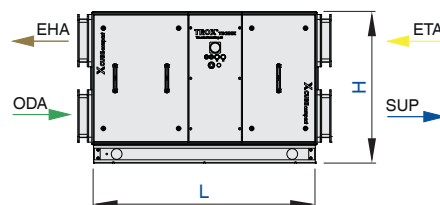
2 Operating side
In supply air flow direction
R Right side
L Left side

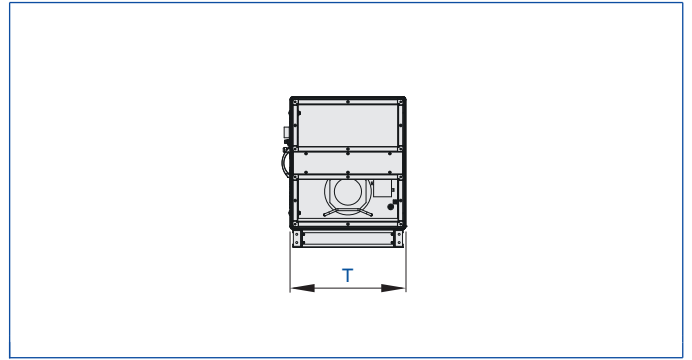
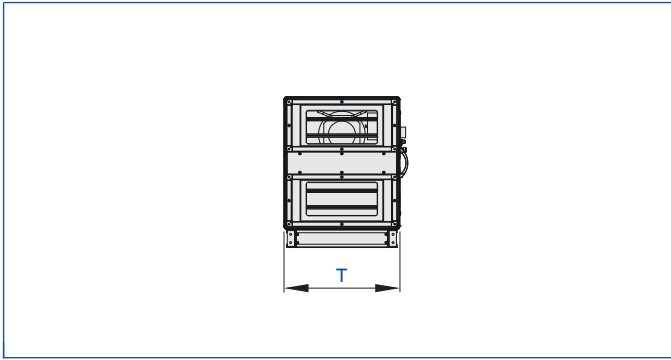
3 Unit type
R/1300
R/2000
R/3000
R/4200
R/5200

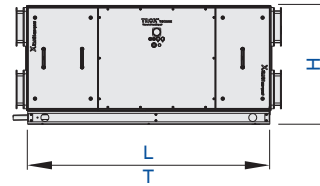
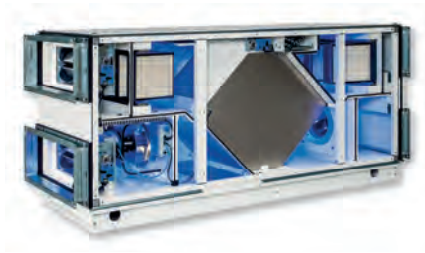
Technical data

R5250	1798 × 1318 × 1588	4 × 1224 × 557	750	3 ~ 400	3.0 / 4.6
R4200	1638 × 1156 × 1518	4 × 1062 × 557	640	3 ~ 400	1.7 / 2.6
R3000	1538 × 1006 × 1318	4 × 912 × 457	570	3 ~ 400	1.65 / 2.5
R2000	1458 × 856 × 1118	4 × 762 × 357	470	3 ~ 400	1.0 / 1.6
R1300	1378 × 706 × 918	4 × 612 × 257	360	1 ~ 230	0.7 / 3.0

The power consumed by the EC motor for the heat recovery unit is 45 W.







X-CUBE compact with counter flow plate heat exchanger

Order code

X-CUBE-C - R - P / 1230

1

2

3

1 Type

X-CUBE-C Compact air handling unit

2 Operating side

In supply air flow direction

R Right side

L Left side

3 Unit type

P/1230

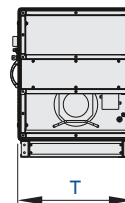
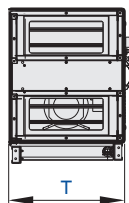
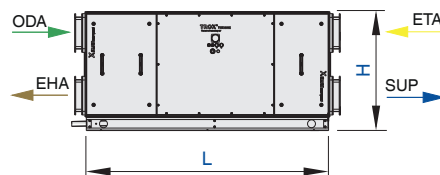
P/1800

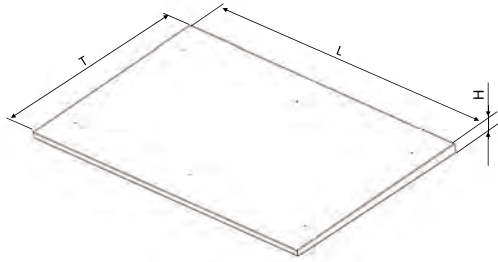
P/2400

P/3600

Technical data

P/3600	2510 × 1318 × 1257	4 × 1224 × 357	780	3 ~ 400	1.7 / 2.6
P/2400	2460 × 942 × 1257	4 × 848 × 357	610	3 ~ 400	1.7 / 2.5
P/1800	2300 × 754 × 1257	4 × 660 × 357	520	1 ~ 230	0.7 / 3.0
P/1850	2017 × 754 × 974	4 × 660 × 257	420	1 ~ 230	0.7 / 3.0





Weather-resistant roof for outdoor installation of units



Order code

XCC-RO – R / 1300

1

2

1 Type

XCC-RO Weather-resistant roof with duplex coating (galvanised steel + powder coating), overhang and drip edge

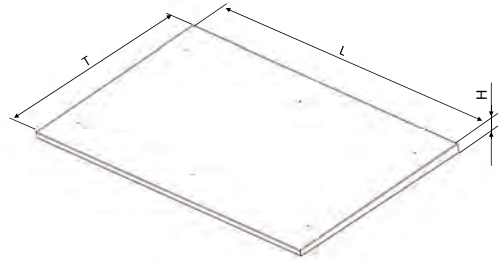
2 Roof for unit type

R/1300
R/2000
R/3000
R/4200

R/5250
P/1230
P/1800
P/2400
P/3600

Hint: Dimensions and weight upon request!





Weatherproof roof for the outdoor installation of XCC-HM or XCC-HCM (accessory), which is attached to the X-CUBE compact with a flange.



Order code

XCC-ROM-HM – R / 1300

1

2

1 Type

XCC-ROM-HM

Weatherproof roof with 2-pack epoxy (galvanised + powder-coated steel), overhang and drip edge, standard colour RAL 7012; Roof for heating coil module

XCC-ROM-HCM

Weatherproof roof with 2-pack epoxy (galvanised + powder-coated steel); Roof with overhang and drip edge, standard colour RAL 7012; Roof for heating/cooling coil module

2 Operating side

In supply air flow direction

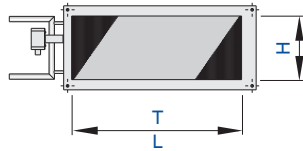
R Right side
L Left

3 Roof for unit type

R/1300
R/2000
R/3000
R/4200
R/5250
P/1230
P/1800
P/2400
P/3600

Hint: Dimensions and weight upon request!





Heating coil (pumped warm water system) for rectangular ducts, with integral capillary tube for frost protection

Order code

XCC-HD – R – R / 1300

1 2 3 4

1 Type

XCC-HD

Heating coil for rectangular ducts, with external controls and with temperature sensors for air and operating fluid (with frost protection)

2 X-CUBE compact variant

R Right side
L Left side

3 X-CUBE compact heat recovery

R Rotary heat exchanger
P Counter flow plate heat exchanger

4 Nominal size

Rotary heat exchanger
1300
2000
3000
4200
5250
Counter flow plate heat exchanger
1230
1800
2400
3600

+ Features

- Heating coil for heating the supply air, suitable for air handling units of Type X-CUBE compact.
- ▶ Heat exchanger with copper tubes and aluminium fins
 - ▶ Capillary tube for frost protection fixed to the heat exchanger
 - ▶ Frost protection triggering device outside of the duct
 - ▶ Can be cleaned up to the core
 - ▶ External controls module
 - ▶ Temperature sensors for air and operating fluid

Application

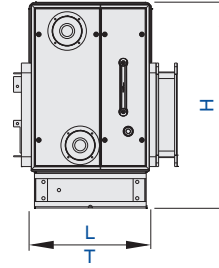
- ▶ Hot water heat exchanger for heating the airflow
- ▶ For hot water up to 100 °C
- ▶ For X-CUBE compact units

★ Special characteristics

- ▶ Heat exchanger with copper tubes and aluminium fins
- ▶ Frost protection capillary tube fixed to the heat exchanger
- ▶ Frost protection triggering device outside of the duct
- ▶ Can be cleaned up to the core
- ▶ External controls module

Hint: Dimensions and weight upon request!





PWW heating coil module as encased unit

Order code

XCC-HM – R – R / 5250

1 2 3 4

1 Type

XCC-HM

Heating coil module for rectangular ducts, with external controls and with temperature sensors for air and operating fluid (with frost protection)

2 X-CUBE compact variant

R Right side
L Left side

3 X-CUBE compact heat recovery

R Rotary heat exchanger
P Counter flow plate heat exchanger

4 Nominal size

Rotary heat exchanger
1300
2000
3000
4200
5250
Counter flow plate heat exchanger
1230
1800
2400
3600



+ Features

Heating coil module for heating the supply air, suitable for air handling units of Type X-CUBE compact.

- ▶ High-quality powder-coated X-CUBE casing
- ▶ Connection that prevents the transmission of structure-borne noise
- ▶ Diffusion tight pipe penetrations
- ▶ Slide-out frost protection frame
- ▶ External controls module
- ▶ Temperature sensors for air and operating fluid

Application

- ▶ Encased hot water heat exchangers for heating the airflow
- ▶ For hot water up to 100 °C
- ▶ For X-CUBE compact units

+ Useful additions

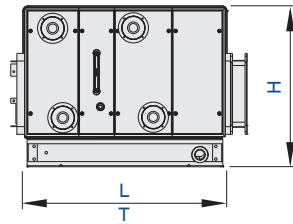
- ▶ Wire slings to facilitate lifting

★ Special characteristics

- ▶ High-quality powder-coated X-CUBE casing
- ▶ Connection that prevents the transmission of structure-borne noise
- ▶ Slide-out frost protection frame
- ▶ Diffusion tight pipe penetrations
- ▶ External controls module
- ▶ Lifting points for wire slings at the top

Hint: Dimensions and weight upon request!





Heating coil/cooling coil module (pumped warm water/pumped chilled water system) as encased unit

Order code

XCC-HCM - R - P / 2400

1 2 3 4

1 Type

XCC-HCM

Heating/cooling coil module for rectangular ducts, with external controls and with temperature sensors for air and operating fluid (with frost protection)

2 X-CUBE compact variant

R Right side
L Left side

3 X-CUBE compact heat recovery

R Rotary heat exchanger
P Counter flow plate heat exchanger

4 Nominal size

Rotary heat exchanger
1300
2000
3000
4200
5250
Counter flow plate heat exchanger
1230
1800
2400
3600

+ Features

- Heating/cooling coil module for heating and cooling the supply air, suitable for air handling units of Type X-CUBE compact.
- ▶ High-quality powder-coated X-CUBE casing
 - ▶ Connection that prevents the transmission of structure-borne noise
 - ▶ Diffusion tight pipe penetrations
 - ▶ Slide-out frost protection frame
 - ▶ Condensate drip tray made of stainless steel, sloped in all directions
 - ▶ Removable droplet eliminator with flush pull handle and stainless steel frame
 - ▶ External controls module
 - ▶ Temperature sensors for air and operating fluid

X Application

- ▶ Hot water heat exchanger for heating the airflow
- ▶ Chilled water heat exchanger for cooling the airflow
- ▶ For hot water up to 100 °C
- ▶ For X-CUBE compact units

+ Useful additions

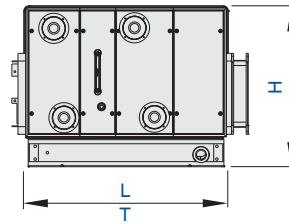
- ▶ Wire slings to facilitate lifting

★ Special characteristics

- ▶ High-quality powder-coated X-CUBE casing
- ▶ Connection that prevents the transmission of structure-borne noise
- ▶ Slide-out frost protection frame
- ▶ Diffusion tight pipe penetrations
- ▶ Condensate drip tray made of stainless steel, sloped in all directions
- ▶ Removable droplet eliminator with flush pull handle and stainless steel frame
- ▶ External controls module

Hint: Dimensions and weight upon request!





Electric duct air heater for rectangular ducts



Order code

XCC-EHD – P / 2400

1

2

3

1 Type

XCC-EHD Electric duct air heater for rectangular ducts

2 X-CUBE compact heat recovery

R Rotary heat exchanger
P Counter flow plate heat exchanger

3 Nominal size

Rotary heat exchanger
1300
2000
3000
4200
5250

Counter flow plate heat exchanger
1230
1800
2400
3600



+ Features

Electric duct air heater for heating the supply air, suitable for air handling units of Type X-CUBE compact.

- ▶ Stainless steel heating elements
- ▶ Integral thermal cut-out
- ▶ Overheating protection with manual reset
- ▶ Electronic volume flow monitor
- ▶ Casing made of galvanised sheet steel
- ▶ Duct temperature sensor for supply air



X Application

- ▶ Electric air heater for reheating the airflow
- ▶ For X-CUBE compact units



★ Special characteristics

- ▶ Stainless steel heating elements
- ▶ Integral thermal cut-out
- ▶ Overheating protection with manual reset
- ▶ Electronic volume flow monitor
- ▶ Duct temperature sensor for supply air

Hint: Dimensions and weight upon request!





Controls module for the integration of functional modules



Order code

XCC-CB - 1

1

2

1 Type

XCC-CB Controls for X-CUBE compact

2 Type

1 Controls module, small

2 Controls module, large





Room control panels for room installation

Order code

XCC-CD – RD

1

2

1 Type

XCC-CD Room control panels for X-CUBE compact

2 Variant

RA Analogue control panel
RD Digital control panel

Features

Various control elements are available to control air handling units. They may be used as control panels or as a tool for maintenance.

Digital control panel

- ▶ High-quality look and feel
- ▶ Many setting options
- ▶ Timeless design
- ▶ Temperature measurement

Analogue room control panel

- ▶ High-quality casing
- ▶ Temperature setpoint adjustment ± 5 °C
- ▶ Temperature measurement

Application

- ▶ Control panels for room temperature control

Variants

- ▶ Analogue control panel for surface mounting
- ▶ Digital control panel for flush mounting, standard junction box

Special characteristics

- ▶ Integral sensor for continuous room temperature measurement

Hint: Dimensions and weight upon request!





Sensor for duct and room installation



Order code

XCC-S – TCO2HR

1

2

1 Type

XCC-S Sensor for X-Cube compact

2 Variant

TD Duct temperature sensor

CO2VOC Combined CO2 and VOC sensor
for ducts

TCO2HR Combined room temperature,
CO2 and humidity sensor


Hint: Dimensions and weight upon request!






Parts kit for pressure-based control

 **Order code**

XCC-CPC 

 **Type**
XCC-CPC Constant pressure control for X-CUBE compact

Hint: Dimensions and weight upon request!





Valve assembly for the hydraulic connection of heating and/or cooling coils



Order code

XCC-V / 063

1

2

1 Type

XCC-V Valve assembly consisting of 3-way valve, actuator and lockshield

2 Type

063, 1, 16, 25, 4, 63, 10

Hint: Dimensions and weight upon request!





Circulator pump for the hydraulic connection of heating coils

 Order code

XCC-P – A2540

1

2

1 Type
XCC-P Circulator pump

2 Type
A2540

Hint: Dimensions and weight upon request!





Set of wire rope slings (steel) for easy transport



Order code

XCC-LE

1

[1](#) Type

XCC-LE Set of wire rope slings (steel)

Hint: Dimensions and weight upon request!





X-FANS



8 X-FANS

8.1 Roof smoke exhaust fans



For conveying smoke gases of the temperature class F400 / F600

BVD

689



For conveying smoke gases of temperature classes F200 / F300 / F400

BVDAX

691



For conveying smoke gases of the temperature class F600

BVW-D

693

8.2 Smoke exhaust axial fans



For conveying smoke gases of the temperature class F300

BVAXO

697



For conveying smoke gases of the temperature class F400

BVAXO 9/27

700



For conveying smoke gases of the temperature class F400

BVAXO 10/50

702



For conveying smoke gases of temperature classes F400 and F600

BVAXN 8/56

704



For conveying smoke gases of temperature classes F200, F300 and F400

BVAXN 6_9_12/56

706



For conveying smoke gases of temperature classes F200, F300 and F400

BVZAXN 6_9_12/56

708

8.3 Smoke exhaust centrifugal fans



For conveying smoke gases of the temperature class F400

BVREH

713



For conveying smoke gases of the temperature class F600

BVRA

715



For conveying smoke gases of the temperature class F600

BVW-B

717

8.4 Smoke exhaust plug fans



For conveying smoke gases of the temperature class F300

BVERV 23/1.2

721

8.5 Wall smoke exhaust fans



For conveying smoke gases of the temperature class F600

BVW-A/R

725

8.6 Smoke exhaust jet fans



For conveying smoke gases of temperature classes F300 and F400

BVGAXO/N/R and BVGREH

729

8.7 Roof ventilation fans



For building ventilation

DAX

735



For building ventilation

DRV / DRH

737



Ventilation of buildings, offices and production facilities.

DRV-EC

740



For ventilating buildings, offices and production facilities, for extracting air from kitchens and for extracting aggressive gases or vapours.

DRVF-H

741

8.8 Ventilation axial fans



Axial fans with direct drive for building ventilation and aeration

AXO

747



Axial fans with direct drive for building ventilation and aeration

AXO 9/27

750



Axial fans with direct drive for building ventilation and aeration

AXO 10/50

752



Axial fans with direct drive and outlet guide vanes AXN 12/56

AXN 6_9_12/56

754



Axial fans with direct drive for building ventilation and aeration

AXN-KSE 12/56

756



Axial fans with direct drive for building ventilation and aeration

ZAXN 6_9_12 / 56

758



Axial fans with direct drive for building ventilation and aeration

GLDF

760

8.9 Ventilation centrifugal fans



Centrifugal fans for building ventilation and aeration

REH

763



Centrifugal fans for building ventilation and aeration

KFB

765



Centrifugal fans for building ventilation and aeration

RZH

767

8.10 Ventilation plug fans



Centrifugal fans for industrial drying systems and other applications

ERV

770

8.11 Duct fans



For building ventilation and aeration

DF

772

8.12 Ventilation jet fans



For ventilation and smoke extraction

GAXO

774

8.13 Heat exchangers



Air heater

KTH / ETH / RTH

778

8.14 Indoor units



Building heating, aeration and ventilation

ThermoVent I

782

8.15 Roof top units



Building heating, aeration and ventilation

ThermoVent D

784

8.16 Fans for aggressive air



Exhaust air fans made of plastic

DRVF-K / AXN-K /
REH-K

785

8.17 Fans for industrial applications



Exhaust air fans for industrial processes

REH / ERM / AXN /
DRVF-H / BVD

786

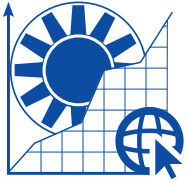
Roof smoke exhaust fans

	Specifications		
	BVD	BVW-D	BVDAX
Temperature classes			
F 200			●
F 300			●
F 400	●		●
F 600	●	●	
Installation type			
Outdoors	●	●	●
In the building in the fire area			
In the building outside of the fire area			
Motor type			
Single-speed	●	●	●
Dual-speed	●	●	●
Suitable for operation on a frequency inverter (not in the case of smoke extraction)	●	●	●
Suitable for operation on a frequency inverter (in the case of smoke extraction)			●
Technical type			
Motor in airflow			●
Motor encased - not in airflow	●	●	
Snow load class SL 1000	●	●	●
Assembly on a flat or pitched roof	●	●	● Up to 35° / 30° (up to NG 900 / as of NG 1000)
Technical data			
Max. volume flow rate	54,360 m ³ /h	50,000 m ³ /h	100,000 m ³ /h
Max. pressure	2,300 Pa	2,100 Pa	1,250 Pa
Max. drive capacity	30	20	45
Nominal sizes (mm)	315-710	315-710	355-1.120
Material			
Impeller	Steel	Steel	Steel
Casing	Aluminium	Steel	Aluminium
Accessories			
Fan diagnosis system VD	○	○	○
Volume flow rate measuring unit VME	○	○	○
Shock pulse bearing monitoring STI	○	○	○
Acoustic and thermal insulation	○	○	○
Steel roof base for smooth roofs	○	○	
Sound attenuating base	○	○	
Silencing cover SDH (horizontal)			
Silencing cover SDV (vertical)			
Silencing cover SDV (vertical) with separate ventilation			
Outlet silencer SDI	○		
Self-powered shut-off damper	○	○	○
Flexible connectors	○	○	○
Matching flange	○	○	○
Equipotential bonding	○	○	○
Cover grille (inlet and outlet side)	○	○	○ Inlet side only
Terminal box	●	●	●
Local isolator loose (for outside of fire area)		○	○
Local isolator attached (terminal box not required)	○		
Insulated base plate	○	○	
Tilting frame for foldable type	○		
Deflector hood SL 1000	○		



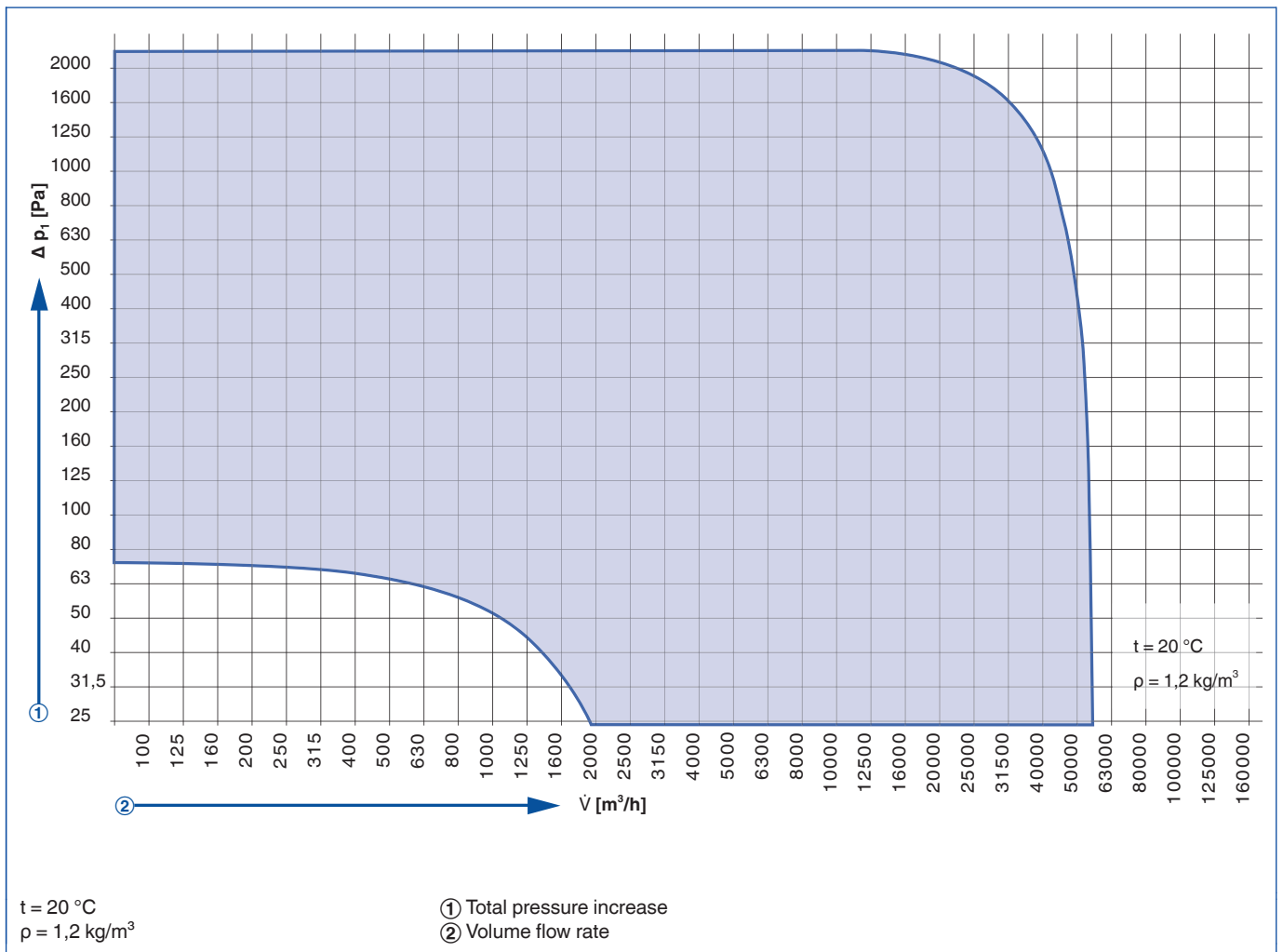
	Specifications		
	BVD	BVW-D	BVDAX
Silicone-free type	○	○	
Frequency inverter (for ventilation mode only)	○	○	○ For smoke extract mode too
Extract air and smoke extract controller	○	○	○
Flow redresser	○	○	○
Surface protection			
Corrosion protection category C2		●	
Corrosion protection category C3	●	○	
Corrosion protection category C4	○	○	
Corrosion protection category C5	○	○	●
Explanation			
● - Standard			
○ - Optional			





For conveying smoke gases of the temperature class F400 / F600

BVD Performance Range



+ **Features**

For conveying smoke gases of temperature classes F400 and F600.

Vertical outlet, with direct drive due to three-phase current IEC standard motor

Encased against volume flow rate and separately ventilated through a motor cooling air system

Casing made of corrosion-resistant aluminium

- ▶ 6 sizes
- ▶ More than 100 types
- ▶ Volume flow rate V max. 54,360 m³/h
- ▶ Total pressure increase p₁ max. 2,300
- ▶ Powder coating possible in all RAL colours
- ▶ Corrosion protection category up to C5
- ▶ With deflector hood SL1000
- ▶ Type can be insulated for the building

Application

Roof-mounted smoke exhaust fan for free outlet

Free inlet or connected on the inlet side. Dual function (ventilation and smoke extraction possible)

◊ **Variants**

- ▶ Roof-mounted smoke exhaust fan BVD F400 / F600
- ▶ Roof-mounted smoke exhaust fan incl. outlet silencer BVD-SDI F400 / F600

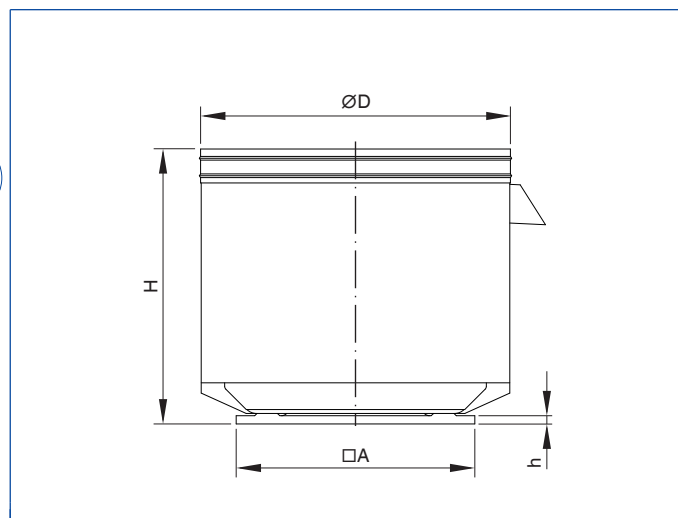
& **Accessories**

- ▶ Fan diagnosis system VD
- ▶ Volume flow rate measuring unit VME
- ▶ Shock pulse bearing monitoring STI
- ▶ Steel roof base for smooth roofs
- ▶ Sound attenuating base
- ▶ Outlet silencer SDI
- ▶ Self-powered shut-off damper
- ▶ Self-powered shut-off damper, thermally insulated
- ▶ Insulated / thermally insulated base plate
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Cover grille (inlet and outlet side)
- ▶ Local isolator attached (terminal box not required)
- ▶ Tilting frame for foldable type (up to NG 500 without SDI)
- ▶ Deflector hood SL 1000
- ▶ Silicone-free type
- ▶ Frequency inverter (for ventilation mode only)
- ▶ Extract air and smoke extract controller

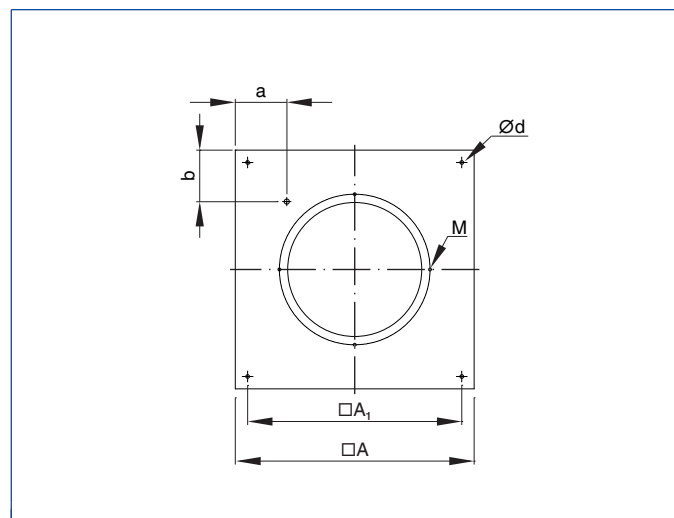
ISO **Classification, standards and guidelines**

- ▶ Temperature / time classification as per EN 12101 - Part 3:
- ▶ F400 CE no.: 0761-CPD-0007,
- ▶ F600 CE no.: 0761-CPD-0006,
- ▶ Declaration of performance (DoP)

BVD



BVD base plate



Dimensions [mm]

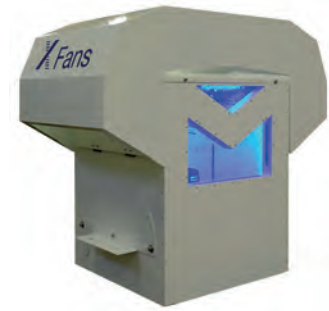
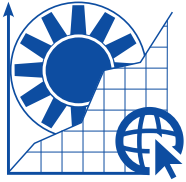
①	ØD	□A	H	h	□A1	a	b	Ød	M*
315	638	560	695 ¹⁾	40	460	110	110	14	6
355	808	710	772	40	600	143	143	14	8
400	808	710	848	40	600	143	143	14	8
500	993	1000	923	40	880	197	197	18	8
630	1272	1000	1337	40	880	197	197	18	10
630XL	1500	1000	1337	40	880	197	197	18	10
710	1272	1160	1337	40	1040	265	195	18	10
710XL	1500	1160	1337	40	1040	265	195	18	10

* Connecting flanges as per DIN 24154, Part 3. An air intake grille can be assembled directly on the base plate or on the flanges.

¹⁾ BVD 315/30-2=744

① Nominal size





For conveying smoke gases of temperature classes F200 / F300 / F400

+ Features

- ▶ Casing in corrosion protection category C5M as standard
- ▶ Casing available in all RAL colours
- ▶ Thermally insulated casing
- ▶ Meets all legal framework conditions (smoke extraction, German Energy Saving Ordinance)
- ▶ Building envelope's leakage and insulation properties are not compromised
- ▶ Heat transition class T4 (as per DIN EN 1866)
- ▶ Temperature bridge class TB4 (as per DIN EN 1866)
- ▶ Certified safety (functional integrity for F400, F300 and F200)
- ▶ Weatherproof and robust (EN 12101-3, SL 1000)
- ▶ Powerful (volume flow rates exceeding 100,000 m³/h)
- ▶ Versatile (can be integrated with all TROX axial fans up to F400 and NG 1120)
- ▶ Lightweight and durable, easy assembly
- ▶ Easy maintenance
- ▶ Bellmouth (integrated in the case of free inlet)

X Application

- ▶ Roof-mounted smoke exhaust fan
- ▶ Free outlet
- ▶ Free inlet or connected on the inlet side
- ▶ Dual function (ventilation and smoke extraction possible)

◇ Variants

- ▶ Roof-mounted smoke exhaust fan BVDAXN/-O Temp. class F200 to F400
- ▶ Flat or pitched roof type

& Accessories

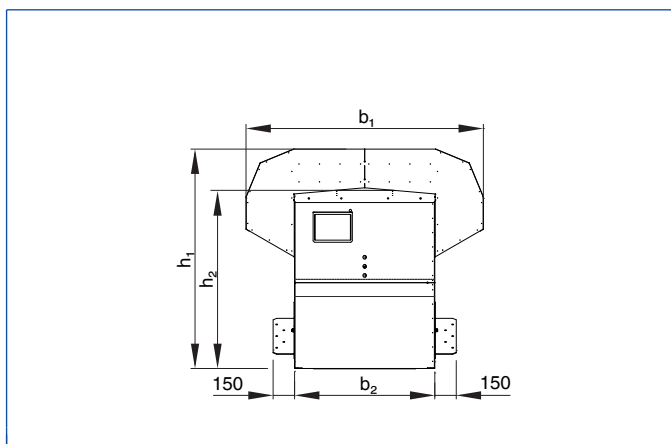
- ▶ Fan diagnosis system VD
- ▶ Volume flow rate measuring unit VME
- ▶ Shock pulse bearing monitoring STI
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Cover grille (inlet side)
- ▶ Flow redresser
- ▶ Local isolator
- ▶ Frequency inverter
- ▶ Extract air and smoke extract controller

ISO Classification, standards and guidelines

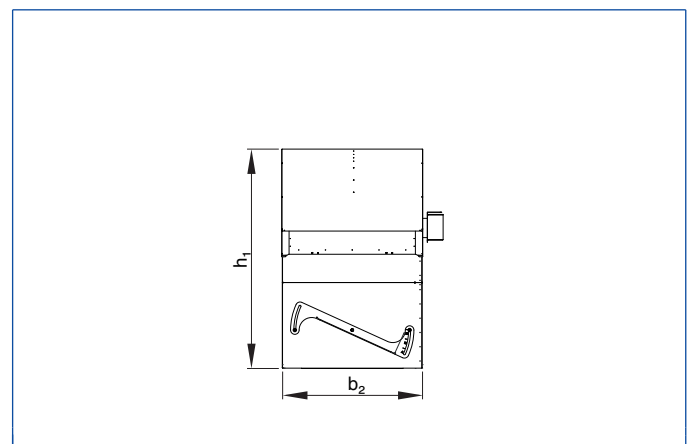
- ▶ Temperature / time classification as per EN 12101 - Part 3
- ▶ For the temperature classes F200 to F400 as per the axial smoke exhaust fan used
- ▶ Declaration of performance (DoP)
- ▶ Snow load class SL 1000



BVDAX



BVDAX

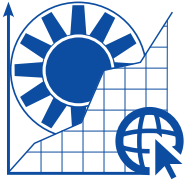


Dimensions [mm]

①	h1	h2	b1	b2
355	1176	947	1287	730
400	1176	947	1287	730
450	1176	947	1287	730
355	1376	1147	1287	730
400	1376	1147	1287	730
450	1376	1147	1287	730
500	1537	1258	1659	980
560	1537	1258	1659	980
630	1537	1258	1659	980
500	1818	1544	1659	980
560	1818	1544	1659	980
630	1818	1544	1659	980
710	2130	1772	2165	1300
800	2130	1772	2165	1300
900	2130	1772	2165	1300
710	2503	2145	2165	1300
800	2503	2145	2165	1300
900	2503	2145	2165	1300
1000	2675	2233	2605	1550
1120	2675	2233	2605	1550

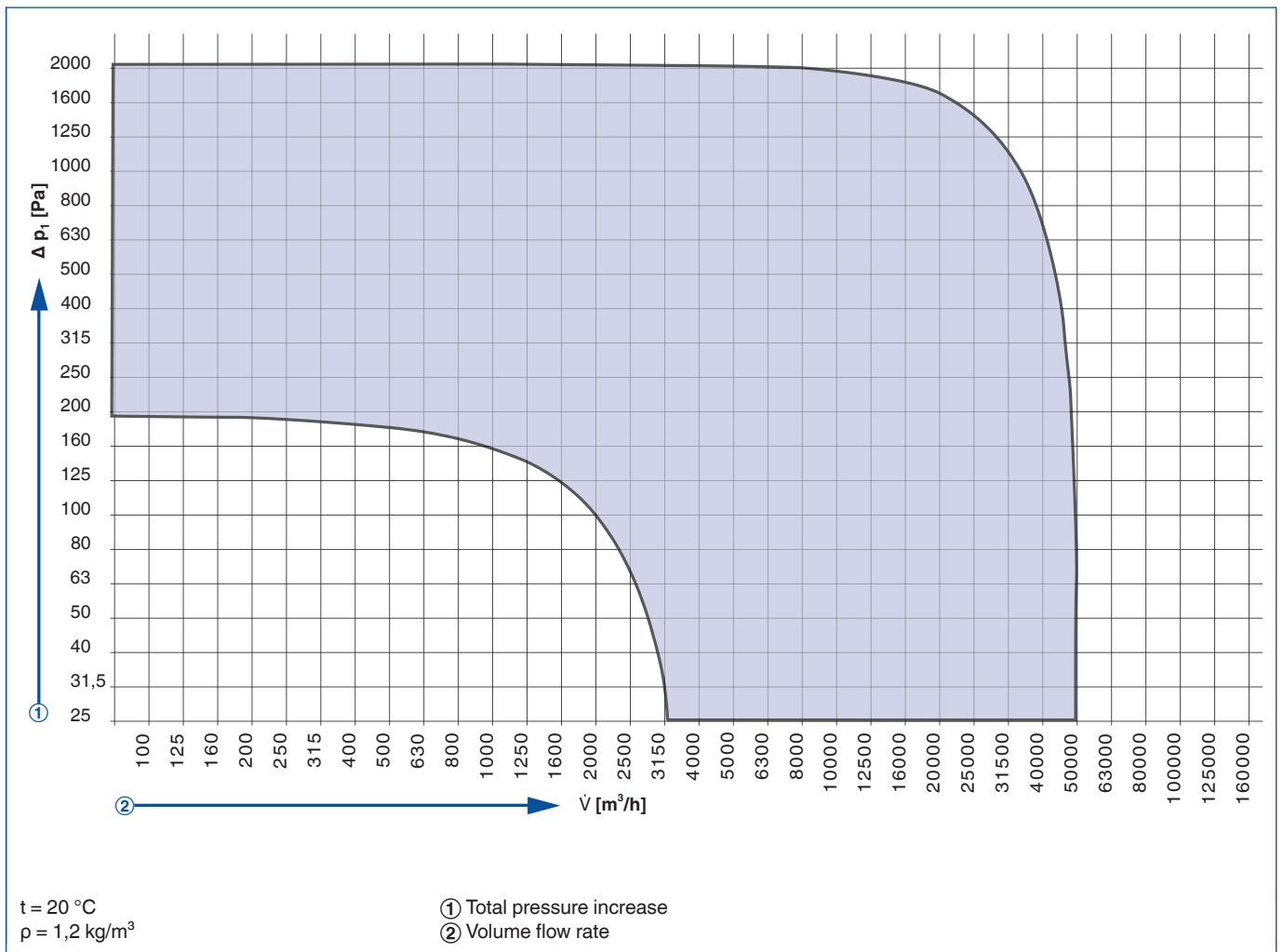
① Nominal size





For conveying smoke gases of the temperature class F600

BVW-D Performance Range



+ Features

- ▶ Casing and impeller made of sheet steel
- ▶ Protected by polyester resin-based powder coating, with bellmouth and motor fastening plate
- ▶ 6 sizes
- ▶ More than 35 types
- ▶ Volume flow rate V max. 50,000 m³/h
- ▶ Total pressure increase p1 max. 2,100 Pa

X Application

- ▶ Roof-mounted smoke exhaust fan for free outlet
- ▶ Free inlet or connected on the inlet side
- ▶ Dual function (ventilation and smoke extraction possible)

◊ Variants

- ▶ In temperature classes F400 and F600

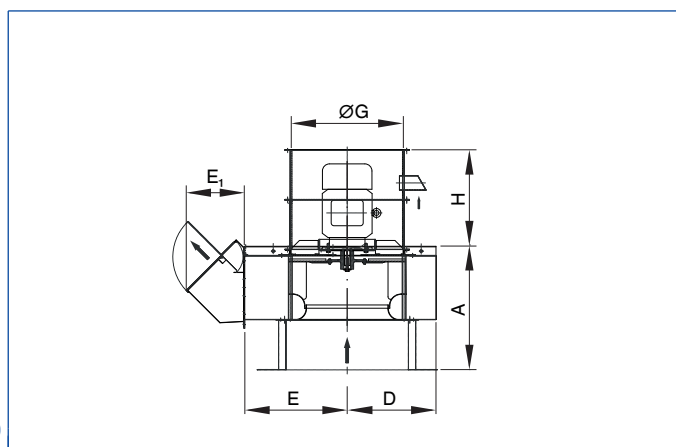
& Accessories

- ▶ Fan diagnosis system VD
- ▶ Shock pulse bearing monitoring STI
- ▶ Steel roof base for smooth roofs
- ▶ Sound attenuating base
- ▶ Outlet box incl. cover grille and self-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Cover grille (inlet side)
- ▶ Local isolator loose
- ▶ Insulated base plate
- ▶ Silicone-free type
- ▶ Frequency inverter (for ventilation mode only)
- ▶ Extract air and smoke extract controller

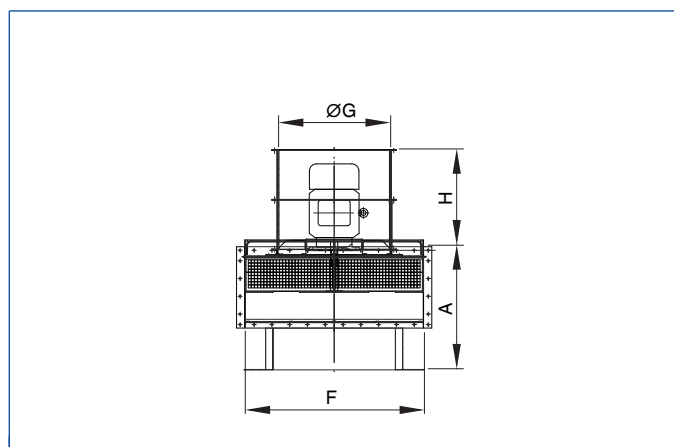
ISO Classification, standards and guidelines

- ▶ Temperature / time classification as per EN 12101 - Part 3
- ▶ F600 CE no.: 0761-CPR-0008 with declaration of performance (DoP)
- ▶ General building inspectorate licence no. Z-78.-11-127

BVW-D



BVW-D



Dimensions [mm]

①	A	D	E	F	E1	ØG	H	③
315	295	316	415	632	200	400	375	92
355	295	356	455	712	225	400	675	125
400	325	401	500	802	255	400	375	165
500	401	501	600	1002	320	500	450	230
630	516	626	725	1252	400	500 ¹⁾ /800 ²⁾	425 ¹⁾ /680 ²⁾	385
710	566	701	800	1402	450	500 ¹⁾ /800 ²⁾	425 ¹⁾ /680 ²⁾	475

¹⁾ Up to motor size 132

²⁾ Up to motor size 160

① Nominal size • ③ Max. weight [kg]



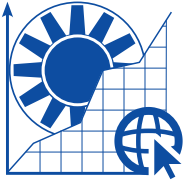
Smoke exhaust axial fans

	Specifications					
	BV(Z)AXN			BVAXO		
	8/56	6/9/12/56	AXO	9/27	10/50	
Temperature classes						
F 200		●	●	●	●	
F 300		●	●	●	●	
F 400	●	●		●	●	
F 600		●				
Installation type						
Outdoors	●	●	●	●	●	
In the building in the fire area	●	●	●	●	●	
In the building outside of the fire area	●	●	●	●	●	
Motor type						
Single-speed	●	●	●	●	●	
Dual-speed	●	●	●	●	●	
Suitable for operation on a frequency inverter (in ventilation mode)	●	●	●	●	●	
Suitable for operation on a frequency inverter (in smoke extract mode)	●	●	●	●		
Technical type						
Outlet guide vanes	●	●	●			
Adjustable impeller blades (at a standstill)			● Not F400			
Motor in airflow	●		●	●	●	
Motor encased - not in airflow		●				
Motor cooling due to cooling air fan		●				
Reversing mode				●	●	
Technical data						
Max. volume flow rate [m³/h]	550,000	320,000	230,000	250,000	170,000	140,000
Max. pressure [Pa]	4,500	4,000	2,500 (3150)	1,800 Pa	1,050	1,500
Max. drive capacity [kW]	315	315	132	90	45	75
Nominal sizes [mm]	550-2.000	550-1.800	315-1.600	400-1.600	315-1.600	315-1.250
Material						
Impeller	Steel	Steel	Aluminium	Aluminium	Steel	Steel
Casing	Steel	Steel	Steel	Steel	Steel	Steel
Accessories						
Roof cowl DAX (BVAX to NG 1120)	○		○	○	○	○
Fan diagnosis system VD	○	○	○	○	○	○
Volume flow rate measuring unit VME	○	○	○		○	
Shock pulse bearing monitoring STI	○	○	○	○	○	○
Acoustic and thermal insulation	○	○	○	○	○	○
Weather protection roof for acoustic and thermal insulation	○	○	○	○	○	○
Round silencers TSR (inlet and outlet side)	○	○	○	○	○	○
Round silencers TSR with interior core (inlet and outlet side)	○	○	○			
Extension duct	○	○	○	○	○	○
Inspection hatch	○	○	○	○	○	○
Self-powered shut-off damper	○	○	○	○	○	○
Flexible connectors	○	○	○	○	○	○
Matching flange	○	○	○	○	○	○
Equipotential bonding	○	○	○	○	○	○
Bellmouth	○	○	○	○	○	○
Cover grille (inlet and outlet side)	○	○	○	○	○	○
Diffuser	○	○	○	○	○	○



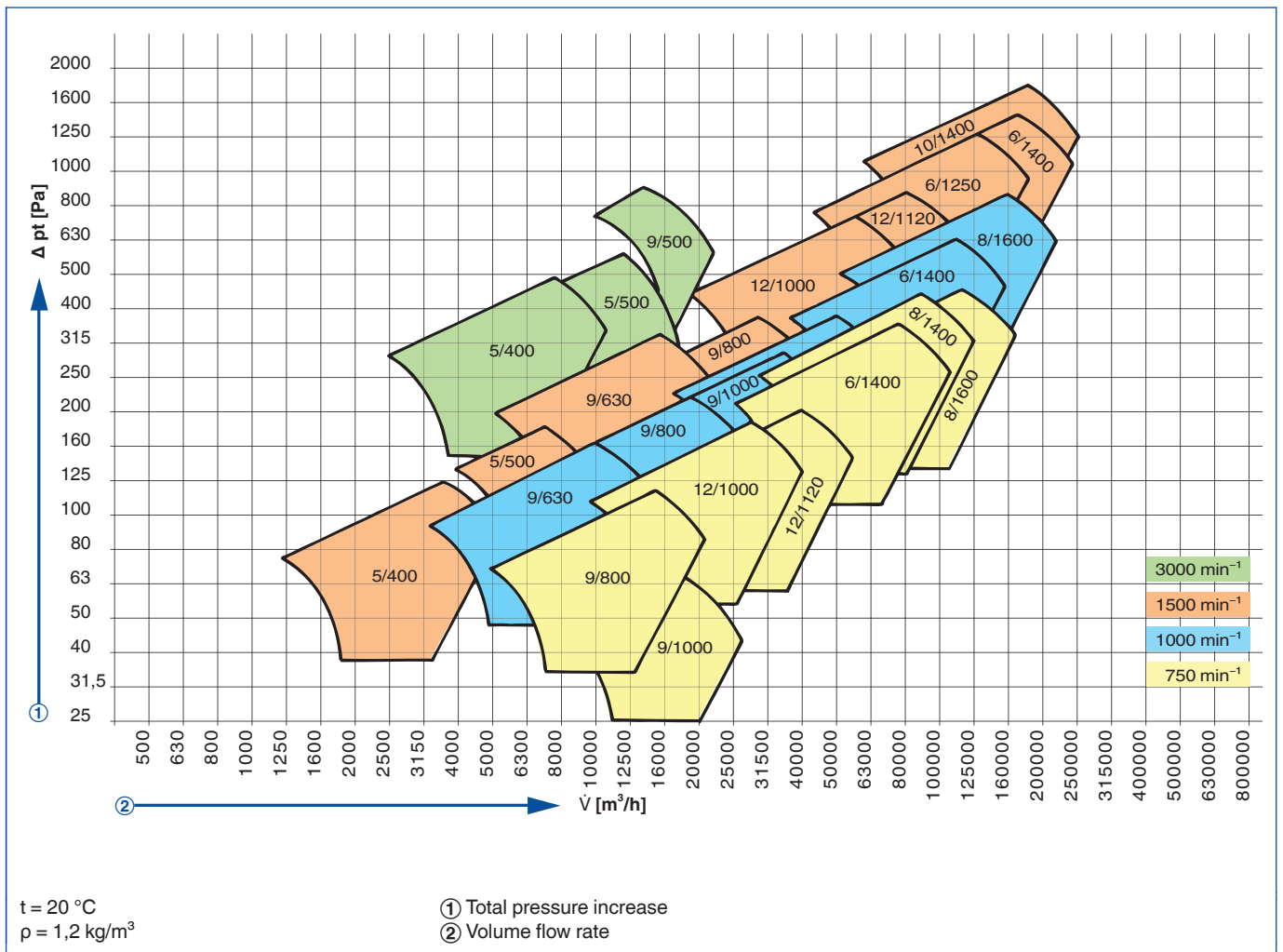
	Specifications					
	BV(Z)AXN			BVAXO		
	8/56	6/9/12/56	AXO	9/27	10/50	
Diffuser with interior core	○	○	○			
Outlet duct with cover grille	○	○	○	○	○	○
Mounting feet	○	○	○	○	○	○
Brackets (for vertical assembly)	○	○	○	○	○	○
Spring anti-vibration mounts	○	○	○	○	○	○
Terminal box	●	●	●	●	●	●
Local isolator loose (for outside of fire area)	○	○	○	○	○	○
Angular wall ring with brackets (inlet and outlet side)	○	○	○	○	○	○
Cooling air fan		○				
Flexible connector for cooling air fan		○				
Weather protection roof for cooling air fan		○				
Silicone-free type	○	○	○	○	○	○
Extract air and smoke extract controller	○	○	○	○	○	○
Surface protection						
Corrosion protection category C2	●	●	●	●	●	●
Corrosion protection category C3	○	○	○	○	○	○
Corrosion protection category C4	○	○	○	○	○	○
Corrosion protection category C5	○	○	○	○	○	○
Explanation						
● - Standard						
○ - Optional						





For conveying smoke gases of the temperature class F300

BVAXO Performance Range



+ **Features**

Compact size for installation even when space is tight.

- ▶ Casing available in all RAL colours
- ▶ Nine sizes
- ▶ Impeller's nominal diameter 400 to 1,600 mm
- ▶ Volume flow rate up to 250,000 m³/h
- ▶ Total pressure increase max. 1,800 Pa

X **Application**

- ▶ For installation inside and outside of the fire zone.
- ▶ Suitable for free inlet / outlet or for pipeline installation in a horizontal and vertical style.
- ▶ Dual smoke extract and ventilation function.

◊ **Variants**

- ▶ Design as wall-mounted smoke exhaust fan with wall mounting plate and outlet casing with self-powered multileaf damper

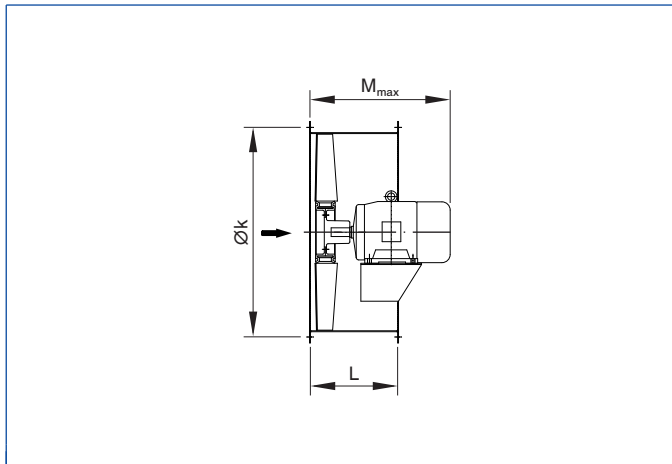
& **Accessories**

- ▶ Fan diagnosis system VD
- ▶ Shock pulse bearing monitoring STI
- ▶ Acoustic and thermal insulation
- ▶ Weather protection roof for acoustic and thermal insulation
- ▶ Round silencers TSR (inlet and outlet side)
- ▶ Extension duct
- ▶ Inspection hatch
- ▶ Self-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Bellmouth
- ▶ Cover grille (inlet and outlet side)
- ▶ Diffuser
- ▶ Outlet duct with cover grille
- ▶ Mounting feet
- ▶ Brackets (for vertical assembly)
- ▶ Spring anti-vibration mounts
- ▶ Terminal box
- ▶ Local isolator loose (for outside of fire area)
- ▶ Angular wall ring with brackets (inlet and outlet side)
- ▶ Silicone-free type
- ▶ Extract air and smoke extract controller
- ▶ Surface protection powder-coated and/or hot-dip galvanised in corrosion protection category C2 to C5M

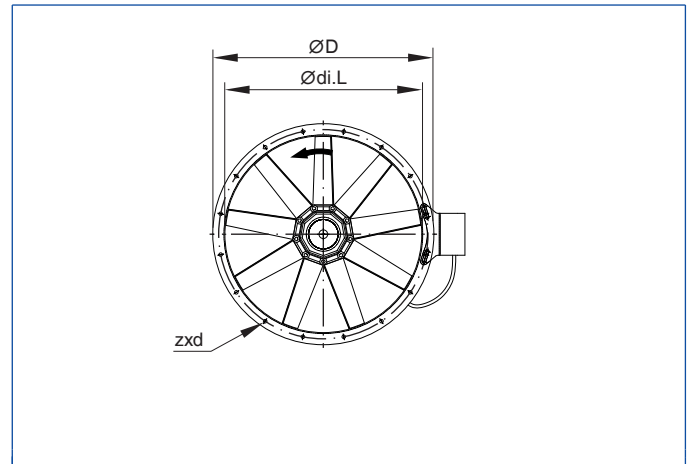
ISO **Classification, standards and guidelines**

- ▶ EN 12101 - Part 3
- ▶ F300 CE no.: 0761-CPD-0013 incl. declaration of performance (DoP) Application approval no. Z-78.11-131
- ▶ F300 CE no.: 0761-CPD-0073 incl. declaration of performance (DoP) Application approval no. Z-78.11-191

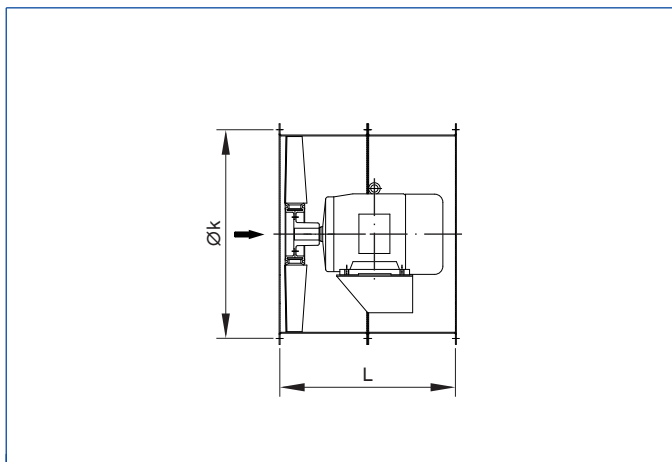
BVAXO to NG 1120



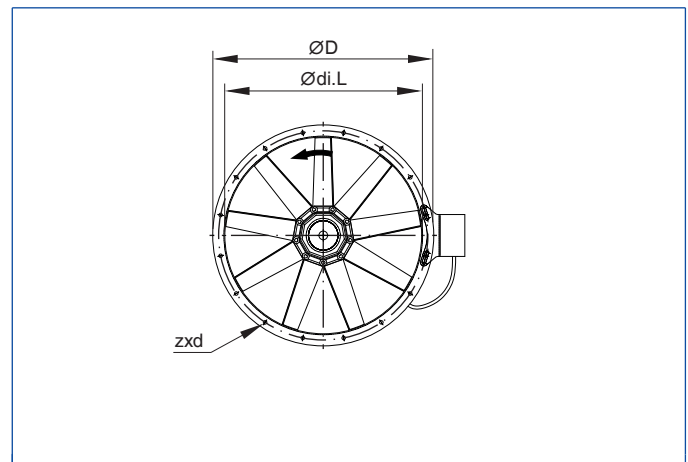
BVAXO to NG 1120



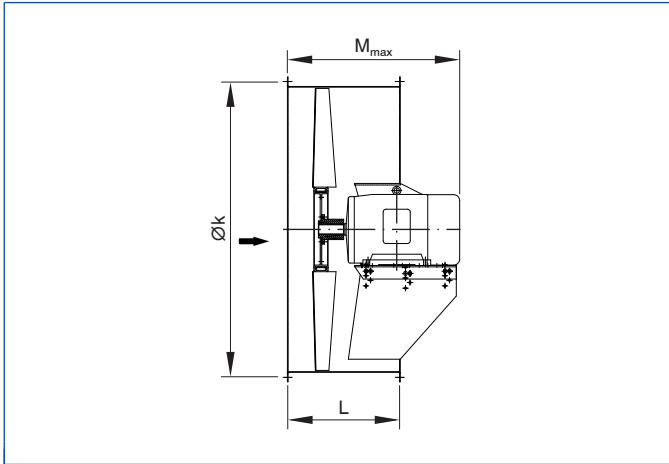
BVAXO to NG 1120 with extension duct



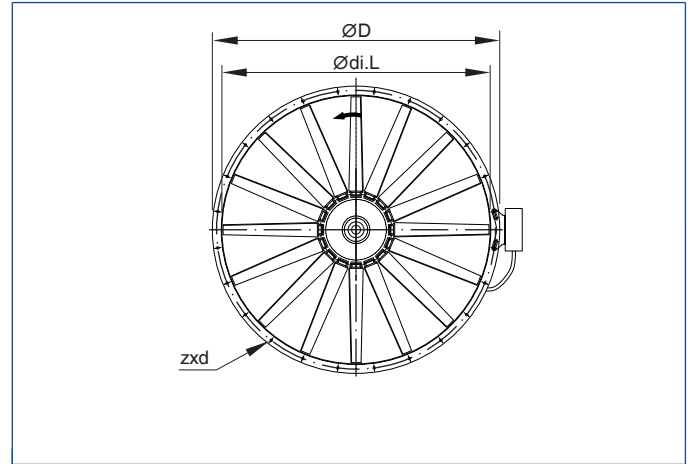
BVAXO to NG 1120 with extension duct



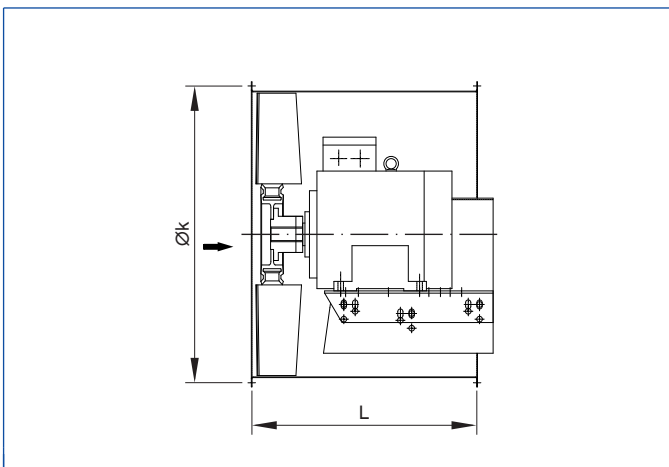
BVAXO as of NG 1250



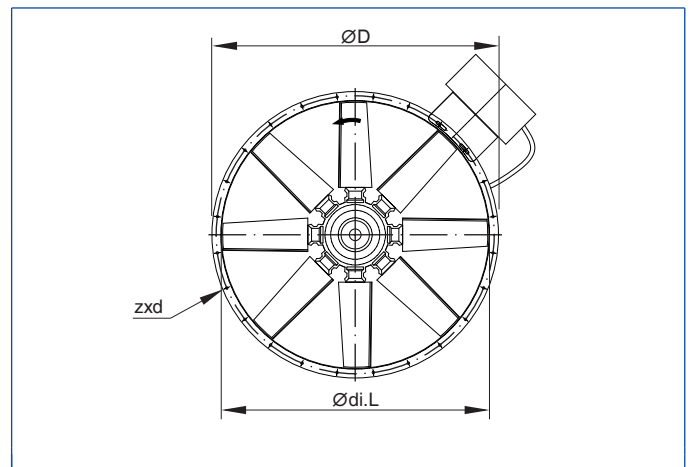
BVAXO as of NG 1250



BVAXO as of NG 1250 with extension duct



BVAXO as of NG 1250 with extension duct



Dimensions [mm]

①	②	Ø clear width	Øk	ØD	zxd	L	M _{max}	③
315	71-80	320	356	386	8 x 9.5	150	265	6
400	71-90	401	438	468	12 x 9.5	188	348	11
	100	401	438	468	12 x 9.5	376	390	16
500	80-100	504	541	571	12 x 9.5	225	570	16
	90-132	504	541	571	12 x 9.5	450	451	22
630	90-112	634	674	712	16 x 11.5	286	595	30
	132	634	674	712	16 x 11.5	572	575	29
800	100-132	797	837	875	24 x 11.5	350	760	50
	160	797	837	875	24 x 11.5	700	810	70
1000	132-180	1003	1043	1081	24 x 11.5	415	730	85
	200	1003	1043	1081	24 x 11.5	830	770	105
1120	132-200	1124	1174	1214	24 x 11.5	450	825	110
1250	160-225	1261	1311	1351	24 x 11.5	500	⊗	⊗
	250-280	1261	1311	1351	24 x 11.5	100	⊗	⊗
1400	180-225	1415	1465	1545	24 x 11.5	560	⊗	⊗
	250-315	1415	1465	1545	24 x 11.5	1120	⊗	⊗
1600	180-225	1587	1637	1717	32 x 11.5	630	⊗	⊗
	250-315	1587	1637	1717	32 x 11.5	1260	⊗	⊗

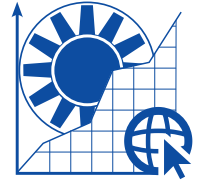
① Nominal size, an extension duct may be needed for different sizes in the case of vibration-dampened installation •

② Motor size B3 style •

③ Weight without motor (approx.) [kg] •

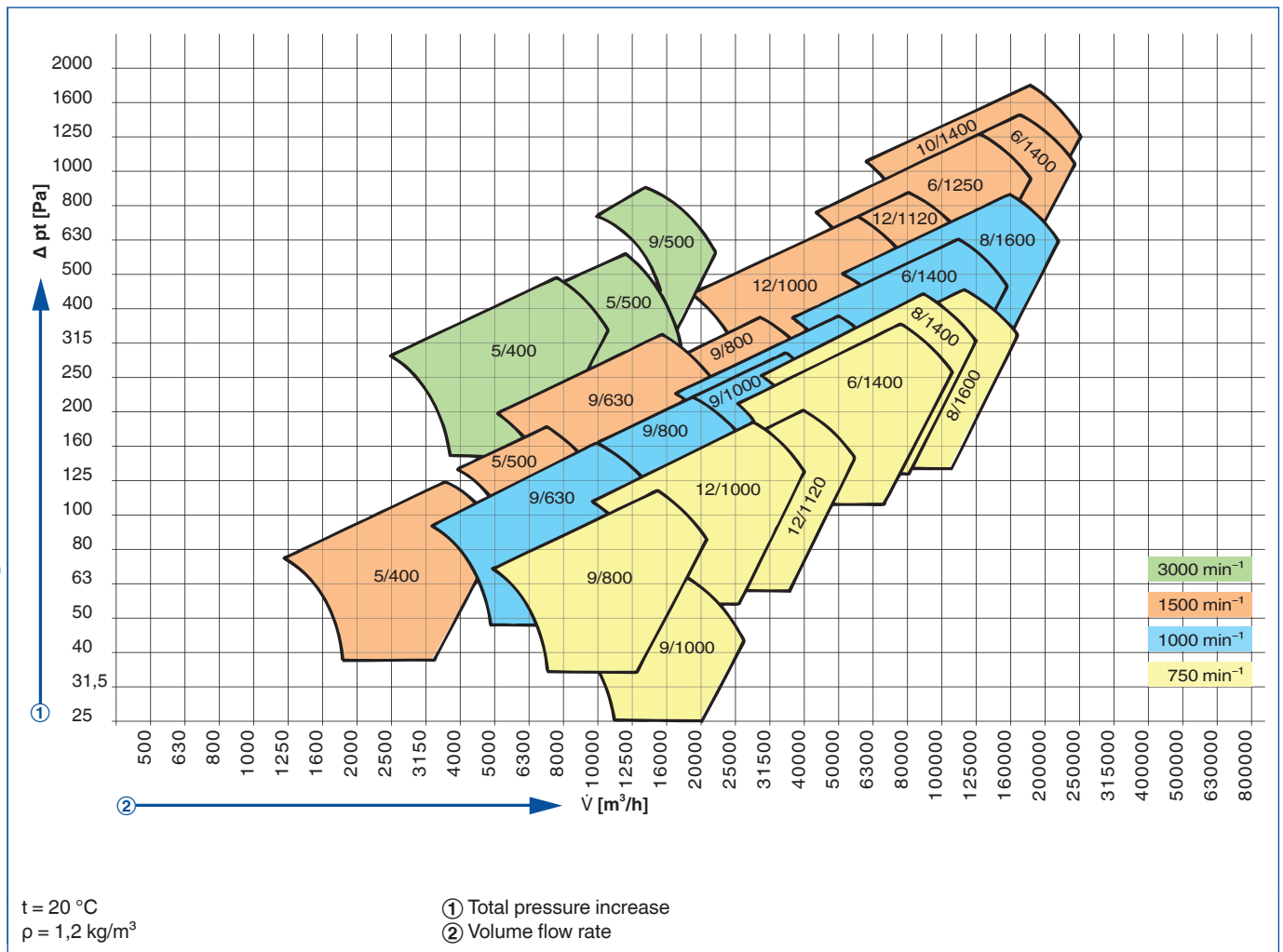
⊗ Upon request





For conveying smoke gases of the temperature class F400

BVAXO Performance Range





Features

Compact size for installation even when space is tight.

- ▶ Casing available in all RAL colours
- ▶ 13 sizes
- ▶ Impeller's nominal Ø 315 to 1,600 mm
- ▶ Volume flow rate V max. 170,000 m³/h
- ▶ Total pressure increase Δpt max. 1,050 Pa



Application

- ▶ For installation inside and outside of the fire zone.
- ▶ Suitable for free inlet / outlet or for pipeline installation in a horizontal and vertical style.
- ▶ Dual smoke extract and ventilation function.



Accessories

- ▶ Fan diagnosis system VD
- ▶ Volume flow rate measuring unit VME
- ▶ Shock pulse bearing monitoring STI
- ▶ Acoustic and thermal insulation
- ▶ Weather protection roof for acoustic and thermal insulation
- ▶ Round silencers TSR (inlet and outlet side)
- ▶ Extension duct
- ▶ Inspection hatch
- ▶ Self-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Bellmouth
- ▶ Cover grille (inlet and outlet side)
- ▶ Diffuser
- ▶ Outlet duct with cover grille
- ▶ Wall mounting plate
- ▶ Louvre box

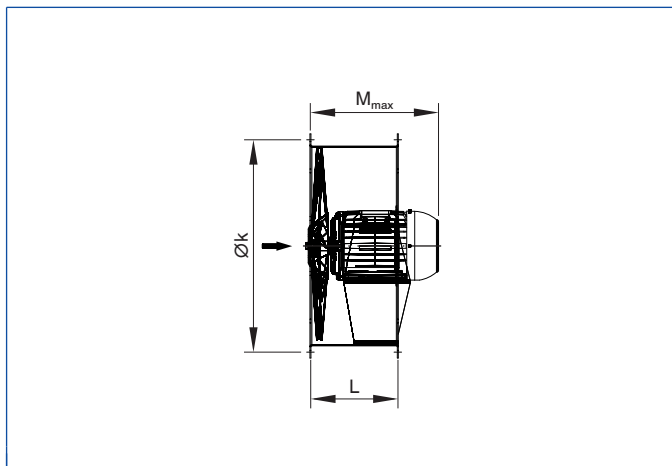
- ▶ Mounting feet
- ▶ Brackets (for vertical assembly)
- ▶ Spring anti-vibration mounts
- ▶ Local isolator loose (for assembly outside of the fire area)
- ▶ Angular wall ring with brackets (inlet and outlet side)
- ▶ Silicone-free type
- ▶ Extract air and smoke extract controller
- ▶ Surface protection powder-coated and/or hot-dip galvanised in corrosion protection category C2 to C5M



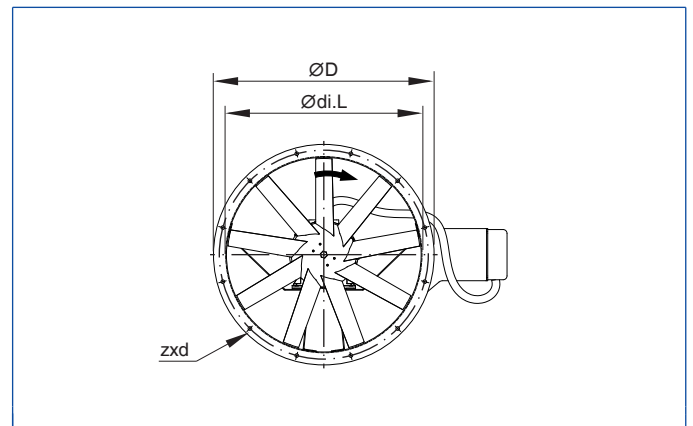
Classification, standards and guidelines

- ▶ Temperature / time classification as per EN 12101 - Part 3
- ▶ F400 CE no.: 0761-CPR-0491 with declaration of performance (DoP)

AXO 9/27



AXO 9/27

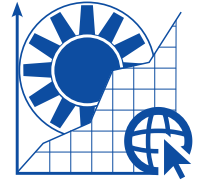


Dimensions [mm]

①	②	Ø clear width	Øk	ØD	zxd	L	M _{max}
315	71-80	320	356	386	8 x 9.5	150	265
400	71-90	401	438	468	12 x 9.5	188	348
	100	401	438	468	12 x 9.5	376	390
500	80-100	504	541	571	12 x 9.5	225	570
	90-132	504	541	571	12 x 9.5	450	451
630	90-112	634	674	712	16 x 11.5	286	595
	132	634	674	712	16 x 11.5	572	575
800	100-132	797	837	875	24 x 11.5	350	760
	160	797	837	875	24 x 11.5	700	810
1000	132-180	1003	1043	1081	24 x 11.5	415	730
	200	1003	1043	1081	24 x 11.5	830	770
1120	132-200	1124	1174	1214	24 x 11.5	450	825
1250	250-280	1261	1311	1351	24 x 11.5	500	⊗
1400	250-315	1415	1465	1545	24 x 11.5	560	⊗
1600	250-315	1587	1637	1717	32 x 11.5	630	⊗

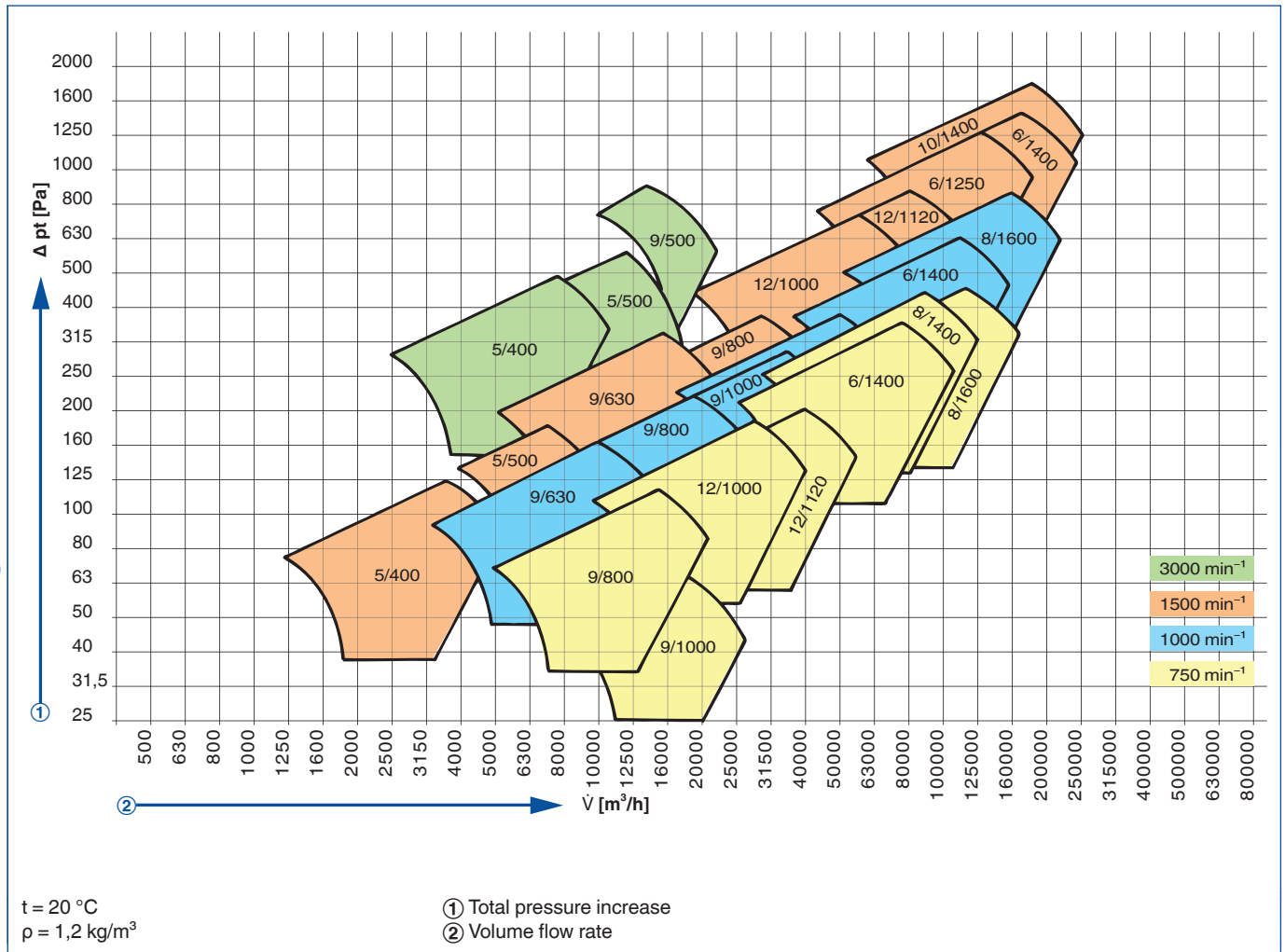
- ① Nominal size, an extension duct may be needed for different sizes in the case of vibration-dampened installation •
- ② Motor size B3 style •
- ⊗ Upon request





For conveying smoke gases of the temperature class F400

BVAXO Performance Range



+ Features

- ▶ Impellers with different blade pitch angles are used depending on the size and the desired output; please specify when ordering.
- ▶ Compact size enables installation even when space is tight.
- ▶ Motors can come with thermal contacts or a PTC thermistor
- ▶ Casing available in all RAL colours
- ▶ Also available with acoustic insulation.
- ▶ Efficiency up to 63%
- ▶ 15 sizes
- ▶ Impeller's nominal Ø 315 to 1,250 mm
- ▶ Volume flow rate V. max. 140,000 m³/h
- ▶ Total pressure increase pt max. 1,500 Pa
- ▶ M style - with direct drive. Impeller assembled directly on the motor shaft.

Application

- ▶ Fan for reversible operation.
- ▶ Installation inside and outside of the fire zone without additional cooling.

& Accessories

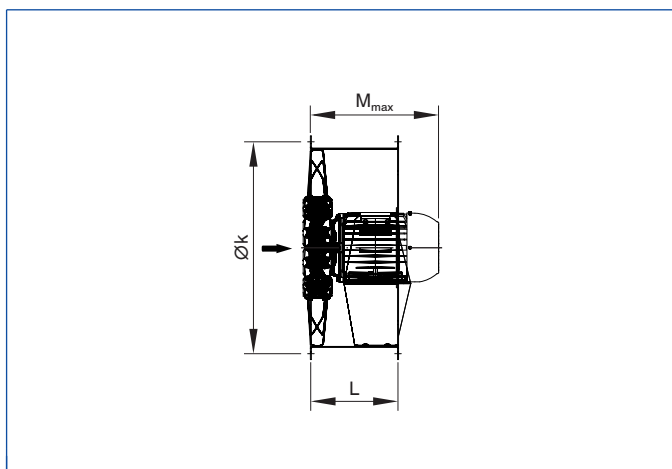
- ▶ Fan diagnosis system VD
- ▶ Shock pulse bearing monitoring STI
- ▶ Round silencers TSR (inlet and outlet side)
- ▶ Extension duct
- ▶ Inspection hatch
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Bellmouth
- ▶ Cover grille (inlet and outlet side)
- ▶ Diffuser
- ▶ Outlet duct with cover grille

- ▶ Mounting feet
- ▶ Spring anti-vibration mounts
- ▶ Terminal box
- ▶ Local isolator loose (for outside of fire area)
- ▶ Angular wall ring with brackets (inlet and outlet side)
- ▶ Silicone-free type
- ▶ Extract air and smoke extract controller
- ▶ Surface protection category C3 to C5

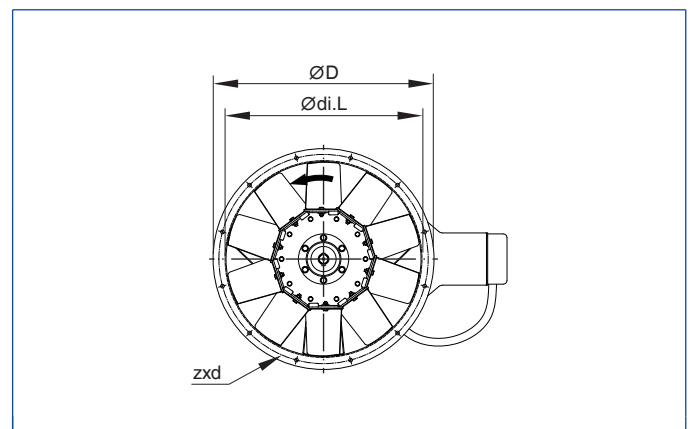
ISO Classification, standards and guidelines

- ▶ Temperature / time classification as per EN 12101 - Part 3
- ▶ F400 CE no.: CE 0761-CPR-0168 with declaration of performance (DoP)

BVAXO 10/50



BVAXO 10/50



Dimensions [mm]

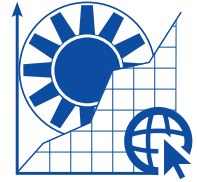
①	②	Ø clear width	Øk	ØD	zxd	L	M _{max}
315	71-80	320	356	386	8 x 9.5	150	265
400	71-90	401	438	468	12 x 9.5	188	348
	100	401	438	468	12 x 9.5	376	390
500	80-100	504	541	571	12 x 9.5	225	570
	90-132	504	541	571	12 x 9.5	450	451
630	90-112	634	674	712	16 x 11.5	286	595
	132	634	674	712	16 x 11.5	572	575
800	100-132	797	837	875	24 x 11.5	350	760
	160	797	837	875	24 x 11.5	700	810
1000	132-180	1003	1043	1081	24 x 11.5	415	730
	200	1003	1043	1081	24 x 11.5	830	770
1120	132-200	1124	1174	1214	24 x 11.5	450	825
1250	250-280	1261	1311	1351	24 x 11.5	500	⊗
1400	250-315	1415	1465	1545	24 x 11.5	560	⊗
1600	250-315	1587	1637	1717	32 x 11.5	630	⊗

① Nominal size, an extension duct may be needed for different sizes in the case of vibration-dampened installation •

② Motor size B3 style •

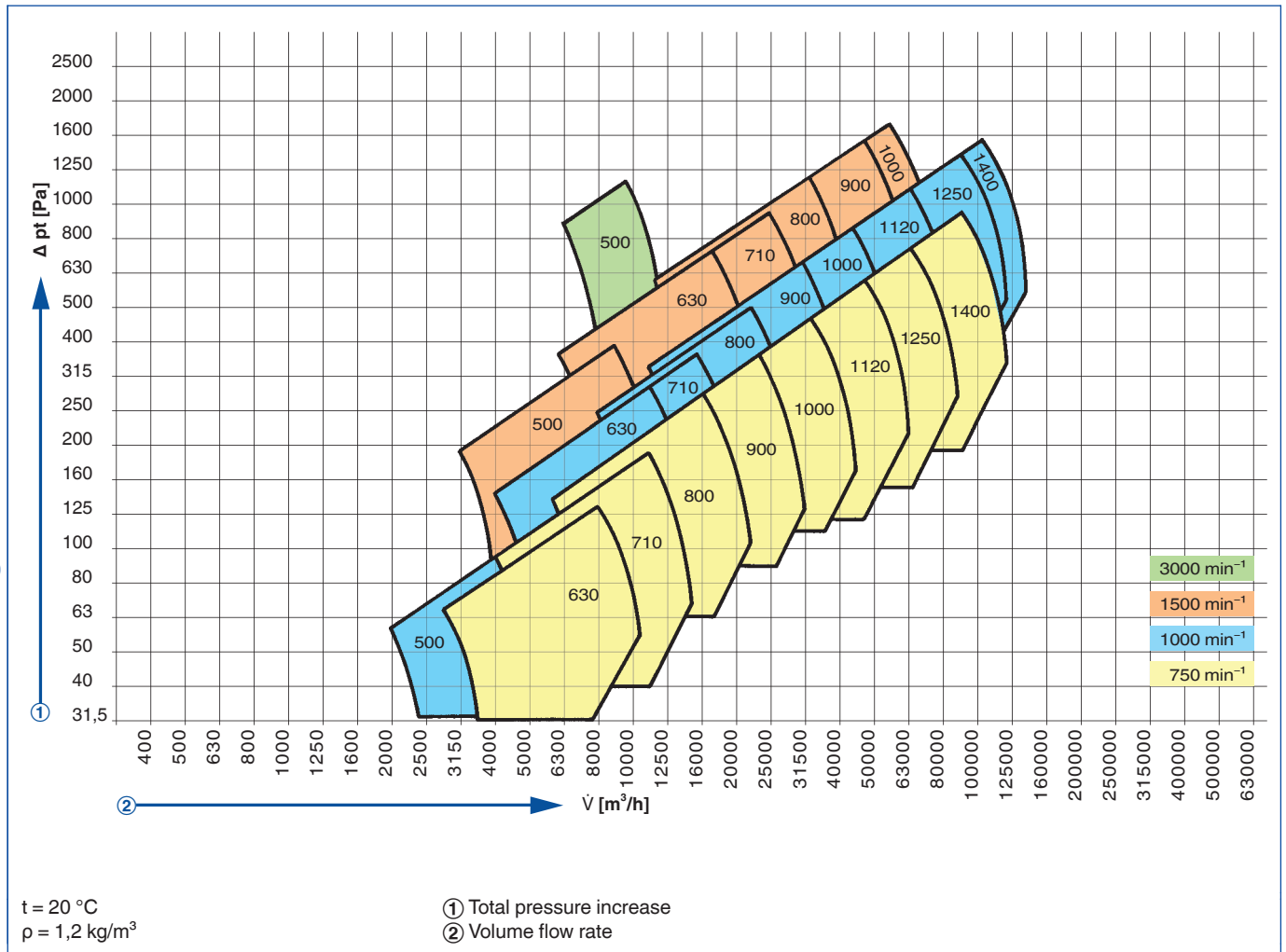
⊗ Upon request





For conveying smoke gases of temperature classes F400 and F600

BVAXN 8/56 Performance Range





Features

- ▶ Operation on a frequency inverter also permissible in the event of smoke extraction, so ideal for multiple-area systems (as of an NG 630 fan and a 132 motor size)
- ▶ Large volume flow rates can be realised with small nominal diameters due to high permissible circumferential speeds
- ▶ Powder coating possible in all RAL colours
- ▶ Can be installed in the fire zone if the cooling system is provided by the customer.
- ▶ Optimised outlet guide vanes to increase the pressure coefficients
- ▶ Low-noise operation due to low circumferential speeds and thus high pressure coefficients.
- ▶ 12 sizes
- ▶ Impeller's nominal Ø 500 to 1,800 mm
- ▶ Volume flow rate V max. 320,000 m³/h
- ▶ Total pressure increase pt max 4,000



Application

- ▶ For installation inside and outside of the fire zone.
- ▶ Suitable for free inlet / outlet or for pipeline installation in a horizontal and vertical style.
- ▶ Dual smoke extract and ventilation function.



Accessories

- ▶ Fan diagnosis system VD
- ▶ Volume flow rate measuring unit VME
- ▶ Shock pulse bearing monitoring STI
- ▶ Acoustic and thermal insulation
- ▶ Weather protection roof for acoustic and thermal insulation
- ▶ Round silencers TSR (inlet and outlet side) for F600 only
- ▶ Round silencers TSR with interior core (inlet and outlet side)
- ▶ Extension duct
- ▶ Inspection hatch
- ▶ Self-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Bellmouth
- ▶ Cover grille (inlet and outlet side)
- ▶ Diffuser
- ▶ Diffuser with interior core
- ▶ Outlet duct with cover grille
- ▶ Mounting feet
- ▶ Brackets (for vertical assembly)
- ▶ Spring anti-vibration mounts
- ▶ Terminal box (for assembly outside of the fire area)
- ▶ Local isolator loose (for assembly outside of the fire area)

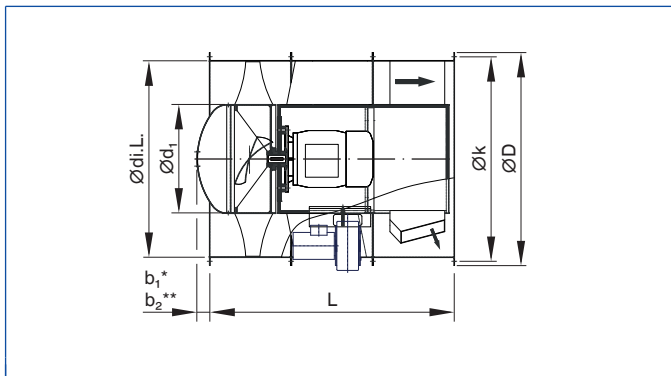
- ▶ Angular wall ring with brackets (inlet and outlet side)
- ▶ Cooling air fan
- ▶ Flexible connector for cooling air fan
- ▶ Weather protection roof for cooling air fan
- ▶ Silicone-free type
- ▶ Extract air and smoke extract controller
- ▶ Corrosion protection category up to C5M possible



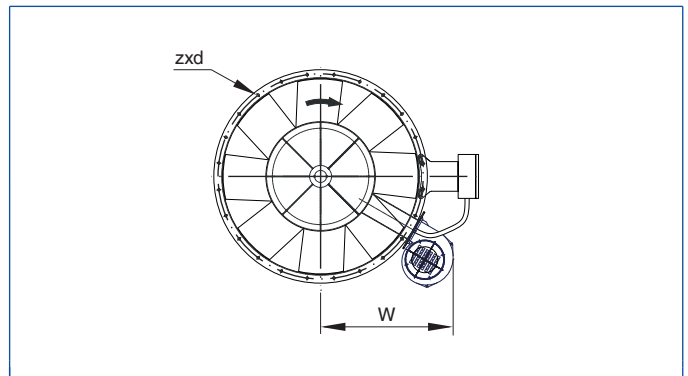
Classification, standards and guidelines

- ▶ Temperature / time category as per EN 12101 - Part 3:
- ▶ F600 CE no.: 0761-CPD-0201 or 0761-CPR-0392 for operation on a frequency inverter in the case of smoke extraction, incl. declaration of performance (DoP)
- ▶ F400 CE no.: 0761-CPR-0494
- ▶ General building inspectorate licence no. Z-78.11-130

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Dimensions [mm]

①	Ø clear width	Øk	ØD	zxd	L***	Ød ₁	b1*	b2**	~W	②	③
450	450	487	517	12 x 9.5	600	250	40	55	580	100	60
500	504	541	571	12 x 9.5	675	280	30	45	620	112	70
560	565	605	643	16 x 11.5	726	316	20	35	640	112	90
630	634	674	712	16 x 11.5	858	355	10	30	665	132	110
710	711	751	789	16 x 11.5	915	397	0	40	610	160	150
800	797	837	875	24 x 11.5	1050	445	0	30	655	180	210
900	894	934	972	24 x 11.5	1119	498	75	105	690	200	260
1000	1003	1043	1081	24 x 11.5	1245	560	0	40	765	225	320
1120	1124	1174	1253	24 x 11.5	1350	630	0	0	935	250	500
1250	1261	1311	1391	24 x 11.5	1500/1630	710	0	0	880	280	700
1400	1415	1465	1545	24 x 11.5	1680/2040	790	0	94	970	315	945
1600	1587	1637	1717	32 x 11.5	1890/2110	890	0	0	⊗	315	1240
1800	1780	1830	1910	32 x 11.5	2130	1000	0	0	⊗	315	1450

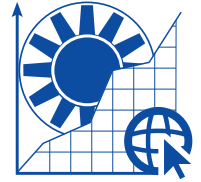
* Blade pitch angle 0-15° ** Blade pitch angle 16-35° *** Depending on the motor size

① Nominal size; an extension duct may be needed for different sizes in the case of vibration-dampened installation •

② Max. motor size • ③ Weight without motor (approx.) [kg] •

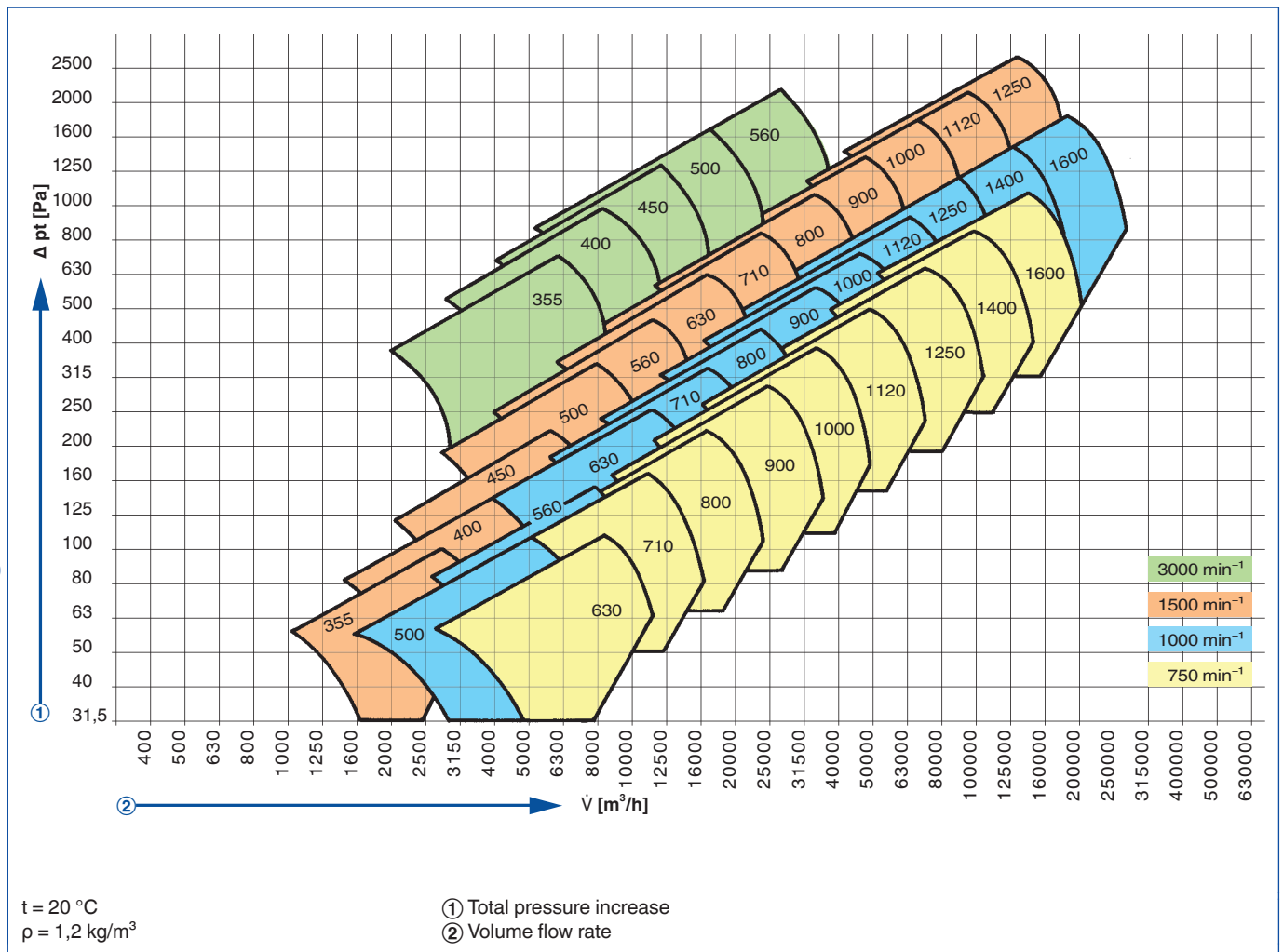
⊗ Upon request





For conveying smoke gases of temperature classes F200, F300 and F400

BVAXN 12/56 Performance Range



+ Features

- ▶ For installation in the fire zone without additional cooling.
- ▶ Low-noise operation due to low circumferential speeds caused by high pressure coefficients.
- ▶ Optimised outlet guide vanes to increase the pressure coefficients.
- ▶ Extensive adjustments to the relevant operating point and subsequent motor rating corrections can be made by steplessly adjusting the impeller blades

without any need to disassemble the impeller (the impeller blades cannot be adjusted in the case of the F400 temperature class).

- ▶ The desired operating point is optimised to achieve the best possible efficiency using a variable number of blades (6 / 9 / 12).
- ▶ Aluminium impeller; impeller's nominal diameter 315 to 1,600 mm
Volume flow rate max. 230,000 m³/h
Total pressure max. 2,500 Pa
15 sizes
- ▶ Casing available in all RAL colours

X Application

- ▶ For installation inside and outside of the fire zone.
- ▶ Suitable for free inlet / outlet or for pipeline installation in a horizontal and vertical style.
- ▶ Dual smoke extract and ventilation function.





Variants

- ▶ Temperature class F200 (nominal size: 355 to 1250)
- ▶ Temperature class F300 (nominal size: 315 to 1600)
- ▶ Temperature class F400 (nominal size: 315 to 1400)
- ▶ Design as wall-mounted smoke exhaust fan with wall mounting plate and outlet casing with self-powered multileaf damper



Accessories

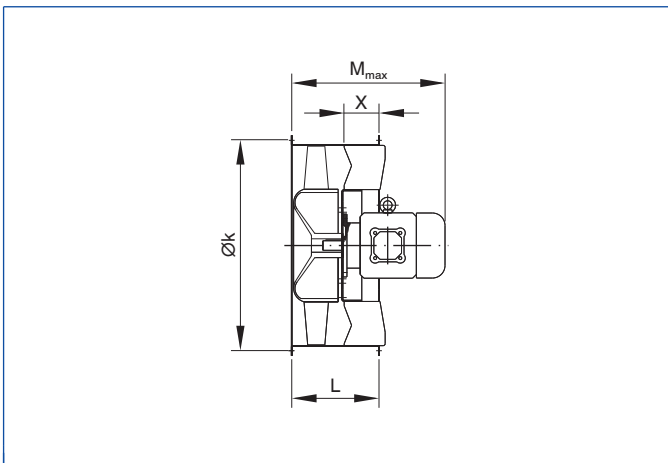
- ▶ Roof cowl DAX (BVAX to NG 1120)
 - ▶ Fan diagnosis system VD
 - ▶ Volume flow rate measuring unit VME
 - ▶ Shock pulse bearing monitoring STI
 - ▶ Acoustic and thermal insulation
 - ▶ Weather protection roof for acoustic and thermal insulation
 - ▶ Round silencers TSR (inlet and outlet side)
 - ▶ Round silencers TSR with interior core (inlet and outlet side)
 - ▶ Extension duct
- ▶ Inspection hatch
 - ▶ Self-powered shut-off damper
 - ▶ Flexible connectors
 - ▶ Matching flange
 - ▶ Equipotential bonding
 - ▶ Bellmouth
 - ▶ Cover grille (inlet and outlet side)
 - ▶ Diffuser
 - ▶ Diffuser with interior core
 - ▶ Outlet duct with cover grille
 - ▶ Wall mounting plate
 - ▶ Louvre box
 - ▶ Mounting feet
 - ▶ Brackets (for vertical assembly)
 - ▶ Spring anti-vibration mounts
 - ▶ Local isolator loose (for assembly outside of the fire area)
 - ▶ Angular wall ring with brackets (inlet and outlet side)
 - ▶ Silicone-free type
 - ▶ Extract air and smoke extract controller
 - ▶ Surface protection powder-coated and/or hot-dip galvanised in corrosion protection category C2 to C5M



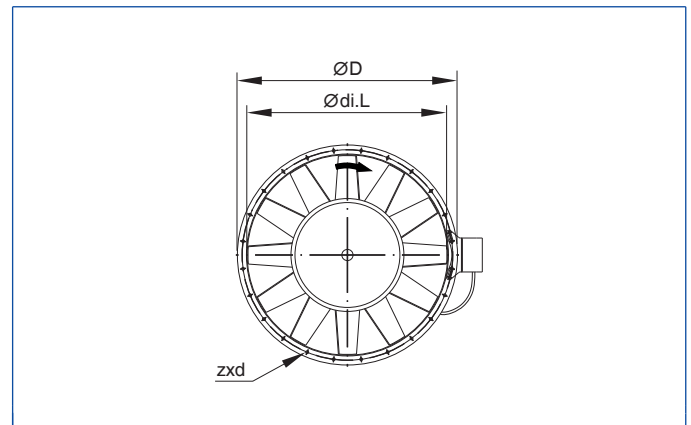
Classification, standards and guidelines

- ▶ For conveying smoke gases of temperature classes F200, F300 and F400
- ▶ Temperature / time classification as per EN 12101 - Part 3:
F200 CE no.: 0761-CPD-0009, incl. declaration of performance (DoP)
General building inspectorate licence no. Z-78.11-128
- ▶ F300 CE no.: 0761-CPD-0010, or 0761-CPR-0492 for operation on a frequency inverter in the case of smoke extraction, incl. declaration of performance (DoP)
General building inspectorate licence no. Z-78.11-128
- ▶ F400 CE no.: 0761-CPD-0011, or 0761-CPR-0493 for operation on a frequency inverter in the case of smoke extraction, incl. declaration of performance (DoP)
General building inspectorate licence no. Z-78.11-128

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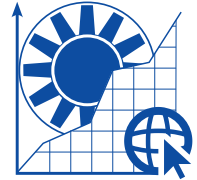
Dimensions [mm]

①	Ø clear width	Øk	ØD	Zxd	L	X	M _{max}	Weight without motor (approx. kg)
315	320	356	386	8 x 9.5	150	71	320	6.5
355	359	395	425	8 x 9.5	165	77	370	8
400	401	438	468	12 x 9.5	188	88	430	12
450	450	487	517	12 x 9.5	200	88	440	14
500	504	541	571	12 x 9.5	225	100	540	18
560	565	605	643	16 x 11.5	242	100	560	26
630	634	674	712	16 x 11.5	286	128	570	33
710	711	751	789	16 x 11.5	305	128	700	45
800	797	837	875	24 x 11.5	350	150	780	56
900	894	934	972	24 x 11.5	373	149	930	74
1000	1003	1043	1081	24 x 11.5	415	165	960	93
1120	1124	1174	1214	24 x 11.5	450	170	1200	120
1250	1261	1311	1351	24 x 11.5	500	185	1230	145
1400	1415	1465	1545	24 x 11.5	560	204	1020	460
1600	1587	1637	1717	32 x 11.5	630	230	1070	570

① Nominal size, up to size 1250, an extension duct may sometimes be needed in the case of vibration-dampened installation •

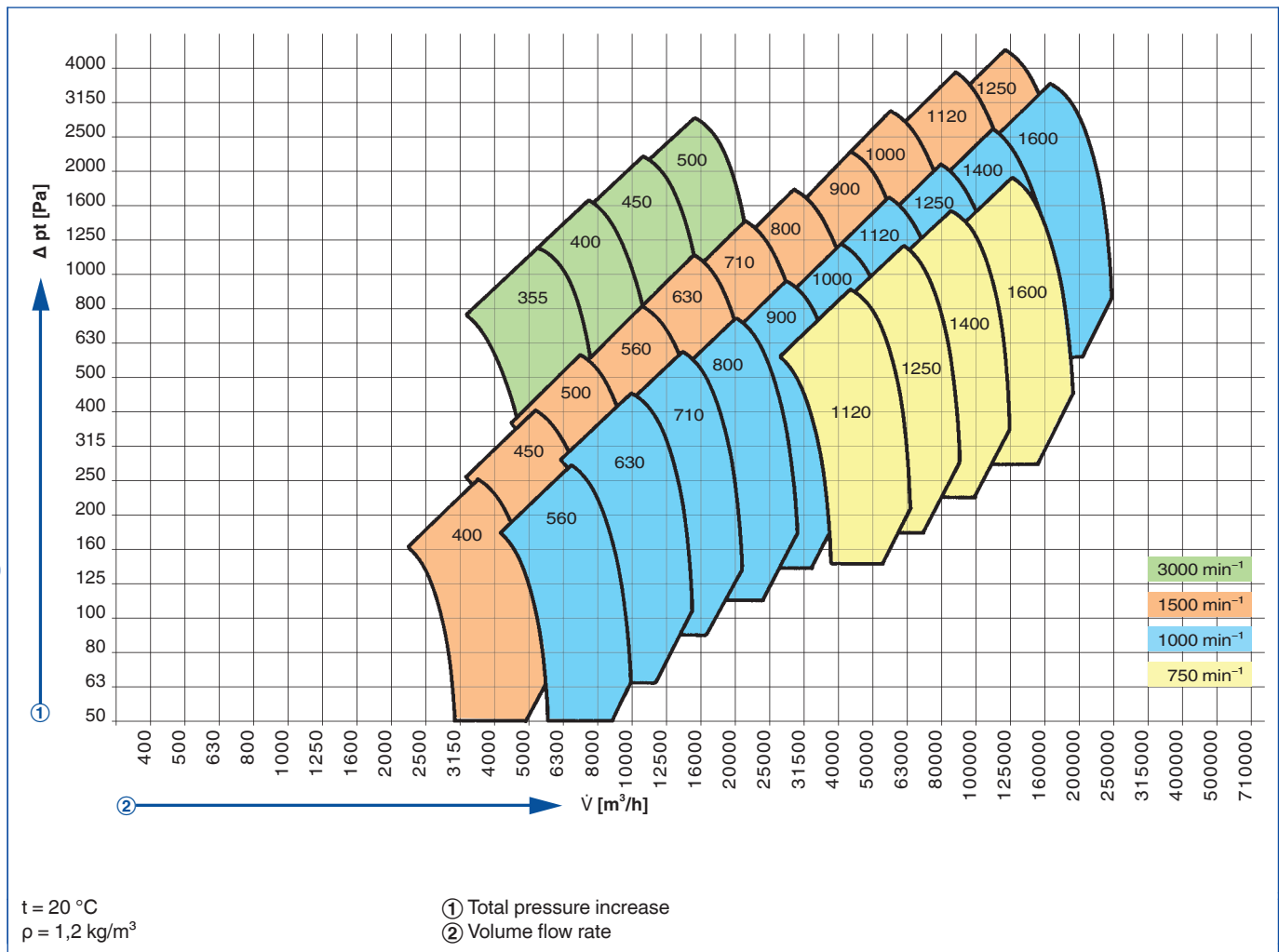
③ Weight without motor (approx.) [kg] •





For conveying smoke gases of temperature classes F200, F300 and F400

BVZAXN 12/56 Performance Range



+ Features

- ▶ For installation in the fire zone without additional cooling.
- ▶ Low-noise operation due to low circumferential speeds and high pressure coefficients.
- ▶ Optimised outlet guide vanes to increase the pressure coefficients.
- ▶ Extensive adjustments to the relevant operating point and subsequent motor rating corrections can be made by steplessly adjusting the impeller blades without any need to disassemble the impeller (the impeller blades cannot be adjusted in the case of the F400 temperature class).
- ▶ The desired operating point is optimised to achieve the best possible efficiency using a variable number of blades (6 / 9 / 12).
- ▶ 15 sizes
- ▶ Impeller's nominal diameter 315 to 1,600 mm
- ▶ Volume flow rate max. 230,000 m³/h
- ▶ Total pressure max. 3,150 Pa
- ▶ Casing available in all RAL colours

Application

- ▶ For installation inside and outside of the fire zone.
- ▶ Suitable for free inlet / outlet or for pipeline installation in a horizontal and vertical style.
- ▶ Dual smoke extract and ventilation function.

- ▶ Based on two fans connected in series, suitable for extracting smoke from underground car parks and extract air (66% redundancy in emergency mode)

◊ Variants

- ▶ Temperature class F200 / F300 / F400

& Accessories

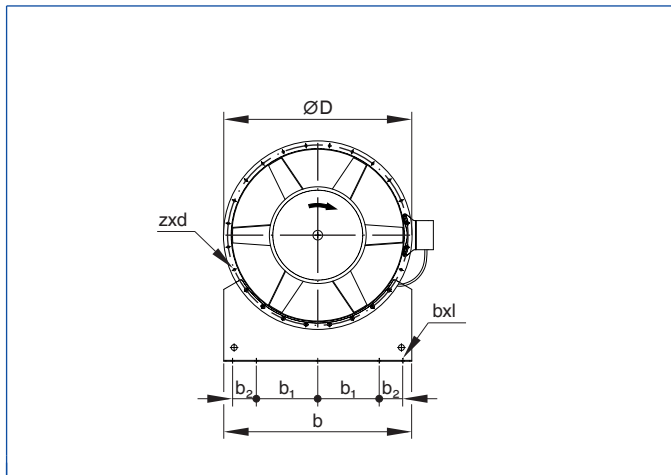
- ▶ Fan diagnosis system VD
- ▶ Volume flow rate measuring unit VME
- ▶ Shock pulse bearing monitoring STI
- ▶ Acoustic and thermal insulation
- ▶ Weather protection roof for acoustic and thermal insulation
- ▶ Round silencers TSR (inlet and outlet side)
- ▶ Round silencers TSR with interior core (inlet and outlet side)
- ▶ Extension duct
- ▶ Inspection hatch
- ▶ Self-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Bellmouth
- ▶ Cover grille (inlet and outlet side)
- ▶ Diffuser
- ▶ Diffuser with interior core
- ▶ Outlet duct with cover grille
- ▶ Mounting feet
- ▶ Brackets (for vertical assembly)
- ▶ Spring anti-vibration mounts

- ▶ Terminal box
- ▶ Local isolator loose (for outside of fire area)
- ▶ Angular wall ring with brackets (inlet and outlet side)
- ▶ Silicone-free type
- ▶ Extract air and smoke extract controller
- ▶ Surface protection powder-coated and/or hot-dip galvanised in corrosion protection category C2 to C5M

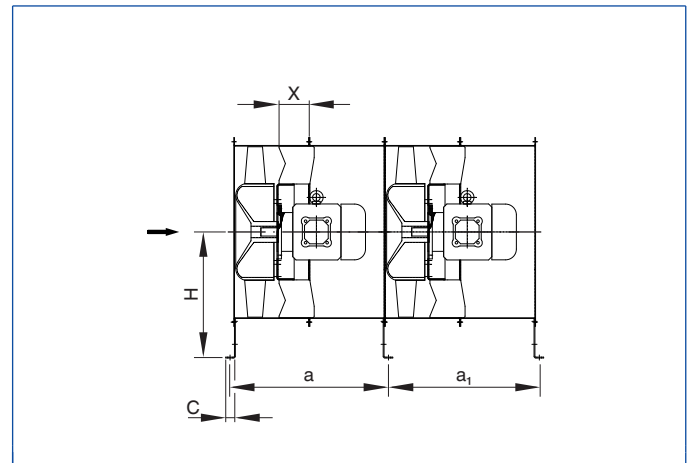
ISO Classification, standards and guidelines

- ▶ For conveying smoke gases of the temperature classes F200, F300 and F400
- ▶ Temperature / time classification as per EN 12101 - Part 3:
- ▶ F200 CE no.: 0761-CPD-0009, incl. declaration of performance (DoP) General building inspectorate licence no. Z-78.11-128
- ▶ F300 CE no.: 0761-CPD-0010, or 0761-CPR-0492 for operation on a frequency inverter in the case of smoke extraction, incl. declaration of performance (DoP) General building inspectorate licence no. Z-78.11-128
- ▶ F400 CE no.: 0761-CPD-0011, or 0761-CPR-0493 for operation on a frequency inverter in the case of smoke extraction, incl. declaration of performance (DoP) General building inspectorate licence no. Z-78.11-128

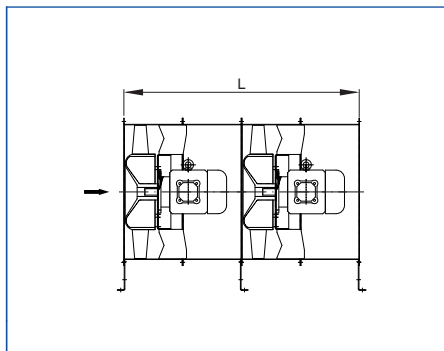
BVZAXN 12/56



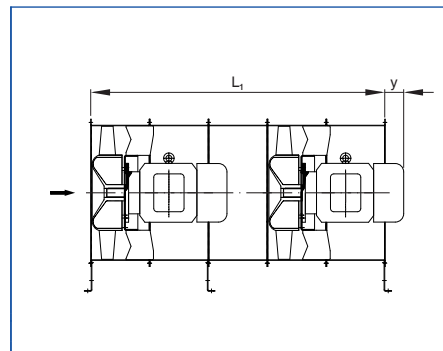
BVZAXN 12/56



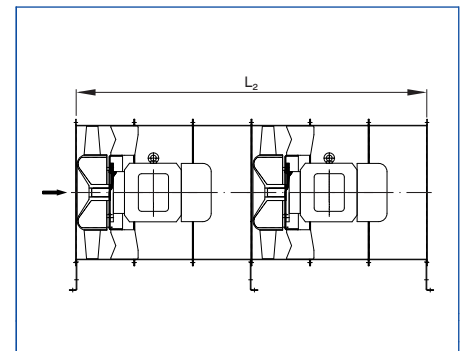
BVZAXN 12/56



BVZAXN 12/56



BVZAXN 12/56



Principal dimensions

①	Ø clear width	Øk	ØD	zxd	H	a	a ₁	C	b	b ₁	b ₂	③ b x l
315	320	356	386	8 x 9.5	240	328	302	35	356	68	80	12 x 20
355	359	395	425	8 x 9.5	270	356	330	35	398	88	80	12 x 20
400	401	438	468	12 x 9.5	300	406	379	37	438	104	80	12 x 20
450	450	487	517	12 x 9.5	335	430	400	37	487	124	80	12 x 20
500	504	541	571	12 x 9.5	375	480	453	37	541	151	80	12 x 20
560	565	605	643	16 x 11.5	420	519	483	45	605	183	80	12 x 20
630	634	674	712	16 x 11.5	470	607	575	45	674	203	100	12 x 20
710	711	751	789	16 x 11.5	525	645	613	45	721	210	110	12 x 20
800	794	837	875	24 x 11.5	585	735	703	45	872	285	110	14 x 22
900	894	934	972	24 x 11.5	655	785	753	45	860	225	160	14 x 22
100	1003	1043	1081	24 x 11.5	730	881	833	57	940	265	160	14 x 22
1120	1124	1174	1214	24 x 11.5	760	951	903	57	1184	380	160	14 x 22
1250	1261	1311	1251	24 x 11.5	855	1051	1003	57	1321	465	160	14 x 22
1400	1415	1465	1545	24 x 11.5	⊗	⊗	⊗	⊗	1475	520	165	14 x 22
1600	1587	1637	1717	32 x 11.5	⊗	⊗	⊗	⊗	1649	615	160	18 x 25

- ① Nominal size •
- ③ Slotted hole width x length •
- ⊗ Upon request

Dimensions dependent on the number of extensions

①	②	L	④	②	L ₁ ²⁾	y	④	②	L ₂ ²⁾	④
315	71	600	20	80	750	12	25	80	900	29
355	80	660	25	90	825	8	30	90	990	35
400	90	752	36	112	940	54	43	112	1128	51
450	90	800	43	112	1000	34	52	112	1200	62
500	112	900	56	132	1125	81	68	132	1350	80
560	112	968	82	132	1210	64	99	132	1452	117
630	132	1144	150	-	-	-	-	-	-	-
710	132	1220	130	160	1525	112	152	160	1830	174
800	132	1400	164	180	1750	104	198	180	2100	232
900	132	1492	220	225	1865	78	264	225	2238	309
100	160	1660	274	225	2075	113	329	225	2490	383
1120	180	1800	380	280	2250	180	425	280	2700	470
1250	200	2000	450	280	2500	115	500	280	3000	550
1400	180	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
1600	225	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗

²⁾ Additional empty ducts are required here, so the a + a₁ dimensions change

- ① Nominal size •
- ② Max. motor size •
- ③ Slotted hole width x length •
- ④ Weight without motors (approx.) [kg] •
- ⊗ Upon request



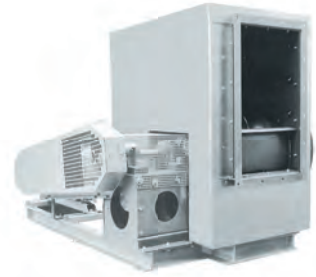
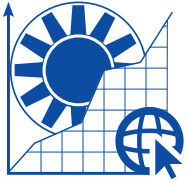
Smoke exhaust centrifugal fans

	Specifications				
	BVREH	BVRA	BVW-B		
Temperature classes					
F 200					
F 300					
F 400	●				
F 600		●	●	●	●
Installation type					
Outdoors	○	○	○	○	
In the building in the fire area					●
In the building outside of the fire area	●	●	●	●	●
Floor-mounted installation	●	●	●	●	●
Motor type					
Single-speed	●	●	●	●	●
Dual-speed	●	●	●	●	●
Suitable for operation on a frequency inverter (not in the case of smoke extraction)	●	●	●	●	●
Suitable for operation on a frequency inverter (in the case of smoke extraction)	○ As of MBG 132	○ As of MBG 132			
Technical type					
Belt drive	●	●	●		
Direct driven				●	●
Casing orientation (RD/LG - 0° - 90° - 180° - 270°)	●	●	●	●	●
Casing orientation (inlet and outlet variable)				○	○
Cooling air intake manifold (arrangement variable)				●	●
Inlet box				○	○
Pipe connection (inlet side)	●	●	●	○	○
Casing split horizontally	● As of NG 710	● As of NG 710	○		
Motor in airflow					
Motor encased - not in airflow					●
Motor cooling with ambient air	●	●	●	●	
Technical data					
Max. volume flow rate	250,000	200,000	140,000 m³/h	50,000	50,000
Max. pressure	4,000	2,750	3,150 Pa	2,100	2,100
Max. drive capacity	110	110	55	20	20
Nominal sizes (mm)	315-1.800	315-1.800	180-1.400	315-710	315-710
Material					
Impeller	Steel	Steel	Steel	Steel	Steel
Casing	Steel	Steel	Steel	Steel	Steel
Accessories					
Fan diagnosis system VD	○	○	○	○	○
Volume flow rate measurement unit VME	○	○		○	○
Shock pulse bearing monitoring STI	○	○	○	○	○
Acoustic and thermal insulation	○	○	○	○	○
Insulation for outdoor installation	○	○	○	○	○
Weather protection for motor (and belt drive)	○	○	○	○	○
Base frame	○	○	○	○	○
Spring anti-vibration mounts	○	○	○	○	○
Rotary speed measurement port in V-belt protective casing	●	●			
Flexible connectors	○	○	○	○	○



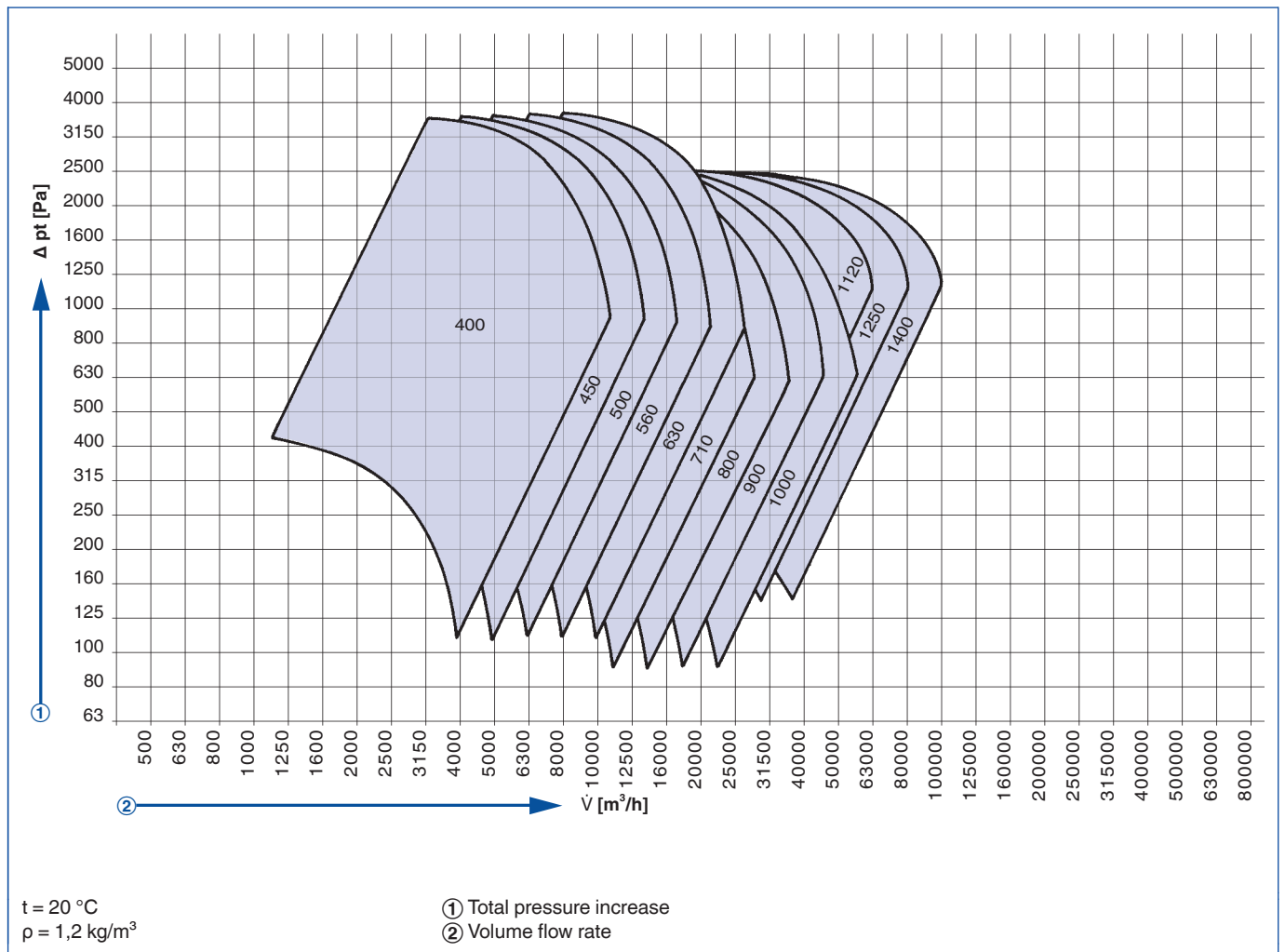
	Specifications				
	BVREH		BVRA	BVW-B	
Matching flange	○	○	○	○	○
Inspection hatch	○	○	○	●	●
Self-powered shut-off damper (rounded or rectangular)	○	○	○	○	○
Cover grille (inlet and outlet side)	○	○	○	○	○
Equipotential bonding	○	○	○	○	○
Outlet duct with cover grille	○ For RD/LG 90° only	○ For RD/LG 90° only	○ For RD/LG 90° only	○	○
Condensation drainage nozzle	○	○	○		
Motor terminal box	●	●	●	●	●
Terminal box	○	○	○	○	○
Local isolator loose (for outside of fire area)	○	○	○	○	○
Surface protection					
Corrosion protection category C2	●	●	●	●	●
Corrosion protection category C3	○	○	○	○	○
Corrosion protection category C4	○	○		○	○
Corrosion protection category C5				○	○
Explanation					
● - Standard					
○ - Optional					





For conveying smoke gases of the temperature class F400

BVREH Performance Range



+ Features

- ▶ Casing in sturdy welded structure, casing's side walls reinforced.
- ▶ High-performance radial impeller made of sheet steel in welded design with backward curved blades.
- ▶ Optimised to save energy with peak efficiency (87%)
- ▶ 12 sizes
- ▶ Impeller's nominal \varnothing 315 to 1,400 mm
- ▶ Volume flow rate V max. 250,000 m³/h
- ▶ Total pressure increase pt max. 4,000 Pa

Application

- ▶ Centrifugal smoke exhaust fan for installation outside of the fire zone in the building or outdoors.
- ▶ Suitable for pipeline installation in a horizontal style.
- ▶ Dual smoke extract and ventilation function.

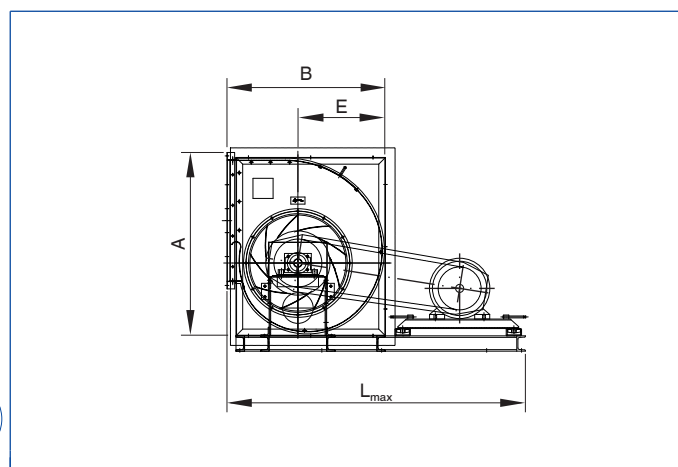
& Accessories

- ▶ Fan diagnosis system VD
- ▶ Shock pulse bearing monitoring STI
- ▶ Acoustic and thermal insulation
- ▶ Insulation for outdoor installation
- ▶ Can be installed outdoors
- ▶ Base frame with motor slide rails
- ▶ Spring anti-vibration mounts
- ▶ V-belt drive
- ▶ V-belt protective casing
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Inspection hatch
- ▶ Condensation drainage nozzle
- ▶ Equipotential bonding
- ▶ Outlet duct with cover grille (for RD/LG 90° only)
- ▶ Local isolator (loose, outside of fire area)

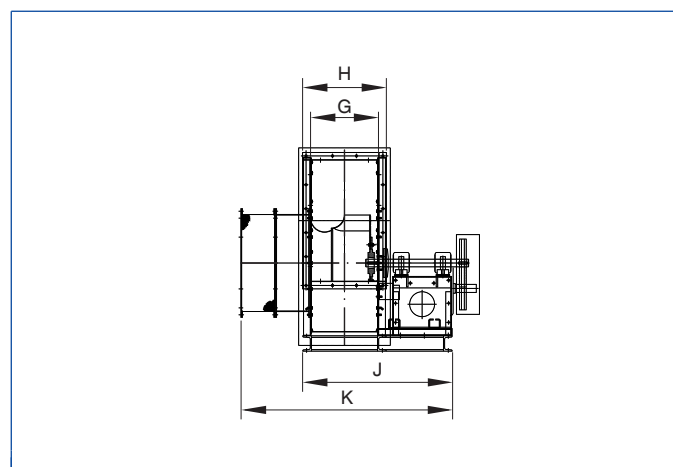
ISO Classification, standards and guidelines

- ▶ Temperature / time category as per EN 12101 - Part 3:
- ▶ F400 CE no.: 0761-CPD-0015 incl. declaration of performance (DoP)
- ▶ General building inspectorate licence no. Z-78.11-132

BVREH



BVREH



Dimensions [mm]

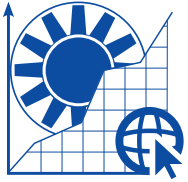
①	A	B	E	G	H	K	L _{max}	J	②	③
400	776	670	369	282	362	970	1600	646	90	45
450	874	755	410	317	397	1005	1650	683	105	50
500	957	827	457	357	437	1102	1850	778	140	55
560	1070	920	509	402	482	1147	1950	821	170	64
630	1211	1026	574	452	532	1227	2050	901	205	80
710	1343	1152	647	899	983	1312	2300	989	325	120
800	1505	1290	727	999	1083	1369	2400	1046	390	180
900	1702	1443	811	1119	1243	1469	300	1156	495	200
1000	1871	1577	894	1249	1373	1645	3200	1337	590	240
1120	2350	2072	1162	802	922	1756	3500	1436	870	300
1250	2625	2320	1297	902	1028	2056	3800	1733	1170	330
1400	2930	2600	1455	1002	1128	2137	4100	1834	1485	384

① Nominal size •

② Weight without motor, base frame and V-belt drive (approx.) [kg] •

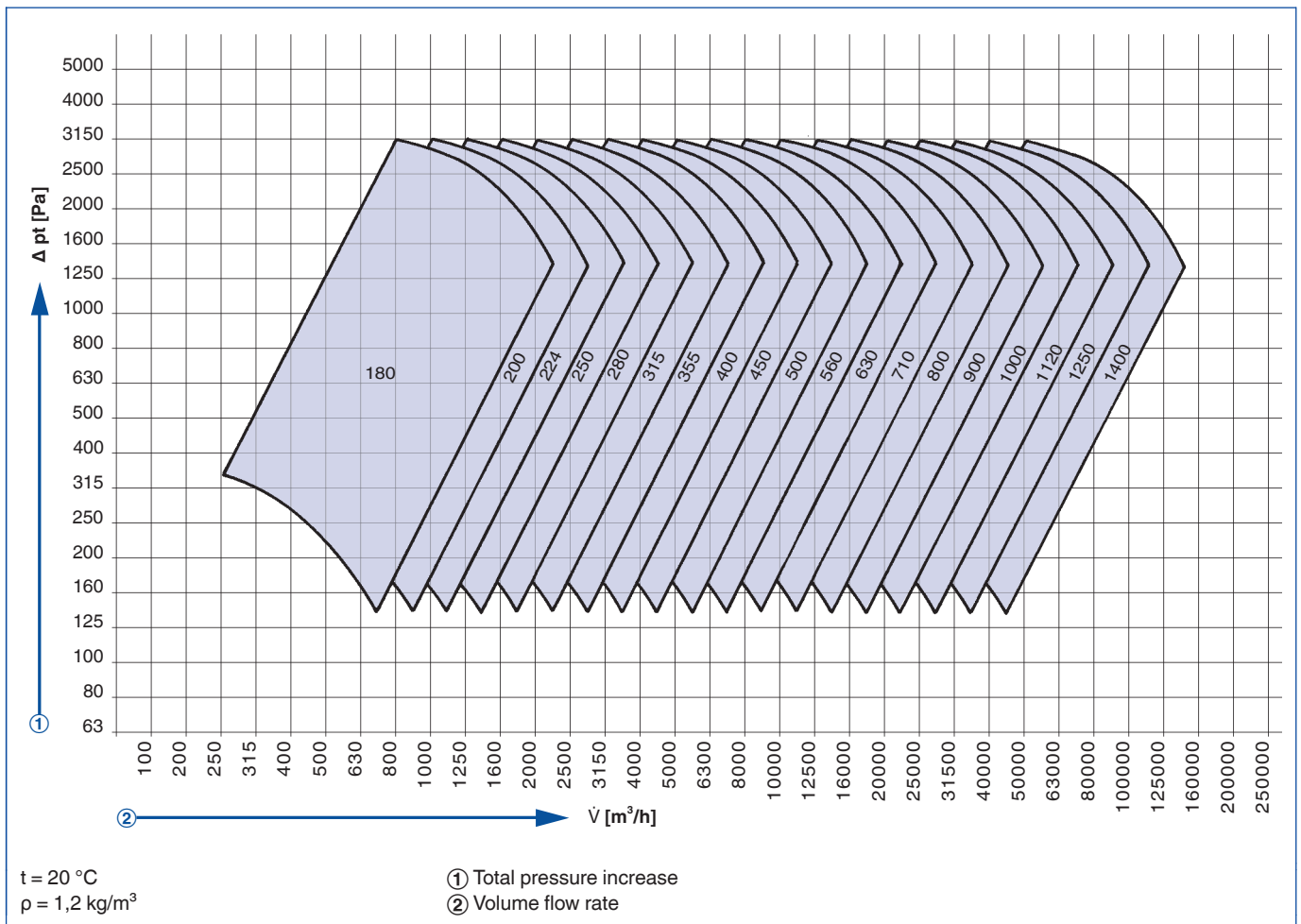
③ Weight of insulation (approx.) [kg]





For conveying smoke gases of the temperature class F600

BVRA Performance Range



+ Features

- ▶ Casing in sturdy welded structure, casing's side walls reinforced
- ▶ Impeller with single inlet, in welded sheet steel design
- ▶ Optimised to save energy for high efficiency levels
- ▶ 19 sizes
- ▶ Impeller's nominal Ø 180 to 1,400 mm
- ▶ Volume flow rate V max. 140,000 m³/h
- ▶ Total pressure increase pt max. 3,150 Pa

& Application

- ▶ Centrifugal smoke exhaust fan for installation outside of the fire zone in the building or outdoors.
- ▶ Suitable for pipeline installation in a horizontal style.
- ▶ Dual smoke extract and ventilation function.

& Accessories

- ▶ Fan diagnosis system VD
- ▶ Shock pulse bearing monitoring STI
- ▶ Acoustic and thermal insulation
- ▶ Hot-dip galvanising for outdoor installation
- ▶ Motor protection roof for outdoor installation
- ▶ Spring anti-vibration mounts
- ▶ Flexible connectors for inlet and outlet

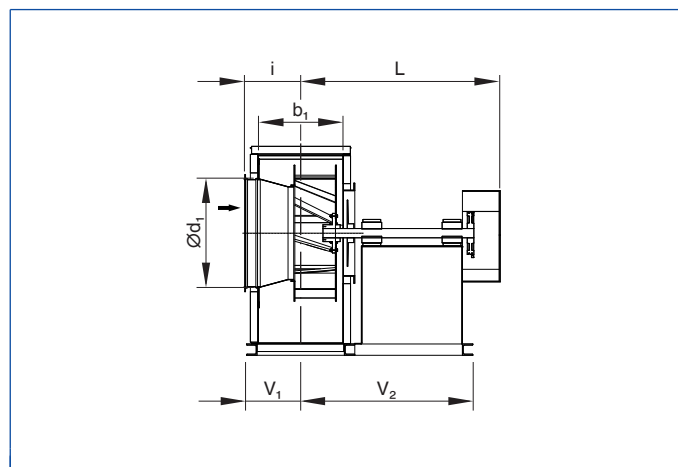
- ▶ Matching flange
- ▶ Matching frame
- ▶ Inspection hatch
- ▶ Condensation drainage nozzle
- ▶ Equipotential bonding
- ▶ Outlet duct with cover grille (for RD/LG 90° only)
- ▶ Local isolator (loose, outside of fire area)

ISO Classification, standards and guidelines

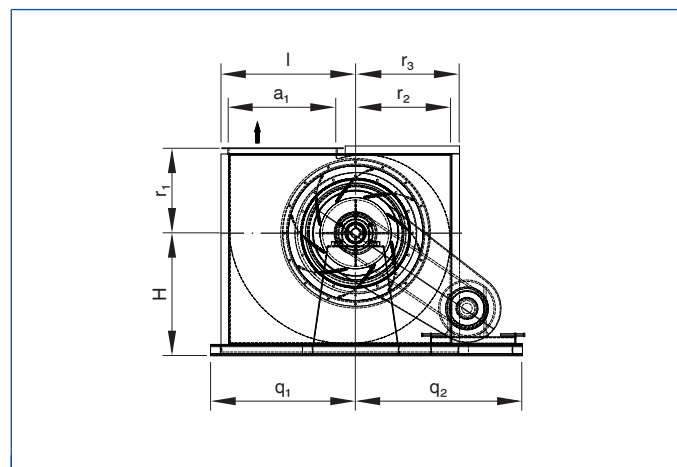
- ▶ Temperature / time classification as per EN 12101 - Part 3:
- ▶ F600 CE no.: 0761-CPD-0037 incl. declaration of performance (DoP)
- ▶ General building inspectorate licence no. Z-78.11-160



BVRA



BVRA

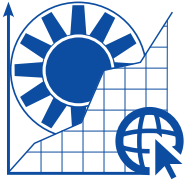


Dimensions [mm]

①	②	a ₁	b ₁	d ₁	r ₁	r ₂	r ₃	l	H 360°	H 90°	v ₁ +v ₂	v ₁	q ₂	q ₁	L	i	③	④
180	90	183	146	183	175	172	212	256	242	220	631	128	605	296	510	173	36	60
200	90	205	164	205	190	190	230	280	260	235	644	137	605	320	520	182	40	65
	100	205	164	205	190	190	230	280	260	235	719	137	605	320	590	182	43	69
224	90	229	183	229	205	210	250	310	285	255	663	452	605	350	530	192	50	80
	112	229	183	229	205	210	250	310	285	255	723	452	605	350	590	192	53	85
250	112	256	205	256	220	230	270	340	310	275	725	463	670	380	595	203	55	90
	132	256	205	256	220	230	270	340	310	275	825	463	670	380	695	203	60	95
280	112	288	229	288	245	268	290	360	330	315	749	175	680	400	620	215	60	100
	132	288	229	288	245	268	290	360	330	315	880	175	720	400	750	215	70	113
315	112	322	256	322	266	284	324	420	380	330	806	188	720	463	660	228	80	130
	132M	322	256	322	266	284	324	420	380	330	890	188	720	463	755	228	110	135
355	112	361	288	361	292	318	258	470	425	370	838	204	720	510	670	244	100	160
	355M	361	288	361	292	318	258	470	425	370	943	204	720	510	755	244	125	170
400	132S	404	322	404	330	360	360	520	480	430	942	221	840	570	760	261	130	205
	160M	404	322	404	330	360	360	520	480	430	1080	221	840	570	890	261	170	218
450	132S	453	361	453	354	396	436	580	520	450	981	241	840	630	780	181	155	245
	160L	453	361	453	354	396	436	580	520	450	1141	241	840	630	940	181	205	270
500	132M	407	404	507	405	450	490	640	590	520	1069	262	880	695	860	312	180	295
	180M	407	404	507	405	450	490	640	590	520	1199	262	880	695	990	312	220	320
560	160M	569	453	569	450	500	540	710	650	570	1198	287	880	765	950	327	250	390
	180L	569	453	569	450	500	540	710	670	590	1300	277	945	755	1050	327	320	430
630	160L	638	507	638	480	550	590	800	720	620	1252	319	1010	855	1000	354	300	470
	200	638	507	638	480	550	590	800	740	640	1427	319	1020	845	1090	354	360	500
710	180M	715	569	715	535	620	660	900	820	710	1339	245	1035	945	1050	385	390	600
	225S	715	569	715	535	620	660	900	840	730	1500	245	1050	950	1330	385	485	640
800	180L	801	638	801	590	690	730	1000	930	795	1443	379	1100	1050	1120	419	460	720
	225M	801	638	801	590	690	730	1000	930	795	1625	379	1100	1050	1430	419	513	750
900	180L	898	715	898	665	780	820	1120	1040	885	1520	418	1150	1170	1170	458	720	1045
	225S	898	715	898	665	780	820	1120	1040	885	1650	418	1150	1170	1300	458	750	1065
	250M	898	715	898	665	780	820	1120	1060	905	1850	423	1150	1170	1500	458	805	1100
1000	225S	1007	801	1007	740	870	910	1240	1160	1000	1681	461	1170	1295	1330	520	850	1240
	250M	1007	801	1007	740	870	910	1240	1160	1000	1861	461	1435	1296	1510	520	900	1260
	280S	1007	801	1007	740	870	910	1240	1180	1020	2050	466	1435	1296	1750	520	1020	1280
1120	250M	1130	898	1130	836	984	1026	1402	1340	1135	1986	519	1340	1465	1530	569	1040	1545
	280M	1130	898	1130	836	984	1026	1402	1340	1135	3115	519	1340	1465	1780	569	1400	1700
1250	280M	1267	1007	1267	930	110	1142	1562	1480	1270	2235	574	1625	1627	1736	624	1300	2060
	315S	1267	1007	1267	930	110	1142	1562	1480	1270	3397	574	1625	1627	1895	624	1865	2150
1400	315	1421	1130	1421	1040	1250	1282	1762	1670	1430	2525	640	1800	1932	2050	685	2400	2550

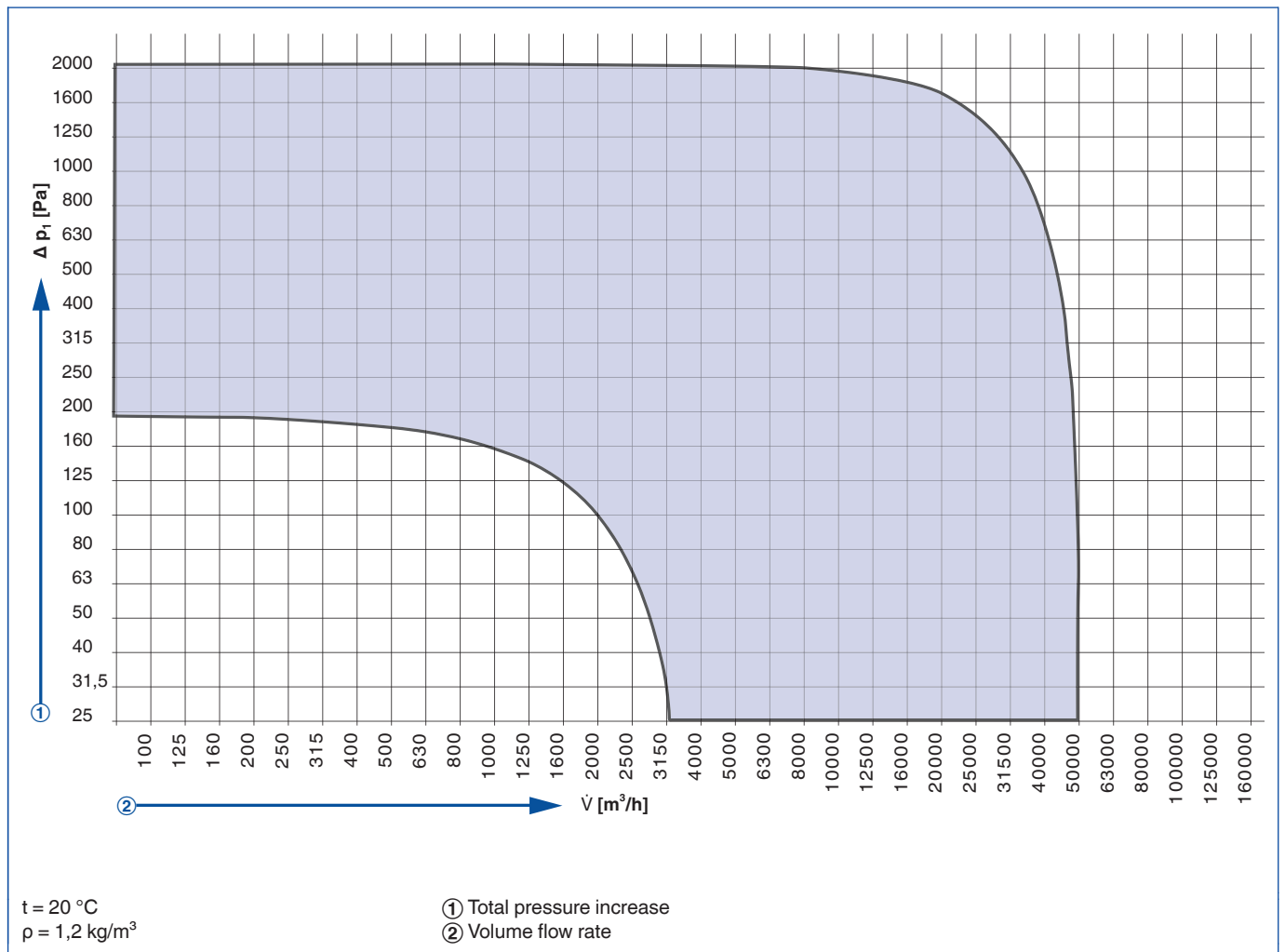
① Nominal size • ② Max motor size • ③ Weight without insulation / without motor (approx.) [kg] • ④ Weight with insulation / with motor (approx.) [kg]





For conveying smoke gases of the temperature class F600

BVW Performance Range



+ Features

- ▶ Casing and impeller made of sheet steel, protected by polyester resin-based powder coating, with bellmouth and motor fastening plate
- ▶ 6 sizes
- ▶ More than 35 types
- ▶ Volume flow rate V max. 50,000 m³/h
- ▶ Total pressure increase p1 max. 2,100 Pa

Application

- ▶ Smoke exhaust fan for floor-mounted installation in or outside of the fire area.
- ▶ Dual smoke extract and ventilation function.

Variants

- ▶ BVW-A/B: floor-mounted installation, outside of the fire area
- ▶ BVW-AI/B: floor-mounted installation - insulated, outside of the fire area
- ▶ BVW-R/B: floor-mounted installation, inside the fire area

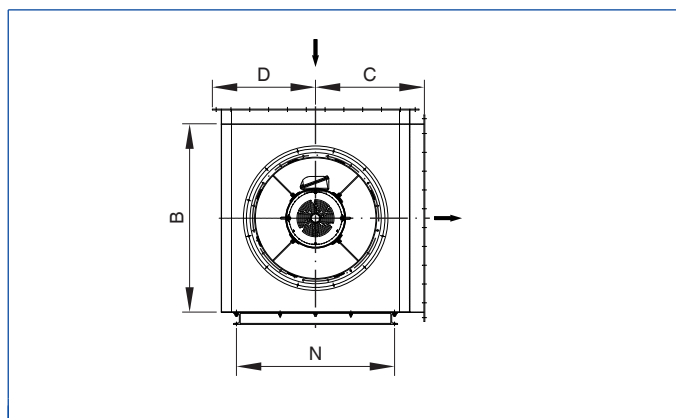
& Accessories

- ▶ Fan diagnosis system VD
- ▶ Shock pulse bearing monitoring STI
- ▶ Acoustic and thermal insulation
- ▶ Base frame
- ▶ Spring anti-vibration mounts
- ▶ Flexible connectors (inlet and outlet)
- ▶ Inlet box
- ▶ Pipeline connection
- ▶ Matching flange

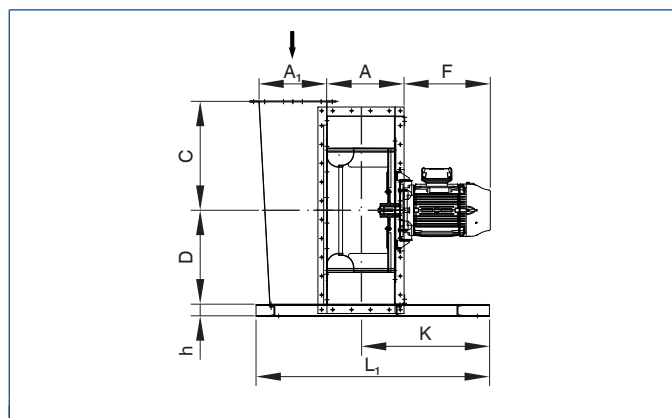
ISO Classification, standards and guidelines

- ▶ Temperature / time classification as per EN 12101 - Part 3
- ▶ F600 CE no.: 0761-CPD-0034 with declaration of performance (DoP)
General building inspectorate licence no. Z-78.-11-127

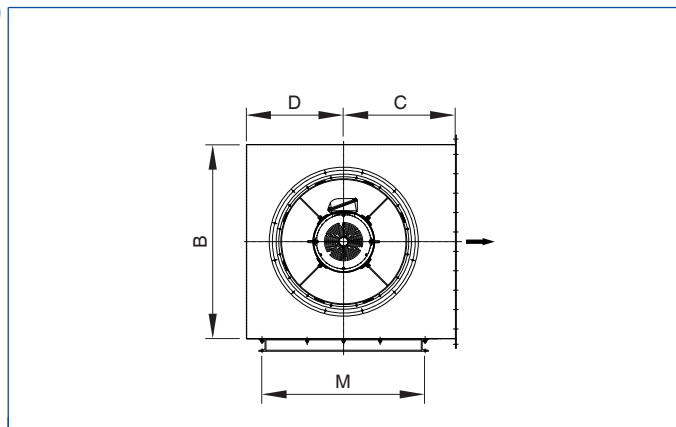
BVW-A_B with inlet box



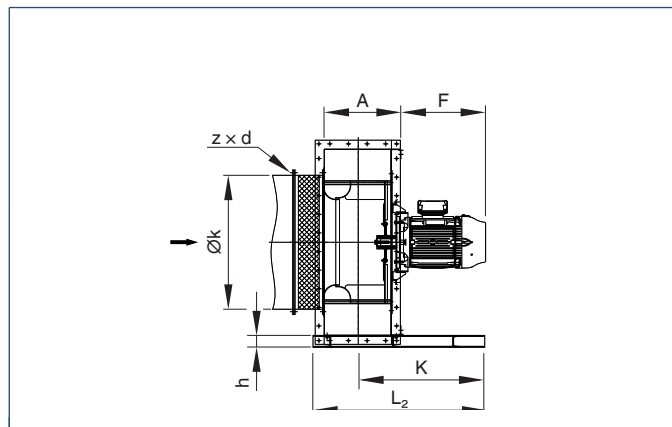
BVW-A_B with inlet box



BVW-A_B for pipe connection



BVW-A_B for pipe connection



Dimensions of the BVW-AB series [mm]

①	A	A ₁	B	C	D	F	h	K	L ₁	L ₂	Øk	zxd
315	295	252	632	415	316	315	65	500	850	850	356	8x10
355	295	252	632	415	356	260	65	500	850	850	395	8x10
400	325	282	802	500	401	315	65	550	950	850	438	12x10
500	401	357	1002	600	501	410	80	650	1150	850	541	12x10
630	516	452	1252	725	626	395 ¹⁾ /600 ²⁾	80	850	1550	1200	674	16x12
710	566	502	1402	800	701	395 ¹⁾ /600 ²⁾	100	900	1650	1400	751	16x12

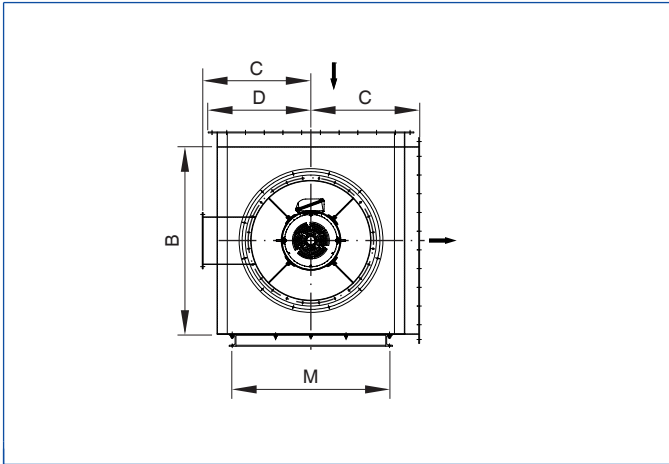
¹⁾ Up to motor size 132

²⁾ As of motor size 160

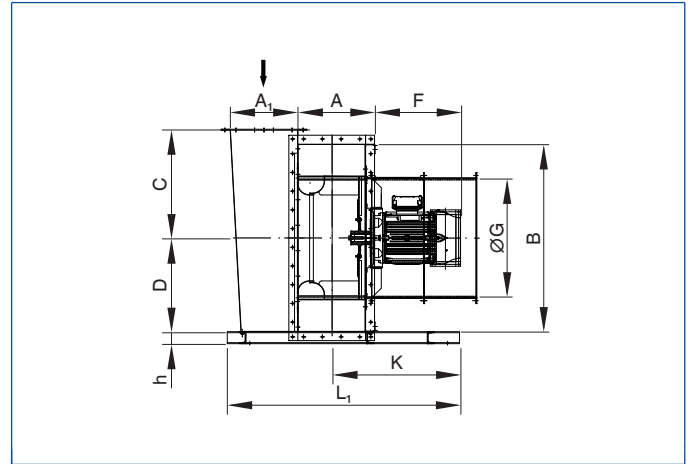
① Nominal size



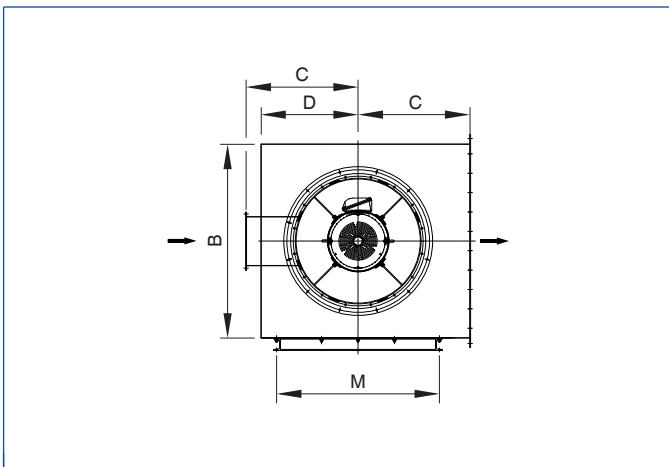
BVW-R_B with inlet box



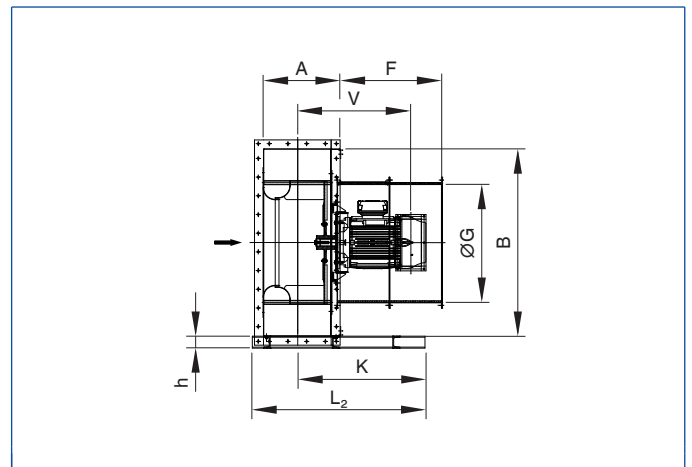
BVW-R_B with inlet box



BVW-R_B free inlet



BVW-R_B free inlet



Dimensions of the BVW-R/B series

①	A	A1	B	C	D	ØG	H	v	h	K	L1	L2	M
315	295	252	632	415	316	400	375	440	65	500	850	850	580
355	295	252	632	415	356	400	375	440	65	500	850	850	580
400	325	282	802	500	401	400	375	440	65	550	950	850	650
500	401	357	1002	600	501	500	450	540	80	650	1150	850	850
630	516	452	1252	725	626	500 ¹⁾ /800 ²⁾	425 ¹⁾ /680 ²⁾	610 ¹⁾ /760 ²⁾	80	850	1550	1200	1050
710	566	502	1402	800	701	500 ¹⁾ /800 ²⁾	425 ¹⁾ /680 ²⁾	610 ¹⁾ /760 ²⁾	100	900	1650	1400	1250

¹⁾ Up to motor size 132

²⁾ As of motor size 160

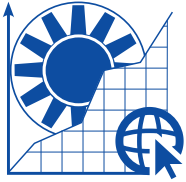
① Nominal size



Smoke exhaust plug fans

	Specifications
	BVERV 23/1.2
Temperature classes	
F 200	
F 300	●
F 400	
F 600	
Installation type	
Outdoors	
In the building, in the fire area	●
In the building outside of the fire area	
Motor type	
Single-speed	●
Dual-speed	●
Suitable for operation on a frequency inverter (not in the case of smoke extraction)	●
Suitable for operation on a frequency inverter (in the case of smoke extraction)	
Technical type	
Motor in the conveying medium	●
Bellmouth	●
Base frame	●
Technical data	
Max. volume flow rate	63,000 m ³ /h
Max. pressure	2,500
Max. drive capacity	75
Nominal sizes (mm)	250-1.120
Material	
Impeller	Steel
Casing	Steel
Accessories	
Fan diagnosis system VD	○
Volume flow rate measuring unit VME	○
Shock pulse bearing monitoring STI	○
Flexible connectors	○
Matching flange	○
Equipotential bonding	○
Cover grille (inlet side)	○
Spring anti-vibration mounts	○
Motor terminal box	●
Guided-out cable	○
Local isolator loose (for outside of fire area)	○
Extract air and smoke extract controller	○
Silicone free	○
Surface protection	
Corrosion protection category C2	●
Corrosion protection category C3	○
Corrosion protection category C4	○
Corrosion protection category C5	○
Explanation	
● - Standard	
○ - Optional	





For conveying smoke gases of the temperature class F300

+ Features

- ▶ Impeller aerodynamically designed for the best free outlet, in welded sheet steel design
- ▶ Substructure with plate, motor bracket and base frame in torsion-free sheet steel design, screwed and welded
- ▶ Bellmouth in pressed sheet steel design, aerodynamically coordinated to the impeller
- ▶ 14 sizes
- ▶ Impeller's nominal \varnothing 250 to 1,120 mm
- ▶ Volume flow rate V max. 63,000 m³/h
- ▶ Stat. differential pressure ps max. 2,500 Pa

Application

- ▶ Smoke exhaust fan without impeller casing for installation in walled; F30 and/or F90 chambers or tested VAC devices.

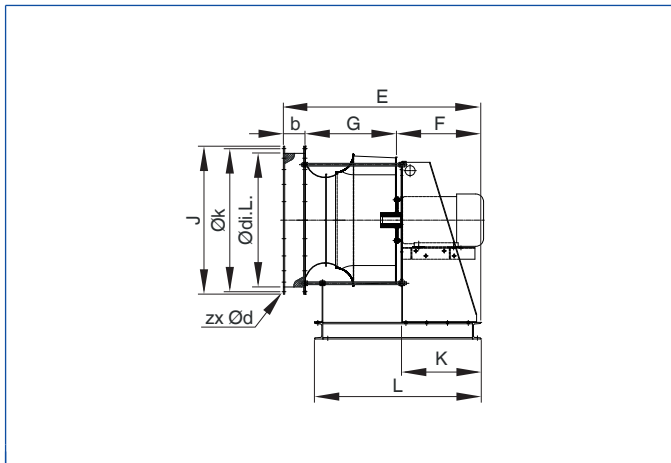
& Accessories

- ▶ Fan diagnosis system VD
- ▶ Volume flow rate measuring unit VME
- ▶ Shock pulse bearing monitoring STI
- ▶ Flexible connectors
- ▶ Equipotential bonding
- ▶ Cover grille (inlet side)
- ▶ Spring anti-vibration mounts
- ▶ Local isolator loose (for outside of fire area)
- ▶ Extract air and smoke extract controller

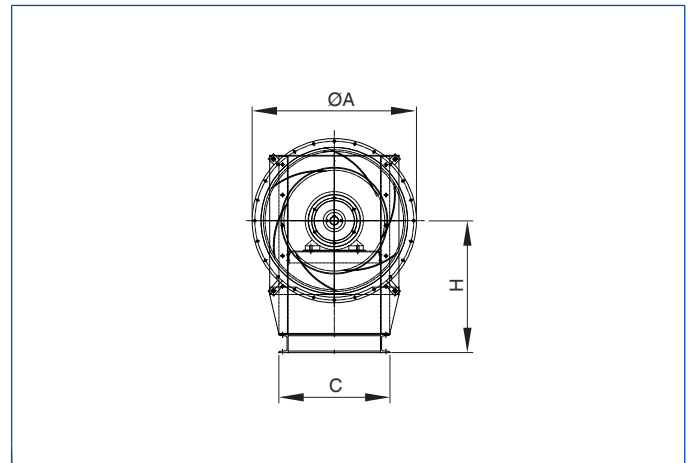
ISO Classification, standards and guidelines

- ▶ Temperature / time classification as per EN 12101 - Part 3:
- ▶ F300 CE no.: 0761-CPD-0014 incl. declaration of performance (DoP)
- ▶ General building inspectorate licence no. Z-78.1-43

BVERV / ERV



BVERV / ERV



Dimensions [mm]

①	Ø A	H	C	Ø clear width	approx. E	F	G	b	approx. J	K	L	Øk	② z x Ød	
250	306	250	290	256	617	258	179	180	403	240	420	286	6	7
280	348	250	290	288	639	260	202	180	426	240	420	322	8	10
315	386	285	350	322	710	310	220	180	478	285	500	356	8	10
355	425	320	350	361	733	310	249	180	533	285	500	395	8	10
400	468	360	435	404	860	410	270	180	594	385	675	438	12	10
450	517	400	435	453	895	410	308	180	650	385	675	487	12	10
500	571	450	435	507	940	415	345	180	736	385	705	541	12	10
560	643	530	480	569	998	430	389	180	852	405	730	605	16	12
630	712	570	480	638	1046	430	436	180	926	405	730	674	16	12
710	814	640	480	714	1186	510	496	180	1047	475	900	775	16	14
800	904	715	600	804	1240	510	550	180	1167	475	1000	861	24	14
900	1004	800	650	904	1478	680	618	180	1302	645	1150	958	24	14
1000	1105	900	650	1005	1545	680	685	180	1453	645	1115	1067	24	14
1120	1125	1000	780	1005	1679	740	734	205	1553	710	1350	1067	27	14

① Nominal size •

② Number of holes z x Ød



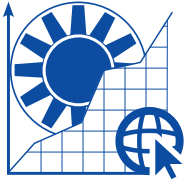
Wall smoke exhaust fans

	Specifications	
	BVW-A	BVW-R
Temperature classes		
F 200		
F 300		
F 400		
F 600	●	●
Installation type		
Outdoors	●	
In the building in the fire area		●
In the building outside of the fire area		●
Motor type		
Single-speed	●	●
Dual-speed	●	●
Suitable for operation on a frequency inverter (not in the case of smoke extraction)	●	●
Suitable for operation on a frequency inverter (in the case of smoke extraction)		
Technical type		
Wall installation	●	●
Adjustable impeller blades up to F300 (at a standstill)		
Casing orientation (inlet and outlet variable)	●	●
Cooling air intake manifold (arrangement variable)	●	●
Wall mounting plate, inside wall		
Outlet box with self-powered damper	○	○
Motor in airflow		
Motor encased - not in airflow		●
Motor cooling with ambient air	●	
Technical data		
Max. volume flow rate	50,000 m ³ /h	50,000 m ³ /h
Max. pressure	2,100 Pa	2,100 Pa
Max. drive capacity	18.5	18.5
Nominal sizes (mm)	315-710	315-710
Material		
Impeller	Steel	Steel
Casing	Steel	Steel
Accessories		
Fan diagnosis system VD	○	○
Volume flow rate measuring unit	○	○
Shock pulse bearing monitoring STI	○	○
Bellmouth with cover grille	○	○
Pipe / duct connection (inlet side)	○	○
Inlet box	○	○
Flexible connectors	○	○
Matching flange	○	○
Equipotential bonding	○	○
Inspection hatch	●	●
Outlet casing with self-powered shut-off damper	○	○
Self-powered shut-off damper rounded / rectangular	○	○
Mounting brackets	○	○
Spring anti-vibration mounts	○	○
Wall transition sleeve (outlet)	○	○



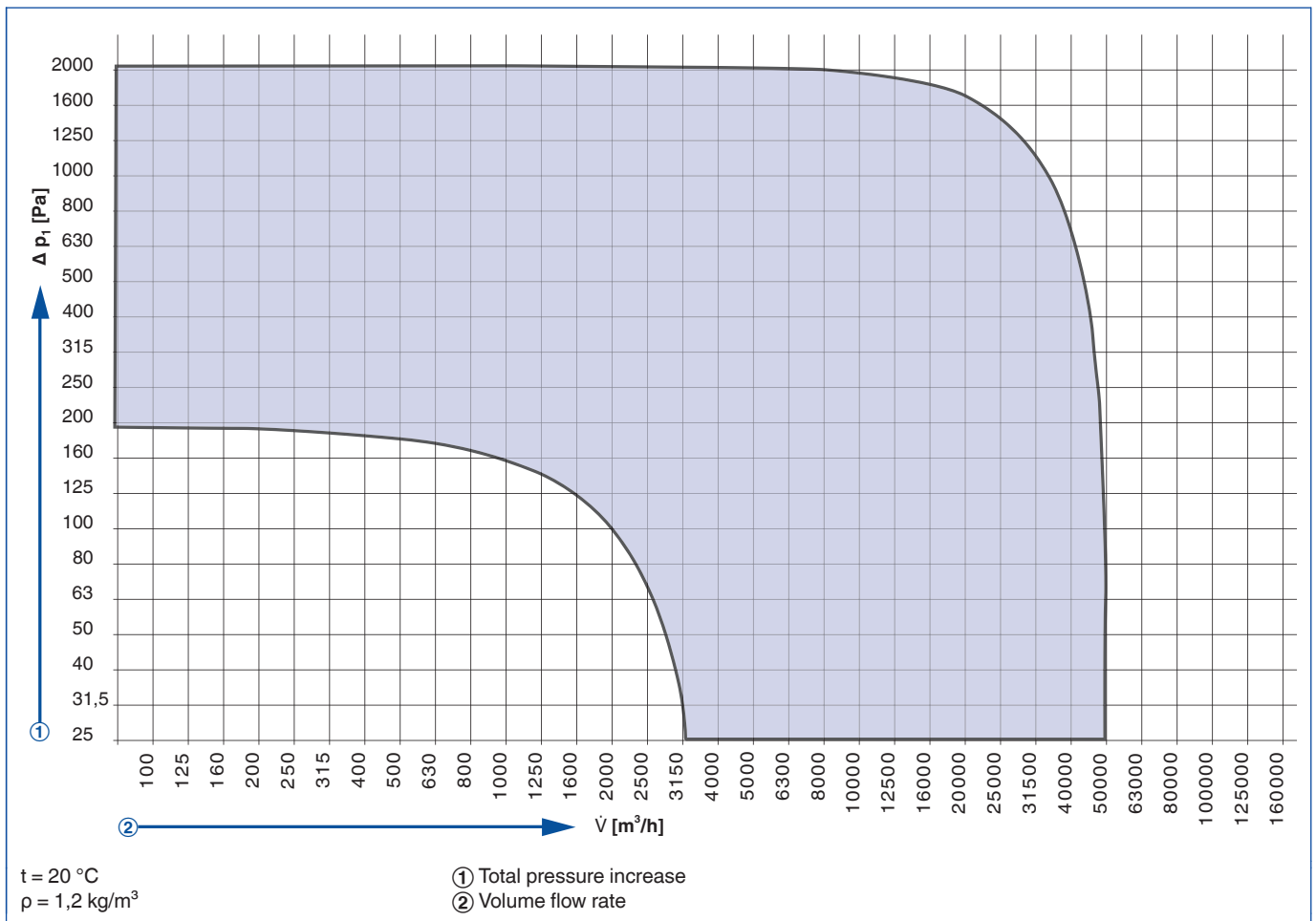
	Specifications	
	BVW-A	BVW-R
Wall transition sleeve (cooling air)	○	○
Motor terminal box	●	●
Terminal box	○	○
Local isolator loose (for outside of fire area)	○	○
Extract air and smoke extract controller	○	○
Surface protection		
Corrosion protection category C2	●	●
Corrosion protection category C3	○	○
Corrosion protection category C4	○	○
Corrosion protection category C5	○	○
Explanation		
● - Standard		
○ - Optional		





For conveying smoke gases of the temperature class F600

BVW Performance Range



+ Features

- ▶ Casing and impeller made of sheet steel, protected by polyester resin-based powder coating, with bellmouth and motor fastening plate
- ▶ 6 sizes
- ▶ More than 35 types
- ▶ Volume flow rate V max. 50,000 m³/h
- ▶ Total pressure increase p1 max. 2,100 Pa

X Application

- ▶ Smoke exhaust fan for wall mounting in or outside of the fire area
- ▶ BVW-A series suitable for outdoor installation
- ▶ Dual smoke extract and ventilation function

◇ Variants

- ▶ BVW-A: wall mounting, outside of the building
- ▶ BVW-AI: wall mounting - insulated, outside of the fire area
- ▶ BVW-R: inside the fire area

& Accessories

- ▶ Fan diagnosis system VD
- ▶ Shock pulse bearing monitoring STI
- ▶ Acoustic and thermal insulation
- ▶ Wall fixing
- ▶ Spring anti-vibration mounts
- ▶ Flexible connectors (inlet and outlet)
- ▶ Wall transition sleeves
- ▶ Inlet box
- ▶ Pipeline connection

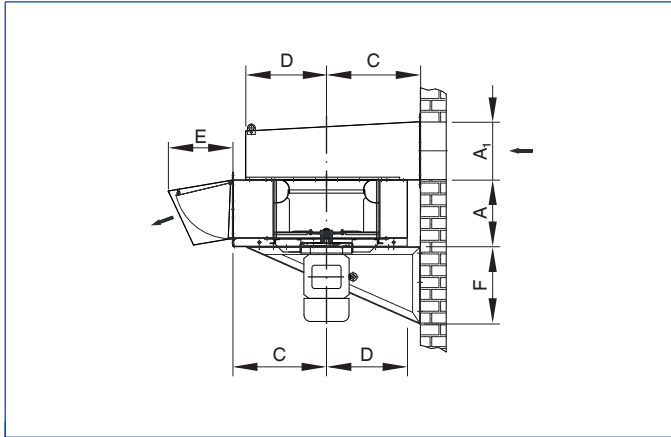
- ▶ Matching flange
- ▶ Matching frame
- ▶ Self-powered shut-off damper (for duct connection)
- ▶ Cover grille (inlet and outlet side)
- ▶ Equipotential bonding
- ▶ Outlet duct with cover grille
- ▶ Local isolator loose (for outside of fire area)

ISO Classification, standards and guidelines

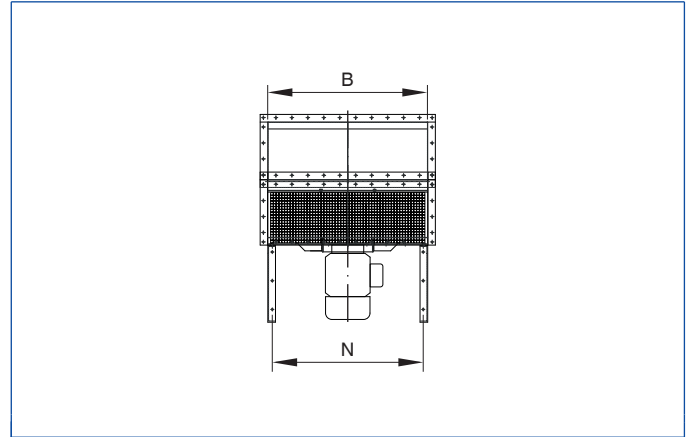
- ▶ Temperature / time classification as per EN 12101 - Part 3
- ▶ F600 CE no.: 0761-CPR-0008 with declaration of performance (DoP); general building inspectorate licence no. Z-78.-11-127
- ▶ F600 CE no.: 0761-CPR-0008 with declaration of performance (DoP); general building inspectorate licence no. Z-78.-11-127



BVW-A



BVW-A



BVW-A, dimensions [mm]

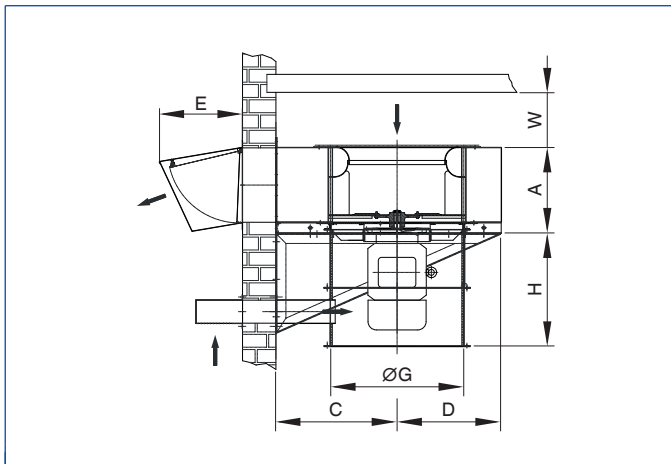
①	A	A ₁	B	C	D	E	F	N	ØG	H	v	W	a	b
315	295	252	632	415	316	300	315	588	400	375	440	225	252	632
355	295	252	712	455	356	300	260	668	400	375	440	250	252	712
400	325	282	802	500	401	330	315	742	400	375	440	300	282	802
500	401	357	1002	600	501	400	410	932	500	450	540	375	357	1002
630	516	452	1252	725	626	500	395 ¹⁾ /600	1182	500 ¹⁾ /800 ²⁾	425 ¹⁾ /680 ²⁾	610 ¹⁾ /760 ²⁾	475	452	1252
710	566	502	1402	800	701	560	395 ¹⁾ /600 ²⁾	1332	500 ¹⁾ /800 ²⁾	425 ¹⁾ /680 ²⁾	610 ¹⁾ /760 ²⁾	525	502	1402

¹⁾ Up to motor size 132

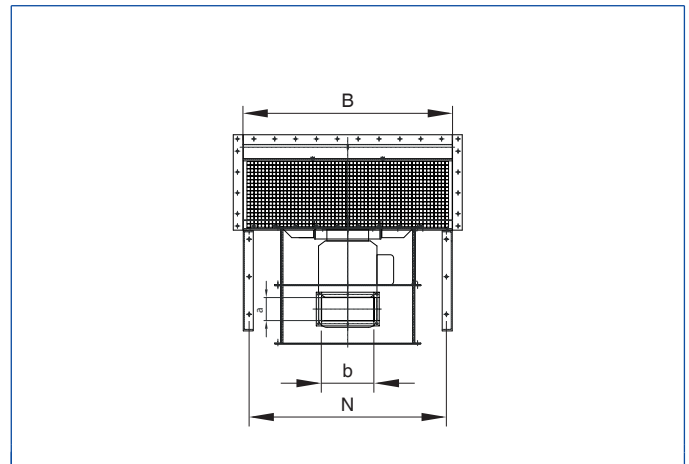
²⁾ As of motor size 160

① Nominal size

BVW-R



BVW-R



BVW-R, dimensions [mm]

①	A	B	C	D	E	F	N	ØG	H	v	W	a	b
315	295	632	415	316	300	315	588	400	375	440	225	252	632
355	295	712	455	356	300	260	668	400	375	440	250	252	712
400	325	802	500	401	330	315	742	400	375	440	300	282	802
500	401	1002	600	501	400	410	932	500	450	540	375	357	1002
630	516	1252	725	626	500	395 ¹⁾ /600	1182	500 ¹⁾ /800 ²⁾	425 ¹⁾ /680 ²⁾	610 ¹⁾ /760 ²⁾	475	452	1252
710	566	1402	800	701	560	395 ¹⁾ /600 ²⁾	1332	500 ¹⁾ /800 ²⁾	425 ¹⁾ /680 ²⁾	610 ¹⁾ /760 ²⁾	525	502	1402

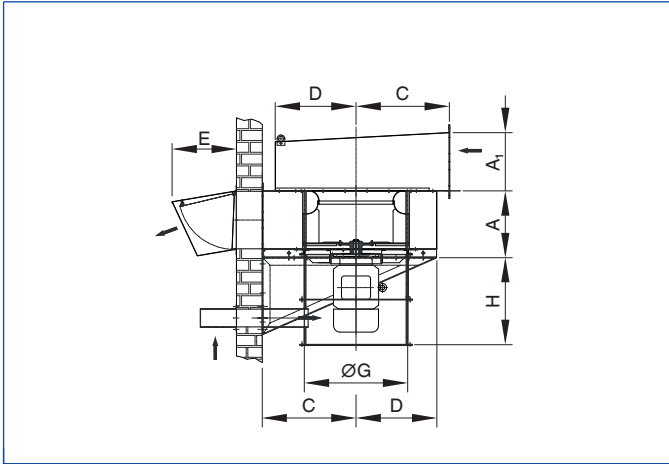
¹⁾ Up to motor size 132

²⁾ As of motor size 160

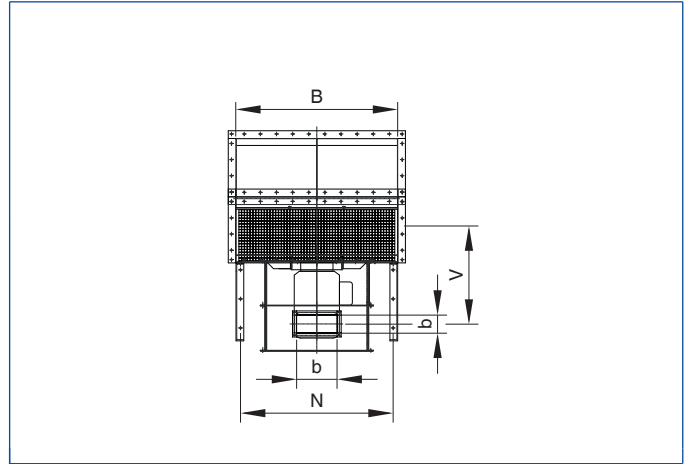
① Nominal size



BVW-R with inlet box



BVW-R with inlet box



BVW-R with inlet box, dimensions [mm]

①	A	A ₁	B	C	D	E	F	N	ØG	H	v	w	a	b
315	295	252	632	415	316	300	315	588	400	375	440	225	252	632
355	295	252	712	455	356	300	260	668	400	375	440	250	252	712
400	325	282	802	500	401	330	315	742	400	375	440	300	282	802
500	401	357	1002	600	501	400	410	932	500	450	540	375	357	1002
630	516	452	1252	725	626	500	395 ¹⁾ /600	1182	500 ¹⁾ /800 ²⁾	425 ¹⁾ /680 ²⁾	610 ¹⁾ /760 ²⁾	475	452	1252
710	566	502	1402	800	701	560	395 ¹⁾ /600 ²⁾	1332	500 ¹⁾ /800 ²⁾	425 ¹⁾ /680 ²⁾	610 ¹⁾ /760 ²⁾	525	502	1402

¹⁾ Up to motor size 132

²⁾ As of motor size 160

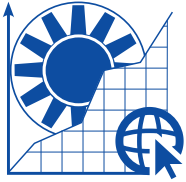
① Nominal size



Smoke exhaust jet fans

	Specifications							
	BV GAXO-C			BV GAXN		BV GAXR-C		
	6/315	6/400	10/400	12/315	9/400	5/315	5/400	10/400
Direction of airflow	①	①	①	①	①	②	②	②
Temperature classes								
F 200								
F 300	●	●		●	●	●	●	
F 400	●		●	●	●			●
F 600								
Installation type								
Outdoors								
In the building, in the fire area	●	●	●	●	●	●	●	●
In the building, outside of the fire area								
Motor type								
Single-speed	●	●	●	●	●	●	●	●
Dual-speed	●	●	●	●	●	●	●	●
Suitable for operation on a frequency inverter (in ventilation mode)	○	○	○	○	○	○	○	○
Technical type								
Outlet guide vanes				●	●			
Motor in airflow	●	●	●	●	●	●	●	●
Reversing mode						●	●	●
Technical data								
Thrust (principal direction mode) [N]	21 / 5	56 / 14	52 / 12	31 / 7	73 / 18	18 / 5	47 / 12	52 / 12
Thrust (reversing mode) [N]						16 / 4	42 / 10	40 / 10
Max. drive capacity (kW)	0.5 / 0.1	1.3 / 0.26	1.5 / 0.37	1.1 / 0.26	2.2 / 0.48	0.75 / 0.18	1.5 / 0.37	1.5 / 0.37
Nominal sizes (mm)	315	400	400	315	400	315	400	400
Material								
Impeller	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Steel
Casing	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel
Accessories								
Terminal box	●	●	●	●	●	●	●	●
Local isolator loose (max. ambient temperature)	○				○	○	○	○
Local isolator attached								
Surface protection								
Corrosion protection category C2	●	●	●	●	●	●	●	●
Corrosion protection category C3	○	○	○	○	○	○	○	○
Corrosion protection category C4	○	○	○	○	○	○	○	○
Corrosion protection category C5								
● - Standard								
○ - Optional								
① - Unidirectional								
② - Reversible								





For conveying smoke gases of temperature classes F300 and F400

+ Features

- ▶ Ceiling suspension
- ▶ Compact, space-saving, flat style

Axial-type jet fans:

- ▶ Max. thrust up to 73 N,
- ▶ With or without outlet guide vanes (coordinated to the application)
- ▶ Unidirectional as series: GAXO-C or GAXN
- ▶ Reversible as series: BVGAXR / BVGAXR-C
- ▶ Nominal sizes: 315, 400
- ▶ Impeller made of cast aluminium, directly on the motor shaft
- ▶ Motor arranged in the flow
- ▶ Terminal box assembled outside on the casing
- ▶ Sound attenuator on the inlet and outlet side
- ▶ Edged, oval design
- ▶ Cover grille on the inlet and outlet side
- ▶ Baffle plate on the outlet side

Centrifugal-type jet fans:

- ▶ Max. thrust up to 97 N,
- ▶ nominal sizes 50 / 75 / 100
- ▶ Unidirectional

Application

- ▶ Installation inside the fire zone
- ▶ Ceiling suspension
- ▶ In the unidirectional and reversible type

Variants

- ▶ Temperature classes F300 and F400
- ▶ Unidirectional as axial fan series: BVGAXO-C / BVGAXN
- ▶ Reversible as axial fan series: BVGAXR / BVGAXR-C
- ▶ Unidirectional as centrifugal fan series: GREH

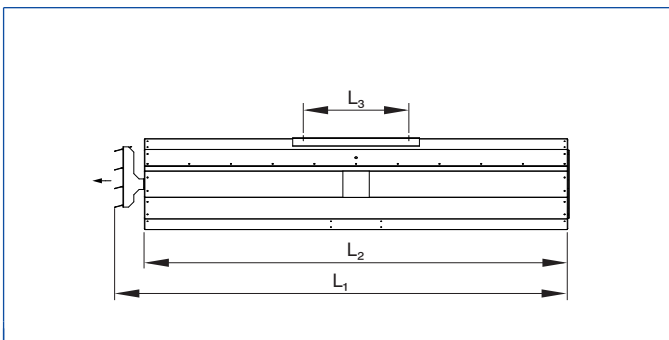
& Accessories

- ▶ Possible in all RAL colours
- ▶ Corrosion protection category C3 to C4M
- ▶ Fan diagnosis system VD
- ▶ Shock pulse bearing monitoring STI
- ▶ Underground car park controller
- ▶ CO alarm system
- ▶ Local isolator loose

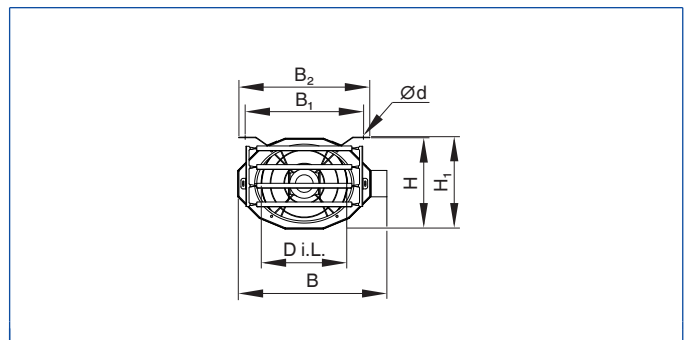
ISO Classification, standards and guidelines

- ▶ BVGAXO - F300: CE no.: 0761-CPD-0067
- ▶ BVGAXN - F300: CE no.: 0761-CPD-0070
- ▶ BVGAX-C - F300: CE no.: 0761-CPD-0239
- ▶ BVGAX-C - F400: CE no.: 0761-CPR-0429
- ▶ BVGAXR - F300: CE no.: 0761-CPD-0068
- ▶ BVGREH - F300: CE no.: 0370-CPR-2353
- ▶ Incl. application approval (DoP)

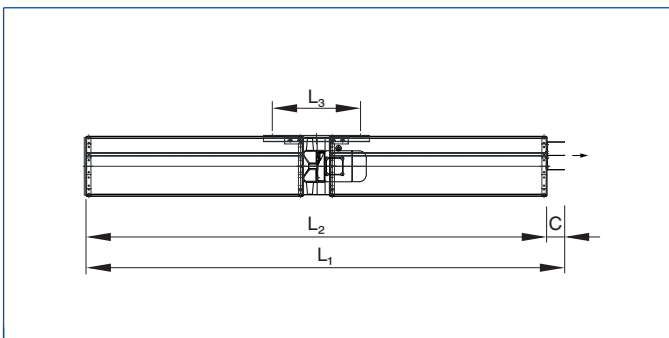
BVGAXO-C



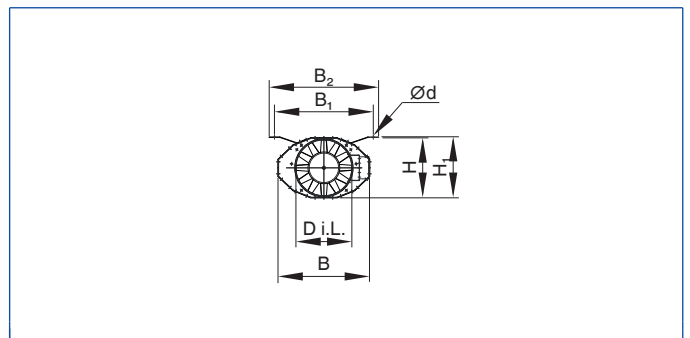
BVGAXO-C



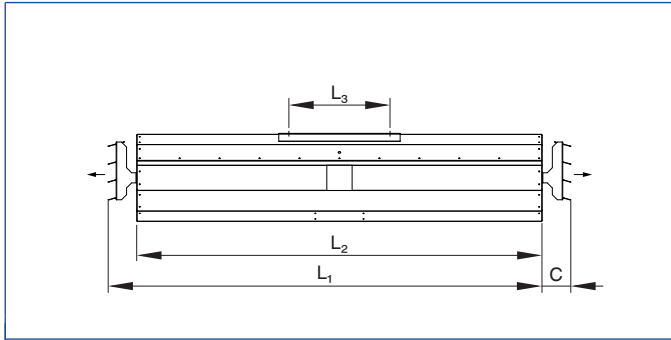
BVGAXN



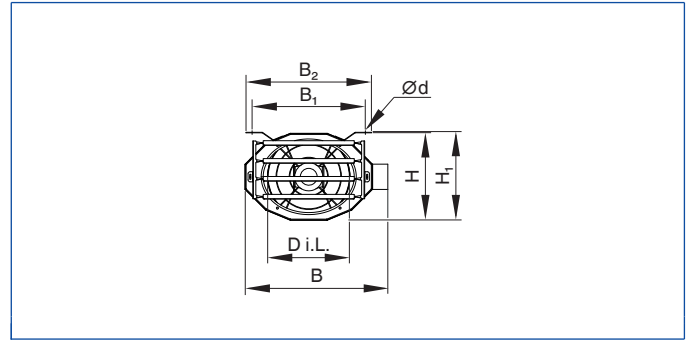
BVGAXN



BVGAXR-C



BVGAXR-C



BVGAXO-C, dimensions [mm]

①	L_1	L_2	L_3	\varnothing clear width	B	B_1	B_2	H	H_1	$\varnothing d$	②
315	2111	2005	500	320	596	560	620	340	345	12	95
400	2153	2005	500	401	706	560	620	430	430	12	100

① Nominal size • ② Weight (approx.) [kg]

BVGAXN, dimensions [mm]

①	L_1	L_2	L_3	\varnothing clear width	B	B_1	B_2	H	H_1	$\varnothing d$	②
315	2710	2610	500	320	520	560	620	340	345	12	95
400	2774	2648	500	401	630	560	620	430	435	12	100

① Nominal size • ② Weight (approx.) [kg]

BVGAXR-C, dimensions [mm]

①	L_1	L_2	L_3	\varnothing clear width	B	B_1	B_2	H	H_1	$\varnothing d$	c	②
315	2217	2005	500	320	569	560	620	340	345	12	106	95
400	2288	2005	500	401	706	560	620	430	435	12	142	100

① Nominal size • ② Weight (approx.) [kg]



Roof ventilation fans

	Specifications				
	DRH-Minivent	DRH	DRV-Minivent	DRV	DRV-EC
Flow current temperature					
Max. 50°C	●		●		
Max. 60°C		●		●	●
Max. 70°C			○		
Max. 80°C					
Max. 120°C					
Motor type					
Single-speed	●	●	●	●	
Dual-speed	●	●	●	●	
Can be regulated using a transformer	●	●	●	●	
Suitable for operation on a frequency inverter					
EC technology					●
Technical type					
Roof cowl DAX - soundproof and thermally insulated type with motor-powered shut-off damper					
Outlet guide vanes					
Adjustable impeller blades (at a standstill)					
Explosion Protection Directive 94/9/EC - "2014/34/EU" as of 01/2016					
Constant pressure / volume flow rate regulation					●
Motor protection	●	●	●	●	●
Air outlet - horizontal	●	●			
Air outlet - vertical			●	●	●
Motor in airflow	●	●	●	●	●
Motor encased - arranged outside of the airflow					
Motor encased - fresh air supply through cooling duct on the fan side					
Bellmouth in the base plate	●	●	●	●	●
Snow load class SL 1000					
Assembly on a flat or pitched roof	●	●	●	●	●
Technical data					
Max. volume flow rate (m ³ /h)	1,100	35,000	1,000	32,000	3,700
Max. pressure (Pa)	425	800	400	800	450
Max. drive capacity (kW)	0.115	5	0.115	5	
Nominal sizes (mm)	180-224	250-710	180-224	250-710	180-500
Material					
Impeller	Steel	Steel	Steel	Steel	Plastic / aluminium
Casing	Aluminium / steel	Aluminium / steel	Aluminium / steel	Aluminium / steel	Aluminium / steel
Accessories					
Volume flow rate measuring unit VME	○	○	○	○	○
Steel roof base for smooth roofs	○	○	○	○	○
Sound attenuating base	○	○	○	○	○
Silencing cover SDH (horizontal)	○	○			
Silencing cover SDV (vertical)			○	○	
Silencing cover SDV (vertical) with separate ventilation					
Outlet silencer SDI					
Air intake pipe					
Sleeve with tensioning strap					
Self-powered shut-off damper	○	○	○	○	○
Motor-powered shut-off damper	○	○	○	○	○
Flexible connectors	○	○	○	○	○



	Specifications				
	DRH-Minivent	DRH	DRV-Minivent	DRV	DRV-EC
Matching flange	○	○	○	○	○
Equipotential bonding	○	○	○	○	○
Cover grille (inlet and outlet side)	○	○	○	○	○
Terminal box					○
Local isolator loose					
Local isolator attached (terminal box not required)	○	○	○	○	○
Insulated base plate	○	○	○	○	○
Tilting frame for foldable type	○	○	○	○	○
Deflector hood SL 1000					
Frequency inverter					
Silicone-free type					○
Surface protection					
C3	●	●	●	●	●
C4					
C5	○	○	○	○	○
Explanation					
● - Standard					
○ - Optional					



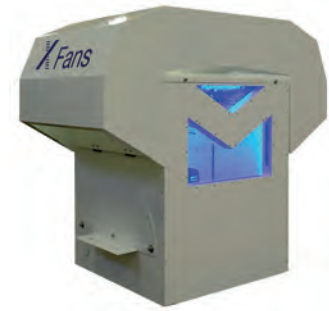
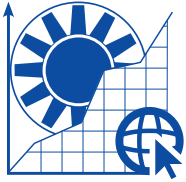
Roof ventilation fans

	Specifications				
	DRVF	DRVF-H	DRVF-K	DAXO	DAXN
Flow current temperature					
Max. 50°C					
Max. 60°C	●			●	●
Max. 70°C			●		
Max. 80°C				○	○
Max. 120°C		●			
Motor type					
Single-speed	●	●	●	●	●
Dual-speed	●	●	●	●	●
Can be regulated using a transformer					
Suitable for operation on a frequency inverter (not in the case of smoke extraction)	●	●	●	●	●
EC technology					
Technical type					
Roof cowl DAX - soundproof and thermally insulated type with motor-powered shut-off damper				●	●
Outlet guide vanes					●
Adjustable impeller blades (at a standstill)					●
Explosion Protection Directive 94/9/EC - "2014/34/EU" as of 01/2016	○	○	○		
Constant pressure / volume flow rate regulation					
Motor protection	○	○	○	○	○
Air outlet - horizontal					
Air outlet - vertical	●	●	●	●	●
Motor in airflow				●	●
Motor encased - arranged outside of the airflow	●				
Motor encased - fresh air supply through cooling duct on the fan side		●	●		
Bellmouth in the base plate	●	●	●	● In the case of "free inlet"	● In the case of "free inlet"
Snow load class SL 1000	○	○		●	●
Assembly on a flat or pitched roof	●	●	●	● Up to 25°	● Up to 25°
Technical data					
Max. volume flow rate (m ³ /h)	54,360	54,300	30,000	120,000	130,000
Max. pressure (Pa)	2,300	2,300	700	800	2,000
Max. drive capacity (kW)	30	30	7.5	45	75
Nominal sizes (mm)	180-500	250-710	160-710	315-1120	315-1120
Material					
Impeller	Steel	Steel	Plastic	Plastic / aluminium	Aluminium
Casing	Aluminium / steel	Aluminium / steel	Plastic	Aluminium / steel	Aluminium / steel
Accessories					
Volume flow rate measuring unit VME	○	○			○
Steel roof base for smooth roofs	○	○	○		
Sound attenuating base	○	○	○		
Silencing cover SDH (horizontal)					
Silencing cover SDV (vertical)	○				



	Specifications				
	DRVF	DRVF-H	DRVF-K	DAXO	DAXN
Silencing cover SDV (vertical) with separate ventilation		○			
Outlet silencer SDI		○			
Air intake pipe			○		
Sleeve with tensioning strap			○		
Self-powered shut-off damper	○	○	○		
Motor-powered shut-off damper	○	○			
Flexible connectors	○	○		○	○
Matching flange	○	○		○	○
Equipotential bonding	○	○		○	○
Cover grille (inlet and outlet side)	○	○	○	○ Inlet side	○ Inlet side
Terminal box	○ In the case of "Ex requirement" too	○ In the case of "Ex requirement" too	○	○	○
Local isolator				○	○
Local isolator attached (terminal box not required)	○ In the case of "Ex requirement" too	○ In the case of "Ex requirement" too	○		
Insulated base plate	○	○			
Tilting frame for foldable type	○	○		○	○
Deflector hood SL 1000	○	○			
Frequency inverter	○	○	○	○	○
Silicone-free type	○	○	○	○	○
Surface protection					
C3	●	●			
C4					
C5	○	○	●	●	●
Explanation					
● - Standard					
○ - Optional					





For building ventilation

+ Features

- ▶ Meets all legal framework conditions set down in the German Energy Saving Ordinance
- ▶ Casing in corrosion protection category C5M as standard
- ▶ Casing available in all RAL colours
- ▶ Low operating and maintenance costs
- ▶ Building envelope's leakage and insulation properties are not compromised
- ▶ Heat transition class T4 (as per DIN EN 1866)
- ▶ Temperature bridge class TB4 (as per DIN EN 1866)
- ▶ Weatherproof and robust, snow load class SL 1000
- ▶ Powerful (volume flow rates exceeding 100,000 m³/h)
- ▶ Versatile (can be used with all TROX axial fans)
- ▶ Lightweight and durable,
- ▶ Easy installation
- ▶ Bellmouth integrated in the case of free inlet

X Application

- ▶ Roof-mounted ventilation fan with free outlet,
- ▶ free inlet or connected on the inlet side.

◇ Variants

- ▶ Flat or pitched roof type

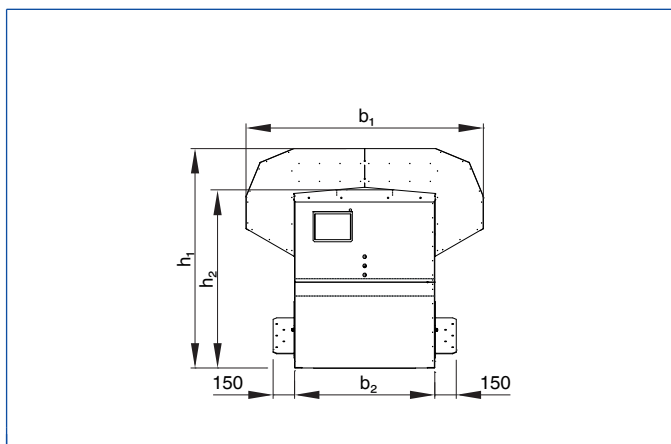
& Accessories

- ▶ Volume flow rate measuring unit VME
- ▶ Shock pulse bearing monitoring STI
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Cover grille (inlet side)
- ▶ Flow redresser
- ▶ Local isolator
- ▶ Frequency inverter
- ▶ Extract air and smoke extract controller
- ▶ Flow redresser

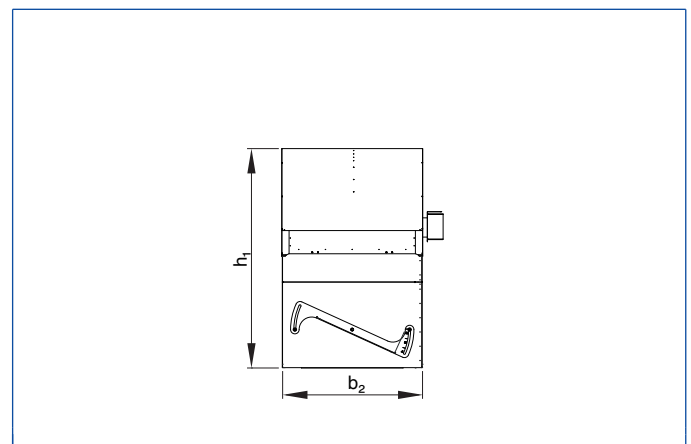
ISO Classification, standards and guidelines

- ▶ Heat transition class T4 (as per DIN EN 1866)
- ▶ Temperature bridge class TB4 (as per DIN EN 1866)
- ▶ Snow load class (SL 1000)

DAX



DAX

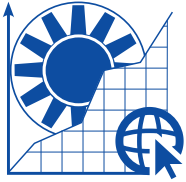


Dimensions [mm]

①	h1	h2	b1	b2
355	1176	947	1287	730
400	1176	947	1287	730
450	1176	947	1287	730
355	1376	1147	1287	730
400	1376	1147	1287	730
450	1376	1147	1287	730
500	1537	1258	1659	980
560	1537	1258	1659	980
630	1537	1258	1659	980
500	1818	1544	1659	980
560	1818	1544	1659	980
630	1818	1544	1659	980
710	2130	1772	2165	1300
800	2130	1772	2165	1300
900	2130	1772	2165	1300
710	2503	2145	2165	1300
800	2503	2145	2165	1300
900	2503	2145	2165	1300
1000	2675	2233	2605	1550
1120	2675	2233	2605	1550

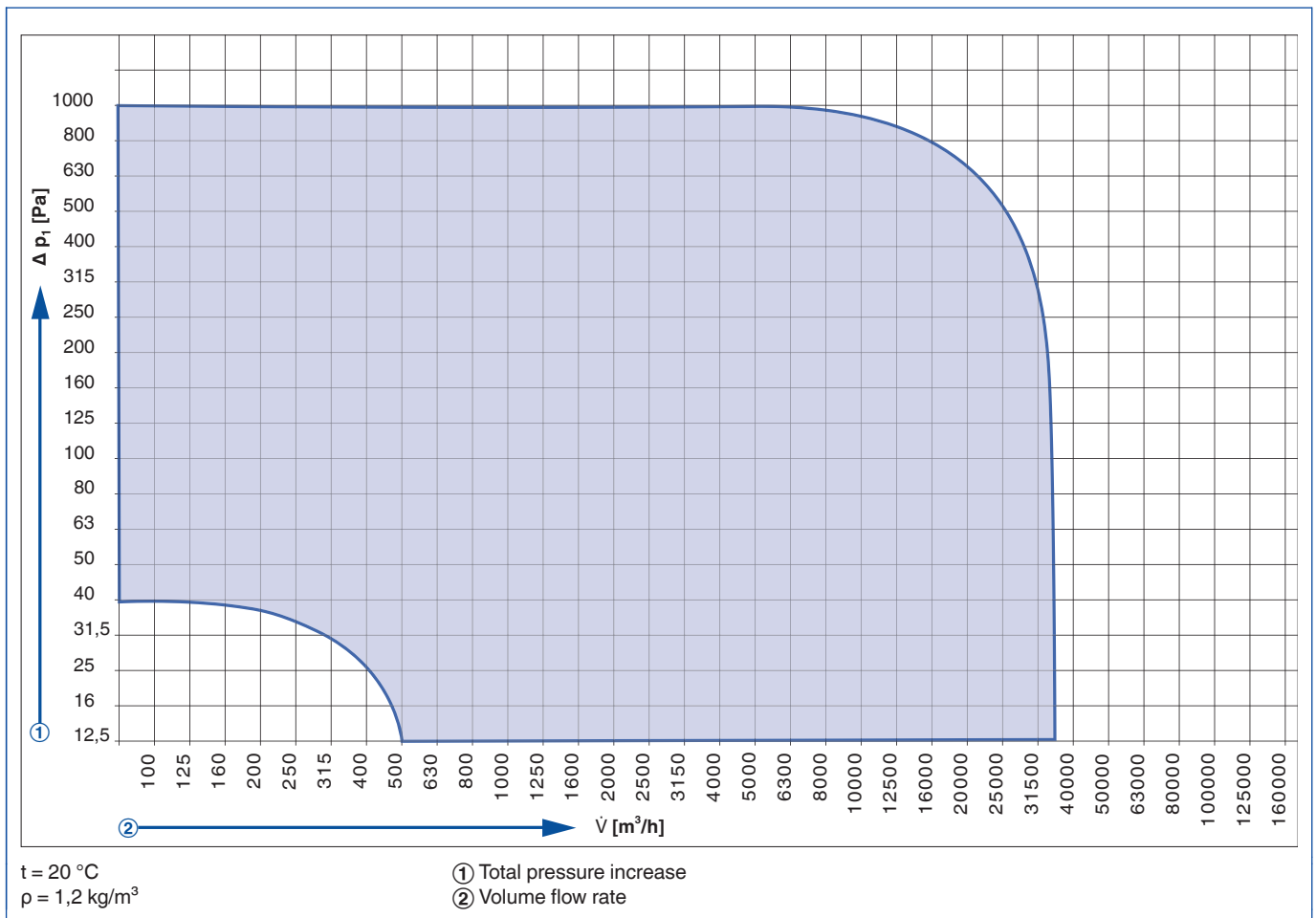
① Nominal size





For building ventilation

DRV/DRH Performance Range



+ Features

- ▶ Can be assembled at an incline of up to 20° (available for bigger roof pitches upon request). The bellmouth is deep-drawn for the best flow properties and therefore enables high aerodynamic efficiency.
- ▶ The impeller is made of sheet steel, has backward curved blades and is dynamically balanced.
- ▶ The fan has an external rotor three-phase or alternating current motor and a closed design with moisture protection insulation. The motor is fully protected due to guided-out thermal contacts embedded in the motor winding
- ▶ 8 sizes
- ▶ More than 100 types
- ▶ Volume flow rate V max. 32,000 m³/h
- ▶ Total pressure increase p_1 max. 800 Pa

X Application

- ▶ Roof-mounted extract air fan
- ▶ Free outlet
- ▶ Free inlet or pipeline on the inlet side

D Variants

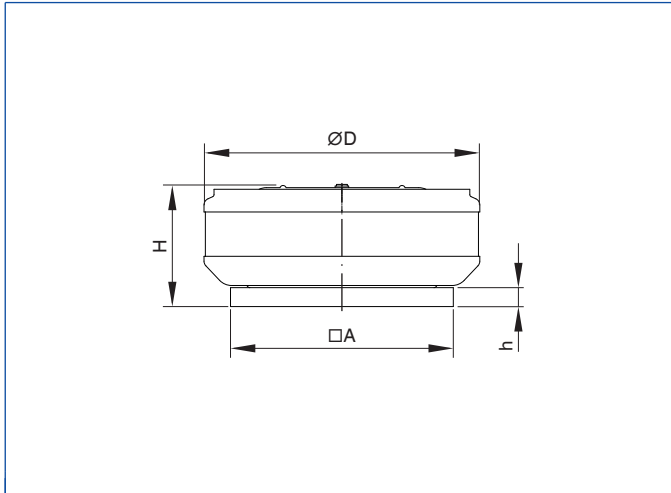
- ▶ Vertical outlet: DRV series
- ▶ Horizontal outlet: DRH series

& Accessories

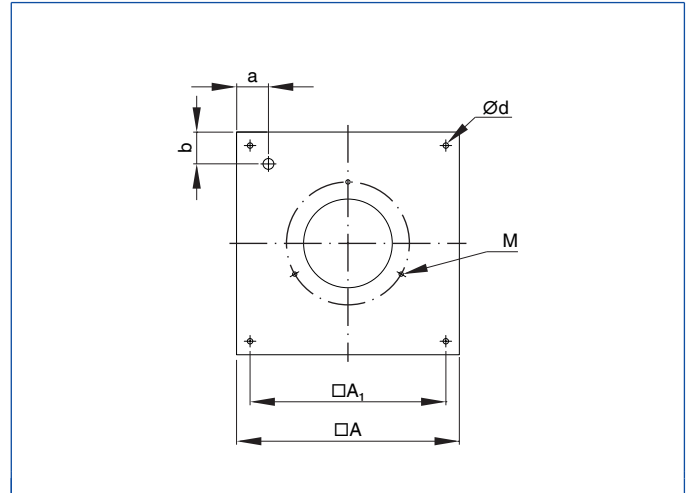
- ▶ Volume flow rate measuring unit VME
- ▶ Steel roof base for smooth roofs
- ▶ Sound attenuating base
- ▶ Silencing cover SDV (vertical)
- ▶ Self-powered shut-off damper (optional: thermally insulated damper blade)
- ▶ Motor-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Cover grille (inlet and outlet side)
- ▶ Local isolator attached (terminal box not required)
- ▶ Insulated base plate
- ▶ Tilting frame for foldable type



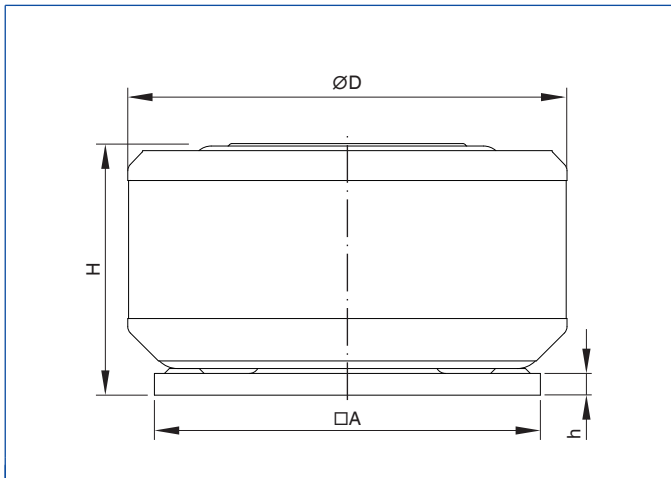
DRV Minivent 1-6 and DRV 224



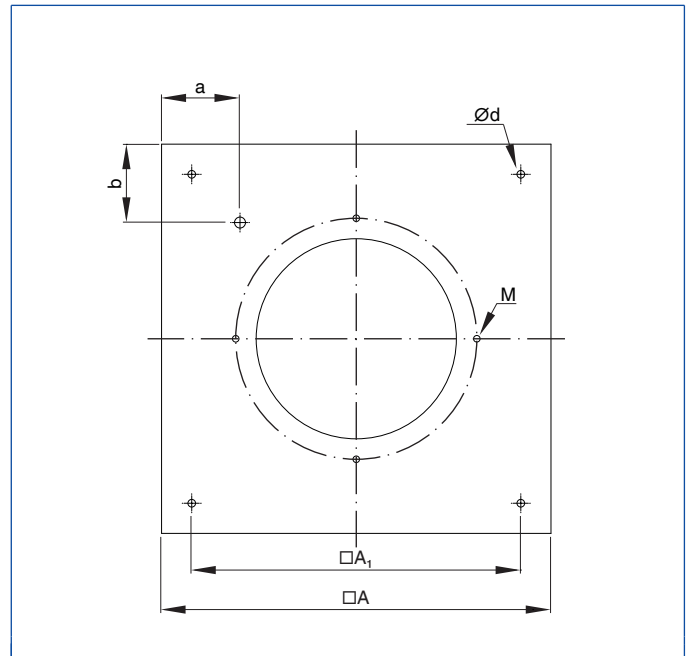
Base plate DRV Minivent 1-6 and DRV 224



DRV 250 to DRV 710



Base plate DRV 250 to DRV 710



DRV, dimensions [mm]

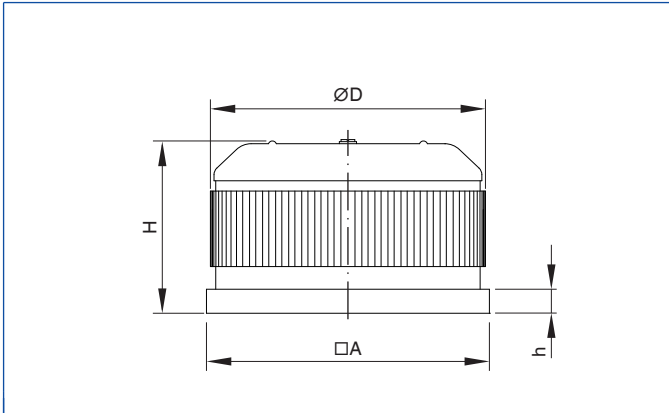
①	ØD	□A	H	h	□A1	a	b	Ød	M*
Minivent	510	412	217	34	362	59	59	10	6
224	638	412	257	34	362	59	59	10	6
250	638	560	430	40	460	175	87	14	6
315	638	560	430	40	460	110	110	14	6
355	808	710	450	40	600	143	143	14	8
400	808	710	450	40	600	143	143	14	8
500	993	1000	525	40	880	197	197	18	8
630	1272	1000	730	40	880	197	197	18	10
710	1272	1160	617	40	1040	265	195	18	10

* Connecting flanges as per DIN 24154, Part 3. An air intake grille can be assembled directly on the base plate or on the flanges.

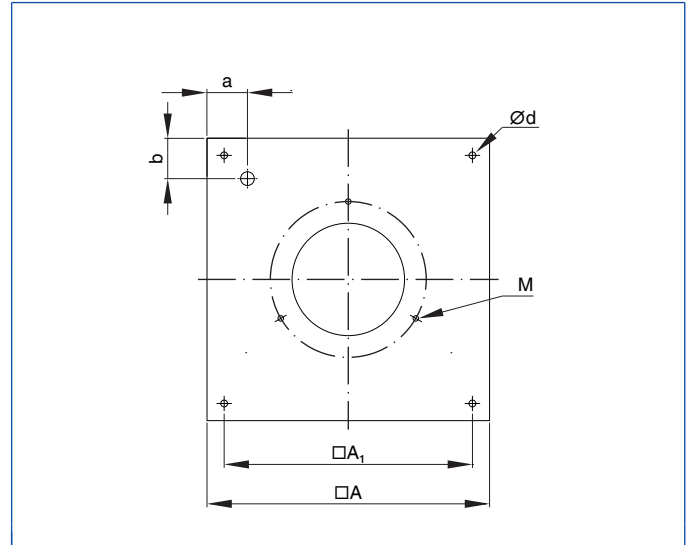
① Nominal size



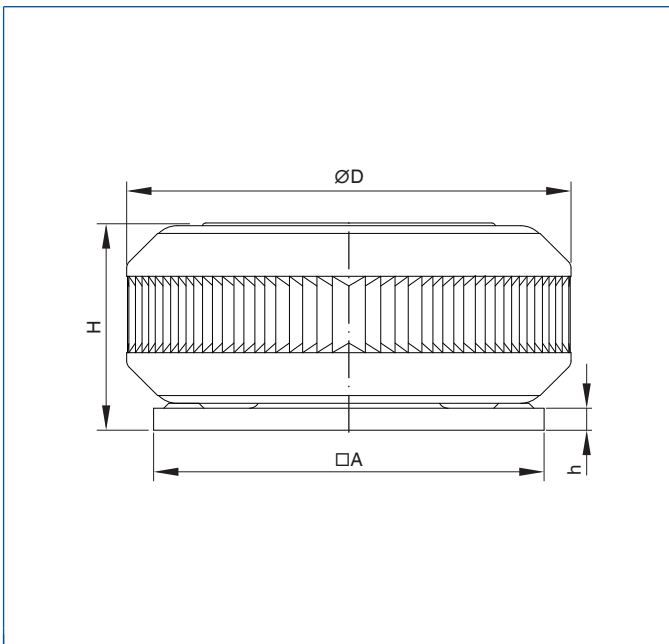
DRH Minivent 1-6 and DRH 224



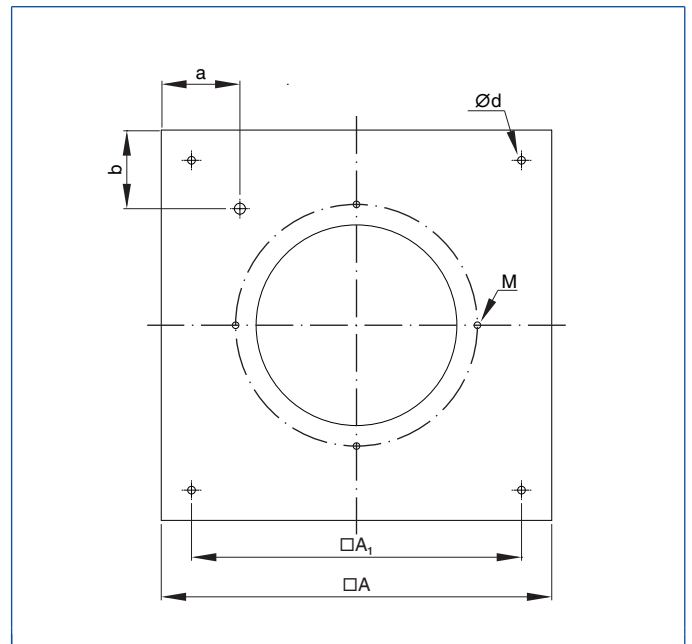
Base plate DRH Minivent 1-6 and DRH 224



DRH 250 to DRH 710



Base plate DRH 250 to DRH 710



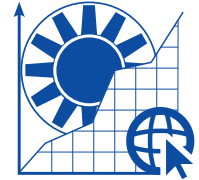
DRH, dimensions [mm]

①	ØD	□A	H	h	□A1	a	b	Ød	M*
Minivent	390	412	217	34	362	59	59	10	6
224	390	412	257	34	362	59	59	10	6
250	638	560	430	40	460	175	87	14	6
315	638	560	430	40	460	110	110	14	6
355	808	710	450	40	600	143	143	14	8
400	808	710	450	40	600	143	143	14	8
500	993	1000	525	40	880	197	197	18	8
630	1272	1000	730	40	880	197	197	18	10
710	1272	1160	617	40	1040	265	195	18	10

* Connecting flanges as per DIN 24154, Part 3. An air intake grille can be assembled directly on the base plate or on the flanges.

① Nominal size





Ventilation of buildings, offices and production facilities.

+ Features

Energy-efficient, rotary speed-controllable and low-noise due to EC technology. Up to 50% energy savings achievable in practice

- ▶ Controlled ventilation possible (basic and needs-based ventilation)
- ▶ Optionally available with regulation (constant pressure or constant volume flow rate)
- ▶ Simple installation and maintenance-friendly
- ▶ High efficiency, even in controlled mode
- ▶ Rotary speed steplessly adjustable
- ▶ Operating point can be optimally adjusted to the system requirements

- ▶ Simple system balancing
- ▶ A system's volume flow rate and its pressure can be regulated
- ▶ Cut operating costs
- ▶ Longer service life than conventional motors
- ▶ Unit sizes
- ▶ Volume flow rate V max. 3,700 m³/h
- ▶ Total pressure increase p1 max. 450 Pa

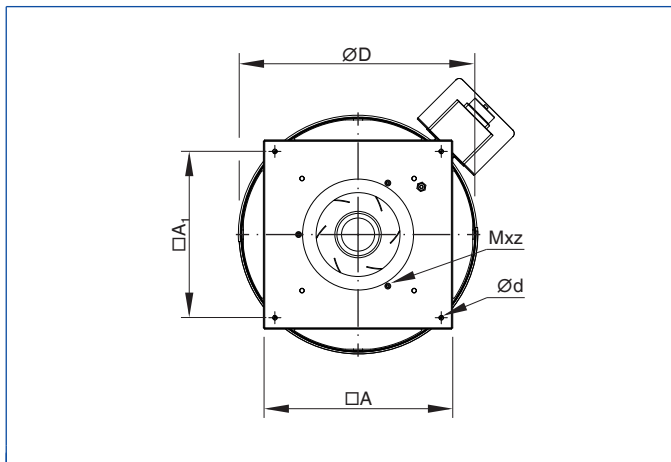
Application

- ▶ Roof-mounted extract air fan
- ▶ Free outlet
- ▶ Free inlet or pipeline on the inlet side

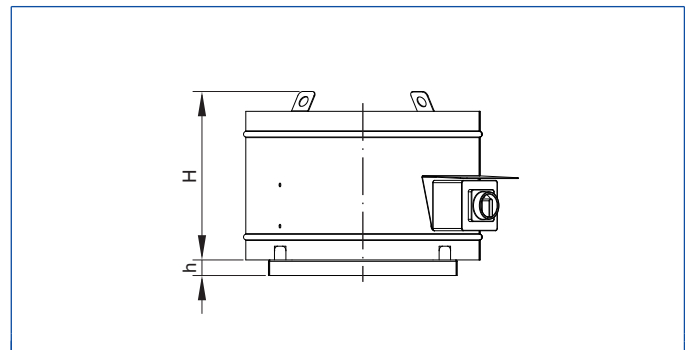
& Accessories

- ▶ Volume flow rate measuring unit VME
- ▶ Steel roof base for smooth roofs
- ▶ Sound attenuating base
- ▶ Self-powered shut-off damper (optional: thermally insulated damper blade)
- ▶ Motor-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Cover grille (inlet and outlet side)
- ▶ Terminal box
- ▶ Insulated base plate
- ▶ Tilting frame for foldable type
- ▶ Silicone-free type

Base plate DRV-B-EC



DRV-B-EC

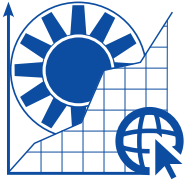


Dimensions [mm]

①	ØD	□A	H	h	□A ₁	Ød	M
180	64	409	338	34	362	10	M6 x 3
250	494	557	408	40	460	14	M6 x 3
315-L	694	557	421	40	460	14	M8 x 4
315-H1	694	557	458	40	460	14	M8 x 4
315-H2	694	557	458	40	460	14	M8 x 4
355	861	706	511	40	600	14	M8 x 4
400	861	770	524	40	600	14	M8 x 6
500-L	1116	995	586	40	880	18	M8 x 6
500-H	1116	995	586	40	880	18	M8 x 6

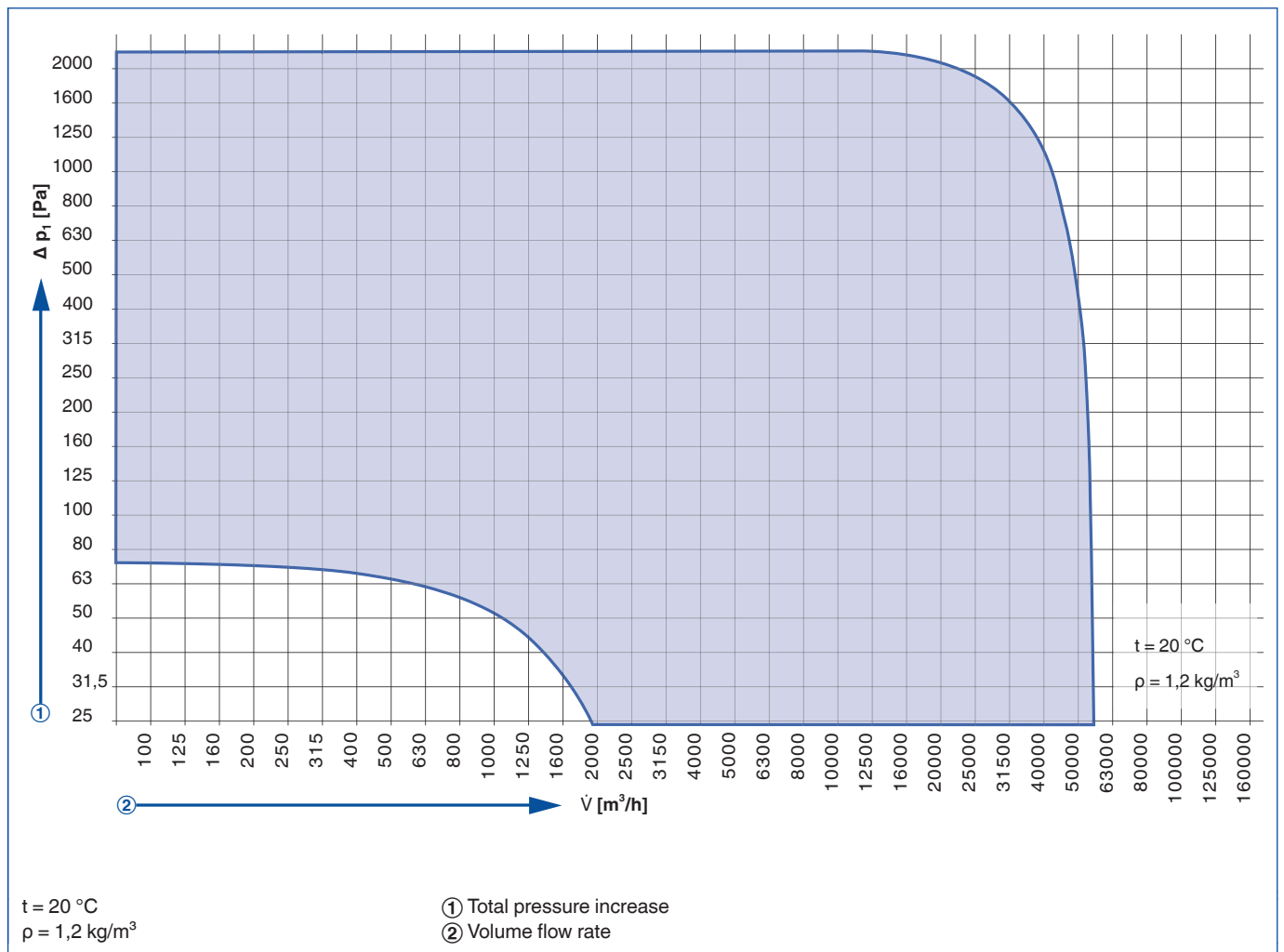
① Nominal size





For ventilating buildings, offices and production facilities, for extracting air from kitchens and for extracting aggressive gases or vapours.

DRVF-H Performance Range



+ Features

The bellmouth is deep-drawn for the best flow properties and therefore enables high aerodynamic efficiency. The shape of the casing guarantees a truly vertical, powerfully guided air jet. Cooling air is supplied to the motor via a duct

- ▶ 7 sizes
- ▶ More than 100 types
- ▶ For a volume flow rate of max. 54,300 m³/h
- ▶ Explosion protection as per ATEX up to Ex II 2/2 G c IIB T4
- ▶ DRVF-H series: max. temp. +60°C in continuous operation
- ▶ DRVF-H series: max. temp. +120°C in continuous operation, suitable for kitchen extract air
- ▶ Satisfies VDI Guidelines 2078 and 2052.

Application

- ▶ Roof-mounted extract air fan
- ▶ Free outlet
- ▶ Free inlet or pipeline on the inlet side
- ▶ Suitable for fatty kitchen extract air

◊ Variants

- ▶ DRVF (DS standard motor)
- ▶ DRVF-SDV (DS standard motor, with sound attenuation cowl)
- ▶ DRVF-H (DS standard motor encapsulated from the flow and separately ventilated)
- ▶ DRVF-H-SDI (DS standard motor encapsulated from the flow and separately ventilated, soundproof)
- ▶ DRVF-H-SDV (DS standard motor encapsulated from the flow and separately ventilated, with sound attenuation cowl)

& Accessories

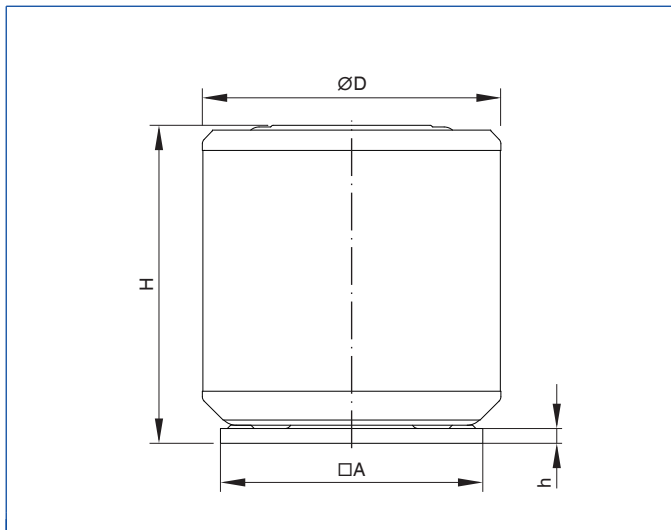
- ▶ Volume flow rate measuring unit VME
- ▶ Steel roof base for smooth roofs
- ▶ Sound attenuating base
- ▶ Silencing cover SDV (vertical) with separate ventilation
- ▶ Outlet silencer SDI
- ▶ Self-powered shut-off damper
- ▶ Motor-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Cover grille (inlet and outlet side)

- ▶ Terminal box
- ▶ Local isolator attached (terminal box not required)
- ▶ Insulated base plate
- ▶ Tilting frame for foldable type
- ▶ Deflector hood SL 1000
- ▶ Frequency inverter
- ▶ Silicone-free type

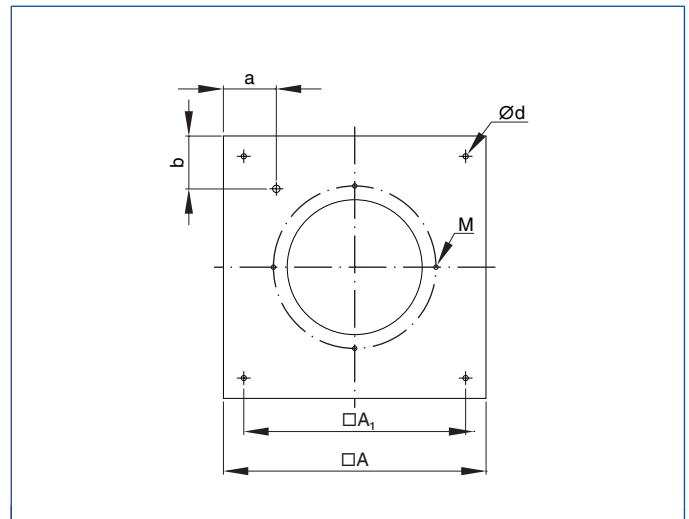
ISO Classification, standards and guidelines

- ▶ DRVFH and DRVFH-SDI: VDI Guidelines 2078 and 2052.

DRVF/DRVF-H 710



Base plate DRVF/DRVF-H 710



Dimensions [mm]

①	ØD	□A	H	h	□A1	a	b	Ød	M*
250	638	560	695	40	460	175	87	14	6
315	638	560	695 ¹⁾	40	175	87	14	6	317
355	808	710	772	40	600	143	143	14	8
400	808	710	848	40	600	143	143	14	8
500	993	1000	923	40	880	197	197	18	8
630	1272	1000	1337	40	880	197	197	18	10
630XL	1500	1000	1337	40	880	197	197	18	10
710	1272	1160	1337	40	1040	265	195	18	10

* Connecting flanges as per DIN 24154, Part 3. An air intake grille can be assembled directly on the base plate or on the flanges.

¹⁾ DRVF/DRVF-H 315/30-2 = 744

① Nominal size



Ventilation axial fans

	Specifications						
	AXN						ZAXN
	12/56	12/56KSE	12/56 R1	12/56 R2	12/50	12/45	6/9/12/56
Flow rate temperature							
Max. 60°C	●	●	●	●	●	●	●
Max. 80°C	○	○	○	○	○	○	○
Max. 100°C	○	○	○	○	○	○	○
Motor type							
Single-speed	●	●	●	●	●	●	●
Dual-speed	●	●	●	●	●	●	●
Suitable for operation on a frequency inverter (in ventilation mode)	●	●	●	●	●	●	●
Technical type							
Outlet guide vanes	●	●	●	●	●	●	●
Adjustable impeller blades (at a standstill)	●	●	●	●			●
Characteristic curve stabiliser		●					
Reversing mode							
Direct driven	●	●			●	●	●
Explosion Protection Directive 94/9/EC - "2014/34/EU" as of 01/2016	○				○	○	○
Belt drive			●	●			
Wall installation	○						
Wall mounting plate	○						
Outlet box							
Swing-out "motor impeller unit" (M-A style)	○				○	○	○
Two motor impeller units in series							●
Air direction "D" (motor in outlet)	●	●	●	●	●	●	●
Air direction "S" (motor in inlet)							
Motor in airflow	●	●			●	●	●
Motor cooling with ambient air			●	●			
Technical data							
Max. volume flow rate [m³/h]	400,000	400,000	10,000	315,000	425,000	450,000	400,000
Max. pressure [Pa]	2,600	2,600	1,500	1,700	2,000	2,000	3,000-4.500
Max. drive capacity [kW]	355	355	37	200	355	355	2 x 355
Nominal sizes [mm]	250-2.000	400-1.600	2,000	2,000	2,240	2,500	315-2.000
Material							
Impeller	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
Casing	Steel	Steel	Steel	Steel	Steel	Steel	Steel
Accessories							
Roof cowl DAX	○						
Volume flow rate measuring unit VME	○				○	○	○
Shock pulse bearing monitoring STI	○	○	○	○	○	○	○
Thermal motor protection	○	○	○	○	○	○	○
Acoustic and thermal insulation	○	○			○	○	○
Weather protection roof for acoustic and thermal insulation	○				○	○	○
Round silencers TSR (inlet and outlet side)	○		○	○	○	○	○
Round silencers TSR with interior core (inlet and outlet side)	○	○	○	○	○	○	○
Extension duct	○	○	○	○	○	○	○
Inspection hatch	○	○	○	○	○	○	○
Self-powered shut-off damper	○	○	○	○	○	○	○
Flexible connectors	○	○	○	○	○	○	○
Matching flange	○	○	○	○	○	○	○
Equipotential bonding	○	○	○	○	○	○	○



	Specifications						
	AXN						ZAXN
	12/56	12/56KSE	12/56 R1	12/56 R2	12/50	12/45	6/9/12/56
Bellmouth	○	○	○	○	○	○	○
Cover grille (inlet and outlet side)	○	○	○	○	○	○	○
Spark protection plate	○				○	○	
Diffuser	○	○	○	○	○	○	
Diffuser with interior core	○	○	○	○	○	○	○
Outlet duct with cover griller	○	○	○	○	○	○	○
Mounting feet	○	○	○	○	○	○	○
Brackets (for vertical assembly)	○	○	○	○	○	○	○
Spring anti-vibration mounts	○	○	○	○	○	○	○
Rubber anti-vibration mounts	○	○	○	○	○	○	○
Terminal box	○	○	○	○	○	○	○
Local isolator loose (for outside of fire area)	○	○	○	○	○	○	○
Local isolator loose (for outside of fire area)	○	○	○	○	○	○	○
Local isolator attached (terminal box not required)	○	○	○	○	○	○	○
Angular wall ring with brackets (inlet and outlet side)	○	○	○	○	○	○	○
Flow redresser	○	○	○	○	○	○	○
Silicone free	○						
Surface protection							
Corrosion protection category	●	●	●	●	●	●	●
Corrosion protection category C	○	○	○	○	○	○	○
Corrosion protection category C4	○	○	○	○	○	○	○
Corrosion protection category C5	○	○			○	○	○
Explanation							
Standard ●							
Optional ○							



Ventilation axial fans

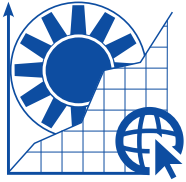
	Specifications				
	AXO			WAXN	WAXO
	Standard	10/50	9/27		
Flow rate temperature					
Max. 60°C	●	●	●	●	●
Max. 80°C	○	○	○	○	○
Max. 100°C	○	○	○	○	○
Motor type					
Single-speed	●	●	●	●	●
Dual-speed	●	●	●	●	●
Suitable for operation on a frequency inverter (in ventilation mode)	●	●	●	●	●
Technical type					
Outlet guide vanes					
Adjustable impeller blades (at a standstill)		●		●	
Characteristic curve stabiliser					
Reversing mode		●	●		
Direct driven	●	●	●	●	●
Explosion Protection Directive 94/9/EC - "2014/34/EU" as of 01/2016	○				
Belt drive					
Wall installation	○	○	○	●	●

	Specifications				
	AXO			WAXN	WAXO
	Standard	10/50	9/27		
Wall mounting plate	○	○	○	●	●
Outlet box				●	●
Swing-out "motor impeller unit" (M-A style)	○	○	○		
Two motor impeller units in series					
Air direction "D" (motor in outlet)	●	●	●	●	●
Air direction "S" (motor in inlet)	○	●			
Motor in airflow	○●	●	●	●	●
Motor cooling with ambient air					
Technical data					
Max. volume flow rate [m ³ /h]	250,000	200,000	200,000	50,000	40,000
Max. pressure [Pa]	1,800	1,600	1,000	1,650	1,250
Max. drive capacity [kW]	160	132	55	22	22
Nominal sizes [mm]	315-1.600	315-1.600	315-1.600	400/500/630/800	400/500/630/800/1,000
Material					
Impeller	Aluminium / plastic	Steel	Steel	Aluminium	Aluminium / plastic / steel
Casing	Steel	Steel	Steel	Steel	Steel
Accessories					
Roof cowl DAX	○	○	○		
Volume flow rate measuring unit VME		○	○	○	○
Shock pulse bearing monitoring STI	○	○	○	○	○
Thermal motor protection	○	○	○	○	○
Acoustic and thermal insulation	○	○	○		
Weather protection roof for acoustic and thermal insulation	○	○	○		
Round silencers TSR (inlet and outlet side)	○	○	○		
Round silencers TSR with interior core (inlet and outlet side)					
Extension duct	○	○	○		
Inspection hatch	○	○	○		
Self-powered shut-off damper	○	○	○		
Flexible connectors	○	○	○	○	○
Matching flange	○	○	○	○	○
Equipotential bonding	○	○	○	○	○
Bellmouth	○	○	○	○	○
Cover grille (inlet and outlet side)	○	○	○	○	○
Spark protection plate	○				
Diffuser	○	○	○		
Diffuser with interior core					
Outlet duct with cover griller	○	○	○		
Mounting feet	○	○	○		
Brackets (for vertical assembly)	○	○	○		
Spring anti-vibration mounts	○	○	○		
Rubber anti-vibration mounts	○	○	○		
Terminal box	○	○	○	○	○
Local isolator loose	○	○	○	○	○
Local isolator attached (terminal box not required)	○	○	○		
Angular wall ring with brackets (inlet and outlet side)	○	○	○		
Flow redresser	○	○	○	○	○
Silicone free	○	○	○		



	Specifications				
	AXO			WAXN	WAXO
	Standard	10/50	9/27		
Surface protection					
Corrosion protection category C2	●	●	●	●	●
Corrosion protection category C3	○	○	○	○	○
Corrosion protection category C4	○	○	○	○	○
Corrosion protection category C5	○	○	○	○	○
Explanation					
● - Standard					
○ - Optional					





Axial fans with direct drive for building ventilation and aeration

+ Features

- Impellers with a different number of blades are used (5, 6, 8, 9, 10 or 12) depending on the size and the desired output; please specify when ordering. Compact size enables installation even when space is tight.
- ▶ M-D style: air direction with motor in outlet, with direct drive.
- ▶ Suitable in horizontal and vertical style.
- ▶ Casing available in all RAL colours
- ▶ Also available with acoustic insulation.
- ▶ Efficiency up to 68%
- ▶ 10 sizes
- ▶ Impeller's nominal \varnothing 315 to 1,600 mm
- ▶ Volume flow rate V max. 250,000 m³/h
- ▶ Total pressure increase pt max. 1,800 Pa
- ▶ M style with direct drive. Impeller assembled directly on the motor shaft
- ▶ Motors can come with thermal contacts or a PTC thermistor

X Application

- ▶ Ventilation fan for supply or exhaust air
- ▶ Free inlet or connected to the pipeline on the inlet side
- ▶ Free outlet or connected to the pipeline on the outlet side

◊ Variants

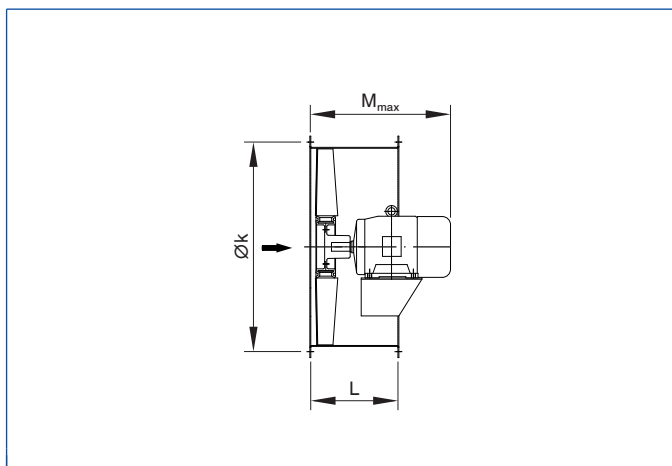
- ▶ M-S style: air direction with motor in inlet, with direct drive.
- ▶ Temperature limits
For ISO-F motors: 60°C
For ISO-H motors: 80°C.
- ▶ Fan for conveying potentially explosive media as per Directive 94/9/EC (ATEX 95) II 2/2 G c IIC + H2 T3 or II 2/2 G c IIB H2 T4 (pressure-resistant encased motor for rotary speed regulation via frequency inverter) reg. no. PTB 08 ATEX D074
- ▶ Design as wall-mounted smoke exhaust fan with wall mounting plate and outlet casing with self-powered multileaf damper

& Accessories

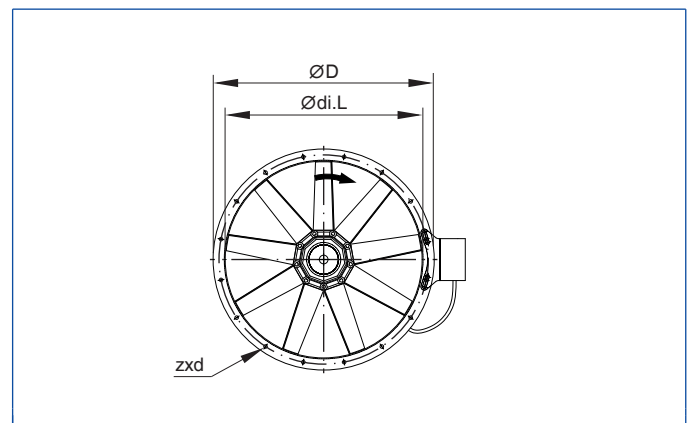
- ▶ Roof cowl DAX
- ▶ Shock pulse bearing monitoring STI
- ▶ Thermal motor protection
- ▶ Acoustic insulation
- ▶ Weather protection roof for acoustic insulation
- ▶ Round silencers TSR (inlet and outlet side)
- ▶ Extension duct
- ▶ Inspection hatch
- ▶ Self-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Bellmouth
- ▶ Cover grille (inlet and outlet side)
- ▶ Diffuser
- ▶ Outlet duct with cover grille
- ▶ Mounting feet (for horizontal assembly)
- ▶ Brackets (for vertical assembly)
- ▶ Spring anti-vibration mounts
- ▶ Rubber anti-vibration mounts
- ▶ Local isolator attached (terminal box not required)
- ▶ Angular wall ring with brackets (inlet and outlet side)
- ▶ Flow redresser
- ▶ Silicone-free type
- ▶ Surface protection powder-coated and/or hot-dip galvanised in corrosion protection category C2 to C5M



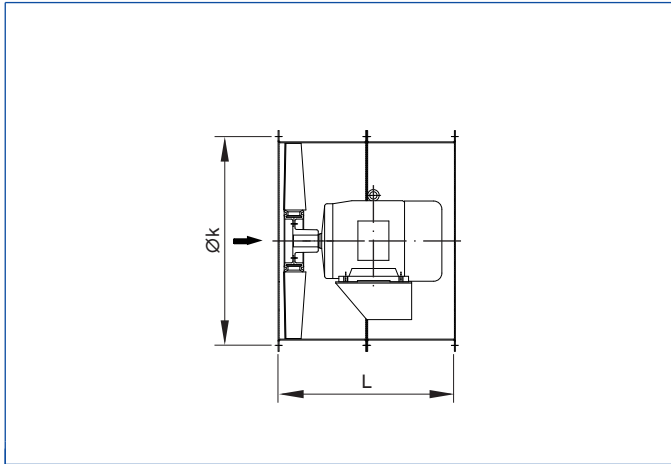
AXO to NG 1120



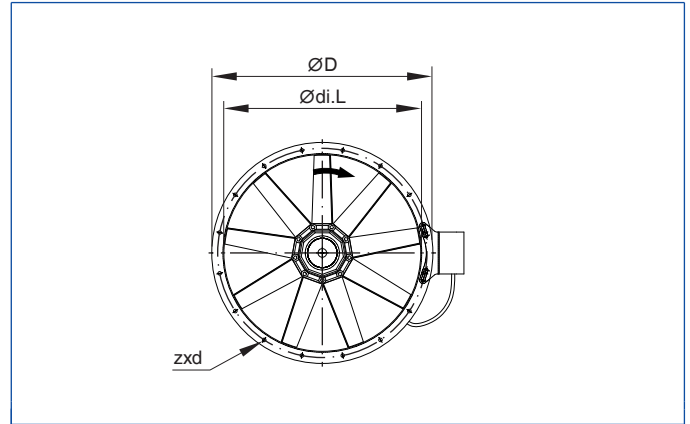
AXO to NG 1120



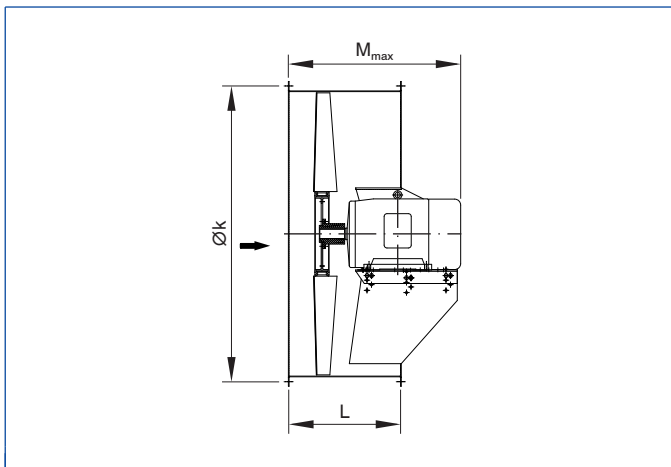
AXO to NG 1120 with extension duct



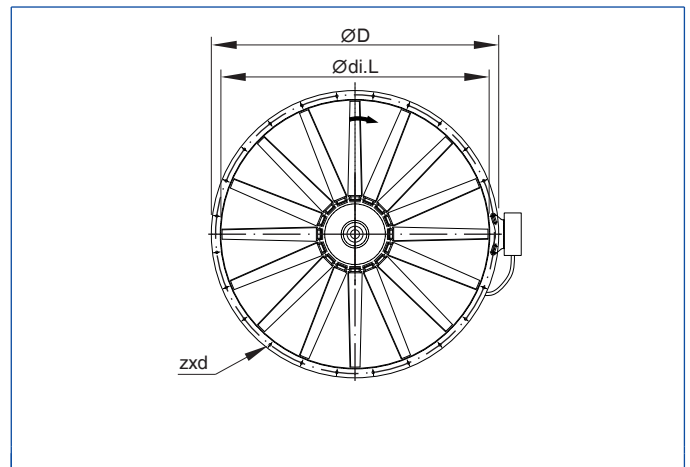
AXO to NG 1120 with extension duct



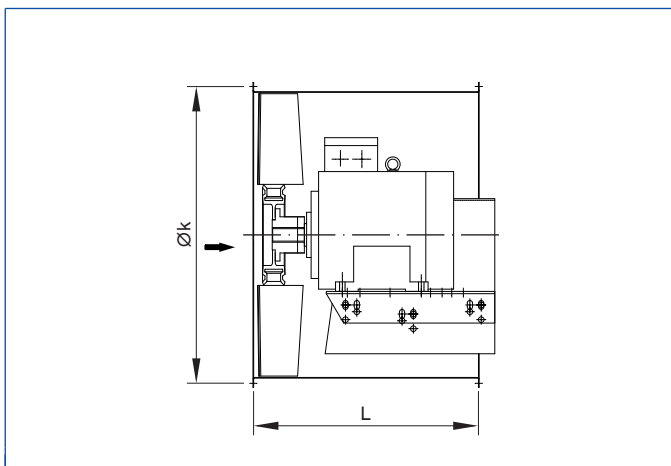
AXO as of NG 1250



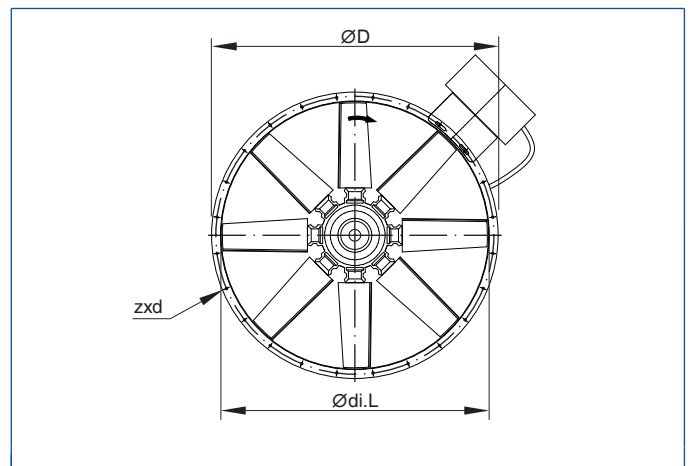
AXO as of NG 1250



AXO as of NG 1250 with extension duct



AXO as of NG 1250 with extension duct

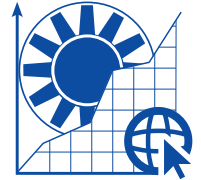


Dimensions [mm]

①	②	Ø clear width	Øk	ØD	zxd	L	M _{max}	③
315	71-80	320	356	386	8 × 9.5	150	265	6
400	71-90	401	438	468	12 × 9.5	188	348	11
	100	401	438	468	12 × 9.5	376	390	16
500	80-100	504	541	571	12 × 9.5	225	570	16
	90-132	504	541	571	12 × 9.5	450	451	22
630	90-112	634	674	712	16 × 11.5	286	595	30
	132	634	674	712	16 × 11.5	572	575	29
800	100-132	797	837	875	24 × 11.5	350	760	50
	160	797	837	875	24 × 11.5	700	810	70
1000	132-180	1003	1043	1081	24 × 11.5	415	730	85
	200	1003	1043	1081	24 × 11.5	830	770	105
1120	132-200	1124	1174	1214	24 × 11.5	450	825	110
1250	160-225	1261	1311	1351	24 × 11.5	500	⊗	⊗
	250-280	1261	1311	1351	24 × 11.5	1000	⊗	⊗
1400	180-225	1415	1465	1545	24 × 11.5	560	⊗	⊗
	250-315	1415	1465	1545	24 × 11.5	1120	⊗	⊗
1600	180-225	1587	1637	1717	32 × 11.5	630	⊗	⊗
	250-315	1587	1637	1717	32 × 11.5	1260	⊗	⊗

- ① Nominal size; an extension duct may be needed for different sizes in the case of vibration-dampened installation •
- ② Motor size B3 style •
- ③ Weight without motor (approx.) [kg] •
- ⊗ Upon request





Axial fans with direct drive for building ventilation and aeration

+ Features

- Different blade pitch angles are used depending on the size and the desired output; please specify when ordering. Compact size enables installation even when space is tight. Motors can come with thermal contacts or a PTC thermistor
- ▶ Suitable in horizontal and vertical style.
 - ▶ Effect-optimised steel impeller, efficiency up to 74%
 - ▶ Casing available in all RAL colours
 - ▶ Also available with acoustic insulation.
 - ▶ 15 sizes
 - ▶ Impeller's nominal \varnothing 315 to 1,600 mm
 - ▶ Volume flow rate V. max. 200,000 m³/h
 - ▶ Total pressure increase pt max. 1,000 Pa
 - ▶ M-D style: air direction with motor in outlet, impeller assembled directly on the motor shaft.
 - ▶ Conveying temperatures of up to +130°C possible with special motors (upon request)

X Application

- ▶ Supply or exhaust air as round duct fan
- ▶ Free inlet or connected to the pipeline on the inlet side
- ▶ Free outlet or connected to the pipeline on the outlet side

◊ Variants

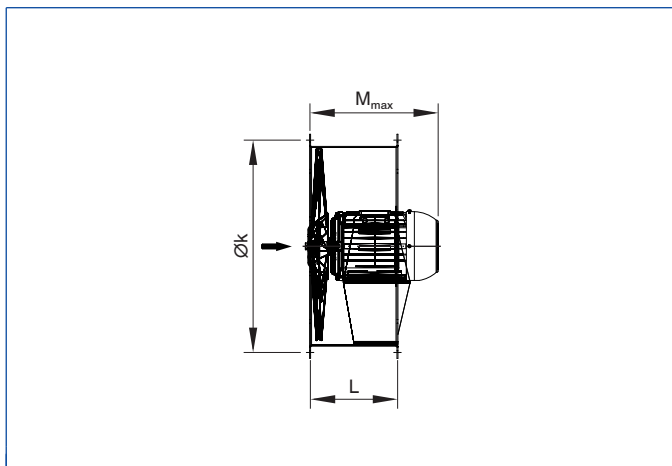
- ▶ Temperature limits
For ISO-F motors: 60°C
For ISO-H motors: 80°C.
Up to 130°C with special motors

& Accessories

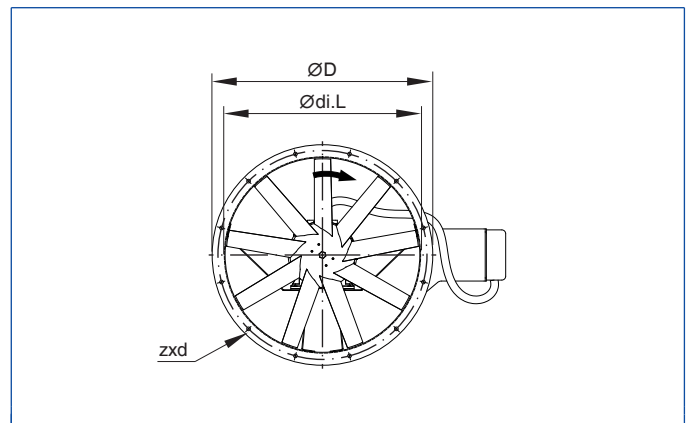
- ▶ Roof cowl DAX
- ▶ Shock pulse bearing monitoring STI
- ▶ Thermal motor protection
- ▶ Acoustic insulation
- ▶ Weather protection roof for acoustic insulation
- ▶ Round silencers TSR (inlet and outlet side)
- ▶ Extension duct
- ▶ Inspection hatch
- ▶ Self-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Bellmouth
- ▶ Cover grille (inlet and outlet side)
- ▶ Diffuser
- ▶ Outlet duct with cover grille
- ▶ Mounting feet (for horizontal assembly)
- ▶ Brackets (for vertical assembly)
- ▶ Spring anti-vibration mounts
- ▶ Rubber anti-vibration mounts
- ▶ Local isolator attached (terminal box not required)
- ▶ Angular wall ring with brackets (inlet and outlet side)
- ▶ Flow redresser
- ▶ Silicone-free type
- ▶ Surface protection powder-coated and/or hot-dip galvanised in corrosion protection category C2 to C5M



AXO 9/27



AXO 9/27

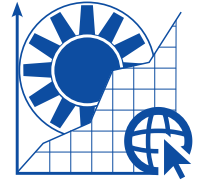


Dimensions [mm]

①	②	Ø clear width	Øk	ØD	zxd	L	M _{max}	③
315	71-80	320	356	386	8 x 9.5	150	265	6
400	71-90	401	438	468	12 x 9.5	188	348	11
	100	401	438	468	12 x 9.5	376	390	16
500	80-100	504	541	571	12 x 9.5	225	570	16
	90-132	504	541	571	12 x 9.5	450	451	22
630	90-112	634	674	712	16 x 11.5	286	595	30
	132	634	674	712	16 x 11.5	572	575	29
800	100-132	797	837	875	24 x 11.5	350	760	50
800	160	797	837	875	24 x 11.5	700	810	70
	132-180	1003	1043	1081	24 x 11.5	415	730	85
1000	200	1003	1043	1081	24 x 11.5	830	770	105
	132-200	1124	1174	1214	24 x 11.5	450	825	110
1250	160-225	1261	1311	1351	24 x 11.5	500	⊗	⊗
	250-280	1261	1311	1351	24 x 11.5	1000	⊗	⊗
1400	180-225	1415	1465	1545	24 x 11.5	560	⊗	⊗
	250-315	1415	1465	1545	24 x 11.5	1120	⊗	⊗
1600	180-225	1587	1637	1717	32 x 11.5	630	⊗	⊗
	250-315	1587	1637	1717	32 x 11.5	1260	⊗	⊗

- ① Nominal size; an extension duct may be needed for different sizes in the case of vibration-dampened installation •
- ② Motor size B3 style •
- ③ Weight without motor (approx.) [kg] •
- ⊗ Upon request





Axial fans with direct drive for building ventilation and aeration

+ Features

Impellers with different blade pitch angles are used depending on the size and the desired output; please specify when ordering. Compact size enables installation even when space is tight. Motors with thermal contacts or a PTC thermistor upon request

- ▶ Suitable in horizontal and vertical style.
- ▶ Casing available in all RAL colours
- ▶ Also available with acoustic insulation.
- ▶ Efficiency up to 63%
- ▶ 15 sizes
- ▶ Impeller's nominal \varnothing 315 to 1,600 mm
- ▶ Volume flow rate V. max. 200,000 m³/h
- ▶ Total pressure increase pt max. 1,600 Pa
- ▶ M style - with direct drive. Impeller assembled directly on the motor shaft.

Application

- ▶ Supply or exhaust air as round duct fan
- ▶ Free inlet or connected to the pipeline on the inlet side
- ▶ Free outlet or connected to the pipeline on the outlet side
- ▶ Fan for reversible operation.

◊ Variants

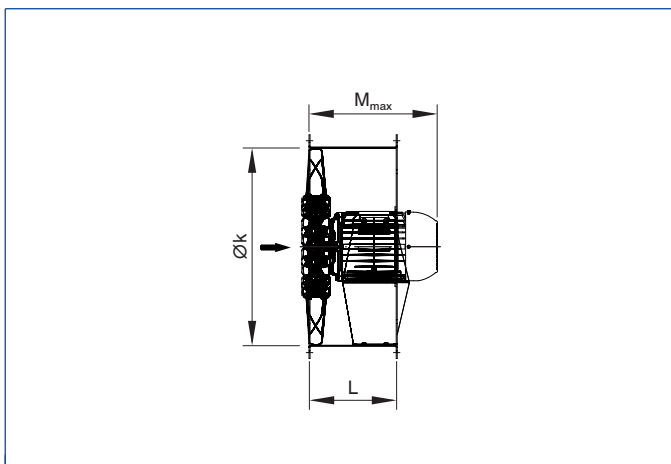
- ▶ Temperature limits
For ISO-F motors: 60°C
For ISO-H motors: 80°C.

& Accessories

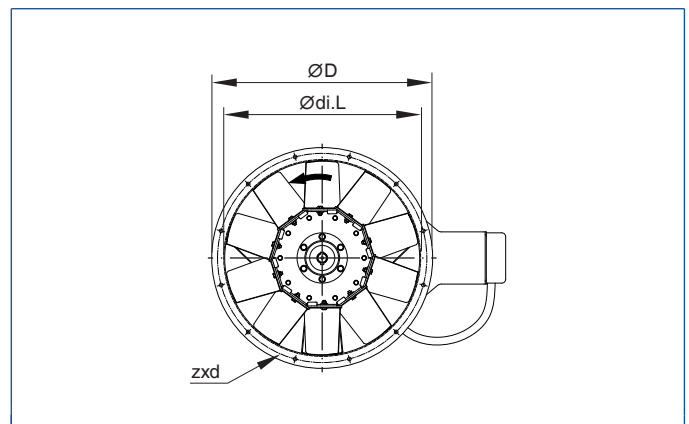
- ▶ Shock pulse bearing monitoring STI
- ▶ Thermal motor protection
- ▶ Acoustic insulation
- ▶ Weather protection roof for acoustic insulation
- ▶ Round silencers TSR (inlet and outlet side)
- ▶ Extension duct
- ▶ Inspection hatch
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Bellmouth
- ▶ Cover grille (inlet and outlet side)
- ▶ Diffuser
- ▶ Outlet duct with cover grille
- ▶ Mounting feet (for horizontal assembly)
- ▶ Brackets (for vertical assembly)
- ▶ Spring anti-vibration mounts
- ▶ Rubber anti-vibration mounts

- ▶ Local isolator attached (terminal box not required)
- ▶ Angular wall ring with brackets (inlet and outlet side)
- ▶ Flow redresser
- ▶ Silicone-free type
- ▶ Surface protection powder-coated and/or hot-dip galvanised in corrosion protection category C2 to C5M

AXO 10/50



AXO 10/50

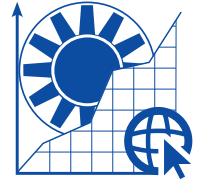


Dimensions [mm]

①	②	Ø clear width	Øk	ØD	zxd	L	M _{max}	③
315	71-80	320	356	386	8 x 9.5	150	265	6
400	71-90	401	438	468	12 x 9.5	188	348	11
	100	401	438	468	12 x 9.5	376	390	16
500	80-100	504	541	571	12 x 9.5	225	570	16
	90-132	504	541	571	12 x 9.5	450	451	22
630	90-112	634	674	712	16 x 11.5	286	595	30
	132	634	674	712	16 x 11.5	572	575	29
800	100-132	797	837	875	24 x 11.5	350	760	50
	160	797	837	875	24 x 11.5	700	810	70
1000	132-180	1003	1043	1081	24 x 11.5	415	730	85
1000	200	1003	1043	1081	24 x 11.5	830	770	105
1120	132-200	1124	1174	1214	24 x 11.5	450	825	110
1250	160-225	1261	1311	1351	24 x 11.5	500	⊗	⊗
	250-280	1261	1311	1351	24 x 11.5	1000	⊗	⊗
1400	180-225	1415	1465	1545	24 x 11.5	560	⊗	⊗
	250-315	1415	1465	1545	24 x 11.5	1120	⊗	⊗
1600	180-225	1587	1637	1717	32 x 11.5	630	⊗	⊗
	250-315	1587	1637	1717	32 x 11.5	1260	⊗	⊗

- ① Nominal size; an extension duct may be needed for different sizes in the case of vibration-dampened installation •
- ② Motor size B3 style •
- ③ Weight without motor (approx.) [kg] •
- ⊗ Upon request





Axial fans with direct drive and outlet guide vanes AXN 12/56

+ Features

- ▶ Extensive adjustments to the relevant operating point and subsequent motor rating corrections can be made by steplessly adjusting the impeller blades without any need to disassemble the impeller
- ▶ Optimised outlet guide vanes to increase the pressure coefficients.
- ▶ Low-noise operation due to low circumferential speeds caused by high pressure coefficients.
- ▶ 21 sizes
- ▶ Impeller's nominal \varnothing 250 to 2,500 mm
- ▶ Volume flow rate V. max. 400,000 m³/h
- ▶ Total pressure increase pt max. 2,600 Pa
- ▶ M-D style: air direction with motor in outlet, with direct drive. Impeller assembled directly on the motor shaft
- ▶ Can be installed horizontally and vertically in the building and outdoors.
- ▶ Corrosion protection category up to C5M possible
- ▶ Casing available in all RAL colours

X Application

- ▶ Ventilation fan for supply or exhaust air
- ▶ Free inlet or connected to the pipeline on the inlet side
- ▶ Free outlet or connected to the pipeline on the outlet side

◊ Variants

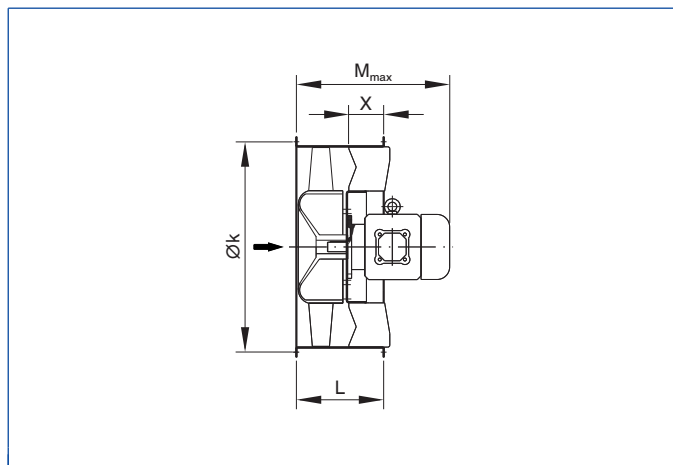
- ▶ Temperature limits
For ISO-F motors: 60°C
For ISO-H motors: 80°C
Up to 130°C with special motors
- ▶ Fan for conveying potentially explosive media as per Directive 94/9/EC (ATEX 95)
II 2/2 G c IIC + H2 T3 or
II 2/2 G c IIB + H2 T4 (pressure-resistant encased motor for rotary speed regulation via frequency inverter) reg. no. PTB 08 ATEX D074
- ▶ Design as wall-mounted fan with wall mounting plate and outlet casing with self-powered multileaf damper
- ▶ Version with V-belt drive AXN 12/56 R1 and R2
- ▶ Swing-out version AXN 12/56 MA

& Accessories

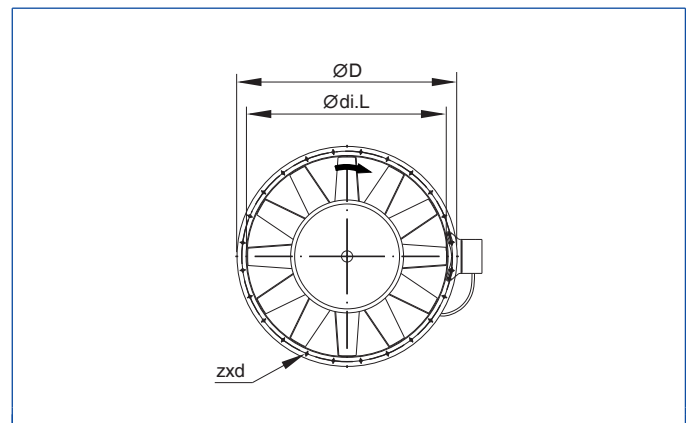
- ▶ Roof cowl DAX
- ▶ Volume flow rate measuring unit VME
- ▶ Shock pulse bearing monitoring STI
- ▶ Thermal motor protection
- ▶ Acoustic and thermal insulation
- ▶ Weather protection roof for acoustic and thermal insulation
- ▶ Round silencers TSR (inlet and outlet side)
- ▶ Round silencers TSR with interior core (inlet and outlet side)
- ▶ Extension duct

- ▶ Inspection hatch
- ▶ Self-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Bellmouth
- ▶ Cover grille (inlet and outlet side)
- ▶ Spark protection plate
- ▶ Diffuser
- ▶ Diffuser with interior core
- ▶ Outlet duct with cover grille
- ▶ Mounting feet (for horizontal assembly)
- ▶ Brackets (for vertical assembly)
- ▶ Spring anti-vibration mounts
- ▶ Rubber anti-vibration mounts
- ▶ Local isolator attached (terminal box not required)
- ▶ Angular wall ring with brackets (inlet and outlet side)
- ▶ Flow redresser
- ▶ V-belt drive
- ▶ Silicone-free type

AXN 12/56



AXN 12/56



Dimensions [mm]

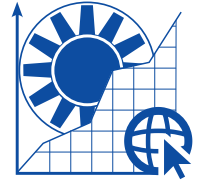
①	Ø clear width	Øk	ØD	Zxd	L	X	M _{max}	③
250	254	286	310	6 x 7	125	62	275	4
280	286	322	352	8 x 9.5	135	64	310	5
315	320	356	386	8 x 9.5	150	71	320	6.5
355	359	395	425	8 x 9.5	165	77	370	8
400	401	438	468	12 x 9.5	188	88	430	12
450	450	487	517	12 x 9.5	200	88	440	14
500	504	541	571	12 x 9.5	225	100	540	18
560	565	605	643	16 x 11.5	242	100	560	26
630	634	674	712	16 x 11.5	286	128	570	33
710	711	751	789	16 x 11.5	305	128	700	45
800	797	837	875	24 x 11.5	350	150	780	56
900	894	934	972	24 x 11.5	373	149	930	74
1000	1003	1043	1081	24 x 11.5	415	165	960	93
1120	1124	1174	1214	24 x 11.5	450	170	1200	120
1250	1261	1311	1351	24 x 11.5	500	185	1230	145
1400	1415	1465	1545	24 x 11.5	560	204	1020	460
1600	1587	1637	1717	32 x 11.5	630	230	1070	570
1800	1780	1830	1910	32 x 11.5	⊗	⊗	⊗	⊗
2000	1997	2047	2167	32 x 11.5	⊗	⊗	⊗	⊗

① Nominal size; an extension duct may be needed for different sizes in the case of vibration-dampened installation •

③ Weight without motor (approx.) [kg] •

⊗ Upon request





Axial fans with direct drive for building ventilation and aeration

+ Features

- ▶ Suitable in horizontal and vertical style.
- ▶ Increase in pressure coefficients due to optimised outlet guide vanes.
- ▶ The impeller blades can be steplessly adjusted without any need to disassemble the impeller. This adjustment option allows the user to make extensive adjustments to the relevant operating point, as well as subsequent motor rating corrections.
- ▶ High pressure coefficients enable low circumferential speeds and therefore low-noise operation
- ▶ Compact size enables installation even when space is tight
- ▶ M-D style - with direct drive, with motor in outlet. Impeller assembled directly on the motor shaft
- ▶ Upon request for higher pressures, or emergency mode / redundancy even possible in two-stage ZAXN-KSE 12/56 series
- ▶ Efficiency up to 89%
- ▶ Casing available in all RAL colours
- ▶ 12 sizes
- ▶ Impeller's nominal \varnothing 400 to 1,600 mm
- ▶ Volume flow rate V . max. 400,000 m^3/h
- ▶ Total pressure increase p_t max. 2,600 Pa



X Application

- ▶ Supply or exhaust air as round duct fan
- ▶ Free inlet or connected to the pipeline on the inlet side
- ▶ Free outlet or connected to the pipeline on the outlet side
- ▶ Advanced stable characteristic curve due to characteristic curve stabiliser unit

◇ Variants

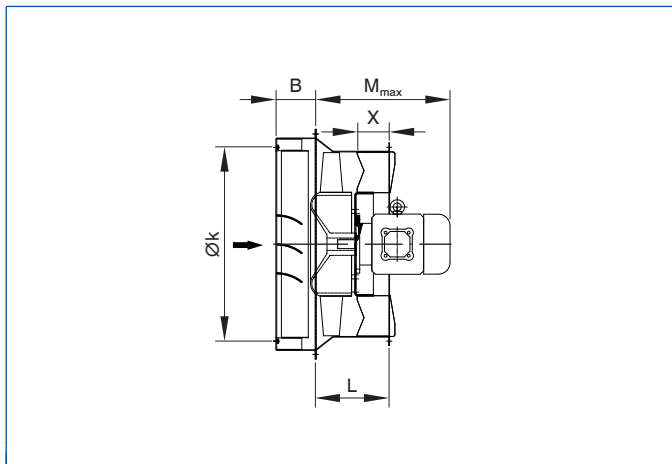
- ▶ Temperature limits
For ISO-F motors: 60°C
For ISO-H motors: 80°C.

& Accessories

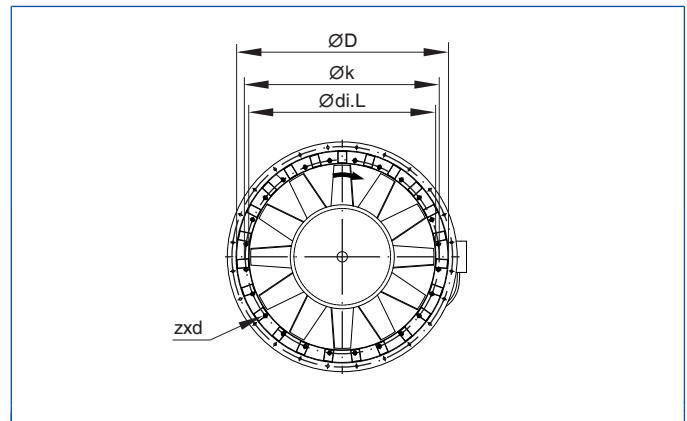
- ▶ Shock pulse bearing monitoring STI
- ▶ Thermal motor protection
- ▶ Round silencers TSR (inlet and outlet side)
- ▶ Round silencers TSR with interior core (inlet and outlet side)
- ▶ Extension duct
- ▶ Inspection hatch
- ▶ Self-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Bellmouth
- ▶ Bellmouth pulled back when space is tight, e.g. in smoke pressure units (SPUs)

- ▶ Cover grille (inlet and outlet side)
- ▶ Diffuser
- ▶ Diffuser with interior core
- ▶ Outlet duct with cover grille
- ▶ Mounting feet (for horizontal assembly)
- ▶ Brackets (for vertical assembly)
- ▶ Spring anti-vibration mounts
- ▶ Rubber anti-vibration mounts
- ▶ Local isolator attached (terminal box not required)
- ▶ Angular wall ring with brackets (inlet and outlet side)
- ▶ Flow redresser
- ▶ Silicone-free type
- ▶ Surface protection powder-coated and/or hot-dip galvanised in corrosion protection category C2 to C5M

AXN-KSE 12/56



AXN-KSE 12/56



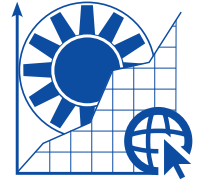
Dimensions [mm]

①	Ø clear width	Øk	ØD	Zxd	L	X	M _{max}	③
400	401	438	468	12 x 9.5	176	90	88	430
450	450	487	517	12 x 9.5	190	101	88	440
500	504	541	571	12 x 9.5	206	110	100	540
560	565	605	643	16 x 11.5	216	124	100	560
630	634	674	712	16 x 11.5	258	137	128	570
710	711	751	789	16 x 11.5	275	153	128	700
800	797	837	875	24 x 11.5	319	172	150	780
900	894	934	972	24 x 11.5	333	195	149	930
1000	1003	1043	1081	24 x 11.5	372	217	165	960
1120	1124	1174	1214	24 x 11.5	403	244	170	1200
1250	1261	1311	1351	24 x 11.5	445	271	185	1230
1400	1415	1465	1545	24 x 11.5	1190	303	764	-
1600	1587	1637	1717	32 x 11.5	1333	343	860	-

① Nominal size; an extension duct may be needed for different sizes in the case of vibration-dampened installation •

③ Weight without motor (approx.) [kg]





Axial fans with direct drive for building ventilation and aeration

+ Features

Based on two fans connected in series, suitable for underground car park extract air (66% redundancy in emergency mode)

- ▶ Suitable in horizontal and vertical style.
- ▶ The desired operating point is achieved with the best efficiency due to the optional number of blades (6 / 9 / 12).
- ▶ Optimised outlet guide vanes for increasing the pressure coefficients, so low-noise operation due to low circumferential speed
- ▶ Extensive adjustments to the relevant operating point and subsequent motor rating corrections can be made by steplessly adjusting the impeller blades without any need to disassemble the impeller
- ▶ The total pressure increase is double that of single fans.
- ▶ Casing available in all RAL colours
- ▶ 15 sizes
- ▶ Impeller's nominal diameter 315 to 1,600 mm
- ▶ Volume flow rate 400,000 m³/h max.
- ▶ Total pressure increase max. 4,500 Pa

Application

- ▶ Supply or exhaust air as round duct fan
- ▶ Free inlet or connected to the pipeline on the inlet side
- ▶ Free outlet or connected to the pipeline on the outlet side

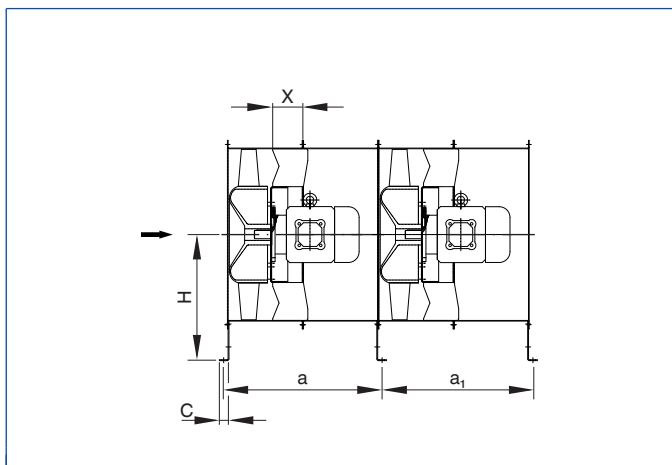
& Accessories

- ▶ Volume flow rate measuring unit VME
- ▶ Shock pulse bearing monitoring STI
- ▶ Thermal motor protection
- ▶ Acoustic insulation
- ▶ Weather protection roof for acoustic insulation
- ▶ Round silencers TSR (inlet and outlet side)
- ▶ Round silencers TSR with interior core (inlet and outlet side)
- ▶ Extension duct
- ▶ Inspection hatch
- ▶ Self-powered shut-off damper
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Equipotential bonding
- ▶ Bellmouth

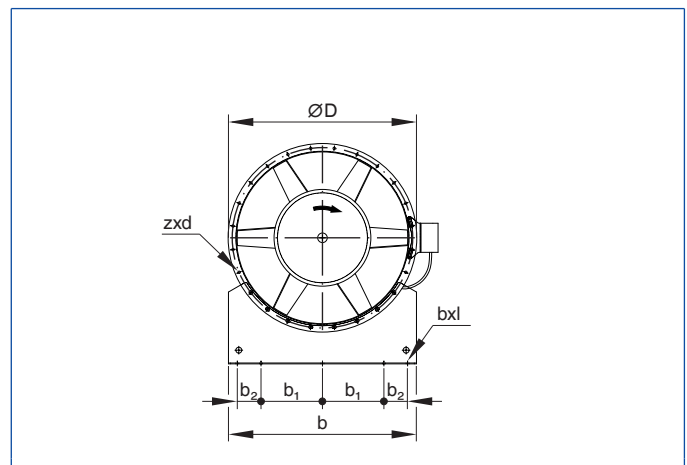
- ▶ Cover grille (inlet and outlet side)
- ▶ Diffuser
- ▶ Diffuser with interior core
- ▶ Outlet duct with cover grille
- ▶ Mounting feet (for horizontal assembly)
- ▶ Brackets (for vertical assembly)
- ▶ Spring anti-vibration mounts
- ▶ Rubber anti-vibration mounts
- ▶ Local isolator attached (terminal box not required)
- ▶ Angular wall ring with brackets (inlet and outlet side)
- ▶ Flow redresser
- ▶ Silicone-free type
- ▶ Surface protection powder-coated and/or hot-dip galvanised in corrosion protection category C2 to C5M



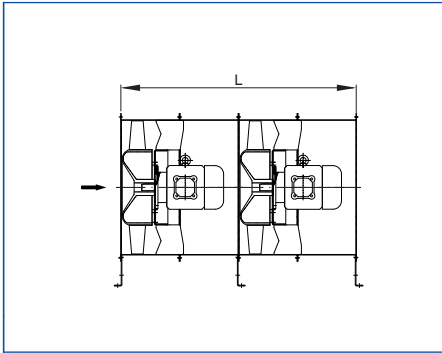
ZAXN12/56



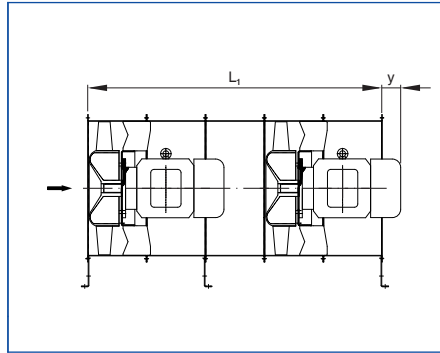
ZAXN12/56



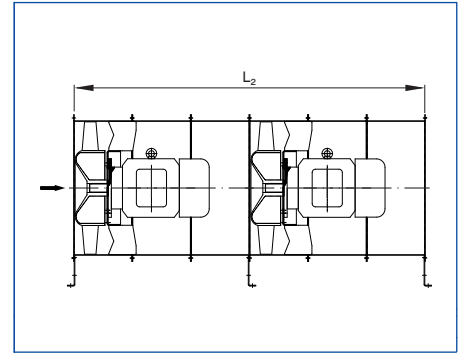
ZAXN12/56



ZAXN12/56



ZAXN12/56



Principal dimensions

①	Ø clear width	Øk	ØD	zxd	H	a	a ₁	c	b	b ₁	b ₂	② w x l
315	320	356	386	8 x 9.5	240	328	302	35	356	68	80	12 x 20
355	359	395	425	8 x 9.5	270	356	330	35	398	88	80	12 x 20
400	401	438	468	12 x 9.5	300	406	379	37	438	104	80	12 x 20
450	450	487	517	12 x 9.5	335	430	400	37	487	124	80	12 x 20
500	504	541	571	12 x 9.5	375	480	453	37	541	151	80	12 x 20
560	565	605	643	16 x 11.5	420	519	483	45	605	183	80	12 x 20
630	634	674	712	16 x 11.5	470	607	575	45	674	203	100	12 x 20
710	711	751	789	16 x 11.5	525	645	613	45	721	210	110	12 x 20
800	794	837	875	24 x 11.5	585	735	703	45	872	285	110	14 x 22
900	894	934	972	24 x 11.5	655	785	753	45	860	225	160	14 x 22
100	1003	1043	1081	24 x 11.5	730	881	833	57	940	265	160	14 x 22
1120	1124	1174	1214	24 x 11.5	760	951	903	57	1184	380	160	14 x 22
1250	1261	1311	1251	24 x 11.5	855	1051	1003	57	1321	465	160	14 x 22
1400	1415	1465	1545	24 x 11.5	⊗	⊗	⊗	⊗	1475	520	165	14 x 22
1600	1587	1637	1717	32 x 11.5	⊗	⊗	⊗	⊗	1649	615	160	18 x 25

- ① Nominal size •
- ② Slotted hole width x length •
- ⊗ Upon request



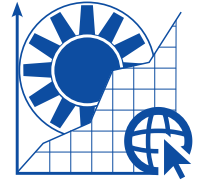
Dimensions dependent on the number of extensions

①	②	L	④	②	L ₁ ¹⁾	y	④	②	L ₂ ¹⁾	④
315	71	600	20	80	750	12	25	80	900	29
355	80	660	25	90	825	8	30	90	990	35
400	90	752	36	112	940	54	43	112	1128	51
450	90	800	43	112	1000	34	52	112	1200	62
500	112	900	56	132	1125	81	68	132	1350	80
560	112	968	82	132	1210	64	99	132	1452	117
630	132	1144	150	-	-	-	-	-	-	-
710	132	1220	130	160	1525	112	152	160	1830	174
800	132	1400	164	180	1750	104	198	180	2100	232
900	132	1492	220	225	1865	78	264	225	2238	309
100	160	1660	274	225	2075	113	329	225	2490	383
1120	180	1800	380	280	2250	180	425	280	2700	470
1250	200	2000	450	280	2500	115	500	280	3000	550
1400	180	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
1600	225	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗

¹⁾ Additional empty ducts are required here, so the a + a₁ dimensions change

- ① Nominal size •
- ② Max. motor size •
- ④ Weight without motors •
- ⊗ Upon request





Axial fans with direct drive for building ventilation and aeration

+ Features

This series has the highest fan efficiency and therefore the lowest electricity consumption out of all the fans in its performance class. It is over 50% more efficient than normal round duct fans. Roughly 70% to 90% of a fan's total costs can be attributed to electricity costs. These costs are cut by more than 30% with GLDF fans! What's more, the GLDF series is surprisingly affordable despite its good product properties.

Its extraordinary performance data, and particularly its high fan efficiency, are due to the profiled blade shape and the continuous meridian channel. This results in very low-loss energy conversion in the fan

- ▶ 10 sizes
- ▶ Volume flow rate V max. approx. 20,000 m³/h
- ▶ The sizes 560, 630 and 710 can also be operated directly on the 400 V / 50 Hz three-phase supply

Application

- ▶ Axial ventilation fan (supply and exhaust air) for installation in pipeline
- ▶ Installation / suspension in the building.

◊ Variants

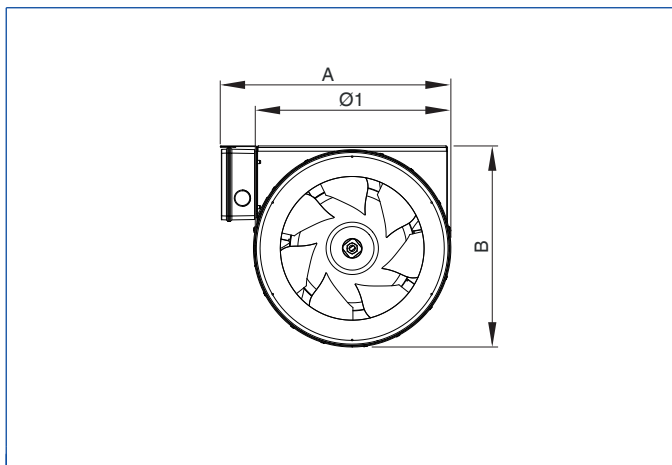
- ▶ 1 ~ 230V - 50 Hz motor
- ▶ 3 ~ 400V - 50 Hz three-phase current motor (can be controlled using a frequency inverter)
- ▶ 1 ~ 230V - Hz EC motor

& Accessories

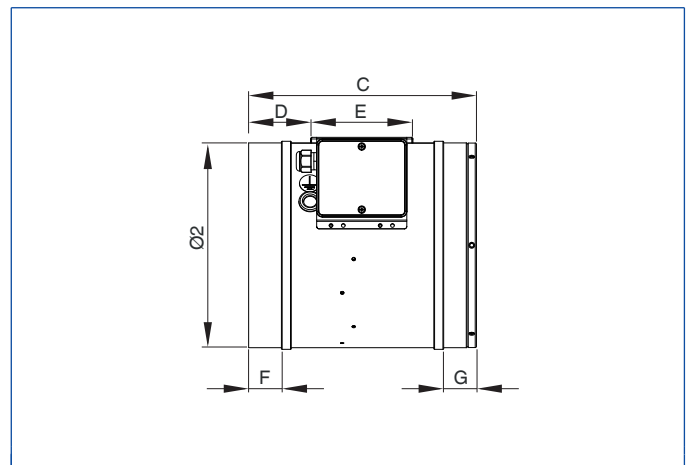
- ▶ Installation bracket
- ▶ Connection sleeve
- ▶ Cover grille
- ▶ Duct with self-powered shut-off damper
- ▶ Round silencers, rigid
- ▶ Round silencers, flexible
- ▶ Adapter plate (bridge between duct / pipe)
- ▶ Filter box with pocket filter F5 and hot water heating coils
- ▶ Filter box for pocket filter (without filter)
- ▶ Filter box with fleece G3
- ▶ 5-stage transformer (AP)
- ▶ 7-stage transformer (UP)
- ▶ EC controller
- ▶ Frequency inverter
- ▶ Local isolator, loose



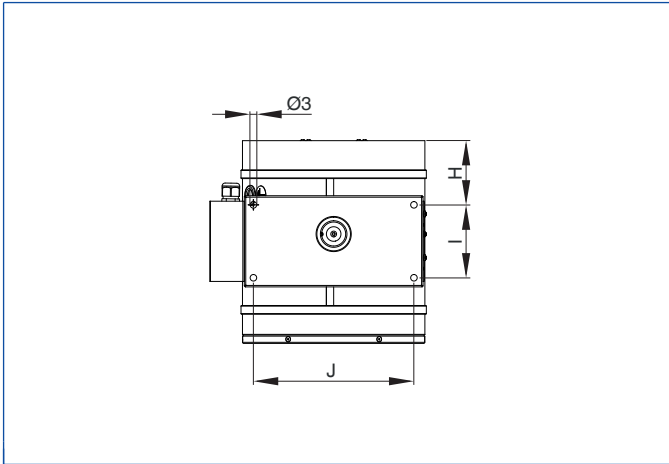
GLDF



GLDF



GLDF



Dimensions [mm]

①	A	B	C	D	E	F	G	H	I	J	Ø1	Ø2	Ø3
AX 200 E2 01	199	205±2	225±1					129±3	96±3	180±1.5	204	201±1	9
AX 250 E2 01	297±2	259±2	278±1	76±1	125	40±1	40±1	88±1	100	220	254±2	250±1	9
AX 250 E2 06		259±2	215±1			30±1	40±1	59±1	90	220	254±1	250±1	9
AX 280 E2 02	322±2	290±2	308±1	78±1	145	40±1	40±1	91±1	120	239	285±2	281±1	9
AX 315 E2 01	349±2	324±2	351±1	82±1	185	40±1	40±1	94±1	160	260	319±2	315±1	9
AX 315 E2 03	337±2	319±2	308±1	74±1	150	35±3	35±3	89±1	120	239±1		315±1	9
AX 355 E2 01	389±2	363±2	396±1	97±1	200	40±1	40±1	110±1	175	300	358	354±1	9
AX 355 E4 01	389±2	363±2	396±1	97±1	200	40±1	40±1	110±1	175	300	358±2	354±1	9
AX 400 E4 01	307±2	432±2	416±3	55±1	250	40±1	72±1	70±1	220	275	407±2	403±1	9
AX 450 E4 01	357±2	467±2	467±3	85±1	280	70±1	72±1	100±1	250	310	457±2	453±1	9
AX 500 E4 01	398±2	512±2	516±3	88±1	290	70±1	72±1	108±1	250	360	507±2	504±1	9
AX 560 E4 01	468±2	573±2	582±3	115±1	290	70±1	72±1	135±1	250	440	568±2	564±1	9
AX 630 E4 01	538±2	643±2	654±3	156±1	340	70±1	72±1	181±1	290	490	638±2	634±1	9

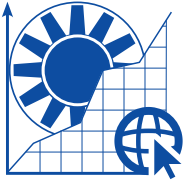
① Nominal size; an extension duct may be needed for different sizes in the case of vibration-dampened installation



Ventilation centrifugal fans

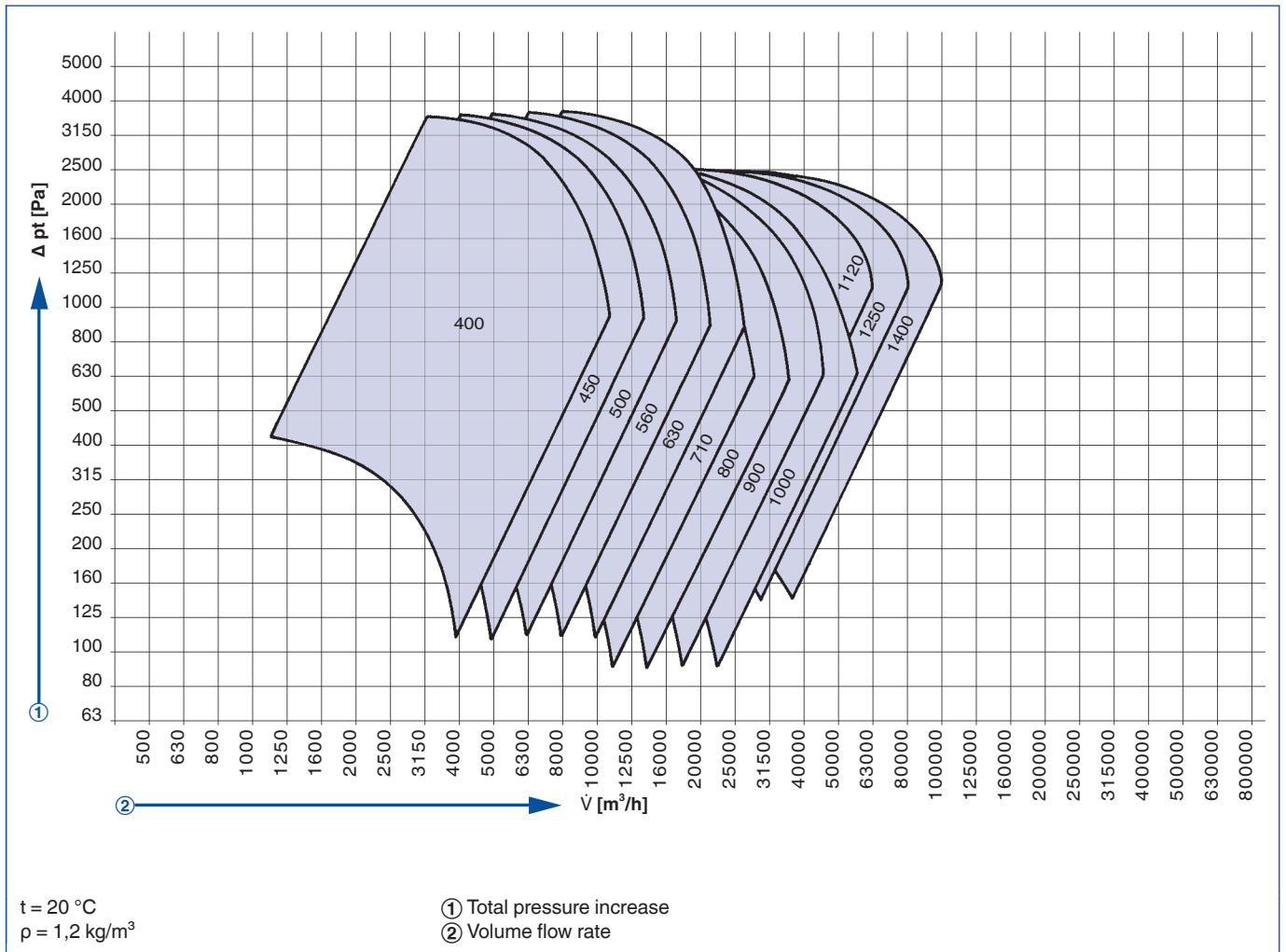
	Specifications			
	REH		RZH	
	REH - R	REH - M / REH-K	9/400	KFB
Flow current temperature				
Max. 80°C	●	●	●	●
Max. 250°C	○	○		○
Motor type				
Single-speed	●	●	●	●
Dual-speed	●	●	●	
Suitable for operation on a frequency inverter	●	●	●	●
Technical type				
Single inlet	●	●		●
Double inlet)			●	
Belt drive	●		●	
Direct driven		● REH-K via coupling		●
Explosion Protection Directive 94/9/EC - "2014/34/EU" as of 01/2016	○	○	○	○
Casing orientation (RD/LG - 0 - 90° - 180° - 270°)	●	●	●	●
Casing split horizontally	● As of NG 710	● As of NG 710	● As of NG 710	
Motor outside of flow	●	●	●	●
Technical data				
Max. volume flow rate (m³/h)	100,000	100,000	200,000	7,200
Max. pressure (Pa)	3,500	3,500	3,500	1,350
Max. drive capacity (kW)	110	110	132	2.1
Nominal sizes (mm)	400-1.400	400-1.400	400-1.400	200-400
Material				
Impeller	Steel	Steel	Steel	Steel
Casing	Steel	Steel	Steel	Steel
Accessories				
Volume flow rate measuring unit VME	●	○	○	
Shock pulse bearing monitoring STI	○	○	○	
Acoustic and thermal insulation	○	○		
Insulation for outdoor installation	○	○		
Weather protection for motor (and belt drive)	○	○		○
Rubber anti-vibration mounts	○	○	○	
Spring anti-vibration mounts	○	○	○	
V-belt protective casing	●		●	
Rotary speed measurement port	○	○	○	
Flexible connectors	○	○	○	
Matching flange	○	○	○	
Inspection hatch	○	○	○	
Lubrication line	○	○	○	
Cover grille (inlet side)	○	○	○	
Outlet duct with cover grille	○	○		
Condensate drain	○	○	○	
Motor terminal box	●	●	●	●
Local isolator, loose	○	○	○	○
Surface protection				
Corrosion protection category C2	●	●	●	●
Corrosion protection category C3	○	○	○	
Corrosion protection category C4	○	○	○	
Corrosion protection category C5		○		
Explanation				
● - Standard				
○ - Optional				





Centrifugal fans for building ventilation and aeration

REH Performance Range



+ Features

High-performance impeller made of sheet steel with backward curved blades.

The impellers have GG screw-on hubs with taper lock steel clamping bushes.

Steel weld-in hubs are used as of size 1120.

Bellmouth aerodynamically optimised

- ▶ 16 sizes (nominal size: 315 to 1600)
- ▶ Volume flow rate V max. 100,000 m³/h
- ▶ Total pressure increase max. 3,500 Pa
- ▶ Four casing orientations available (0°, 90°, 180°, 270°).
- ▶ Can also be used for process exhaust air:
- ▶ Explosion protection as per ATEX up to Ex II 2/2 G c IIB T4
- ▶ Hot gas up to T max. +250°C constant temperature

Application

Ventilation fan for duct / pipe connection on both sides or free outlet

Can be installed in the building or outdoors

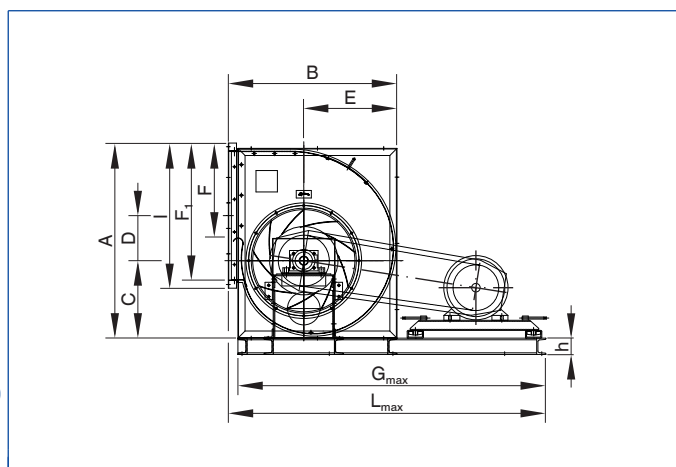
Variants

- ▶ M style with direct drive
- ▶ R style with V-belt drive
- ▶ K style with coupling drive

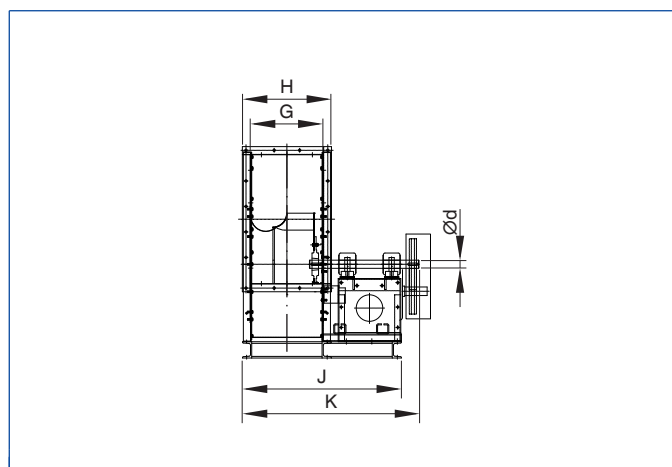
& Accessories

- ▶ Volume flow rate measuring unit VME
- ▶ Shock pulse bearing monitoring STI
- ▶ Vibration monitoring
- ▶ Acoustic and thermal insulation
- ▶ Insulation for outdoor installation
- ▶ Weather protection for motor (and belt drive)
- ▶ Rubber anti-vibration mounts
- ▶ Spring anti-vibration mounts
- ▶ V-belt drive
- ▶ V-belt protective casing
- ▶ Rotary speed measurement port
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Inspection hatch
- ▶ Lubrication line
- ▶ Cover grille (inlet side)
- ▶ Outlet duct with cover grille
- ▶ Condensation drainage nozzle
- ▶ Motor terminal box
- ▶ Local isolator
- ▶ Explosion protection
- ▶ Temperature-resistant design

REH



REH



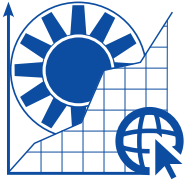
Dimensions [mm]

①	A	B	C	D	E	F	F1	G	G max	H	I	J	K	L max	②
315	632	553	255	146	306	269	402	226	1155	296	462	545	718	1155	38
400	776	670	306	179	369	340	502	282	1555	362	582	615	998	1600	46
450	874	755	351	202	410	380	562	317	1605	397	642	652	936	1650	65
500	957	827	380	221	457	425	632	357	1805	437	712	747	1028	1850	88
560	1070	920	427	247	509	477	712	402	1905	482	792	790	1072	1950	95
630	1211	1026	479	291	574	550	802	452	2005	532	882	842	1129	2050	130
710	1343	1152	539	313	647	600	899	499	2300	583	983	931	1198	2300	210
800	1505	1289	604	359	726	673	999	559	2400	643	1083	991	1245	2400	250
900	1702	1443	674	407	811	755	1119	629	2600	753	1243	1080	1372	2600	340
1000	1872	1577	746	433	894	848	1249	709	2800	833	1373	1329	1455	2800	460
1120	2350	2072	974	813	1162	926	1002	802	3170	922	1122	1438	1563	3300	700
1250	2625	2320	1088	911	1298	1044	1122	902	3670	1028	1248	1733	1908	3800	1000
1400	2930	2600	1218	1023	1455	1160	1252	1002	3970	1128	1378	1834	2025	4100	1500
1600	3269	2896	1357	1148	1611	1305	1402	1122	4270	1248	1522	2042	2220	4400	1850

① Nominal size •

② Weight without motor, without base frame (approx.) [kg] •





Centrifugal fans for building ventilation and aeration

+ Features

Especially developed for the tough operating conditions of a kitchen extract air fan. The impellers used with backward curved blades are insensitive to fatty deposits. They are also more efficient, which means the operating costs and the investment costs for the transformer control unit are much lower.

- ▶ 5 sizes
- ▶ From 200 to 400 mm
- ▶ Volume flow rate V max. approx. 7,200 m³/h

Application

- ▶ Centrifugal ventilation fan (supply and exhaust air), particularly for extracting air from kitchens
- ▶ Can be installed indoors and outdoors

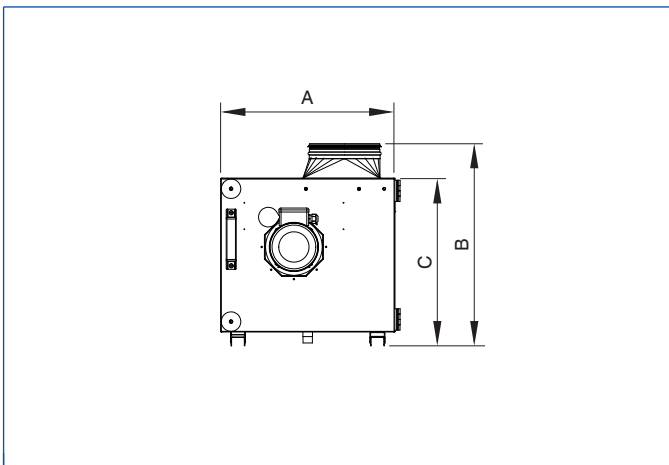
& Accessories

- ▶ Wall bracket
- ▶ Connection sleeve
- ▶ Duct with self-powered shut-off damper
- ▶ Weather hood for motor
- ▶ 5-stage transformer (AP)
- ▶ 7-stage transformer (UP)
- ▶ Frequency inverter
- ▶ Local isolator, loose

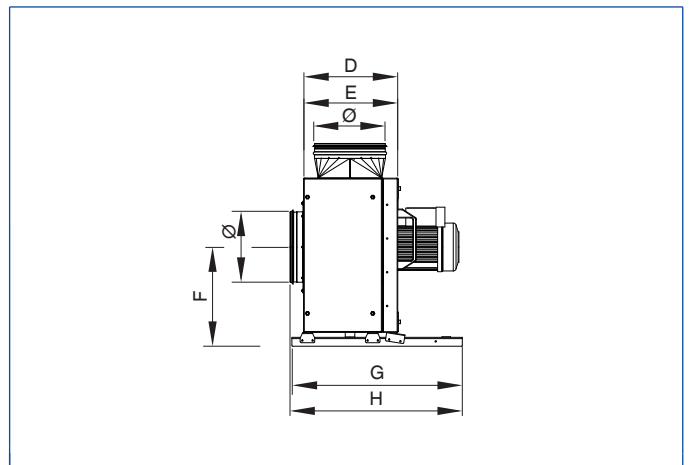
ISO Classification, standards and guidelines

- ▶ Satisfies VDI Guidelines 2078 and 2052

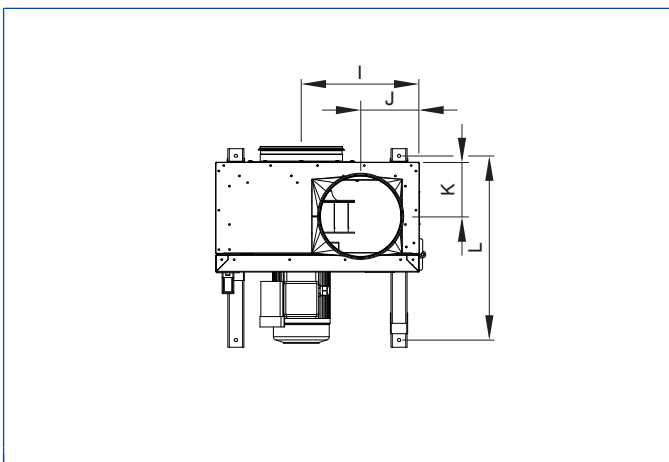
KFB



KFB



KFB

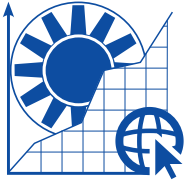


Dimensions [mm]

①	A	B	C	D	F	G	H	I	J	K	L	Ø
225 E2 20	492	571	474	475	279	480	485	285	142	131	445	199
250 E2 20	592	690	561	548	329	540	567	344	166	156	505	249
280 E2 20	592	692	561	567	329	540	568	344	200	156	505	314
315 E2 20	700	790	663	669	382	590	611	405	220	181	555	354
400 E4 20	832	916	789	592	448	590	611	477	220	181	555	354
450 E4 20	832	916	789	637	448	590	611	477	220	181	555	354
500 E4 20	1016	1092	954	823	539	834	871	584	242	253	799	399
560 D4 10	884		930	820±10	487	730	766	500	217	215	695	399

① Nominal size





Centrifugal fans for building ventilation and aeration



Features

High-performance impeller made of sheet steel with backward curved blades. Bellmouth aerodynamically optimised.

Welding robots for consistent impeller precision

- ▶ 12 sizes
- ▶ Impeller's nominal \varnothing 400 to 1,400
- ▶ Volume flow rate V max. 200,000 m³/h
- ▶ Total pressure increase p1 max. 3,500 Pa
- ▶ Four casing orientations available (0°, 90°, 180°, 270°)



Application

- ▶ Ventilation fan for installation in VAC units and/or air-conditioning chambers
- ▶ Free inlet



Variants

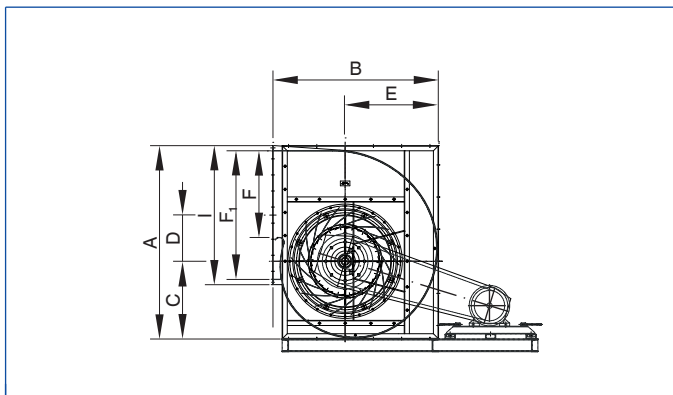
- ▶ R - 39 style (light bearing)
- ▶ R - 38 style (heavy bearing)



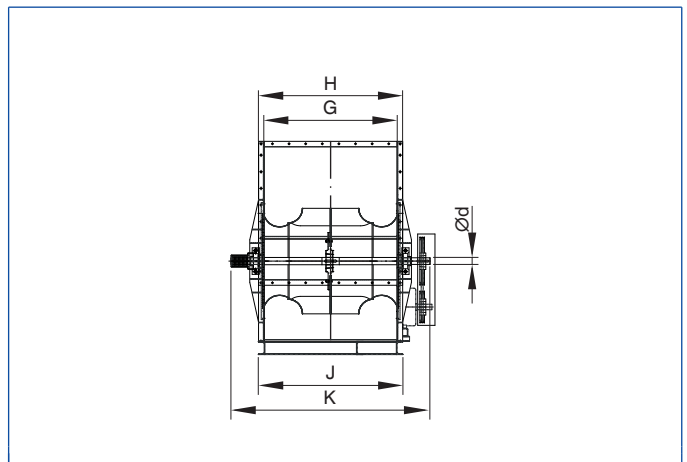
Accessories

- ▶ Shock pulse bearing monitoring STI
- ▶ Rubber anti-vibration mounts
- ▶ Spring anti-vibration mounts
- ▶ V-belt drive
- ▶ V-belt protective casing
- ▶ Rotary speed measuring port in the V-belt protection box
- ▶ Flexible connectors
- ▶ Matching flange
- ▶ Inspection hatch
- ▶ Lubrication line for fan bearing
- ▶ Cover grille (inlet side)
- ▶ Condensation drainage nozzle
- ▶ Local isolator

RZH



RZH



Dimensions [mm]

①	A	B	C	D	E	F	F ₁	G	H	J	K	Ød	③
400	776	670	306	179	369	340	502	502	582	578	822	②	55
450	874	755	351	202	410	380	562	562	642	642	930	②	75
500	957	827	380	221	457	425	632	632	712	708	1050	②	100
560	1070	920	427	247	509	477	712	712	792	784	1080	②	125
	1070	920	427	247	509	477	712	712	792	784	1180④	②	125
630	1211	1026	479	291	574	550	802	802	882	878	1200	②	160
	1211	1026	479	291	574	550	802	802	882	878	1250④	②	160
710	1343	1152	539	313	647	600	899	899	983	984	1397	②	240
800	1505	1290	604	359	727	673	999	999	1083	1084	1497	②	290
900	1702	1443	674	407	811	755	1119	1119	1243	1224	1650	②	390
1000	1871	1577	746	438	894	848	1249	1249	1373	1364	1786	②	520
1120	2350	2072	974	813	1162	1002	-	1402	1522	1530	1750	②	855
1250	2625	2320	1088	911	1297	1122	-	1602	1728	1730	1969	②	1200
1400	1930	2600	1218	1023	1455	1252	-	1802	1928	1970	2240	②	1890

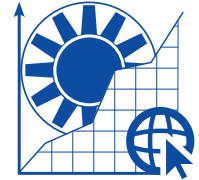
- ① Nominal size •
- ② To be defined acc. to order •
- ③ Weight without motor, base frame and V-belt drive (approx.) [kg]
- ④ Mirror-inverted casing orientation



Ventilation plug fans

	Specifications			
	ER	ERV	ERK	ERM
Flow current temperature				
Max. 60°C		●	●	●
Max. 100°C		○	○	○
Max. 250°C	●			
Motor type				
Single-speed	●	●	●	●
Dual-speed	●	●	●	●
Suitable for operation on a frequency inverter	●	●	●	●
Technical type				
H style (horizontal installation)		●		
V A style (vertical installation)		●		
V B style (vertical suspension)				●
Direct driven		●	●	●
Explosion Protection Directive 94/9/EC - *2014/34/EU as of 01/2016	○	○	○	○
Base frame		●	●	
Motor in airflow		●	●	
Technical data				
Max. volume flow rate	140,000 m³/h	140,000 m³/h	140,000 m³/h	140,000 m³/h
Max. pressure	3,150 Pa	3,150 Pa	3,150 Pa	3,150 Pa
Max. drive capacity				
Nominal sizes [mm]	200-1.600	200-1.600	400-1.600	400-1.600
Material				
Impeller	Steel	Steel	Steel	Steel
Installation frame	Steel	Steel	Steel	Steel
Accessories				
Volume flow rate measuring unit VME	○	○	○	○
Flexible connector <small>(inlet side)</small>	○	○	○	
Matching flange <small>(inlet side)</small>	○	○	○	
Cover grille <small>(inlet side)</small>	○	○	○	○
Spring anti-vibration mounts	○	○	○	
Rubber anti-vibration mounts	○	○	○	
Motor terminal box	●	●	●	●
Thermal motor protection	○	○	○	○
Frequency inverter	○	○	○	○
Surface protection				
Corrosion protection category C2	●	●	●	●
Corrosion protection category C3	○	○	○	○
Corrosion protection category C4	○	○	○	○
Corrosion protection category C5	○	○	○	○
Temperature-resistant lacquer paint finish				○
Explanation				
● - Standard				
○ - Optional				





Centrifugal fans for industrial drying systems and other applications

+ Features

Bellmouth calibrated as a measuring element for volume flow rate measurements. The characteristic curves have a steep, stable progression with a wide design range and high efficiency progression. On average, the total acoustic power level of the centrifugal plug-in fans is 5 dB lower than the value of the dual-inlet casing fans with comparable flow cross-sections

- ▶ 19 sizes
- ▶ Impeller's nominal \varnothing 200 to 1,600 mm
- ▶ Volume flow rate V max. 140,000 m³/h
- ▶ Stat. differential pressure ps max. 3,150 Pa
- ▶ Peak efficiency of 76%
- ▶ Due to a high delivery coefficient, the fan can be used in a highly efficient manner across a large volume flow rate bandwidth
- ▶ Impeller also suitable for installation in dryers up to a conveying temperature of +250°C
- ▶ In connection with installation frame (motor outside of flow)

Application

- ▶ Ventilation fan for installation in VAC units and/or air-conditioning chambers.
- ▶ Free inlet.
- ▶ Can be installed horizontally or vertically

◊ Variants

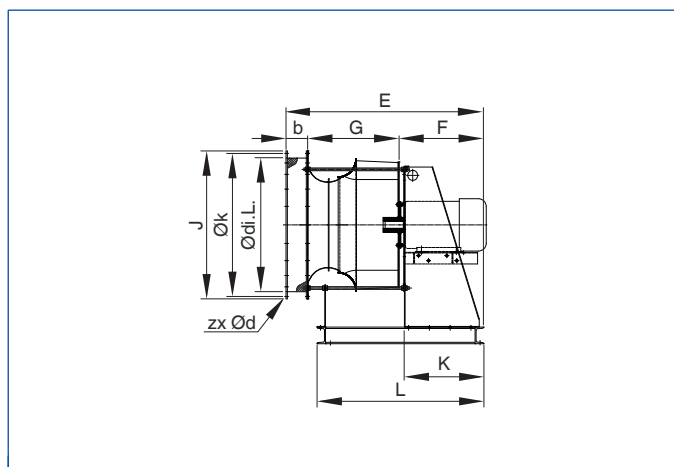
- ▶ Horizontal installation: ERV 23/1.0 and 23/1.2-FU-H
- ▶ Vertical installation: ERV 23/1.0 and 23/1.2 FL-VA/VB

& Accessories

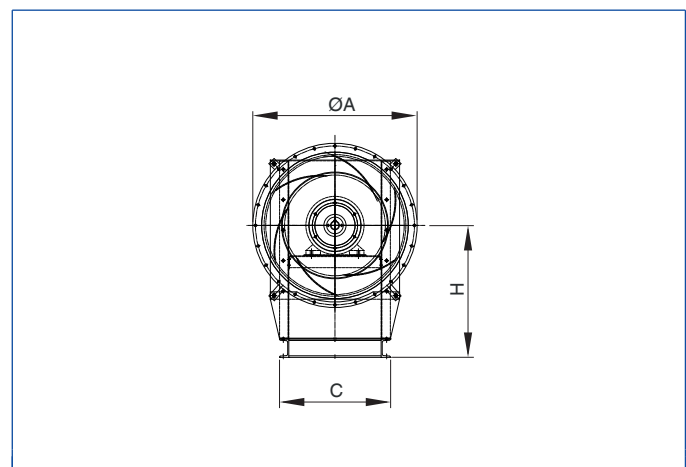
- ▶ Volume flow rate measuring unit VME
- ▶ Flexible connectors (inlet side)
- ▶ Matching flange (inlet side)
- ▶ Cover grille (inlet side)
- ▶ Spring anti-vibration mounts
- ▶ Rubber anti-vibration mounts
- ▶ Frequency inverter



BVERV / ERV



BVERV / ERV



Dimensions [mm]

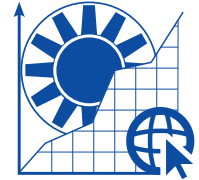
①	Ø A	H	C	Ø clear width	approx. E	F	G	b	approx. J	K	L	Øk	② z x Ød	
200	255	225	290	205	520	259	141	180	353	240	400	235	6	7
224	279	225	290	228	596	259	157	180	365	240	400	259	6	7
250	306	250	290	256	617	258	179	180	403	240	420	286	6	7
280	348	250	290	288	639	260	202	180	426	240	420	322	8	10
315	386	285	350	322	710	310	220	180	478	285	500	356	8	10
355	425	320	350	361	733	310	249	180	533	285	500	395	8	10
400	468	360	435	404	860	410	270	180	594	385	675	438	12	10
450	517	400	435	453	895	410	308	180	650	385	675	487	12	10
500	571	450	435	507	940	415	345	180	736	385	705	541	12	10
560	643	530	480	569	998	430	389	180	852	405	730	605	16	12
630	712	570	480	638	1046	430	436	180	926	405	730	674	16	12
710	814	640	480	714	1186	510	496	180	1047	475	900	775	16	14
800	904	715	600	804	1240	510	550	180	1167	475	1000	861	24	14
900	1004	800	650	904	1478	680	618	180	1302	645	1150	958	24	14
1000	1105	900	650	1005	1545	680	685	180	1453	645	1115	1067	24	14
1120	1125	1000	780	1005	1679	740	734	205	1553	710	1350	1067	27	14
1250	1245	1125	780	1125	1788	745	838	205	1755	710	1450	1200	32	18
1400	1385	1260	880	1255	2040	875	960	205	1948	815	1775	1337	32	18
1600	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗

① Nominal size; an extension duct may be needed for different sizes in the case of vibration-dampened installation •

② Number of holes z x Ød •

⊗ Upon request





For building ventilation and aeration

+ Features

- ▶ DF series round duct fan
Seven sizes (NG 100 to 315)
Volume flow rate V max. approx. 1,990 m³/h
Space-saving pipe installation fan made of metal
Backward curved radial impeller
- ▶ DFB series round duct fan box
Eight sizes (NG 125 to 500)
Volume flow rate V max. approx. 4,480 m³/h
Soundproof pipe installation box
Very quiet
Forward curved radial impeller
Casing easy to disassemble due to quick-release catches
- ▶ GLDFB series rectangular duct fan
Five sizes
Volume flow rate V max. approx. 10,000 m³/h
Energy-optimised axial impeller with profiled blades
High efficiency levels
- ▶ EFB series extract air box
Nine sizes (NG 225 to 630)
Volume flow rate V max. approx. 16,300 m³/h
Backward curved radial impeller
Pipe connections (on inlet and outlet side)

- can be designed in a variable manner
Motor outside of flow
Integrated fat pan
Suitable for kitchen extract air (satisfies VDI 2078 and 2052)
- ▶ Different motor variants possible depending on the variant:
1 x 230V - 50 Hz motor
3 x 400V - 50 Hz three-phase current motor (can be controlled using a frequency inverter)
1 x 230V - Hz EC motor
- ▶ (Please see the product configurator for details)

X Application

- ▶ Ventilation fans for pipeline installation or duct installation.
- ▶ Partially suitable for outdoor installation.

◊ Variants

- ▶ DF series round duct fan
- ▶ DFB series round duct fan box
- ▶ GLDFB series rectangular duct fan
- ▶ EFB series extract air box

& Accessories

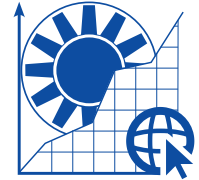
- ▶ Installation bracket
- ▶ Connection sleeve
- ▶ Cover grille
- ▶ Duct with self-powered shut-off damper
- ▶ Round silencers, rigid
- ▶ Round silencers, flexible
- ▶ Filter box with pocket filter F5 and hot water heating coils
- ▶ Filter box for pocket filter (without filter)
- ▶ Filter box with fleece G3
- ▶ Electronic controller
- ▶ 5-stage transformer (AP)
- ▶ 7-stage transformer (UP)
- ▶ Local isolator, loose



Ventilation jet fans

	Specifications					
	GAXO		GAXN		GAXR	
	6/315	6/400	12/315	9/400	5/315	5/400
Flow current temperature						
Max. 60°C	●	●	●	●	●	●
Technical type						
Outlet guide vanes			●	●		
Motor in airflow	●	●	●	●	●	●
Reversing mode					●	●
Technical data						
Thrust (principal direction mode) [N]	21/5	56/14	31/7	73/18	18/5	47/12
Thrust (reversing mode) [N]					16/4	42/10
Max. drive capacity (kW)	0.5/0.1	1.3/0.26	1.1/0.26	2.2/0.48	0.75/0.18	1.5/0.37
Nominal sizes (mm)	315	400	315	400	315	400
Direction of airflow	Unidirectional	Unidirectional	Unidirectional	Unidirectional	Bidirectional	Bidirectional
Material						
Impeller	Plastic	Plastic	Aluminium	Aluminium	Aluminium	Aluminium
Casing	Steel	Steel	Steel	Steel	Steel	Steel
Accessories						
Terminal box	●	●	●	●	●	●
Local isolator loose (max. ambient temperature)	○	○	○	○	○	○
Local isolator attached (terminal box not required)	○	○	○	○	○	○
Surface protection						
Corrosion protection category C2	●	●	●	●	●	●
Corrosion protection category C3	○	○	○	○	○	○
Corrosion protection category C4						
Corrosion protection category C5						
Explanation						
● - Standard						
○ - Optional						





For ventilation and smoke extraction

+ Features

- ▶ Ceiling suspension
- ▶ Compact, space-saving, flat style

Axial-type jet fans:

- ▶ Max. thrust up to 73 N,
- ▶ With or without outlet guide vanes (coordinated to the application),
- ▶ Unidirectional as series: GAXO-C or GAXN
- ▶ Reversible as series: BVGAXR / BVGAXR-C
- ▶ Nominal sizes: 315, 400
- ▶ Impeller made of cast aluminium or plastic, directly on the motor shaft
- ▶ Motor arranged in the flow rate,
- ▶ Terminal box assembled outside on the casing.
- ▶ Sound attenuator on the inlet and outlet side
- ▶ Edged, oval design
- ▶ Cover grille on the inlet and outlet side,
- ▶ Baffle plate on the outlet side

Centrifugal-type jet fans upon request:

- ▶ Max. thrust up to 97 N,
- ▶ Nominal sizes 50 / 75 / 100
- ▶ Unidirectional

Application

- ▶ The TROX TLT jet fan system satisfies the requirements placed on a modern and highly effective ventilation system in underground car parks and, with appropriate project planning, can be used in line with all European statutory regulations. In addition to the cost savings, more flexible installation and simpler assembly, it offers far better effectiveness in terms of air distribution and mixing. This results in direct benefits for clients, designers, HVAC contractors, system owners and users.
- ▶ Flat style

◊ Variants

Axial-type jet fans:

- ▶ Unidirectional as series: GAXO-C or GAXN
- ▶ Reversible as series: BVGAXR / BVGAXR-C

Centrifugal-type jet fans:

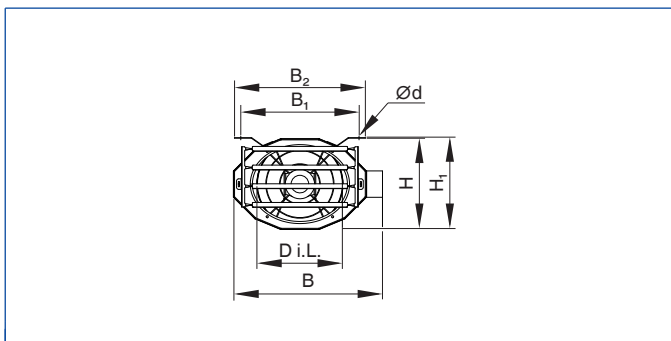
- ▶ Unidirectional

& Accessories

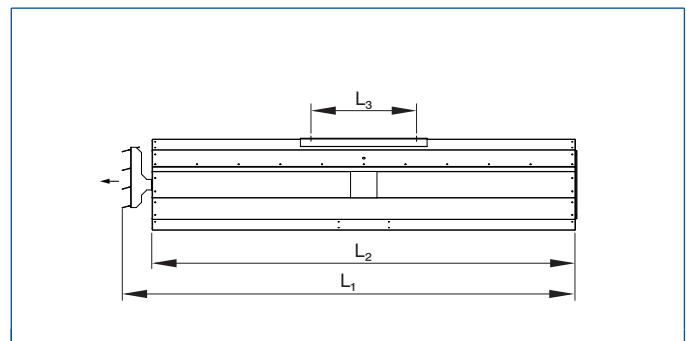
- ▶ Possible in all RAL colours
- ▶ Corrosion protection category C3 to C4M
- ▶ Fan diagnosis system VD
- ▶ Shock pulse bearing monitoring STI
- ▶ Underground car park controller
- ▶ CO alarm system
- ▶ Local isolator attached (terminal box not required)



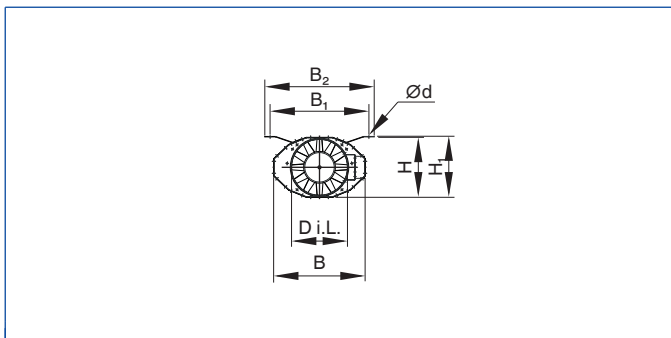
GAXO-C



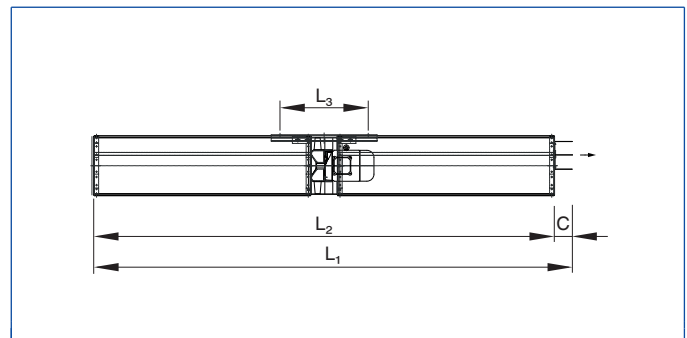
GAXO-C



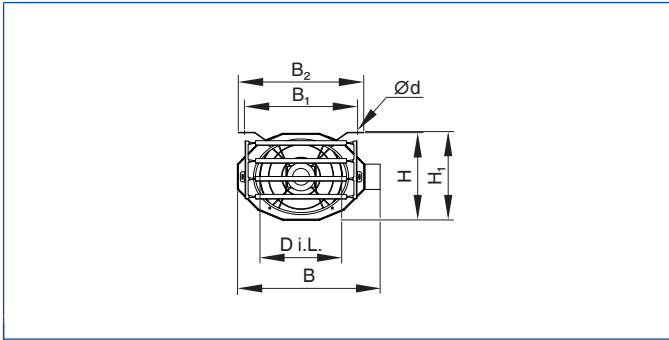
GAXN



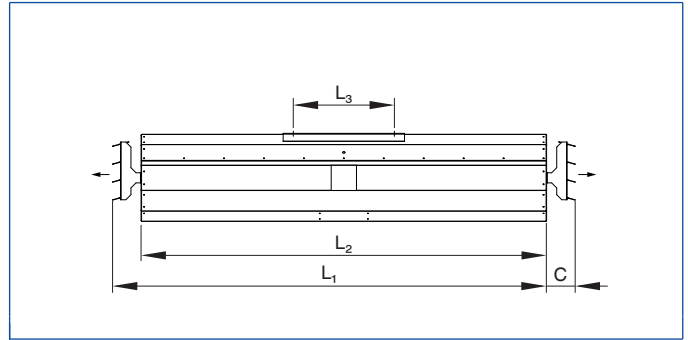
GAXN



GAXR-C



GAXR-C



GAXO-C, dimensions [mm]

①	L ₁	L ₂	L ₃	Ø clear width	B	B ₁	B ₂	H	H ₁	Ø d	②
315	2111	2005	500	320	596	560	620	340	345	12	95
400	2153	2005	500	401	706	560	620	430	430	12	100

① Nominal size • ② Weight (approx.) [kg]

GAXN, dimensions [mm]

①	L ₁	L ₂	L ₃	Ø clear width	B	B ₁	B ₂	H	H ₁	Ø d	②
315	2710	2610	500	320	520	560	620	340	345	12	95
400	2774	2648	500	401	630	560	620	430	435	12	100

① Nominal size • ② Weight (approx.) [kg]

GAXR-C, dimensions [mm]

①	L ₁	L ₂	L ₃	Ø clear width	B	B ₁	B ₂	H	H ₁	Ø d	c	②
315	2217	2005	500	320	569	560	620	340	345	12	106	95
400	2288	2005	500	401	706	560	620	430	435	12	142	100

① Nominal size • ② Weight (approx.) [kg]



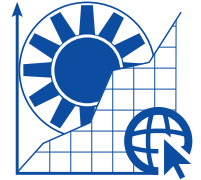
Heat exchangers

	Compact Thermon			Radial Thermon	Electric Thermon
	KTH	KTH-C	KTH-I	RTH	ETH
Flexible installation					
Assembly layout variable	●	●	●		
Casing shape variable				●	●
Heating medium					
Water	●	●	●	●	
Vapour	●		●	●	
Electronics					●
Heating coil					
Steel pipe with steel blades, galvanised - (St / St)	●		●	●	
Copper pipe with aluminium blades (Cu / Al)		●	○		
Electronic air heaters (3 x 400 V)					●
Motor type					
Voltage-controllable	●	●			
Single-speed)			○	○	
Dual-speed	●	●	●	●	●
Triple-speed	○	○			
Technical type					
Wall-mounted unit	●	●	●	●	●
Ceiling-mounted unit	●	●	●		●
Motor protective device	●	●	●	●	●
Technical data					
Max. volume flow rate	8,500 m ³ /h	9,600 m ³ /h	9,600 m ³ /h	6,500 m ³ /h	5,500 m ³ /h
Max. drive capacity	0.68 kW	0.68 kW	0.66 kW	1.1 kW	0.38 kW
Max. temperature (t) - [medium]	150 °C	120 °C	150 °C	150 °C	
Max. pressure (P) - [medium]	11 bar - for water	16 bar	11 bar - for water	11 bar - for water	-
Nominal sizes	4	4	4	3	3
Material					
Motor	External rotor	External rotor	IEC standard	IEC standard	External rotor
Impeller	Aluminium	Aluminium	Aluminium	Steel - powder-coated	Aluminium
Casing	Sheet steel sendzimir-galvanised	Sheet steel sendzimir-galvanised	Sheet steel sendzimir-galvanised	Sheet steel sendzimir-galvanised	Sheet steel sendzimir-galvanised
Accessories					
Flexible connector	○	○	○	○	○
Filters	○	○	○	○	○
Spare filter mat	○	○	○	○	○
Mixing box	○	○	○	○	○
Damper adjustment motor for MB	○	○	○	○	○
External weather louvre	○	○	○	○	○
Motor locking louvre	○	○	○		
Normal nozzle	○	○	○		○
Nozzle for gate shielding	○	○	○		○
Special cast nozzle	○	○	○		
Air distributor, four-sided	○	○	○		○
Fixing to the ceiling slab	○	○	○		○
Wall fixing	○	○	○	●	○
Outlet louvre (blades) - can be adjusted by hand - self-locking	●	●	●	●	●
Induction louvre (blades) - adjustable by hand or self-powered	○	○	○	○	○
Combination of motor circuit breakers FP...	○	○	○	○	
Room thermostat RT	○	○	○	○	
Room thermostat URT with clock and weekly programme	○	○	○	○	



	Compact Thermon			Radial Thermon	Electric Thermon
	KTH	KTH-C	KTH-I	RTH	ETH
Anti-frost thermostat RAK with 1.5 m capillary	○	○	○	○	
Switchgear ASR (N/K/KN)	○	○		○	
Valve regulator RVR	○	○		○	
Room sensor RF	○	○		○	
External thermostat AT	○	○		○	
Switch cabinet ETH-S					○
Terminal box	●	●	●	● Motor terminal box	●
Local isolator attached (terminal box not required)	○	○	○	○	○
Surface protection					
Corrosion protection (KWK) (standard (C2 or C3)), type-dependent	●	●	●	●	●
C4					
C5					
Explanation					
● - Standard					
○ - Optional					





Air heater

+ Features

Air heaters in an extremely wide range of styles; heating media and performance levels.

- ▶ KTH series: Compact Thermon available in four sizes (KTH 2 / 4 / 6 / 8)

Heating capacity for water up to approx. 130 kW / vapour up to approx. 180 kW

Volume flow rate up to 8,500 m³/h

Optionally available with Cu / Al or St / galv. heating coil

Equipped with axial fans in the external rotor style, also available with DS standard motor in the KTH-I special style for industrial applications

Can be assembled on the wall and/or ceiling, with adjustable outlet blades as standard

- ▶ ETH series: Compact Thermon available in three sizes (ETH 2 / 4 / 6)

Heating capacity of electric heating coil up to 36 kW

Volume flow rate up to 5,500 m³/h

Equipped with axial fans in the external rotor style,

Can be assembled on the wall and/or ceiling

- ▶ RTH series: Radial Thermon available in three sizes (RTH 3 / 5 / 7)

Heating capacity for water up to approx. 132 kW / vapour up to approx. 126 kW

Volume flow rate up to 6,500 m³/h

St / galv. heating coil

Equipped with centrifugal fan and DS standard motor for industrial applications
Wall-mounted assembly

- ▶ All series equipped with adjustable outlet blades and external terminal box as standard.
- ▶ Casing made of sendzimir-galvanised sheet steel and additional RAL 7030 powder coating.
- ▶ For further information, please enquire at our headquarters.

Application

- ▶ Air heaters for heating and fresh air supply in halls; sales outlets, etc.

Variants

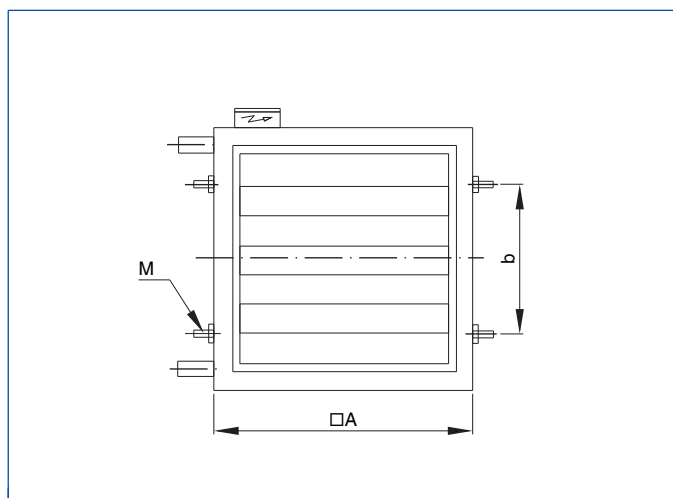
- ▶ KTH series: compact heater for water / vapour
- ▶ ETH series: electric heater
- ▶ RTH series: radial heater - heater for water / vapour

& Accessories

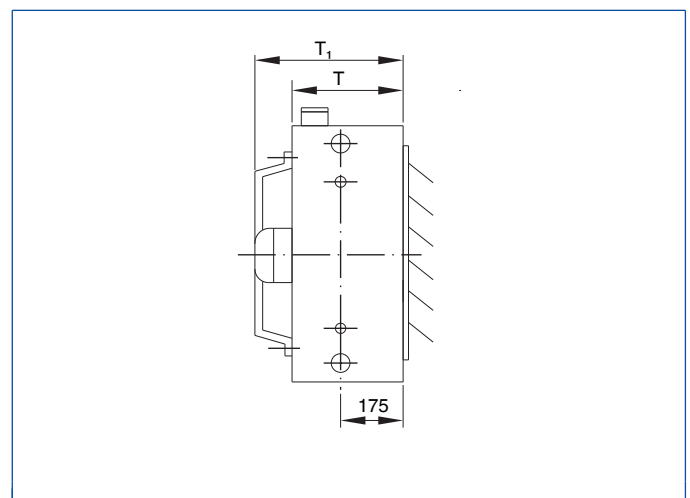
- ▶ Wall fixing
- ▶ Ceiling attachment
- ▶ Mixing box with actuator
- ▶ Motor locking louvre
- ▶ Filter box
- ▶ Flexible connector
- ▶ Special outlet nozzles / heads (air distributors)
- ▶ Air intake duct
- ▶ External weather louvre
- ▶ Rain hood
- ▶ Various control units (air and water side) available



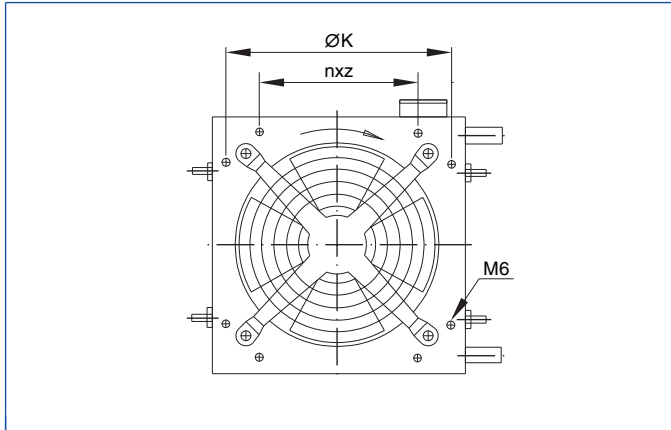
KTH-C



KTH-C



KTH-C

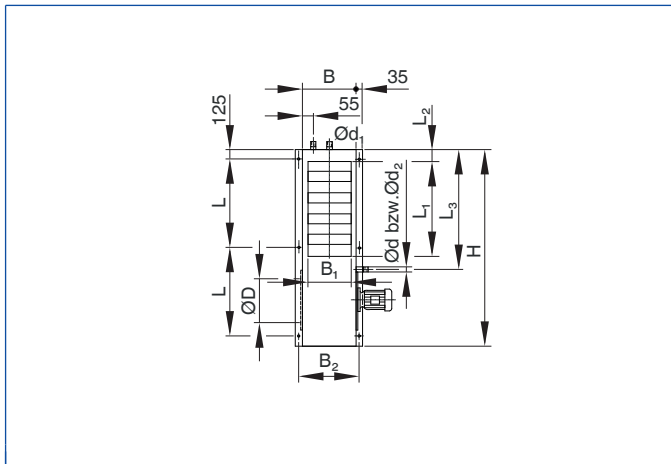


KTH, dimensions [mm]

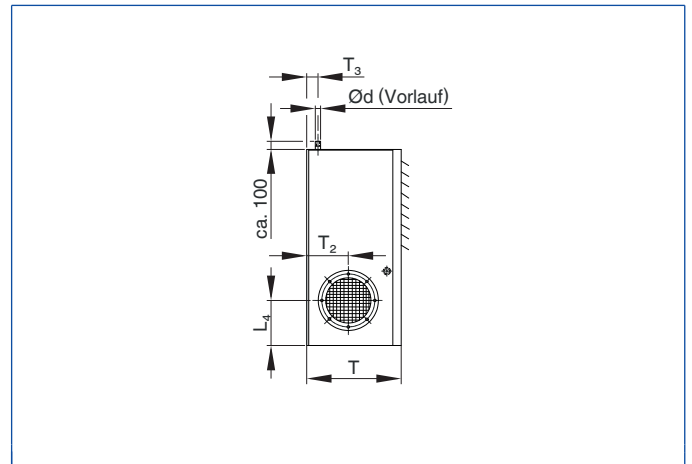
①	□A	T	T1	c	ØK	n x z
400	450	310	358	160	392	2x150
450	550	310	381	300	487	2x220
500	700	315	390	400	602	2x220
560	850	365	425	500	747	3x220

① Nominal size

RTH



RTH



RTH, dimensions [mm]

①	H	B	T	C	L	nxL	L1	L2	L3	L4	B1	B2	ØD	T1	T2	T3
3113	1340	370	660	180	1090	1x1090	650	70	825	290	265	410	270	554	300	114
3213	1340	370	660	180	1090	1x1090	650	70	825	290	265	410	270	554	300	70
5113	1650	450	790	200	700	2x700	780	80	1030	380	345	490	390	684	346	75
5223	1650	450	790	200	700	2x700	780	80	1030	380	345	490	390	684	346	75
7112	1900	560	965	220	825	2x825	890	80	1305	420	430	600	435	860	460	85
7222	1900	560	965	220	825	2x825	890	80	1305	420	430	600	435	860	460	85

① Nominal size

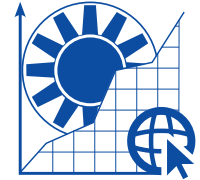


	Specifications	
	ThermoVent I	ThermoVent D
Style		
Indoor installation	●	
Roof installation		●
Unit installation type		
Connector horizontal / vertical	●	
Ceiling / floor / wall-mounted installation horizontal / vertical	●	
Type		
Rotary heat exchanger	●	●
Motor		
EC motor	●	●
Technical type		
Self-cleaning rotary heat exchanger	●	●
Extendible rotor		●
Ready-to-connect "Plug and Play" type	●	●
Integrated, wired regulation	●	●
Different bus languages	●	●
Connection to higher-level central BMS	○	○
Filter monitoring	●	●
Heating coil - external heat exchanger	○	○
Cooling coil	○	
Integrated motor-powered shut-off dampers	●	●
Frame-free casing	●	
Separation of the supply and exhaust air flows due to the double purge sector principle	●	●
Inclined rotary heat exchanger (low construction height)	●	
Local isolator attached and wired	●	●
Technical data		
Max. volume flow rate	6,000 m ³ /h	16,000 m ³ /h
Max. pressure	650 Pa	550 Pa
Max. drive capacity	1.5 kW	6.14 kW
Nominal sizes (mm)	650/950/1,250	1,500 / 1,700 / 1,900 / 1,900XL
Material		
Impeller	Aluminium	Aluminium
Casing	Aluminium	Aluminium
Accessories		
Operation via web browser	○	○
Manual operation device	○	○
Air quality sensor	○	○
Humidity sensor	○	○
Motion detector	○	○
Temperature control	○	○
Differential pressure sensor	○	○
CO ₂ sensor	○	○
Integrated air volume measurement	○	○
Filters	○	○
Commissioning and adjustment	○	○
Anti-vibration element	○	
Steel roof base for smooth roofs with internal insulation		○
Mixed air box		○



	Specifications	
	ThermoVent I	ThermoVent D
Flexible connector	○	○
Supply air grille		○
Inlet duct		○
Intermediate piece		○
Outlet sound attenuator, SDI type		○
Outlet sound attenuator, SDI long		○
Explanation		
● - Standard		
○ - Optional		





Building heating, aeration and ventilation

+ Features

- ▶ Efficient energy recovery
- ▶ Energy savings can be made with very short amortisation times
- ▶ Indoor installation
- ▶ CO₂ reduction
- ▶ Low weight
- ▶ Low inherent energy requirement
- ▶ Small heating system
- ▶ Less time and effort needed to install the heating pipes (affordable installation)
- ▶ High operational reliability
- ▶ Low energy costs
- ▶ Optimum room climate
- ▶ Heat recovered from rotary exchangers cuts the system's energy costs and increases its efficiency
- ▶ Low construction height
- ▶ 3 sizes
- ▶ Volume flow rates of 800 to 6,000 m³/h

Application

- ▶ Compact air handling unit incl. heat recovery for building assembly in horizontal or vertical style.

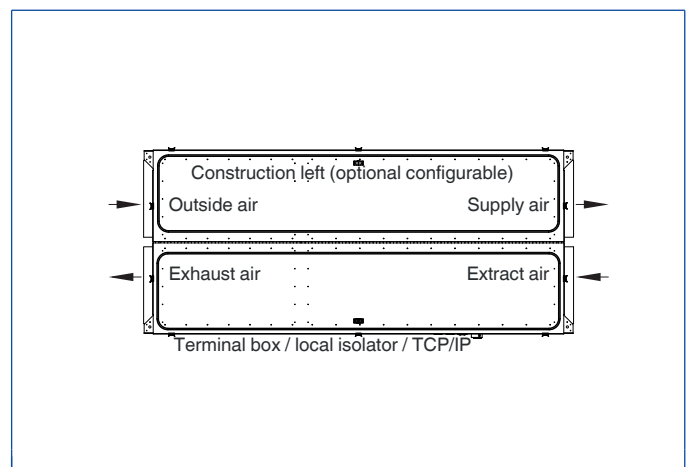
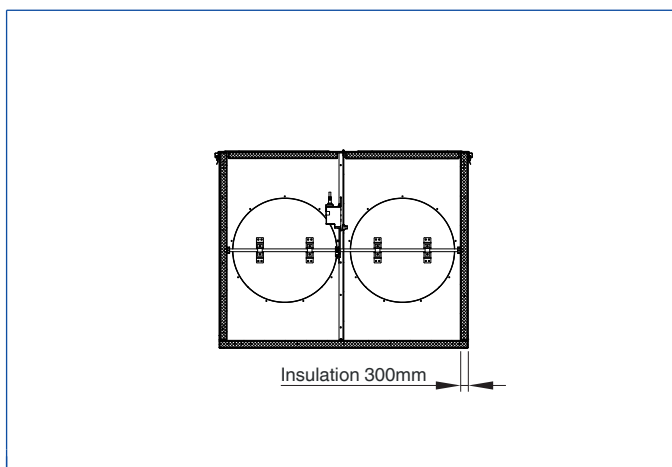
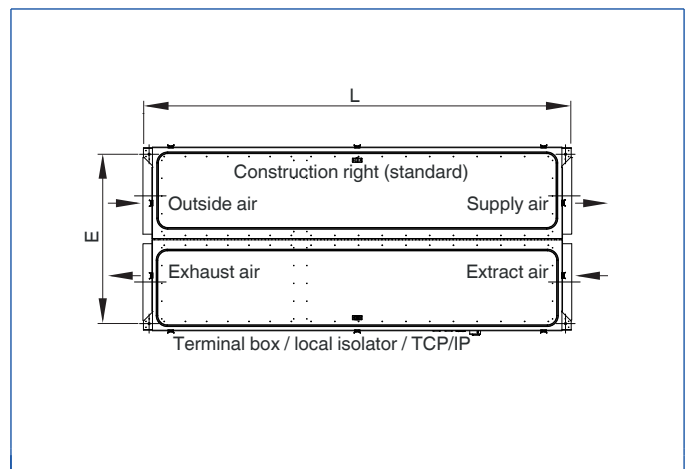
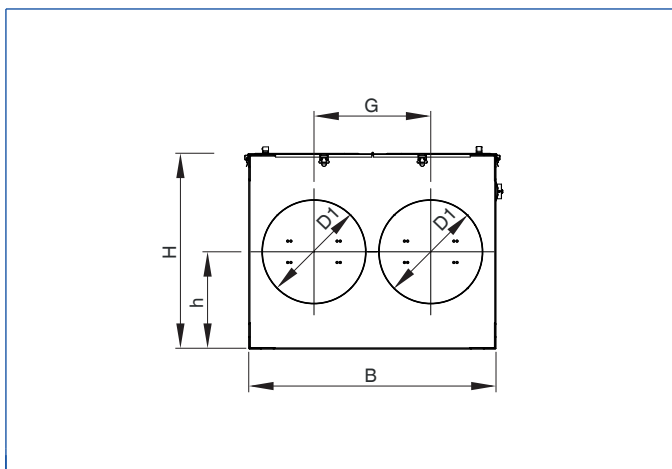
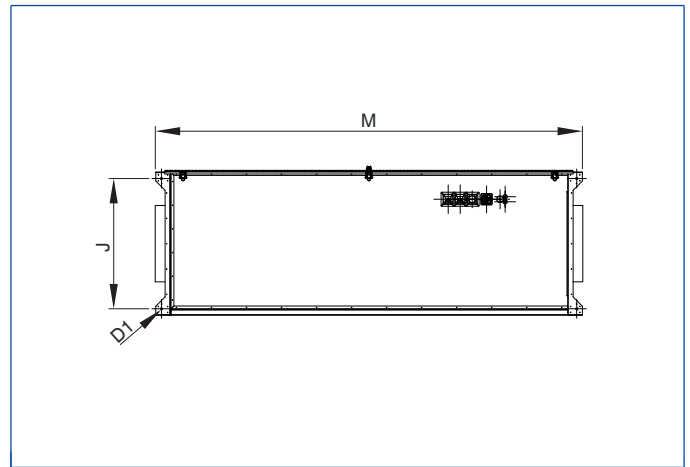
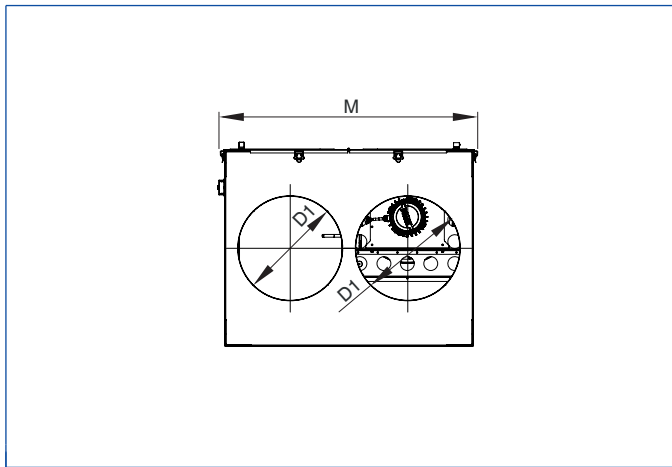
& Accessories

- ▶ Operation via web browser
- ▶ Manual operation device
- ▶ Air quality sensor
- ▶ Humidity sensor
- ▶ Motion detector
- ▶ Temperature control
- ▶ Differential pressure sensor
- ▶ CO₂ sensor
- ▶ Integrated air volume measurement
- ▶ Filters
- ▶ Anti-vibration element
- ▶ Flexible connectors

ISO Classification, standards and guidelines

- ▶ Satisfies the Ökodesign Guideline 1253/2014
- ▶ Conformity check as per VDI 6022 for NG 950



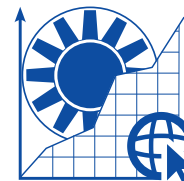


Dimensions [mm]

①	L	B	H	Ø D1	F	E	J	Ø D2	G	h	X	M	②
ThermoVent 650	2230	890	717	355	2157	813	828	13	435	352	700	950	200
ThermoVent 950	2530	1077	856	450	2457	1000	771	13	538	424	800	1177	260
ThermoVent 1250	3032	1389	1020	560	2957	1312	933	13	671	505	1000	1450	350

① Nominal size • ② Weight (approx.) [kg]





Building heating, aeration and ventilation

+ Features

- ▶ Energy savings can be made with very short amortisation times
- ▶ Roof installation
- ▶ Compact unit for heating, ventilation and aeration
- ▶ Maximum efficiency due to high heat recovery efficiency of up to 90%
- ▶ Self-cleaning rotary heat exchanger
- ▶ Extendible rotor
- ▶ Complete separation of the supply and exhaust air flows
- ▶ Low pressure losses in the rotor due to the double purge sector principle
- ▶ No air deflections
- ▶ Integrated, wired regulation
- ▶ Needs-based regulation
- ▶ Highly efficient EC drive motors
- ▶ Amortisation of approx. one to three years depending on the daily operating time
- ▶ 3 sizes
- ▶ Volume flow rates of 4,000 to 16,000 m³/h

Application

- ▶ Air handling unit incl. heat recovery for industrially or commercially used rooms and halls, as well as gyms
- ▶ Roof installation

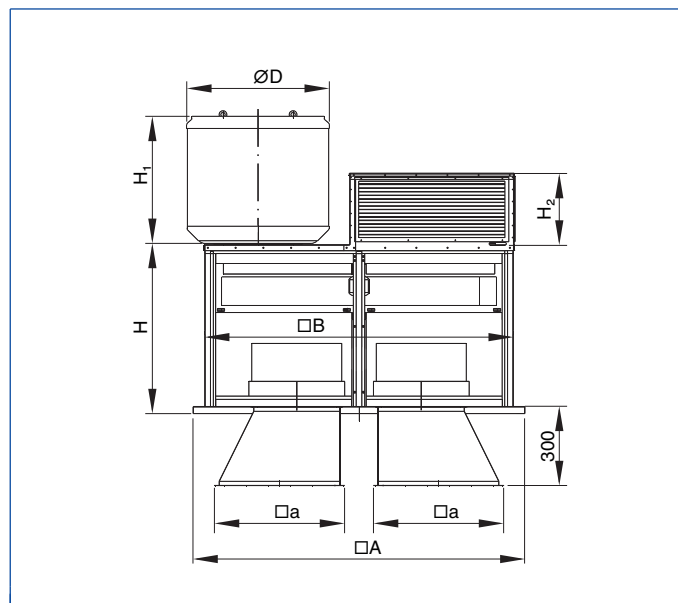
& Accessories

- ▶ Operation via web browser
- ▶ Manual operation device
- ▶ Air quality sensor
- ▶ Humidity sensor
- ▶ Motion detector
- ▶ Temperature control
- ▶ Differential pressure sensor
- ▶ CO₂ sensor
- ▶ Integrated air volume measurement
- ▶ Filters
- ▶ Steel roof base for smooth roofs with internal insulation
- ▶ Mixed air box

- ▶ Flexible connector
- ▶ Supply air grille
- ▶ Inlet duct
- ▶ Intermediate piece
- ▶ Outlet sound attenuator, SDI type
- ▶ Outlet sound attenuator, type: SDI long



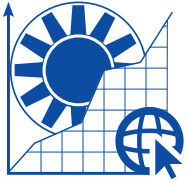
ThermoVent D



Dimensions [mm]

①	Ø D	□ A	□ B	H	H1	H2	□ a
TV-D 1500	828	1920	1757	1128	450	400	708
TV-D 1700	993	2120	1957	1128	525	450	851
TV-D 1900	1272	2320	2157	1128	730	500	898





Exhaust air fans made of plastic

+ Features

- ▶ Volume flow rates and pressure depending on series:
DRVF-K: up to 26,000 m³/h; max. pressure 1,200 Pa
AXN-K: up to 18,000 m³/h; max. pressure 800 Pa
REH-K: up to 110,000 m³/h; max. pressure 5,000 Pa
- ▶ Casing materials: PVC / PPS / PPS-el
- ▶ Impeller materials: PVC / PPs / PPS-el / GRP / stainless steel
- ▶ Other materials available upon request (e.g. Tegon-coated).
- ▶ The casings are equipped with shatter protection as standard.
- ▶ Also available as the explosion-proof type as per ATEX.
- ▶ Centrifugal fans optionally available with forward or backward curved blades.
- ▶ Different impeller geometries available, coordinated to the pressure loss to be overcome.

X Application

- ▶ Exhaust air fans for aggressive conveying medium.
- ▶ DRVF-K series as roof fan, free outlet
- ▶ AXN-K and REH-K series for installation in the duct system.
- ▶ (REH-K series for outdoor installation too)

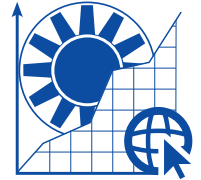
◇ Variants

- ▶ DRVF-K: roof fan
- ▶ AXN-K: axial fan
- ▶ REH-K: centrifugal fan (V-belt drive / direct drive)

& Accessories

- ▶ Coordinated to the relevant series.
- ▶ Please enquire at our headquarters





Exhaust air fans for industrial processes

+ Features

The following products are also suitable for process applications with additional measures. (More detailed information about this can be found in the relevant product data sheets)

REH series centrifugal fans, suitable for:

- ▶ Conveying temperatures up to +250°C constant temperature
- ▶ Extraction of drilling emulsions; oily extract air; slightly dusty extract air
- ▶ Slightly aggressive medium (stainless steel version, material: 1.4571)
- ▶ Potentially explosive atmosphere

ERM series centrifugal plug-in fans, suitable for:

- ▶ Conveying temperatures up to +280°C constant temperature
- ▶ Potentially explosive atmosphere

AXN series axial fans

- ▶ Constant temperatures up to max. +130°C (BVAXN 8/56 series: F600 up to +250°C)
- ▶ Slightly aggressive medium (stainless steel version, material: 1.4571) e.g. for the paper industry

DRVF-H and BVD series roof fans

- ▶ Slightly aggressive medium (stainless steel version, material: 1.4571) DRVF-H series
- ▶ Conveying temperatures up to max. +250°C BVD series

X Application

- ▶ Process exhaust air fans for duct / pipeline installation.
- ▶ Indoor and outdoor installation

& Accessories

- ▶ Terminal box
- ▶ Local isolator loose (max. ambient temperature)
- ▶ Local isolator attached (terminal box not required)



ACF	615	CS	156
ACFC	613	DAX	735
ACFI	612	DCA	641
Adjustment and addressing devices	277	DF	772
Adjustment devices	416	Differential pressure transducer	540
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AK	456	DRV-EC	740
AK-Ex	466	DRVF-H	741
AKK	462	DRVF-K / AXN-K / REH-K	785
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ARK2	92	Dynamic differential pressure transducers	497
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KUL	84	SLC	285
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MFI	577	ThermoVent D	784
MFP	584	ThermoVent I	782
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WGK	55
WG-KUL	67
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WT	508
X-AIR-CP	550
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XCC-CD	674
XCC-CPC	676
XCC-EHD	672
XCC-HCM	671
XCC-HD	669
XCC-HM	670
XCC-LE	679
XCC-P	678
XCC-RO	667
XCC-ROM-HM	668
XCC-S	675
XCC-V	677
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X-CUBE CROFCU	663
XKA	132
XSA	121
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ZAXN 6_9_12 / 56	758
ZL	564

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The information regarding the scope of delivery, appearance, performance, dimensions, and weights was correct at the time of going to press. Subject to change. This edition replaces all previous editions.

QUICK SELECTION
GUIDE 2019



TROX[®] TECHNİK

The art of handling air

TROX GmbH

Heinrich-Trox-Platz
47504 Neukirchen-Vluyn

Phone: +49 2845 202-0

Fax: +49 2845 202-265

trox@trox.de

www.troxtechnik.com