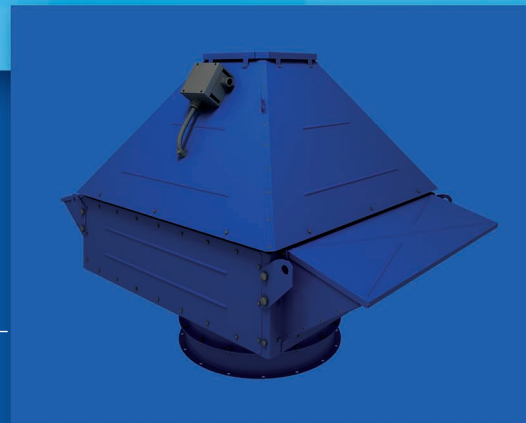
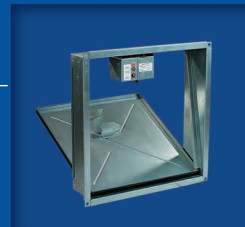


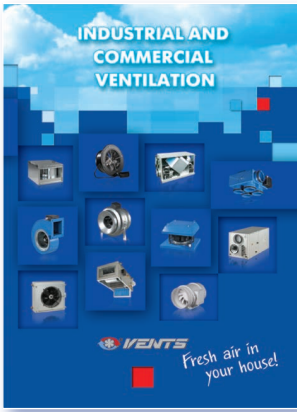
# ROOF-MOUNTED SMOKE EXHAUST FANS

■ Smoke exhaust fans



■ Fire-safety dampers





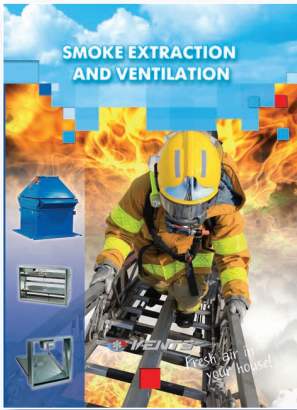
**Industrial and commercial ventilation**  
(Catalogue no. 1)

Industrial and commercial ventilation components - fans for round and rectangular ducts, sound-insulated, axial and roof fans, air handling units with heat recovery, air heating units, accessories.



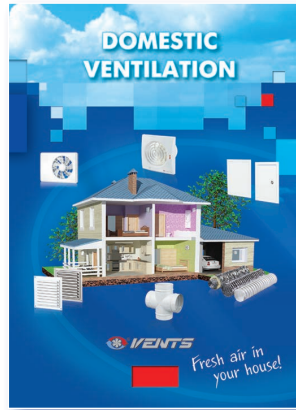
**Energy saving ventilation**  
Air handling units  
(Catalogue no. 2)

Energy saving supply and exhaust units and air handling units with heat recovery with air capacity up to 6500 m<sup>3</sup>/h.



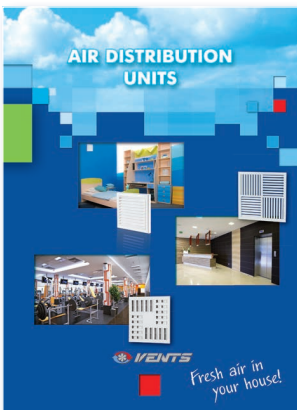
**Smoke extraction and ventilation**  
(Catalogue no. 5)

Smoke protection systems of buildings and premises.



**Domestic ventilation**  
(Catalogue no. 6)

Domestic ventilation: fans, mono-pipe exhaust kitchen and bathroom fans, air distribution units, air ducts and fittings, access doors, ventilation kits.



**Air distribution units**  
(Catalogue no. 9)

Plastic and metal air distribution products (grilles, disk valves, diffusers, etc.) for ventilation, air conditioning and heating.



**Access doors**  
(Catalogue no. 10)

Plastic and metal access doors for accessing concealed equipment and utility lines. Special offers for ceramic tiles.



**Spirally wound ducts**  
(Catalogue no. 13)

SPIROVENT spiral seam vent ducts and fittings of 100 to 1600 mm diameter.



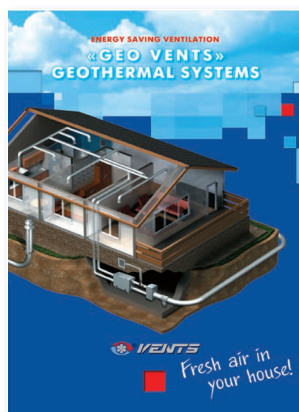
**Flexible ducts and fittings for ventilation, air conditioning and heating**  
(Catalogue no. 14)

Flexible and semi-flexible air ducts made of polymeric materials, aluminium, galvanized or stainless steel, metal fittings for ventilation, air conditioning, heating, gas handling and abrasive particles aspiration.



**Air handling units  
AirVENTS  
(Catalogue no. 3)**

Energy saving air handling units with air flow up to 40 000 m<sup>3</sup>/h, for use in large residential, industrial and commercial objects.



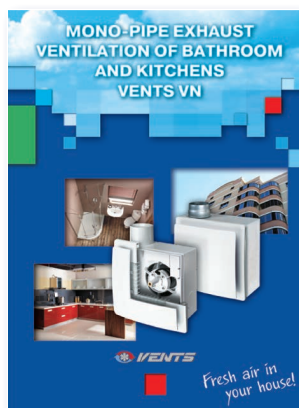
**Energy saving ventilation  
Geothermal systems  
GEO VENTS  
(Catalogue no. 4)**

Energy saving system GEO VENTS with use of the earth's surface layers heat. High ventilation system energy efficiency and low operating costs.



**Domestic fans  
(Catalogue no. 7)**

Domestic fans with air flow up to 365 m<sup>3</sup>/h with extra functions: timer, humidity sensor, motion sensor, etc. Applied for premises up to 30 m<sup>2</sup>.



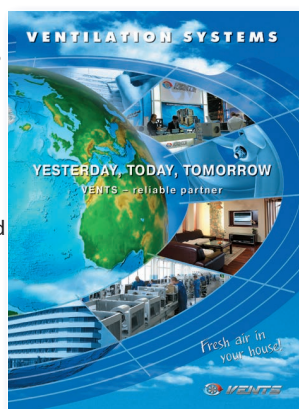
**VENTS VN  
Mono-pipe exhaust ventilation  
(Catalogue no. 8)**

Exhaust ventilation in houses with mono-pipe ventilation system based on VENTS VN fans.



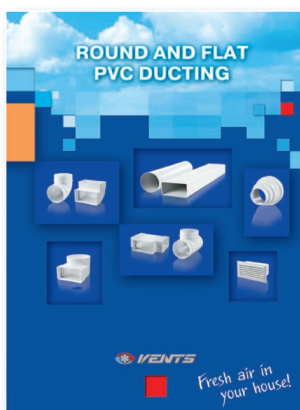
**Energy saving ventilation. Single room energy recovery ventilators  
MICRA.  
(Catalogue no.11)**

MICRA single room ventilators with energy regeneration for efficient ventilation and lowest investments in ready-built and brand new premises.



**VENTS presentation catalogue  
(Catalogue no.12)**

VENTS mission is to bring fresh air to your house and surround you with the world of comfortable microclimate.



**Round and flat PVC ducting  
(Catalogue no. 15)**

Flat and round PVC ducts PLASTIVENT for ventilation of residential, office and commercial premises and connection of exhaust ventilation equipment (kitchen extractors, hoods, exhaust boxes, etc). Wide product range of fittings.



**Energy saving ventilation. Single room energy recovery ventilators  
TwinFresh.  
(Catalogue no.16)**

Single room reverse ventilators with energy regeneration TwinFresh for efficient ventilation and lowest investments in ready-built and brand new premises.

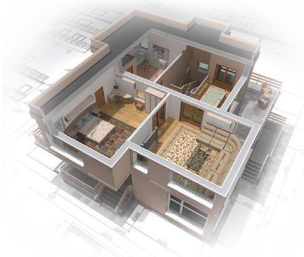
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Roof-mounted centrifugal smoke exhaust fan **VENTS VKDV/VENTS VKDH**

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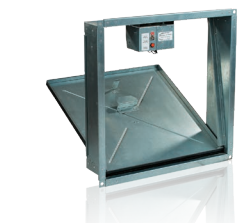
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Multi-purpose fire safety smoke damper **VENTS KPD**

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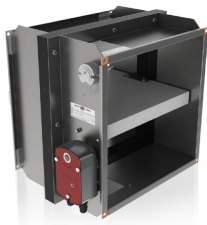
Multi-purpose fire safety smoke damper **VENTS KPDU**

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Fire-resisting damper (EI 60) **VENTS KP-1**

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Fire-resisting damper (EI 120) **VENTS KP-2**

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# WELCOME TO THE WORLD OF VENTS!



- The company's product range includes over 50.000 items
- Over the years the company has produced 100 million fans
- The production facilities spread across 150.000 square meters of territory
- The company employs more than 3.500 professionals involved in the entire life cycle of creating ventilation equipment – from concept to high-tech product
- Among other assets the facilities include the climatic equipment research and development centre and a suite of state-of-the-art laboratories manned by 200 engineers
- The company utilises the latest metal and polymer processing technology
- 99 % of our products are made in-house
- We are the only company in the industry which develops and builds 85 % of its ventilation equipment components

Being the world's ventilation leader VENTS offers a wide range of cutting-edge ventilation equipment to satisfy most demanding customers. Since the inception, the company's products have become popular in more than 100 countries worldwide while the VENTS brand has earned a solid reputation for quality, reliability and innovation. Every tenth domestic fan in the world rolled off the assembly line of the VENTS factory. Every time you buy a product carrying the VENTS

brand you can be confident that you have made the right choice. Thanks to a comprehensive range of ventilation equipment for home, commercial and industrial applications you can always find the necessary equipment and components to suit your needs. The climatic engineering and design solutions department is tasked with developing bespoke ventilation and air conditioning systems for even the most challenging projects.

## Technology of the future

The VENTS factory is not just about state-of-the-art production lines equipped with processing machines from the leading global suppliers. Today this is a full-on research and development facility spreading across 150.000 square metres of territory which includes a climatic equipment research and development centre and a comprehensive suite of state-of-the-art laboratories.

The full-time staff of more than 200 engineers are continuously seeking to improve the VENTS products. The company utilises cutting-edge metal and polymer processing technology manufacturing 99 % of its products in-house.

We are the only company in the industry which develops and builds 85 % of its ventilation equipment components including electric motors, heat exchangers as well as control and automation equipment.



## Getting better every day

The world of today is nothing but stable or permanent. Each day the market comes up with new expectations with regards to ventilation equipment quality and performance. Therefore, VENTS places a strong emphasis on constant development and improvement.

To this end the company has adopted a policy which includes continuous upgrades to its process equipment fleet, implementing the latest in manufacturing technology, and holding regular training workshops for its staff. Not only does this help us keep abreast with the times –these efforts help us to exceed our customers' expectations.



## Uncompromising quality

VENTS maintains a stringent quality control system to make sure that its products always meet most demanding international standards as confirmed by numerous certificates issued by the world's largest and most reputable organisations for quality control. The VENTS production process is certified according to ISO 9001:2015 international

standard for quality management systems of organizations and enterprises. The company operates in accordance with all the applicable environmental standards and continuously implements new technology in order to ensure compliance with the latest environmental regulations.

## Energy efficiency and energy saving

Energy resources are finite and costly. This is why energy-saving is among the company's top priorities. We pay a special attention to using heat and electricity in the most efficient manner which helps us reduce the environmental footprint of the manufacturing process and develop

more competitive products. The outstanding energy efficiency and low power consumption of our ventilation equipment are achieved by using high-performance EC motors and heat exchangers.

## Human resources: a valuable asset



Besides maintaining technical leadership and developing new technology the company also values the people that it owes its success to.

Today VENTS employs more than 3.500 professionals involved in the entire life cycle of ventilation equipment creation – from concept to high-tech product. The company strives to create a comfortable working environment for its employees to maximise their performance and encourage their professional and personal development.

## Responsible corporate citizen



Being a responsible corporate citizen VENTS takes an active part in various academic and charity initiatives. The company has a long history of cooperation with a number of educational establishments extending its support to talented youth.

The company takes an active part in student competitions and workshops sharing its wealth of practical knowledge and providing access to state-of-the-art ventilation equipment. The company employees participate in a range of charitable events and sporting competitions on a regular basis.

## Following the customer's lead

*VENTS uses its extensive research and technical capabilities to develop bespoke ventilation products and solutions for its customers from around the world.*

*Our products have earned a reputation for reliability being used in polar regions and in the Sahara desert, in the jungle of South-Eastern Asia and in the Pamir mountains.*

*Wherever our customers are they can always depend on prompt delivery thanks to our worldwide network of strategically located logistics centres.*

*The company's newest arrivals are presented by its engineers at numerous international exhibitions every year.*



**Welcome to the world of modern ventilation by VENTS!**

**Smoke control** is a complex process involving smoke extraction and fresh air supply by the supply and exhaust ventilation system of buildings in order to ensure safe evacuation of people in case of a fire in any of the spaces.

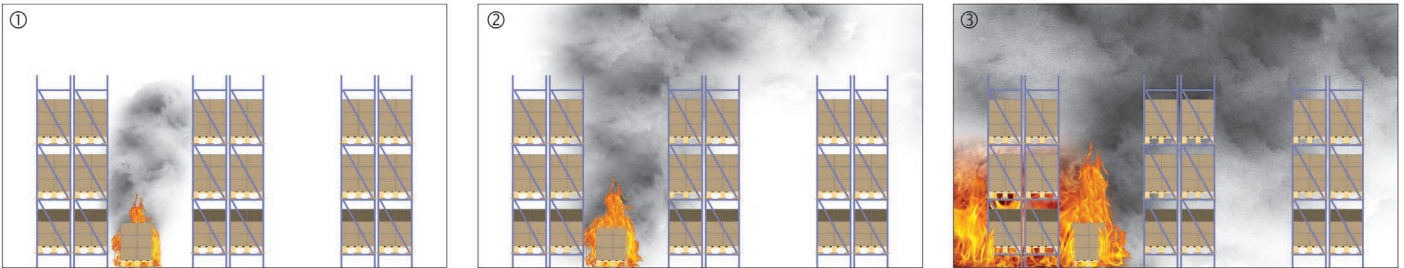


The **smoke control system** of a building or structure must ensure protection of people along the evacuation paths from the fire hazards during the time required for the personnel evacuation procedure or the entire period of fire development and control by means of extracting the combustion and thermal decomposition products and/or preventing their spreading. A smoke control system is an integral element of a utility system design including all kinds of high-rise buildings, shopping and office centres, hospital facilities, production and storage spaces etc. as well as underground structures.

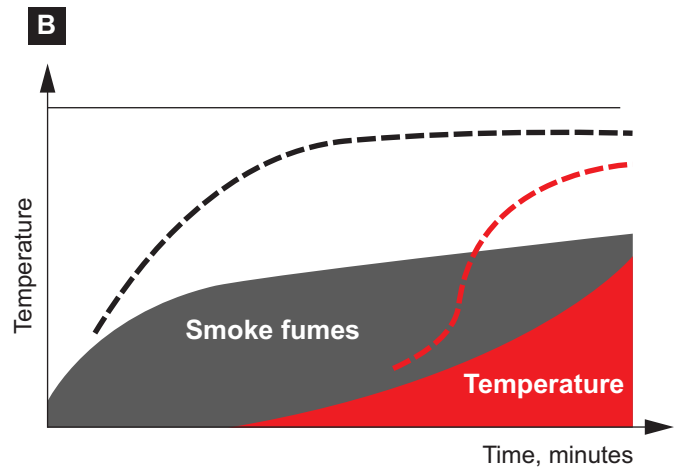
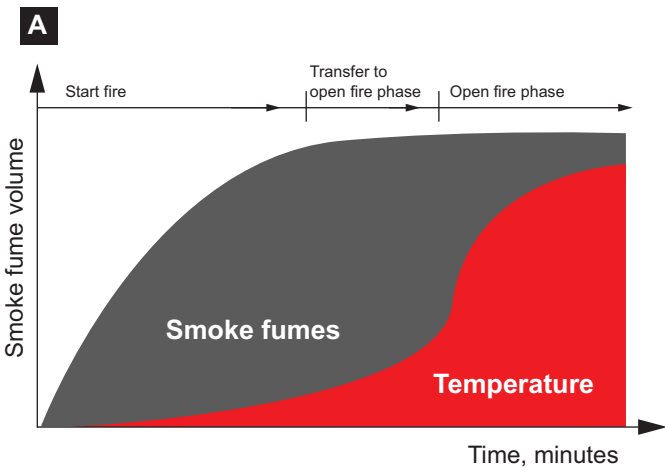
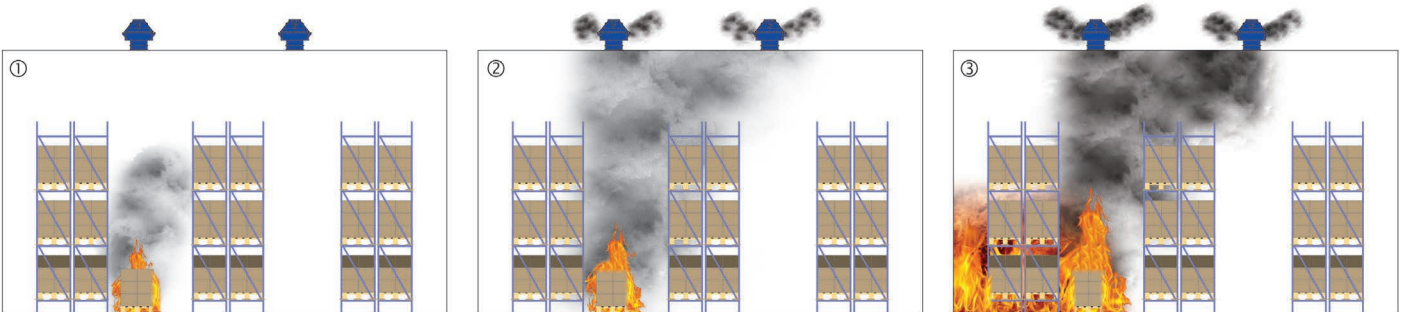


According to conclusive evidence the majority of mortalities in a fire are caused by poisoning from carbon monoxide and other combustion products. Carbon monoxide is one of the most toxic smoke components. It is carbon monoxide poisoning that accounts for 80 % the fire accident causes. Fires in closed spaces where oxygen supply is limited are especially prone to intensive carbon monoxide generation. Carbon monoxide poisoning occurs when its concentration in the inspiratory air exceeds 0.08 %. Concentration growth up to 0.32 % results in paralysis and loss of consciousness (with imminent death in about 30 minutes). Concentrations in excess of 1.2 % lead to loss of consciousness after 2-3 aspirations whereas another 2-3 minutes are fatal. Smoke spreads much faster than fire, therefore causing loss of consciousness and cardiac arrest before the victim reaches the safety outdoors. Furthermore, smoke contamination impacts spatial orientation forcing the victim to negotiate obstacles by touch and, quite often, to diverge from the escape paths.

Fire in a Building Without a Smoke Control System



Fire in a Building Equipped with a Smoke Control System



The A chart clearly shows that at the fire origin where no fire control systems are present, the smoke fume volume rapidly becomes critical.

However, the B chart shows that a fire control extraction system helps to significantly reduce the content of smoke in the gas environment which remains below the safety threshold during the entire duration of fire.



### Smoke control system functions:

- ▶ Prevention of smoke spreading from the ignition source.
- ▶ Prevention of smoke transfer to the evacuation paths (maintaining acceptable conditions for the people being evacuated from the building).
- ▶ Maintaining a microclimate beyond the ignition source area to enable normal operation of fire-fighting teams.
- ▶ Protecting life of people in the building.
- ▶ Protecting property against damage.

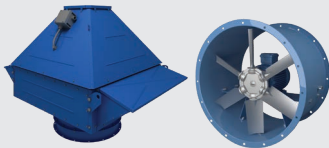
The smoke control system elements are integrated at the initial phase of the building (residential complex, office block, warehouse facility etc.) construction. These communications must be contained in the design engineering documents specific to the life-support system. All the works specific to the design and installation of smoke control systems are strictly covered by the applicable construction standards and regulations.

Smoke control plays a paramount role in making a building safe and ensuring compliance with any and all fire safety standards and regulations. Purpose-built smoke exhaust duct lines provide additional safety and enable easy evacuation of people using corridors and stairs which are completely free of hazardous fumes.

Smoke control is a complex process affected by numerous conditions and factors, and, therefore, the design of such communication systems requires an expert qualification. Smoke control systems must only be designed by professionals since any disregard of the commonly accepted state regulations may lead to human casualties.



### Smoke control systems consist of:



Smoke exhaust fans which are used in emergency exhaust ventilation systems for forced extraction of smoke and heated gases and simultaneous transfer of heat generated by the fire away and beyond the limits of the serviced spaces where the ignition occurs. Such units are used in production, public, residential, administrative and other spaces. Such fans are capable of handling smoke and air mixtures with temperatures up to 600 °C.



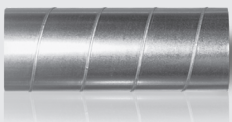
Pressurization fans are intended for creating a positive pressure differential in lift shafts, at landings and in air-lock corridors to prevent their contamination by smoke.



Smoke dampers installed on the protected premises accept smoke fumes and direct them into smoke shafts. Such devices are equipped with electric magnet or electric actuators. The dampers are rated according to the fire-resistance limit which can vary up to 180 minutes at the smoke temperature of 600 °C.

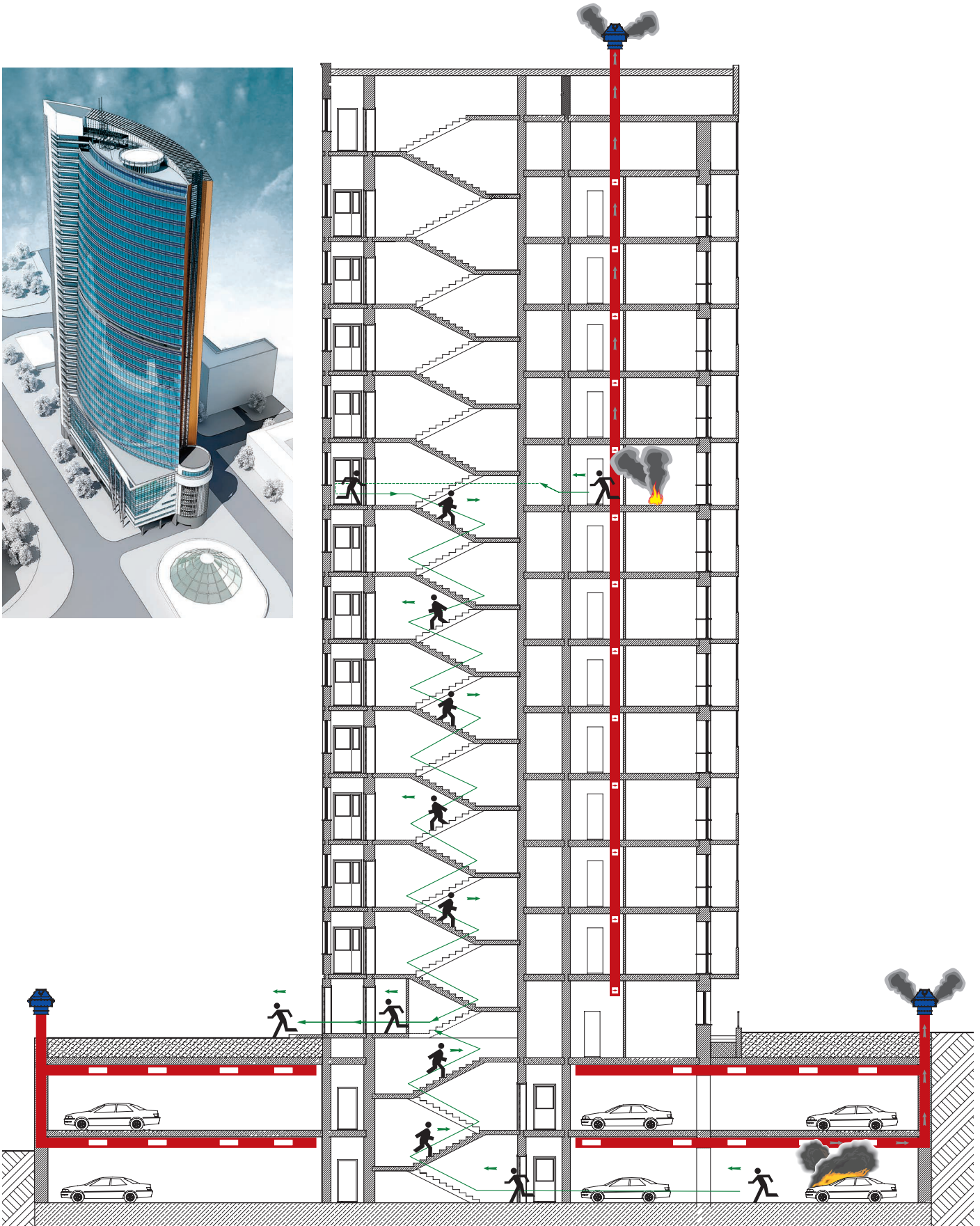


Fire-resisting dampers are installed in exhaust ventilation and general ventilation systems to prevent the spread of fire hazards (fire and smoke fumes). Such units are equipped with an electric actuator or a thermal lock.



Ventilation air ducts and shafts are intended for transferring smoke fumes from the protected premises away from the building. Air ducts are made of non-combustible materials.

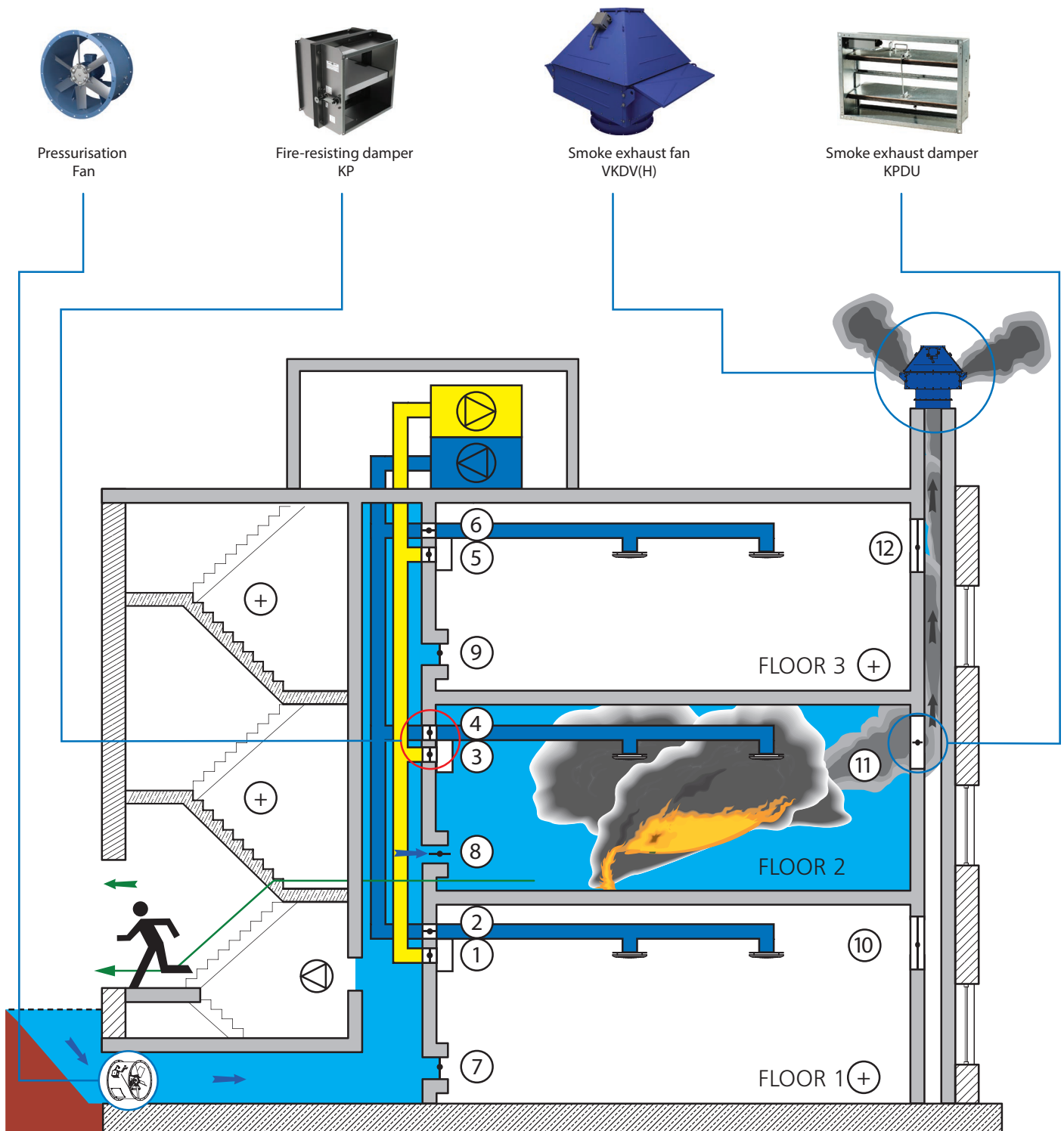
Sample scheme and operation of a smoke-extraction system in a multi-storey residential building with an underground car park:



Typical smoke control system solution in case of a fire on the second floor:

**Ventilation system:** fire-resisting dampers KP (3) and (4) block the floor 2 (closed), thus containing the fire and smoke at the ignition floor, fire-resisting dampers KP (2) and (6) remain open enabling pressurisation of the adjacent floors 1 and 3 by the supply ventilation system while fire-resisting dampers KP (1) and (5) in the exhaust ventilation branch remain closed.

**Smoke control system:** smoke extraction is handled by the VKDV (VKDH) fan via the open KPDU (11) damper, the supply air is fed from the air pressurisation system via the open damper (8) while dampers (7), (9), (10) and (12) remain closed.



Series  
**VKDV**



Roof-mounted centrifugal fan for smoke extraction with vertical air discharge

■ **Application**

Smoke exhaust fans are used in emergency exhaust ventilation systems for forced extraction of smoke and heated gases and simultaneous transfer of heat away and beyond the limits of the serviced spaces in case of fire. Such units are used in production, public, residential, administrative and other spaces.

■ **Operation**

The fans are capable of handling smoke and air mixtures with temperatures up to +600 °C for 120 minutes. The fans can operate in conjunction with a frequency converter (hereinafter referred to as FC) or directly when connected to power supply. The relevant characteristics for these modes are listed in the tables below.

Series  
**VKDH**



Roof-mounted centrifugal fan for smoke extraction with horizontal air discharge

The fan can be used for general exhaust ventilation at a rotational speed reduced by at least 25 % of the rated speed of the electric motor. The fan can be designed for moderate (U) or tropical (T) climate conditions.

■ **Design**

The fans are made of heat resistant steel with polymer coating providing weathering resistance. There are two types of roof-mounted smoke exhaust fans: with horizontal air discharge (VKDH) and vertical air discharge (VKDV). The models with vertical air discharge are equipped with a backdraft damper. The fan has a protective grille to prevent accidental contact and penetration of foreign objects. The impeller with backward curved blades are painted with powder coating.

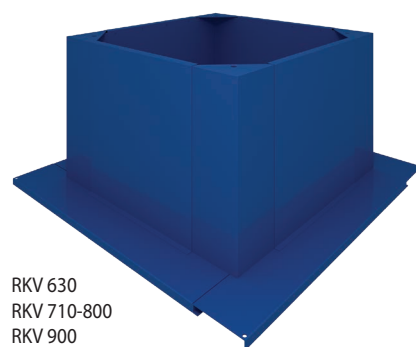
■ **Motor**

The fans are equipped with three-phase electric motors rated for 400 V. The motor is located in the compartment offset from the transported air stream. Motor ingress protection rating is IP54.

■ **Installation**

The roof fans are installed on the RKV mounting frame (simplified version) or RKVI mounting frame (heat-insulated version). The RKV and RKVI mounting frames are designed for mounting the fan on the roof without a slope. Make sure that the location provides for sufficient space as required for the fan maintenance.

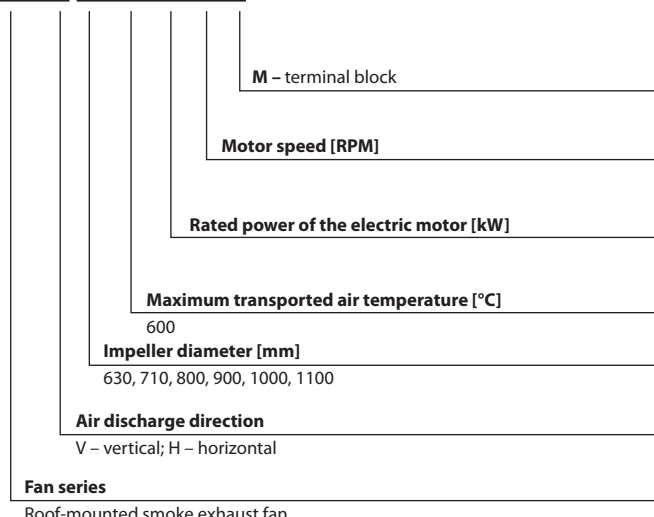
**RKV mounting frame**



RKV 630  
RKV 710-800  
RKV 900  
RKV 1000-1100

Designation key: \_\_\_\_\_

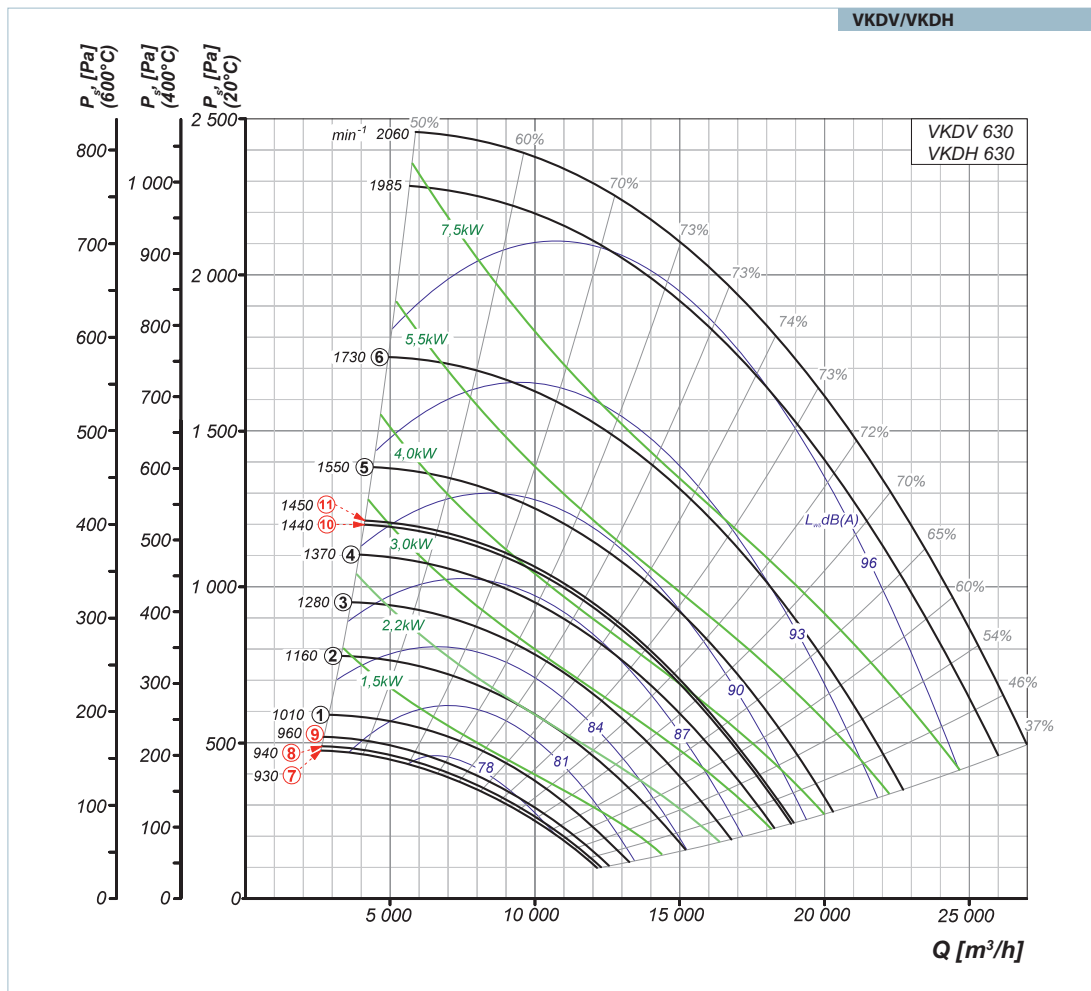
**VENTS VKDX X-X-X/X-X**



**Technical data:**

	VKDV(H) 630-600-1.5/930	VKDV(H) 630-600-2.2/940	VKDV(H) 630-600-3.0/960
Voltage [V]	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50
Rated power Ny [kW]	1.5	2.2	3.0
Current [A]	3.7	5.6	7.4
Rated RPM [min <sup>-1</sup> ]	930	940	960
Maximum RPM when operating from FC [min <sup>-1</sup> ]	1010	1160	1280
Maximum frequency when operating from FC [Hz]	54	62	67
Curve number at the diagram when operating from FC	①	②	③
Curve number at the diagram when operating from supply network	⑦	⑧	⑨

	VKDV(H) 630-600-4.0/1440	VKDV(H) 630-600-5.5/1450	VKDV(H) 630-600-7.5/1440
Voltage [V]	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50
Rated power Ny [kW]	4.0	5.5	7.5
Current [A]	8.8	11.3	15.5
Rated RPM [min <sup>-1</sup> ]	1440	1450	1440
Maximum RPM when operating from FC [min <sup>-1</sup> ]	1370	1550	1730
Maximum frequency when operating from FC [Hz]	48	53	60
Curve number at the diagram when operating from FC	④	⑤	⑥
Curve number at the diagram when operating from supply network	-	⑪	⑩

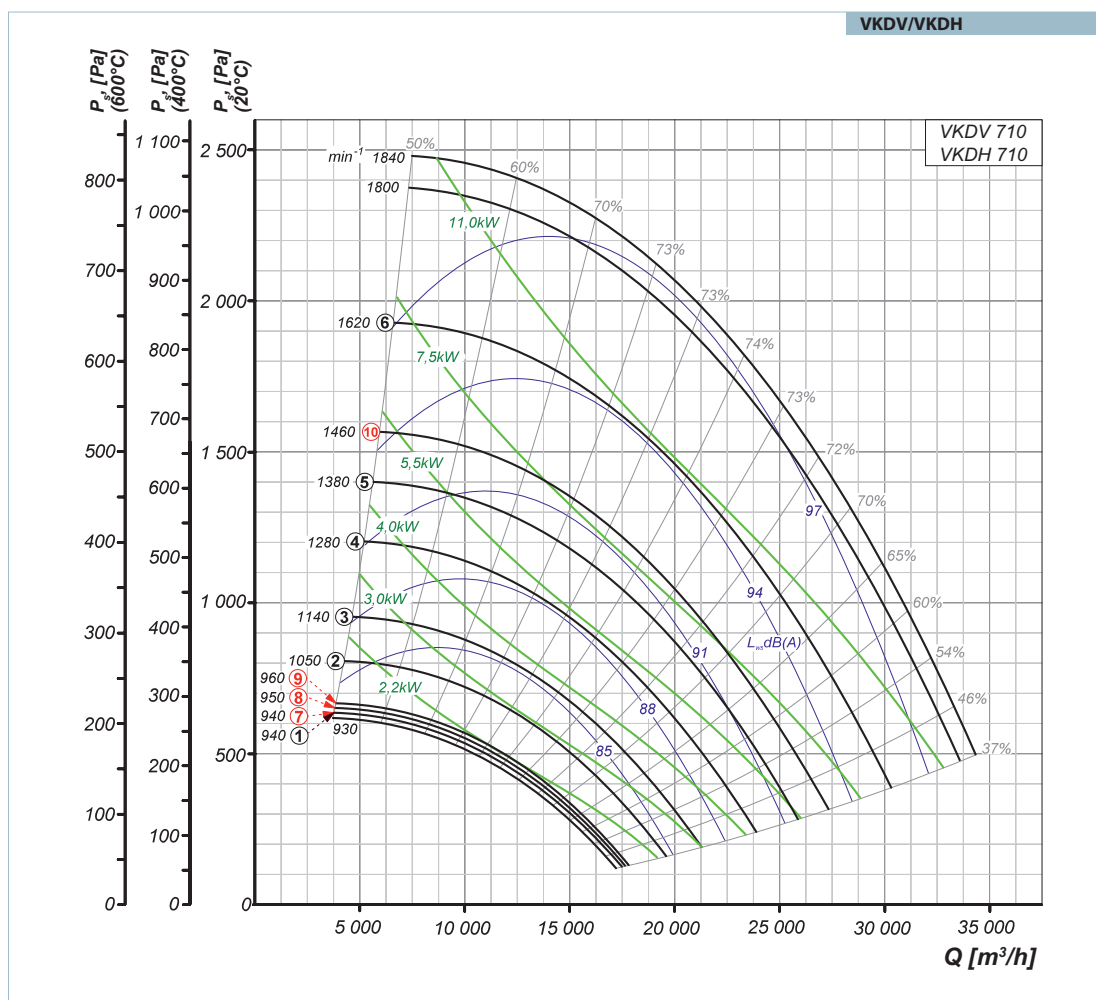


## ROOF-MOUNTED SMOKE REMOVAL FANS

### Technical data:

	VKDV(H) 710-600-2.2/940	VKDV(H) 710-600-3/960	VKDV(H) 710-600-4/950
Voltage [V]	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50
Rated power Ny [kW]	2.2	3.0	4.0
Current [A]	5.3	7.4	8.4
Rated RPM [min <sup>-1</sup> ]	940	960	950
Maximum RPM when operating from FC [min <sup>-1</sup> ]	940	1050	1140
Maximum frequency when operating from FC [Hz]	50	55	60
Curve number at the diagram when operating from FC	①	②	③
Curve number at the diagram when operating from supply network	⑦	⑨	⑧

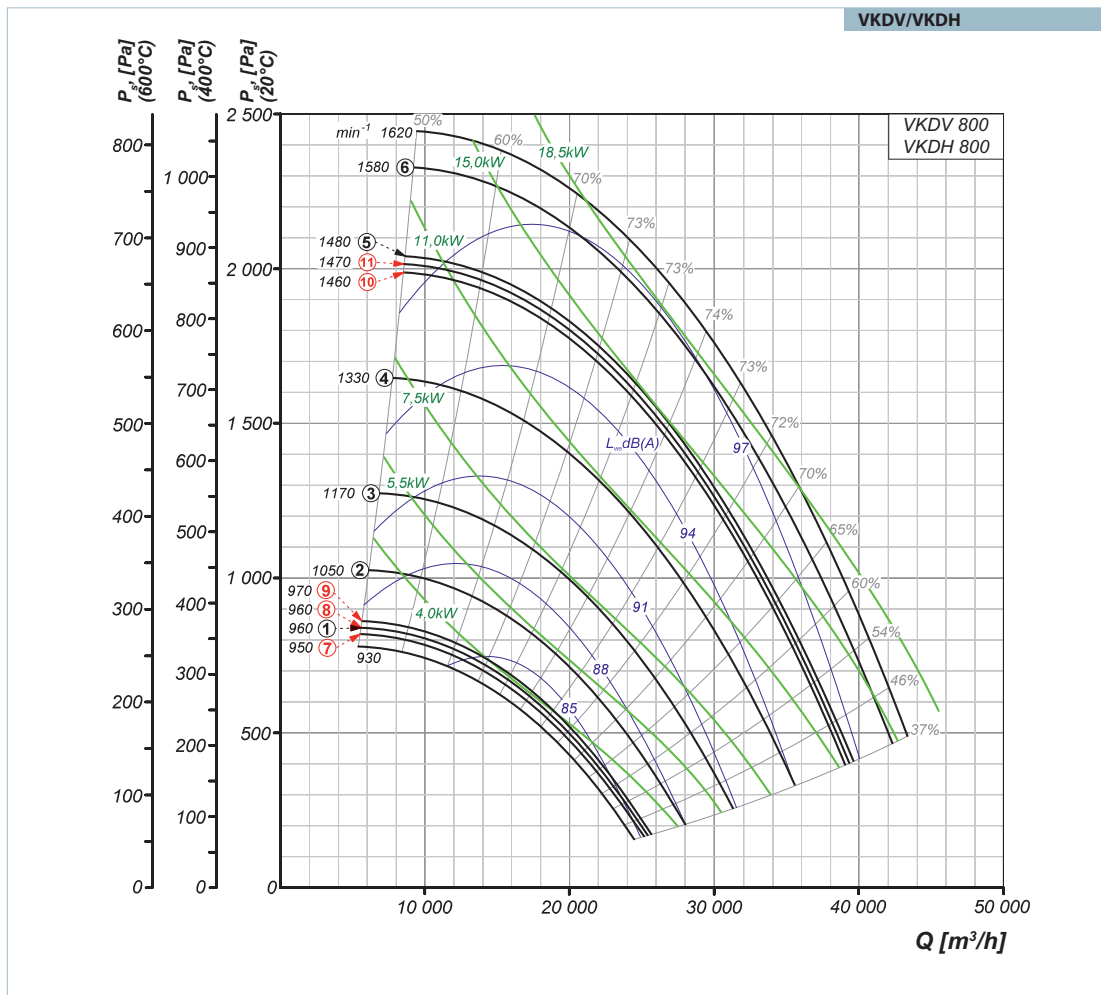
	VKDV(H) 710-600-5.5/960	VKDV(H) 710-600-7.5/1455	VKDV(H) 710-600-11/1460
Voltage [V]	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50
Rated power Ny [kW]	5.5	7.5	11.0
Current [A]	11.2	15.1	21.2
Rated RPM [min <sup>-1</sup> ]	960	1455	1460
Maximum RPM when operating from FC [min <sup>-1</sup> ]	1280	1380	1620
Maximum frequency when operating from FC [Hz]	67	47	55
Curve number at the diagram when operating from FC	④	⑤	⑥
Curve number at the diagram when operating from supply network	⑨	-	⑩



**Technical data:**

	VKDV(H) 800-600-4/960	VKDV(H) 800-600-5.5/950	VKDV(H) 800-600-7.5/970
Voltage [V]	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50
Rated power Ny [kW]	4.0	5.5	7.5
Current [A]	9.2	12.3	15.7
Rated RPM [min <sup>-1</sup> ]	960	950	970
Maximum RPM when operating from FC [min <sup>-1</sup> ]	960	1050	1170
Maximum frequency when operating from FC [Hz]	50	55	60
Curve number at the diagram when operating from FC	①	②	③
Curve number at the diagram when operating from supply network	⑧	⑦	⑨

	VKDV(H) 800-600-11/960	VKDV(H) 800-600-15/1460	VKDV(H) 800-600-18.5/1470
Voltage [V]	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50
Rated power Ny [kW]	11.0	15.0	18.5
Current [A]	21.2	29.5	36.4
Rated RPM [min <sup>-1</sup> ]	960	1460	1470
Maximum RPM when operating from FC [min <sup>-1</sup> ]	1330	1480	1580
Maximum frequency when operating from FC [Hz]	69	51	54
Curve number at the diagram when operating from FC	④	⑤	⑥
Curve number at the diagram when operating from supply network	⑧	⑩	⑪



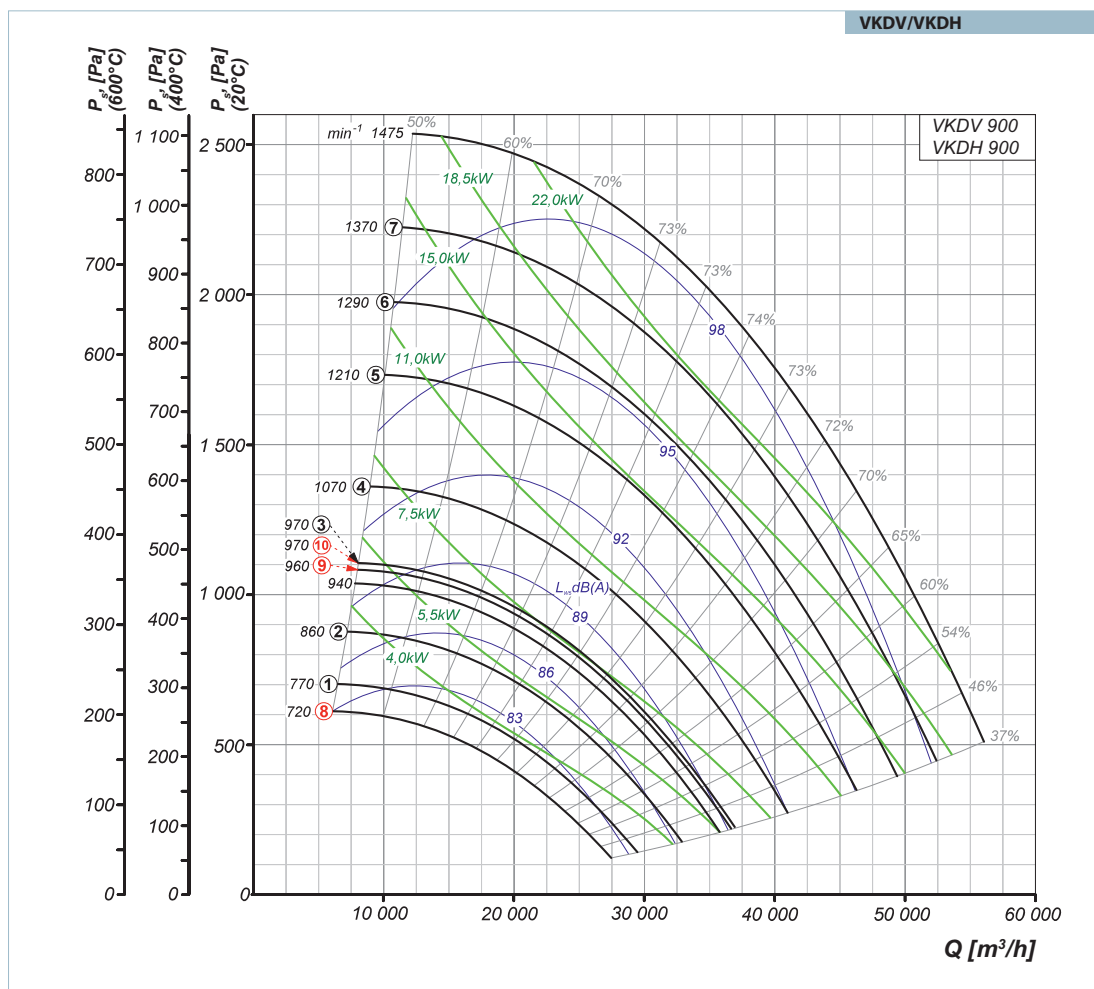
## ROOF-MOUNTED SMOKE REMOVAL FANS

### Technical data:

	VKDV(H) 900-600-4/720	VKDV(H) 900-600-5.5/960	VKDV(H) 900-600-7.5/970	VKDV(H) 900-600-11/970
Voltage [V]	3~400	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50	50
Rated power Ny [kW]	4.0	5.5	7.5	11.0
Current [A]	10.0	12.3	15.7	23.0
Rated RPM [min <sup>-1</sup> ]	720	960	970	970
Maximum RPM when operating from FC [min <sup>-1</sup> ]	770	860	970	1070
Maximum frequency when operating from FC [Hz]	53	45	50	55
Curve number at the diagram when operating from FC	①	②	③	④
Curve number at the diagram when operating from supply network	⑧	—	⑩	⑩

	VKDV(H) 900-600-15/960	VKDV(H) 900-600-18.5/960	VKDV(H) 900-600-22/960
Voltage [V]	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50
Rated power Ny [kW]	15.0	18.5	22.0
Current [A]	31.0	36.4	44.0
Rated RPM [min <sup>-1</sup> ]	960	960	960
Maximum RPM when operating from FC [min <sup>-1</sup> ]	1210	1290	1370
Maximum frequency when operating from FC [Hz]	63	67	71
Curve number at the diagram when operating from FC	⑤	⑥	⑦
Curve number at the diagram when operating from supply network	⑨	⑨	⑨

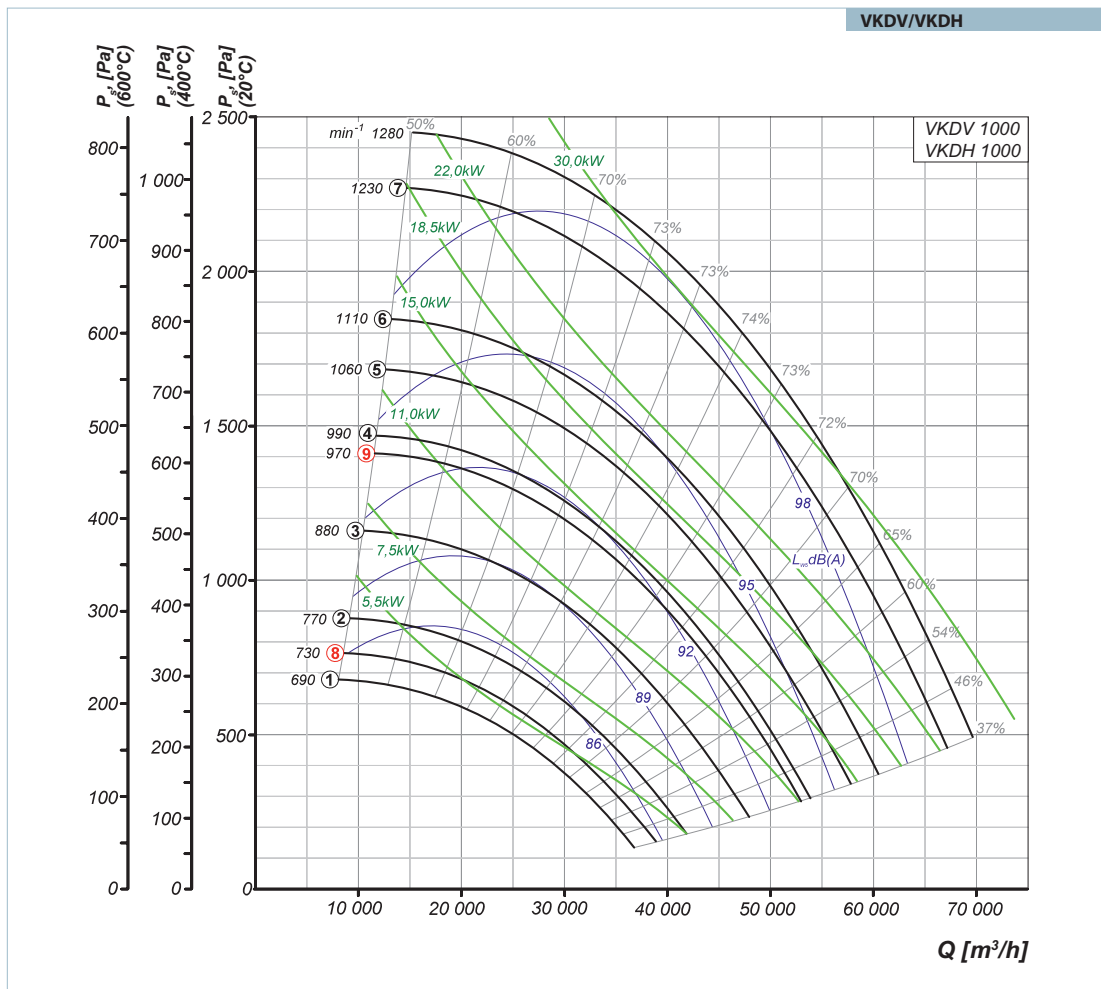




**Technical data:**

	VKDV(H) 1000-600-5.5/720	VKDV(H) 1000-600-7.5/730	VKDV(H) 1000-600-11/970	VKDV(H) 1000-600-15/970
Voltage [V]	3~400	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50	50
Rated power Ny [kW]	5.5	7.5	11.0	15.0
Current [A]	13.6	18.0	23.0	31.0
Rated RPM [min <sup>-1</sup> ]	720	730	970	970
Maximum RPM when operating from FC [min <sup>-1</sup> ]	690	770	880	990
Maximum frequency when operating from FC [Hz]	48	53	45	51
Curve number at the diagram when operating from FC	①	②	③	④
Curve number at the diagram when operating from supply network	—	⑧	—	⑨

	VKDV(H) 1000-600-18.5/970	VKDV(H) 1000-600-22/970	VKDV(H) 1000-600-30/970
Voltage [V]	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50
Rated power Ny [kW]	18.5	22.0	30.0
Current [A]	36.5	44.6	59.6
Rated RPM [min <sup>-1</sup> ]	970	970	970
Maximum RPM when operating from FC [min <sup>-1</sup> ]	1060	1110	1230
Maximum frequency when operating from FC [Hz]	55	57	63
Curve number at the diagram when operating from FC	⑤	⑥	⑦
Curve number at the diagram when operating from supply network	⑨	⑨	⑨



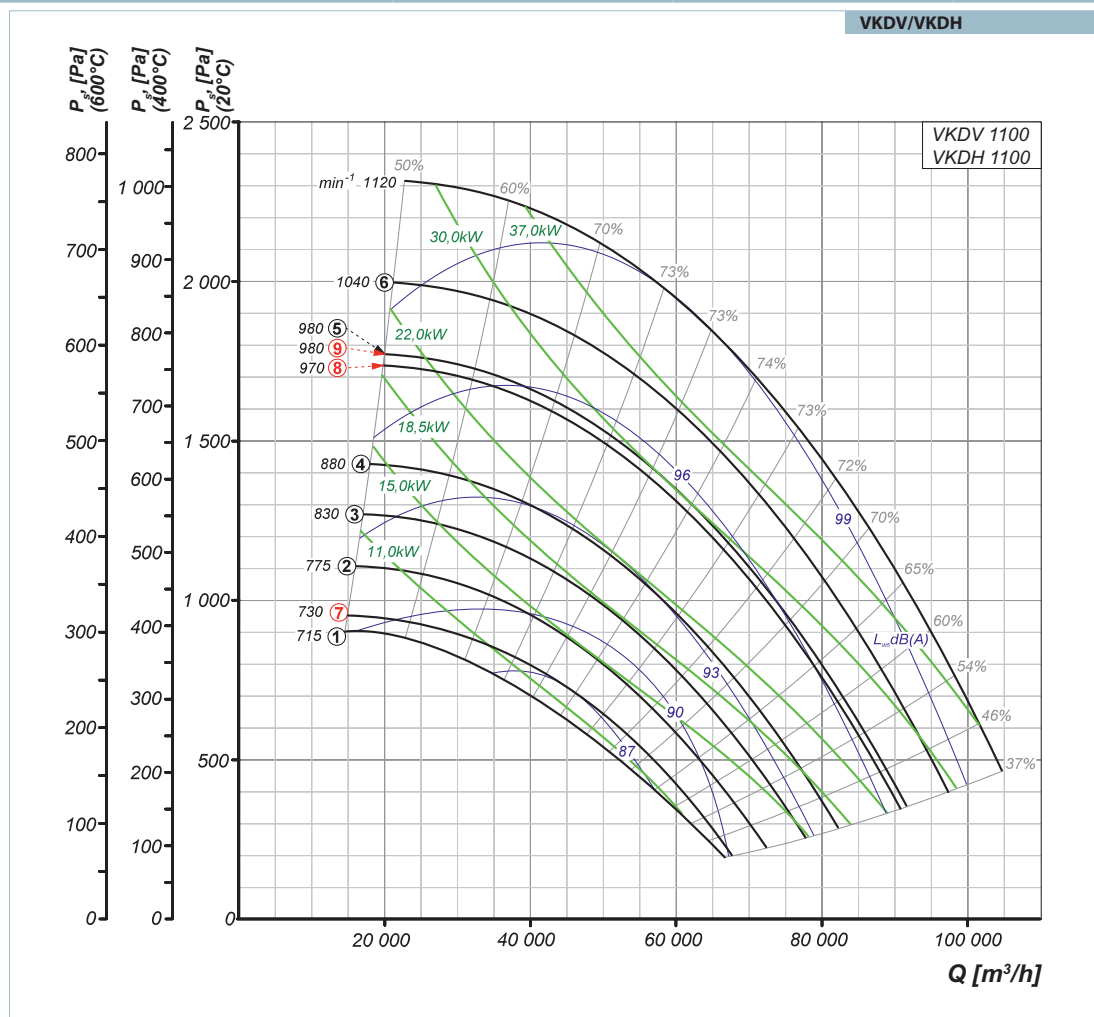
## ROOF-MOUNTED SMOKE REMOVAL FANS

### Technical data:

	VKDV(H) 1100-600-11/730	VKDV(H) 1100-600-15/730	VKDV(H) 1100-600-18.5/970
Voltage [V]	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50
Rated power Ny [kW]	11.0	15.0	18.5
Current [A]	25.1	32.3	36.5
Rated RPM [min <sup>-1</sup> ]	730	730	970
Maximum RPM when operating from FC [min <sup>-1</sup> ]	715	775	830
Maximum frequency when operating from FC [Hz]	49	53	43
Curve number at the diagram when operating from FC	①	②	③
Curve number at the diagram when operating from supply network	—	⑦	—

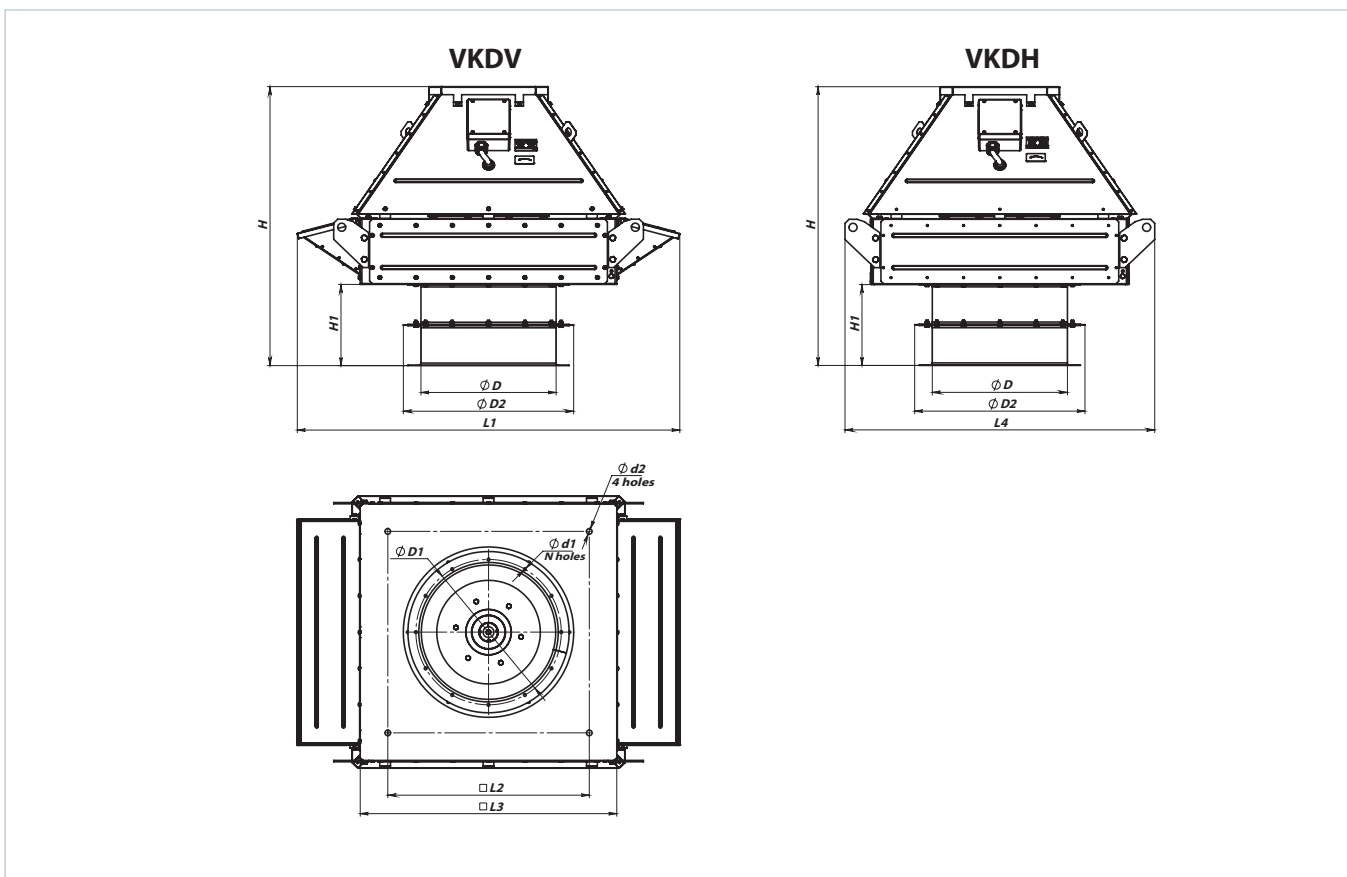
  

	VKDV(H) 1100-600-22/970	VKDV(H) 1100-600-30/970	VKDV(H) 1100-600-37/980
Voltage [V]	3~400	3~400	3~400
Rated frequency [Hz]	50	50	50
Rated power Ny [kW]	22.0	30.0	37.0
Current [A]	44.6	59.6	70.0
Rated RPM [min <sup>-1</sup> ]	970	970	980
Maximum RPM when operating from FC [min <sup>-1</sup> ]	880	980	1040
Maximum frequency when operating from FC [Hz]	45	51	53
Curve number at the diagram when operating from FC	④	⑤	⑥
Curve number at the diagram when operating from supply network	—	⑧	⑨



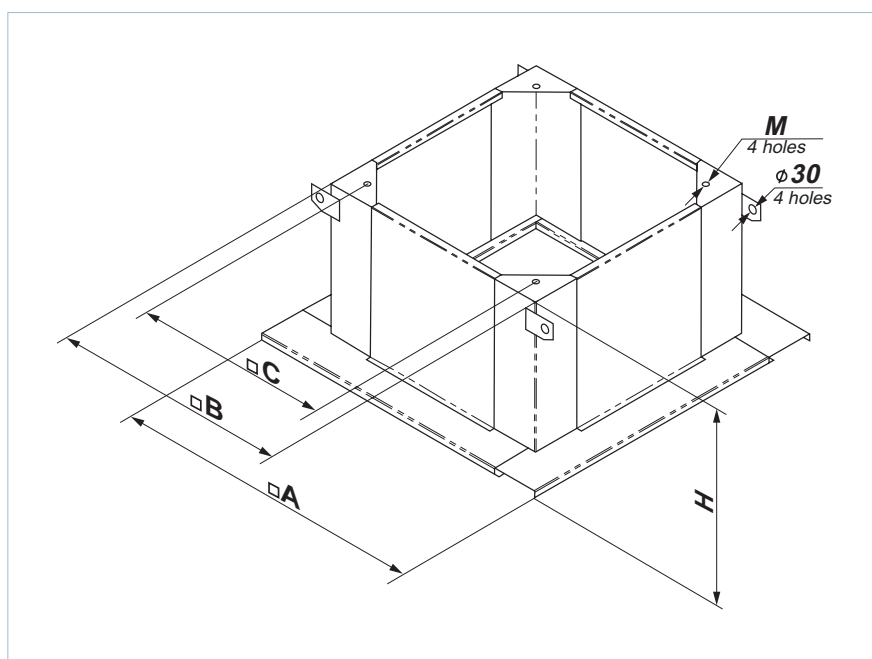
## Overall dimensions:

Name	H	H1	L1	L2	L3	L4	ØD	ØD1	ØD2	Ød1	Ød2	n	Weight [kg]	RKV, RKVI mounting frame compatibility
VKDV(H) 630-600-1.5/930	1038	302	1424	750	955	1153	503	541	634	10	21	12	200	RKV(I) 630
VKDV(H) 630-600-2.2/940		210												
VKDV(H) 630-600-3/960	1043	307											225	
VKDV(H) 630-600-4/1440	1038	302											216	
VKDV(H) 630-600-5.5/1450	1043	307											230	
VKDV(H) 630-600-7.5/1440	1134												255	
VKDV(H) 710-600-2.2/940	1181	317	1508	840	1040	1238	633	674	730	12	21	16	242	RKV(I) 710-800
VKDV(H) 710-600-3/960	1186	322											252	
VKDV(H) 710-600-4/950													253	
VKDV(H) 710-600-5.5/960													280	
VKDV(H) 710-600-7.5/1455													281	
VKDV(H) 710-600-11/1460													292	
VKDV(H) 800-600-4/960			1239	345	1543	840	1040	1238	633	674	784	12	21	16
VKDV(H) 800-600-5.5/950	305													
VKDV(H) 800-600-7.5/970	1335	355	312											
VKDV(H) 800-600-11/960			390											
VKDV(H) 800-600-15/1460			390											
VKDV(H) 800-600-18.5/1470			395											
VKDV(H) 900-600-4/720	1379	363	1871	1050	1200	1398	713	751	874	12	21	16	376	RKV(I) 900
VKDV(H) 900-600-5.5/960	1398												372	
VKDV(H) 900-600-7.5/970		380												
VKDV(H) 900-600-11/970		418												
VKDV(H) 900-600-15/960		433												
VKDV(H) 900-600-18.5/960	1491	482												
VKDV(H) 900-600-22/960	1565	566												
VKDV(H) 1000-600-5.5/720	1365	398	2111	1240	1430	1628	803	837	974	12	23	24	467	RKV(I) 1000-1100
VKDV(H) 1000-600-7.5/730	1573	403											588	
VKDV(H) 1000-600-11/970													590	
VKDV(H) 1000-600-15/970													595	
VKDV(H) 1000-600-18.5/970													639	
VKDV(H) 1000-600-22/970													670	
VKDV(H) 1000-600-30/970			690											
VKDV(H) 1100-600-11/730	1721	441	2236	1240	1430	1628	903	934	1075	12	23	24	720	RKV(I) 1100-1100
VKDV(H) 1100-600-15/730													775	
VKDV(H) 1100-600-18.5/970													763	
VKDV(H) 1100-600-22/970													794	
VKDV(H) 1100-600-30/970													812	
VKDV(H) 1100-600-37/980													1773	



RKV, RKVI mounting frame overall dimensions:

Model	Dimensions [mm]					RKV weight [kg]	RKVI weight [kg]
	A	B	C	H	M		
RKV(I) 630	1212	912	750	600	M18	65.9	85.45
RKV(I) 710, 800	1262	962	840	600		68.5	89.04
RKV(I) 900	1512	1212	1050	650		85.7	113
RKV(I) 1000, 1100	1712	1412	1240	730	M20	103.7	140.59





Series  
**VKT**



Roof exhaust gas extraction booster fan for fireplaces.  
Air flow up to **1000 m<sup>3</sup>/h**

■ **Application**

The fans are designed for boosting the draft and extracting smoke fumes heated up to 200 °C\* for 5 hours. The units are used for extracting hot smoke from fireplaces, furnaces and hearths. The fans are also suitable for standard periodic or constant exhaust ventilation.

■ **Design**

The fan casing is made of galvanized steel with a polymer coating protecting from weather elements and aggressive environments. The fan has a protective grille to prevent accidental contact and penetration of foreign objects.

■ **Motor**

The fan is equipped with a single-phase asynchronous motor on ball bearings which contribute to a long-term uninterrupted service. The motor is offset from the transported air stream and has an integral thermal protection. The compartment housing of the motor is isolated from the hot air stream and has ventilation openings for air circulation and heat removal.

A purpose-designed impeller with backward-curved blades minimizes soot and carbon deposits for trouble-free operation and easy maintenance.

■ **Speed regulation and fan control**

The fan is connected to the power mains via a transformer or thyristor speed controller, which enables draft regulation and, consequently, maximum efficiency of the fireplace operation.

**WARNING!**

**The fan must be turned on in case of open fire in the fireplace. When the transported air temperature is 200 °C the fans must run at the top speed without a speed controller.**

■ **Installation**

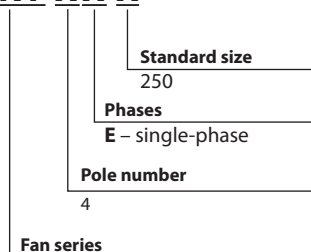
The fan is mounted on the roof on the top section of the chimney. Make sure that the location provides for sufficient space as required for the fan maintenance. The approximate temperature of the effluent gases can be determined according to the kindling colour.

\*The smoke fume temperatures can be determined by putting a piece of kindling into the chimney at the level chosen for the fan installation and keeping it there for 30 minutes while the fireplace is hot.

Kindling colour	Approximate smoke fume temperature, [°C]
Unchanged	up to 150
Yellow (wheat bread crust)	200
Brown (brown bread crust)	250
Black	300
Charred kindling	400

Designation key: \_\_\_\_\_

**VENTS VKT XX X**



**Accessories**



SRS-1



RS-1-300



RS-1-400



PS-1 N(V)



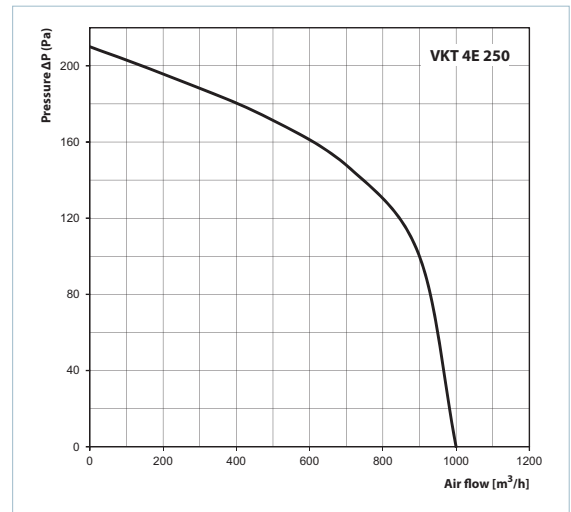
RSA5E-2-P



RSA5E-2-M

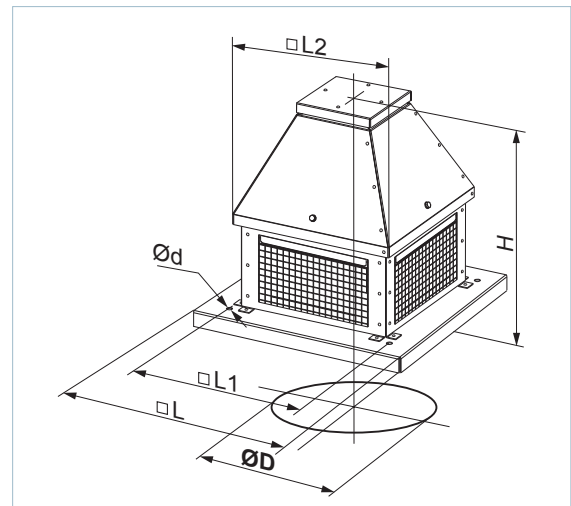
**Technical data:**

	VKT 4E 250
Voltage [V] at 50 Hz	1~230
Power [W]	96
Current [A]	0.6
Maximum air flow [m <sup>3</sup> /h]	1000
RPM [min <sup>-1</sup> ]	1500
Sound pressure level at 3 m distance [dBA]	52
Max. transported air temperature [°C]	200
Ingress protection rating	IP44



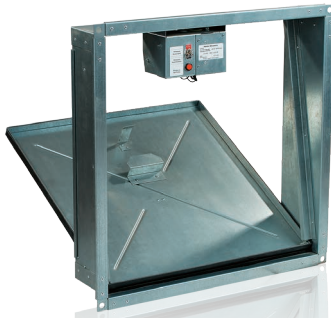
**Fan Dimensions:**

Fan Type	Dimensions [mm]						Weight [kg]
	Ø D	Ø d	H	L	L1	L2	
VKT 4E 250	250	11	434	430	330	323	14.6



**VKT fan application option**

Series  
**KPD**



Normally closed single louvre fire safety dampers, fire resistance rating of 180 minutes at smoke temperature of 600 °C

**Application**

The dampers are intended for integration into smoke control systems of buildings and structures of various purpose and designed for extraction of combustion products from the spaces of floor corridors, hallways, air locks etc.

The dampers can be used as smoke dampers in emergency smoke exhaust ventilation systems in the event of a fire to support evacuation of people from the building at the initial phase of the fire occurring in any of the building spaces.

The KPD/KPDU multi-purpose fire safety smoke dampers are rated to resist fire for 180 minutes (E 180) at the temperature of 600 °C.

Series  
**KPDU**



Normally closed multiple-louvre fire safety dampers, fire resistance rating of 180 minutes at smoke temperature of 600 °C

**Design**

The damper casing is made of galvanised steel 1.5 mm thick. The dampers are available in the wall-mounted or duct-mounted variant which have either one or two attachment flanges.

The units are available in 3 control variants:

▶ **With an electric magnet (220 or 24 V).**

The damper opens via a spring when the electric magnet is energized. When the damper reaches the end position, a limit switch opens the circuit disconnecting the electric magnet from the power mains. The electric magnet must not remain energized for more than 10 seconds. The damper is reset to the safety (closed) position manually by means

of a handle. The damper equipped with an electric magnet has a special button for testing the unit performance.

▶ **With a 230 or 24 V electric actuator and a return spring.**

The flaps are automatically set to the normal (closed) position when applying voltage to the electric actuator. On a fire alarm signal the electric actuator is de-energized causing its return spring to set the damper to an open position. The electric actuator is equipped with a contact group to signal its end positions. The damper can also be controlled manually and fixed in any position. The unit can be unlocked either manually using a hex wrench or automatically upon power-up.

▶ **With a 230 or 24 V electric actuator and two-wire control.**

The damper flap is set from the "Open" to the "Closed" position by an external command sending the voltage phase from one actuator contact to the other. The electric actuator is equipped with a contact group to signal its end positions. The damper can be controlled manually by means of a hex key.

**Note.** The KPDU dampers with a height of 300 and 350 mm have one louvre. The main difference between the KPDU and the KPD dampers with a similar height of 300 and 350 mm is that the method of fastening the flap, which ensures a smaller overhang of the flap beyond the KPDU valve.

**Installation**

The dampers are not intended for installation in air ducts and ducts of spaces with fire and explosion hazard categories A and B, in local exhaust systems designed for extraction of flammable and explosive mixtures as well as in systems containing environ-

Designation key: \_\_\_\_\_

**KPDX-XxX-X-X-X-X**

<p><b>Damper Series</b> KPD – single-louvre KPDU – multi-louvre</p>	<p><b>Protective grille</b> S – vandal-proof mesh R – decorative fascia O – no protective grille RD or RD1 smoke exhaust grille</p>
<p><b>Damper flow area width [mm]</b> 300; 350; 400; 450; 500; 550; 600; 650; 700; 750; 800; 850; 900; 950; 1000</p>	<p><b>Actuator Location</b> SN – outside VN – inside</p>
<p><b>Damper flow area height [mm]</b> 300; 350; 400; 450; 500; 550; 600; 650; 700; 750; 800; 850; 900; 950; 1000</p>	<p><b>Actuator Type</b> EM220/24 – 220/24 V electric magnet PKP24 – 24 V ZERN electric actuator with a return spring PKP230 – 230 V ZERN electric actuator with a return spring PV24 – 24 V BELIMO open/close electric actuator PV230 – 230 V BELIMO open/close electric actuator PVP24 – 24 V BELIMO electric actuator with a return spring PVP230 – 230 V BELIMO electric actuator with a return spring PS24 – 24 V SIEMENS open/close electric actuator PS230 – 230 V SIEMENS open/close electric actuator PSP24 – 24 V SIEMENS electric actuator with a return spring PSP230 – 230 V SIEMENS actuator with a return spring</p>
<p><b>Number of flanges</b> 1 – one 2 – two</p>	

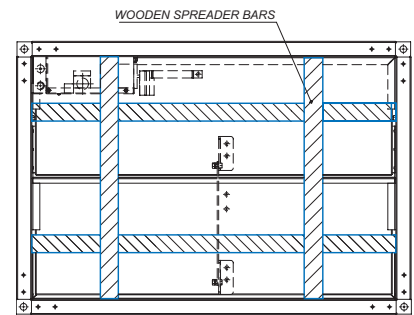


ments more aggressive to plain carbon steels than air or those containing sticky and fibrous materials. Fire safety dampers are only intended for installation in systems subjected to regular cleaning to prevent formation of flammable deposits. The damper must be installed into the building envelope structure in accordance with the applicable standards and regulations.

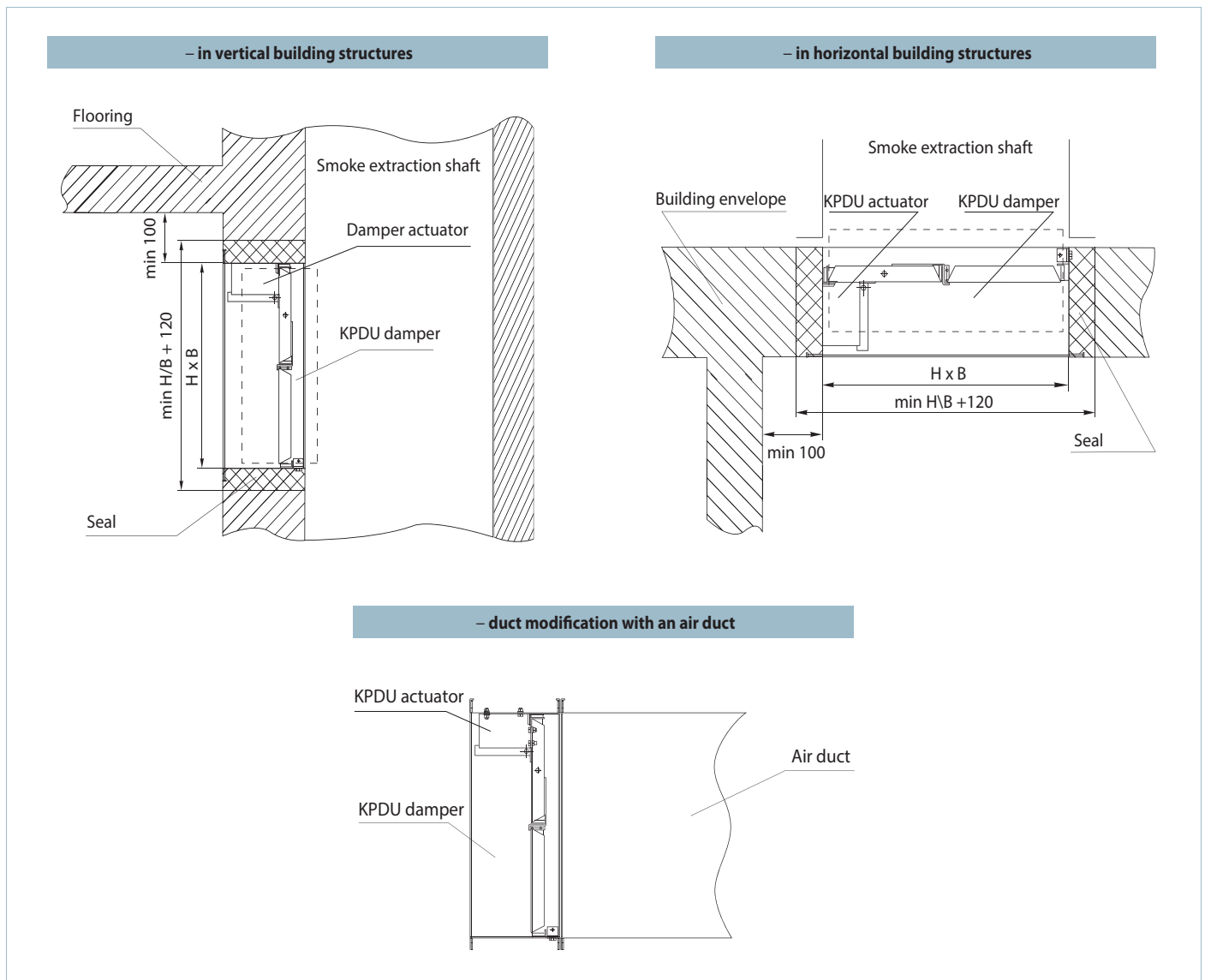
The seal fire resistance must be at least equal to that of the building envelope. When preparing for installation the damper casing should be fitted with wooden spreader bars to prevent deformation, torsional twisting or geometry perturbation of the

casing which may result in louvre jamming and, eventually, loss of the damper functionality.

Upon completion of the damper brickwork envelope in the smoke shaft, fire division wall or flooring and complete cure (setting) of the sealing, remove the wooden spreader bars and check the louvre for free and frictionless opening. Ground the damper, connect the electric magnet or electric actuator (depending on the modification) to the automatic fire-fighting system and test the damper actuation.

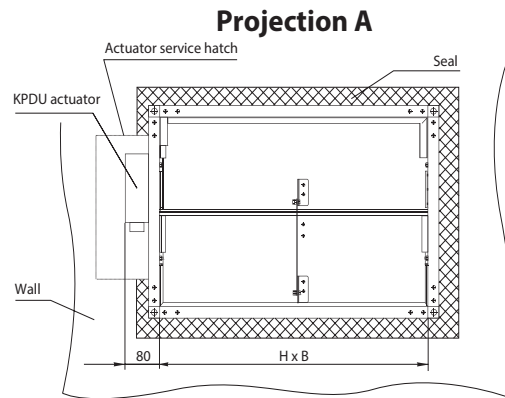
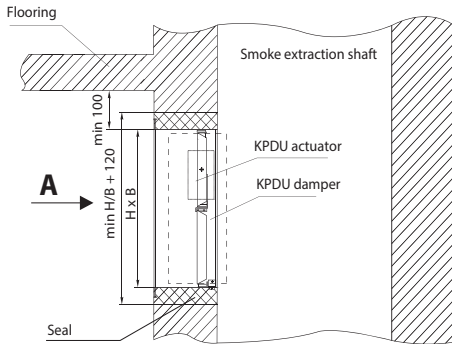


**■ Installation recommendation for the KPDU damper with an internally connected actuator**

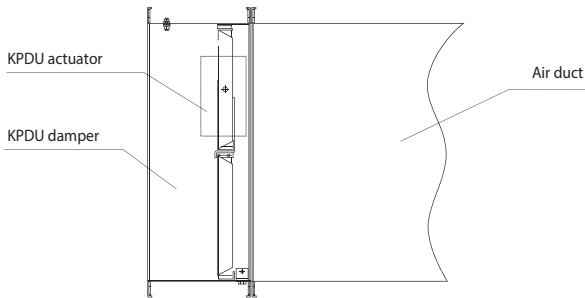


■ Installation recommendation for the KPDU damper with an externally located actuator

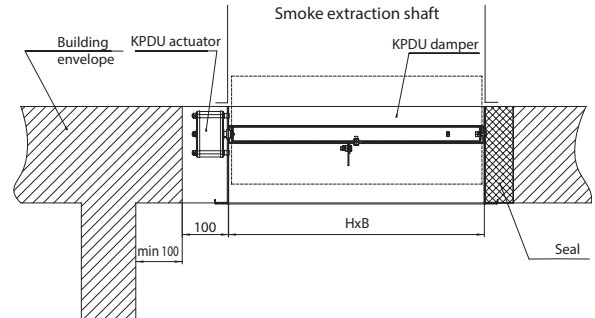
– in vertical building structures



– duct modification with an air duct

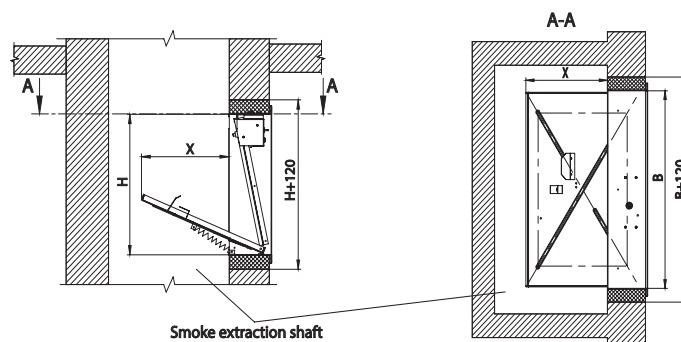


– in horizontal building structures

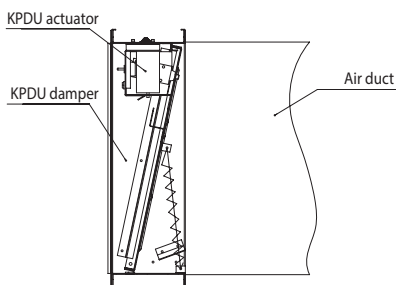


■ Installation recommendation for the KPD damper with an internally connected actuator

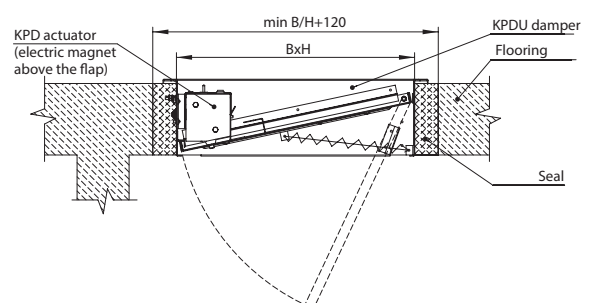
– in vertical building structures



– duct modification with an air duct



– in horizontal building structures

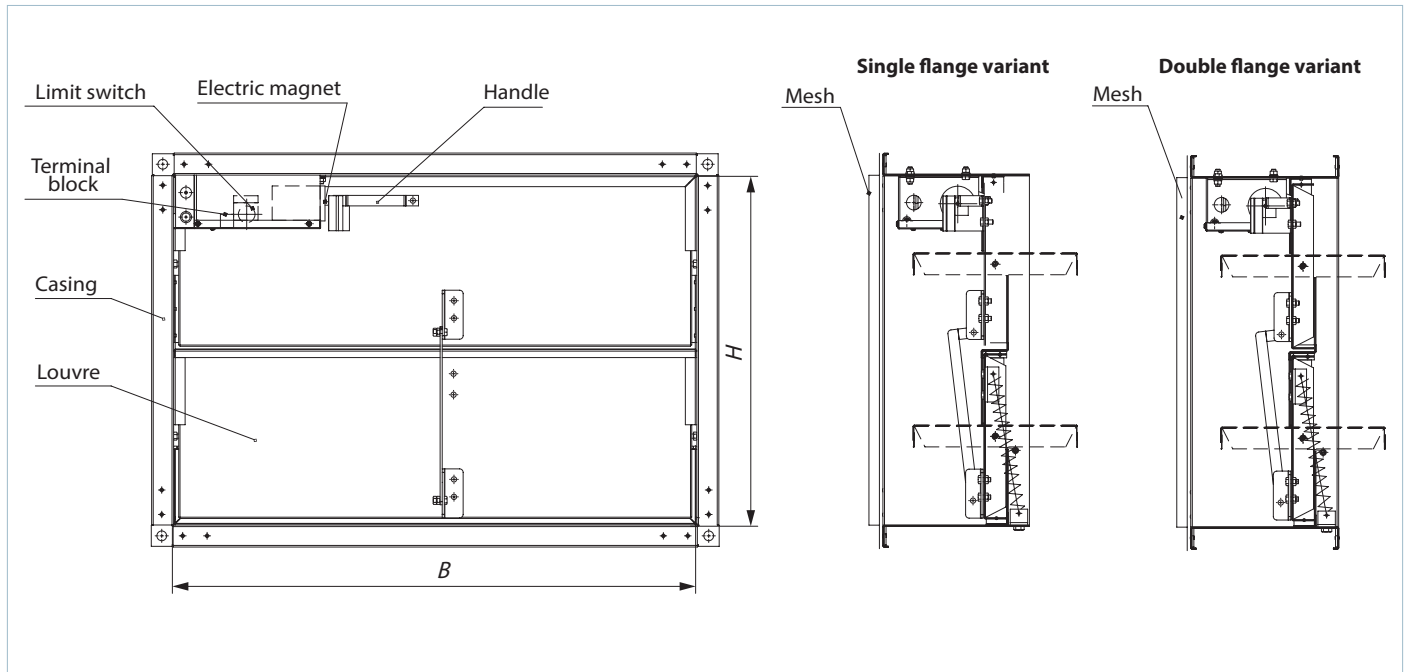


**Possible KPDU damper variants**

▶ **The KPDU damper with an internally installed electric magnet (220/24 V), single or double flange:**  
The single-flange variant is intended for wall or ceiling mounting irrespective of the dimensional orientation.

Upon the test or emergency damper actuation the louvres can only be manually reset to the initial position. The double-flange variant is intended for duct installation irrespective of the dimensional orientation.

Upon the test or emergency damper actuation the louvres can only be manually reset to the initial position.



**Flow area of the KPDU smoke exhaust damper with an electric magnet [m<sup>2</sup>]**

B/H	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
300	0.06														
350	0.08	0.10													
400	0.09	0.11	0.12												
450	0.10	0.13	0.14	0.16											
500	0.12	0.14	0.15	0.18	0.20										
550	0.13	0.16	0.17	0.20	0.23	0.25									
600	0.15	0.18	0.19	0.22	0.25	0.28	0.31								
650	0.16	0.19	0.20	0.24	0.27	0.30	0.33	0.37							
700	0.17	0.21	0.22	0.26	0.29	0.33	0.36	0.40	0.43						
750	0.19	0.22	0.24	0.28	0.31	0.35	0.39	0.43	0.46	0.48					
800	0.20	0.24	0.26	0.30	0.34	0.38	0.42	0.46	0.50	0.51	0.55				
850	0.21	0.26	0.27	0.31	0.36	0.40	0.44	0.48	0.53	0.54	0.59	0.63			
900	0.23	0.27	0.29	0.33	0.38	0.42	0.47	0.51	0.56	0.58	0.62	0.67	0.71		
950	0.24	0.29	0.31	0.35	0.40	0.45	0.50	0.54	0.59	0.61	0.66	0.71	0.75	0.80	
1000	0.25	0.30	0.32	0.37	0.42	0.47	0.52	0.57	0.62	0.64	0.69	0.74	0.79	0.84	0.89

**Note:** Select the required BxH cross-section damper according to the completed table cells. Since the damper can be installed in any spatial position, a change of the height and width (B and H values) orientation may enable selection of a damper with the cross-section beyond the completed cell range. **For example, a 700x500 damper can be ordered as 500x700.**

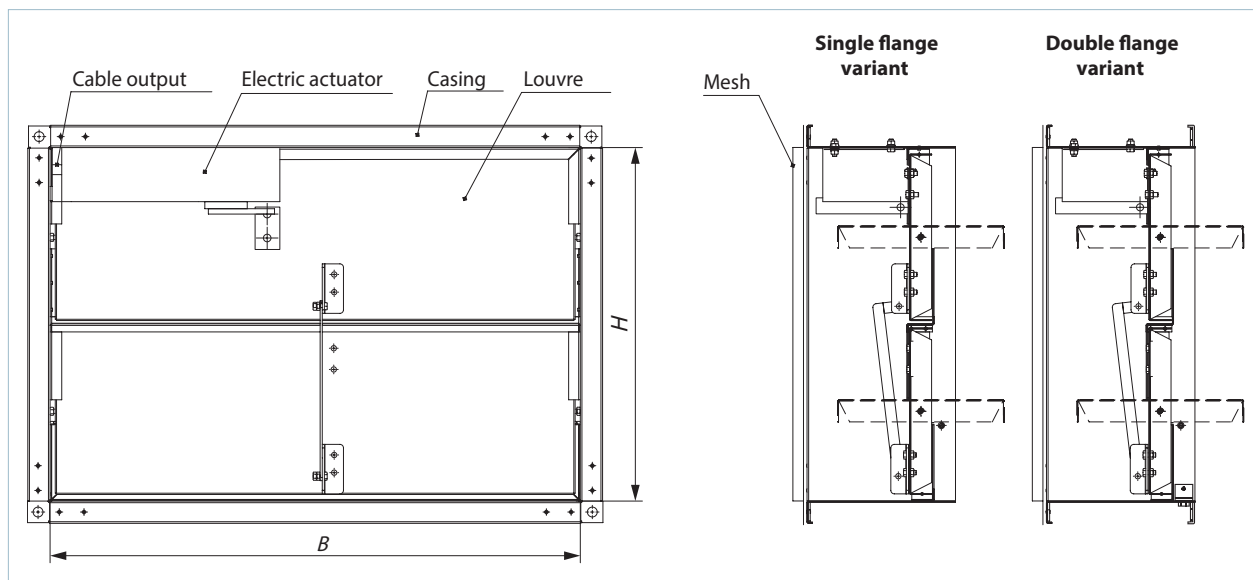
## MULTI-PURPOSE FIRE SAFETY SMOKE DAMPER

### ► The KPDU damper with an electric actuator (230 or 24 V) installed inside the damper, single or double flange:

The single flange variant is intended for wall or ceiling mounting irrespective of the dimensional orientation.

The double flange variant is intended for duct installation irrespective of the dimensional orientation. The louvres of dampers equipped with a two-position electric actuator are set to the "open" or "closed" position by an external actuating signal.

After a test or emergency actuation the louvres of dampers equipped with an electric actuator with a return spring can return to the initial position automatically upon feeding the supply voltage.



Flow area of the KPDU smoke exhaust damper with an electric actuator installed inside the damper [m<sup>2</sup>]

B/H	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
300	0.06														
350	0.08	0.10													
400	0.09	0.11	0.12												
450	0.10	0.13	0.14	0.16											
500	0.12	0.14	0.15	0.18	0.20										
550	0.13	0.16	0.17	0.20	0.23	0.25									
600	0.15	0.18	0.19	0.22	0.25	0.28	0.31								
650	0.16	0.19	0.20	0.24	0.27	0.30	0.33	0.37							
700	0.17	0.21	0.22	0.26	0.29	0.33	0.36	0.40	0.43						
750	0.19	0.22	0.24	0.28	0.31	0.35	0.39	0.43	0.46	0.48					
800	0.20	0.24	0.26	0.30	0.34	0.38	0.42	0.46	0.50	0.51	0.55				
850	0.21	0.26	0.27	0.31	0.36	0.40	0.44	0.48	0.53	0.54	0.59	0.63			
900	0.23	0.27	0.29	0.33	0.38	0.42	0.47	0.51	0.56	0.58	0.62	0.67	0.71		
950	0.24	0.29	0.31	0.35	0.40	0.45	0.50	0.54	0.59	0.61	0.66	0.71	0.75	0.80	
1000	0.25	0.30	0.32	0.37	0.42	0.47	0.52	0.57	0.62	0.64	0.69	0.74	0.79	0.84	0.89

**Note:**

Select the required BxH cross-section damper according to the completed table cells.

Since the damper can be installed in any spatial position, a change of the height and width (B and H values) orientation may enable selection of a damper with the cross-section beyond the completed cell range.

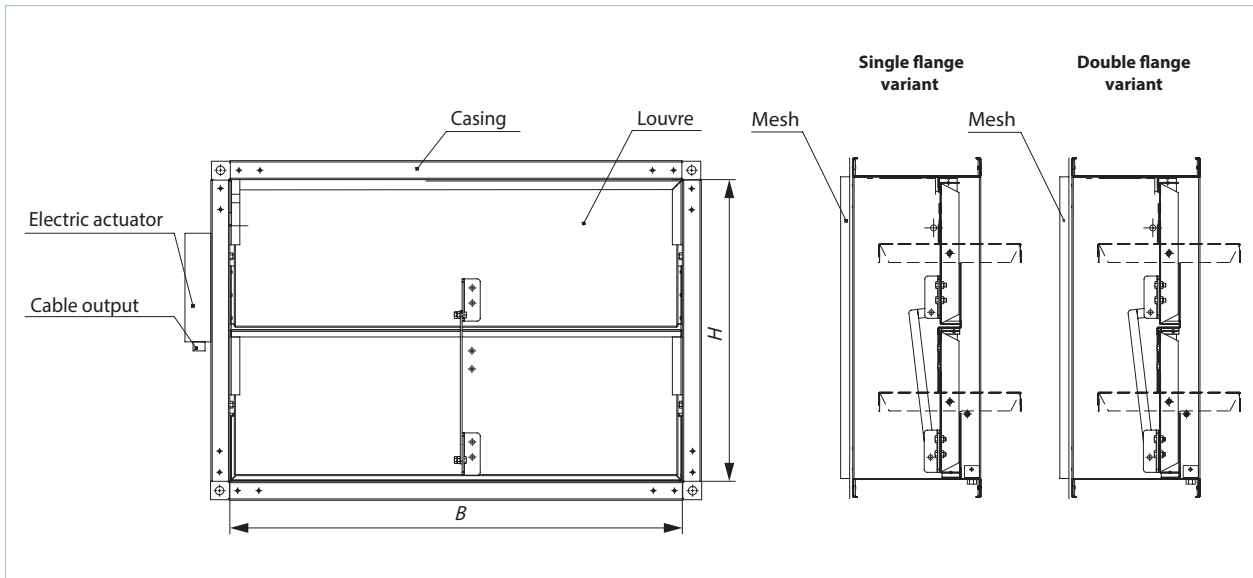
**For example,** a 700x500 damper can be ordered as 500x700.

► **The KPDU damper with an electric actuator (230 or 24 V) installed outside the damper, single or double flange:**

The single flange variant is intended for wall or ceiling mounting irrespective of the dimensional orientation.

The double flange variant is intended for duct installation irrespective of the dimensional orientation. The louvres of dampers equipped with a two-position electric actuator are set to the "open" or "closed" position by an external actuating signal.

After a test or emergency actuation the louvres of dampers equipped with an electric actuator with a return spring can return to the initial position automatically upon feeding the supply voltage.



**Flow area of the KPDU smoke exhaust damper with an electric actuator installed outside the damper [m<sup>2</sup>]**

B/H	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
300	0.07														
350	0.09	0.11													
400	0.10	0.12	0.13												
450	0.11	0.14	0.15	0.17											
500	0.13	0.15	0.16	0.19	0.21										
550	0.14	0.17	0.18	0.21	0.24	0.26									
600	0.16	0.18	0.20	0.23	0.26	0.29	0.32								
650	0.17	0.20	0.21	0.25	0.28	0.31	0.34	0.38							
700	0.18	0.22	0.23	0.27	0.30	0.34	0.37	0.41	0.44						
750	0.20	0.23	0.25	0.29	0.32	0.36	0.40	0.44	0.47	0.49					
800	0.21	0.25	0.27	0.31	0.35	0.39	0.43	0.47	0.51	0.52	0.56				
850	0.22	0.27	0.28	0.32	0.37	0.41	0.45	0.49	0.54	0.55	0.60	0.64			
900	0.24	0.28	0.30	0.34	0.39	0.43	0.48	0.52	0.57	0.59	0.63	0.68	0.72		
950	0.25	0.30	0.32	0.36	0.41	0.46	0.51	0.55	0.60	0.62	0.67	0.72	0.76	0.81	
1000	0.26	0.31	0.33	0.38	0.43	0.48	0.53	0.58	0.63	0.65	0.70	0.75	0.80	0.85	0.90

**Note:** Select the required BxH cross-section damper according to the completed table cells. Since the damper can be installed in any spatial position, a change of the height and width (B and H values) orientation may enable selection of a damper with the cross-section beyond the completed cell range. **For example, a 700x500 damper can be ordered as 500x700.**

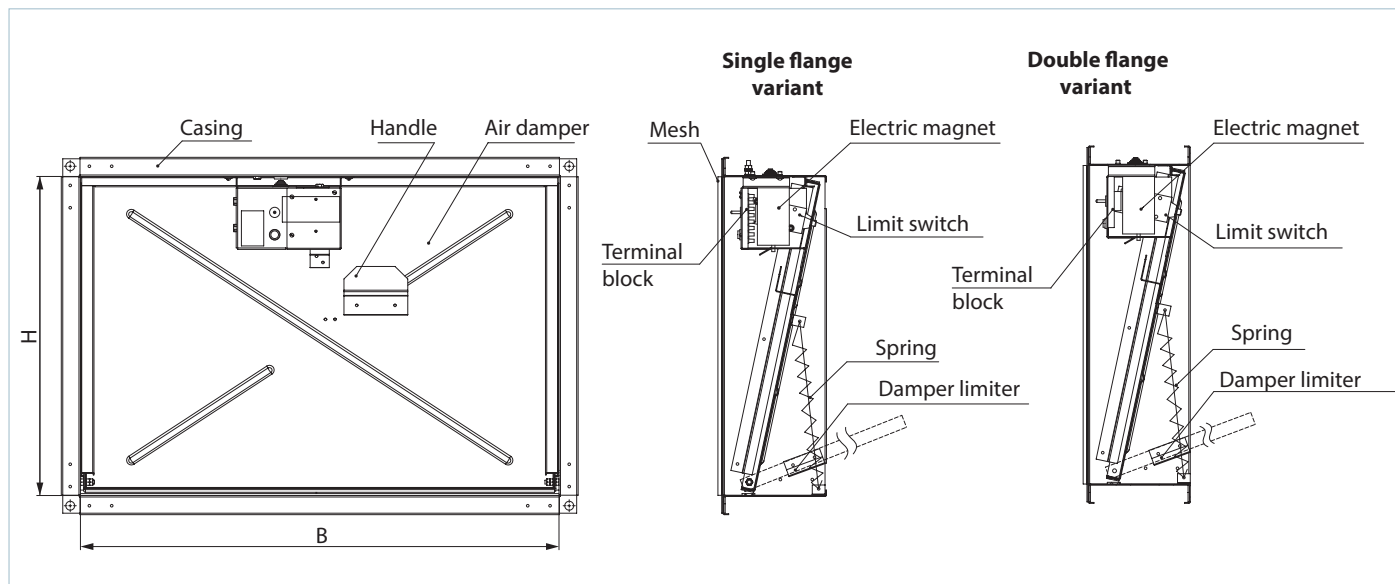
■ Possible KPD Damper variants

▶ The KPD damper with an internally installed electric magnet (220/24 V), single or double flange:

The single flange variant is intended for wall or ceiling installation.

The damper must be installed according to the installation guidelines for the KPD damper with an internal actuator (see page 24). Upon the test or emergency damper actuation, the louvres can only be

manually reset to initial position. The double flange variant is intended for duct installation. Upon the test or emergency damper actuation the louvres can only be manually reset to the initial position.



Flow area of the KPD smoke exhaust damper with an electric magnet [m²]

B/H	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
300	0.06														
350	0.08	0.10													
400	0.09	0.11	0.12												
450	0.10	0.13	0.14	0.16											
500	0.12	0.14	0.15	0.18	0.20										
550	0.13	0.16	0.17	0.20	0.23	0.25									
600	0.15	0.18	0.19	0.22	0.25	0.28	0.31								
650	0.16	0.19	0.20	0.24	0.27	0.30	0.33	0.37							
700	0.17	0.21	0.22	0.26	0.29	0.33	0.36	0.40	0.43						
750	0.19	0.22	0.24	0.28	0.31	0.35	0.39	0.43	0.46	0.48					
800	0.20	0.24	0.26	0.30	0.34	0.38	0.42	0.46	0.50	0.51	0.55				
850	0.21	0.26	0.27	0.31	0.36	0.40	0.44	0.48	0.53	0.54	0.59	0.63			
900	0.23	0.27	0.29	0.33	0.38	0.42	0.47	0.51	0.56	0.58	0.62	0.67	0.71		
950	0.24	0.29	0.31	0.35	0.40	0.45	0.50	0.54	0.59	0.61	0.66	0.71	0.75	0.80	
1000	0.25	0.30	0.32	0.37	0.42	0.47	0.52	0.57	0.62	0.64	0.69	0.74	0.79	0.84	0.89

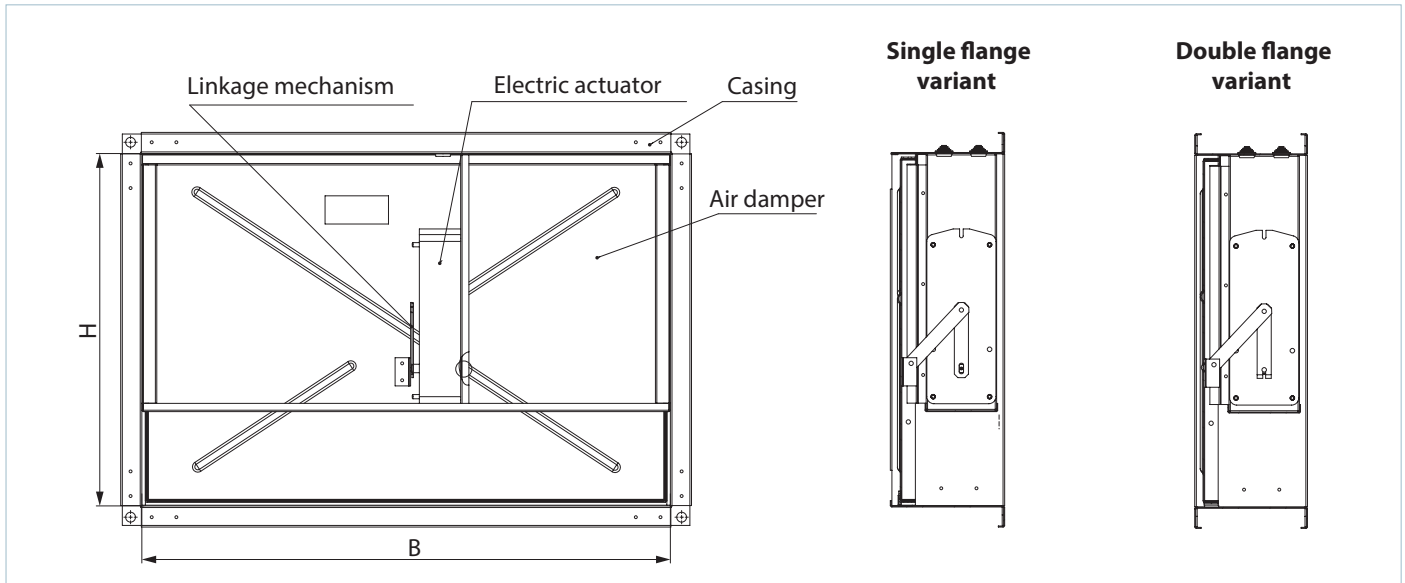
Note: Select the required BxH cross-section damper according to the completed table cells.

► **The KPD damper with an electric actuator (230 or 24 V) installed inside the damper, single or double flange:**

The single flange variant is intended for wall or ceiling mounting irrespective of the dimensional orientation.

The double flange variant is intended for duct installation irrespective of the dimensional orientation. The louvres of dampers equipped with a two-position electric actuator are set to the "open" or "closed" position by an external actuating signal. After

a test or emergency actuation the louvres of dampers equipped with an electric actuator with a return spring can return to the initial position automatically upon feeding the supply voltage.



**Flow area of the KPD smoke exhaust damper with an electric actuator installed inside the damper [m<sup>2</sup>]**

B/H	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
300	0.06														
350	0.08	0.10													
400	0.09	0.11	0.12												
450	0.10	0.13	0.14	0.16											
500	0.12	0.14	0.15	0.18	0.20										
550	0.13	0.16	0.17	0.20	0.23	0.25									
600	0.15	0.18	0.19	0.22	0.25	0.28	0.31								
650	0.16	0.19	0.20	0.24	0.27	0.30	0.33	0.37							
700	0.17	0.21	0.22	0.26	0.29	0.33	0.36	0.40	0.43						
750	0.19	0.22	0.24	0.28	0.31	0.35	0.39	0.43	0.46	0.48					
800	0.20	0.24	0.26	0.30	0.34	0.38	0.42	0.46	0.50	0.51	0.55				
850	0.21	0.26	0.27	0.31	0.36	0.40	0.44	0.48	0.53	0.54	0.59	0.63			
900	0.23	0.27	0.29	0.33	0.38	0.42	0.47	0.51	0.56	0.58	0.62	0.67	0.71		
950	0.24	0.29	0.31	0.35	0.40	0.45	0.50	0.54	0.59	0.61	0.66	0.71	0.75	0.80	
1000	0.25	0.30	0.32	0.37	0.42	0.47	0.52	0.57	0.62	0.64	0.69	0.74	0.79	0.84	0.89

**Note:** Select the required BxH cross-section damper according to the completed table cells. Since the damper can be installed in any spatial position any change of the height and width (B and H values) orientation may enable selection of a damper with the cross-section beyond the completed cell range.  
**For example, a 700x500 damper can be ordered as 500x700.**

## MULTI-PURPOSE FIRE SAFETY SMOKE DAMPER

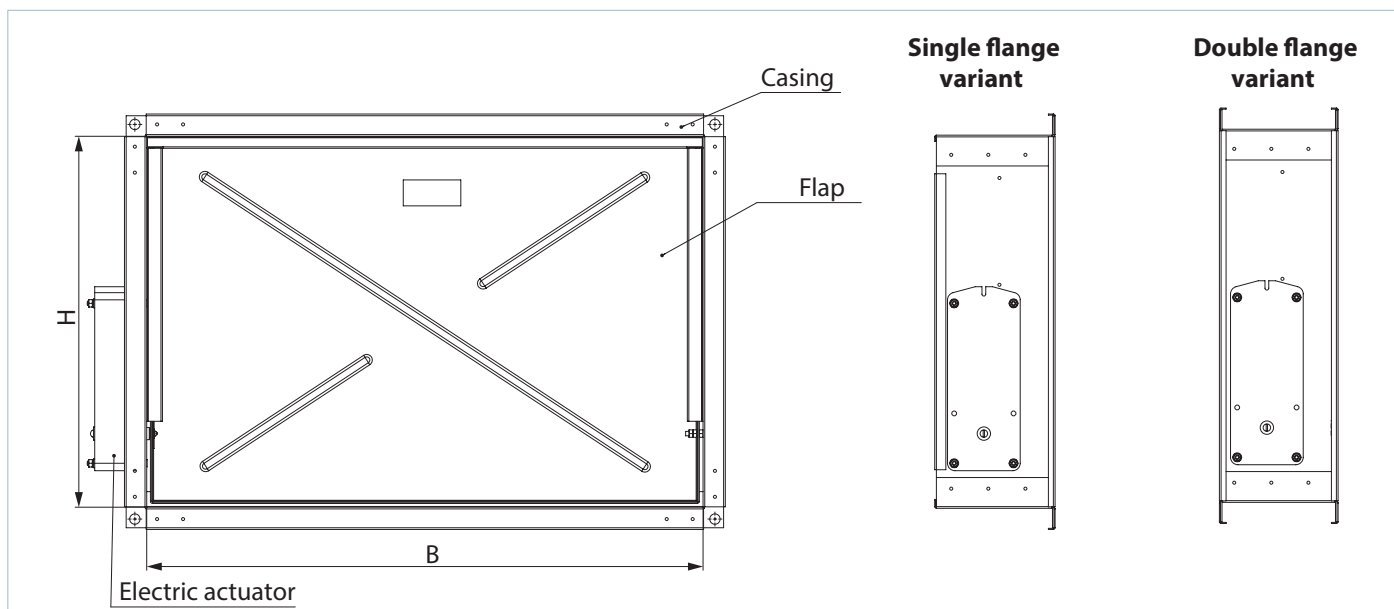
### ► The KPD damper with an electric actuator (230 or 24 V) installed outside the damper, single or double flange:

The single flange variant is intended for wall or ceiling mounting irrespective of the dimensional orientation.

The double flange variant is intended for duct installation irrespective of the dimensional orientation.

The louvres of dampers equipped with a two-position electric actuator are set to the "open" or "closed" position by an external actuating signal.

After a test or emergency actuation the louvres of dampers equipped with an electric actuator with a return spring can return to the initial position automatically upon feeding the supply voltage.



Flow area of the KPD smoke exhaust damper with an electric actuator installed outside the damper [m<sup>2</sup>]

B/H	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
300	0.07														
350	0.09	0.11													
400	0.10	0.12	0.13												
450	0.11	0.14	0.15	0.17											
500	0.13	0.15	0.16	0.19	0.21										
550	0.14	0.17	0.18	0.21	0.24	0.26									
600	0.16	0.18	0.20	0.23	0.26	0.29	0.32								
650	0.17	0.20	0.21	0.25	0.28	0.31	0.34	0.38							
700	0.18	0.22	0.23	0.27	0.30	0.34	0.37	0.41	0.44						
750	0.20	0.23	0.25	0.29	0.32	0.36	0.40	0.44	0.47	0.49					
800	0.21	0.25	0.27	0.31	0.35	0.39	0.43	0.47	0.51	0.52	0.56				
850	0.22	0.27	0.28	0.32	0.37	0.41	0.45	0.49	0.54	0.55	0.60	0.64			
900	0.24	0.28	0.30	0.34	0.39	0.43	0.48	0.52	0.57	0.59	0.63	0.68	0.72		
950	0.25	0.30	0.32	0.36	0.41	0.46	0.51	0.55	0.60	0.62	0.67	0.72	0.76	0.81	
1000	0.26	0.31	0.33	0.38	0.43	0.48	0.53	0.58	0.63	0.65	0.70	0.75	0.80	0.85	0.90

**Note:**

Select the required BxH cross-section damper according to the completed table cells. Since the damper can be installed in any spatial position any change of the height and width (B and H values) orientation may enable selection of a damper with the cross-section beyond the completed cell range.

**For example,** a 700x500 damper can be ordered as 500x700.



### ■ Technical specifications of the electric magnet

Parameter name	Parameter value
Rated voltage [V]	220/24
Rated current at the ambient temperature of 25±10 °C [A]	0.6/5.5
Armature stroke [mm]	10±1
Armature release time [seconds]	2
Tractive force [N]	45
Maximum active power consumption at 220 V [W]	600
Maximum total power consumption at 220 V [W]	1200
Maximum total power consumption at 24 V [W]	60

### ■ Main technical specifications of Belimo electric actuators with a return spring

Technical data	Basic models		Models with increased torque	
Rated voltage	AC/DC 24 V	AC 230 V	AC/DC 24 V	AC 230 V
Rated voltage range	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V
Rated voltage frequency AC	50/60 Hz			
Power consumption in rest position [W]	1.4	2.0	2	3
Power consumption in operation [W]	4.0	4.5	7	8.5
Maximum design capacity [VA]	6	9.0	10	11
Motor torque [Nm]	9		18	
Spring torque [Nm]	7		12	
SEC class	III	II	III	II
Ingress protection rating	IP54			
Auxiliary switches	2 pcs., single-pole, reversible 1 mA...3 (0.5) A, AC 250 V		2 pcs., single-pole, reversible 1 mA...6 (3) A, AC 250 V	
Electric motor connection cable	1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free)			
Auxiliary switch connection cable	1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)			
Running time spring	20 seconds at -10...+55 °C < 60 seconds at -30...-10 °C		16 seconds at +20 °C	
Running time motor	< 60 s/90°		< 120 s/90°	
Service life	Min. 60 000 emergency positions			
Technical maintenance	Not required			

### ■ Main technical specifications of Belimo two-position electric actuators

Technical data	Basic models		Models with increased torque	
Rated operation voltage	AC/DC 24 V	AC 230 V	AC/DC 24 V	AC 230 V
Rated voltage range	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V
Rated voltage frequency AC	50/60 Hz			
Power consumption in rest position [W]	<0.5	<1	0.5	0.5
Power consumption in operation [W]	7.5	5	12	8
Maximum design capacity [VA]	9	12	18	15
Motor torque [Nm]	15		40	
Holding torque [Nm]	20		50	
SEC class	III	II	III	II
Ingress protection rating	IP54			
Auxiliary switches	2 pcs., single-pole, reversible, 1 mA...3(0.5)A, AC 250 V			
Electric motor connection cable	1 m, 3 x 0.75 mm <sup>2</sup> (halogen-free)			
Auxiliary switch connection cable	1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)			
Running time	< 30 s/90°		< 60 s/90°	
Service life	Min. 10 000 emergency positions			
Technical maintenance	Not required			

■ Main technical specifications of ZERN electric actuators with a return spring

Technical data	Basic models		Models with increased torque	
Rated operation voltage	AC/DC 24 V	AC 100-240 V	AC/DC 24 V	AC 100-240 V
Permissible operating voltage tolerance	AC/DC 19.2...28.8 V	AC 85...265 V	AC/DC 19.2...28.8 V	AC 85...265 V
AC mains frequency	50/60 Hz			
Power consumption in rest position [W]	3			
Power consumption in operation [W]	5			
Motor torque [Nm]	5		8	
Spring torque [Nm]	5		8	
SEC class	III	II	III	II
Ingress protection rating	IP54			
Auxiliary switches	2 pcs., single-pole, reversible, 1 mA...3(0.5)A, AC 220 V			
Electric motor connection cable	1 m, 2 x 0.5 mm <sup>2</sup> (halogen-free)			
Auxiliary switch connection cable	1 m, 6 x 0.5 mm <sup>2</sup> (halogen-free)			
Running time spring	<20 seconds < 60 seconds at -30...-10 °C		<25 seconds < 60 seconds at -30...-10 °C	
Running time motor	< 70 s/95°		< 100 s/95°	

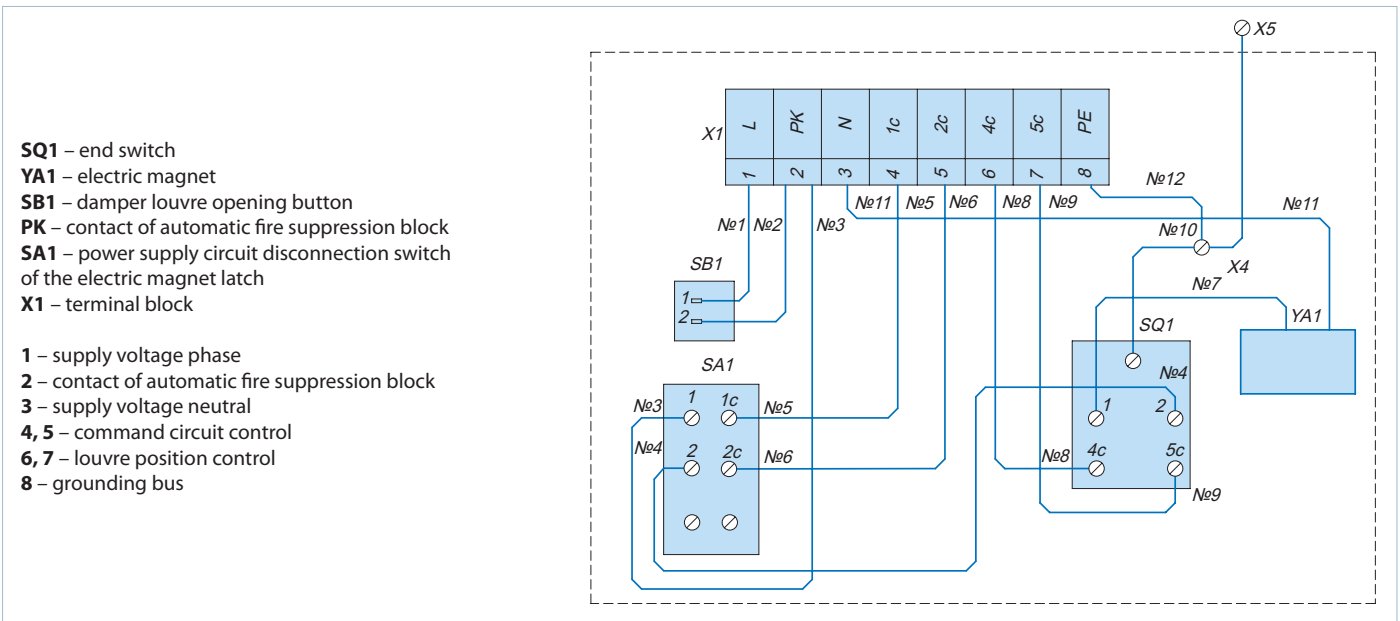
■ Main technical specifications of Siemens electric actuators with a return spring

Technical data	Basic models		Models with increased torque	
Rated operation voltage	AC 24 V/ DC 24...48 V	AC 230 V	AC 24 V/ DC 24...48 V	AC 230 V
Permissible operating voltage tolerance	AC/DC ±20 %	AC ±15 %	AC/DC ±20 %	AC ±15 %
AC mains frequency	50/60 Hz			
Power consumption in rest position [W]	2	3.5	3	4
Power consumption in operation [W]	3.5	4.5	5	6
Maximum design capacity [VA]	5	7	7	8
Motor torque [Nm]	9		18	
Spring torque [Nm]	7		18	
SEC class	III	II	III	II
Ingress protection rating	IP54			
Auxiliary switches	2 pcs., single-pole, reversible, 6(2)A, AC 24...250 V			
Electric motor connection cable	0.9 m, 2 x 0.75 mm <sup>2</sup> (halogen-free)			
Auxiliary switch connection cable	0.9 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)			
Running time spring	15 seconds < 60 seconds at -30...-10 °C			
Running time motor	90 s/90°			
Service life	10 000 emergency positions			
Technical maintenance	Not required			

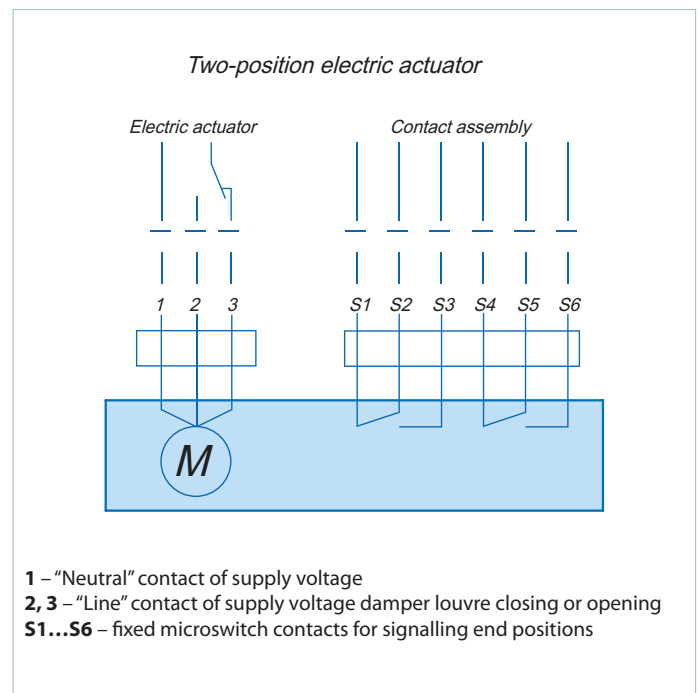
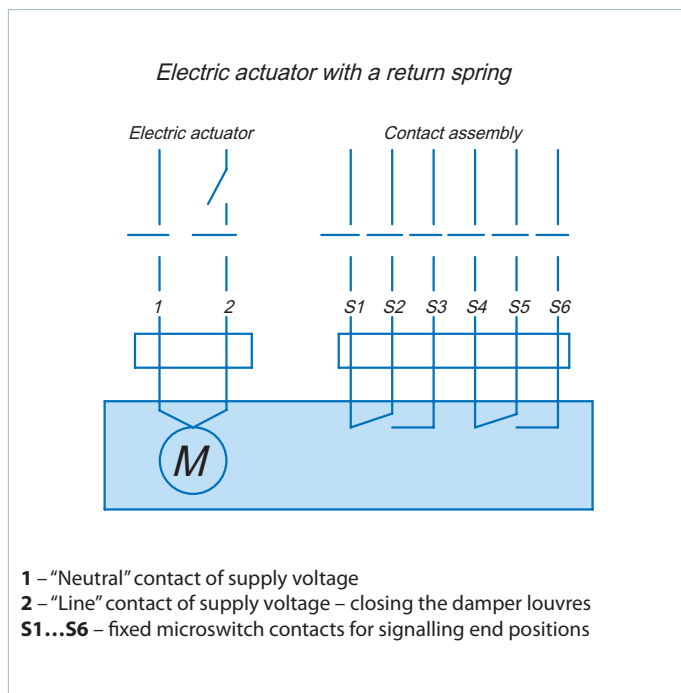
**Note:** The table "Main technical specifications of Siemens two-position electric actuators" is in development. This information is available upon request.

■ Electrical connection diagrams of KPD/KPDU dampers

Electrical connection diagram of KPD/KPDU dampers equipped with an electric magnet



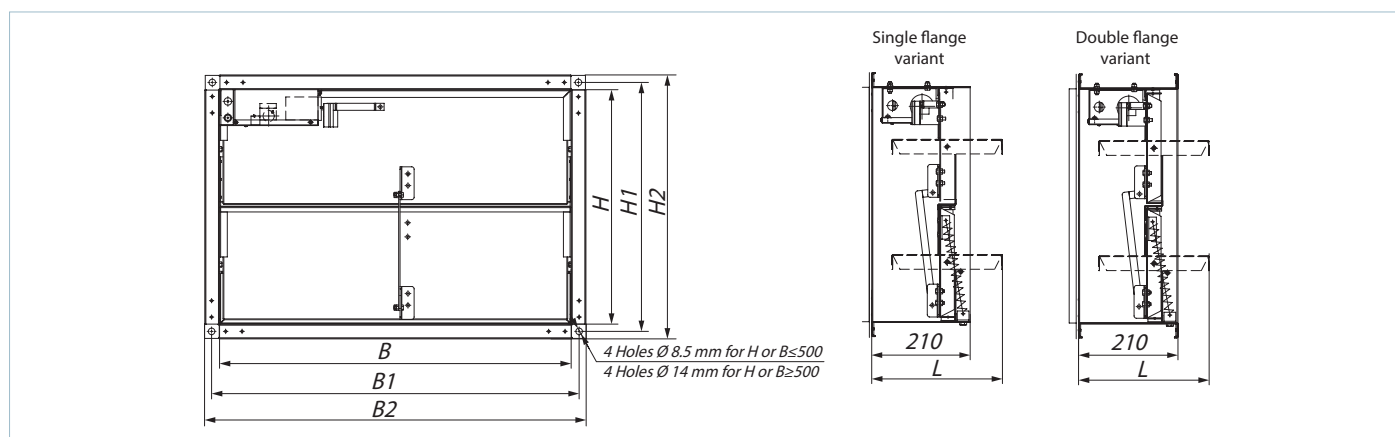
Wiring diagram of KPD/KPDU dampers



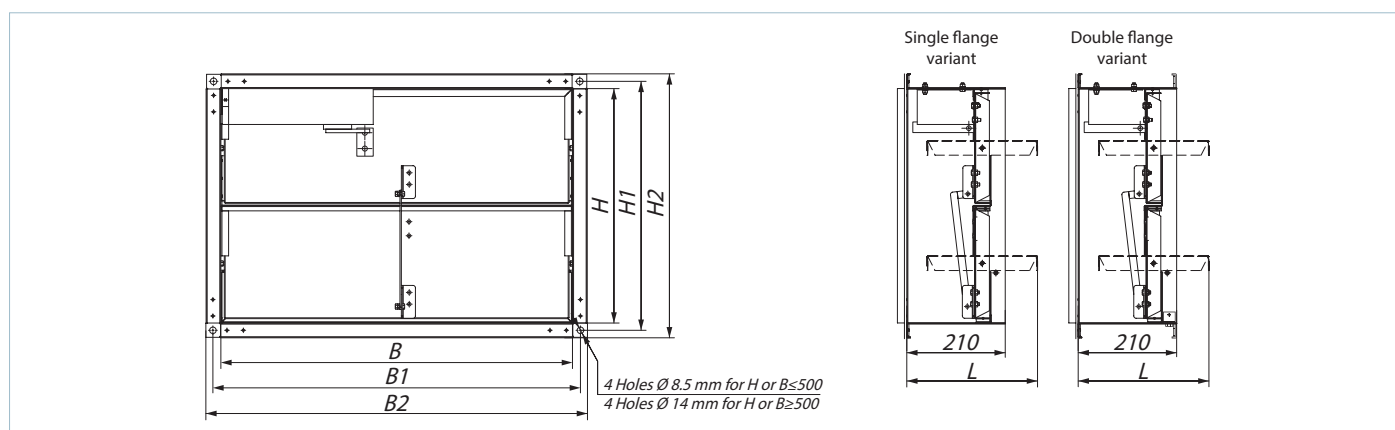
Overall and connecting dimensions of KPDU multi-louvre dampers

Standard damper size	Minimum flow area [m <sup>2</sup> ]	KPDU size [mm]							Maximum KPDU weight [kg]
		H	H1	H2	B	B1	B2	L	
400x400	0.12	400	420	440	400	420	440	260	9.5
500x500	0.2	500	520	540	500	520	540	285	12.1
600x600	0.31	600	630	660	600	630	660	260	17
700x700	0.43	700	730	760	700	730	760	275	20.3
800x800	0.55	800	830	860	800	830	860	260	24.1
900x900	0.71	900	930	960	900	930	960	270	27.4
1000x1000	0.9	1000	1030	1060	1000	1030	1060	285	31.7

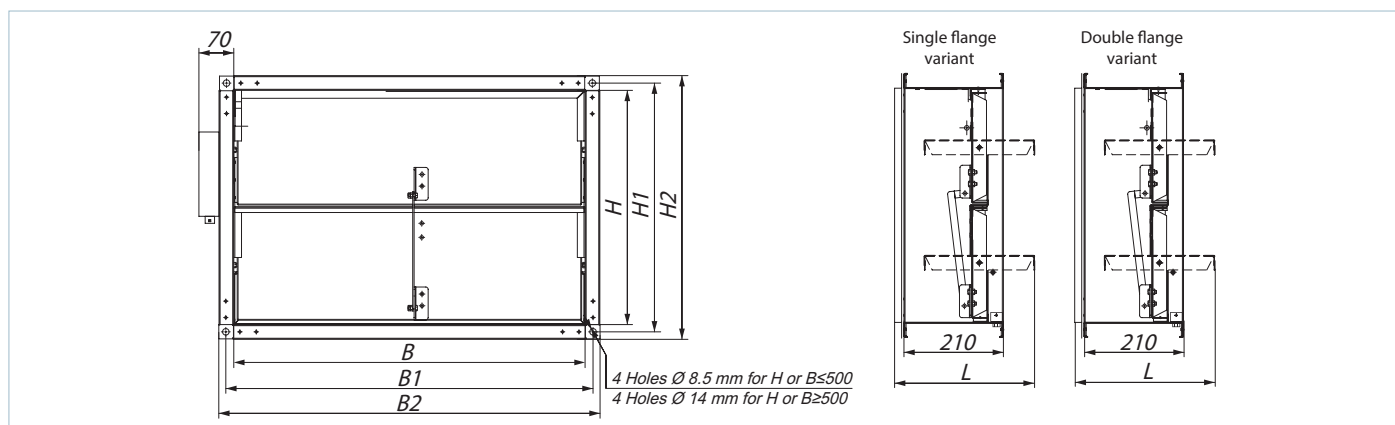
The KPDU damper with an internally installed electric magnet (220/24 V), single or double flange.



The KPDU damper with an electric actuator (230 or 24 V) installed inside the damper, single or double flange.



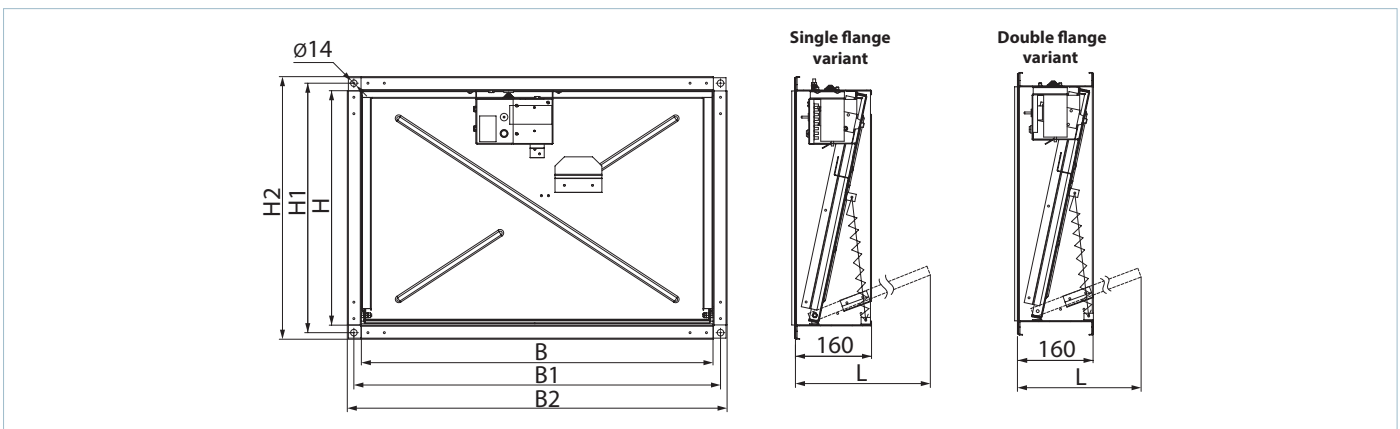
The KPDU damper with an electric actuator (230 or 24 V) installed outside the damper, single or double flange.



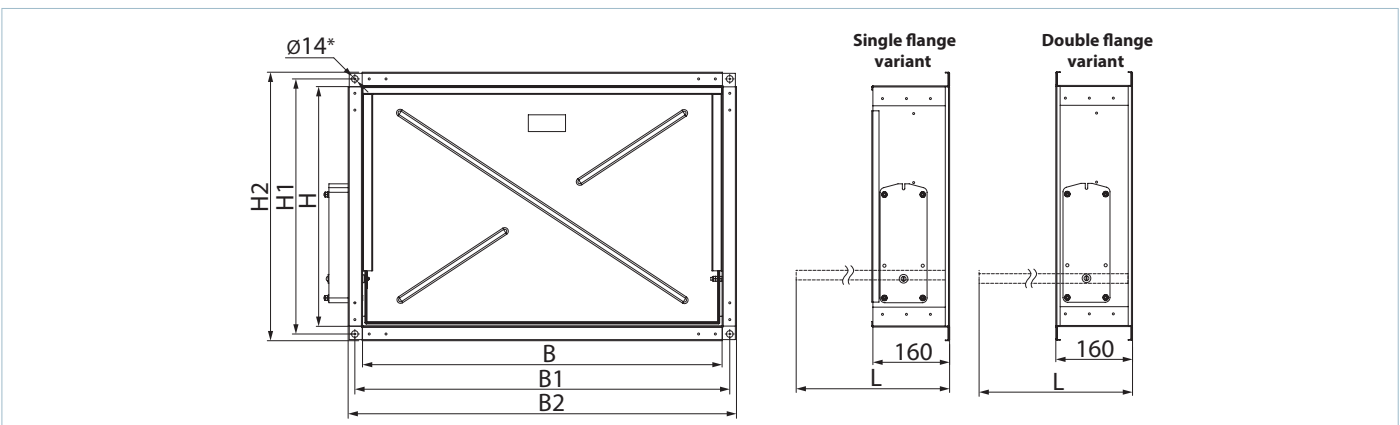
■ Overall and connecting dimensions of the KPD single-louvre damper

Standard damper size	Minimum flow area [m <sup>2</sup> ]	KPD size, mm							Maximum KPD weight [kg]
		H	H1	H2	B	B1	B2	L	
400x400	0.12	400	430	460	400	430	460	390	8.2
500x500	0.2	500	530	560	500	530	560	490	10.6
600x600	0.31	600	630	660	600	630	660	590	13.2
700x700	0.43	700	730	760	700	730	760	690	16
800x800	0.55	800	830	860	800	830	860	790	19
900x900	0.71	900	930	960	900	930	960	890	22.2
1000x1000	0.9	1000	1030	1060	1000	1030	1060	990	25.6

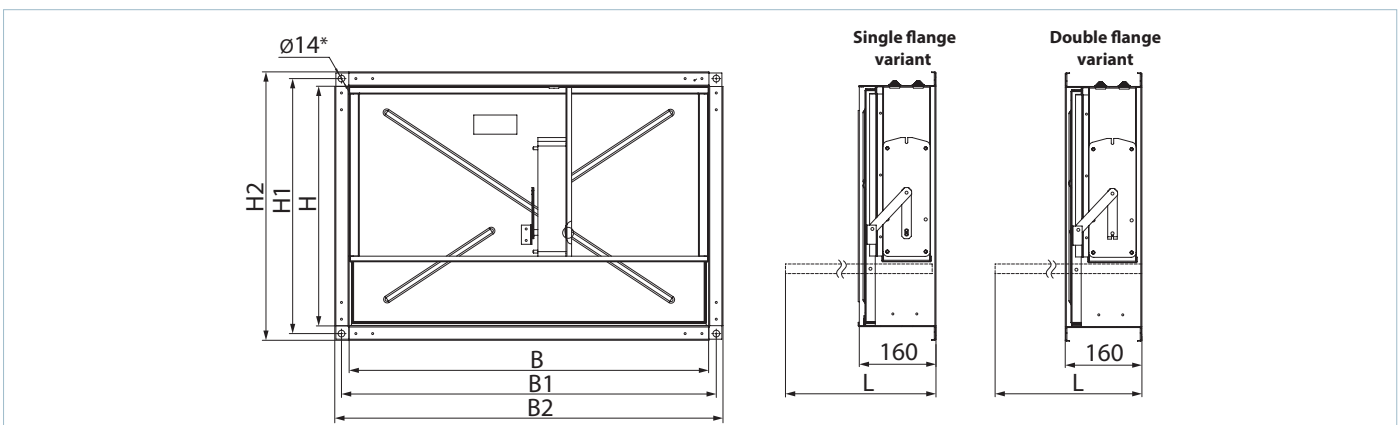
► The KPD damper with an internally installed electric magnet (220/24 V), single or double flange.



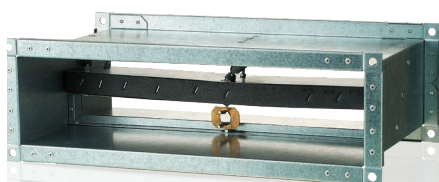
► The KPD damper with an electric actuator (230 or 24 V) installed outside the damper, single or double flange.



► The KPD damper with an electric actuator (230 or 24 V) installed inside the damper, single or double flange.



**KP-1...72S**  
Series



Normally open fire-resisting duct damper with mechanical drive mechanism

**KP-1...PKP**  
**KP-1...PVP**  
**KP-1...PSP**  
Series



Normally open fire-resisting duct damper with electric drive mechanism

**Application**

The fire dampers are intended for automatic closing of process openings and air duct penetrations in intermediate floors, walls and partitions, as well as closing of openings in supply and exhaust ducts of smoke ventilation systems.

The dampers of this particular design are not suitable for installation in air ducts and ducts of premises with rated explosion and fire safety category A and B and in flammable and explosive mixture intakes.

The KP-1 fire-resisting duct dampers are capable of resisting fire for at least 60 minutes (EI 60) at the temperature of 600 °C.

**Design**

The KP-1 series dampers are made in the general-purpose industrial version with a minimized variety of hardware components using low-alloy galvanized steel. The damper flap is made of fire-resistant material. The duct installation design results in two mounting flanges on the casing for integration into a ventilation ducts (air ducting) and external configuration of the drive mechanism for easier maintenance. The KP-1 series dampers are characterised by a simplified design and the absence of a hot and cold zone baffle. Depending on the design variant KP-1 series dampers are equipped with:

▶ **Mechanical actuating unit with a thermal fuse and a return spring.**

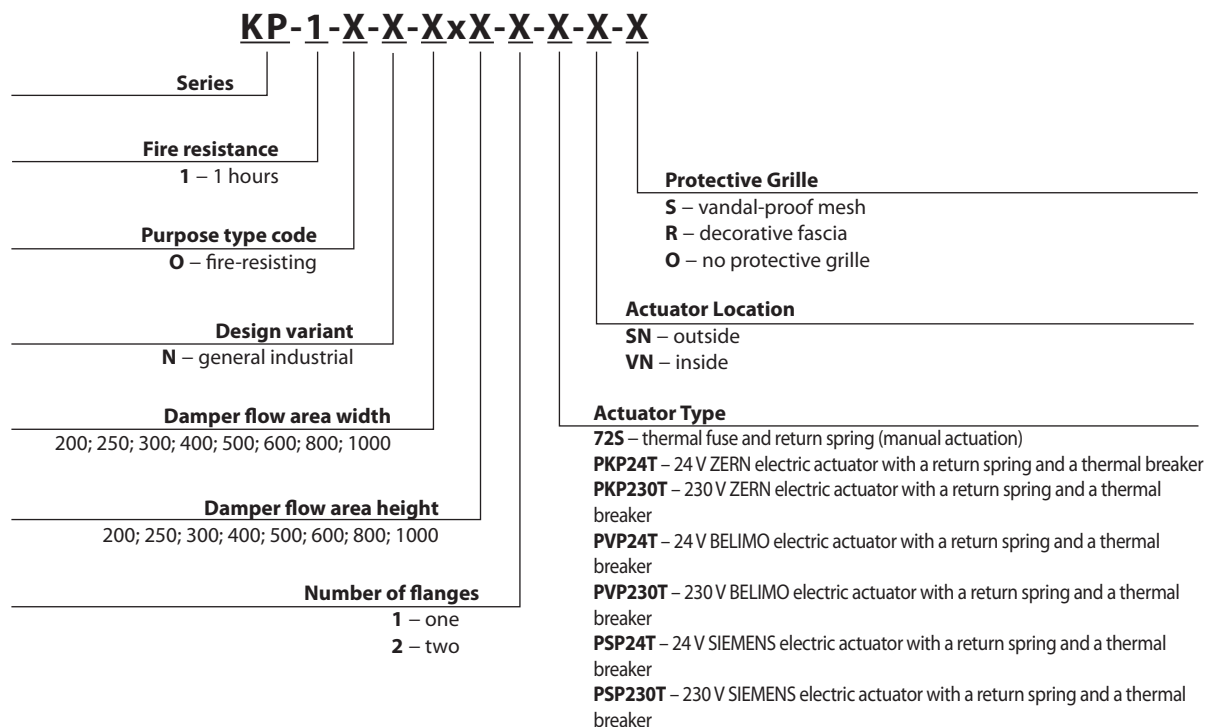
The damper is set to the operating position upon the thermal fuse breakdown resulting from a temperature increase.

Emergency Damper Actuation: The flap remains in the protective position (damper unaffected by fire) and is fixed by a thermal fuse (the return spring is cocked upon setting the damper to the protective position). Upon emergency actuation (damper directly affected by fire) the thermal fuse breaks down and the return spring sets the flap to the operating condition.

▶ **Electric actuator with a built-in return spring and a back-up thermal breaker.**

Setting the damper to operating position (direct fire contact): remotely, via electric actuator. The damper

**Designation key:**

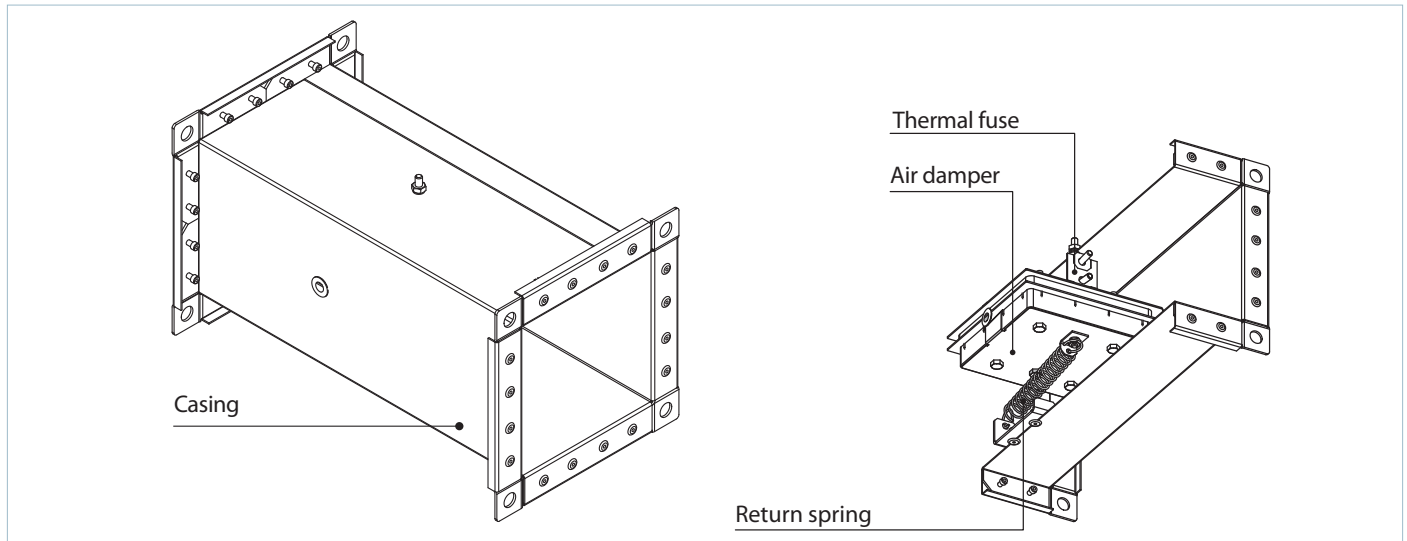


can be set to the operating or protective position either remotely via the control panel or manually using the manual cocking handle which is always included in the standard delivery set of the electric actuator. In case of the remote control panel failure, the back-up thermal breaker interrupts the power supply to

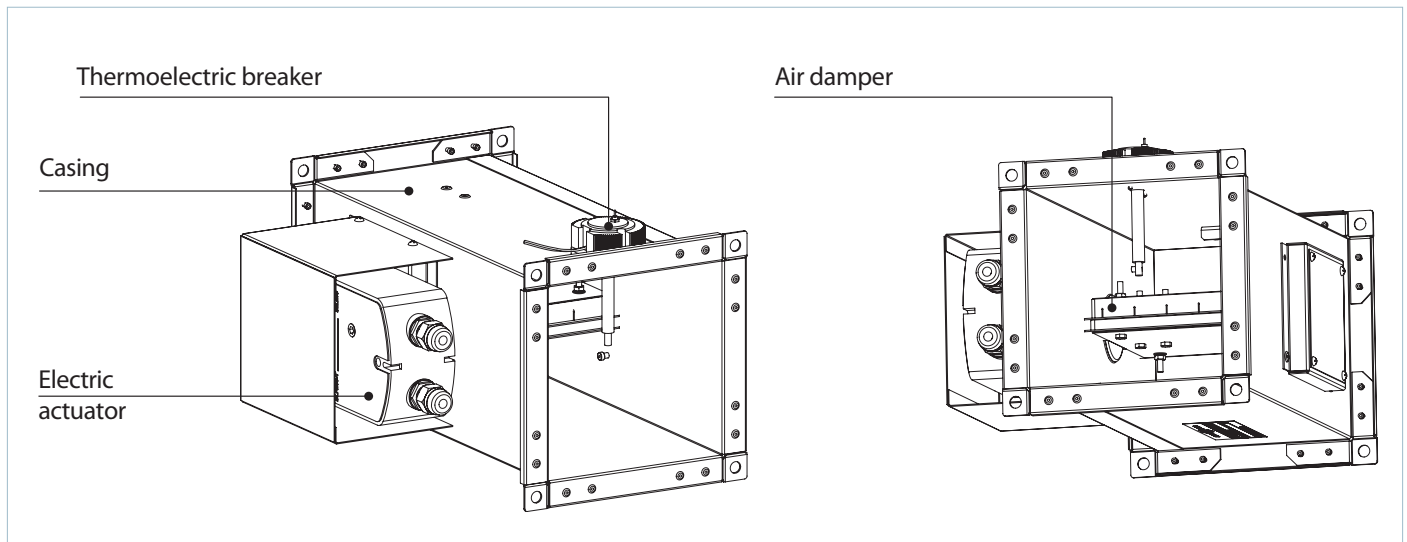
the electric actuator and the return spring sets the damper to the operating position. Emergency damper actuation: the damper flap is set to the protective position automatically (damper unaffected by fire). The electric actuator remains energized at all times. In case of an emergency actuation (direct fire contact):

The electric actuator equipped with a return spring is de-energized and the damper flap is set to the operating position by means of the spring energy. In case of a power failure not related to fire and its subsequent restoration at the actuator with a return spring, the damper flap returns to protective position.

■ **KP-1...72S fire safety damper with a mechanical actuating unit with a thermal fuse and a return spring**



■ **KP-1...PKP/KP-1...PVP/KP-1...PSP fire safety damper with a Belimo electric actuator and a thermoelectric breaker**



## FIRE-RESISTING DAMPER

### Installation

The damper must be installed into the building envelope structure in accordance with the applicable standards and regulations. The seal fire resistance must be at least equal to that of the building envelope.

The dampers can be installed in any position in vertical and horizontal ducts of fire-protection structures.

The ducts for damper installation must be made in such a way so as to prevent the transfer of loads caused by the fire-protection structures to the damper casing.

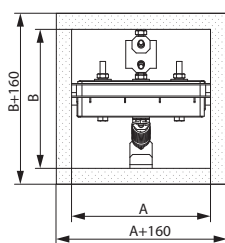
The adjoining air duct must be suspended in such a way so as to prevent the transfer of air duct load to the damper flange.

The minimum free space for accessing the control parts must be at least 350 mm. Make sure to arrange an inspection hole. While carrying out the installation consider size K. When two or more dampers are installed into the same fire-protection separation structure, the distance between the two adjacent dampers must be at least 200 mm.

The damper must be installed in such a way so that the damper flap (in its closed position) is located in the fire-protection separation structure. If such installation is not possible, the damper casing part between the fire-protection separation structure and the damper flap must be insulated with a suitable material pursuant

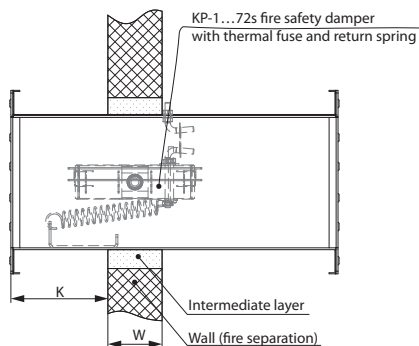
to the applicable standards. The damper control mechanism must be protected against damage and contamination. The damper casing must not deform any deformation during embedding. After the installation the flap must not catch against the damper casing while opening or closing. The fire safety damper can be integrated into a tight wall structure – e.g. made of conventional concrete work of minimum width  $W = 100$  mm or into a plasterboard wall of the necessary fire resistance class or into a tight ceiling structure – e.g. made of conventional concrete of minimum width  $W = 150$  mm. Do not use any foaming substances for sealing the damper in the separation structure.

### Installation recommendations for KP-1...72S dampers with a thermal fuse and a return spring:

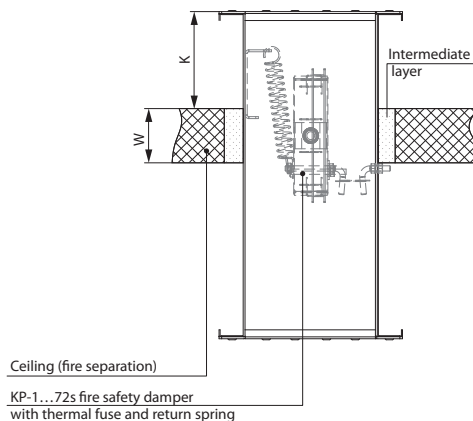


For sizes A and B please refer to the dimension table

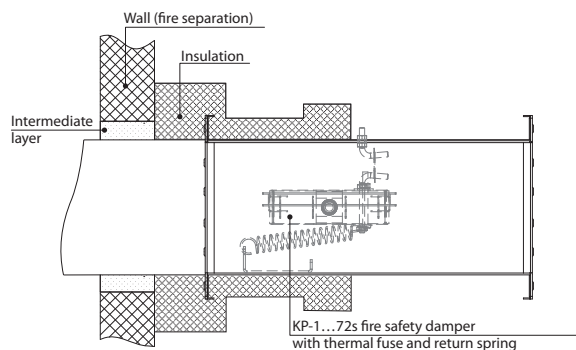
#### – in vertical building structures



#### – in horizontal building structures

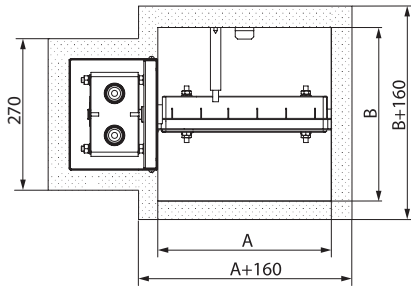


#### – duct modification with an air duct



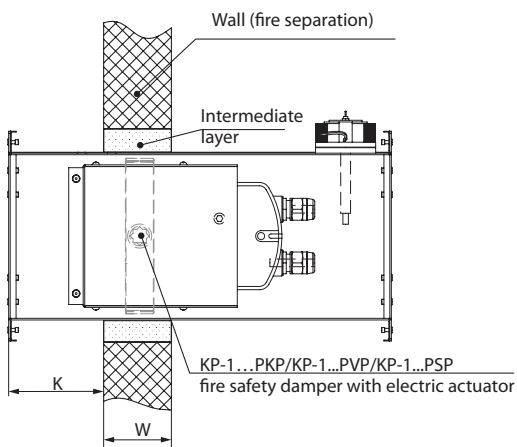


■ Installation recommendations for KP-1...PKP/KP-1...PVP/KP-1...PSP fire safety dampers with electric actuator and thermoelectric breaker

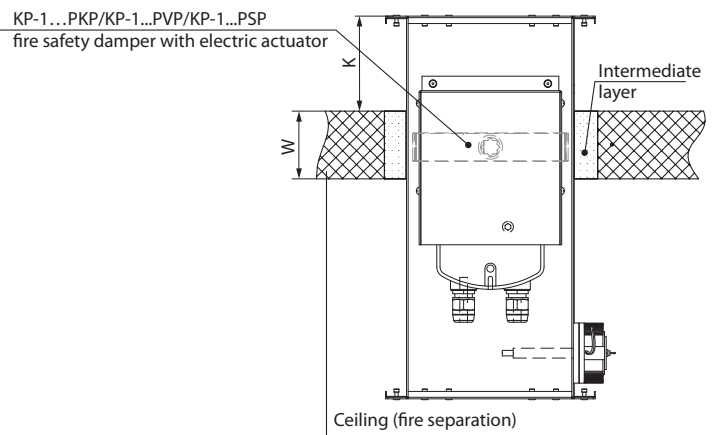


For sizes A and B please refer to the dimension table

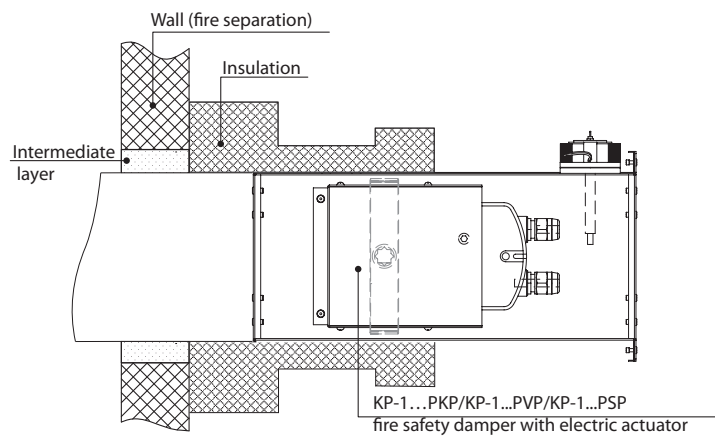
- in vertical building structures



- in horizontal building structures

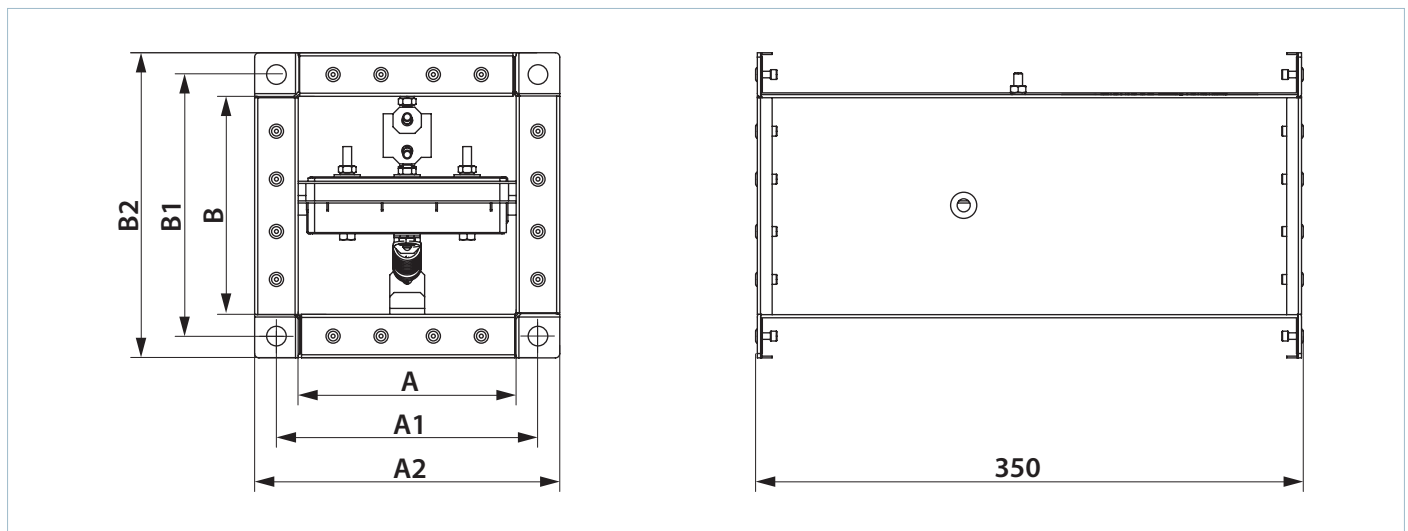


- duct modification with an air duct



Overall and connecting dimensions of KP-1...725 dampers with a mechanical actuator:

Duct cross-section	Dimensions [mm]						Weight [kg]
	A	A1	A2	B	B1	B2	
KP-1-0-N-200x200-2-72S-SN-0	200	220	240	200	220	240	3.5
KP-1-0-N-250x200-2-72S-SN-0	250	270	290	200	220	240	4
KP-1-0-N-250x250-2-72S-SN-0	250	270	290	250	270	290	4.5
KP-1-0-N-300x200-2-72S-SN-0	300	320	340	200	220	240	4.5
KP-1-0-N-300x250-2-72S-SN-0	300	320	340	250	270	290	5.1
KP-1-0-N-300x300-2-72S-SN-0	300	320	340	300	320	340	5.8
KP-1-0-N-400x250-2-72S-SN-0	400	420	440	250	270	290	6.3
KP-1-0-N-400x300-2-72S-SN-0	400	420	440	300	320	340	7.1
KP-1-0-N-400x400-2-72S-SN-0	400	420	440	400	420	440	8.7
KP-1-0-N-500x300-2-72S-SN-0	500	520	540	300	320	340	8.5
KP-1-0-N-500x400-2-72S-SN-0	500	520	540	400	420	440	10.3
KP-1-0-N-500x500-2-72S-SN-0	500	520	540	500	520	540	12
KP-1-0-N-600x400-2-72S-SN-0	600	620	640	400	420	440	11.9
KP-1-0-N-600x500-2-72S-SN-0	600	620	640	500	520	540	13.8
KP-1-0-N-600x600-2-72S-SN-0	600	620	640	600	620	640	16.1



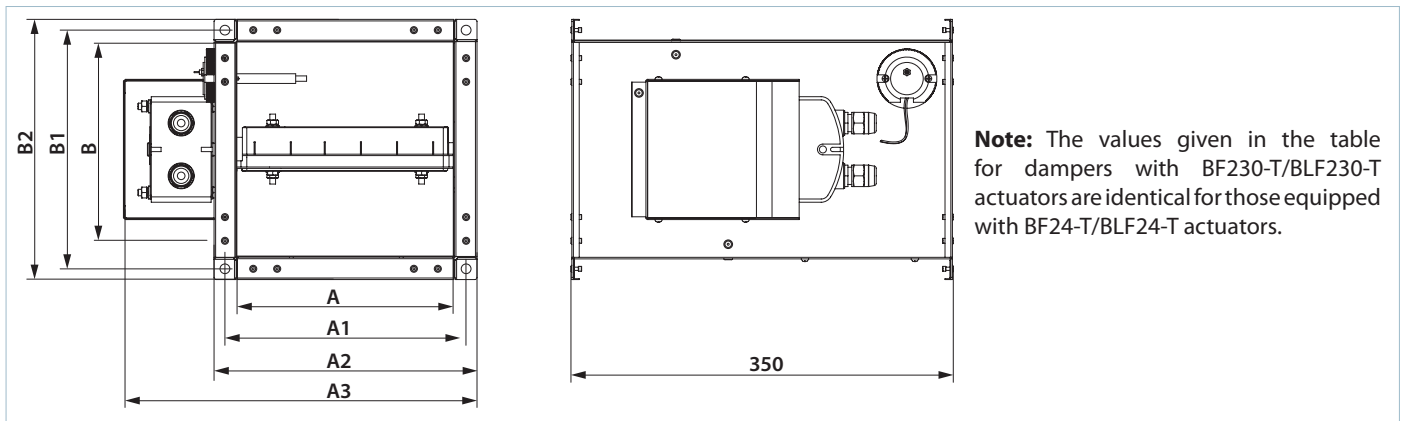
Flow area of fire-resisting duct damper with mechanical actuator [m²]

A/B	200	250	300	400	500	600
200	0.032					
250	0.04	0.053				
300	0.048	0.063	0.078			
400	0.064	0.084	0.104	0.144		
500	0.08	0.105	0.13	0.18	0.23	
600	0.096	0.126	0.156	0.216	0.276	0.336

Dampers with dimensions not included in the table can be produced on request.  
Limit damper size: 600x600.

■ Overall and connecting dimensions of KP-1...PKP/KP-1...PSP dampers with electric actuators:

Duct cross-section	Dimensions [mm]							Weight [kg]
	A	A1	A2	A3	B	B1	B2	
KP-1-0-N-200x200-2-...-SN-0	200	220	240	325	200	220	240	6.2
KP-1-0-N-250x200-2-...-SN-0	250	270	290	375	200	220	240	6.8
KP-1-0-N-250x250-2-...-SN-0	250	270	290	375	250	270	290	7.3
KP-1-0-N-300x200-2-...-SN-0	300	320	340	425	200	220	240	7.3
KP-1-0-N-300x250-2-...-SN-0	300	320	340	425	250	270	290	7.9
KP-1-0-N-300x300-2-...-SN-0	300	320	340	425	300	320	340	8.5
KP-1-0-N-400x250-2-...-SN-0	400	420	440	525	250	270	290	9.1
KP-1-0-N-400x300-2-...-SN-0	400	420	440	525	300	320	340	9.8
KP-1-0-N-400x400-2-...-SN-0	400	420	440	525	400	420	440	11.3
KP-1-0-N-500x300-2-...-SN-0	500	520	540	625	300	320	340	10.7
KP-1-0-N-500x400-2-...-SN-0	500	520	540	625	400	420	440	12.9
KP-1-0-N-500x500-2-...-SN-0	500	530	560	635	500	530	560	16.6
KP-1-0-N-600x400-2-...-SN-0	600	620	640	725	400	420	440	14.5
KP-1-0-N-600x500-2-...-SN-0	600	630	660	735	500	530	560	18.4
KP-1-0-N-600x600-2-...-SN-0	600	630	660	735	600	630	660	20.6
KP-1-0-N-800x500-2-...-SN-0	800	830	860	935	500	530	560	22.3
KP-1-0-N-800x600-2-...-SN-0	800	830	860	935	600	630	660	24.8
KP-1-0-N-800x800-2-...-SN-0	800	830	860	935	800	830	860	30.1
KP-1-0-N-1000x600-2-...-SN-0	1000	1030	1060	1135	600	630	660	29
KP-1-0-N-1000x800-2-...-SN-0	1000	1030	1060	1135	800	830	860	35.4
KP-1-0-N-1000x1000-2-...-SN-0	1000	1030	1060	1135	1000	1030	1060	41.7



**Flow area of the duct fire-resistant damper with an electric actuator installed outside the damper [m²]**

S2/S1	200	250	300	400	500	600	800	1000
200	0.032							
250	0.04	0.053						
300	0.048	0.063	0.078					
400	0.064	0.084	0.104	0.144				
500	0.08	0.105	0.13	0.18	0.23			
600	0.096	0.126	0.156	0.216	0.276	0.336		
800	0.128	0.168	0.208	0.288	0.368	0.448	0.608	
1000	0.16	0.21	0.26	0.36	0.46	0.56	0.76	0.96

Dampers with dimensions not included in the table can be produced on request.  
Limit damper size: 1000x1000.

**■ Main technical specifications of Belimo electric actuators with a return spring and a thermal breaker**

Technical data	Basic models		Models with increased torque		Models with the highest torque	
Rated operation voltage	AC/DC 24 V	AC 230 V	AC/DC 24 V	AC 230 V	AC/DC 24 V	AC 230 V
Permissible operating voltage tolerance	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V
AC mains frequency	50/60 Hz					
Power consumption at rest [W]	0.8	1.1	1.4	2.1	2	3
Power consumption in operation [W]	2.5	3.5	4	5	7	8.5
Maximum design capacity [VA]	4	6.5	6	10	10	11
Motor torque [Nm]	4		9		18	
Spring torque [Nm]	3		7		12	
SEC class	III	II	III	II	III	II
Ingress protection rating	IP54					
Auxiliary switches	2 pcs., single-pole, reversible 1 mA...3 (0.5) A, AC 250 V				2 pcs., single-pole, reversible, 1 mA...6(3)A, AC 250 V	
Electric motor connection cable	1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free)					
Auxiliary switch connection cable	1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)					
Running time spring	20 seconds at -10...+55 °C < 60 seconds at -30...-10 °C				16 seconds at +20 °C	
Running time motor	< 60 s/90°				< 120 s/90°	
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C					
Service life	Min. 60 000 emergency positions					
Technical maintenance	Not required					

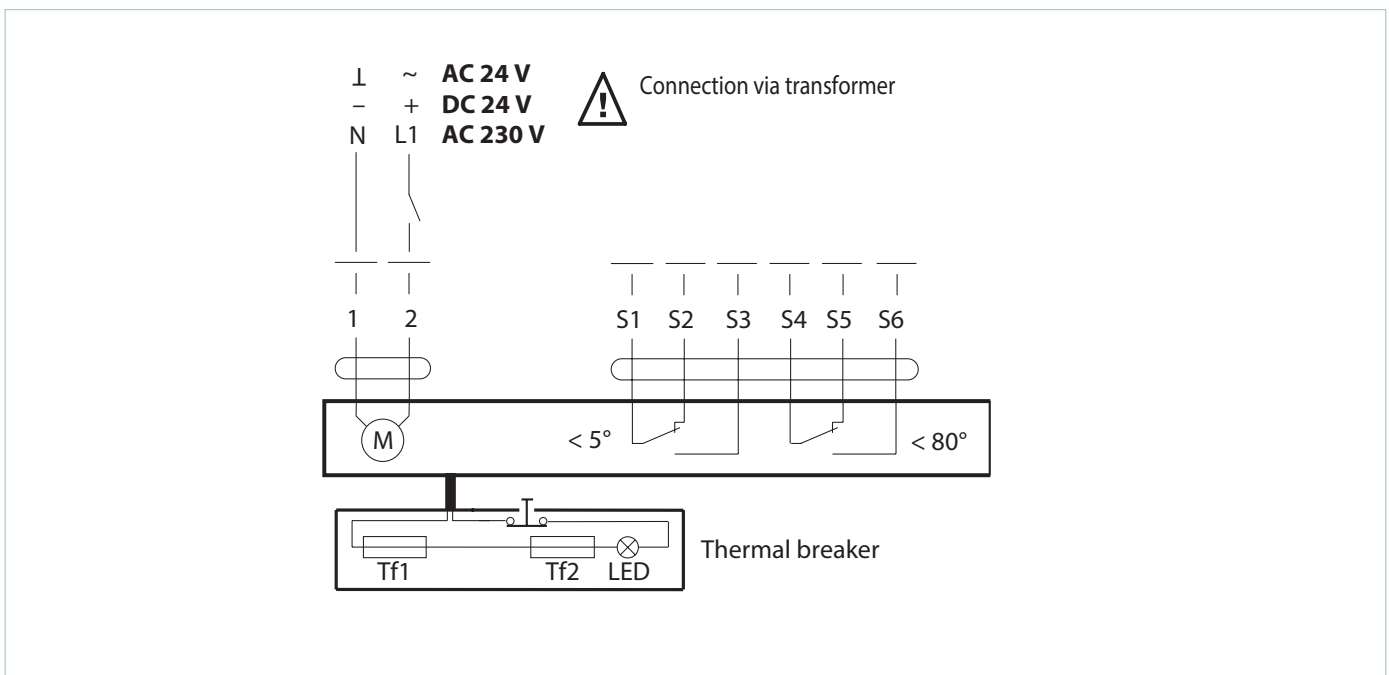
■ Main technical specifications of Zern electric actuators with a return spring and a thermal breaker

Technical data	Basic models		Models with increased torque	
Rated operation voltage	AC/DC 24 V	AC 100-240 V	AC/DC 24 V	AC 100-240 V
Permissible operating voltage tolerance	AC/DC 19.2...28.8 V	AC 85...265 V	AC/DC 19.2...28.8 V	AC 85...265 V
AC mains frequency	50/60 Hz			
Power consumption at rest [W]	3			
Power consumption in operation [W]	5			
Motor torque [Nm]	5		8	
Spring torque [Nm]				
SEC class	III	II	III	II
Ingress protection rating	IP54			
Auxiliary switches	2 pcs., single-pole, reversible, 1 mA...3(0.5)A, AC 220 V			
Electric motor connection cable	1 m, 2 x 0.5 mm <sup>2</sup> (halogen-free)			
Auxiliary switch connection cable	1 m, 6 x 0.5 mm <sup>2</sup> (halogen-free)			
Running time spring	<20 seconds < 60 seconds at -30...-10 °C		<25 seconds < 60 seconds at -30...-10 °C	
Running time motor	< 70 s/95°		< 100 s/95°	
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C			

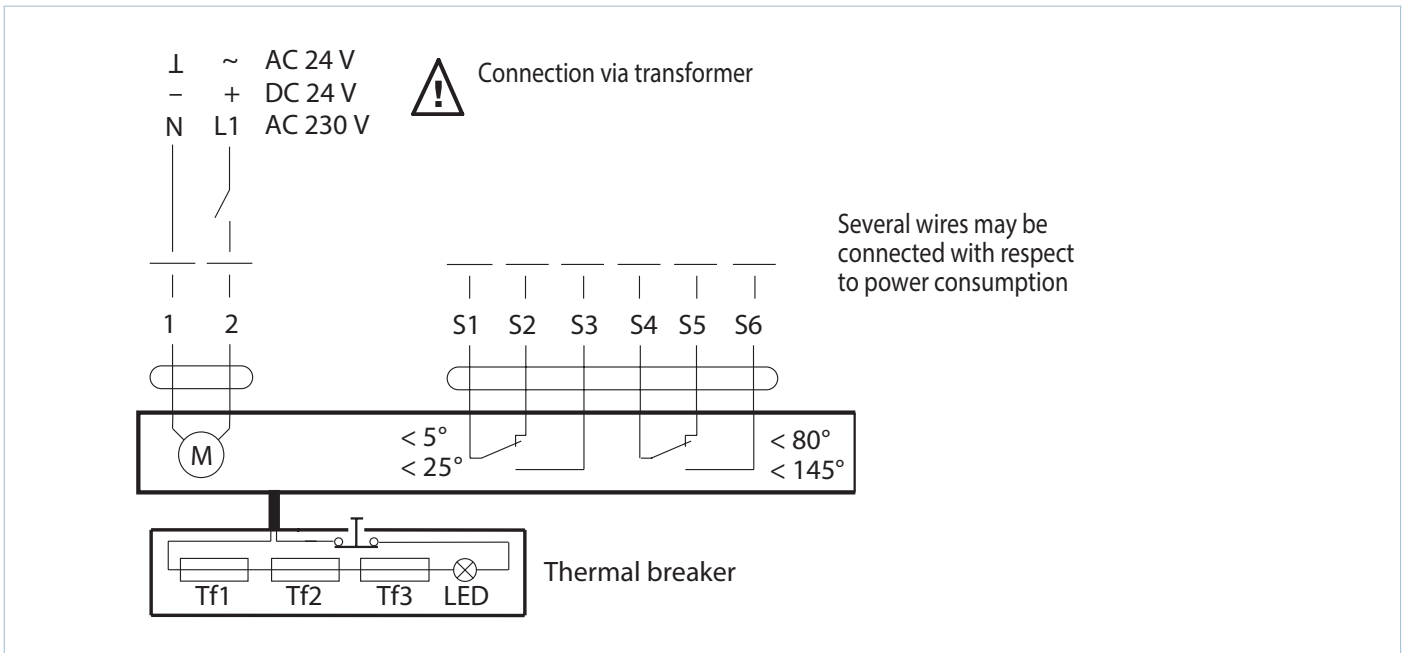
■ **Main technical specifications of Siemens electric actuators with a return spring and a thermal breaker**

Technical data	Basic models		Models with increased torque		Models with the highest torque	
Rated operation voltage	AC 24 V/ DC 24...48 V	AC 230 V	AC 24 V/ DC 24...48 V	AC 230 V	AC 24 V/ DC 24...48 V	AC 230 V
Permissible operating voltage tolerance	AC/DC ±20 %	AC ±15 %	AC/DC ±20 %	AC ±15 %	AC/DC ±20 %	AC ±15 %
AC mains frequency	50/60 Hz					
Power consumption at rest [W]	2	3.5	2	3.5	3	4
Power consumption in operation [W]	3.5	4.5	3.5	4.5	5	6
Maximum design capacity [VA]	5	7	5	7	7	8
Motor torque [Nm]	4		9		18	
Spring torque [Nm]	4		7		18	
SEC class	III	II	III	II	III	II
Ingress protection rating	IP54					
Auxiliary switches	2 pcs., single-pole, reversible, 6(2)A, AC 24...250 V					
Electric motor connection cable	0.9 m, 2 x 0.75 mm <sup>2</sup> (halogen-free)					
Auxiliary switch connection cable	0.9 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)					
Running time spring	15 seconds < 60 seconds at -30...-10 °C					
Running time motor	90 s/90°					
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C					
Service life	10 000 emergency positions					
Technical maintenance	Not required					

■ **Electrical connection of the basic models of Belimo and Zern electric actuators, as well as Belimo and Zern models with increased torque**



■ Electrical connection of Belimo electric actuators with the highest torque, as well as Siemens electric actuators



Series  
**KP-2...72S**



Normally open fire-resisting duct damper with mechanical drive mechanism

Series  
**KP-2...PKP**  
**KP-2...PVP**  
**KP-2...PSP**



Normally open fire-resisting duct damper with electric drive mechanism

Series  
**KP-2...PKP...-1**  
**KP-2...PVP...-1**  
**KP-2...PSP...-1**



Normally open fire-resisting duct damper with simplified design with electric drive mechanism

■ **Application**

The fire dampers are intended for automatic closing of process openings and air duct penetrations in intermediate floors, walls and partitions, as well as closing of openings in supply and exhaust ducts of smoke ventilation systems. The dampers of this particular design are not suitable for installation in air ducts and ducts of premises with rated explosion and fire safety category A and B and in flammable and explosive mixture intakes. The KP-2 fire-resisting duct dampers are capable of resisting fire for at least 120 minutes (EI 120) at the temperature of 600 °C.

■ **Design**

The KP-2 series dampers are made in the general-purpose industrial version with a minimized variety of hardware components using low-alloy galvanized steel. The damper flap is made of fire-resistant material. The duct installation design results in two mounting flanges on the casing for integration into a ventilation ducts (air ducting) and external configuration of the drive mechanism for easier maintenance.

The **KP-2...PKP/KP-2...PVP/KP-2...PSP** dampers are equipped with a hot and cold zone baffle.

The **KP-2...PKP...-1/KP-2...PVP...-1/KP-2...PSP...-1** dampers have a simplified construction:

- Simplified damper swing mechanism
- The zone baffle has been replaced by casing perforation covered with ceramic fibre material and aluminium foil tape
- New material and altered flap thickness.

Depending on the design variant the KP series dampers are equipped with:

- ▶ **Mechanical actuating unit with a thermal fuse and a return spring.**

The damper is set to the operating position upon the

**Conventional Designation:**

<b>KP-2-X-X-XxX-X-X-X-X-1</b>	
<b>Series</b>	2
<b>Fire resistance</b>	2 – 2 hours
<b>Purpose type code</b>	O – fire-resisting
<b>Design variant</b>	N – general industrial
<b>Damper flow area width</b>	200; 250; 300; 400; 500; 600; 800; 1000
<b>Damper flow area height</b>	200; 250; 300; 400; 500; 600; 800; 1000
<b>Number of flanges</b>	1 – one 2 – two
<b>Design variant</b>	1 – simplified damper design
<b>Protective grille</b>	S – vandal-proof mesh R – decorative grille O – no protective grille
<b>Actuator location</b>	SN – outside VN – inside
<b>Actuator type</b>	72S – thermal fuse and return spring (manual actuation) PKP24T – 24 V ZERN electric actuator with a return spring and a thermal breaker PKP230T – 230 V ZERN electric actuator with a return spring and a thermal breaker PVP24T – 24 V BELIMO electric actuator with a return spring and a thermal breaker PVP230T – 230 V BELIMO electric actuator with a return spring and a thermal breaker PSP24T – 24 V SIEMENS electric actuator with a return spring and a thermal breaker PSP230T – 230 V SIEMENS electric actuator with a return spring and a thermal breaker



thermal fuse breakdown resulting from a temperature increase. The damper can then be re-set to the protective position only manually by using a handle and by replacing the thermal fuse through the access hole.

Emergency damper actuation: the flap remains in protective position (damper unaffected by fire) and is fixed by a thermal fuse (when the flap is installed in security position, a reverse spring is activated). Upon emergency actuation (damper directly affected by fire) the thermal fuse breaks down and the return spring moves the flap to operating position.

Upon an emergency activation (direct damper contact with fire) the thermal fuse breaks down enabling the

lock with releases the handle allowing the return spring to set the damper flap to the operating position.

► **Electric actuator with a built-in return spring and a back-up thermal breaker.**

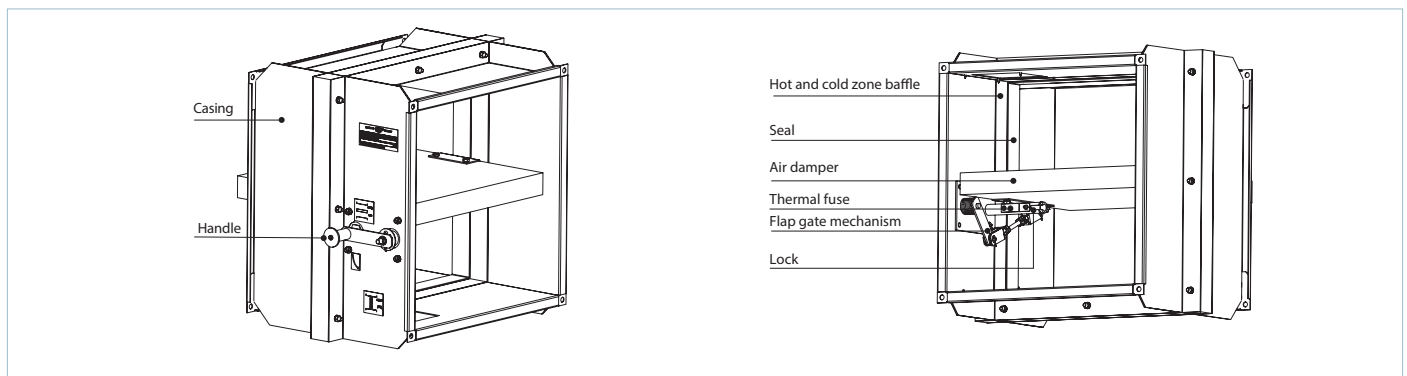
Setting the damper to operating position (direct fire contact): remotely, via electric actuator.

The damper can be set to the operating or protective position either remotely via the control panel or manually using the manual cocking handle which is always included in the standard delivery set of the electric actuator. In case of the remote control panel failure, the back-up thermal breaker interrupts the power supply to the electric actuator and the return spring sets the

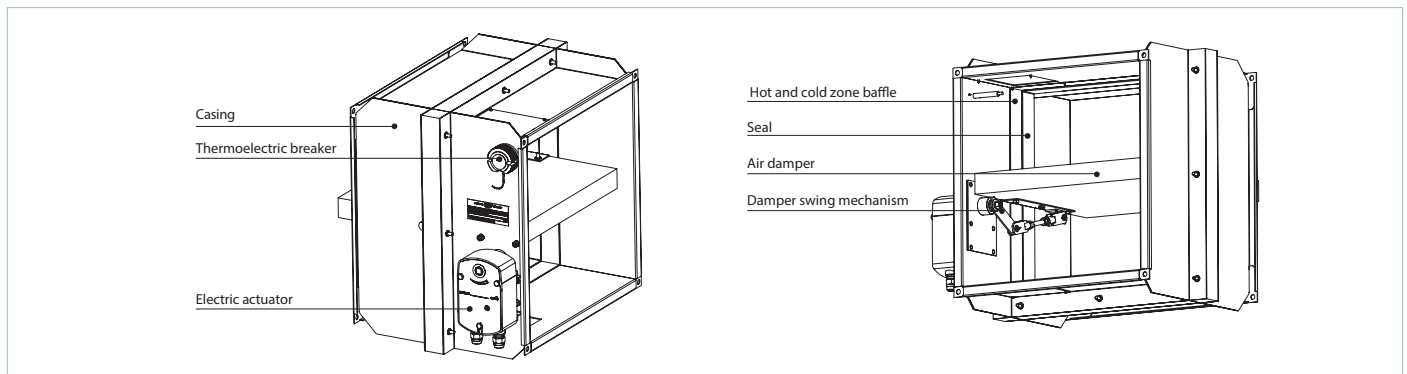
damper to the operating position. Emergency damper actuation: the damper flap is set to the protective position automatically (damper unaffected by fire).

The electric actuator remains energized at all times. In case of an emergency actuation (direct fire contact): the electric actuator equipped with a return spring is de-energized and the damper flap is set to the operating position by means of the spring energy. In case of a power failure not related to fire and its subsequent restoration at the actuator with a return spring, the damper flap returns to protective position.

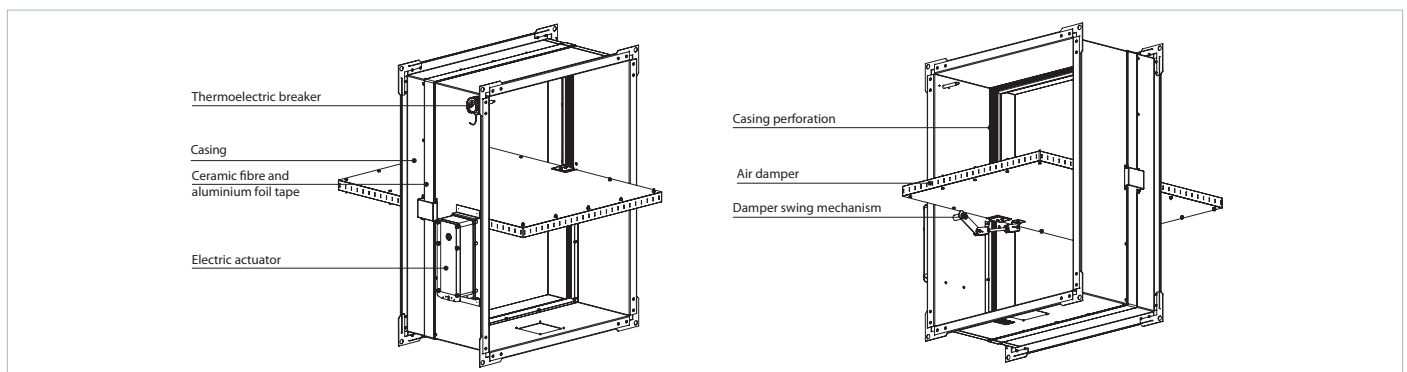
■ **The KP-2...72S fire safety damper with a mechanical actuating unit with a thermal fuse and a return spring**



■ **The KP-2...PKP/KP-2...PVP/KP-2...PSP fire safety damper with Belimo electric actuator and thermoelectric breaker**



■ **The KP-2...PKP...-1/KP-2...PVP...-1/KP-2...PSP...-1 fire safety damper with Belimo electric actuator and thermoelectric breaker**



## FIRE-RESISTING DAMPER

### Installation

The damper must be installed into the building envelope structure in accordance with the applicable standards and regulations. The seal fire resistance must be at least equal to that of the building envelope. The dampers can be installed in any position in vertical and horizontal ducts of fire-protection structures. The ducts for damper installation must be made in such a way so as to prevent the transfer of loads caused by the fire-protection structures to the damper casing. The adjoining air duct must be suspended in such a way so as to prevent the transfer of air duct load to the damper flange. The minimum free space for accessing the control parts

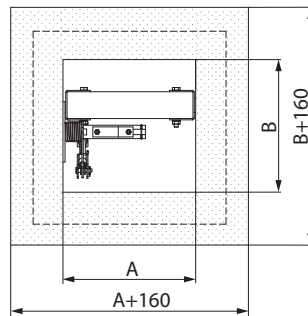
must be at least 350 mm. Make sure to arrange an inspection hole. While carrying out the installation consider size K. When two or more dampers are installed into the same fire-protection separation structure, the distance between the two adjacent dampers must be at least 200 mm. If such installation is not possible, the damper casing part between the fire-protection separation space and the damper flap must be insulated with a suitable material pursuant to the applicable standards. If such installation is not possible, the damper casing part between the fire-protection separation structure and the damper flap must be insulated with a suitable material pursuant to the applicable standards.

The damper control mechanism must be protected against damage and contamination. The damper casing must not deform any deformation during embedding.

After the installation the flap must not catch against the damper casing while opening or closing.

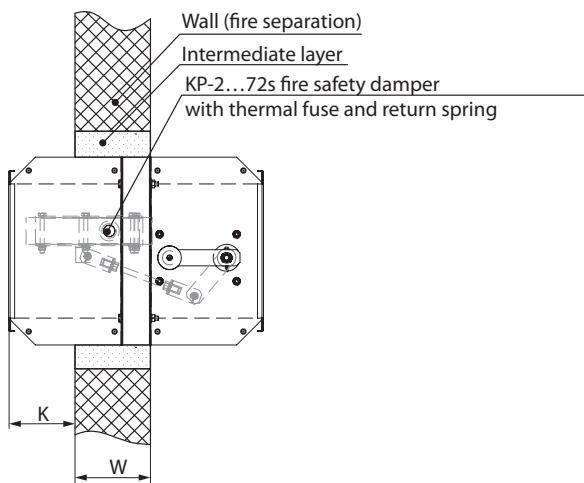
The fire safety damper can be integrated into a tight wall structure - e.g. made of conventional concrete work of minimum width  $W = 100$  mm or into a plasterboard wall of the necessary fire resistance class or into a tight ceiling structure - e.g. made of conventional concrete of minimum width  $W = 150$  mm. Do not use any foaming substances for sealing the damper in the separation structure.

### Installation recommendations for KP-2...72S dampers with a thermal fuse and a return spring

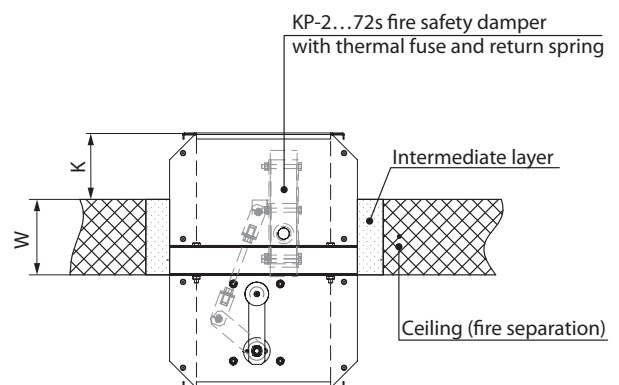


For sizes A and B please refer to the dimension table

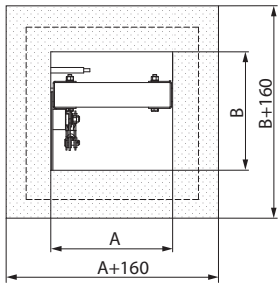
#### - in vertical building structures



#### - in horizontal building structures

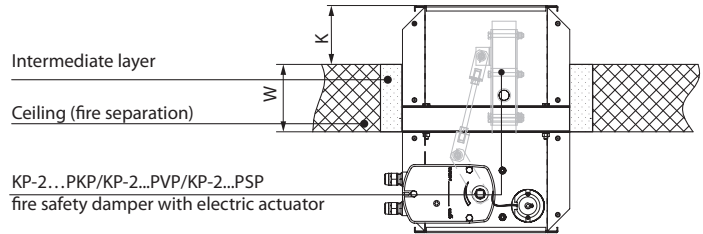


■ Installation recommendations for KP-2...PKP/KP-2...PVP/KP-2...PSP fire safety dampers with electric actuator and thermoelectric breaker

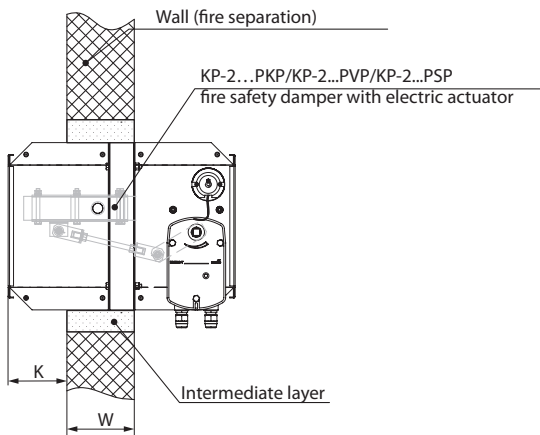


For sizes A and B please refer to the dimension table

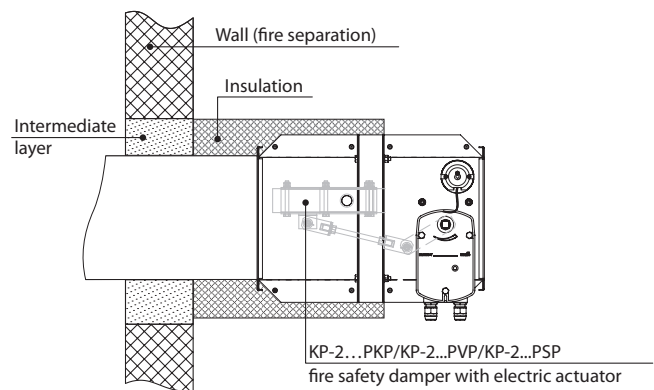
– in horizontal building structures



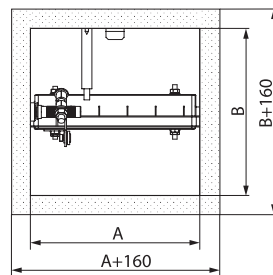
– in vertical building structures



– duct modification with an air duct

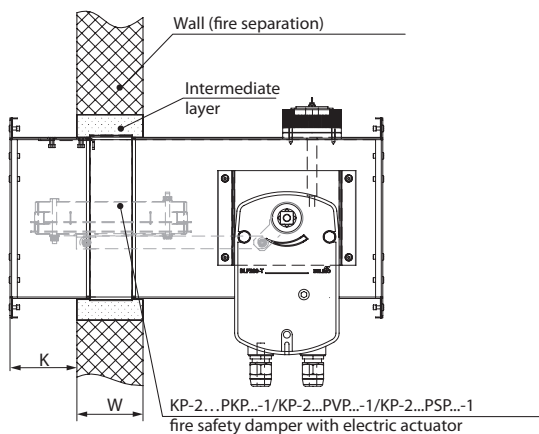


■ Installation recommendations for KP-2...PKP...-1/KP-2...PVP...-1/KP-2...PSP...-1 fire safety dampers with an electric actuator and thermoelectric breaker

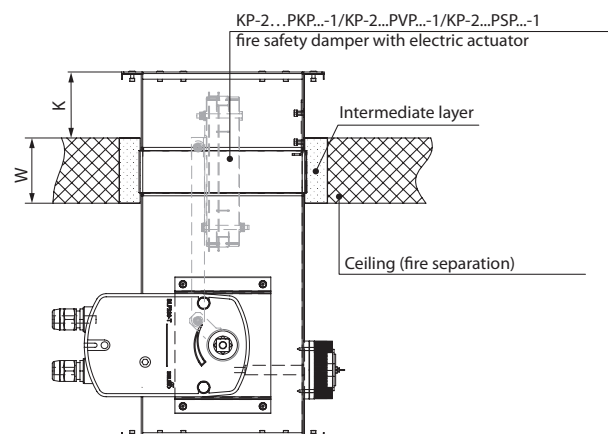


For sizes A and B please refer to the dimension table

– in vertical building structures

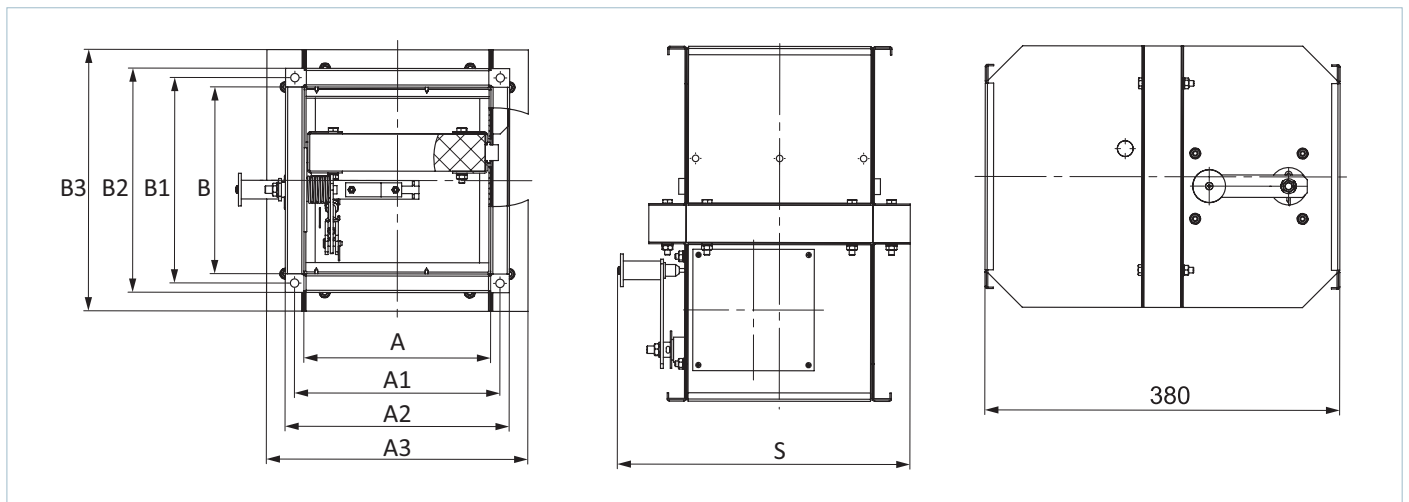


– duct modification with an air duct



Overall and connecting dimensions of KP-2...72S dampers with a mechanical actuator:

Duct cross-section	Dimensions [mm]									Weight [kg]
	A	A1	A2	A3	B	B1	B2	B3	S	
KP-2-0-N-200x200-2-72S-SN-0	200	220	240	280	200	220	240	280	315	12
KP-2-0-N-250x200-2-72S-SN-0	250	270	290	330	200	220	240	280	365	13
KP-2-0-N-250x250-2-72S-SN-0	250	270	290	330	250	270	290	330	365	14.1
KP-2-0-N-300x200-2-72S-SN-0	300	320	340	380	200	220	240	280	415	14
KP-2-0-N-300x250-2-72S-SN-0	300	320	340	380	250	270	290	330	415	15.3
KP-2-0-N-300x300-2-72S-SN-0	300	320	340	380	300	320	340	380	415	18.8
KP-2-0-N-400x250-2-72S-SN-0	400	420	440	480	250	270	290	330	515	19.2
KP-2-0-N-400x300-2-72S-SN-0	400	420	440	480	300	320	340	380	515	19.7
KP-2-0-N-400x400-2-72S-SN-0	400	420	440	480	400	420	440	480	515	22
KP-2-0-N-500x300-2-72S-SN-0	500	520	540	580	300	320	340	380	615	22.5
KP-2-0-N-500x400-2-72S-SN-0	500	520	540	580	400	420	440	480	615	24.7
KP-2-0-N-500x500-2-72S-SN-0	500	520	540	580	500	520	540	580	615	29.8
KP-2-0-N-600x400-2-72S-SN-0	600	620	640	680	400	420	440	480	715	29.7
KP-2-0-N-600x500-2-72S-SN-0	600	620	640	680	500	520	540	580	715	36
KP-2-0-N-600x600-2-72S-SN-0	600	620	640	680	600	620	640	680	715	38



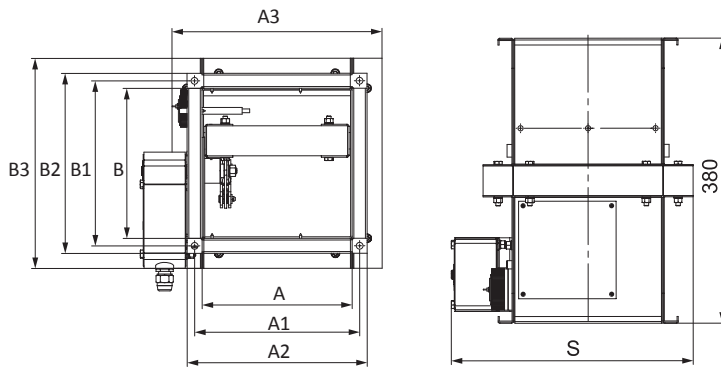
Flow area of fire-resisting duct damper with a mechanical actuator [m<sup>2</sup>]

S2/S1	200	250	300	400	500	600
200	0.032					
250	0.04	0.053				
300	0.048	0.063	0.078			
400	0.064	0.084	0.104	0.144		
500	0.08	0.105	0.13	0.18	0.23	
600	0.096	0.126	0.156	0.216	0.276	0.336

Dampers with dimensions not included in the table can be produced on request.  
Limit damper size: 600x600.

■ Overall and connecting dimensions of KP-2...PKP/KP-2...PVP/KP-1...PSP dampers with electric actuators:

Duct cross-section	Dimensions [mm]									Weight [kg]
	A	A1	A2	A3	B	B1	B2	B3	S	
KP-2-0-N-200x200-2-...-SN-0	200	220	240	280	200	220	240	280	340	13.3
KP-2-0-N-250x200-2-...-SN-0	250	270	290	330	200	220	240	280	390	14.3
KP-2-0-N-250x250-2-...-SN-0	250	270	290	330	250	270	290	330	390	15.4
KP-2-0-N-300x200-2-...-SN-0	300	320	340	380	200	220	240	280	440	15.3
KP-2-0-N-300x250-2-...-SN-0	300	320	340	380	250	270	290	330	440	16.6
KP-2-0-N-300x300-2-...-SN-0	300	320	340	380	300	320	340	380	440	20.1
KP-2-0-N-400x250-2-...-SN-0	400	420	440	480	250	270	290	330	540	20.5
KP-2-0-N-400x300-2-...-SN-0	400	420	440	480	300	320	340	380	540	21
KP-2-0-N-400x400-2-...-SN-0	400	420	440	480	400	420	440	480	540	23.3
KP-2-0-N-500x300-2-...-SN-0	500	520	540	580	300	320	340	380	640	23.8
KP-2-0-N-500x400-2-...-SN-0	500	520	540	580	400	420	440	480	640	26
KP-2-0-N-500x500-2-...-SN-0	500	530	560	580	500	530	560	580	650	33
KP-2-0-N-600x400-2-...-SN-0	600	620	640	680	400	420	440	480	740	32.7
KP-2-0-N-600x500-2-...-SN-0	600	630	660	680	500	530	560	580	750	38.4
KP-2-0-N-600x600-2-...-SN-0	600	630	660	680	600	630	660	680	750	43
KP-2-0-N-800x500-2-...-SN-0	800	830	860	880	500	530	560	580	950	47
KP-2-0-N-800x600-2-...-SN-0	800	830	860	880	600	630	660	680	950	52
KP-2-0-N-800x800-2-...-SN-0	800	830	860	880	800	830	860	880	950	63
KP-2-0-N-1000x600-2-...-SN-0	1000	1030	1060	1080	600	630	660	680	1150	63
KP-2-0-N-1000x800-2-...-SN-0	1000	1030	1060	1080	800	830	860	880	1150	75
KP-2-0-N-1000x1000-2-...-SN-0	1000	1030	1060	1080	1000	1030	1060	1080	1150	87



**Note:** The values given in the table for dampers with BF230-T/BLF230-T actuators are identical for those equipped with BF24-T/BLF24-T actuators.

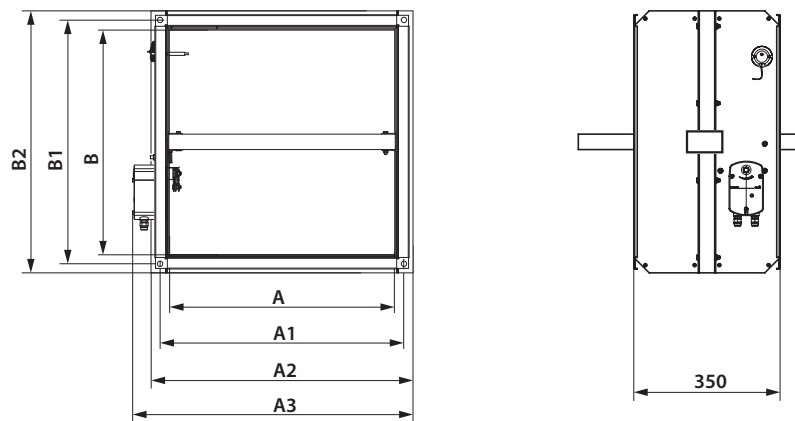
**Flow area of the duct fire-resistant damper with an electric actuator installed outside the damper [m<sup>2</sup>]**

S2/S1	200	250	300	400	500	600	800	1000
200	0.032							
250	0.04	0.053						
300	0.048	0.063	0.078					
400	0.064	0.084	0.104	0.144				
500	0.08	0.105	0.13	0.18	0.23			
600	0.096	0.126	0.156	0.216	0.276	0.336		
800	0.128	0.168	0.208	0.288	0.368	0.448	0.608	
1000	0.16	0.21	0.26	0.36	0.46	0.56	0.76	0.96

Dampers with dimensions not included in the table can be produced on request.  
Limit damper size: 1000x1000.

Overall and connecting dimensions of KP-2...PKP...-1/KP-2...PVP...-1/KP-1...PSP...-1 dampers with electric actuators:

Duct cross-section	Dimensions [mm]							Weight [kg]
	A	A1	A2	A3	B	B1	B2	
KP-2-0-N-200x200-2-...-SN-0-1	200	220	240	340	200	220	240	5.7
KP-2-0-N-250x200-2-...-SN-0-1	250	270	290	390	200	220	240	6.2
KP-2-0-N-250x250-2-...-SN-0-1	250	270	290	390	250	270	290	6.9
KP-2-0-N-300x200-2-...-SN-0-1	300	320	340	440	200	220	240	6.8
KP-2-0-N-300x250-2-...-SN-0-1	300	320	340	440	250	270	290	7.5
KP-2-0-N-300x300-2-...-SN-0-1	300	320	340	440	300	320	340	9.2
KP-2-0-N-400x250-2-...-SN-0-1	400	420	440	540	250	270	290	9
KP-2-0-N-400x300-2-...-SN-0-1	400	420	440	540	300	320	340	10.8
KP-2-0-N-400x400-2-...-SN-0-1	400	420	440	540	400	420	440	12.6
KP-2-0-N-500x300-2-...-SN-0-1	500	520	540	640	300	320	340	12.3
KP-2-0-N-500x400-2-...-SN-0-1	500	520	540	640	400	420	440	14.3
KP-2-0-N-500x500-2-...-SN-0-1	500	530	560	650	500	530	560	23
KP-2-0-N-600x400-2-...-SN-0-1	600	620	640	740	400	420	440	16.2
KP-2-0-N-600x500-2-...-SN-0-1	600	630	660	750	500	530	560	25.6
KP-2-0-N-600x600-2-...-SN-0-1	600	630	660	750	600	630	660	28.6
KP-2-0-N-800x500-2-...-SN-0-1	800	830	860	950	500	530	560	31.3
KP-2-0-N-800x600-2-...-SN-0-1	800	830	860	950	600	630	660	34.7
KP-2-0-N-800x800-2-...-SN-0-1	800	830	860	950	800	830	860	42
KP-2-0-N-1000x600-2-...-SN-0-1	1000	1030	1060	1150	600	630	660	40.7
KP-2-0-N-1000x800-2-...-SN-0-1	1000	1030	1060	1150	800	830	860	50.2
KP-2-0-N-1000x1000-2-...-SN-0-1	1000	1030	1060	1150	1000	1030	1060	58



**Note:** The values given in the table for dampers with BF230-T/BLF230-T actuators are identical for those equipped with BF24-T/BLF24-T actuators.

**Flow area of the duct fire-resistant damper  
with an electric actuator installed outside the damper [m<sup>2</sup>]**

A/B	200	250	300	400	500	600	800	1000
200	0.032							
250	0.04	0.053						
300	0.048	0.063	0.078					
400	0.064	0.084	0.104	0.144				
500	0.08	0.105	0.13	0.18	0.23			
600	0.096	0.126	0.156	0.216	0.276	0.336		
800	0.128	0.168	0.208	0.288	0.368	0.448	0.608	
1000	0.16	0.21	0.26	0.36	0.46	0.56	0.76	0.96

Dampers with dimensions not included in the table can be produced on request.

Limit damper size: 1000x1000.

■ Main technical specifications of Belimo electric actuators with a return spring and a thermal breaker

Technical data	Basic models		Models with increased torque		Models with the highest torque	
Rated operation voltage	AC/DC 24 V	AC 230 V	AC/DC 24 V	AC 230 V	AC/DC 24 V	AC 230 V
Permissible operating voltage tolerance	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V
AC mains frequency	50/60 Hz					
Power consumption at rest [W]	0.8	1.1	1.4	2.1	2	3
Power consumption in operation [W]	2.5	3.5	4	5	7	8.5
Maximum design capacity [VA]	4	6.5	6	10	10	11
Motor torque [Nm]	4		9		18	
Spring torque [Nm]	3		7		12	
SEC class	III	II	III	II	III	II
Ingress protection rating	IP54					
Auxiliary switches	2 pcs., single-pole, reversible 1 mA...3 (0.5) A, AC 250 V				2 pcs., single-pole, reversible, 1 mA...6(3)A, AC 250 V	
Electric motor connection cable	1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free)					
Auxiliary switch connection cable	1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)					
Running time spring	20 seconds at -10...+55 °C < 60 seconds at -30...-10 °C				16 seconds at +20 °C	
Running time motor	< 60 s/90°				< 120 s/90°	
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C					
Service life	Min. 60 000 emergency positions					
Technical maintenance	Not required					



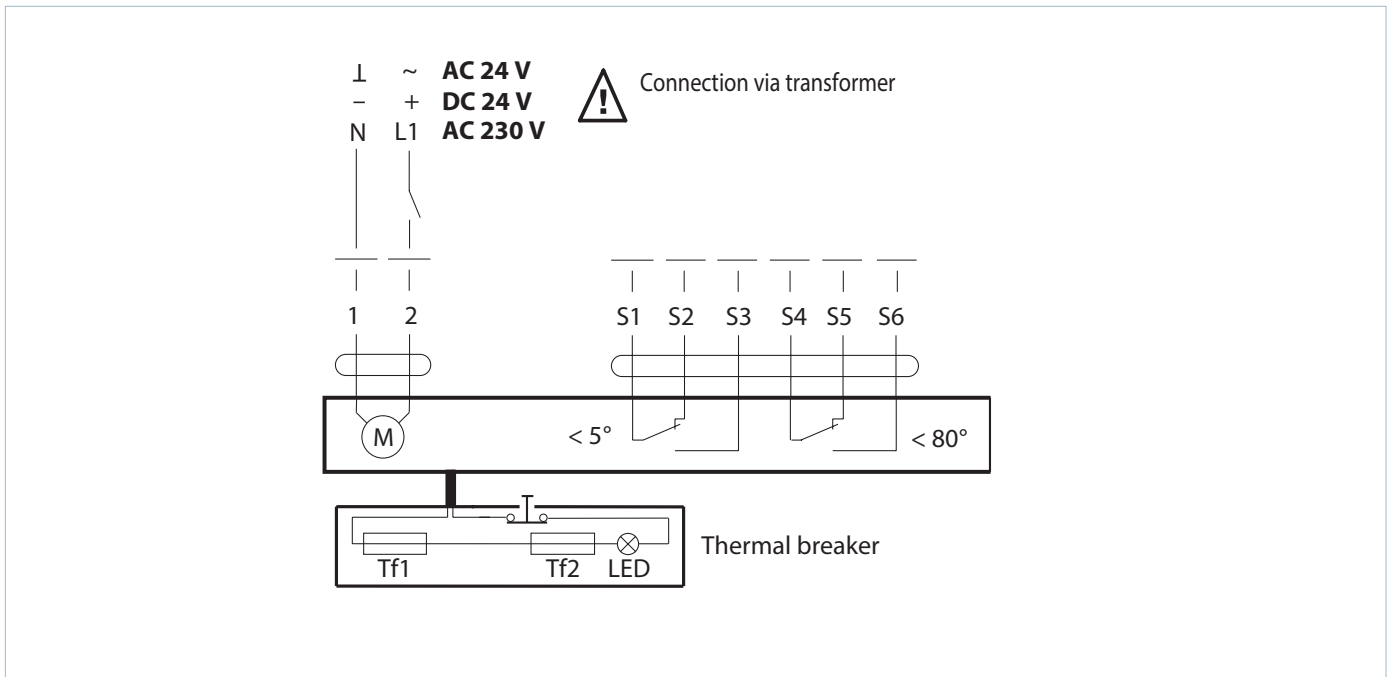
■ Main technical specifications of Zern electric actuators with a return spring and a thermal breaker

Technical data	Basic models		Models with increased torque	
Rated operation voltage	AC/DC 24 V	AC 100-240 V	AC/DC 24 V	AC 100-240 V
Permissible operating voltage tolerance	AC/DC 19.2...28.8 V	AC 85...265 V	AC/DC 19.2...28.8 V	AC 85...265 V
AC mains frequency	50/60 Hz			
Power consumption at rest [W]	3			
Power consumption in operation [W]	5			
Motor torque [Nm]	5		8	
Spring torque [Nm]				
SEC class	III	II	III	II
Ingress protection rating	IP54			
Auxiliary switches	2 pcs., single-pole, reversible, 1 mA...3(0.5)A, AC 220 V			
Electric motor connection cable	1 m, 2 x 0.5 mm <sup>2</sup> (halogen-free)			
Auxiliary switch connection cable	1 m, 6 x 0.5 mm <sup>2</sup> (halogen-free)			
Running time spring	<20 seconds < 60 seconds at -30...-10 °C		<25 seconds < 60 seconds at -30...-10 °C	
Running time motor	< 70 s/95°		< 100 s/95°	
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C			

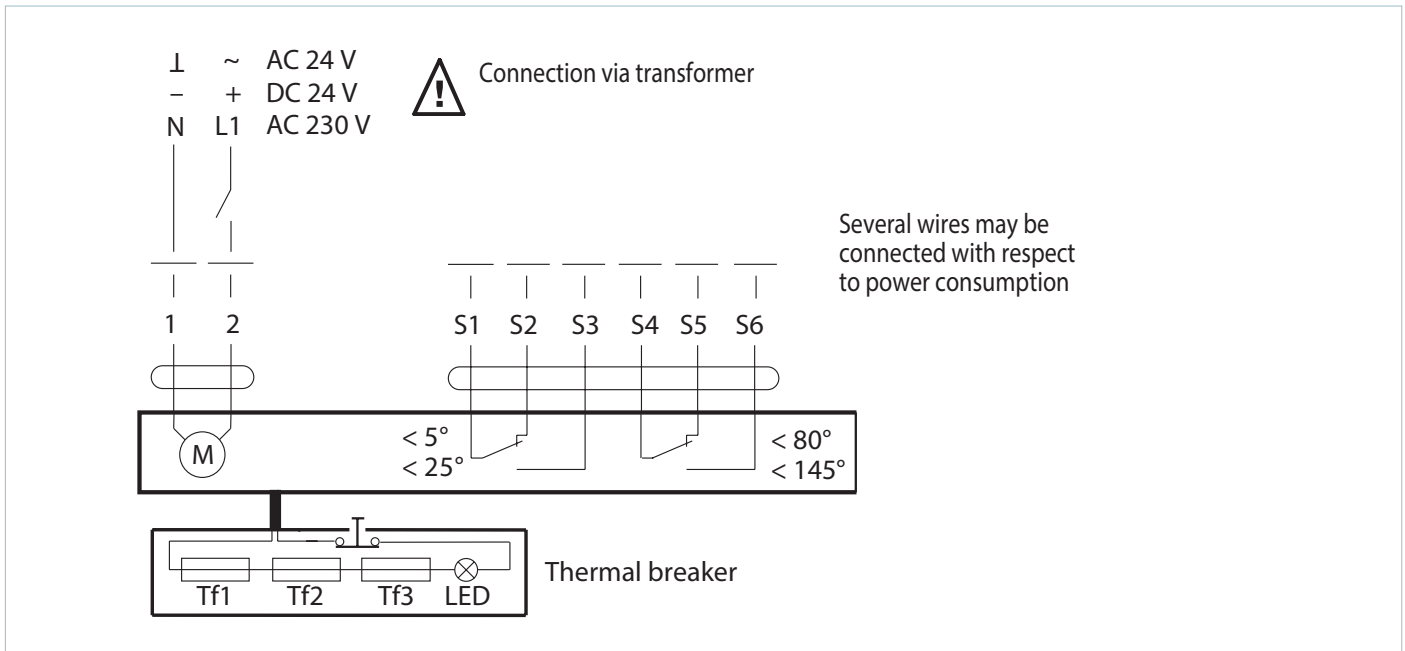
■ **Main technical specifications of Siemens electric actuators with a return spring and a thermal breaker**

Technical data	Basic models		Models with increased torque		Models with the highest torque	
	AC 24 V/ DC 24...48 V	AC 230 V	AC 24 V/ DC 24...48 V	AC 230 V	AC 24 V/ DC 24...48 V	AC 230 V
Rated operation voltage	AC 24 V/ DC 24...48 V	AC 230 V	AC 24 V/ DC 24...48 V	AC 230 V	AC 24 V/ DC 24...48 V	AC 230 V
Permissible operating voltage tolerance	AC/DC ±20 %	AC ±15 %	AC/DC ±20 %	AC ±15 %	AC/DC ±20 %	AC ±15 %
AC mains frequency	50/60 Hz					
Power consumption at rest [W]	2	3.5	2	3.5	3	4
Power consumption in operation [W]	3.5	4.5	3.5	4.5	5	6
Maximum design capacity [VA]	5	7	5	7	7	8
Motor torque [Nm]	4		9		18	
Spring torque [Nm]	4		7		18	
SEC class	III	II	III	II	III	II
Ingress protection rating	IP54					
Auxiliary switches	2 pcs., single-pole, reversible, 6(2)A, AC 24...250 V					
Electric motor connection cable	0.9 m, 2 x 0.75 mm <sup>2</sup> (halogen-free)					
Auxiliary switch connection cable	0.9 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)					
Running time spring	15 seconds < 60 seconds at -30...-10 °C					
Running time motor	90 s/90°					
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C					
Service life	10 000 emergency positions					
Technical maintenance	Not required					

■ Electrical connection of the basic models of Belimo and Zern electric actuators, as well as Belimo and Zern models with increased torque



■ Electrical connection of Belimo electric actuators with the highest torque, as well as Siemens electric actuators



Series  
**PL-10-1A**



Normally open fire-resisting duct damper with thermal fuse and return spring

■ **Application**

A fire safety damper prevents the spread of smoke and fire via ventilation and air conditioning system ducts in the event of fire. Such units are installed in ventilation duct channels which cross fire-separation walls and ceilings. The fire resistance rating according to EN 1366-2 is EIS 60 or EIS 120.

■ **Design**

The PL series dampers are made in the general-purpose industrial version with a minimized variety of hardware components using low-alloy galvanized steel. The flap is made of fire-resistant material (vermiculite) with thermoexpansive fireproof sealing. The duct design implies two connection ports for integration into a ventilation duct (duct system). Depending on the design variant the PL series dampers are equipped with:

- ▶ **mechanical actuating unit with a thermal fuse and a return spring.**

Series  
**PL-10-PAK**  
**PL-10-PVP**  
**PL-10-PSP**



Normally open fire-resisting duct damper with electric actuator, return spring and thermoelectric breaker

The fire safety damper remains open in the protective position. The damper is set to the operating position upon the thermal fuse breakdown resulting from a temperature increase. In the event of fire, the fusible element will melt upon the temperature reaching 72°C and the spring will set the flap to the closed position.

- ▶ **electric actuator with a built-in return spring and thermally sensitive breaker.**

Setting the damper to operating position (direct fire contact): remotely, via electric actuator. The damper can be set to the operating or protective position either remotely via a control panel or manually using the manual cocking handle which is always included in the standard delivery set of the electric actuator.

In case of the remote control panel failure, the back-up thermal breaker interrupts the power supply to the electric actuator and the return spring sets the damper to the operating position.

Emergency damper actuation:

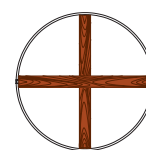
The damper flap is set to the protective position automatically (damper unaffected by fire). The electric actuator remains energized at all times.

In case of an emergency actuation (direct fire contact): The electric actuator equipped with a return spring is de-energized and the damper flap is set to the operating position by means of the spring energy.

In case of a power failure not related to fire and its subsequent restoration at the actuator with a return spring, the damper flap returns to protective position.

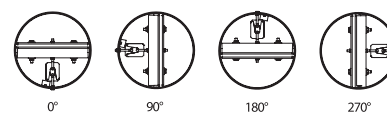
■ **Installation**

During the fire safety damper installation make sure that the release mechanism and the inspection hole face an easily accessible side of the wall or ceiling. This will ensure convenient control of the thermally sensitive release mechanism and its internals. The damper can be embedded into brick or concrete walls with the appropriate fire resistance rating. Wooden spreader bars should be used to avoid casing deformation during the installation.



Use of wooden spreader bars during installation

Upon completing the installation remove the wooden spreader bars.



Recommended damper positions

The damper may not be installed:

Into air ducts and on premises rated explosion and fire safety category A and B.

Into air ducts of local intakes for flammable and explosive mixtures.

Into systems which do not undergo periodic cleaning pursuant to the established regulations for prevention of flammable deposit buildup.

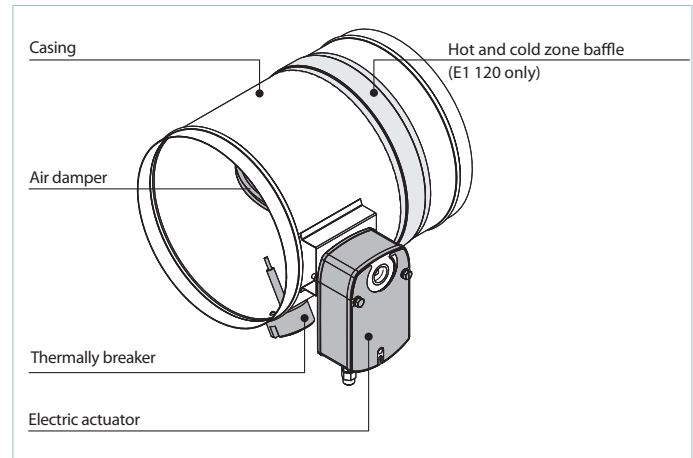
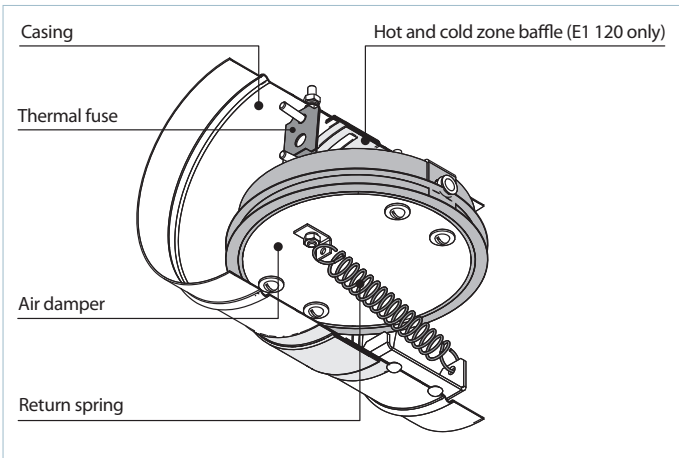
Designation key: \_\_\_\_\_

**PL-10-X- DNX/X**

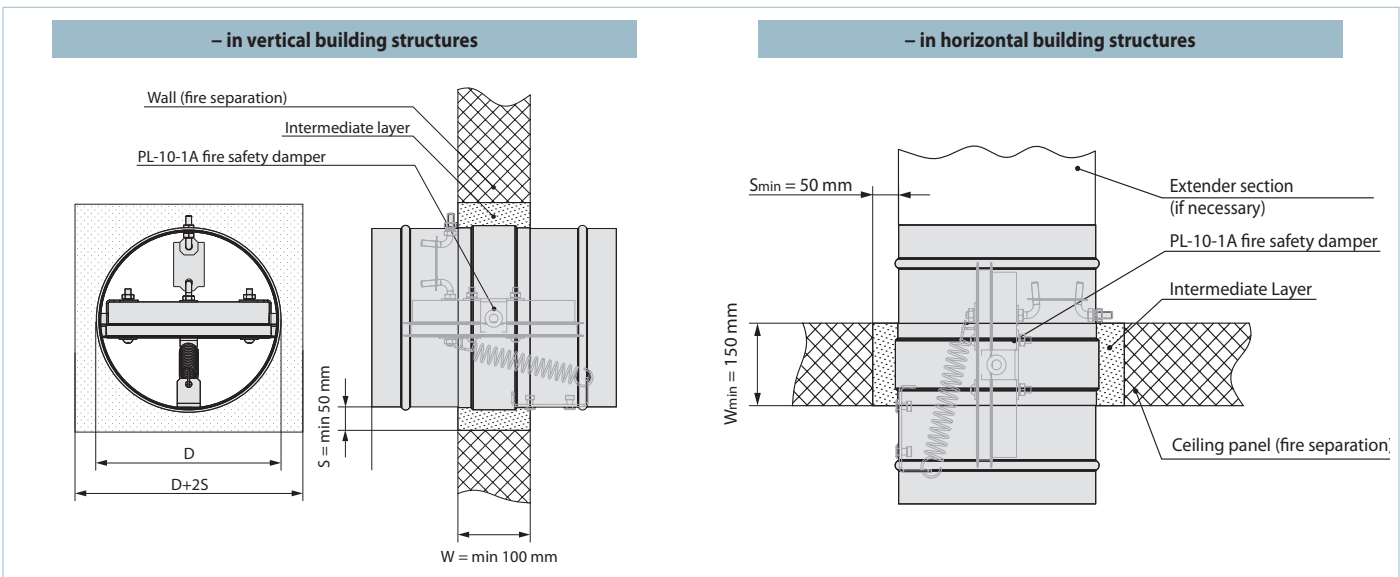
<b>Fire resistance</b>
EI 60 – 1 hour; EI 120 – 2 hours
<b>Rated damper diameter [mm]</b>
100; 125; 150; 160; 180; 200; 225; 250; 315; 355; 400
<b>Actuator type</b>
1A – thermal fuse (72 °C), return spring (manual actuation)
PKP24T – 24 V ZERN electric actuator with a return spring and a thermal breaker
PKP230T – 230 V ZERN electric actuator with a return spring and a thermal breaker
PVP24T – 24 V BELIMO electric actuator with a return spring and a thermal breaker
PVP230T – 230 V BELIMO electric actuator with a return spring and a thermal breaker
PSP24T – 24 V SIEMENS electric actuator with a return spring and a thermal breaker
PSP230T – 230 V SIEMENS electric actuator with a return spring and a thermal breaker
<b>Unit designation</b>
PL-10 – fire safety damper

■ The PL-10-1A fire safety damper with a mechanical actuating unit, a thermal fuse and a return spring

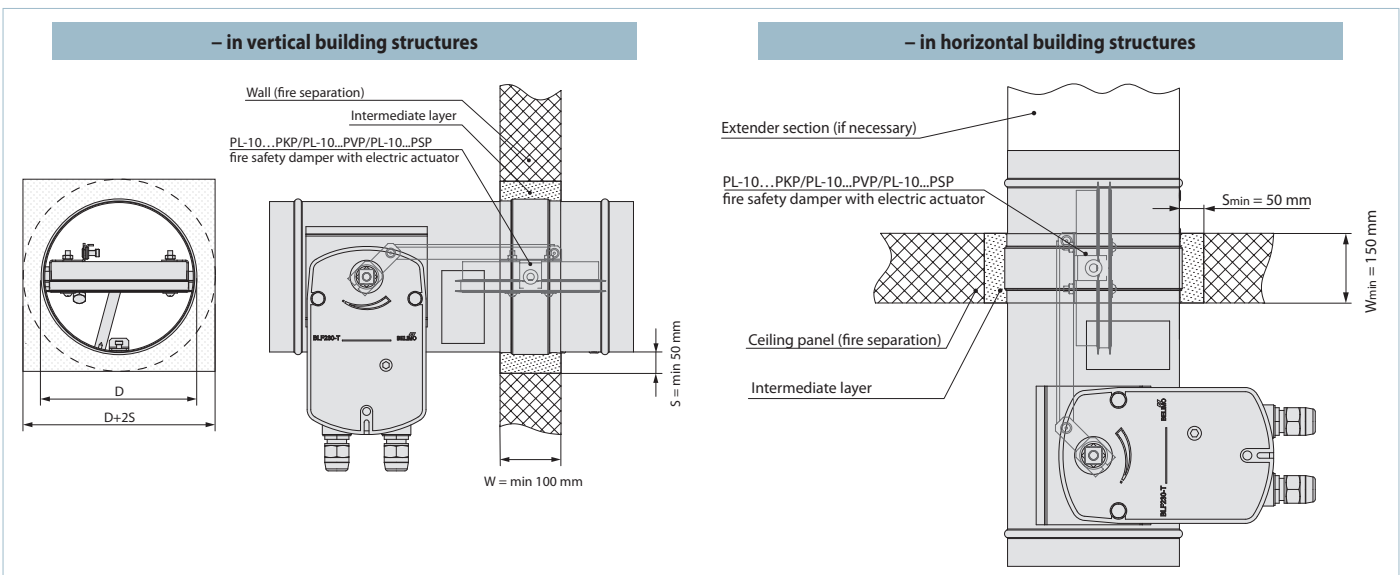
■ The PL-10...PKP/PL-10...PVP/PL-10...PSP fire safety damper with an electric actuator and a thermoelectric breaker



■ Installation recommendations for PL-10...1A dampers with a mechanical actuating unit with a thermal fuse and a return spring

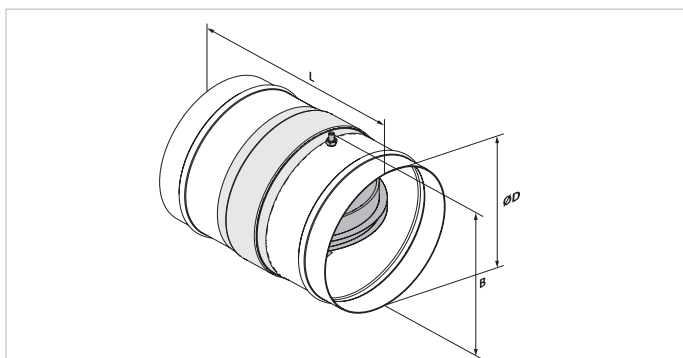


■ Installation recommendations for PL-10...PKP/PL-10...PVP/PL-10...PSP fire safety dampers with electric actuator and thermoelectric breaker

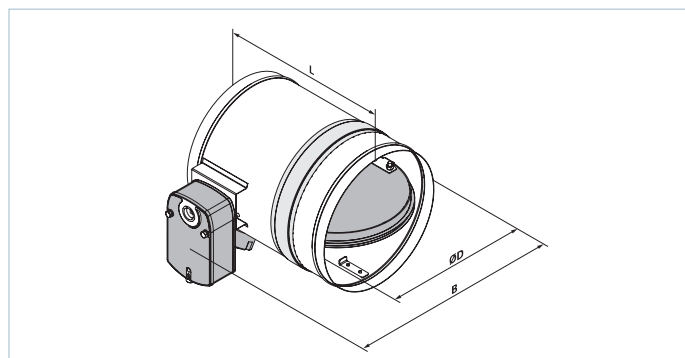


## FIRE-RESISTING DAMPER

■ Fire safety damper with a mechanical actuating unit, a thermal fuse and a return spring



■ Fire safety damper with an electric actuator and thermally sensitive breaker



■ Overall and connecting dimensions of PL dampers with a mechanical actuator

Modification	Dimensions [mm]			Weight [kg]
	ØD	L	B	
PL-10-1A-DN100	99	170	112	1
PL-10-1A-DN125	124	170	137	1.2
PL-10-1A-DN150	149	170	162	1.5
PL-10-1A-DN160	159	170	172	1.6
PL-10-1A-DN180	179	170	192	1.8
PL-10-1A-DN200	199	170	212	2
PL-10-1A-DN225	224	170	237	2.2
PL-10-1A-DN250	249	190	262	2.5
PL-10-1A-DN315	314	190	327	3.6
PL-10-1A-DN355	354	190	367	4.4
PL-10-1A-DN400	399	240	412	6

■ Overall and connecting dimensions of PL dampers

Modification	Dimensions [mm]			Weight [kg]
	ØD	L	B	
PL-10-...-DN100	99	300	195	2.9
PL-10-...-DN125	124	300	215	3.1
PL-10-...-DN150	149	300	245	3.4
PL-10-...-DN160	159	300	255	3.5
PL-10-...-DN180	179	300	275	3.8
PL-10-...-DN200	199	300	295	4
PL-10-...-DN225	224	300	325	4.4
PL-10-...-DN250	249	310	345	4.7
PL-10-...-DN315	314	310	415	6.5
PL-10-...-DN355	354	310	455	8.3
PL-10-...-DN400	399	310	505	9.9

■ Main technical specifications of Belimo electric actuators with a return spring and a thermal breaker

Technical data	Basic models	
	AC/DC 24 V	AC 230 V
Rated operation voltage	AC 19.2...28.8 V DC 21.6...28.8 V	AC 198...264 V
Permissible operating voltage tolerance	50/60 Hz	
AC mains frequency	0.8	1.1
Power consumption at rest [W]	2.5	3.5
Power consumption in operation [W]	4	6.5
Maximum design capacity [VA]	4	
Motor torque [Nm]	3	
Spring torque [Nm]	III	
SEC class	II	
Ingress protection rating	IP54	
Auxiliary switches	2 pcs., single-pole, reversible 1 mA...3 (0.5) A, AC 250 V	
Electric motor connection cable	1 m, 2 x 0.75 mm <sup>2</sup> (halogen-free)	
Auxiliary switch connection cable	1 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)	
Running time spring	20 seconds at -10...+55 °C < 60 seconds at -30...-10 °C	
Running time motor	< 60 s/90°	
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C	
Service life	Min. 60 000 emergency positions	
Technical maintenance	Not required	

■ Main technical specifications of Zern electric actuators with a return spring and a thermal breaker

Technical data	Basic models	
Rated operation voltage	AC/DC 24 V	AC 100-240 V
Permissible operating voltage tolerance	AC/DC 19.2...28.8 V	AC 85...265 V
AC mains frequency	50/60 Hz	
Power consumption at rest [W]	3	
Power consumption in operation [W]	5	
Motor torque [Nm]	5	
Spring torque [Nm]		
SEC class	III	II
Ingress protection rating	IP54	
Auxiliary switches	2 pcs., single-pole, reversible, 1 mA...3(0.5)A, AC 220 V	
Electric motor connection cable	1 m, 2 x 0.5 mm <sup>2</sup> (halogen-free)	
Auxiliary switch connection cable	1 m, 6 x 0.5 mm <sup>2</sup> (halogen-free)	
Running time spring	<20 seconds < 60 seconds at -30...-10 °C	
Running time motor	< 70 s/95°	
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C	

■ Main technical specifications of Siemens electric actuators with a return spring and a thermal breaker

Technical data	Basic models	
Rated operation voltage	AC 24 V/DC 24...48 V	AC 230 V
Permissible operating voltage tolerance	AC/DC ±20 %	AC ±15 %
AC mains frequency	50/60 Hz	
Power consumption at rest [W]	2	3.5
Power consumption in operation [W]	3.5	4.5
Maximum design capacity [VA]	5	7
Motor torque [Nm]	4	
Spring torque [Nm]	4	
SEC class	III	II
Ingress protection rating	IP54	
Auxiliary switches	2 pcs., single-pole, reversible, 6(2)A, AC 24...250 V	
Electric motor connection cable	0.9 m, 2 x 0.75 mm <sup>2</sup> (halogen-free)	
Auxiliary switch connection cable	0.9 m, 6 x 0.75 mm <sup>2</sup> (halogen-free)	
Running time spring	15 seconds < 60 seconds at -30...-10 °C	
Running time motor	90 s/90°	
Response temperature of thermal breaker sensors	Duct sensor 72 °C Outdoor sensor 72 °C	
Service life	10 000 emergency positions	
Technical maintenance	Not required	

## RD1 smoke exhaust grille



The KPD/KPDU smoke exhaust dampers and the KP-1, KP-2 wall-mounted fire-resisting dampers (1 flange) can be additionally equipped with a smoke exhaust grille.

The smoke exhaust grille is used to entirely block the external view of the damper internals in the absence of strict requirements to the unit appearance.

The smoke exhaust grille also doubles as unauthorized access protection for the damper and its actuator.

The grille has one row of non-adjustable horizontal air flow guides fixed at 45°.

The grille can be made of galvanized steel (Zn), carbon steel with a special coating (M), stainless steel (N) or aluminium (A).

The grille is attached directly to the damper flange by means of self-tapping screws with the louvre shutters facing outwards.

### Designation key

## Smoke exhaust grille RD1 X X X

#### Working section of the damper:

BxH (B – width [mm]; H – height [mm])

#### Damper flow area width [mm]

300; 350; 400; 450; 500; 550; 600; 650; 700; 750; 800; 850; 900; 950; 1000

#### Damper flow area height [mm]

300; 350; 400; 450; 500; 550; 600; 650; 700; 750; 800; 850; 900; 950; 1000

#### Damper type:

KPDU, KPD

#### Material:

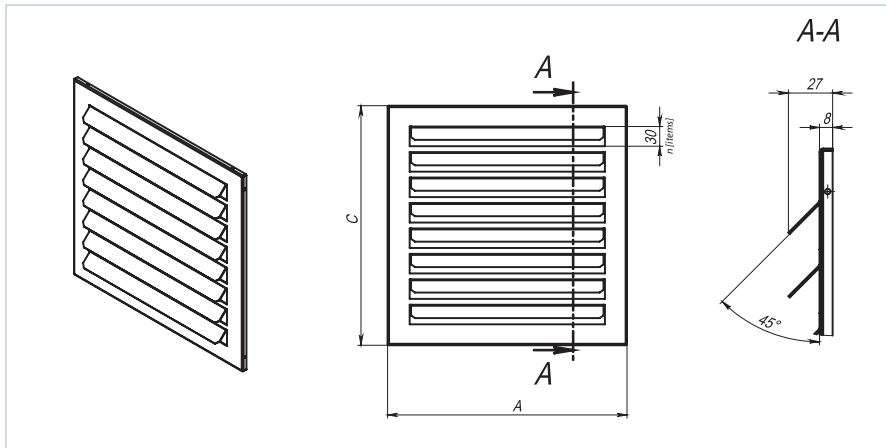
Zn – galvanized steel

N – stainless steel

M – carbon steel with special coating

A – aluminium

### Overall dimensions



When ordering smoke exhaust grilles for KP-1 and KP-2 dampers, it is necessary to order a grille with the name RD1...KPDU...

Name	A [mm]	C [mm]	n [items]	Cross-sectional area [m <sup>2</sup> ]	Weight of the galvanized steel grille [kg]
RD1 300x300 (for KPD)	367			0.059	1.29
RD1 350x300 (for KPD)	417			0.069	1.46
RD1 400x300 (for KPD)	467			0.080	1.63
RD1 450x300 (for KPD)	517			0.090	1.80
RD1 500x300 (for KPD)	567			0.101	1.97
RD1 550x300 (KPDU/KPD)	617			0.111	2.14
RD1 600x300 (KPDU/KPD)	667			0.122	2.32
RD1 650x300 (KPDU/KPD)	717	367	8	0.132	2.49
RD1 700x300 (KPDU/KPD)	767			0.143	2.66
RD1 750x300 (KPDU/KPD)	817			0.153	2.83
RD1 800x300 (KPDU/KPD)	867			0.164	3.00
RD1 850x300 (KPDU/KPD)	917			0.174	3.17
RD1 900x300 (KPDU/KPD)	967			0.185	3.34
RD1 950x300 (KPDU/KPD)	1017			0.195	3.51
RD1 1000x300 (KPDU/KPD)	1067			0.206	3.68



Name	A [mm]	C [mm]	n [items]	Cross-sectional area [m <sup>2</sup> ]	Weight of the galvanized steel grille [kg]
RD1 350x350 (for KPD)	417	417	9	0.079	1.66
RD1 400x350 (for KPD)	467			0.091	1.85
RD1 450x350 (for KPD)	517			0.103	2.04
RD1 500x350 (for KPD)	567			0.115	2.24
RD1 550x350 (KPDU/KPD)	617			0.127	2.43
RD1 600x350 (KPDU/KPD)	667			0.139	2.62
RD1 650x350 (KPDU/KPD)	717			0.151	2.81
RD1 700x350 (KPDU/KPD)	767			0.163	3.01
RD1 750x350 (KPDU/KPD)	817			0.175	3.20
RD1 800x350 (KPDU/KPD)	867			0.187	3.39
RD1 850x350 (KPDU/KPD)	917			0.199	3.59
RD1 900x350 (KPDU/KPD)	967			0.211	3.78
RD1 950x350 (KPDU/KPD)	1017			0.223	3.97
RD1 1000x350 (KPDU/KPD)	1067	0.235	4.17		
RD1 400x400 (for KPD)	467	467	10	0.114	2.07
RD1 450x400 (for KPD)	517			0.129	2.28
RD1 500x400 (for KPD)	567			0.144	2.50
RD1 550x400 (KPDU/KPD)	617			0.159	2.71
RD1 600x400 (KPDU/KPD)	667			0.174	2.93
RD1 650x400 (KPDU/KPD)	717			0.189	3.14
RD1 700x400 (KPDU/KPD)	767			0.204	3.36
RD1 750x400 (KPDU/KPD)	817			0.219	3.57
RD1 800x400 (KPDU/KPD)	867			0.234	3.79
RD1 850x400 (KPDU/KPD)	917			0.249	4.01
RD1 900x400 (KPDU/KPD)	967			0.264	4.22
RD1 950x400 (KPDU/KPD)	1017			0.279	4.44
RD1 1000x400 (KPDU/KPD)	1067			0.294	4.65
RD1 450x450 (for KPD)	517	517	12	0.142	2.51
RD1 500x450 (for KPD)	567			0.158	2.75
RD1 550x450 (KPDU/KPD)	617			0.175	2.98
RD1 600x450 (KPDU/KPD)	667			0.191	3.22
RD1 650x450 (KPDU/KPD)	717			0.208	3.46
RD1 700x450 (KPDU/KPD)	767			0.224	3.69
RD1 750x450 (KPDU/KPD)	817			0.241	3.93
RD1 800x450 (KPDU/KPD)	867			0.257	4.17
RD1 850x450 (KPDU/KPD)	917			0.274	4.41
RD1 900x450 (KPDU/KPD)	967			0.290	4.64
RD1 950x450 (KPDU/KPD)	1017			0.307	4.88
RD1 1000x450 (KPDU/KPD)	1067			0.323	5.12
RD1 500x500 (for KPD)	567			567	13
RD1 550x500 (KPDU/KPD)	617	0.191	3.27		
RD1 600x500 (KPDU/KPD)	667	0.209	3.53		
RD1 650x500 (KPDU/KPD)	717	0.227	3.79		
RD1 700x500 (KPDU/KPD)	767	0.245	4.05		
RD1 750x500 (KPDU/KPD)	817	0.263	4.31		
RD1 800x500 (KPDU/KPD)	867	0.281	4.57		
RD1 850x500 (KPDU/KPD)	917	0.299	4.82		
RD1 900x500 (KPDU/KPD)	967	0.317	5.08		
RD1 950x500 (KPDU/KPD)	1017	0.335	5.34		
RD1 1000x500 (KPDU/KPD)	1067	0.353	5.60		
RD1 550x550 (KPDU/KPD)	617	0.207	3.55		
RD1 600x550 (KPDU/KPD)	667	0.226	3.83		
RD1 650x550 (KPDU/KPD)	717	0.246	4.12		
RD1 700x550 (KPDU/KPD)	767	0.265	4.40		
RD1 750x550 (KPDU/KPD)	817	0.285	4.68		
RD1 800x550 (KPDU/KPD)	867	0.304	4.96		
RD1 850x550 (KPDU/KPD)	917	0.324	5.24		
RD1 900x550 (KPDU/KPD)	967	0.343	5.53		
RD1 950x550 (KPDU/KPD)	1017	0.363	5.81		
RD1 1000x550 (KPDU/KPD)	1067	0.382	6.09		

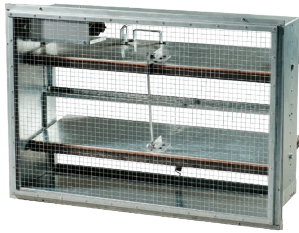
## ACCESSORIES

Name	A [mm]	C [mm]	n [items]	Cross-sectional area [m <sup>2</sup> ]	Weight of the galvanized steel grille [kg]
RD1 600x600 (KPDU/KPD)	667	667	15	0.244	4.14
RD1 650x600 (KPDU/KPD)	717			0.265	4.44
RD1 700x600 (KPDU/KPD)	767			0.286	4.75
RD1 750x600 (KPDU/KPD)	817			0.307	5.05
RD1 800x600 (KPDU/KPD)	867			0.328	5.36
RD1 850x600 (KPDU/KPD)	917			0.349	5.66
RD1 900x600 (KPDU/KPD)	967			0.370	5.97
RD1 950x600 (KPDU/KPD)	1017			0.391	6.27
RD1 1000x600 (KPDU/KPD)	1067			0.412	6.58
RD1 650x650 (KPDU/KPD)	717			717	16
RD1 700x650 (KPDU/KPD)	767	0.306	5.10		
RD1 750x650 (KPDU/KPD)	817	0.329	5.43		
RD1 800x650 (KPDU/KPD)	867	0.351	5.75		
RD1 850x650 (KPDU/KPD)	917	0.374	6.08		
RD1 900x650 (KPDU/KPD)	967	0.396	6.41		
RD1 950x650 (KPDU/KPD)	1017	0.419	6.74		
RD1 1000x650 (KPDU/KPD)	1067	0.441	7.06		
RD1 700x700 (KPDU/KPD)	767	767	18	0.347	5.44
RD1 750x700 (KPDU/KPD)	817			0.372	5.78
RD1 800x700 (KPDU/KPD)	867			0.398	6.13
RD1 850x700 (KPDU/KPD)	917			0.423	6.48
RD1 900x700 (KPDU/KPD)	967			0.449	6.83
RD1 950x700 (KPDU/KPD)	1017			0.474	7.18
RD1 1000x700 (KPDU/KPD)	1067			0.500	7.53
RD1 750x750 (KPDU/KPD)	817			817	19
RD1 800x750 (KPDU/KPD)	867	0.421	6.53		
RD1 850x750 (KPDU/KPD)	917	0.448	6.90		
RD1 900x750 (KPDU/KPD)	967	0.475	7.27		
RD1 950x750 (KPDU/KPD)	1017	0.502	7.64		
RD1 1000x750 (KPDU/KPD)	1067	0.529	8.01		
RD1 800x800 (KPDU/KPD)	867	867	20		
RD1 850x800 (KPDU/KPD)	917			0.473	7.32
RD1 900x800 (KPDU/KPD)	967			0.502	7.71
RD1 950x800 (KPDU/KPD)	1017			0.530	8.11
RD1 1000x800 (KPDU/KPD)	1067			0.559	8.50
RD1 850x850 (KPDU/KPD)	917	917	21	0.498	7.74
RD1 900x850 (KPDU/KPD)	967			0.528	8.16
RD1 950x850 (KPDU/KPD)	1017			0.558	8.57
RD1 1000x850 (KPDU/KPD)	1067			0.588	8.99
RD1 900x900 (KPDU/KPD)	967	967	22	0.554	8.60
RD1 950x900 (KPDU/KPD)	1017			0.586	9.04
RD1 1000x900 (KPDU/KPD)	1067			0.617	9.47
RD1 950x950 (KPDU/KPD)	1017	1017	23	0.614	9.50
RD1 1000x950 (KPDU/KPD)	1067			0.647	9.96
RD1 1000x1000 (KPDU/KPD)	1067	1067	24	0.676	10.45
RD1 300x300 (for KPDU)	347	347	8	0.059	1.15
RD1 350x300 (for KPDU)	397			0.069	1.31
RD1 400x300 (for KPDU)	447			0.080	1.48
RD1 450x300 (for KPDU)	497			0.090	1.64
RD1 500x300 (for KPDU)	547			0.101	1.80
RD1 350x350 (for KPDU)	397	397	9	0.079	1.50
RD1 400x350 (for KPDU)	447			0.091	1.68
RD1 450x350 (for KPDU)	497			0.103	1.87
RD1 500x350 (for KPDU)	547			0.115	2.05
RD1 400x400 (for KPDU)	447	447	10	0.114	1.89
RD1 450x400 (for KPDU)	497			0.129	2.09
RD1 500x400 (for KPDU)	547			0.144	2.30
RD1 450x450 (for KPDU)	497	497	11	0.142	2.32
RD1 500x450 (for KPDU)	547			0.158	2.55
RD1 500x500 (for KPDU)	547	547	12	0.173	2.79

The KP-1, KP-2 fire-resisting duct dampers (2 flanges) for completing with an RD1 grille can be ordered separately.



## RZ protective grille



The KPD/KPDU smoke exhaust dampers and the KP-1, KP-2 wall-mounted fire-resisting dampers (1 flange) can be additionally equipped with a protective grille.

The protective grille serves for protection against unauthorized access to the damper and its actuating mechanism.

The grille is only made from galvanized steel.

The grille is attached directly to the damper flange by means of self-tapping screws.

### Designation key

## RZ X protective grille

**Effective damper cross-section:**

BxH (B – width [mm]; H – height [mm])

**Damper flow area width [mm]**

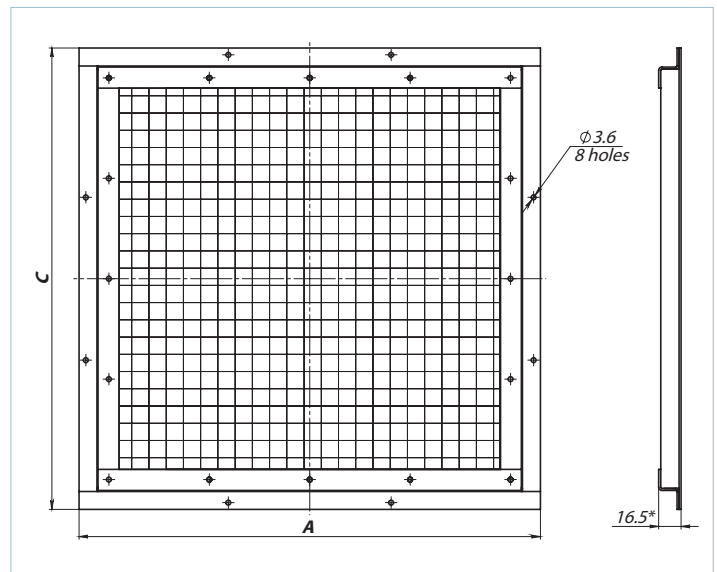
300; 350; 400; 450; 500; 550; 600; 650; 700; 750; 800; 850; 900; 950; 1000

**Damper flow area height [mm]**

300; 350; 400; 450; 500; 550; 600; 650; 700; 750; 800; 850; 900; 950; 1000

### Overall dimensions

Name	A [mm]	C [mm]	Cross-sectional area [m <sup>2</sup> ]	Weight [kg]
RZ 300x300	340	340	0.072	0.75
RZ 350x300	390	340	0.090	0.86
RZ 350x350	390	390	0.103	0.91
RZ 400x300	440	340	0.103	0.91
RZ 400x350	440	390	0.120	0.94
RZ 400x400	440	440	0.141	0.99
RZ 450x300	490	340	0.120	0.94
RZ 450x350	490	390	0.141	0.99
RZ 450x400	490	440	0.159	1.02
RZ 450x450	490	490	0.178	1.12
RZ 500x300	540	340	0.141	0.99
RZ 500x350	540	390	0.159	1.02
RZ 500x400	540	440	0.178	1.12
RZ 500x450	540	490	0.190	1.20
RZ 500x500	540	540	0.210	1.22
RZ 550x300	610	360	0.159	1.02
RZ 550x350	610	410	0.178	1.12
RZ 550x400	610	460	0.190	1.20
RZ 550x450	610	510	0.210	1.22
RZ 550x500	610	560	0.269	1.30
RZ 550x550	610	610	0.293	1.37
RZ 600x300	660	360	0.178	1.12
RZ 600x350	660	410	0.190	1.20
RZ 600x400	660	460	0.210	1.22
RZ 600x450	660	510	0.269	1.30
RZ 600x500	660	560	0.293	1.37
RZ 600x550	660	610	0.305	1.42
RZ 600x600	660	660	0.321	1.45
RZ 650x300	710	360	0.190	1.30
RZ 650x350	710	410	0.210	1.22
RZ 650x400	710	460	0.269	1.30
RZ 650x450	710	510	0.293	1.37
RZ 650x500	710	560	0.305	1.42
RZ 650x550	710	610	0.321	1.45
RZ 650x600	710	660	0.340	1.48
RZ 650x650	710	710	0.392	1.51



Name	A [mm]	C [mm]	Cross-sectional area [m <sup>2</sup> ]	Weight [kg]
RZ 700x300	760	360	0.210	1.22
RZ 700x350	760	410	0.269	1.30
RZ 700x400	760	460	0.293	1.37
RZ 700x450	760	510	0.305	1.42
RZ 700x500	760	560	0.321	1.45
RZ 700x550	760	610	0.340	1.48
RZ 700x600	760	660	0.392	1.51
RZ 700x650	760	710	0.411	1.56
RZ 700x700	760	760	0.446	1.59
RZ 750x300	810	360	0.269	1.30
RZ 750x350	810	410	0.293	1.37
RZ 750x400	810	460	0.305	1.42
RZ 750x450	810	510	0.321	1.45
RZ 750x500	810	560	0.340	1.48
RZ 750x550	810	610	0.392	1.51
RZ 750x600	810	660	0.411	1.56
RZ 750x650	810	710	0.446	1.59
RZ 750x700	810	760	0.495	1.65
RZ 750x750	810	810	0.507	1.70
RZ 800x300	860	360	0.293	1.37
RZ 800x350	860	410	0.305	1.42
RZ 800x400	860	460	0.321	1.45
RZ 800x450	860	510	0.340	1.48
RZ 800x500	860	560	0.392	1.51
RZ 800x550	860	610	0.411	1.56
RZ 800x600	860	660	0.446	1.59
RZ 800x650	860	710	0.495	1.65
RZ 800x700	860	760	0.507	1.70
RZ 800x750	860	810	0.582	1.74
RZ 800x800	860	860	0.614	1.78
RZ 850x300	910	360	0.305	1.46
RZ 850x350	910	410	0.321	1.45
RZ 850x400	910	460	0.340	1.48
RZ 850x450	910	510	0.392	1.51
RZ 850x500	910	560	0.411	1.56
RZ 850x550	910	610	0.446	1.59
RZ 850x600	910	660	0.495	1.65
RZ 850x650	910	710	0.507	1.70
RZ 850x700	910	760	0.582	1.74
RZ 850x750	910	810	0.614	1.78
RZ 850x800	910	860	0.639	1.84
RZ 850x850	910	910	0.694	1.90
RZ 900x300	960	360	0.321	1.45
RZ 900x350	960	410	0.340	1.48
RZ 900x400	960	460	0.392	1.51
RZ 900x450	960	510	0.411	1.56
RZ 900x500	960	560	0.446	1.59
RZ 900x550	960	610	0.495	1.65
RZ 900x600	960	660	0.507	1.70
RZ 900x650	960	710	0.582	1.74
RZ 900x700	960	760	0.614	1.78
RZ 900x750	960	810	0.639	1.84
RZ 900x800	960	860	0.694	1.90
RZ 900x850	960	910	0.715	1.93
RZ 900x900	960	960	0.769	1.98
RZ 950x300	1010	360	0.340	1.48
RZ 950x350	1010	410	0.392	1.51
RZ 950x400	1010	460	0.411	1.56

Name	A [mm]	C [mm]	Cross-sectional area [m <sup>2</sup> ]	Weight [kg]
RZ 950x450	1010	510	0.446	1.59
RZ 950x500	1010	560	0.495	1.65
RZ 950x550	1010	610	0.507	1.70
RZ 950x600	1010	660	0.582	1.74
RZ 950x650	1010	710	0.614	1.78
RZ 950x700	1010	760	0.639	1.84
RZ 950x750	1010	810	0.694	1.90
RZ 950x800	1010	860	0.715	1.93
RZ 950x850	1010	910	0.769	1.98
RZ 950x900	1010	960	0.811	2.05
RZ 950x950	1010	1010	0.874	2.10
RZ 1000x300	1060	360	0.392	1.51
RZ 1000x350	1060	410	0.411	1.56
RZ 1000x400	1060	460	0.446	1.59
RZ 1000x450	1060	510	0.495	1.65
RZ 1000x500	1060	560	0.507	1.70
RZ 1000x550	1060	610	0.582	1.74
RZ 1000x600	1060	660	0.614	1.78
RZ 1000x650	1060	710	0.639	1.84
RZ 1000x700	1060	760	0.694	1.90
RZ 1000x750	1060	810	0.715	1.93
RZ 1000x800	1060	860	0.769	1.98
RZ 1000x850	1060	910	0.811	2.05
RZ 1000x900	1060	960	0.874	2.10
RZ 1000x950	1060	1010	0.913	2.17
RZ 1000x1000	1060	1060	0.945	2.21

The KP-1, KP-2 fire-resisting duct dampers (2 flanges) for completing with an RZ grille can be ordered separately.

## Aluminium decorative grille



**Application**

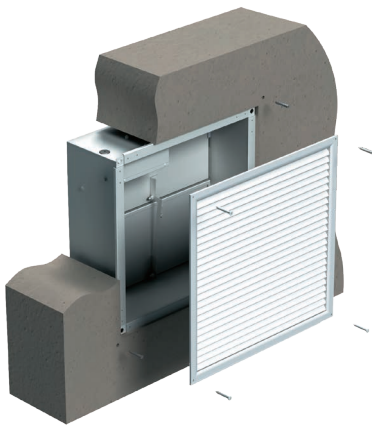
For supply and exhaust ventilation, heating and air conditioning systems in industrial, commercial and domestic premises.

**Design**

Made of high quality extruded aluminium profile. The polymer or anodized coating of the grille provides resistance to adverse weather conditions. Grilles with special dimensions can be manufactured upon request. Grilles from 450 mm in size are produced with an additional partition to provide rigidity (ONFS series).

**Modifications**

Can be equipped with an adapter (A) (see the end of the section).  
Can be equipped with special springs (p) for quick installation (see the end of the section).



The unit can be equipped with a decorative grille made of aluminium for a more aesthetic appearance. The grille has one row of non-adjustable horizontal air flow guides fixed at 45°.

The grille is polymer coated and anodised for extra protection against the weather elements. To enable the decorative grille installation, the damper must be embedded at least 40 mm deep into the wall as measured from the wall face to the damper flange.

**NOTE:**

While selecting the aluminium decorative grille mind the wall opening dimensions.

**Ordering scheme**



**Grille type:** \_\_\_\_\_  
ONF/ONFS – single-row unregulated grille with horizontal (vertical) arrangement of air flow guides (fixed at an angle of 45 °)

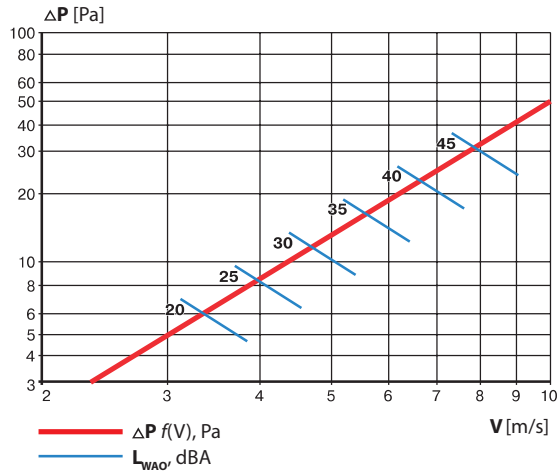
**Opening dimensions:** \_\_\_\_\_  
L – length [mm]  
H – height [mm]

**Grille coating:**  
"\_\_\_" – colour\* (white by default)  
Anodized

**Accessories:**  
\_\_\_ – no  
A – adapter

**Grille fastening:**  
p – spring

**Pressure drop and sound power level**



**Calculation formula**

$$L_w = L_{w0} \times K$$

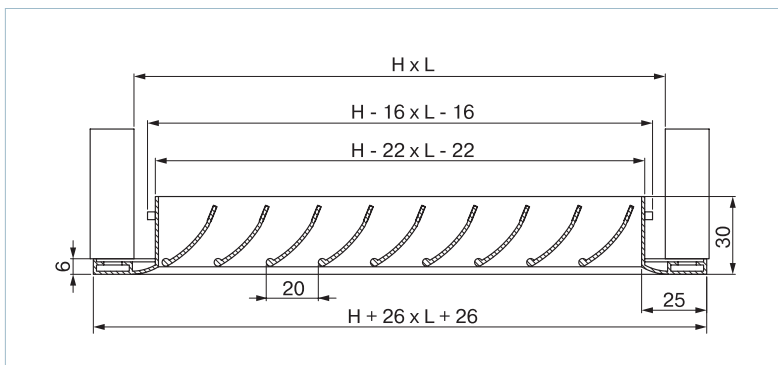
**Correction factor K**

S [m <sup>2</sup> ]	0.005	0.01	0.02	0.03	0.05	0.07	1
K [dBA]	-13	-9	-6	-4.5	-3	-1.5	0

**Designation key:**

- $\Delta P$  – pressure drop [Pa]
- $L_{WA}$  – sound power level [dBA]
- $L_{WAO}$  – sound power level for cross-sectional area of 0.1 m<sup>2</sup> [dBA]
- $K$  – correction factor for sound power level depending on cross-sectional area [dBA]
- $S$  – cross-sectional area [m<sup>2</sup>]
- $V$  – design speed [m/s]

**Overall and mounting dimensions**



**Air flow distribution**



**Deflection angle of air flow guides – 45°**

**Cross-section dimensions and area [m<sup>2</sup>]**

Height H [mm]	Length L [mm]													
	100	150	200	250	300	350	400	450	500	600	700	800	900	1000
100	0.004	0.007	0.010	0.012	0.015	0.018	0.021	0.024	0.027	0.033	0.039	0.045	0.051	0.057
150	0.070	0.010	0.015	0.018	0.023	0.027	0.031	0.035	0.039	0.047	0.055	0.064	0.072	0.080
200	0.010	0.015	0.021	0.026	0.033	0.038	0.045	0.051	0.058	0.070	0.081	0.093	0.105	0.115
250	0.012	0.018	0.026	0.032	0.041	0.047	0.055	0.062	0.070	0.084	0.098	0.106	0.113	0.128
300	0.015	0.023	0.033	0.041	0.051	0.059	0.069	0.077	0.086	0.096	0.115	0.132	0.149	0.168
350	0.017	0.026	0.038	0.047	0.059	0.068	0.080	0.090	0.099	0.111	0.132	0.151	0.170	0.193
400	0.020	0.030	0.044	0.054	0.069	0.079	0.093	0.103	0.117	0.142	0.166	0.189	0.212	0.237
450	0.023	0.035	0.051	0.062	0.080	0.090	0.107	0.117	0.131	0.160	0.186	0.214	0.239	0.265
500	0.026	0.039	0.056	0.070	0.089	0.100	0.119	0.130	0.145	0.178	0.206	0.238	0.265	0.293
600	0.031	0.047	0.067	0.084	0.105	0.121	0.142	0.158	0.173	0.214	0.246	0.287	0.318	0.349
700	0.036	0.055	0.078	0.094	0.124	0.145	0.170	0.184	0.203	0.251	0.288	0.336	0.372	0.408
800	0.042	0.063	0.090	0.112	0.141	0.163	0.190	0.211	0.232	0.288	0.330	0.385	0.426	0.467
900	0.048	0.072	0.103	0.129	0.160	0.185	0.228	0.238	0.262	0.325	0.372	0.435	0.481	0.527
1000	0.053	0.079	0.113	0.141	0.177	0.204	0.239	0.266	0.292	0.361	0.414	0.484	0.536	0.587

## Mounting frame

The KPD/KPDU smoke exhaust dampers can be additionally equipped with a mounting frame.

The mounting frame eases the installation of the damper in the wall opening, creating additional rigidity and preventing deformation of the damper during installation.

The damper is attached directly to the flange of the mounting frame by means of self-tapping screws.

### Designation key

## RM KPD/KPDU X mounting frame

#### Effective damper cross-section:

BxH (B – width [mm]; H – height [mm])

#### Damper flow area width [mm]

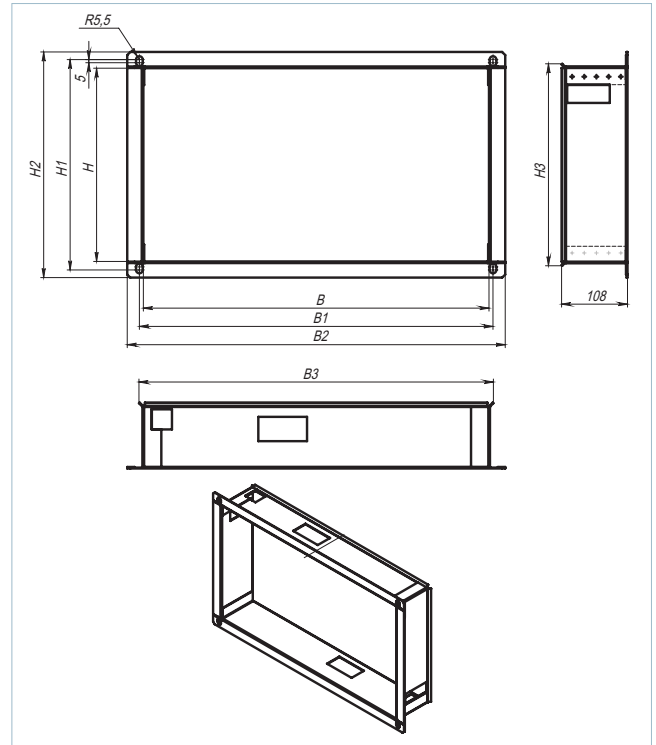
550; 600; 650; 700; 750; 800; 850; 900; 950; 1000

#### Damper flow area height [mm]

300; 350; 400; 450; 500; 550; 600; 650; 700; 750; 800; 850; 900; 950; 1000

### Overall dimensions

Name	B [mm]	B1 [mm]	B2 [mm]	B3 [mm]	H [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]
RM 550x300	567	580	620	580.6					2.97
RM 600x300	617	630	670	630.6					3.13
RM 650x300	667	680	720	680.6					3.29
RM 700x300	717	730	770	730.6					3.45
RM 750x300	767	780	820	780.6	317	345	370	330.6	3.61
RM 800x300	817	830	870	830.6					3.77
RM 850x300	867	880	920	880.6					3.93
RM 900x300	917	930	970	930.6					4.09
RM 950x300	967	980	1020	980.6					4.25
RM 1000x300	1017	1030	1070	1030.6					4.41
RM 550x350	567	580	620	580.6					3.13
RM 600x350	617	630	670	630.6					3.29
RM 650x350	667	680	720	680.6					3.45
RM 700x350	717	730	770	730.6					3.61
RM 750x350	767	780	820	780.6	367	395	420	380.6	3.77
RM 800x350	817	830	870	830.6					3.93
RM 850x350	867	880	920	880.6					4.09
RM 900x350	917	930	970	930.6					4.25
RM 950x350	967	980	1020	980.6					4.41
RM 1000x350	1017	1030	1070	1030.6					4.57
RM 550x400	567	580	620	580.6					3.29
RM 600x400	617	630	670	630.6					3.45
RM 650x400	667	680	720	680.6					3.61
RM 700x400	717	730	770	730.6					3.77
RM 750x400	767	780	820	780.6					3.93
RM 800x400	817	830	870	830.6	417	445	470	430.6	4.09
RM 850x400	867	880	920	880.6					4.25
RM 900x400	917	930	970	930.6					4.41
RM 950x400	967	980	1020	980.6					4.57
RM 1000x400	1017	1030	1070	1030.6					4.73
RM 550x450	567	580	620	580.6					3.45
RM 600x450	617	630	670	630.6					3.61
RM 650x450	667	680	720	680.6					3.77
RM 700x450	717	730	770	730.6					3.93
RM 750x450	767	780	820	780.6					4.09
RM 800x450	817	830	870	830.6	467	495	520	480.6	4.25
RM 850x450	867	880	920	880.6					4.41
RM 900x450	917	930	970	930.6					4.57
RM 950x450	967	980	1020	980.6					4.73
RM 1000x450	1017	1030	1070	1030.6					4.89





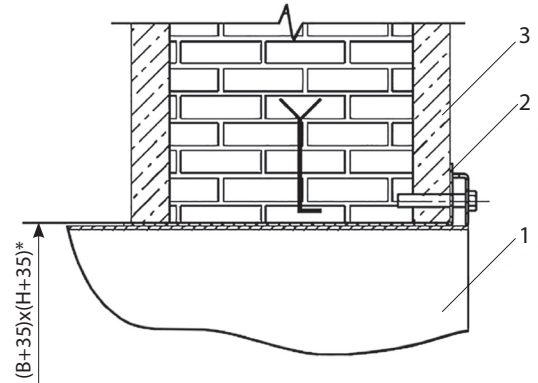
**Overall dimensions**

Name	B [mm]	B1 [mm]	B2 [mm]	B3 [mm]	H [mm]	H1 [mm]	H2 [mm]	H3 [mm]	Weight [kg]
RM 550x500	567	580	620	580.6					3.61
RM 600x500	617	630	670	630.6					3.77
RM 650x500	667	680	720	680.6					3.93
RM 700x500	717	730	770	730.6					4.09
RM 750x500	767	780	820	780.6					4.25
RM 800x500	817	830	870	830.6	517	545	570	530.6	4.41
RM 850x500	867	880	920	880.6					4.57
RM 900x500	917	930	970	930.6					4.73
RM 950x500	967	980	1020	980.6					4.89
RM 1000x500	1017	1030	1070	1030.6					5.05
RM 550x550	567	580	620	580.6					3.77
RM 600x550	617	630	670	630.6					3.93
RM 650x550	667	680	720	680.6					4.09
RM 700x550	717	730	770	730.6					4.25
RM 750x550	767	780	820	780.6					4.41
RM 800x550	817	830	870	830.6	567	595	620	580.6	4.57
RM 850x550	867	880	920	880.6					4.73
RM 900x550	917	930	970	930.6					4.89
RM 950x550	967	980	1020	980.6					5.05
RM 1000x550	1017	1030	1070	1030.6					5.21
RM 600x600	617	630	670	630.6					4.09
RM 650x600	667	680	720	680.6					4.25
RM 700x600	717	730	770	730.6					4.41
RM 750x600	767	780	820	780.6					4.57
RM 800x600	817	830	870	830.6	617	645	670	630.6	4.73
RM 850x600	867	880	920	880.6					4.89
RM 900x600	917	930	970	930.6					5.05
RM 950x600	967	980	1020	980.6					5.21
RM 1000x600	1017	1030	1070	1030.6					5.37
RM 650x650	667	680	720	680.6					4.41
RM 700x650	717	730	770	730.6					4.57
RM 750x650	767	780	820	780.6					4.73
RM 800x650	817	830	870	830.6					4.89
RM 850x650	867	880	920	880.6	667	695	720	680.6	5.05
RM 900x650	917	930	970	930.6					5.21
RM 950x650	967	980	1020	980.6					5.37
RM 1000x650	1017	1030	1070	1030.6					5.53
RM 700x700	717	730	770	730.6					4.73
RM 750x700	767	780	820	780.6					4.89
RM 800x700	817	830	870	830.6					5.05
RM 850x700	867	880	920	980.6	717	745	770	730.6	5.21
RM 900x700	917	930	970	930.6					5.37
RM 950x700	967	980	1020	980.6					5.53
RM 1000x700	1017	1030	1070	1030.6					5.69
RM 750x750	767	780	820	780.6					5.05
RM 800x750	817	830	870	830.6					5.21
RM 850x750	867	880	920	980.6					5.37
RM 900x750	917	930	970	930.6	767	795	820	780.6	5.53
RM 950x750	967	980	1020	980.6					5.69
RM 1000x750	1017	1030	1070	1030.6					5.85
RM 800x800	817	830	870	830.6					5.37
RM 850x800	867	880	920	880.6					5.53
RM 900x800	917	930	970	930.6	817	845	870	830.6	5.69
RM 950x800	967	980	1020	980.6					5.85
RM 1000x800	1017	1030	1070	1030.6					6.01
RM 850x850	867	880	920	880.6					5.69
RM 900x850	917	930	970	930.6					5.85
RM 950x850	967	980	1020	980.6	867	895	920	880.6	6.01
RM 1000x850	1017	1030	1070	1030.6					6.17
RM 900x900	917	930	970	930.6					6.01
RM 950x900	967	980	1020	980.6	917	945	970	930.6	6.17
RM 1000x900	1017	1030	1070	1030.6					6.33
RM 950x950	967	980	1020	980.6					6.33
RM 1000x950	1017	1030	1070	1030.6	967	995	1020	980.6	6.49
RM 1000x1000	1017	1030	1070	1030.6	1017	1045	1070	1030.6	6.65

Note: RM frames not indicated in the table can be produced on request.

**Frame mounting methods**

Sealing of the damper with an RM KPD/KPDU mounting frame in the wall opening

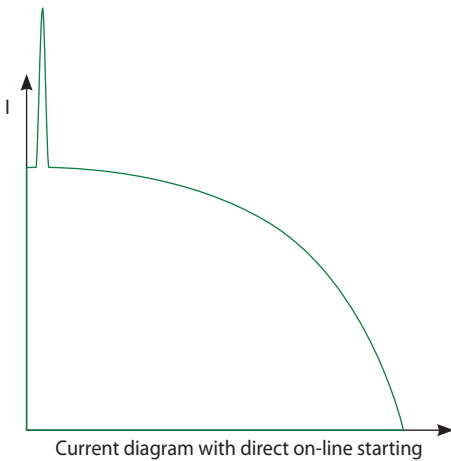


- 1 – damper
- 2 – mounting frame
- 3 – wall overlap, where B [mm] H [mm] – working section of the damper
- \*dimensions of the wall opening for the frame

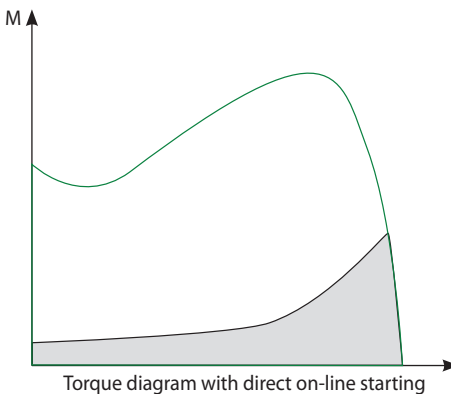
Ventilation systems put a heavy load on the electrical systems of a building. Therefore, reducing the power consumption is among the top priorities for construction project designers.

**Direct on-line starting (DOL)**

As a rule, smoke extraction systems utilize large high-performance fans. During starting the high inertia of the shaft causes a substantial increase in the start-up time – i.e. the time from the application of power to reaching the rated speed. As a result the motor is subjected to high starting current for a prolonged period of time.

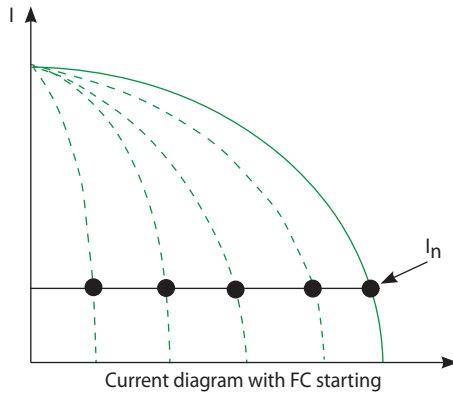


Standard switchgear (automatic circuit breakers, contactors and motor starters) is not designed to withstand prolonged overloads causing the fan to shut down automatically during starting. Using switchgear with a higher maximum current rating renders the electric motor protection system less sensitive. As a result the switchgear will not be able to detect motor overload in time due to a higher current sensing threshold. Such challenges can only be addressed by utilizing a soft starter or a frequency converter to start the fan without causing a prolonged overload.

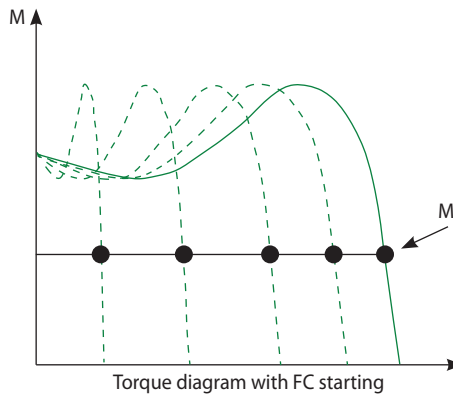


**Frequency converter**

A frequency converter (FC) consists of two main component blocks. One converts alternating current (50 or 60 Hz) into direct current. The other converts direct current into alternating current of variable frequency ranging from 0 to 250 Hz. By controlling the frequency output the FC offers a broad range of motor speed regulation.

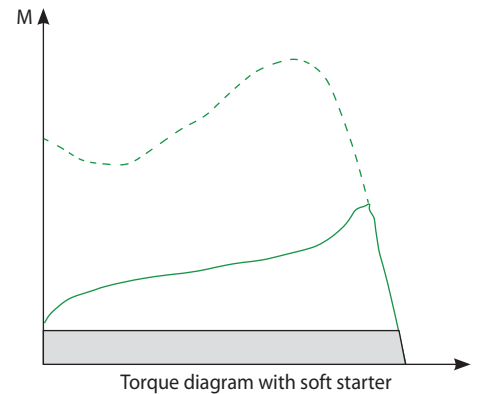
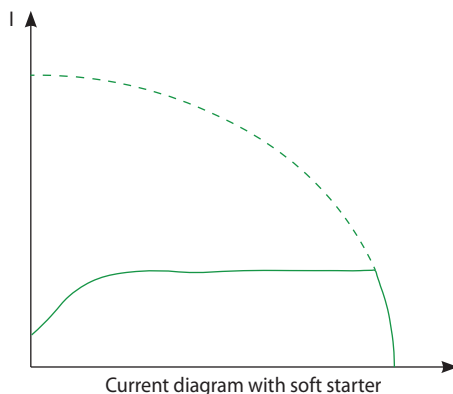


During the starting the FC raises the frequency from 0 Hz to the electrical mains frequency (50 or 60 Hz). As the frequency is increased gradually, the motor can be assumed to operate at its rated speed for a given frequency value. Furthermore, on the assumption that the motor runs at its rated speed the rated torque should be immediately available whereas the current will be approximately equal to the rated value.



**Soft starter**

Unlike an FC, a soft starter does not change the frequency of speed. Instead it gradually increases the voltage supplied to the motor – from the initial level to the rated level.



The very low voltage initially supplied to the motor during starting helps avoid sudden jolts. Both voltage and torque increase gradually.

**Applications in ventilation systems**

Using an FC or a soft starter allows to reduce the starting current thereby avoiding a loss of voltage in the electrical mains. In addition to that the starting torque and mechanical strain on equipment are also reduced which translates into extended maintenance and repair intervals. General exhaust ventilation (GV) systems and emergency smoke extraction (SE) systems of car parks, warehouses, utility and industrial spaces can be integrated into a single system at the design level. As the air flow rate a GV system is considerably lower than that in an SE system a high-capacity fan rated for smoke extraction duty runs in partial load mode. Frequency converters can be programmed for several fixed-speed settings to enable operation in GV and SE modes. The fan operating modes can be switched upon receiving an external signal from the control system. Such integration of ventilation systems allows overall cost savings.

**FC-51 and FC-101. When to use**

This catalogue features two series of frequency converters: FC-51 and FC-101. The FC-51 series is only suitable for general ventilation systems. When using a frequency converter in the framework of smoke exhaust ventilation, it is necessary to complete the fans with FC-101 series frequency converters due to the integrated fire mode. When this mode is activated, the integrated protection of the converter is blocked, and the converter continues to operate despite the possibility of receiving irreparable damage due to overheating or overload. In case of a fire, the FC-101 series frequency converters are capable of maintaining a higher air pressure level at landings compared to other areas of the building in order to keep the landings smoke-free.

## Frequency converters Micro Drive FC-51



### ■ Purpose

This general-purpose variable frequency drive is designed for regulating the rotation speed of an AC electric motor with a maximum power output of 22 kW.

This unit is only suitable for general ventilation systems.

### ■ Features

The drive is designed to keep the forced ventilation away from the electronics. Printed circuit boards are well protected inside the drive.

### ■ Filter

Radio disturbance from motor cables is limited with the built-in RFI filter allowing for 15 m motor cables (screened) up to 50 m (unscreened). Meets EU norms.

### ■ Inputs and outputs

- 5 programmable digital inputs
- PNP/NPN logic
- 20-5000 Hz pulse input
- One 0-10 V or 0-20 mA analogue input
- One 0-20 mA analogue input
- Thermistor input (analogue or digital)
- 1 analogue output
- 1 relay, 240 V, 2 A
- RS 485
- MODBUS RTU

### ■ Installation

The drive is extremely compact and prepared for side-by-side mounting. A compact design allows side-by-side mounting without derating.



### Control panels

Name	Ordering No.
VLT control panel LCP 11 (without potentiometer)	132B0100
VLT control panel LCP 12 (with potentiometer)	132B0101



Name	Ordering No.
Control panel remote mounting kit	132B0102

### Frequency converter type and ordering numbers

Three-phase, 380-480 V			
Power [kW]	Current [A]	Ordering No.	Frame
0.37	1.2	132F0017	M1
0.75	2.2	132F0018	M1
1.5	3.7	132F0020	M2
2.2	5.3	132F0022	M2
3.0	7.2	132F0024	M3
4.0	9.0	132F0026	M3
5.5	12.0	132F0028	M3
7.5	15.5	132F0030	M3
11.0	23.0	132F0058	M4
15.0	31.0	132F0059	M4
18.0	37.0	132F0060	M5
22.0	43.0	132F0061	M5

### Cabinet sizes (mounting flange incl.)

mm	M1	M2	M3	M4	M5
Height	150	176	239	292	335
Width	70	75	90	125	165
Depth	148	168	194	241	248

+ 6 mm with potentiometer

## Frequency converters Basic Drive FC-101



### ■ Application

This general-purpose variable frequency drive is designed for regulating the rotation speed of an AC electric motor with a maximum power output of 90 kW.

This drive is suitable for both general ventilation and smoke extraction ventilation systems.

### ■ Certified fire mode

The fire mode prevents the drive from a self-protecting shutdown. While in this mode the drive continues to perform speed regulation duty for mission-critical fans irrespective of control signals, warnings and alarms.

### ■ Filter

A built-in throttle on the DC link ensures a low harmonic load on the power mains as per the EN 61000-3-12 standard requirements.

### ■ Inputs and outputs

- Four PNP or NPN programmable digital inputs, 0-24 V DC
- 2 analogue inputs (0-10 V or 0/4-20 mA)
- 2 analogue outputs (0/4-20 mA)
- 2 relay outputs
- MODBUS RTU (RS 485)
- BACnet MSTP
- FC Protocol
- N2 Metasys
- FLN Apogee

### ■ Installation

Thanks to an ultra-compact design the drive can be easily fitted into a larger unit or panel of an air ventilation system. The casings are rated IP20/Type 1/IP21 (optional) and IP54.

### Frequency converter type and ordering numbers

Power	Current	VLT® FC 101 Basic Drive 0.37-90 kW (3 x 380 – 480 V~, without a braking transistor)			
0.37	1.2		131L9861	-	-
0.75	2.2		131L9862	131NO177	131NO178
1.5	3.7		131L9863	131NO179	131NO180
2.2	5.3		131L9864	131NO181	131NO182
3	7.2		131L9865	131NO183	131NO184
4	9.1		131L9866	131NO185	131NO186
5.5	12		131L9867	131NO187	131NO188
7.5	15.5		131L9868	131NO189	131NO190
11	23		131L9869	131NO191	131NO192
15	31		131L9870	131NO193	131NO194
18	37		131L9871	131NO195	131NO196
22	42.5		131L9872	131NO197	131NO198
30	61	131L9873	131L9875	131NO201	131NO202
37	73	131L9881	131L9883	131NO205	131NO206
45	90	131L9889	131L9891	131NO209	131NO210
55	106	131L9897	131L9899	131NO213	131NO214
75	147	131L9905	131L9907	131NO217	131NO218
90	177	131L9913	131L9915	131NO221	131NO222
Casing		(E20) IP20/Chassis	(E20) IP20/Chassis	IP54	IP54
EMC filter		(H2) RFI class A2 (for industrial areas)	(H3/H4) RFI class A1/B (for residential areas)	(H2) RFI class A2 (for industrial areas)	(H3) RFI class A1/B (for residential areas)
Control panel		(X) without panel	(X) without panel	Integrated	Integrated

VLT® Basic frequency converters rated up to 22 kW are fitted with circuit boards with a special class 3C3 protective coating. For frequency converters rated higher than 22 kW this protective coating is optional while, the 3C2 coating is standard.

### VLT® FC 101 Basic Drive frequency converter options

Order code	Description	Order code	Description
132B0200	Operator's digital panel	132B0243	Decoupling plate for H7 standard size, large size
132B0201	Kit for remote mounting of the operator panel to an IP55 cabinet, including 3 m cable	132B0209	Decoupling plate for H8 standard size
132B0202	Decoupling plate for H1 and H2 standard sizes	132B0244	External EMC filter class A1/B1 for power output from 0.37 to 2.2 kW
132B0204	Decoupling plate for H3 standard size	132B0245	External EMC filter class A1/B1 for power output from 3 to 7.5 kW
132B0205	Decoupling plate for H4 and H5 standard sizes	132B0246	External EMC filter class A1/B1 for power output from 11 to 15 kW
132B0207	Decoupling plate for H6 standard size	132B0247	External EMC filter class A1/B1 for power output from 18.5 to 22 kW
132B0242	Decoupling plate for H6 standard size, large size		
132B0208	Decoupling plate for H7 standard size		

## ventilation systems

[www.ventilation-system.com](http://www.ventilation-system.com)

SMOKE EXTRACTION AND VENTILATION



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02-2020

