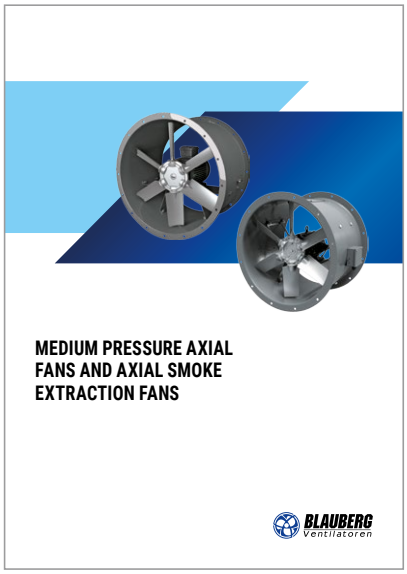


CENTRIFUGAL SMOKE EXTRACTION FANS

BLAUBERG Ventilatoren

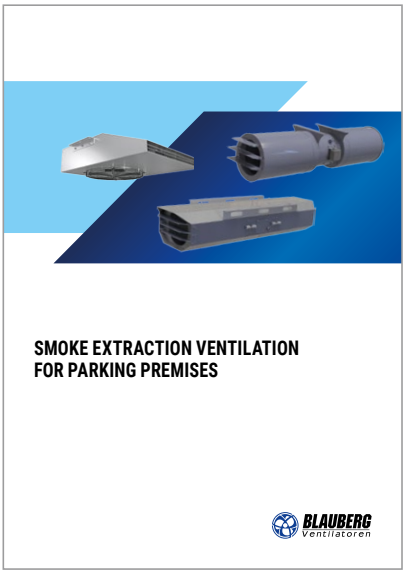
SMOKE EXTRACTION PRODUCT CATALOGS



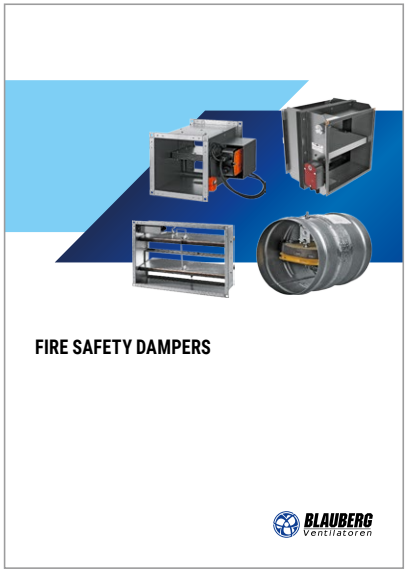
MEDIUM PRESSURE AXIAL FANS AND AXIAL SMOKE EXTRACTION FANS



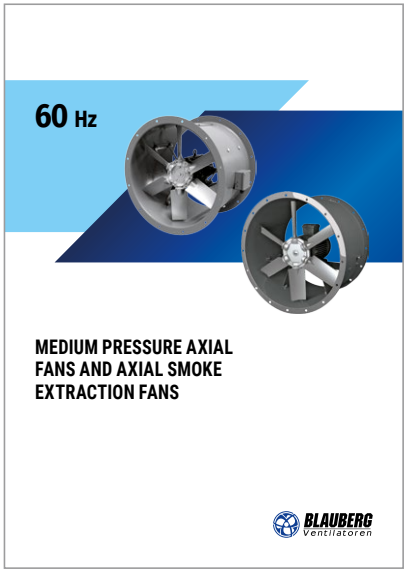
CENTRIFUGAL SMOKE EXTRACTION FANS



SMOKE EXTRACTION VENTILATION FOR PARKING PREMISES



FIRE SAFETY DAMPERS



MEDIUM PRESSURE AXIAL FANS AND AXIAL SMOKE EXTRACTION FANS



SMOKE EXTRACTION VENTILATION FOR PARKING PREMISES

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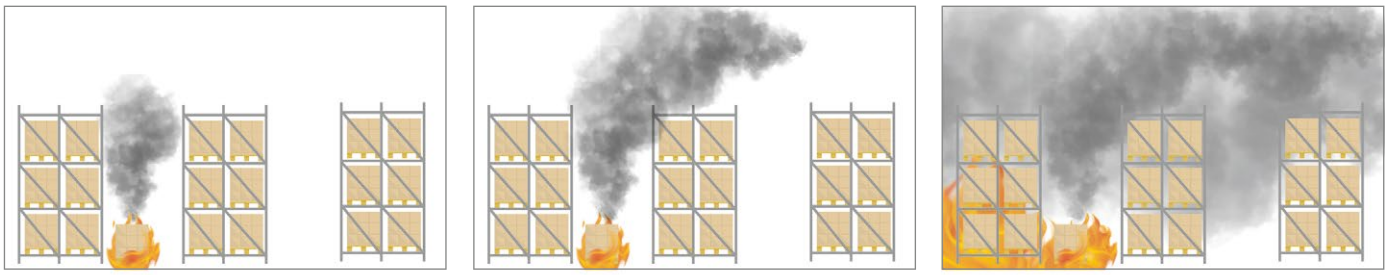
Smoke extraction systems of buildings

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.

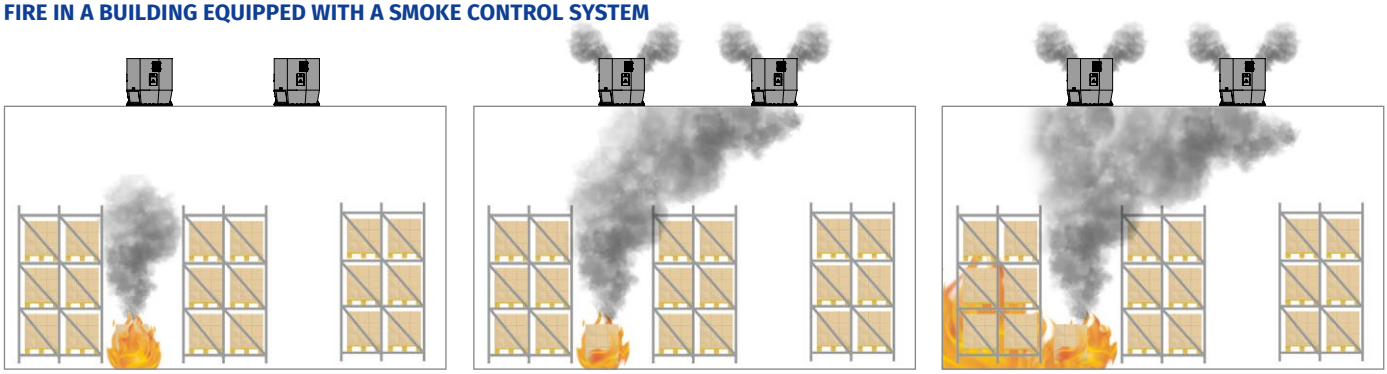
The smoke control system of a building or structure must ensure protection of people along the evacuation paths from the fire hazards during the time required for the personnel evacuation procedure or the entire period of fire development and control by means of extracting the combustion and thermal 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 % of 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.

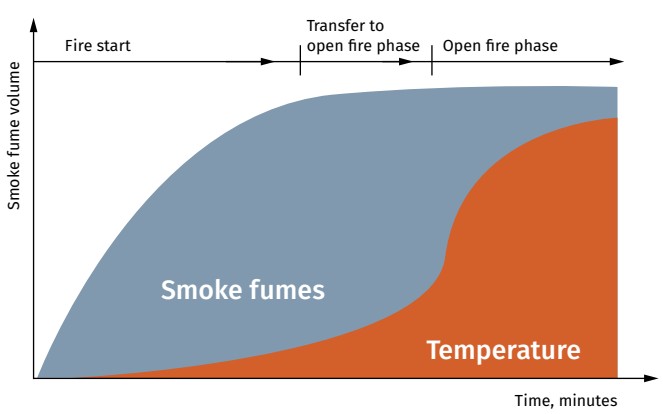
FIRE IN A BUILDING WITHOUT A SMOKE CONTROL SYSTEM



FIRE IN A BUILDING EQUIPPED WITH A SMOKE CONTROL SYSTEM

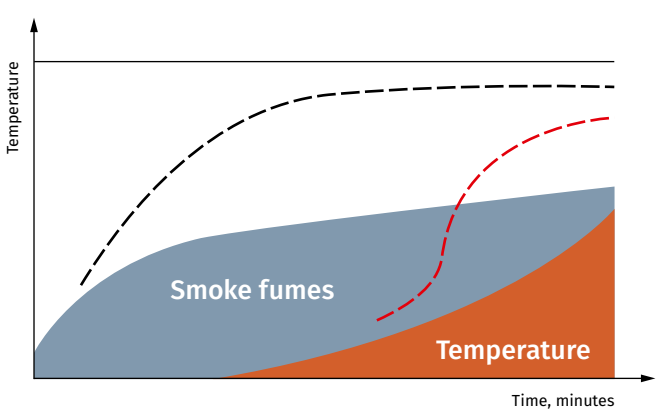


A



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

B



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.

DESIGN:

- 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:

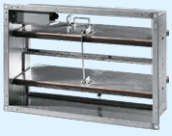
- **Smoke extraction fans** which are used in emergency exhaust ventilation systems for forced extraction of smoke and heated gases and simultaneous transfer of heat generated by the fire away and beyond the limits of the serviced spaces where the ignition occurs. Such units are used in production, public, 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.



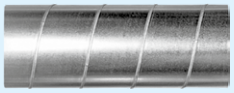
- **Smoke dampers** installed on the protected premises accept smoke fumes and direct them into smoke shafts. Such devices are equipped with electric magnet or electric actuators. The dampers are rated according to the fire-resistance limit which can vary up to 180 minutes at the smoke temperature of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



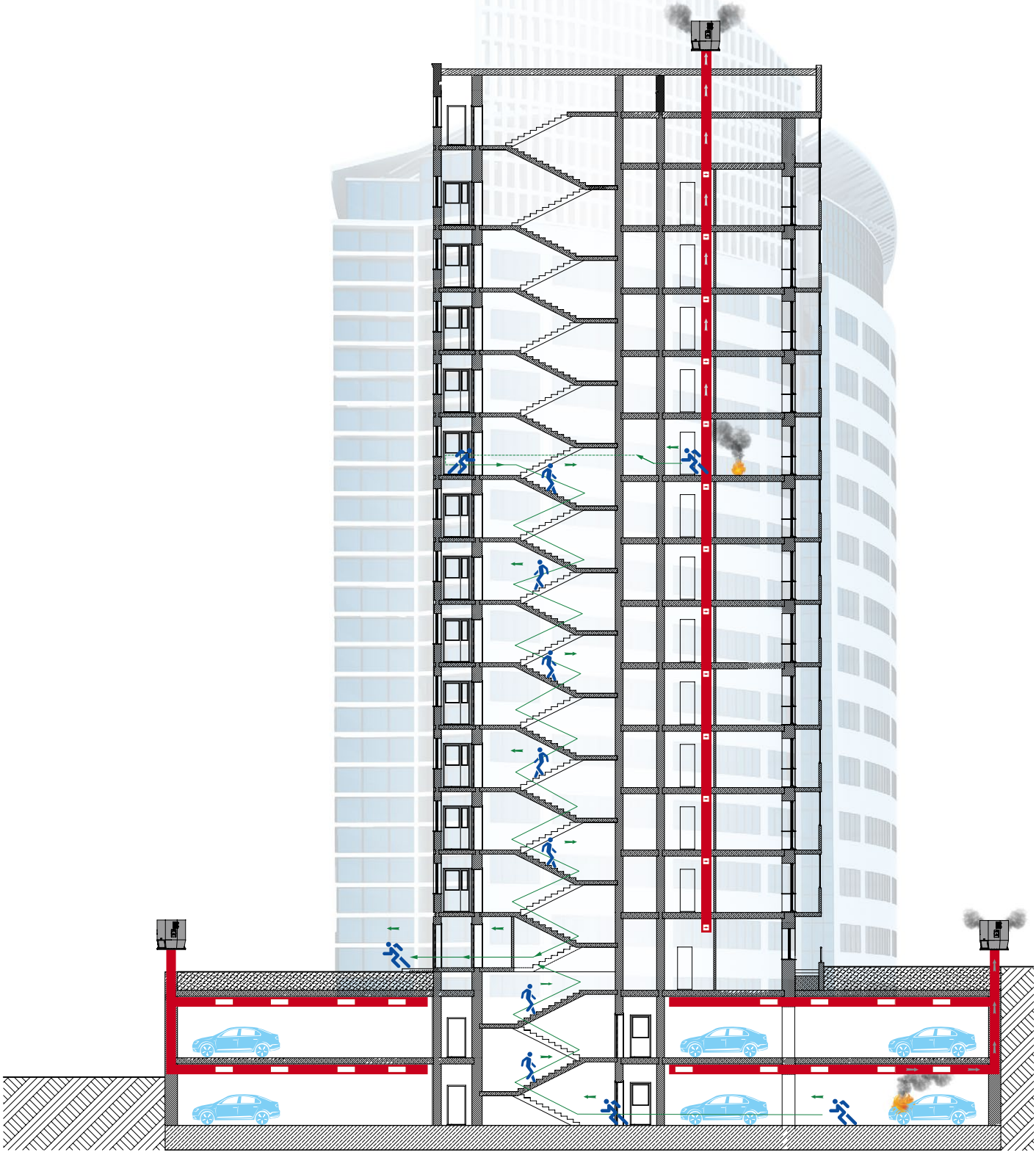
- **Fire-resisting dampers** are installed in exhaust ventilation and general ventilation systems to prevent the spread of fire hazards (fire and smoke fumes). Such units are equipped with an electric actuator or a thermal lock.




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

Smoke control system: smoke extraction is handled by the **Tower-SV-K2** fan via the open **RSKM** (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.



Pressurisation fan Axis-P*



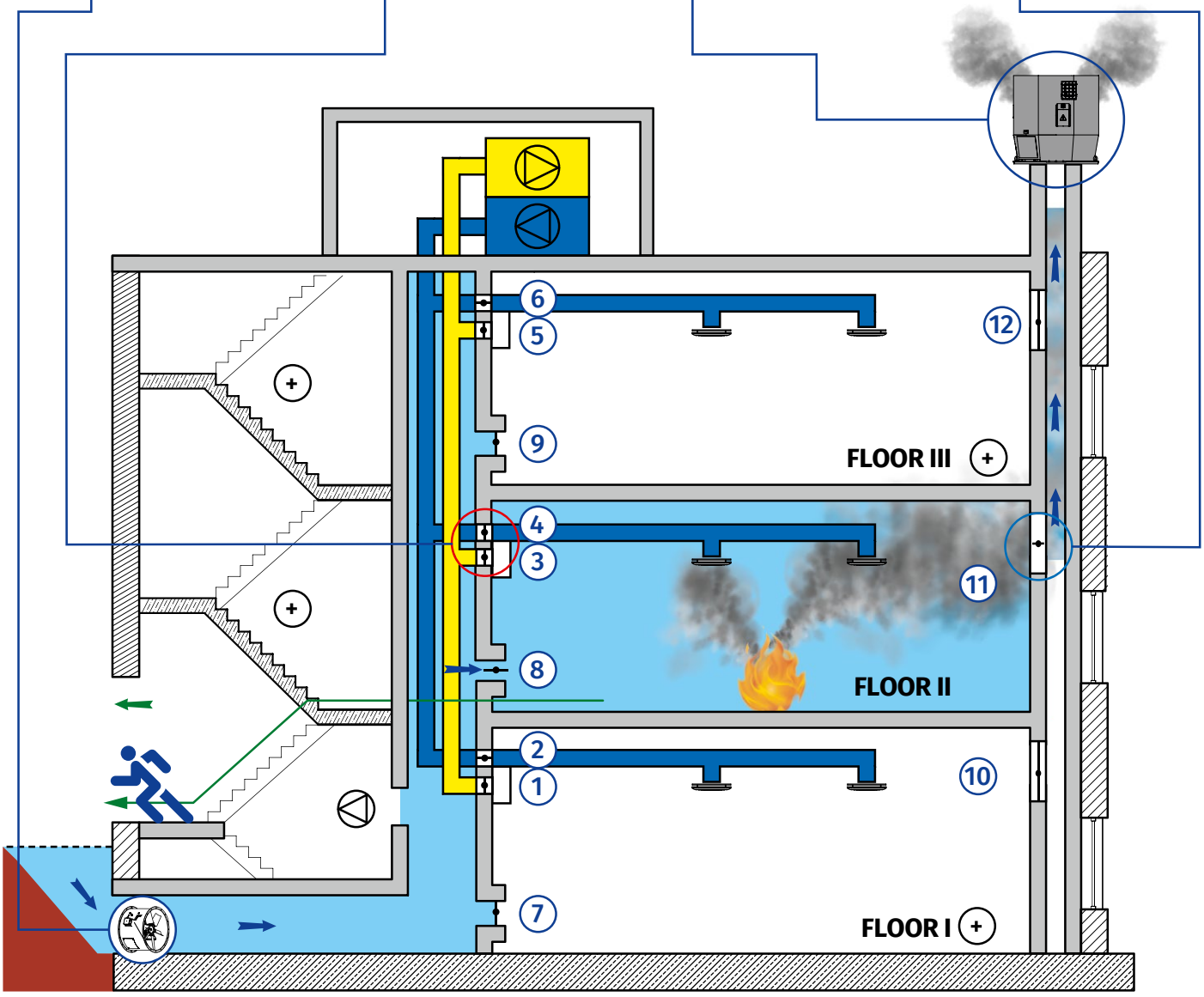
Fire-resisting damper BSK**



Smoke extraction fan Tower-SV-K2



Smoke damper RSKM**



*Detailed information on fans is provided in the “Medium pressure axial fans and axial smoke extraction fans” catalogue.
**Detailed information on dampers is provided in the “Fire safety dampers” catalogue.

Tower-SV-K2

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



Use

- Smoke extraction 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.

Air flow:
up to 105 000 m³/h

Transported air temperature:
600 °C/2 hours

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 aerodynamic characteristics of the fans for mains operation are given below.
- The fan can be used for general exhaust ventilation.
- The fan can be designed for temperate (U), cold (HL), tropical (T) or maritime moderately cold (M) climate conditions.

Design

- The fans are made of heat resistant steel with polymer coating providing weathering resistance.
- Equipped with a protective grille against accidental touches and ingress of foreign objects.
- The impeller with backward curved blades are painted with powder coating.
- Can be additionally equipped with a service switch.

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 IP55.

Installation

- The fans can be installed directly on the roof or on the SM-AF mounting curb.
- Make sure that the location provides for sufficient space as required for the fan maintenance.

Designation key

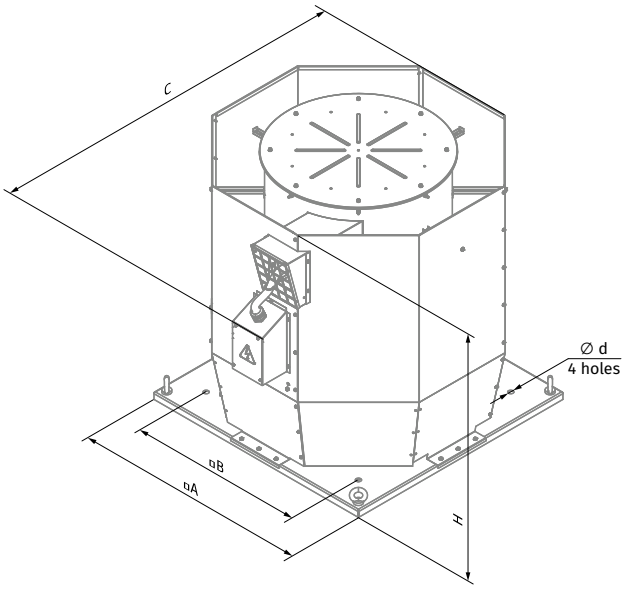
Model		Impeller size [mm]		Number of motor poles	Motor phase and operation modes		Motor power [kW]		Options		Climatic modification		Fire resistance		Frequency [Hz]		Casing material and paint color
Tower-SV-K2: roof-mounted centrifugal smoke extraction fan with vertical air discharge in an octagonal casing		**315; 355; 400; 450; 500; 560; 630; 710; 800; 900; 1000; 1120; 1250**	–	**2; 4; 6; 8**	**E:** single-phase across-the-line motor **EP:** single-phase motor with variable frequency start **D:** three-phase motor **DP:** three-phase motor with variable frequency start	/	**0.12; 0.25; 0.37; 0.55; 0.75; 1.1; 1.5; 2.2; 3; 4; 5.5; 7.5; 11; 15; 18.5; 22; 30; 37; 45**	–	**K:** with a terminal box **S1:** built-in external switch	–	**U1:** temperate climate **HL1:** cold climate **T1:** tropical climate **M1:** maritime moderately cold climate	–	**600/2:** 600°C/2 hours	–	**_:** 50 Hz **60Hz:** 60 Hz	–	**_:** RAL7040 gray by default **RALxxxx:** paint colour according to RALxxxx **Zn:** galvanized steel **ST:** stainless steel (mandatory material for cold climate – HL1)

Accessories

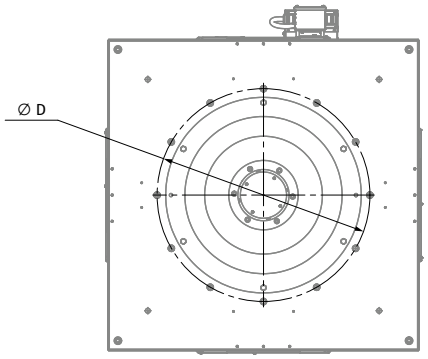
Mounting curb	Frequency converter	Safety switches	Protective hood
			
SM-AF	Basic Drive FC-101	AS	SH

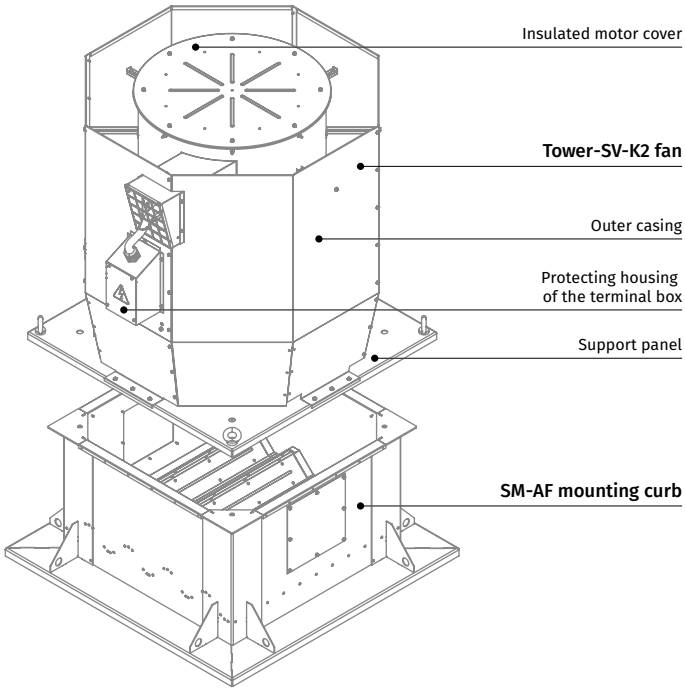
Dimensions [mm]

Model	H	A	B	C	Ø D	Ø d	Weight [kg]
Tower-SV-K2 315-2D/1.1-K	779	680	480	820	355		80
Tower-SV-K2 355-4D/0.25-K	744	680	480	820	395		73
Tower-SV-K2 355-2D/2.2-K	801						89
Tower-SV-K2 400-6D/0.25-K	772	760	580	866	450		82
Tower-SV-K2 400-4D/0.55-K							83
Tower-SV-K2 400-2D/4-K	897			880			112
Tower-SV-K2 450-6D/0.25-K	794	760	580	864	500		92
Tower-SV-K2 450-4D/1.1-K							96
Tower-SV-K2 450-2D/7.5-K	929	810		933			137
Tower-SV-K2 500-8D/0.25-K	888	830	640	950	560		121
Tower-SV-K2 500-6D/0.55-K							122
Tower-SV-K2 500-4D/1.5-K							128
Tower-SV-K2 560-8D/0.37-K	921	1000	750	1082	620		148
Tower-SV-K2 560-6D/0.75-K							151
Tower-SV-K2 560-4D/3-K	991			1094			163
Tower-SV-K2 630-8D/0.75-K	1060	1010	750	1121	690		200
Tower-SV-K2 630-6D/1.5-K							202
Tower-SV-K2 630-4D/5.5-K						16	225
Tower-SV-K2 710-8D/1.1-K	1105	1180	980	1257	770		231
Tower-SV-K2 710-6D/2.2-K							238
Tower-SV-K2 710-4D/11-K	1264			1267			342
Tower-SV-K2 800-8D/2.2-K	1237	1180	980	1311	860		308
Tower-SV-K2 800-6D/4-K							311
Tower-SV-K2 800-4D/15-K	1387						385
Tower-SV-K2 900-8D/4-K	1448	1340	1050	1494	970		435
Tower-SV-K2 900-6D/7.5-K							434
Tower-SV-K2 900-4D/30-K	1600			1524			597
Tower-SV-K2 1000-8D/7.5-K	1595	1550	1340	1686	1070		557
Tower-SV-K2 1000-6D/15-K	1680						608
Tower-SV-K2 1120-8D/11-K	1753	1640	1340	1876	1190		775
Tower-SV-K2 1120-8D/15-K	1866						911
Tower-SV-K2 1120-6D/22-K	1789						856
Tower-SV-K2 1120-6D/30-K	1956						962
Tower-SV-K2 1250-8D/22-K	1956	1745	1500	2000	1320		940
Tower-SV-K2 1250-6D/45-K	2184						1400



Bottom view

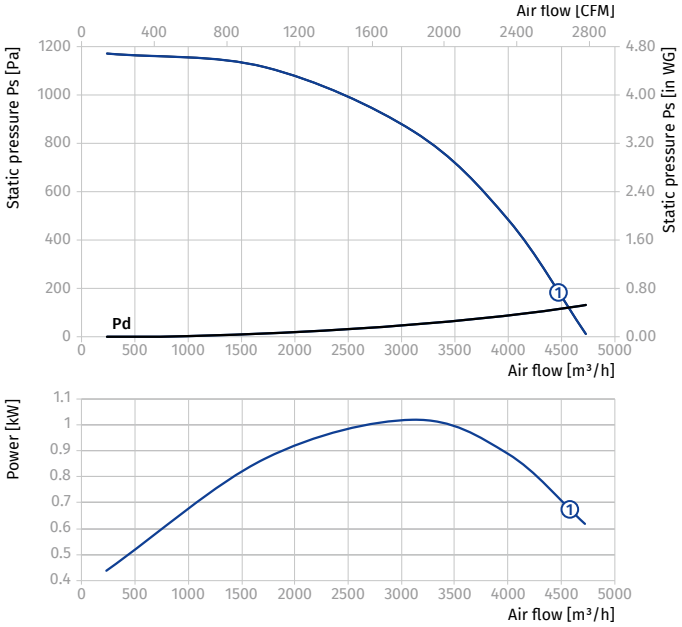




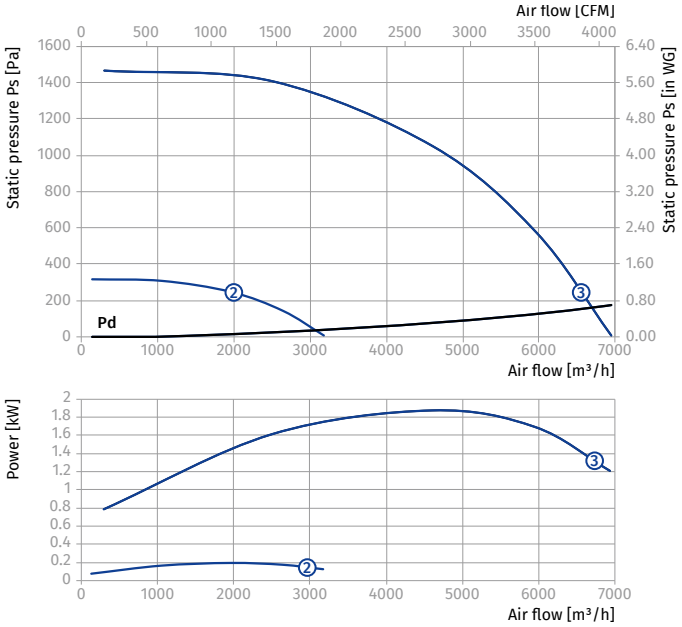
Technical data

Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	Curve number
315	2	3~400	Tower-SV-K2 315-2D/1.1-K	1.1	2880	①
355	4	3~400	Tower-SV-K2 355-4D/0.25-K	0.25	1335	②
	2	3~400	Tower-SV-K2 355-2D/2.2-K	2.2	2900	③
400	6	3~400	Tower-SV-K2 400-6D/0.25-K	0.25	860	④
	4	3~400	Tower-SV-K2 400-4D/0.55-K	0.55	1345	⑤
	2	3~400	Tower-SV-K2 400-2D/4-K	4	2840	⑥
450	6	3~400	Tower-SV-K2 450-6D/0.25-K	0.25	860	⑦
	4	3~400	Tower-SV-K2 450-4D/1.1-K	1.1	1400	⑧
	2	3~400	Tower-SV-K2 450-2D/7.5-K	7.5	2948	⑨

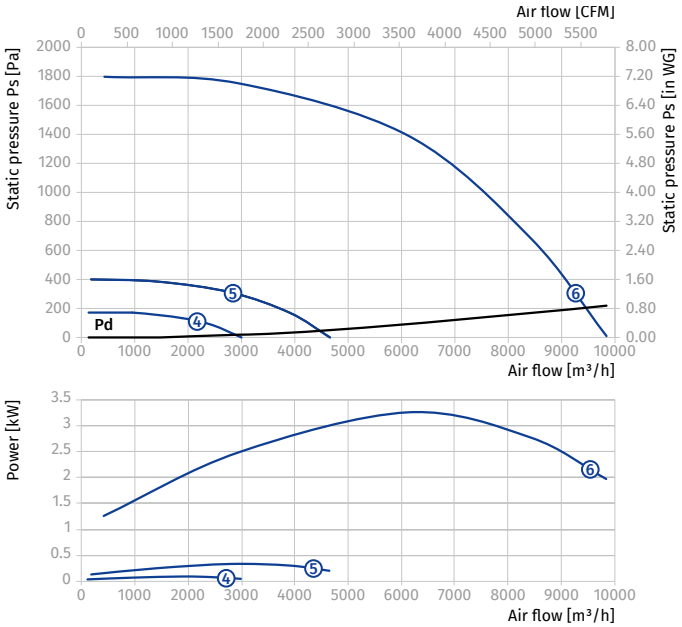
STANDARD SIZE: 315



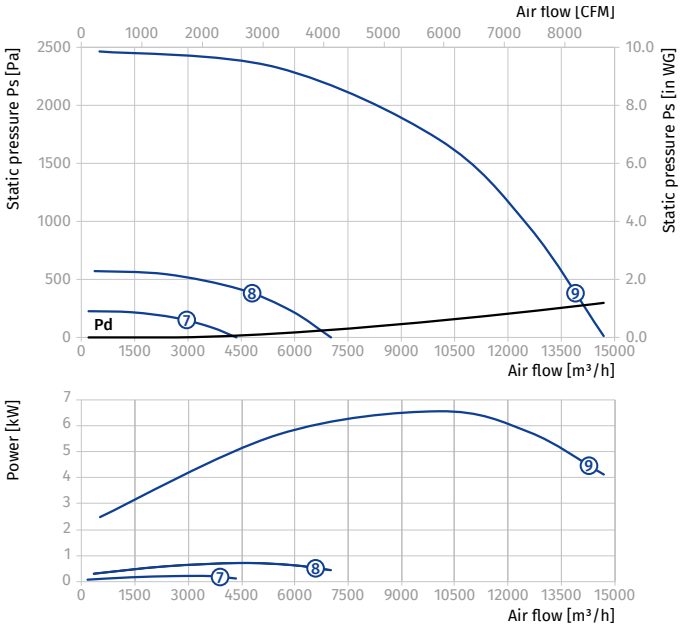
STANDARD SIZE: 355



STANDARD SIZE: 400

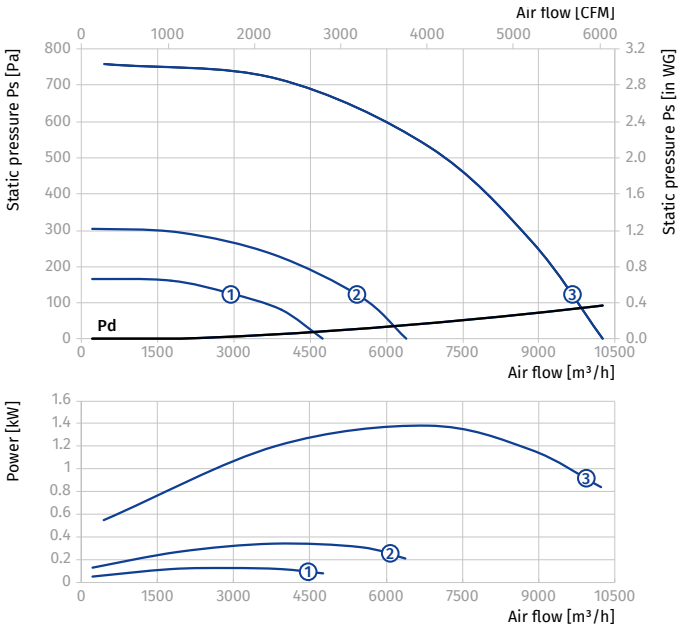


STANDARD SIZE: 450

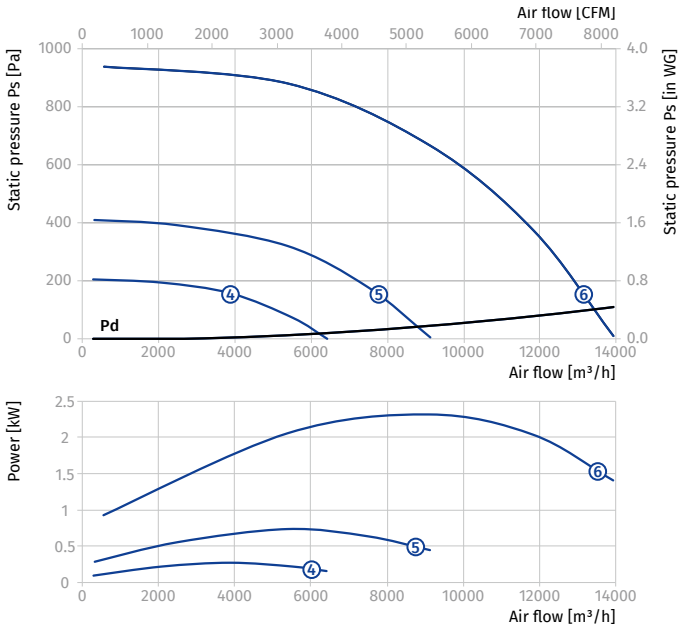


Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	Curve number
500	8	3~400	Tower-SV-K2 500-8D/0.25-K	0.25	670	①
	6	3~400	Tower-SV-K2 500-6D/0.55-K	0.55	900	②
	4	3~400	Tower-SV-K2 500-4D/1.5-K	1.5	1430	③
560	8	3~400	Tower-SV-K2 560-8D/0.37-K	0.37	665	④
	6	3~400	Tower-SV-K2 560-6D/0.75-K	0.75	940	⑤
	4	3~400	Tower-SV-K2 560-4D/3-K	3	1435	⑥
630	8	3~400	Tower-SV-K2 630-8D/0.75-K	0.75	670	⑦
	6	3~400	Tower-SV-K2 630-6D/1.5-K	1.5	940	⑧
	4	3~400	Tower-SV-K2 630-4D/5.5-K	5.5	1400	⑨
710	8	3~400	Tower-SV-K2 710-8D/1.1-K	1.1	660	⑩
	6	3~400	Tower-SV-K2 710-6D/2.2-K	2.2	945	⑪
	4	3~400	Tower-SV-K2 710-4D/11-K	11	1460	⑫

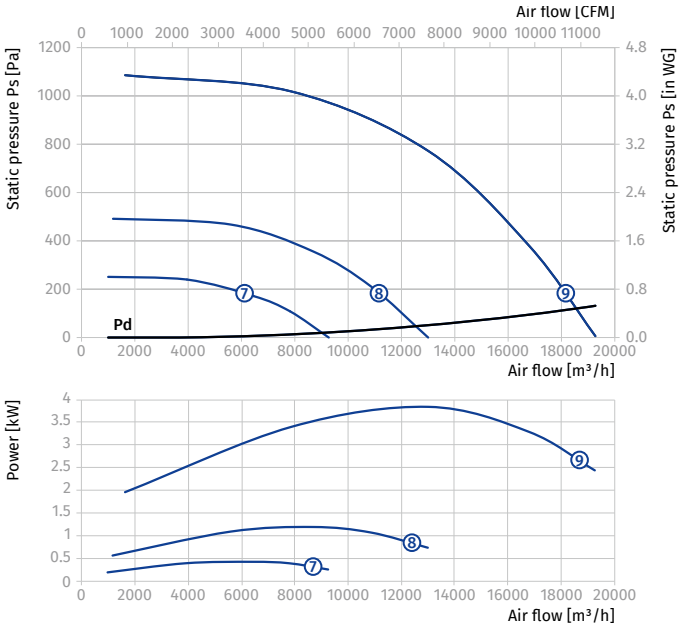
STANDARD SIZE: 500



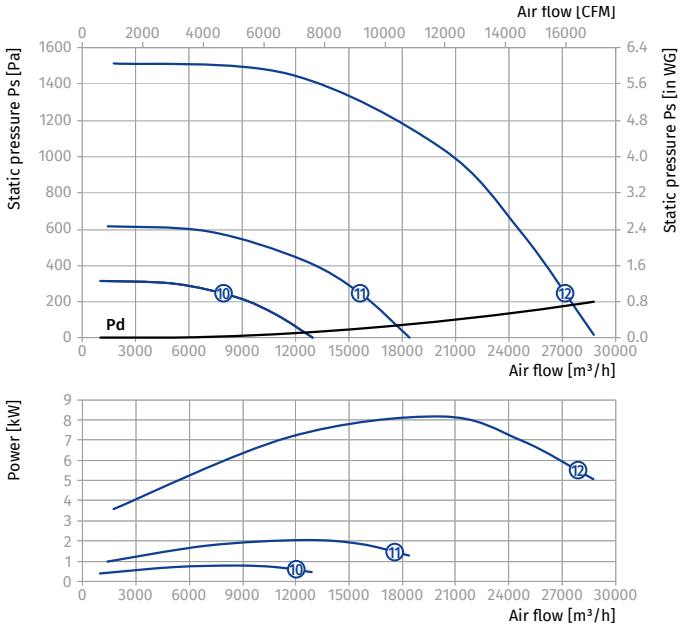
STANDARD SIZE: 560



STANDARD SIZE: 630

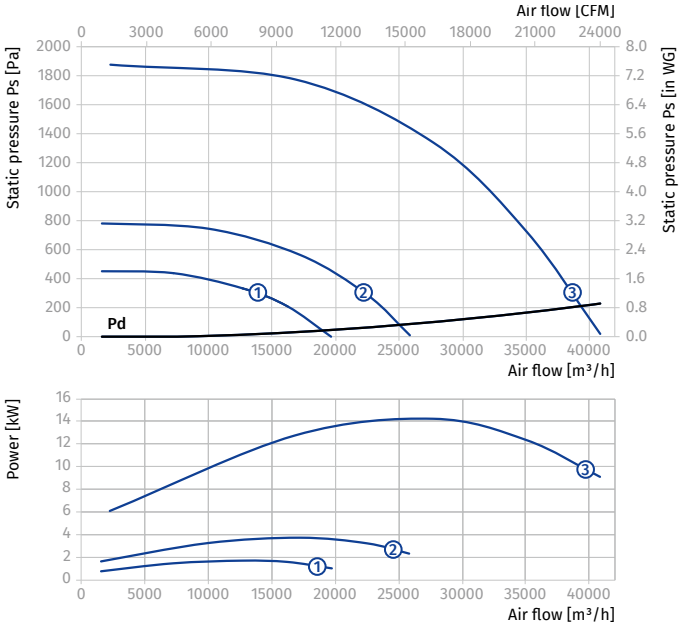


STANDARD SIZE: 710

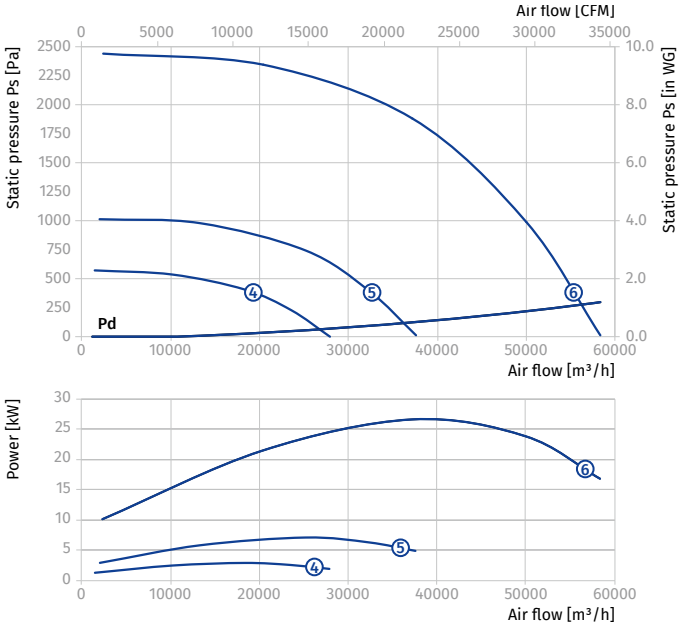


Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	Curve number
800	8	3~400	Tower-SV-K2 800-8D/2.2-K	2.2	700	①
	6	3~400	Tower-SV-K2 800-6D/4-K	4	965	②
	4	3~400	Tower-SV-K2 800-4D/15-K	15	1460	③
900	8	3~400	Tower-SV-K2 900-8D/4-K	4	700	④
	6	3~400	Tower-SV-K2 900-6D/7.5-K	7.5	970	⑤
	4	3~400	Tower-SV-K2 900-4D/30-K	30	1470	⑥
1000	8	3~400	Tower-SV-K2 1000-8D/7.5-K	7.5	705	⑦
	6	3~400	Tower-SV-K2 1000-6D/15-K	15	975	⑧
1120	8	3~400	Tower-SV-K2 1120-8D/11-K	11	720	⑨
	8	3~400	Tower-SV-K2 1120-8D/15-K	15	730	⑩
	6	3~400	Tower-SV-K2 1120-6D/22-K	22	975	⑪
	6	3~400	Tower-SV-K2 1120-6D/30-K	30	980	⑫

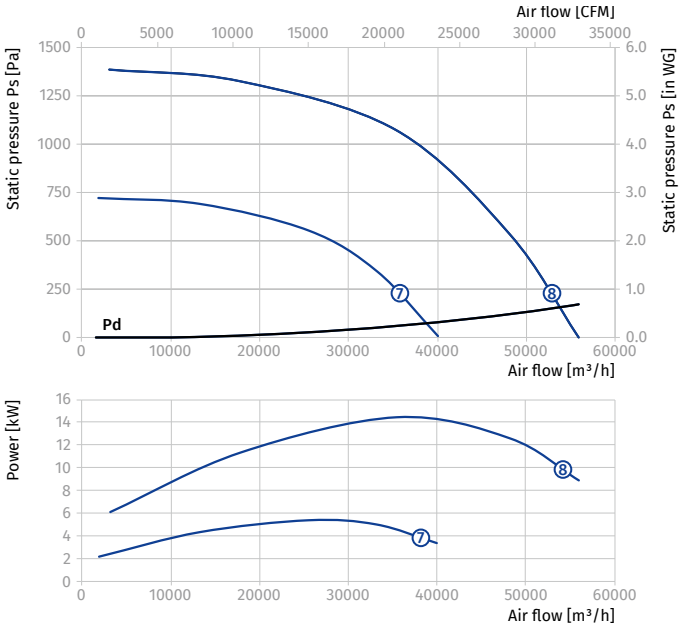
STANDARD SIZE: 800



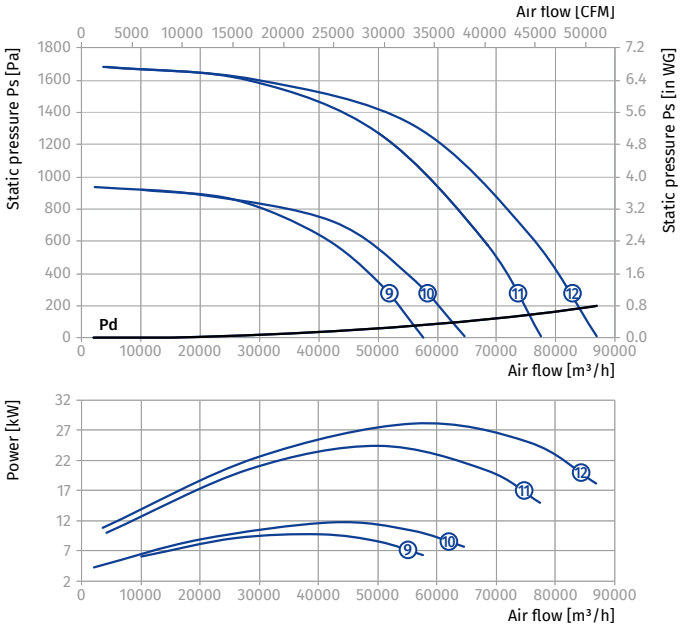
STANDARD SIZE: 900



STANDARD SIZE: 1000

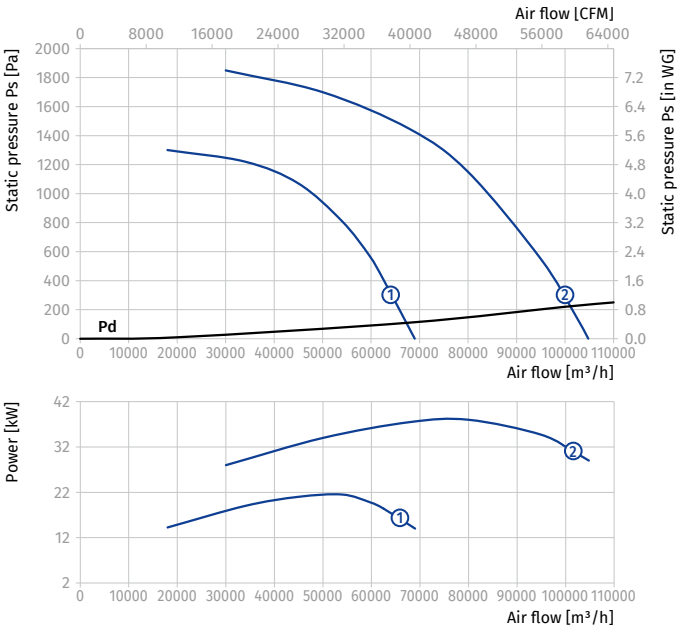


STANDARD SIZE: 1120



Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	Curve number
1250	8	3~400	Tower-SV-K2 1250-8D/22-K	22	750	①
	6	3~400	Tower-SV-K2 1250-6D/45-K	45	1000	②

STANDARD SIZE: 1250



Box-S

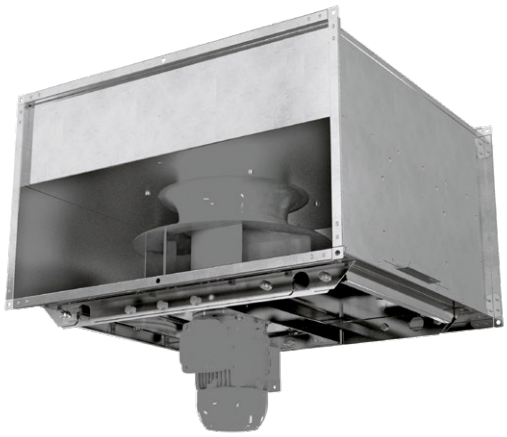
Duct smoke extraction fan

Use

- The dual-purpose fan is used in emergency exhaust ventilation systems for forced removal of smoke, heated gases and combustion products, as well as for general exhaust ventilation of shopping centres, garages, warehouses, kitchens.

Air flow:
up to 28 500 m³/h

Transported air temperature:
+100 °C for long-term operation;
+400 °C for operation
up to 120 minutes



Operation

- The fan is designed to remove smoke and air mixtures up to +400 °C for 120 minutes and for continuous operation at a temperature of the transported medium up to +100 °C.
- The fans can be equipped with a frequency converter for controlling the rotation frequency.

Design

- The fan casing is made of galvanized steel.
- The impeller with backward curved blades made of heat-resisting steel.

Motor

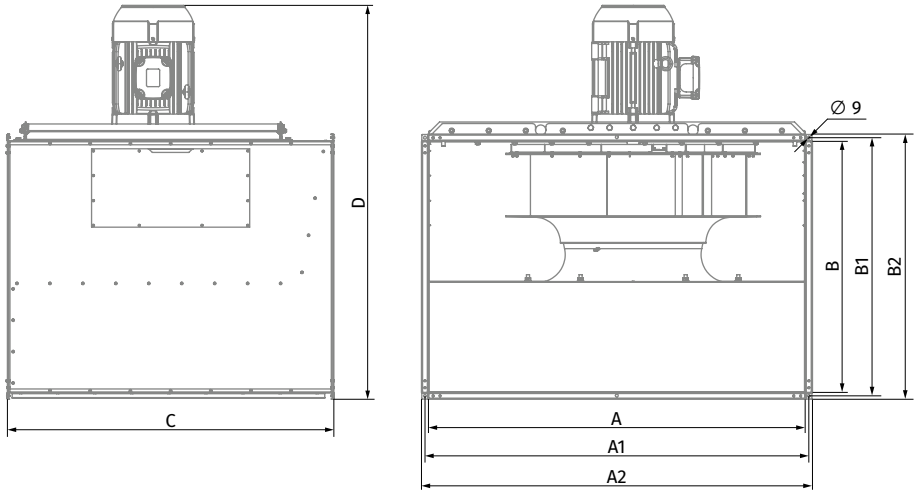
- The fans can be equipped with a single- or three-phase electric motor with power from 0.37 to 7.5 kW, degree of protection IP55 and designed for connection to 230/400 V, 50 Hz power mains.
- Single-speed fans are equipped with 2 or 4 pole motors.
- Two-speed fans are equipped with 2/4, 4/6, 4/8 pole motors.
- The electric motor is installed outside the air flow.

Designation key

Model		Impeller standard size [cm]		Pole number	Number of phases		Motor power [kW]		Spigot dimension [cm]
Box-S: rectangular duct fan for smoke removal	–	**25; 28; 31; 35; 40; 45; 50; 56; 63; 71**		**2:** single-speed fan **4:** single-speed fan **2/4:** two-speed fan **4/6:** two-speed fan	**E:** single-phase **D:** three-phase	/	**x:** single-speed **x/x:** two-speed	–	**50x30; 60x30; 60x35; 70x40; 70x50; 80x60; 90x70; 100x80; 120x90**

Dimensions [mm]

Model	A	A1	A2	B	B1	B2	C	D	Weight [kg]
Box-S 25	500	520	540	300	320	340	680	557	40
Box-S 28	600	620	640	300	320	340	680	558	40
Box-S 31	600	620	640	350	370	390	680	624	56
Box-S 35	700	720	740	400	420	440	680	657	51
Box-S 40	700	720	740	500	520	540	680	772	70
Box-S 45	800	820	840	600	620	640	800	872	89
Box-S 50	800	820	840	600	620	640	840	914	97
Box-S 56	900	920	940	700	720	740	840	1058	100
Box-S 63	1000	1020	1040	800	820	840	1040	1150	130
Box-S 71	1200	1220	1245	900	920	945	1040	1354	178



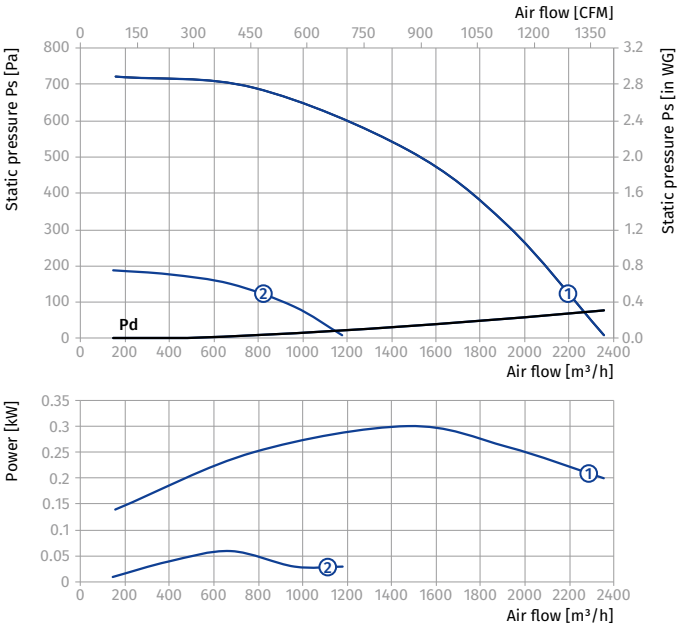
Accessories

Backdraft damper	Flexible joint	Protective mesh	Mounting frame	Frequency converter	Safety switches
					
VRV-BF	**EVAF-BF**	**SZ-BF**	**MF-Box-S**	**Basic Drive FC-101**	**AS**

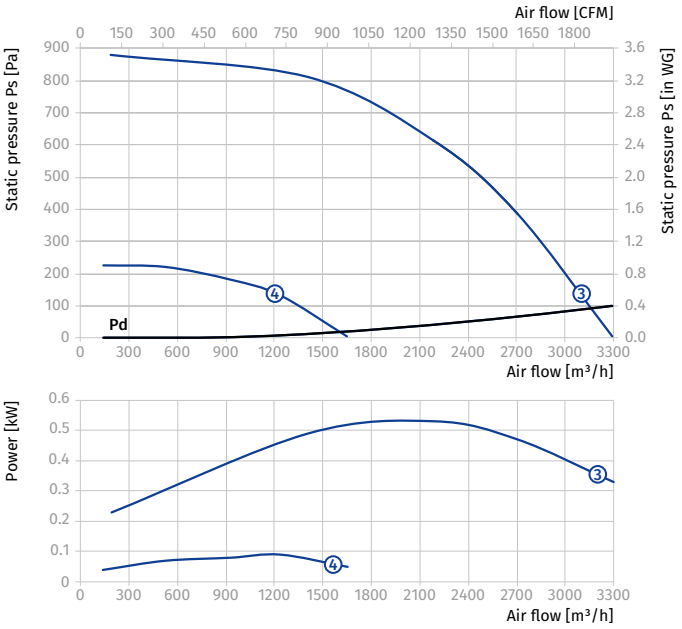
Technical data

Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	High speed chart number	Low speed chart number
250	2	1~230	Box-S 25-2E/0.37-50x30	0.37	2880	①	–
	2	3~400	Box-S 25-2D/0.37-50x30	0.37	2880	①	–
	2/4	3~400	Box-S 25-2/4D/0.37/0.1-50x30	0.37/0.1	2880/1440	①	②
280	2	1~230	Box-S 28-2E/0.55-60x30	0.55	2880	③	–
	2	3~400	Box-S 28-2D/0.55-60x30	0.55	2880	③	–
	2/4	3~400	Box-S 28-2/4D/0.55/0.11-60x30	0.55/0.11	2880/1440	③	④
315	2	1~230	Box-S 31-2E/1.1-60x35	1.1	2880	⑤	–
	2	3~400	Box-S 31-2D/1.1-60x35	1.1	2880	⑤	–
	2/4	3~400	Box-S 31-2/4D/1.1/0.25-60x35	1.1/0.25	2880/1440	⑤	⑥
355	4	1~230	Box-S 35-4E/0.37-70x40	0.37	1420	⑦	–
	4	3~400	Box-S 35-4D/0.37-70x40	0.37	1420	⑦	–
	4/6	3~400	Box-S 35-4/6D/0.37/0.11-70x40	0.37/0.11	1420/905	⑦	⑧

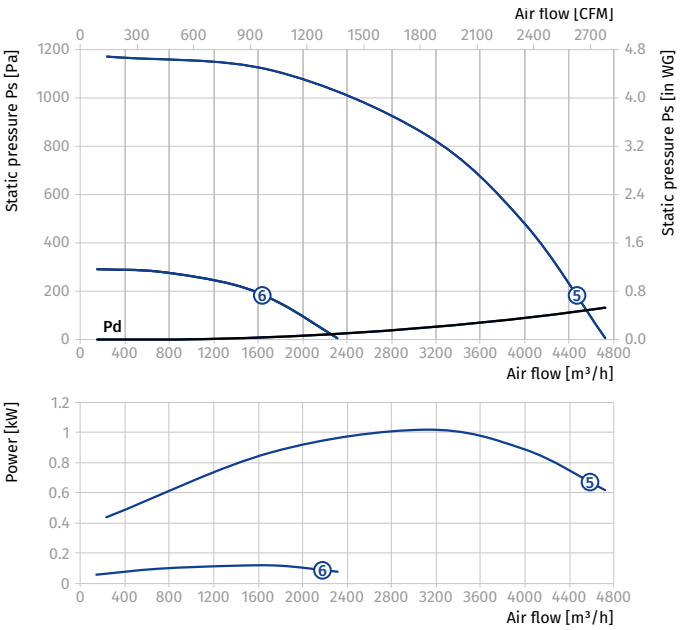
STANDARD SIZE: 250



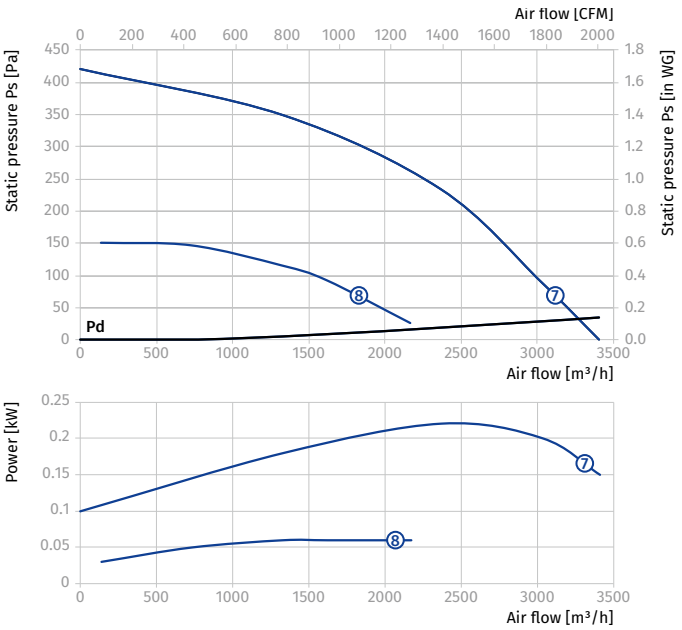
STANDARD SIZE: 280



STANDARD SIZE: 315

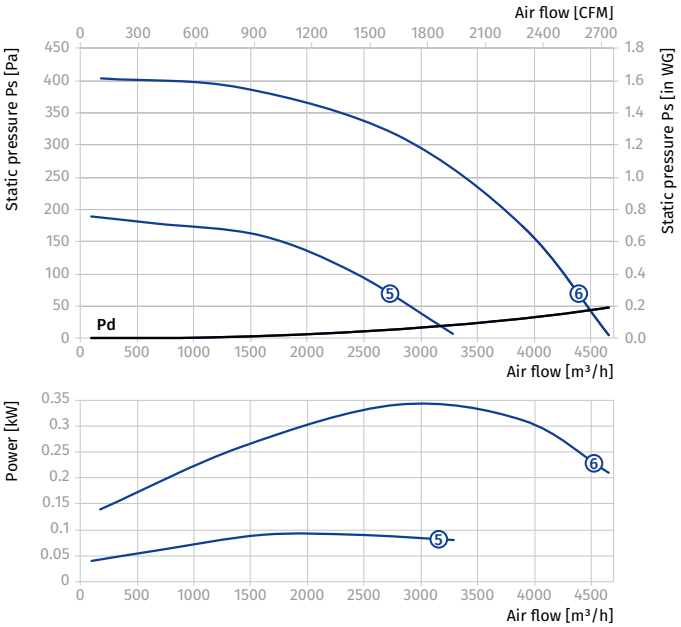


STANDARD SIZE: 355

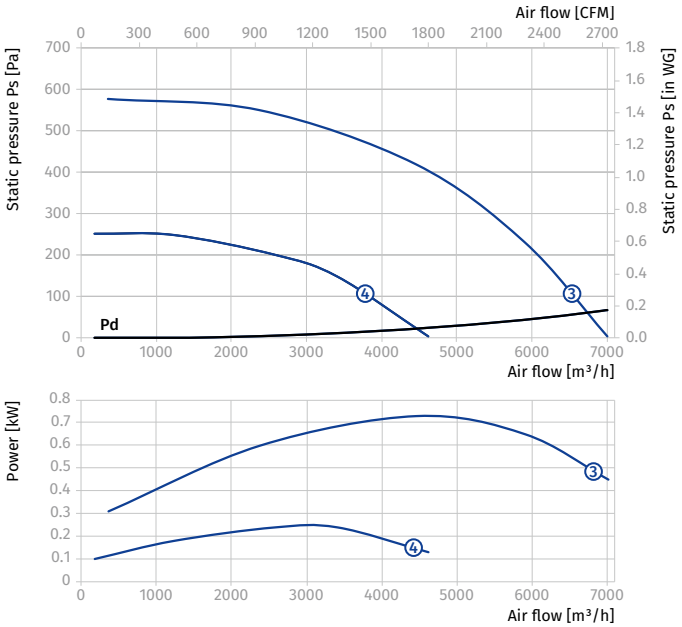


Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	High speed chart number	Low speed chart number
400	4	1~230	Box-S 40-4E/0.55-70x50	0.55	1420	①	–
	4	3~400	Box-S 40-4D/0.55-70x50	0.55	1420	①	–
	4/6	3~400	Box-S 40-4/6D/0.55/0.2-70x50	0.55/0.2	1420/905	①	②
450	4	1~230	Box-S 45-4E/0.75-80x60	0.75	1435	③	–
	4	3~400	Box-S 45-4D/0.75-80x60	0.75	1435	③	–
	4/6	3~400	Box-S 45-4/6D/0.75/0.25-80x60	0.75/0.25	1435/905	③	④
500	4	1~230	Box-S 50-4E/1.5-80x60	1.5	1430	⑤	–
	4	3~400	Box-S 50-4D/1.5-80x60	1.5	1430	⑤	–
	4/6	3~400	Box-S 50-4/6D/1.5/0.37-80x60	1.5/0.37	1430/920	⑤	⑥
560	4	1~230	Box-S 56-4E/3-90x70	3	1435	⑦	–
	4	3~400	Box-S 56-4D/3-90x70	3	1435	⑦	–
	4/6	3~400	Box-S 56-4/6D/3.0/1.0-90x70	3.0/1.0	1435/950	⑦	⑧
	4/8	3~400	Box-S 56-4/8D/2.8/0.7-90x70	2.8/0.7	1435/710	⑦	⑨

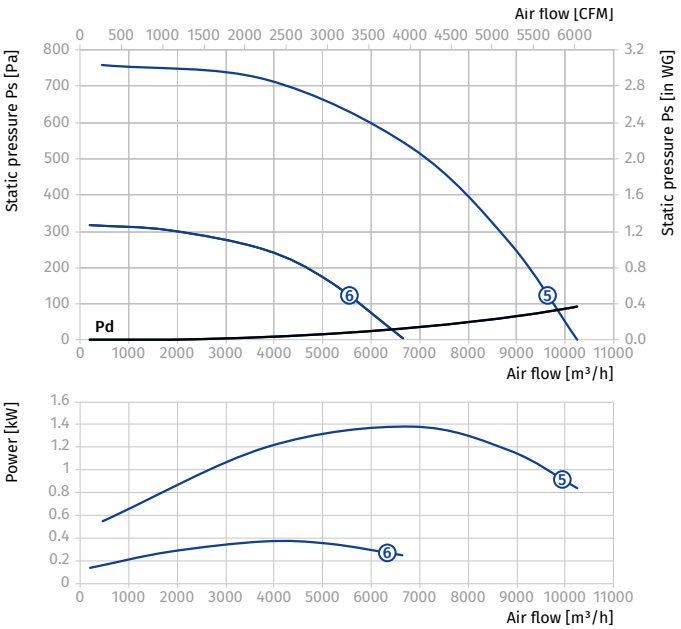
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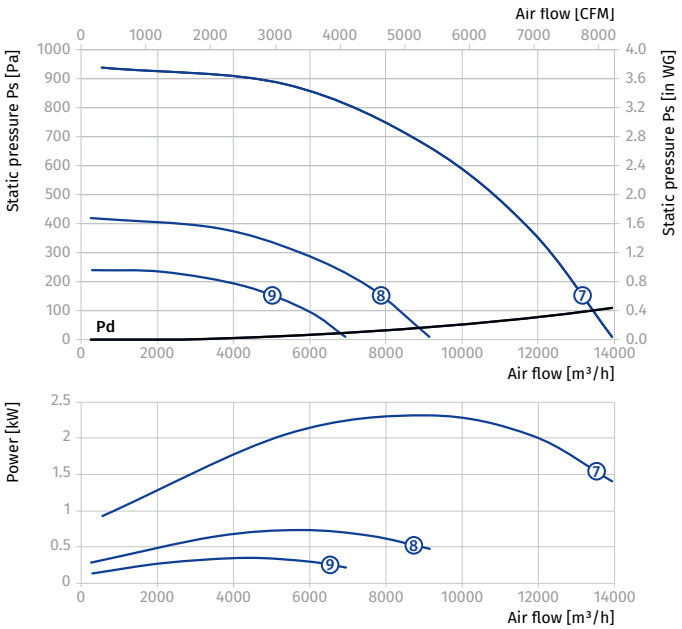
STANDARD SIZE: 450



STANDARD SIZE: 500

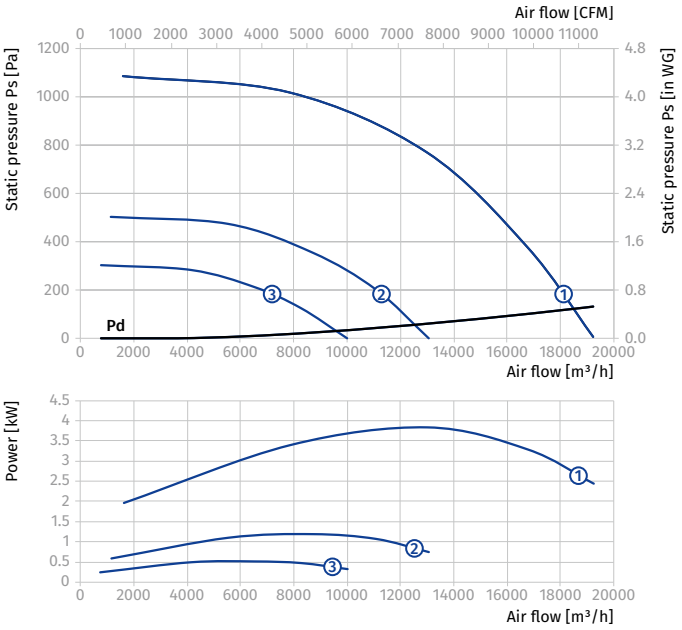


STANDARD SIZE: 560

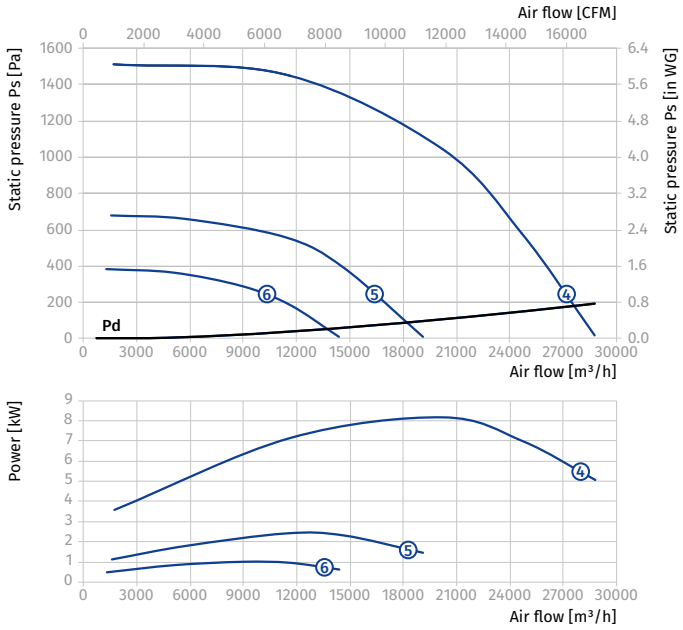


Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	High speed chart number	Low speed chart number
630	4	3~400	Box-S 63-4D/4-100x80	4	1445	①	–
	4/6	3~400	Box-S 63-4/6D/4.5/1.5-100x80	4.5/1.5	1445/950	①	②
	4/8	3~400	Box-S 63-4/8D/3.8/1.0-100x80	3.8/1.0	1445/720	①	③
710	4	3~400	Box-S 71-4D/7.5-120x90	7.5	1455	④	–
	4/6	3~400	Box-S 71-4/6D/7.5/3.5-120x90	7.5/3.5	1455/960	④	⑤
	4/8	3~400	Box-S 71-4/8D/7.2/1.8-120x90	7.2/1.8	1455/720	④	⑥

STANDARD SIZE: 630



STANDARD SIZE: 710



Iso-VS

Sound-insulated smoke extraction fan



Application

- The sound-insulated dual-purpose smoke extraction fan is used in emergency exhaust ventilation systems for forced extraction of smoke, heated gases and combustion products.
- May be used in general exhaust ventilation systems in shopping centers, offices, garages, warehouses and kitchens.

Air flow:
up to 28 500 m³/h

Transported air temperature:
+120 °C for long-term operation;
+400 °C for operation
up to 120 minutes

Operation

- The fan is designed to extract smoke and air mixtures heated up to +400 °C for up to 120 minutes, and long-term operation with transported air temperature of up to +120 °C.
- The fan can be equipped with a frequency converter for speed control.
- The fan can be manufactured for temperate (**U**), cold (**HL**), tropical (**T**) or marine moderately cold (**M**) climates of the first placement category.

Electric motor

- The fan is equipped with a single-phase (up to 1.1 kW) or three-phase electric motor designed for 230/400 V voltage.
- The electric motor is installed outside the air flow on an additional panel inside the fan.
- The motor ingress protection rating according to IEC 60034-5 is IP55.

Mounting

- The fan is installed with a square or round air duct.
- The connection to the air ducts is carried out by means of a flexible joint or an adapter joint of the appropriate cross-section.
- The fan is powered through the external terminal box.
- The fan can be installed in any position according to the direction of air flow, provided that access for maintenance is ensured.

Design

- The fan casing features heat and sound insulating two-layer panels, made of galvanized steel to protect it from environmental exposure.
- The panels are insulated with 20 mm thick non-flammable mineral wool.
- The impeller with backward-curved blades is powder coated.
- The connecting spigots, which also serve as anti-vibration dampers, can be of square or round cross-section.
- The round connecting spigots are equipped with rubber seals.
- The connecting spigots are not included in the delivery set and must be ordered separately.
- The direction of air flow and air mixtures is controlled by rearranging the panels on the fan frame.

Example of repositioning the panels

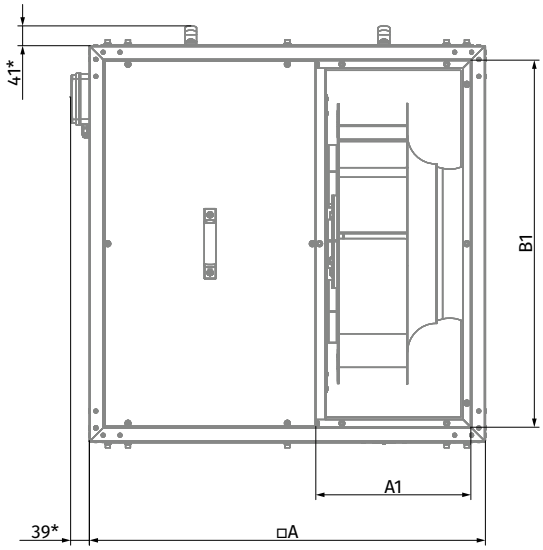


Designation key

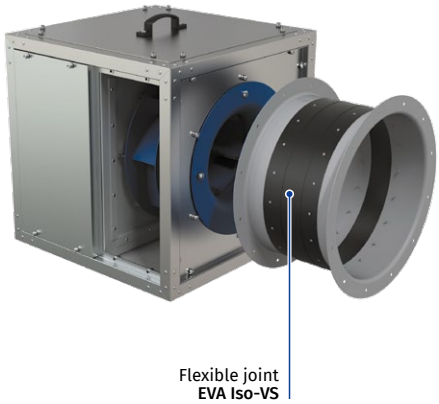
Series	Diameter [cm]		Number of poles	Phases		Motor power [kW]		Climatic category	Case coating
Iso-VS: sound-insulated smoke removal fan (400°C)	**28; 31; 35; 40; 45; 50; 56; 63; 71; 80**	–	**2; 4; 6; 2/4; 4/6; 4/8**	**E:** single-phase **D:** three-phase	/	**x:** single-speed **x/x:** two-speed	–	**U1:** moderate climate **HL1:** cold climate **T1:** tropical climate **M1:** maritime moderately cold climate	**_:** galvanized steel (default) **RAL 7004:** the RAL is specified if applicable

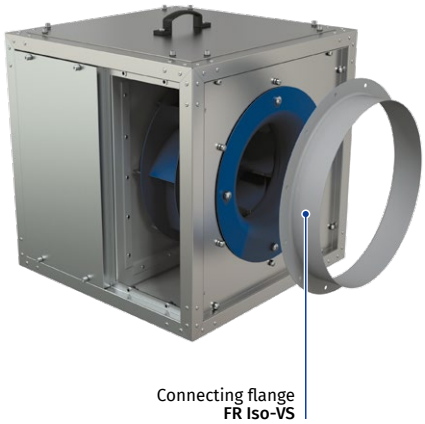
Dimensions [mm]

Model	A	A1	B1	Weight [kg]
Iso-VS 28-2D	450	190	390	39
Iso-VS 28-2E	450	190	390	39
Iso-VS 31-2D	500	200	440	50.6
Iso-VS 31-2E	500	200	440	50.6
Iso-VS 31-4D	500	200	440	46.5
Iso-VS 31-4E	500	200	440	46.5
Iso-VS 35-4D	600	225	540	61.6
Iso-VS 35-4E	600	225	540	61.6
Iso-VS 40-4D	670	252	610	72
Iso-VS 40-4E	670	252	610	65.7
Iso-VS 45-4D	700	282	640	76.7
Iso-VS 45-4E	700	282	640	76.7
Iso-VS 50-4D	820	321	760	111
Iso-VS 56-4D	900	365	840	144
Iso-VS 63-4D	1000	409	940	166
Iso-VS 71-4D	1075	456	1015	262
Iso-VS 71-6D	1075	456	1015	237
Iso-VS 80-6D	1175	506	1115	311



Installation example with accessories

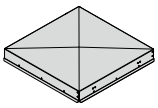

Flexible joint
EVA Iso-VS


Connecting flange
FR Iso-VS


Protective cover
RSD Iso-VS

Mounting bracket
MH Iso-VS

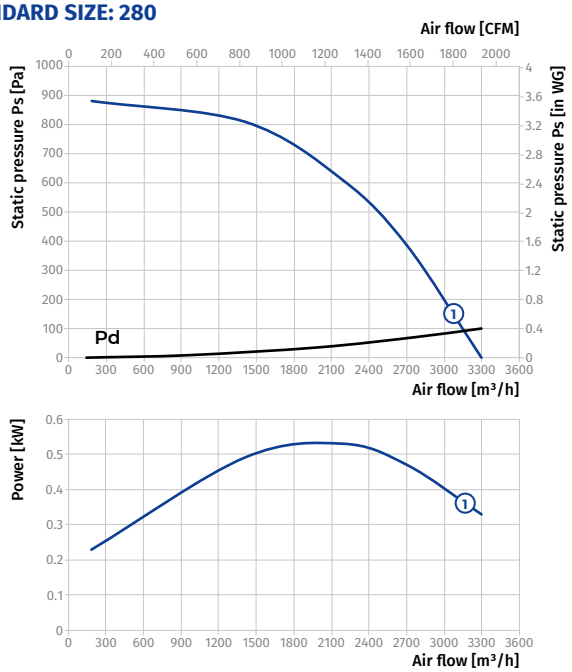
Accessories

Backdraft damper	Flexible joint	Connecting flange	Mounting bracket	Protective cover	Frequency converter	Safety switches
						
VRV-AF...400/2	EVA Iso-VS	FR Iso-VS	MH Iso-VS	RSD Iso-VS	Basic Drive FC-101	AS

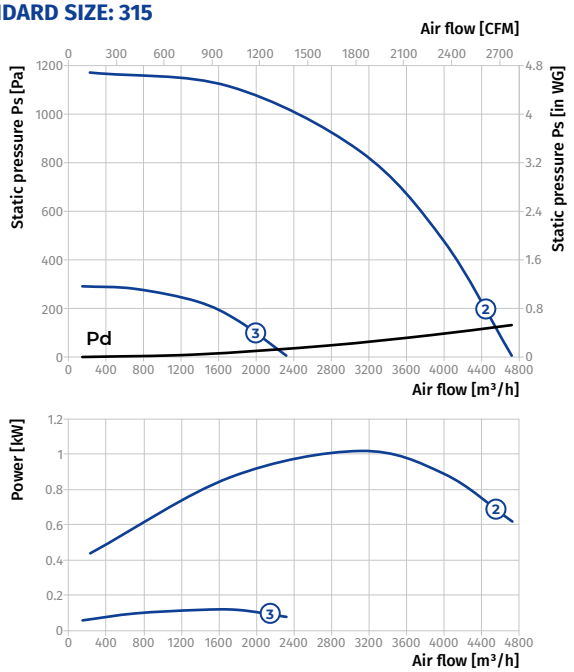
Technical data

Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	High speed curve number	Low speed curve number
280	2	3~400	Iso-VS 28-2D/0.55	0.55	2880	①	
280	2	1~230	Iso-VS 28-2E/0.55	0.55	2880	①	
315	2	3~400	Iso-VS 31-2D/1.1	1.1	2880	②	
315	2	1~230	Iso-VS 31-2E/1.1	1.1	2880	②	
315	4	3~400	Iso-VS 31-4D/0.25	0.25	1440	③	
315	4	1~230	Iso-VS 31-4E/0.25	0.25	1440	③	
315	2/4	3~400	Iso-VS 31-2/4D/1.1/0.25	1.1/0.25	2880/1440	②	③
355	4	3~400	Iso-VS 35-4D/0.37	0.37	1440	④	
355	4	1~230	Iso-VS 35-4E/0.37	0.37	1440	④	
355	4/6	3~400	Iso-VS 35-4/6D/0.37/0.1	0.37/0.1	1420/905	④	⑤
400	4	3~400	Iso-VS 40-4D/0.55	0.55	1440	⑥	
400	4	1~230	Iso-VS 40-4E/0.55	0.55	1440	⑥	
400	4/6	3~400	Iso-VS 40-4/6D/0.55/0.2	0.55/0.2	1420/905	⑥	⑦

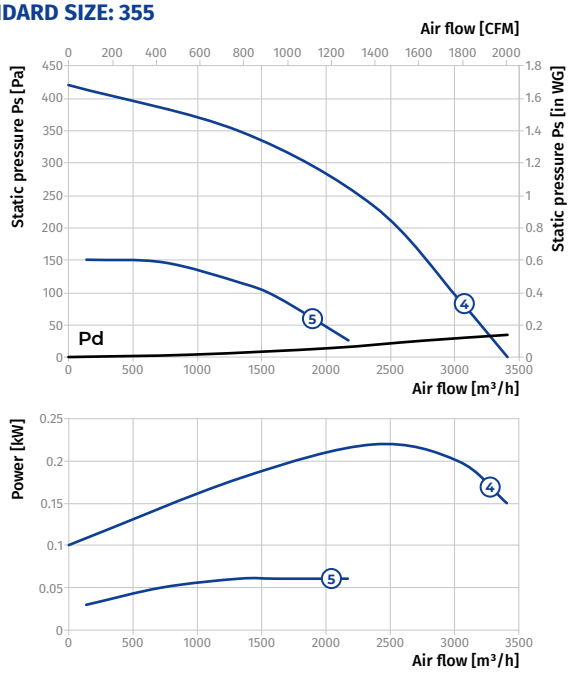
STANDARD SIZE: 280



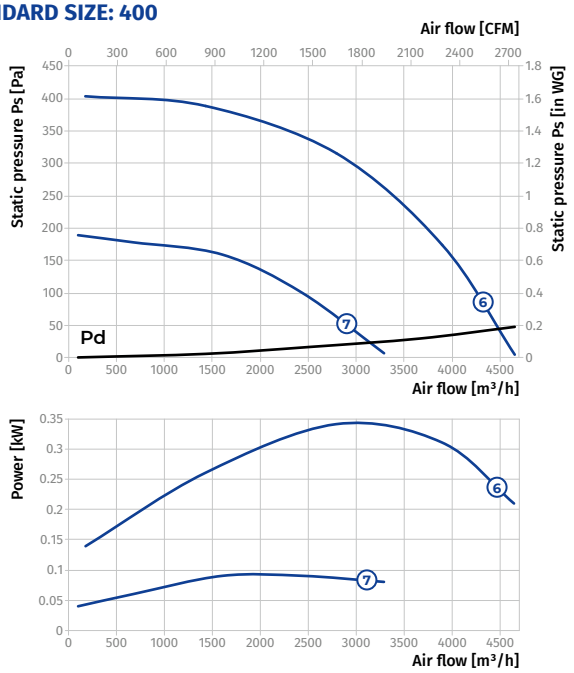
STANDARD SIZE: 315



STANDARD SIZE: 355

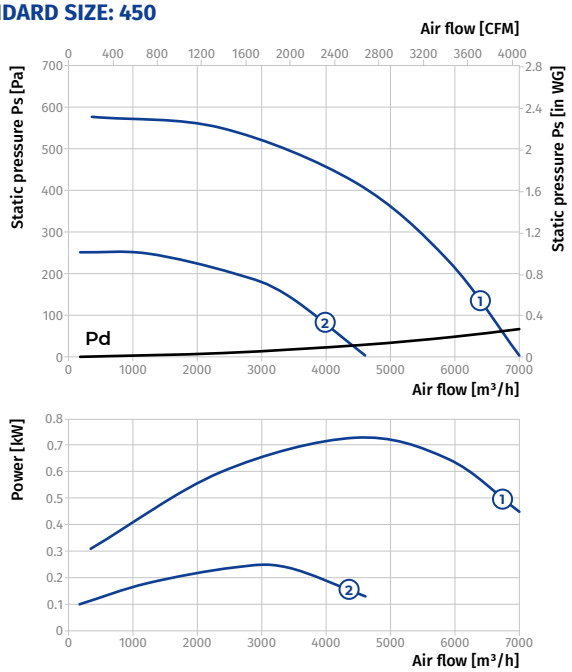


STANDARD SIZE: 400

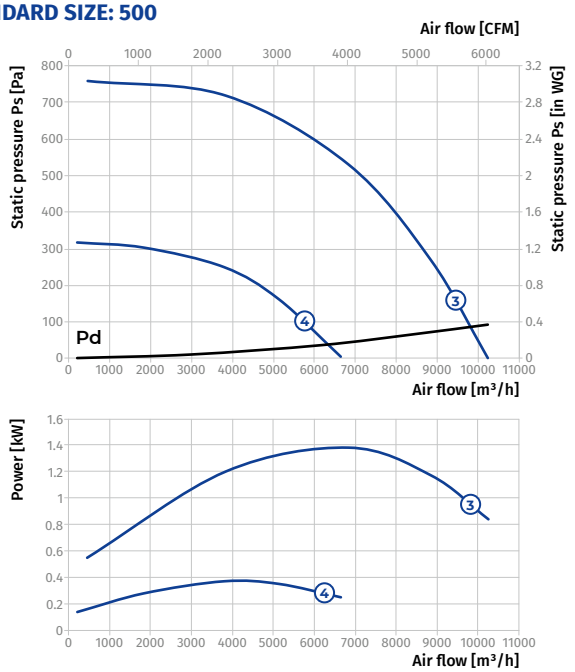


Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min^{-1}]	High speed curve number	Low speed curve number
450	4	3~400	Iso-VS 45-4D/0.75	0.75	1440	①	
450	4	1~230	Iso-VS 45-4E/0.75	0.75	1440	①	
450	4/6	3~400	Iso-VS 45-4/6D/0.75/0.25	0.75/0.25	1435/905	①	②
500	4	3~400	Iso-VS 50-4D/1.5	1.5	1440	③	
500	4/6	3~400	Iso-VS 50-4/6D/1.5/0.37	1.5/0.37	1430/920	③	④
560	4	3~400	Iso-VS 56-4D/3	3	1440	⑤	
560	4/6	3~400	Iso-VS 56-4/6D/3.0/1.0	3.0/1.0	1435/950	⑤	⑥
560	4/8	3~400	Iso-VS 56-4/8D/2.8/0.7	2.8/0.7	1435/710	⑤	⑦
630	4	3~400	Iso-VS 63-4D/4	4	1440	⑧	
630	4/6	3~400	Iso-VS 63-4/6D/4.5/1.5	4.5/1.5	1445/950	⑧	⑨
630	4/8	3~400	Iso-VS 63-4/8D/3.8/1.0	3.8/1.0	1445/720	⑧	⑩

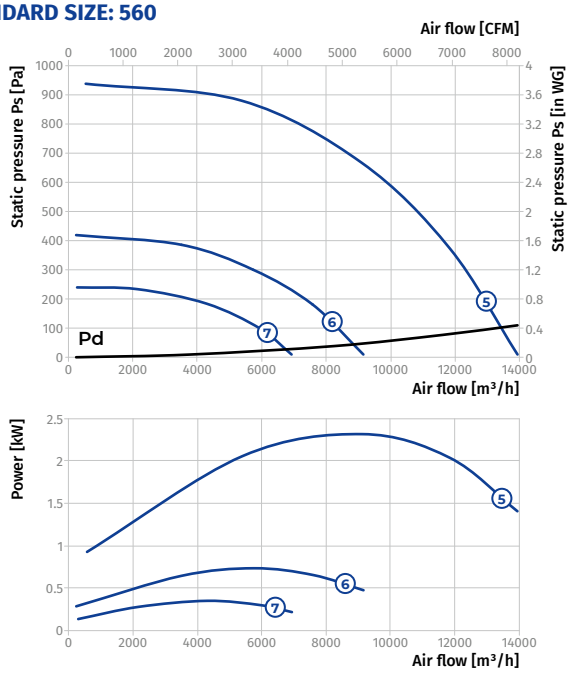
STANDARD SIZE: 450



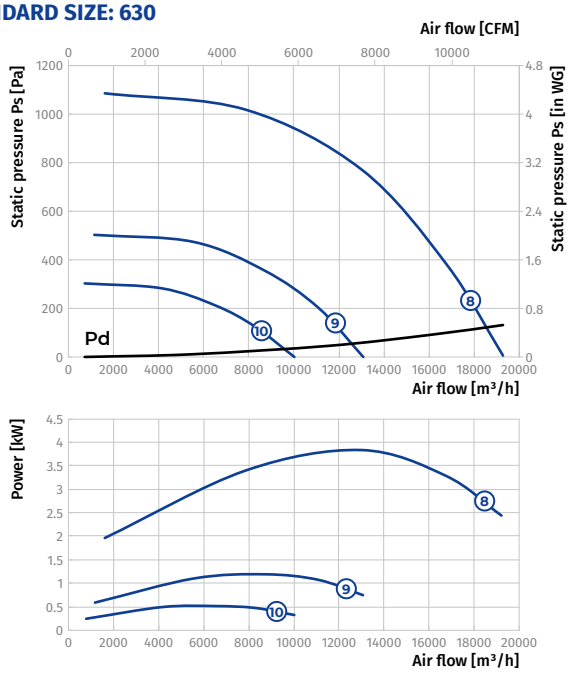
STANDARD SIZE: 500



STANDARD SIZE: 560

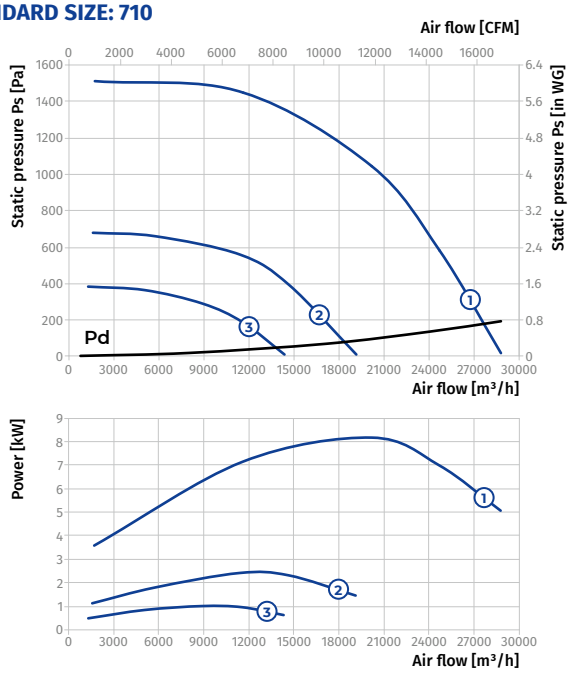


STANDARD SIZE: 630

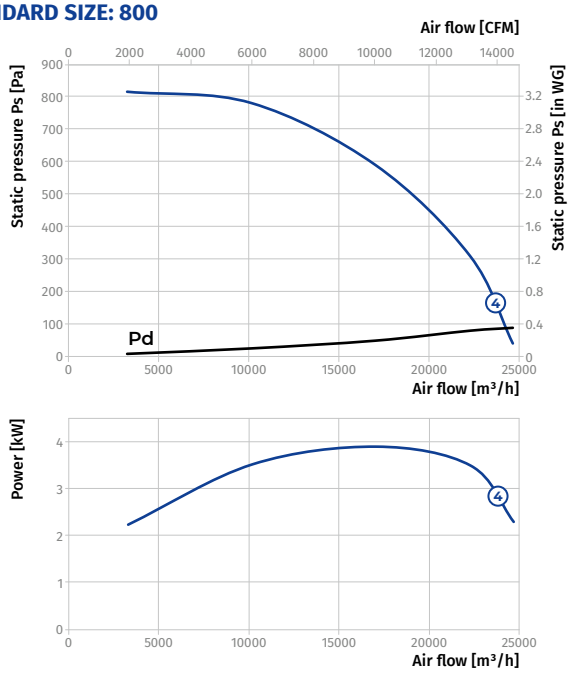


Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	High speed curve number	Low speed curve number
710	4	3~400	Iso-VS 71-4D/7.5	7.5	1440	①	
710	6	3~400	Iso-VS 71-6D/2.2	2.2	960	②	
710	4/6	3~400	Iso-VS 71-4/6D/7.5/3.5	7.5/3.5	1455/960	①	②
710	4/8	3~400	Iso-VS 71-4/8D/7.2/1.8	7.2/1.8	1455/720	①	③
800	6	3~400	Iso-VS 80-6D/4	4	960	④	

STANDARD SIZE: 710



STANDARD SIZE: 800

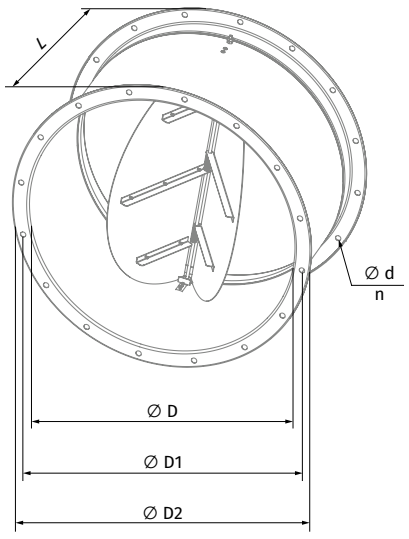


RADIAL CENTRIFUGAL FANS

Iso-VS accessories

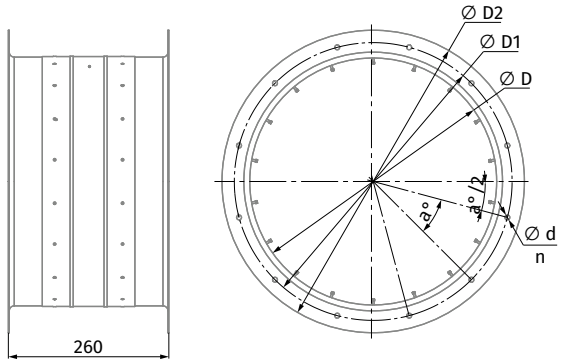
BACKDRAFT DAMPER VRV-AF...400/2

Model	Dimensions [mm]						Weight [kg]
	Ø D	Ø D1	Ø D2	Ø d	n	L	
VRV-AF-280-400/2	280	340	370	8	6	190	3.2
VRV-AF-315-400/2	315	365	405	8	6	190	3.6
VRV-AF-355-400/2	355	405	445	8	6	225	4.5
VRV-AF-400-400/2	400	450	490	8	12	250	5.4
VRV-AF-450-400/2	450	500	540	8	12	250	6.2
VRV-AF-500-400/2	500	560	590	12	12	250	7.1
VRV-AF-560-400/2	560	620	650	12	12	320	9.6
VRV-AF-630-400/2	630	690	720	12	12	370	14.2
VRV-AF-710-400/2	710	770	810	12	16	390	21.4
VRV-AF-800-400/2	800	860	900	12	16	390	25.4



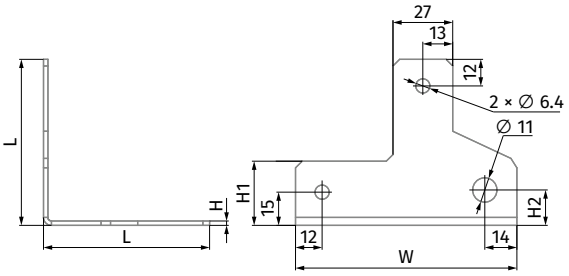
FLEXIBLE JOINT EVA ISO-VS

Model	Dimensions [mm]					Weight [kg]
	Ø D	Ø D1	Ø D2	Ø d	n	
EVA Iso-VS 280	280	340	370	8	6	3.39
EVA Iso-VS 315	315	365	405	8	6	3.79
EVA Iso-VS 355	355	405	445	8	6	4.25
EVA Iso-VS 400	400	450	490	8	12	4.76
EVA Iso-VS 450	450	500	540	8	12	5.34
EVA Iso-VS 500	500	560	600	12	12	6.12
EVA Iso-VS 560	560	620	660	12	12	6.83
EVA Iso-VS 630	630	690	730	12	12	7.66
EVA Iso-VS 710	710	770	810	12	16	8.6
EVA Iso-VS 800	800	860	900	12	16	9.67



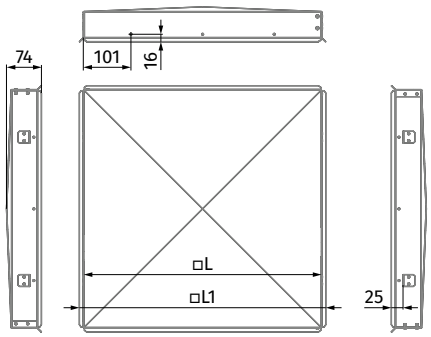
MOUNTING BRACKET MH ISO-VS

Model	Dimensions [mm]				Weight [kg]
	H	H1	L	W	
MH Iso-VS 280-450	2	29	90	125	0.12
MH Iso-VS 500-800	3	29	90	125	0.21



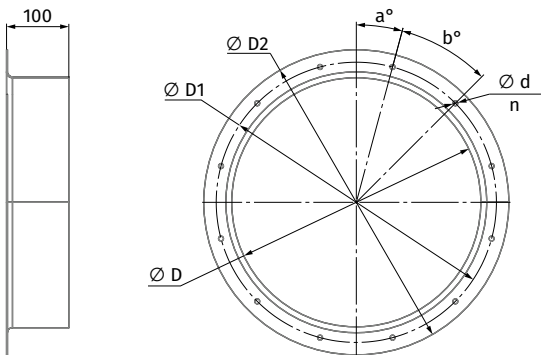
PROTECTIVE COVER RSD ISO-VS

Model	Dimensions [mm]		Weight [kg]
	L	L1	
RSD Iso-VS 280	456	472	2
RSD Iso-VS 315	503	522	2.42
RSD Iso-VS 355	603	622	3.25
RSD Iso-VS 400	673	692	3.91
RSD Iso-VS 450	703	722	4.21
RSD Iso-VS 500	823	842	6.57
RSD Iso-VS 560	903	922	7.71
RSD Iso-VS 630	1003	1022	9.27
RSD Iso-VS 710	1078	1097	10.53
RSD Iso-VS 800	1178	1197	12.3



CONNECTION FLANGE FR ISO-VS

Model	Dimensions [mm]					Weight [kg]
	Ø D	Ø D1	Ø D2	Ø d	n	
FR Iso-VS 280	280	340	370	8	6	1.52
FR Iso-VS 315	315	365	405	8	6	1.7
FR Iso-VS 355	355	405	445	8	6	1.9
FR Iso-VS 400	400	450	490	8	12	2.13
FR Iso-VS 450	450	500	540	8	12	2.39
FR Iso-VS 500	500	560	600	12	12	2.75
FR Iso-VS 560	560	620	660	12	12	3.06
FR Iso-VS 630	630	690	730	12	12	3.44
FR Iso-VS 710	710	770	810	12	16	3.86
FR Iso-VS 800	800	860	900	12	16	4.34



Volute-S

Centrifugal smoke extraction fans

Radial centrifugal smoke extraction fan for removing high-temperature gas-air mixtures and heat generated in case of fire in premises

Air flow:
up to 105 000 m³/h

Transported air temperature:
+120 °C for long-term operation;
+400 °C for operation
up to 120 minutes



Application

- The dual-purpose centrifugal smoke extraction fan is used in emergency exhaust ventilation systems for forced removal of smoke, heated gas and combustion products.
- The fan may be used for general exhaust ventilation.
- The fan is a component part and is not designed for independent operation.

Operation

- The fan is designed to remove smoke and air mixtures heated up to +400 °C for up to 120 minutes, and long-term operation with transported air temperature of up to +120°C.
- The fans can be equipped with a frequency converter to adjust the rotation speed.
- The fan may be used for general extract ventilation.
- The fan can be designed for temperate (**U**) , tropical (**T**) or maritime moderately cold (**M**) climate.

Design

- The fans are made from steel with heat-resistant polymer coating, which ensures protection from weather conditions.
- The impeller and backward curved blades are powder-coated.
- The fan's casing can rotate within the angle range of 0° – 315°.
- The unit design is constantly being improved, thus some models may be slightly different from those described in this catalog.

Motor

- The fans are equipped with three-phase electric motors rated for a voltage of 400 V, 50 Hz.
- The motor is located outside of the transported air flow. The motor protection class according to IEC 60034-5 is IP55.

Designation key

Volute-S 40- 2 D/ x - R 90- U 1 -400/2

Series
Volute-S: centrifugal fan for smoke extraction with direct drive

Impeller size [cm]
28; 31; 35; 40; 45; 50; 56; 63; 71; 80; 90; 100; 112; 125

Number of poles
2, 4, 6, 8

No. of phases
D: three-phase

Motor power [kW]

Casing design
R: right

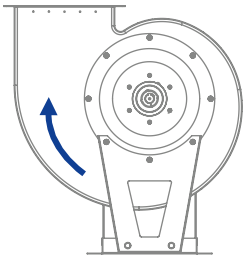
Casing rotation angle
0; 45; 90 (standard); 135; 180; 225; 270; 315

Climatic category
U: temperate climate (-40...+40 °C)
T: tropical climate (-10...+50 °C)
M: maritime moderately cold climate (-40...+40 °C)

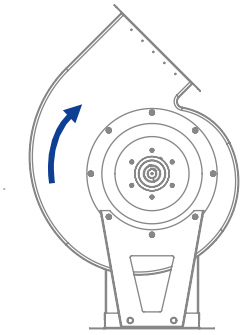
Placement category
1: outdoors
2: under a canopy or indoors, where the conditions are the same as outdoors, except for solar radiation and precipitation
3: indoors without artificial climate control

Fire resistance rating/hours
400/2: 400 °C/2 h

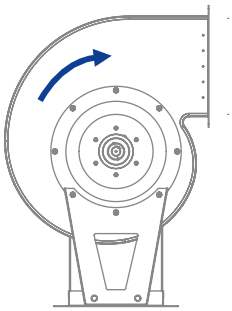
Casing rotation angle



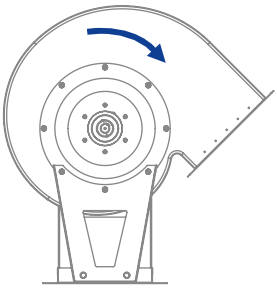
0°



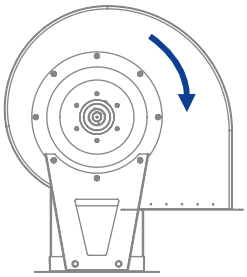
45°



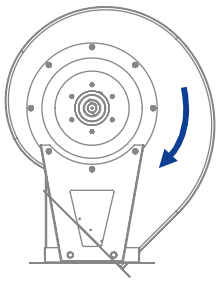
90°



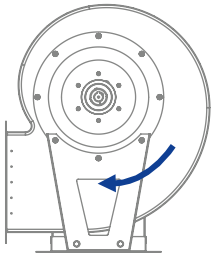
135°



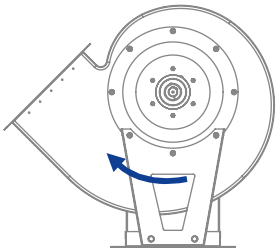
180°



225°



270°



315°

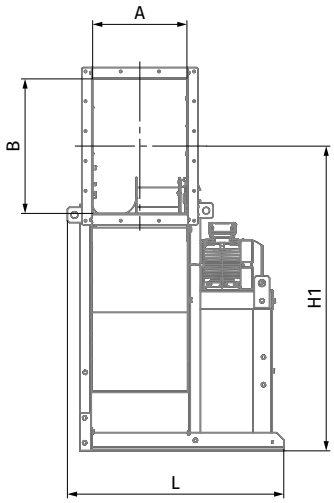
Accessories

Backdraft damper	Flexible joint	Spring-loaded anti-vibration mount	Frequency converter	Safety switches
				
VRV-AF...400/2	EVAF-AF...400/2	SIF-AF	Basic Drive FC-101	A

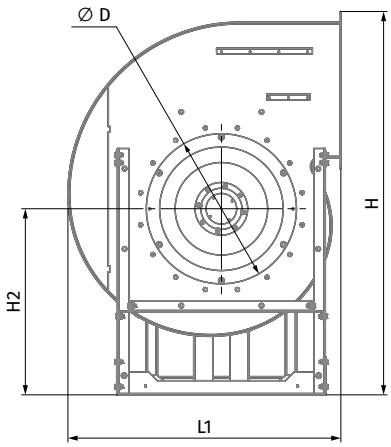
Dimensions [mm]

Model	A	B	∅ D	H (R90)	H (R0)	H1	H2	L	L1 (R90)	L1 (R0)	L2	L3	Weight [kg]
Volute-S 28-2D/0.55-400/2	190	225	280	735	625	590	400	480	475	545	500	350	37.5
Volute-S 31-4D/0.25-400/2	207	252	315	805	685	650	435	530	535	610	530	385	43
Volute-S 31-2D/1.1-400/2	207	252	315	805	685	650	435	530	535	610	530	385	47
Volute-S 35-4D/0.37-400/2	227	284	355	895	755	720	480	555	595	680	575	400	49
Volute-S 35-2D/2.2-400/2	227	284	355	895	755	720	480	555	595	680	575	400	58
Volute-S 40-2D/4-400/2	258	316	400	966	777	771	498	648	655	765	610	400	67
Volute-S 40-4D/0.37-400/2	258	316	400	966	777	771	498	648	655	765	610	400	57
Volute-S 45-2D/7.5-400/2	283	356	450	1078	835	863	556	767	734	856	705	450	112
Volute-S 45-4D/0.75-400/2	283	356	450	1078	835	863	556	767	734	856	705	450	65
Volute-S 50-4D/1.5-400/2	316	390	500	1186	974	951	607	705	813	950	705	450	95
Volute-S 50-6D/0.37-400/2	316	390	500	1186	974	951	607	705	813	950	705	450	87
Volute-S 56-4D/2.2-400/2	353	436	560	1312	1073	1057	671	742	901	1055	705	450	110
Volute-S 56-6D/0.75-400/2	353	436	560	1312	1073	1057	671	742	901	1055	705	450	100
Volute-S 63-6D/1.5-400/2	397	491	630	1469	1204	1186	753	787	1014	1182	767	550	128
Volute-S 63-4D/4-400/2	397	491	630	1469	1204	1186	753	787	1014	1182	767	550	148
Volute-S 71-8D/1.1-400/2	442	554	710	1709	1422	1385	897	895	1146	1338	895	570	153
Volute-S 71-6D/2.2-400/2	442	554	710	1709	1422	1385	897	895	1146	1338	895	570	160
Volute-S 71-4D/7.5-400/2	442	554	710	1709	1422	1385	897	895	1146	1338	895	570	192
Volute-S 80-8D/2.2-400/2	492	703	800	2002	1596	1592	972	1130	1426	1697	1065	940	306
Volute-S 80-6D/4-400/2	492	703	800	2002	1596	1592	972	1130	1426	1697	1065	940	308
Volute-S 80-4D/15-400/2	492	703	800	2002	1596	1592	972	1330	1426	1697	1265	940	392
Volute-S 90-8D/4-400/2	562	782	900	2349	1892	1900	1210	1265	1573	1880	1200	1060	430
Volute-S 90-6D/7.5-400/2	562	782	900	2349	1892	1900	1210	1265	1573	1880	1200	1060	450
Volute-S 90-4D/30-400/2	562	782	900	2349	1892	1900	1210	1415	1573	1880	1350	1060	553
Volute-S 100-8D/7.5-400/2	613	900	1000	2426	1908	1916	1125	1339	1808	2153	1321	1240	542
Volute-S 100-6D/15-400/2	613	900	1000	2426	1908	1916	1125	1339	1808	2153	1321	1240	581
Volute-S 112-8D/11-400/2	686	1001	1120	2663	2091	2103	1225	1468	2003	2383	1450	1300	719
Volute-S 112-8D/15-400/2	763	1001	1120	2663	2091	2103	1225	1595	2003	2383	1577	1300	832
Volute-S 112-6D/22-400/2	686	1001	1120	2663	2091	2103	1225	1518	2003	2383	1500	1300	786
Volute-S 112-6D/30-400/2	763	1001	1120	2663	2091	2103	1225	1685	2003	2383	1667	1300	887
Volute-S 125-8D/22-400/2	730	1071	1250	2840	2231	2245	1305	1651	2143	2546	1633	1380	982
Volute-S 125-6D/45-400/2	730	1071	1250	2840	2231	2245	1305	1839	2143	2546	1699	1380	1334

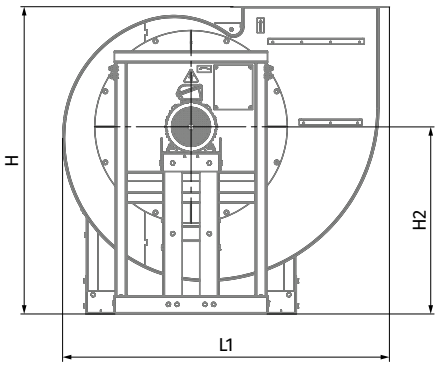
The dimensions provided apply to models with the R0 and R90 rotation angles. Dimensions for models with different rotation angles are available upon request.



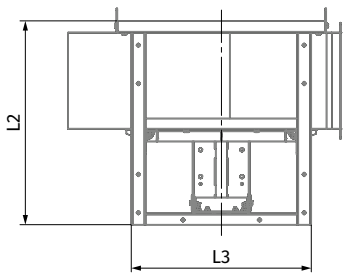
R90



R0



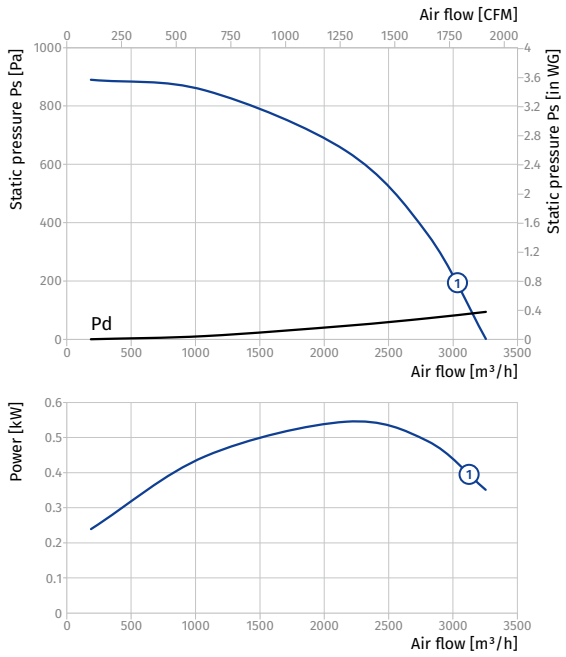
Bottom view



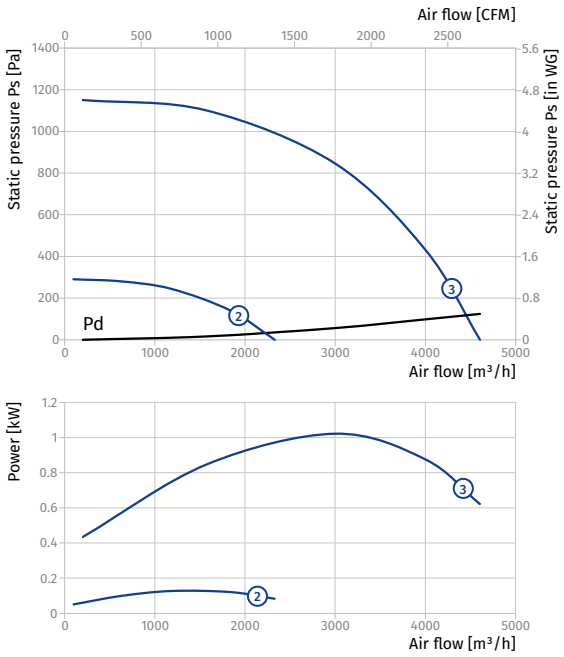
Technical data

Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	Curve number
280	2	3~400	Volute-S 28-2D/0.55-400/2	0.55	2880	①
315	4	3~400	Volute-S 31-4D/0.25-400/2	0.25	1440	②
315	2	3~400	Volute-S 31-2D/1.1-400/2	1.1	2880	③
355	4	3~400	Volute-S 35-4D/0.37-400/2	0.37	1440	④
355	2	3~400	Volute-S 35-2D/2.2-400/2	2.2	2880	⑤
400	4	3~400	Volute-S 40-4D/0.37-400/2	0.37	1440	⑥
400	2	3~400	Volute-S 40-2D/4-400/2	4	2880	⑦

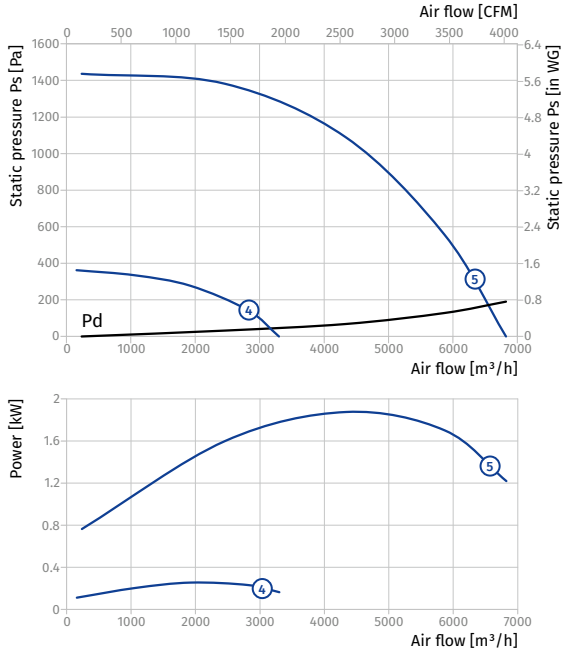
STANDARD SIZE: 280



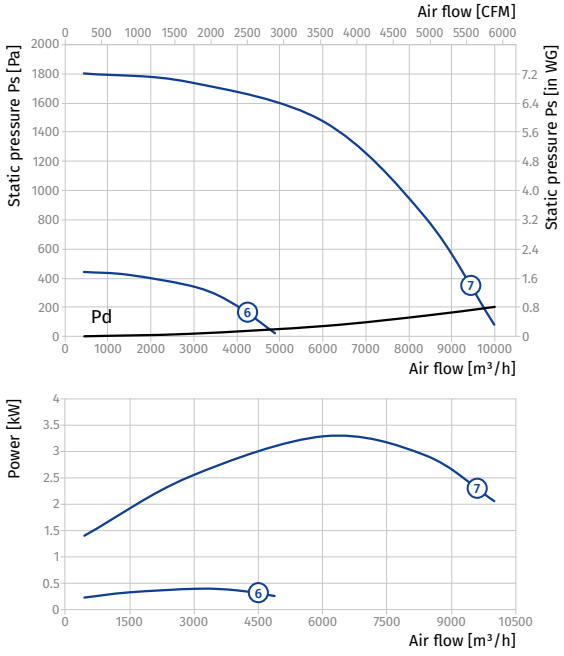
STANDARD SIZE: 315



STANDARD SIZE: 355

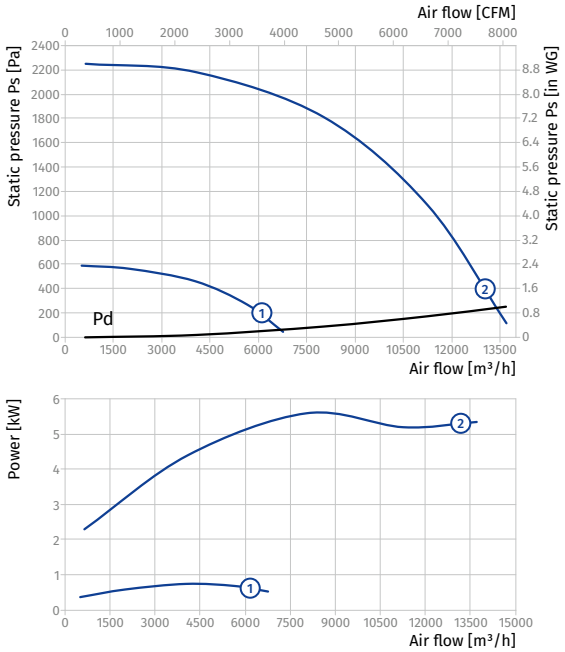


STANDARD SIZE: 400

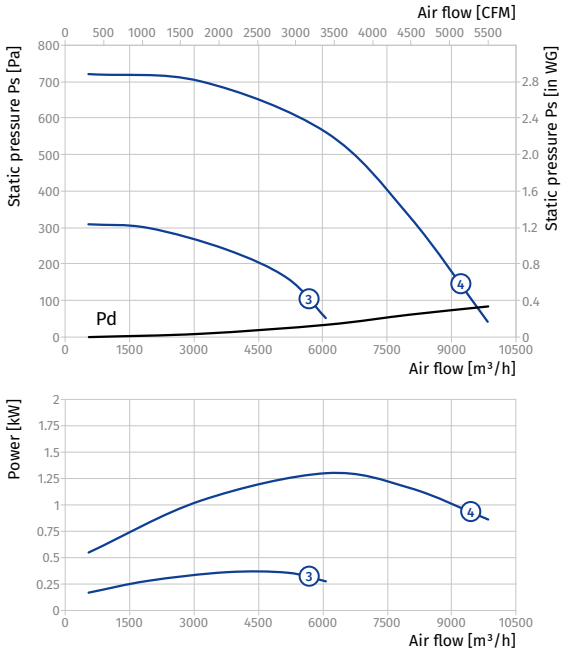


Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	Curve number
450	4	3~400	Volute-S 45-4D/0.75-400/2	0.75	1440	①
450	2	3~400	Volute-S 45-2D/7.5-400/2	7.5	2880	②
500	6	3~400	Volute-S 50-6D/0.37-400/2	0.37	960	③
500	4	3~400	Volute-S 50-4D/1.5-400/2	1.5	1440	④
560	6	3~400	Volute-S 56-6D/0.75-400/2	0.75	960	⑤
560	4	3~400	Volute-S 56-4D/2.2-400/2	2.2	1440	⑥
630	6	3~400	Volute-S 63-6D/1.5-400/2	1.5	950	⑦
630	4	3~400	Volute-S 63-4D/4-400/2	4	1440	⑧

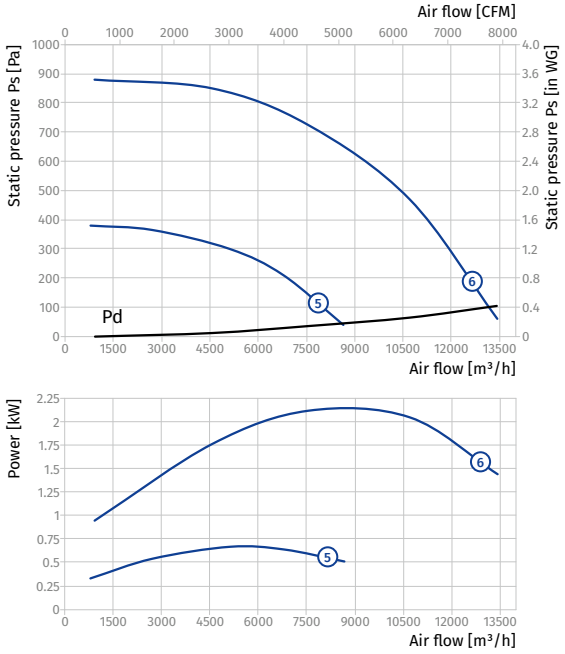
STANDARD SIZE: 450



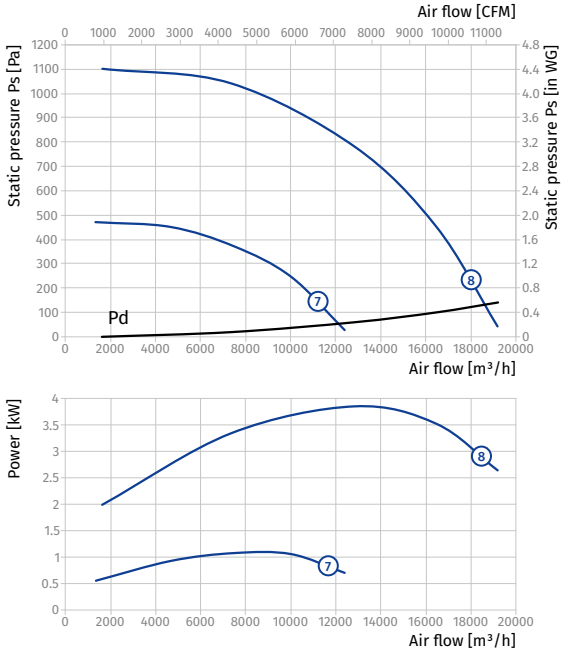
STANDARD SIZE: 500



STANDARD SIZE: 560

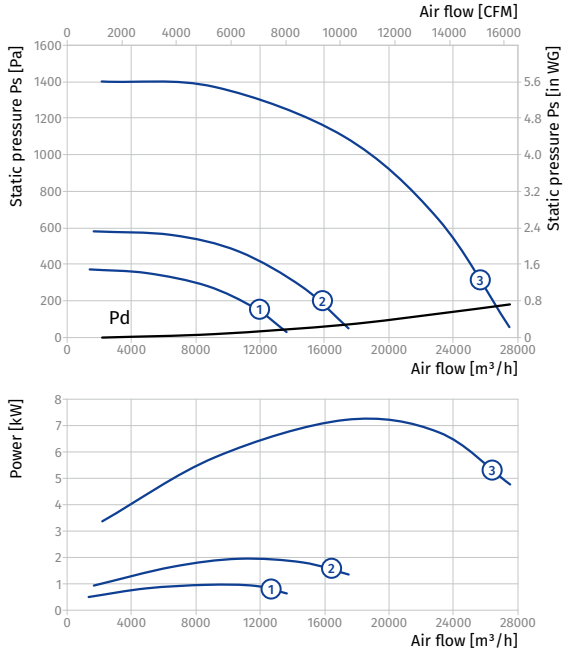


STANDARD SIZE: 630

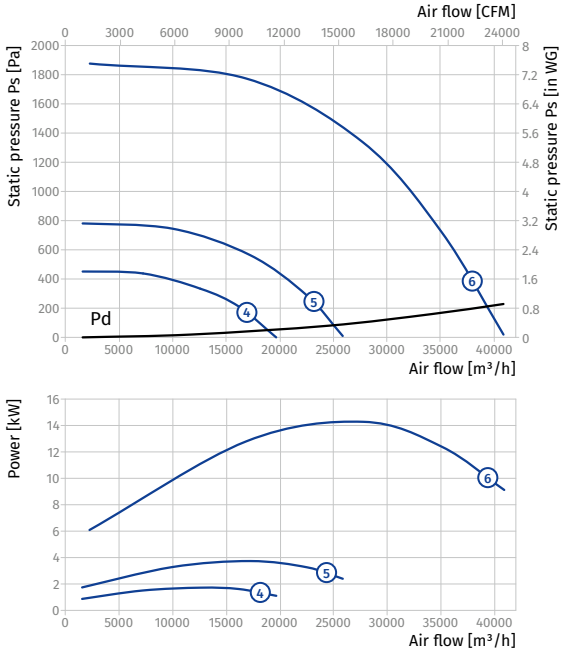


Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	Curve number
710	8	3~400	Volute-S 71-8D/1.1-400/2	1.1	730	①
710	6	3~400	Volute-S 71-6D/2.2-400/2	2.2	940	②
710	4	3~400	Volute-S 71-4D/7.5-400/2	7.5	1440	③
800	8	3~400	Volute-S 80-8D/2.2-400/2	2.2	730	④
800	6	3~400	Volute-S 80-6D/4-400/2	4	940	⑤
800	4	3~400	Volute-S 80-4D/15-400/2	15	1440	⑥
900	8	3~400	Volute-S 90-8D/4-400/2	4	750	⑦
900	6	3~400	Volute-S 90-6D/7.5-400/2	7.5	1000	⑧
900	4	3~400	Volute-S 90-4D/30-400/2	30	1470	⑨
1000	8	3~400	Volute-S 100-8D/7.5-400/2	7.5	750	⑩
1000	6	3~400	Volute-S 100-6D/15-400/2	15	1000	⑪

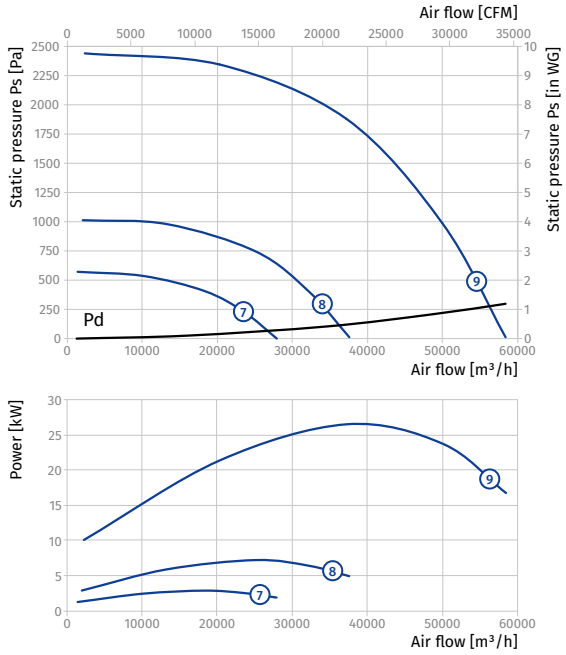
STANDARD SIZE: 710



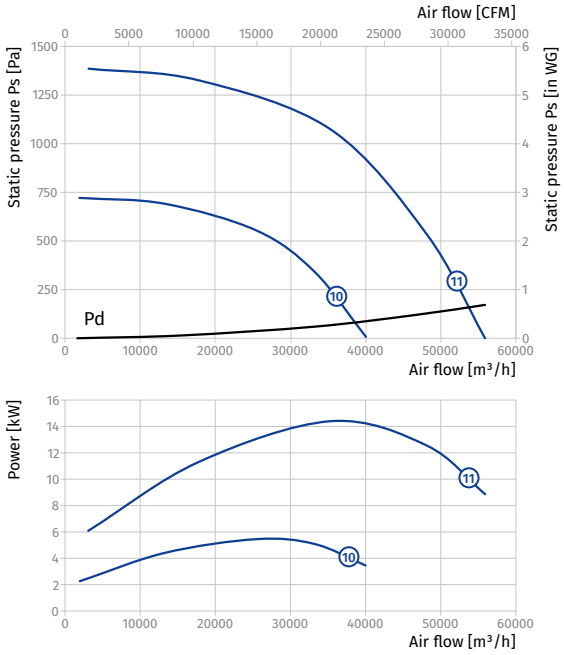
STANDARD SIZE: 800



STANDARD SIZE: 900

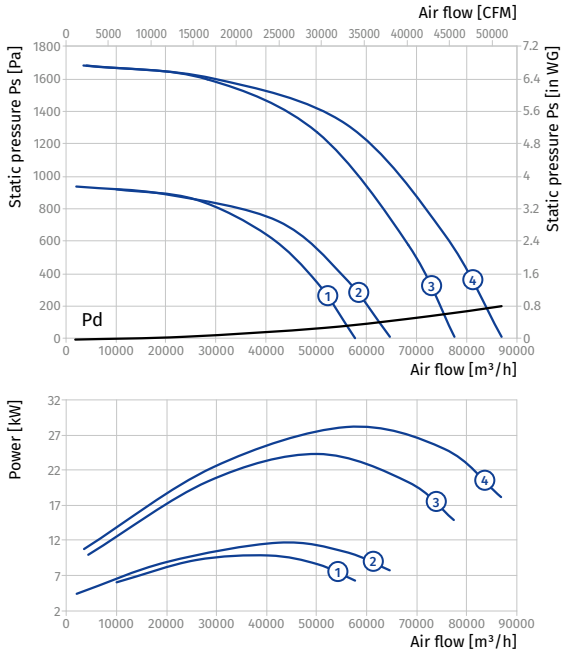


STANDARD SIZE: 1000

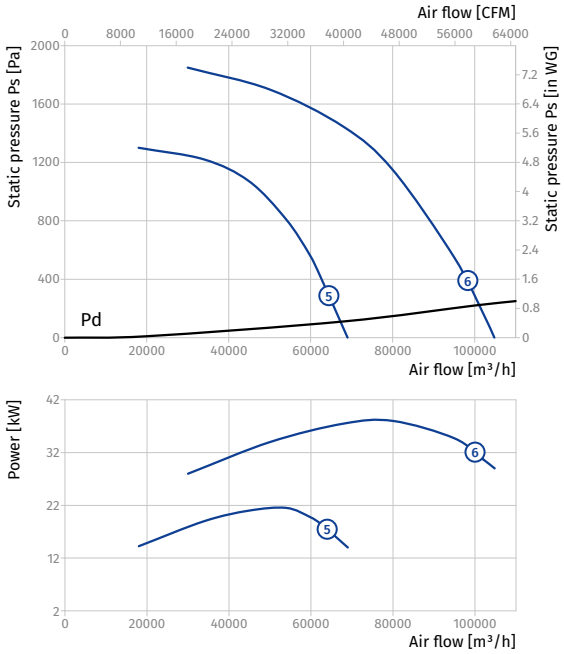


Standard size	Number of poles	Voltage [V/50 Hz]	Fan model	Rated power [kW]	Rated RPM [min⁻¹]	Curve number
1120	8	3~400	Volute-S 112-8D/11-400/2	11	750	①
1120	8	3~400	Volute-S 112-8D/15-400/2	15	750	②
1120	6	3~400	Volute-S 112-6D/22-400/2	22	1000	③
1120	6	3~400	Volute-S 112-6D/30-400/2	30	1000	④
1250	8	3~400	Volute-S 125-8D/22-400/2	22	750	⑤
1250	6	3~400	Volute-S 125-6D/45-400/2	45	1000	⑥

STANDARD SIZE: 1120



STANDARD SIZE: 1250



Accessories for roof-mounted smoke extraction fans

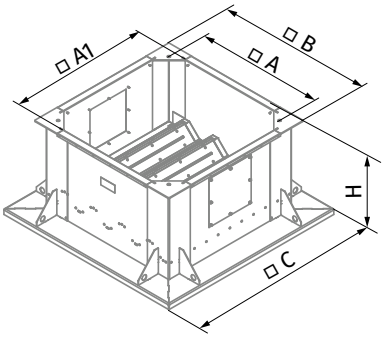
MOUNTING CURB SM-AF

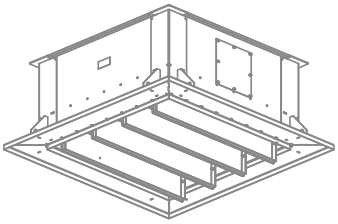
- The unit is used for mounting fans on rooftops.
- The outer frames are supported for installation on the roof. The mounting curb is equipped with a side inspection door. Modifications are available to order according to the naming system.



Designation key

Series		Roof type	Heat insulation	Built-in damper availability:	Damper drive type		Diameter [mm]
SM-AF	–	**0:** for installation on a roof without a slope **1:** for installation on a roof with a slope	**0:** no heat insulation **1:** with heat insulation	**0:** no damper **1:** exhaust damper **2:** supply damper **3:** smoke extraction damper (with electric actuator)	**0:** no drive **1:** 24 V drive **2:** 230 V drive	–	**315; 355; 400; 450; 500; 560; 630; 710; 800; 900; 1000; 1120; 1250**





Model	Dimensions [mm]					Weight [kg]
	H	A	A1	B	C	
SM-AF-0000-315/355	550	480	505	590	800	39.5
SM-AF-0010-315/355						43.5
SM-AF-0020-315/355						43.5
SM-AF-0100-315/355						50.5
SM-AF-0110-315/355						54.5
SM-AF-0120-315/355						54.5
SM-AF-0000-400/450	550	580	605	692	900	46
SM-AF-0010-400/450						51.5
SM-AF-0020-400/450						51.5
SM-AF-0100-400/450						58.5
SM-AF-0110-400/450						64
SM-AF-0120-400/450						64
SM-AF-0000-500	550	640	675	760	970	49
SM-AF-0010-500						56
SM-AF-0020-500						56
SM-AF-0100-500						63
SM-AF-0110-500						70
SM-AF-0120-500						70
SM-AF-0000-560/630	550	750	825	910	1120	56.5
SM-AF-0010-560/630						66.5
SM-AF-0020-560/630						66.5
SM-AF-0100-560/630						72.5
SM-AF-0110-560/630						82.5
SM-AF-0120-560/630						82.5
SM-AF-0000-710/800	550	980	1055	1140	1350	68
SM-AF-0010-710/800						83
SM-AF-0020-710/800						83
SM-AF-0100-710/800						88
SM-AF-0110-710/800						103
SM-AF-0120-710/800						103
SM-AF-0000-900	550	1050	1125	1208	1420	71
SM-AF-0010-900						88.5
SM-AF-0020-900						88.5
SM-AF-0100-900						92
SM-AF-0110-900						109.5
SM-AF-0120-900						109.5
SM-AF-0000-1000/1120	550	1340	1415	1498	1710	85
SM-AF-0010-1000/1120						112
SM-AF-0020-1000/1120						115
SM-AF-0100-1000/1120						111
SM-AF-0110-1000/1120						137
SM-AF-0120-1000/1120						140
SM-AF-0000-1250	550	1500	1605	1688	1900	112
SM-AF-0010-1250						151
SM-AF-0020-1250						156
SM-AF-0100-1250						140
SM-AF-0110-1250						180
SM-AF-0120-1250						185

SH

Protective hood

Use

- The hood is designed to protect the Tower-SV-K2 exhaust fan from exposure to precipitation and its ingress inside the structure, ensuring unobstructed removal of smoke and gases during operation.



Design

- The hood's structure consists of a casing and eight dampers that open under the action of air flow.
- The product is made of galvanized or stainless steel with high anti-corrosion properties, allowing its use in various climatic conditions.

Installation

- It is installed directly onto the Tower-SV-K2 fan casing and does not require any additional elements.



Protective hood SH in closed position



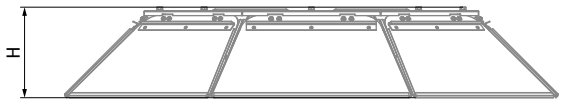
Protective hood SH in open position

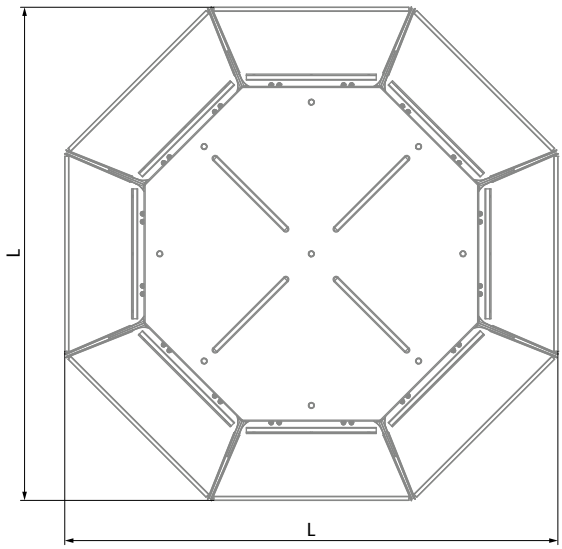
Designation key

Series		Diameter [mm]		Climatic design		Casing material
SH: protective hood	–	**315; 355; 400; 450; 500; 560; 630; 710; 800; 900; 1000; 1120; 1250**	–	**_:** temperate climate design (by default) **HL1:** cold climate design	–	**_:** galvanized steel by default (for temperate climate only) **ST:** stainless steel

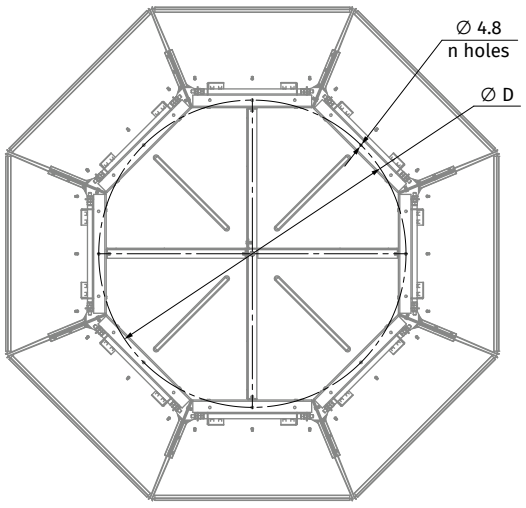
Dimensions [mm]

Model	∅ D	H	L	n	Weight [kg]
SH-315	450	125	703	8	9
SH-355	450	125	703	8	9
SH-400	450	148	745	8	11
SH-400 (2D/4)	525	125	765	8	12
SH-450	450	148	745	8	11
SH-450 (2D/7.5)	525	145	820	8	14
SH-500	525	145	820	8	14
SH-560	525	195	915	8	16
SH-560 (4D/3)	525	210	945	8	17
SH-630	615	181	987	8	18
SH-710	615	230	1082	8	20
SH-710 (4D/11)	715	190	1098	8	20
SH-800	695	230	1154	8	21
SH-900	695	325	1348	8	25
SH-900 (4D/30)	885	245	1378	8	25
SH-1000	715	375	1471	8	30
SH-1120	715	475	1668	8	35
SH-1120 (8D/15; 6D/22; 6D/30)	885	395	1675	12	35
SH-1250 (8D/22)	885	450	1785	12	40
SH-1250 (6D/45)	1120	345	1815	12	40





Bottom view



Accessories for duct smoke extraction fans

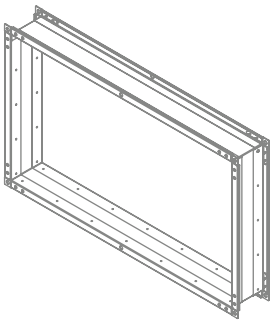
Accessories selection table for Box-S fans

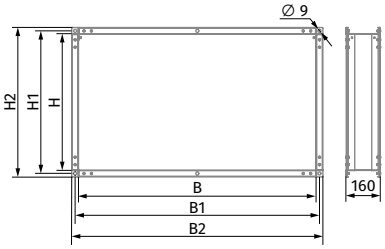
Fan	Heat-resistant flexible joint up to 400 °C	Protective mesh	Mounting frame	Fire-resistant backdraft damper
Box-S 25...50x30	EVAF-BF-50x30	SZ-BF-50x30	MF-Box-S 25-H (V)	VRV-BF-50x30
Box-S 28...60x30	EVAF-BF-60x30	SZ-BF-60x30	MF-Box-S 28-H (V)	VRV-BF-60x30
Box-S 31...60x35	EVAF-BF-60x35	SZ-BF-60x35	MF-Box-S 31-H (V)	VRV-BF-60x35
Box-S 35...70x40	EVAF-BF-70x40	SZ-BF-70x40	MF-Box-S 35-H (V)	VRV-BF-70x40
Box-S 40...70x50	EVAF-BF-70x50	SZ-BF-70x50	MF-Box-S 40-H (V)	VRV-BF-70x50

Fan	Heat-resistant flexible joint up to 400 °C	Protective mesh	Mounting frame	Fire-resistant backdraft damper
Box-S 45...80x60	EVAF-BF-80x60	SZ-BF-80x60	MF-Box-S 45-H (V)	VRV-BF-80x60
Box-S 50...80x60	EVAF-BF-80x60	SZ-BF-80x60	MF-Box-S 50-H (V)	VRV-BF-80x60
Box-S 56...90x70	EVAF-BF-90x70	SZ-BF-90x70	MF-Box-S 56-H	VRV-BF-90x70
Box-S 63...100x80	EVAF-BF-100x80	SZ-BF-100x80	MF-Box-S 63-H	VRV-BF-100x80
Box-S 71...120x90	EVAF-BF-120x90	SZ-BF-120x90	MF-Box-S 71-H	VRV-BF-120x90

FLEXIBLE JOINT EVAF-BF

- Flexible joints cancel out any potential vibrations transmitted by the fans or air handling units to the air ducting as well as partially compensate for the air duct assembly deformations caused by temperature variation.
- Flexible joints are formed by two flanges joined with vibration-absorbing material and are made of polymer-coated steel and PVC tape reinforced with polyamide fabric. The joints are not intended to withstand any significant mechanical loads and, therefore, may not be used as load-bearing structures. The **EVAF-BF** joints are designed for operation at a temperature of 400 ° C for 2 hours..

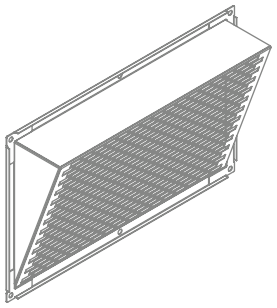


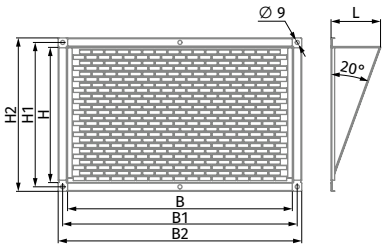


Model	Dimensions [mm]					
	B	H	B1	H1	B2	H2
EVAF-BF-50x30	500	300	520	320	540	340
EVAF-BF-60x30	600	300	620	320	640	340
EVAF-BF-60x35	600	350	620	370	640	390
EVAF-BF-70x40	700	400	720	420	740	440
EVAF-BF-70x50	700	500	720	520	740	540
EVAF-BF-80x60	800	600	820	620	840	640
EVAF-BF-90x70	900	700	920	720	940	740
EVAF-BF-100x80	1000	800	1020	820	1040	840
EVAF-BF-120x90	1200	900	1220	920	1240	940

PROTECTIVE MESH SZ-BF

- Protects the fans against foreign objects.
- Protective mesh with 25x25 mm cells.





Model	Dimensions [mm]						
	B	H	B1	H1	B2	H2	L
SZ-BF-50x30	500	300	520	320	540	340	110
SZ-BF-60x30	600	300	620	320	640	340	110
SZ-BF-60x35	600	350	620	370	640	390	130
SZ-BF-70x40	700	400	720	420	740	440	145
SZ-BF-70x50	700	500	720	520	740	540	185
SZ-BF-80x60	800	600	820	620	840	640	220
SZ-BF-90x70	900	700	920	720	940	740	255
SZ-BF-100x80	1000	800	1020	820	1040	840	295
SZ-BF-120x90	1200	900	1220	920	1240	940	330

VRV-BF

Fire-resistant backdraft dampers 400/2



Application

- The back valve is designed for shutting off air flow in rectangular air ducts and preventing air from moving backwards when the ventilation system is idle. The minimum air flow speed through the back valve's cross-section must be at least 4 m/s. The valve is designed for operation at the temperature of 400 °C for 2 hours.

Design

- The valves are made of galvanized steel in inline design and have two connecting flanges. The gravity blades are attached on rotating axes. The design of the valve enables it to be used in a horizontal position with the blades facing up.

Designation key

VRV-BF - x

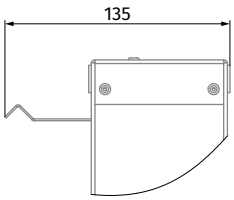
Series
VRV-BF: fire-resistant backdraft damper

Valve's cross-section dimensioins (AxB) [cm]
50x30, 60x30, 60x35, 70x40, 70x50, 80x60, 90x70, 100x80, 120x90

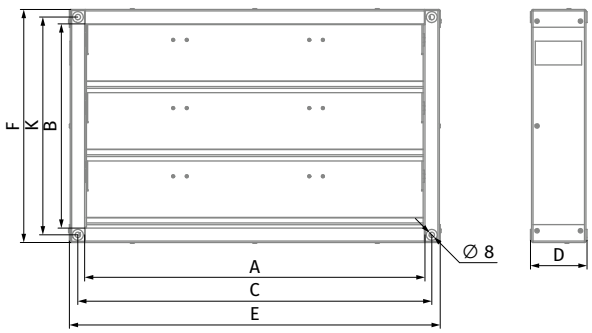
Overall and connecting dimensions [mm]

Overall and connecting dimensions of the standard range of valves are shown below. Other standard sizes of valves can be made upon request.

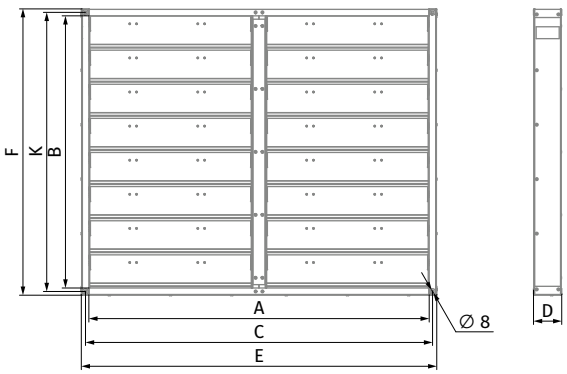
Model	AxB	CxK	ExF	D	Weight [kg]
VRV-BF-50x30	500x300	520x320	545x342	83	5
VRV-BF-60x30	600x300	620x320	645x342	83	5.7
VRV-BF-60x35	600x350	620x370	645x392	83	5.8
VRV-BF-70x40	700x400	720x420	745x442	83	7.7
VRV-BF-70x50	700x500	720x520	745x542	83	9
VRV-BF-80x60	800x600	820x620	845x642	83	12.6
VRV-BF-90x70	900x700	920x720	945x742	83	15.3
VRV-BF-100x80	1000x800	1020x820	1045x842	83	18.4
VRV-BF-120x90	1200x900	1220x920	1245x942	83	23



Blade projection length



VRV-BF-50x30, VRV-BF-60x30, VRV-BF-60x35, VRV-BF-70x40, VRV-BF-70x50



VRV-BF-80x60, VRV-BF-90x70, VRV-BF-100x80, VRV-BF-120x90

MF-Box-S

Mounting frame for Box-S duct fans



Use

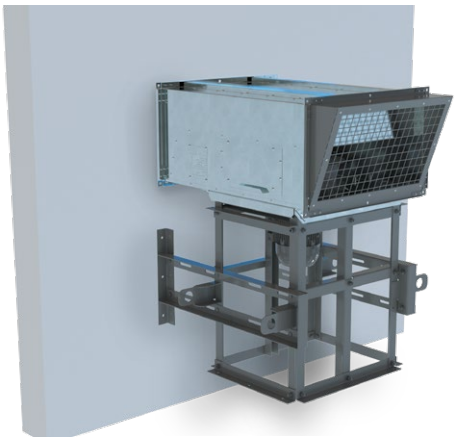
- **MF-Box-S** is designed for vertical or horizontal installation of Box-S series duct fans.
- Based on the standard size of the fan, multiple mounting options are provided: for models up to and including the standard size 500, both horizontal (floor) mounting and vertical (wall) mounting are possible; for models of standard size beyond 500, horizontal mounting only is possible.

Design

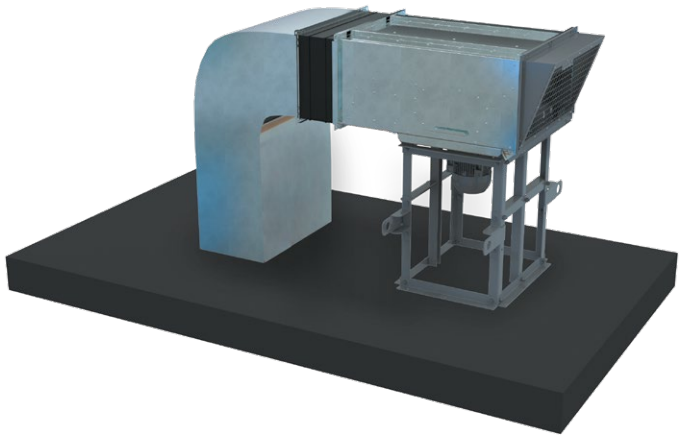
- The mounting frame acts as a transition element ensuring that the Box-S fan is fastened reliably to the supporting surface (wall or floor).
- It is made of carbon steel, providing structure durability and stability.

Mounting example

VERTICAL



HORIZONTAL



Designation key

MF-Box-S 28 - H

MF-Box-S:
mounting frame for Box-S duct fans

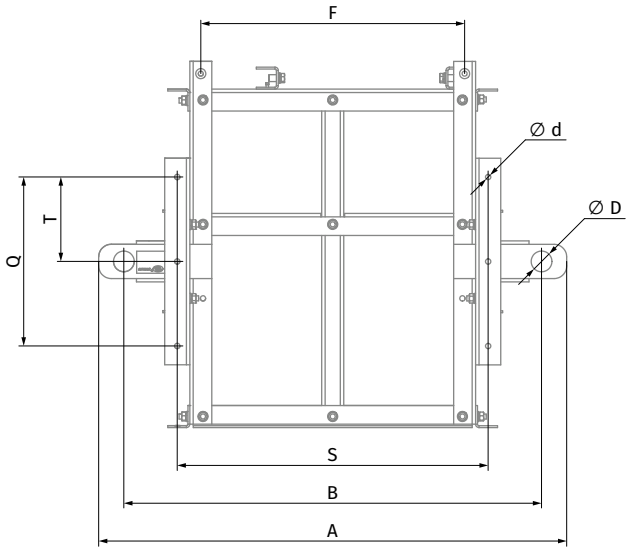
Fan size:
25, 28, 31, 35, 40, 45, 50, 56, 63, 71

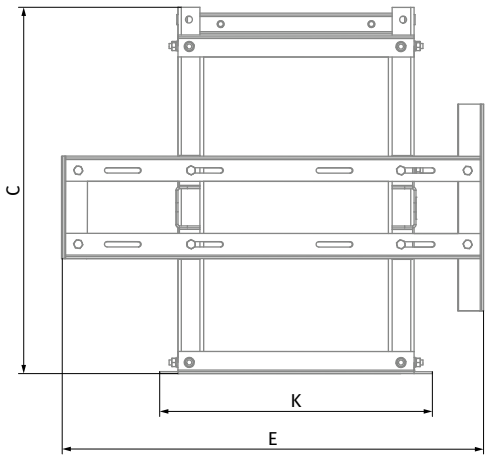
Mounting:
H: horizontal (floor)
V: vertical (wall)

Dimensions [mm]

MF-BOX-S WITH VERTICAL FAN INSTALLATION

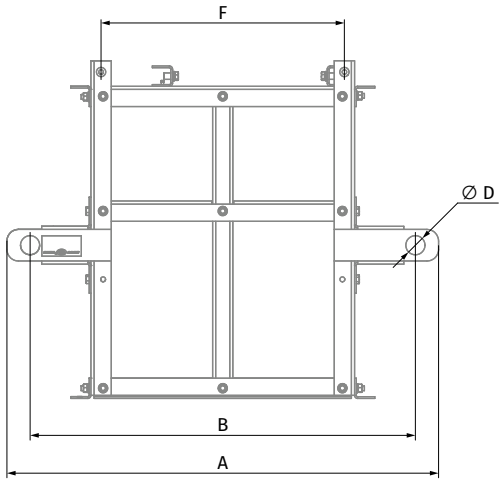
Model	A	B	C	S	F	K	N	R	P	Q	T	E	∅ d	∅ D	Weight [kg]
MF-Box-S 25-V	745	665	583	495	420	434	494	300	150	269	134.5	671	8.5	33	23
MF-Box-S 28-V	829	749	605	579	500	437	578	300	150	269	134.5	672	8.5	33	24
MF-Box-S 31-V	829	749	605	579	500	437	578	300	150	269	134.5	672	8.5	33	24
MF-Box-S 35-V	905	825	605	655	580	502	654	300	150	269	134.5	671	8.5	33	25.4
MF-Box-S 40-V	905	825	605	655	580	519	654	300	150	269	134.5	671	8.5	33	25.2
MF-Box-S 45-V	905	825	657	655	580	588	654	500	250	270	135	841	8.5	33	29.3
MF-Box-S 50-V	905	825	657	655	580	640	654	500	250	270	135	841	8.5	33	30

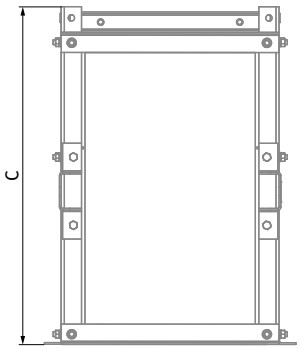


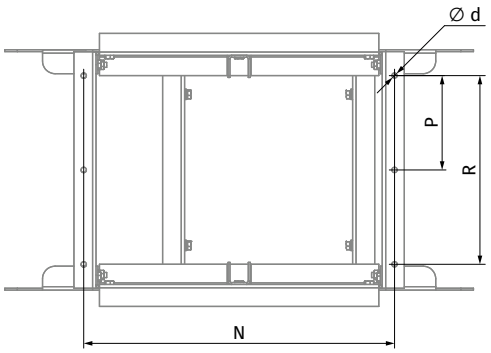


MF-BOX-S WITH HORIZONTAL INSTALLATION OF THE FAN UP TO SIZE 50

Model	A	B	C	F	K	N	R	P	∅ d	∅ D	Weight [kg]
MF-Box-S 25-H	745	665	583	420	434	494	300	150	8.5	33	16
MF-Box-S 28-H	829	749	605	500	437	578	300	150	8.5	33	17
MF-Box-S 31-H	829	749	605	500	437	578	300	150	8.5	33	17
MF-Box-S 35-H	905	825	605	580	502	654	300	150	8.5	33	19
MF-Box-S 40-H	905	825	605	580	519	654	300	150	8.5	33	18.7
MF-Box-S 45-H	905	825	657	580	588	654	500	250	8.5	33	22
MF-Box-S 50-H	905	825	657	580	640	654	500	250	8.5	33	22.5

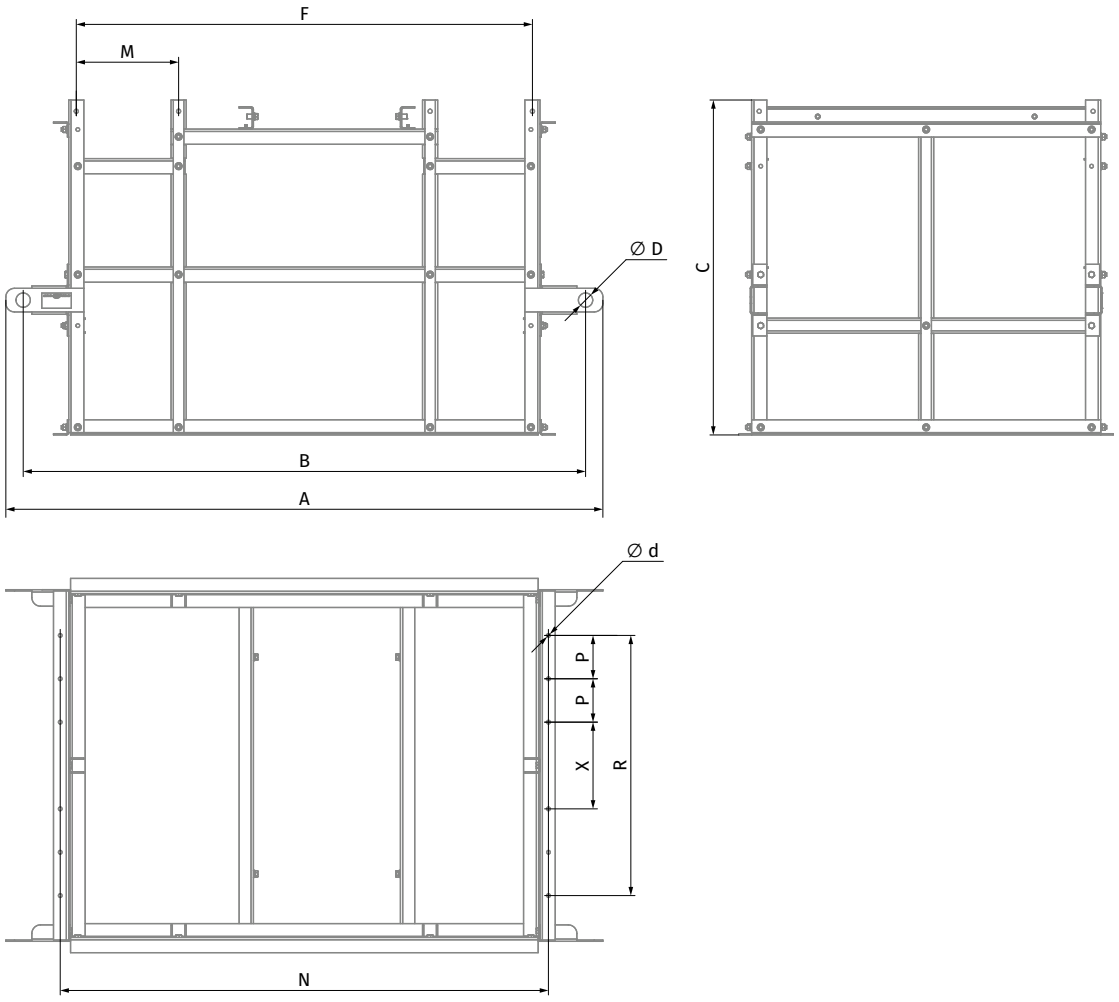




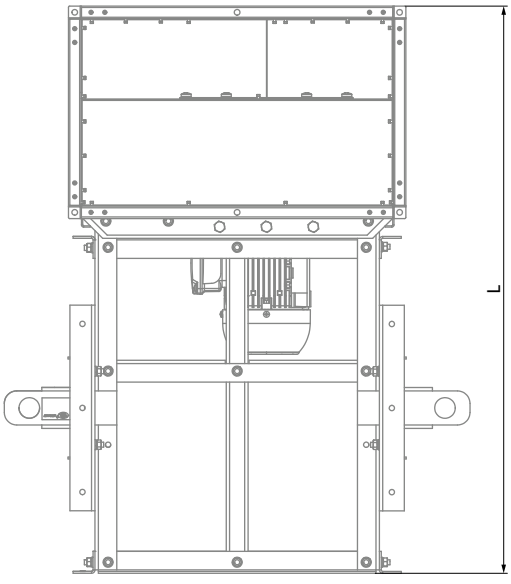


MF-BOX-S WITH HORIZONTAL INSTALLATION OF THE FAN FROM SIZE 56

Model	A	B	C	F	K	N	R	P	X	M	Ø d	Ø D	Weight [kg]
MF-Box-S 56-H	1065	985	685	740	705	814	450	125	200	-	8.5	33	27
MF-Box-S 63-H	1141	1061	675	816	780	890	600	150	300	118	8.5	33	33.8
MF-Box-S 71-H	1377	1297	772	1052	863	1126	600	100	200	236	8.5	33	39



Model	Total height L of MF-Box-S + Box-S [mm]	Total weight of MF-Box-S + Box-S [kg]
MF-Box-S 25-V	907.4	62
MF-Box-S 25-H	907.4	54
MF-Box-S 28-V	931.4	63
MF-Box-S 28-H	931.4	55
MF-Box-S 31-V	982.4	72
MF-Box-S 31-H	982.4	65
MF-Box-S 35-V	1301	73
MF-Box-S 35-H	1301	67
MF-Box-S 40-V	1131	112
MF-Box-S 40-H	1131	105
MF-Box-S 45-V	1281	115
MF-Box-S 45-H	1281	108
MF-Box-S 50-V	1281	126
MF-Box-S 50-H	1281	118
MF-Box-S 56-H	1409	130
MF-Box-S 63-H	1500	163
MF-Box-S 71-H	1702	228

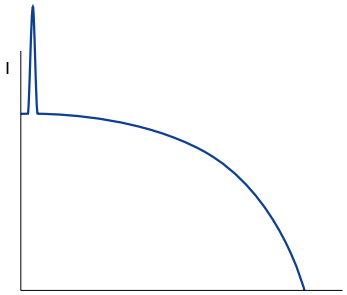


Operation of fans with frequency converters

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

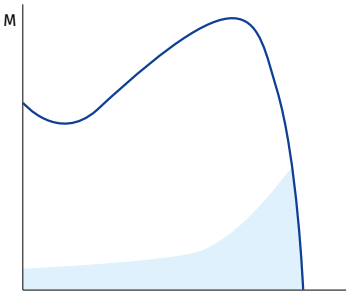
DIRECT ON-LINE STARTING (DOL)

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.



Current diagram with direct on-line starting

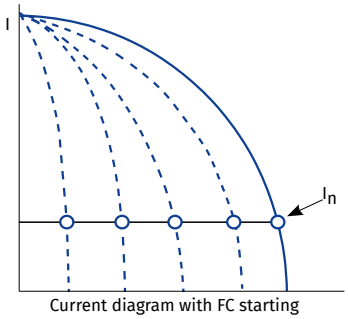
Standard switchgear (automatic circuit breakers, contactors and motor starters) is not designed to withstand prolonged overloads causing the fan to shut down automatically during starting.
Using switchgear with a higher maximum current rating renders the electric motor protection system less sensitive.
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.



Torque diagram with direct on-line starting

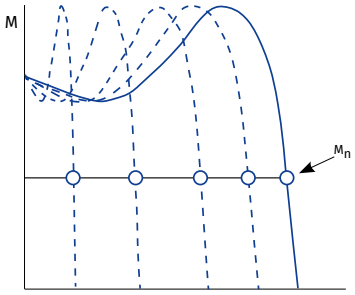
FREQUENCY CONVERTER

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.



Current diagram with FC starting

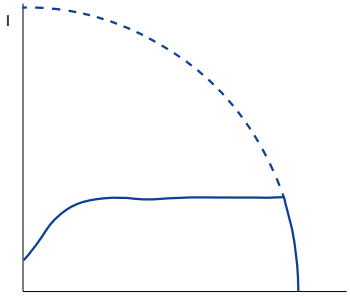
During the starting the FC raises the frequency from 0 Hz to the electrical mains frequency (50 or 60 Hz).
As the frequency is increased gradually, the motor can be assumed to operate at its nominal speed for a given frequency value.
Furthermore, on the assumption that the motor runs at its nominal speed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



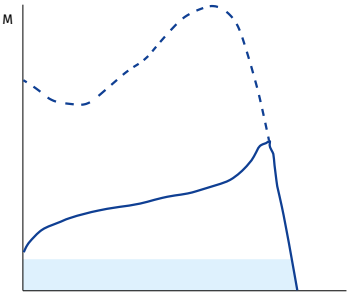
Torque diagram with FC starting

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



Current diagram with soft starter



Torque diagram with soft starter

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.

ATV320 AND FC-101: WHEN TO USE?

This catalogue features two series of frequency converters: ATV320 and FC-101.
The ATV320 series is only suitable for general ventilation systems.
If intended for a smoke extraction system, the fans should be fitted with the FC-101 series units as they feature an integrated fire mode.
When activated the integrated protection equipment of the frequency converter is overridden enabling the unit to continue operation despite the possibility of sustaining irreparable damage due to overheating or overloading.
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.

Basic Drive FC-101

Frequency converters



Use

- 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 shut-down. While in this mode the drive continues to perform speed regulation duty for mission-critical fans irrespective of control signals, warnings and alarms which may otherwise force it shut down.

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 SKU code

Power [kW]	Current [A]	VLT® FC 101 HVAC 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	131N0177	131N0178
1.5	3.7	–	131L9863	131N0179	131N0180
2.2	5.3	–	131L9864	131N0181	131N0182
3	7.2	–	131L9865	131N0183	131N0184
4	9.1	–	131L9866	131N0185	131N0186
5.5	12	–	131L9867	131N0187	131N0188
7.5	15.5	–	131L9868	131N0189	131N0190
11	23	–	131L9869	131N0191	131N0192
15	31	–	131L9870	131N0193	131N0194
18	37	–	131L9871	131N0195	131N0196
22	42.5	–	131L9872	131N0197	131N0198
30	61	131L9873	131L9875	131N0201	131N0202
37	73	131L9881	131L9883	131N0205	131N0206
45	90	131L9889	131L9891	131N0209	131N0210
55	106	131L9897	131L9899	131N0213	131N0214
75	147	131L9905	131L9907	131N0217	131N0218
90	177	131L9913	131L9915	131N0221	131N0222
Casing		(E20) IP20/Chassis	(E20) IP20/Chasis	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	Integral	Integral

VLT® HVAC 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 HVAC Basic Drive frequency converter options

Order code	Description
132B0200	Operator's digital panel
132B0201	Kit for remote mounting of the operator panel to an IP55 cabinet, including 3 m cable
132B0202	Decoupling plate for H1 and H2 standard sizes
132B0204	Decoupling plate for H3 standard size
132B0205	Decoupling plate for H4 and H5 standard sizes
132B0207	Decoupling plate for H6 standard size
132B0242	Decoupling plate for H6 standard size (extra large)

Order code	Description
132B0208	Decoupling plate for H7 standard size
132B0243	Decoupling plate for H7 standard size (extra large)
132B0209	Decoupling plate for H8 standard size
132B0244	External EMC filter class A1/B1 for power output from 0.37 to 2.2 kW
132B0245	External EMC filter class A1/B1 for power output from 3 to 7.5 kW
132B0246	External EMC filter class A1/B1 for power output from 11 to 15 kW
132B0247	External EMC filter class A1/B1 for power output from 18.5 to 22 kW

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