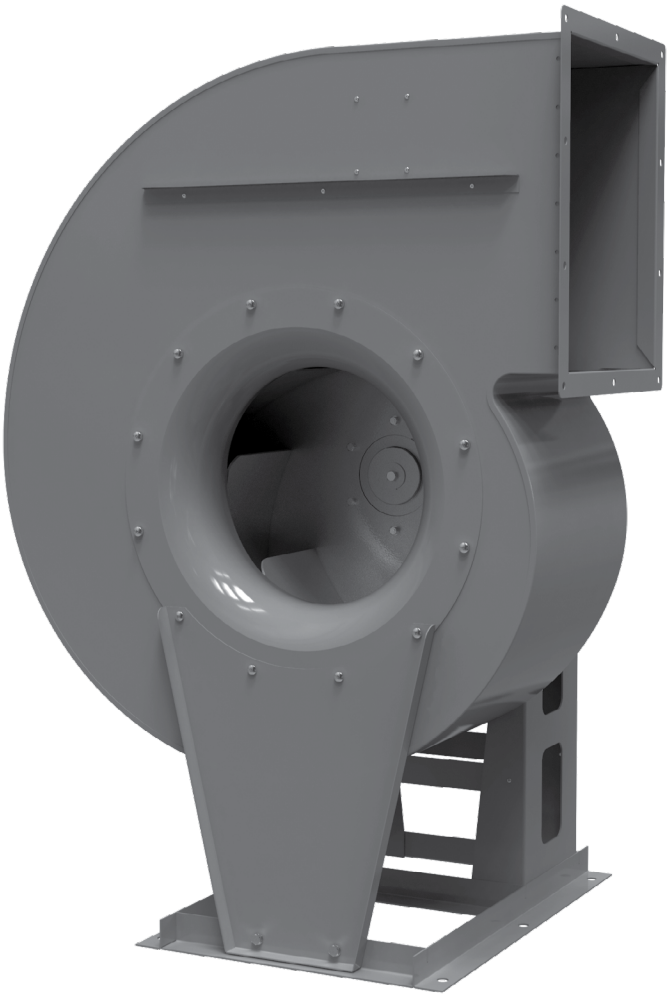


CENTRIFUGAL FAN FOR SMOKE EXTRACTION WITH DIRECT DRIVE

VOLUTE-S

EN *USER'S MANUAL*

BLAUBERG

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This user's manual is a main operating document intended for technical, maintenance, and operating staff.
The manual contains information about purpose, technical details, operating principle, design, and installation of the VOLUTE-S unit and all its modifications.
Technical and maintenance staff must have theoretical and practical training in the field of ventilation systems and should be able to work in accordance with workplace safety rules as well as construction norms and standards applicable in the territory of the country.

SAFETY REQUIREMENTS

This unit is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the unit by a person responsible for their safety.
Children should be supervised to ensure that they do not play with the unit.
This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
Cleaning and user maintenance shall not be done by children without supervision.
Children shall not play with the appliance.

Connection to the mains must be made through a disconnecting device, which is integrated into the fixed wiring system in accordance with the wiring rules for design of electrical units, and has a contact separation in all poles that allows for full disconnection under overvoltage category III conditions.

Ensure that the unit is switched off from the supply mains before removing the guard.

Precautions must be taken to avoid the back-flow of gases into the room from the open flue of gas or other fuel-burning appliances.

The appliance may adversely affect the safe operation of appliances burning gas or other fuels (including those in other rooms) due to back flow of combustion gases. These gases can potentially result in carbon monoxide poisoning. After installation of the unit the operation of flued gas appliances should be tested by a competent person to ensure that back flow of combustion gases does not occur.

All operations described in this manual must be performed by qualified personnel only, properly trained and qualified to install, make electrical connections and maintain ventilation units.
Do not attempt to install the product, connect it to the mains, or perform maintenance yourself. This is unsafe and impossible without special knowledge.
Disconnect the power supply prior to any operations with the unit.
All user's manual requirements as well as the provisions of all the applicable local and national construction, electrical, and technical norms and standards must be observed when installing and operating the unit.
Disconnect the unit from the power supply prior to any connection, servicing, maintenance, and repair operations.
Connection of the unit to power mains is allowed by a qualified electrician with a work permit for the electric units up to 1000 V after careful reading of the present user's manual.
Check the unit for any visible damage of the impeller, the casing, and the grille before starting installation. The casing internals must be free of any foreign objects that can damage the impeller blades.
While mounting the unit, avoid compression of the casing! Deformation of the casing may result in motor jam and excessive noise.
Misuse of the unit and any unauthorised modifications are not allowed.
Transported air must not contain any dust or other solid impurities, sticky substances, or fibrous materials.
Do not use the unit in a hazardous or explosive environment containing spirits, gasoline, insecticides, etc.
Do not close or block the intake or extract vents in order to ensure the efficient air flow.
Do not sit on the unit and do not put objects on it.
The information in this user's manual was correct at the time of the document's preparation.
The Company reserves the right to modify the technical characteristics, design, or configuration of its products at any time in order to incorporate the latest technological developments.
Never touch the unit with wet or damp hands.
Never touch the unit when barefoot.
Do not install or use the product until all construction and finishing work has been completed in the room where it is to be installed.
BEFORE INSTALLING ADDITIONAL EXTERNAL DEVICES, READ THE RELEVANT USER MANUALS.



THE PRODUCT MUST BE DISPOSED SEPARATELY AT THE END OF ITS SERVICE LIFE.
DO NOT DISPOSE THE UNIT AS UNSORTED DOMESTIC WASTE.

PURPOSE

The dual-purpose centrifugal fan for smoke extraction with direct drive is used in emergency exhaust ventilation systems for the forced removal of smoke, heated gases and combustion products, as well as in general exhaust ventilation systems in shopping centres, garages, warehouses, as well as in kitchens where the use of grease filters is mandatory. The unit is a component part and is not designed for independent operation. The unit is rated for continuous operation. The transported air must not contain flammable or explosive mixtures, chemically active fumes, grease or other substances that contribute to the formation of harmful substances (poison, pathogens).

DELIVERY SET

Name	Number
Fan	1 pc.
User's manual	1 pc.
Packing box	1 pc.

DESIGNATION KEY

VOLUTE-S 40-2 D/4-R 0-U 1-400/2 60 Hz

Power supply frequency
– 50Hz
60Hz – 60Hz

Fire resistance rating/hours
120: 120 °C for a long time
400/2: 400 °C/2 h

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

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

Casing rotation angle

Casing design
R – right-hand

Motor power, kW

Number of phases
D: three-phase

Number of poles
2, 4, 6, 8

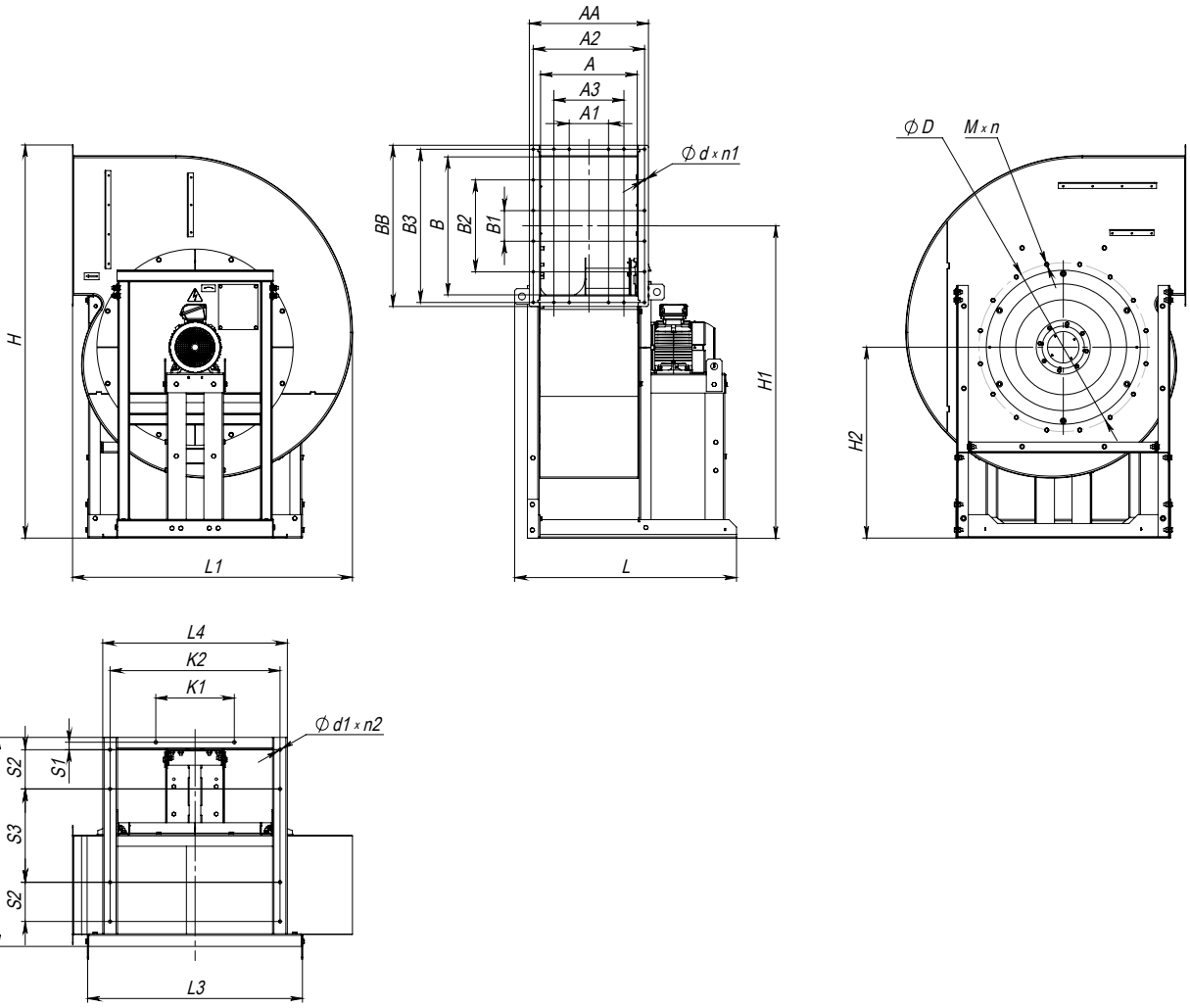
Impeller size, sm

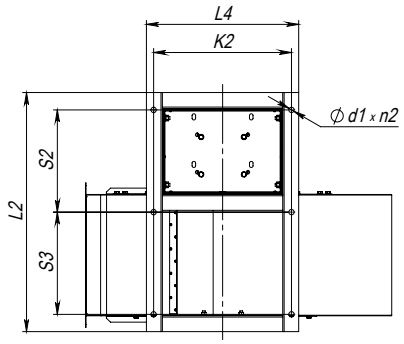
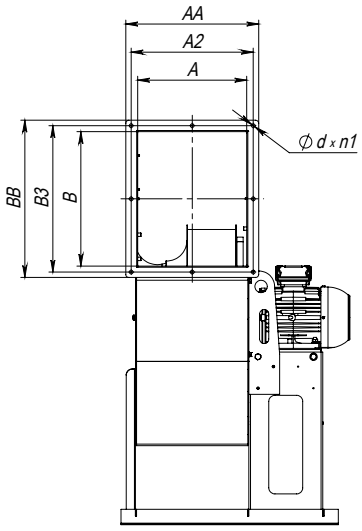
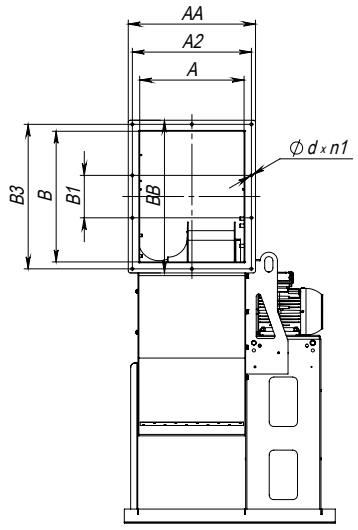
Product designation
VOLUTE-S: Centrifugal fan for smoke extraction with direct drive

TECHNICAL DATA

The unit is designed for application with the ambient temperature ranging from -20 °C up to +40 °C and relative humidity up to 80 %.
The fan is designed to remove smoke and air mixtures up to +400 °C for 120 minutes and to operate continuously with the temperature of the transported medium up to +120 °C.
Engines with a power of 15 kW and above must be connected to the power grid using a soft start device.
The fan body is made of steel with a polymer coating that corresponds to the atmospheric category of the environment environment C3 according to the ISO 12944-2 standard.
According to the type of protection against electric shock, the product belongs to Class 1 devices in accordance with ISO 12.2.007-75.
The motor protection class according to IEC 60034-5 is IP55.
The unit design is constantly being improved, thus some models may be slightly different from those described in this manual.

OVERALL DIMENSIONS AND POSITIONING OPTIONS OF THE VOLUTE-S FAN CASING



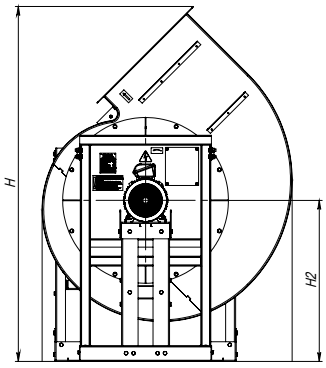
Bottom view	Front view	Front view
VOLUTE-S-28; VOLUTE-S-31.5; VOLUTE-S-35.5; VOLUTE-S 40; VOLUTE-S 45; VOLUTE-S 50; VOLUTE-S 56; VOLUTE-S 63; VOLUTE-S 71	**VOLUTE-S-28; VOLUTE-S-31.5; VOLUTE-S-35.5; VOLUTE-S 40; VOLUTE-S 45; VOLUTE-S 50; VOLUTE-S 56**	**VOLUTE-S 63; VOLUTE-S 71**
		

Model	H	H1	H2	L	L1	D	M	n	A	B	AA	BB	A1	A2	A3
VOLUTE-S 28-2D/0.55-400/2	735	590	400	480	475	325	M6	8	190	225	245	285	–	220	–
VOLUTE-S 31.5-2D/1.1-400/2	805	650	435	530	535	355	M6	8	207	252	265	315	–	235	–
VOLUTE-S 31.5-4D/0.25-400/2															
VOLUTE-S 35.5-2D/2.2-400/2	895	720	480	555	595	395	M8	8	227	284	285	350	–	255	–
VOLUTE-S 35.5-4D/0.37-400/2															
VOLUTE-S 40-2D/4-400/2	966	771	498	648	655	450	M6	12	258	316	334	390	–	300	–
VOLUTE-S 40-4D/0.37-400/2															
VOLUTE-S 45-2D/7.5D-400/2	1078	863	556	767	734	500	M6	12	283	356	360	430	–	325	–
VOLUTE-S 45-4D/0.75-400/2															
VOLUTE-S 50-4D/1.5-400/2	1186	951	607	705	813	560	M10	12	316	390	400	470	–	360	–
VOLUTE-S 50-6D/0.37-400/2															
VOLUTE-S 50-4D/3.0-400/2															
VOLUTE-S 56-4D/2.2-400/2	1312	1057	671	742	901	620	M10	12	353	436	431	510	–	396	–
VOLUTE-S 56-6D/0.75-400/2															
VOLUTE-S 63-6D/1.5-400/2	1469	1186	753	787	1014	690	M10	12	397	491	475	565	–	440	–
VOLUTE-S 63-4D/4-400/2															
VOLUTE-S 71-8D/1.1-400/2	1709	1385	897	895	1146	770	M10	16	442	554	540	648	–	505	–
VOLUTE-S 71-6D/2.2-400/2															
VOLUTE-S 71-4D/7.5-400/2															
VOLUTE-S 80-8D/2.2-400/2	2002	1592	972	1130	1426	860	M10	16	492	703	607	821	200	567	–
VOLUTE-S 80-6D/4-400/2															
VOLUTE-S 80-4D/15-400/2				1330											
VOLUTE-S 90-8D/4-400/2	2349	1900	1210	1265	1573	970	M12	16	562	782	677	900	210	637	–
VOLUTE-S 90-6D/7.5-400/2															
VOLUTE-S 90-4D/30-400/2				1415											
VOLUTE-S 100-8D/7.5-400/2	2426	1916	1125	1339	1808	1070	M12	16	613	900	728	1018	340	688	–
VOLUTE-S 100-6D/15-400/2															
VOLUTE-S 112-8D/11-400/2	2663	2103	1225	1468	2003	1190	M12	20	686	1001	801	1119	150	761	450
VOLUTE-S 112-8D/15-400/2				1595					763		878		170	838	510
VOLUTE-S 112-6D/22-400/2				1518					686		801		150	761	450
VOLUTE-S 112-6D/30-400/2				1685					763		878		170	838	510
VOLUTE-S 125-8D/22-400/2	2840	2245	1305	1651	2143	1320	M12	20	730	1071	845	1190	160	805	480
VOLUTE-S 125-6D/45-400/2				1839											

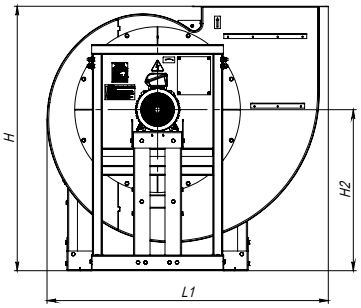
Model	B1	B2	B3	d	n1	L2	L3	L4	K1	K2	S1	S2	S3	d1	n2	Weight, kg
VOLUTE-S 28-2D/0.55-400/2	–	–	260	12	8	500	–	350	–	305	–	227,5	227,5	15	6	37,5
VOLUTE-S 31.5-2D/1.1-400/2	–	–	285	12	8	530	–	385	–	340	–	245	245	15	6	47
VOLUTE-S 31.5-4D/0.25-400/2																43
VOLUTE-S 35.5-2D/2.2-400/2	–	–	320	12	8	575	–	400	–	355	–	267,5	267,5	15	6	58
VOLUTE-S 35.5-4D/0.37-400/2																49
VOLUTE-S 40-2D/4-400/2	–	–	355	12	8	610	–	400	–	356	–	280	280	15	6	67
VOLUTE-S 40-4D/0.37-400/2																57
VOLUTE-S 45-2D/7.5D-400/2	–	–	395	12	8	705	–	450	–	406	–	328	328	15	6	112
VOLUTE-S 45-4D/0.75-400/2																65
VOLUTE-S 50-4D/1.5-400/2	–	–	434	12	8	705	–	450	–	406	–	303	303	15	6	95
VOLUTE-S 50-6D/0.37-400/2																87
VOLUTE-S 50-4D/3.0-400/2																109
VOLUTE-S 56-4D/2.2-400/2	–	–	475	12	8	705	–	450	–	406	–	303	303	15	6	110
VOLUTE-S 56-6D/0.75-400/2																100
VOLUTE-S 63-6D/1.5-400/2	180	–	530	12	10	767	–	550	–	506	–	334	334	18	6	128
VOLUTE-S 63-4D/4-400/2																148
VOLUTE-S 71-8D/1.1-400/2	180	–	613	12	10	895	–	570	–	516	–	382	382	20	6	153
VOLUTE-S 71-6D/2.2-400/2																160
VOLUTE-S 71-4D/7.5-400/2																192
VOLUTE-S 80-8D/2.2-400/2	156	468	780	13	16	1065	1094	940	400	866	38	200	475	16	10	306
VOLUTE-S 80-6D/4-400/2																308
VOLUTE-S 80-4D/15-400/2						1265							675			392
VOLUTE-S 90-8D/4-400/2	172	516	860	15	16	1200	1214	1060	400	986	106	200	475	17	10	430
VOLUTE-S 90-6D/7.5-400/2																450
VOLUTE-S 90-4D/30-400/2						1350							625			553
VOLUTE-S 100-8D/7.5-400/2	195	585	975	15	18	1321	1354	1240	550	1166	118	200	570	19	11	542
VOLUTE-S 100-6D/15-400/2																581
VOLUTE-S 112-8D/11-400/2	360	720	1080	15	22	1450	1510	1300	800	1226	87	280	600	19	11	719
VOLUTE-S 112-8D/15-400/2						1577					151					832
VOLUTE-S 112-6D/22-400/2						1500					112					786
VOLUTE-S 112-6D/30-400/2						1667					96		800			887
VOLUTE-S 125-8D/22-400/2	380	760	1140	15	22	1633	1590	1380	900	1306	59	300	400	19	13	982
VOLUTE-S 125-6D/45-400/2						1699										1334

Model	H(45°)	H(0°)	H(315°)	H(270°)	H2(45°)	H2(0°)	H2(315°)	H2(270°)	L1(45°)	L1(0°)	L1(315°)	L1(270°)
VOLUTE-S 28-2D/0.55-400/2	795	625	595	475	400	400	400	400	470	545	625	610
VOLUTE-S 31.5-2D/1.1-400/2	875	685	655	670	435	435	435	435	530	610	700	535
VOLUTE-S 31.5-4D/0.25-400/2												
VOLUTE-S 35.5-2D/2.2-400/2	970	755	725	745	480	480	480	480	600	680	780	595
VOLUTE-S 35.5-4D/0.37-400/2												
VOLUTE-S 40-2D/4-400/2	1020	777	757	776	498	498	498	498	672	765	867	655
VOLUTE-S 40-4D/0.37-400/2												
VOLUTE-S 45-2D/7.5-400/2	1107	835	816	837	556	556	556	556	755	856	970	733
VOLUTE-S 45-4D/0.75-400/2												
VOLUTE-S 50-4D/1.5-400/2	1276	974	955	978	607	607	607	607	840	950	1076	813
VOLUTE-S 50-6D/0.37-400/2												
VOLUTE-S 50-4D/3.0-400/2												
VOLUTE-S 56-4D/2.2-400/2	1408	1073	1060	1087	671	671	671	671	940	1055	1190	900
VOLUTE-S 56-6D/0.75-400/2												
VOLUTE-S 63-6D/1.5-400/2	1578	1204	1190	1220	753	753	753	753	1056	1182	1336	1013
VOLUTE-S 63-4D/4-400/2												
VOLUTE-S 71-8D/1.1-400/2	1846	1422	1390	1423	895	895	895	895	1191	1338	1514	1146
VOLUTE-S 71-6D/2.2-400/2												
VOLUTE-S 71-4D/7.5-400/2												
VOLUTE-S 80-8D/2.2-400/2	2142	1596	1727	1769	972	972	1102	1102	1509	1697	1901	1426
VOLUTE-S 80-6D/4-400/2												
VOLUTE-S 80-4D/15-400/2												
VOLUTE-S 90-8D/4-400/2	2497	1892	1904	1951	1210	1210	1210	1210	1677	1880	2100	1573
VOLUTE-S 90-6D/7.5-400/2												
VOLUTE-S 90-4D/30-400/2												
VOLUTE-S 100-8D/7.5-400/2	2599	1908	2203	2257	1125	1125	1405	1405	1928	2153	2408	1808
VOLUTE-S 100-6D/15-400/2												
VOLUTE-S 112-8D/11-400/2	2854	2091	2391	2450	1225	1225	1505	1505	2140	2383	2665	2003
VOLUTE-S 112-8D/15-400/2												
VOLUTE-S 112-6D/22-400/2												
VOLUTE-S 112-6D/30-400/2												
VOLUTE-S 125-8D/22-400/2	3045	2231	2552	2616	1305	1305	1605	1605	2289	2546	2849	2143
VOLUTE-S 125-6D/45-400/2												

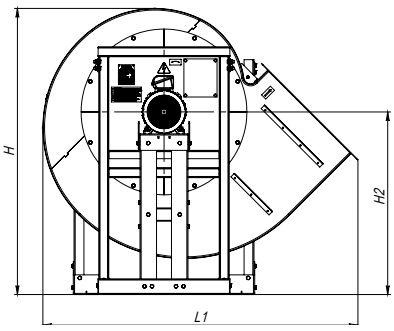
45°



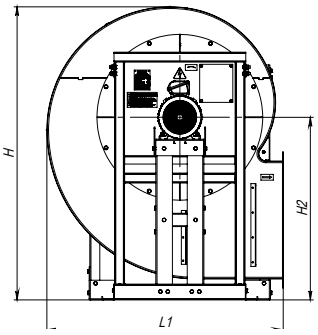
0°



315°



270°



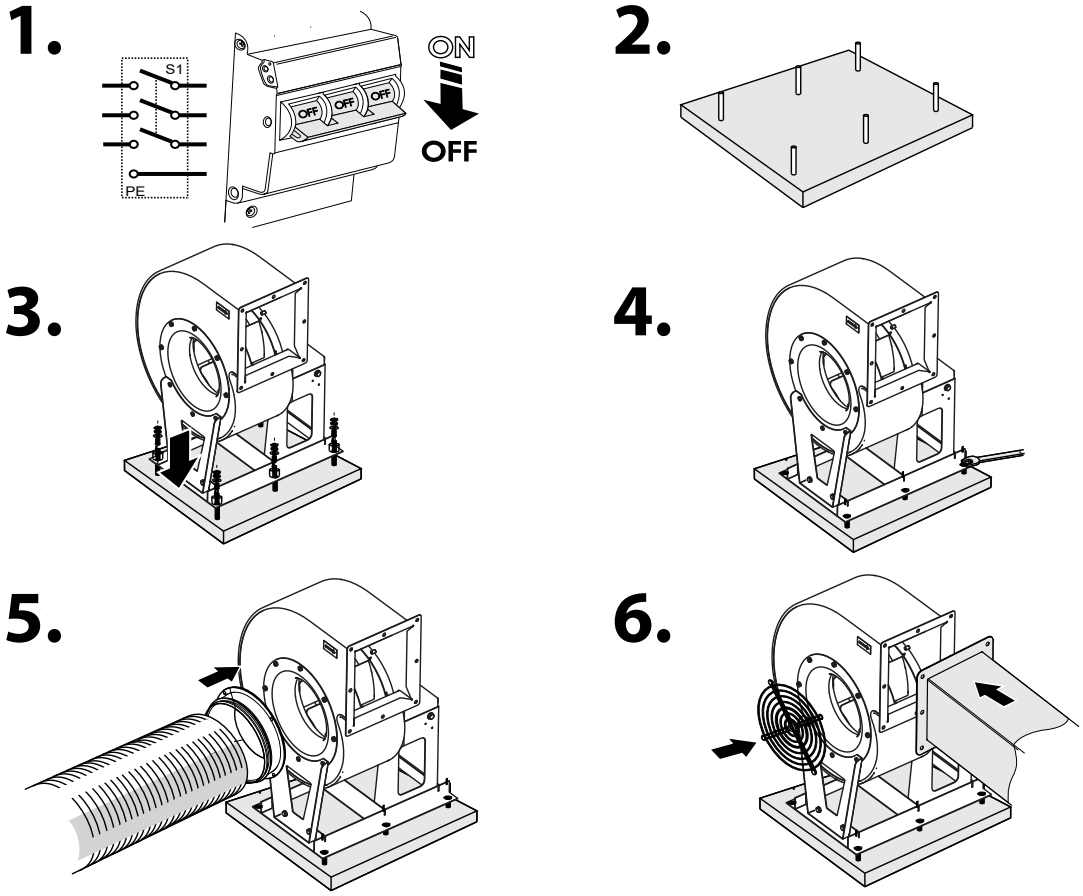
INSTALLATION AND SET-UP

After unpacking the fan and prior to its installation:
- Carefully read the instructions for installation, start-up, operation and maintenance of the fan;
- Check fan for transport damage;
- Check that the fan impeller rotates freely;
- Check that there is no condensation on the motor;
- Check the electrical resistance of the insulation between the motor windings and between each winding and the motor casing.

Follow all safety instructions when preparing the fan for the operation and during its operation.

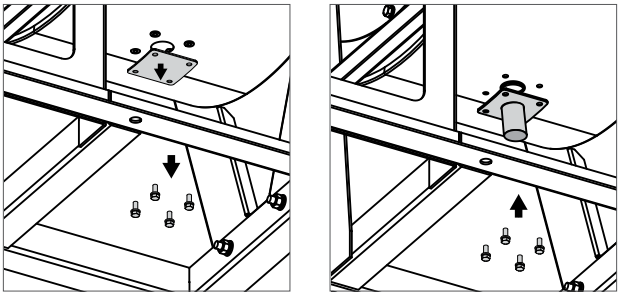
The fan mounting sequence

- Check that the power is not supplied to the motor (Fig. 1).
- Drill holes and secure the bracket using suitable fasteners (e.g. dowels), if necessary, use vibration damping inserts VVCr or VVCp (optional) (Fig. 3).
- Ground the fan (Fig. 4).
- Connect air ducts to the fan. On the air supply side, use the FVC-VCD flange (optional) (Fig. 5) or install the RVC-VCD protective grille (Fig. 6).



After installing the product, check again that the fan impeller rotates freely.

Fans with a housing rotation angle of 45°, 0°, 90°, 315° are equipped with a condensate drain pipe.
To do this, remove the cover plate from the housing, then install the drain pipe in the same place and connect the condensate drainage system to it, drain pipe (included).



CONNECTION TO POWER MAINS

POWER OFF THE POWER SUPPLY PRIOR TO ANY OPERATIONS WITH THE UNIT.
THE UNIT MUST BE CONNECTED TO POWER SUPPLY BY A QUALIFIED ELECTRICIAN.
THE RATED ELECTRICAL PARAMETERS OF THE UNIT ARE GIVEN ON THE MANUFACTURER'S LABEL.

ANY TAMPERING WITH THE INTERNAL CONNECTIONS IS PROHIBITED AND WILL VOID THE WARRANTY.

The ventilator is designed for connection to power mains with the parameters specified in the technical data table.
The connection must be made using durable, insulated and heat-resistant conductors.
When selecting the conductors, it is necessary to take into account the maximum permissible heating temperature of the wire, which depends on the type of wire, its insulation, length and method of laying - in the open, in cable ducts, inside the wall.
The external lead-in must be equipped with a circuit breaker built into the stationary wiring.
The position of the circuit breaker must ensure free access for quick unit power-off.
The rated current of the circuit breaker must correspond to the current consumption of the product (see "Technical data").

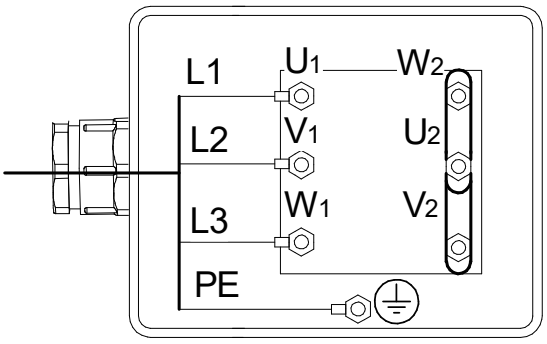
The fan connection sequence

- Check that there is no voltage on the power supply cable;
- Remove the cover from the terminal box located on the motor casing;
- Route the mains wires through the sealing gland located on the terminal box and strip the insulation from the ends of the wires to a length of 7-8 mm;
- Connect the wires to the terminal block in accordance with the wiring diagram and terminal designations;
- Reinstall the terminal box cover.

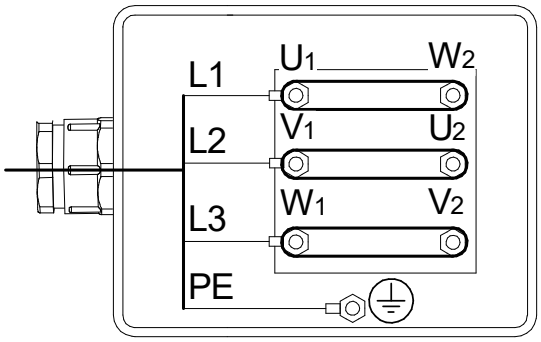
The air flow direction must be the same as indicated by an arrow on the fan casing.
Switch on the fan briefly to check the correct rotation direction of the impeller.
If the rotation direction does not correspond to the specified direction, switch any two phases at the motor terminals by reversing the corresponding wires on the terminal block in the terminal box.

FAN ELECTRICAL CONNECTION WIRING DIAGRAMS

Star connection of 400 V, 50/60 Hz three-phase motor



Delta connection of 400 V, 50/60 Hz three-phase motor



ASYNCHRONOUS ELECTRIC MOTOR STARTING METHODS

There are several methods for starting asynchronous squirrel-cage electric motors.
The most common methods are: direct-on-line (DOL), with a soft starter (SS) or with a frequency converter (FC).

Direct-on-line starting

In case of direct-on-line starting (i.e. by connecting the motor to the electric mains with a simple line contactor), the motor starting time significantly increases due to high inertia of the impeller, which, in turn, results in high in-rush starting currents in the circuit. These currents of long duration may cause voltage slumps (especially if the feed line section falls short of the requirements), which may affect load operation.
The in-rush current consumed by an electric motor in case of DOL starting is 5-8 times larger than the rated value (or even 10-14 times larger in some rare instances). It should be noted that the torque developed by the motor also significantly exceeds the rated value.
Upon energisation the motor operates as a transformer with a squirrel-cage secondary winding formed by the rotor cage with a very low resistance.
The rotor develops high induced current causing a rush of current in the feed line.
The startup torque during starting averages 0.5-1.5 of the rated torque value.

Despite such advantages as simple construction, high startup current, quick start and low cost, direct-on-line systems are suitable only in the following cases:

- the motor power is low compared to the mains power which limits the adverse effect of the rush of current
- the driven mechanism does not require gradual speed build-up or is equipped with a damping device to smooth out the inrush
- the high startup torque has no adverse effects on the operation of the driven mechanism

Soft start. SS starting

A soft starter gradually increases the voltage supplied to the motor – from the initial to the rated value.
This starting system can be used to meet the following goals:

- limit the motor current
- regulate the torque

Regulation by limiting the current sets the maximum in-rush current equal to 300-400 % (or 250 % in some rare instances) of the rated current and reduces torque characteristics. This type of regulation is especially suited for turbomachinery such as centrifugal pumps and fans.
Regulation by variation of torque optimizes the torque during startup and reduces in-rush current in the circuit. These conditions are suitable for mechanisms with constant load resistance.
This type of soft starting may differ in the implementation pattern:

- motor start
- motor start and stop
- device bridging at the end of start sequence
- start and stop of several motors in stage circuits

Soft start. 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 rated speed for a given frequency value. Furthermore, on the assumption that the motor runs at its rated speed the nominal torque should be immediately available whereas the current will be approximately equal to the rated value.
This starting system is used for speed control and regulation and can be used in the following cases:

- start with high-inertia load
- start with high load and limited-capacity power supply source
- optimization of electric power consumption depending on turbomachinery speed

The aforementioned starting system can be used for all types of mechanisms.

Problems associated with DOL starting

The problems caused by DOL starting may be divided into two groups:

1. An abrupt start causes mechanical shock, jolts in the mechanism, shock removal of free play etc.
2. A heavy start cannot be completed.

Let us review three variations of a heavy start:

1. The feed line performance is barely sufficient or insufficient to maintain the induced current.

Typical symptoms: Upon starting the circuit breakers at the system input are tripped; the lights, certain relays and contactors go off, and the supply generator shuts down.

Solution: In the best-case scenario an SS device may help reduce the in-rush current to 250 % of the motor rated current. If this is insufficient, an FC is necessary.

2. The motor cannot start the mechanism with DOL starting.

Typical symptoms: The motor fails to turn or "freezes" at certain speed which is maintained until actuation of the protection suite.

Solution: This problem may not be solved with an SS device. The motor develops insufficient shaft torque. However, this problem can be addressed by using an FC, but each case may be different.

3. The motor spins up the mechanism with authority, but fails to reach the rated rotation speed.

Typical symptoms: The input automatic circuit breaker is tripped during spin-up. This often happens with heavy-weight fans with a considerable rotation speed.

Solution: Such problems may be addressed with an SS device, but not with 100 % certainty. The closer the motor speed to the rated value during the actuation of the protective equipment, the higher the chances of success. The use of an FC in this case helps solve the problem fundamentally.

Standard switching equipment (automatic circuit breakers, contactors and motor starters) is not designed to withstand prolonged overloads normally causing the fan to shut down automatically DOL starting that continues for a long period of time.

Using switching equipment with a higher maximum current rating renders the electric motor protection system less sensitive. As a result the switching equipment will not be able to detect motor overload in time due to a high current sensing threshold. Such problems as mentioned above can only be addressed by utilizing a soft starter or a frequency converter to start the fan.

COMMISSIONING

MAKE SURE THAT THE FAN IMPELLER ROTATES IN THE DIRECTION MARKED BY THE ARROW ON THE FAN CASING.

IF NECESSARY, CHANGE THE IMPELLER ROTATION DIRECTION BY ALTERING THE PHASE SEQUENCE ON THE ELECTRIC MOTOR TERMINALS.

DURING STARTING THE IN-RUSH CURRENTS OF THE FAN MAY SEVERAL TIMES EXCEED THE RATED VALUES.

SEE "ASYNCHRONOUS ELECTRIC MOTOR STARTING METHODS" IN THE "CONNECTION TO POWER MAINS" SECTION

- After the fan start-up, make sure that the motor rotates correctly, without vibrations or external noise.
- Make sure that the fan impeller rotates in the direction marked by the arrow on the fan casing.
- If necessary, change the impeller rotation direction by reversing the phase order (for three-phase motors) or rewire the connection according to the diagram inside the terminal box (for single-phase motors).
- Check that the power consumption of the fan does not exceed the value indicated on the equipment nameplate and that the motor does not overheat excessively.
- It is recommended to check the phase current after the fan has reached its rated operation.
- Do not switch the fan on and off rapidly several times in a row, as this may damage the motor winding or insulation due to overheating.

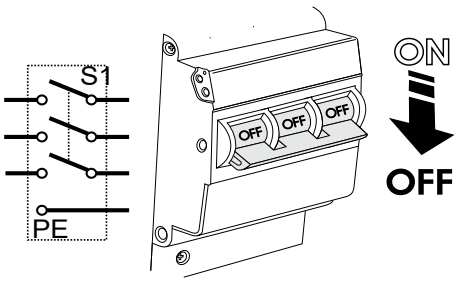
TECHNICAL MAINTENANCE

Prior to performing any technical maintenance and repair disconnect the fan from the electric mains and wait until its rotating parts come to a complete stop.
The technical maintenance includes periodic cleaning of the surfaces from accumulated dust and dirt.
The impeller blades require thorough cleaning once in 6 months.
Technical maintenance steps are as follows:

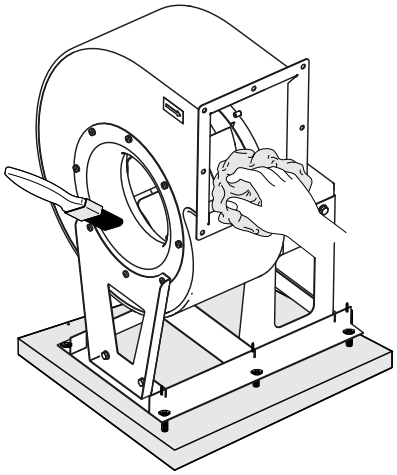
- Disconnect the unit from power supply.
- Ensure access to the impeller blades;
- Unscrew the screws and remove the ring;
- Clean the impeller blades using a soft, dry brush or compressed air;
- If the fan is heavily soiled, wet cleaning is recommended. Clean the impeller blades with a soft cloth dampened in an aqueous solution of neutral detergent. At the same time, avoid exposing the motor to moisture.

After cleaning, perform all operations in the reverse order.

1.



2.



Technical maintenance guidelines

Perform regular maintenance of the fan to ensure reliable, safe and efficient operation.
General technical maintenance includes:

- Daily maintenance;
- Technical maintenance (**TM-1**) after 1,000 hours;
- Current repairs after 10,000 hours;
- Major repairs after 20,000 hours. All types of work must be performed according to the schedule regardless of the technical condition of the fan.
- Daily maintenance is performed by a 4th or 5th category technician.
- Current repairs and major repairs are carried out by a technician and an electrician qualified to repair and operate such equipment.

Daily maintenance involves:

- Checking tightness of the bolts;
- Checking reliability of the grounding connection;
- Checking for absence of external noise.

TM-1 involves:

- Completing the daily maintenance routine;
- Eliminating defects of bolted and welded connections;
- Checking the gap between the impeller and the manifold.

Current repairs involve:

- Performing the TM-1 routine;
- Cleaning the housing and impeller from dirt.

Major repairs involve:

- Disconnecting the air ducts;
- Performing unit disassembly;
- Performing unit assembly using new or repaired details;
- Checking lubrication in the bearings, checking unit position.

TROUBLESHOOTING

Problem	Possible reasons	Troubleshooting
The fan does not start.	No power supply.	Make sure the power supply line is connected correctly, otherwise troubleshoot the connection error.
	Jammed motor.	Turn off the fan. Troubleshoot the motor jamming. Turn on the fan again.
When the device is switched on, the circuit breaker protection is activated.	Overcurrent as a result of short circuit in the electric circuit.	Turn off the fan. Contact the Seller.
Noise, vibration.	The fan impeller is soiled.	Clean the impellers.
	Loose tightening of screw connections.	Check and tighten the screw connections if necessary.
	Resonance with the mounting structure.	Use the VVCr and VVCp vibration isolators recommended for your fan model.

STORAGE AND TRANSPORTATION REGULATIONS

- Store the unit in the manufacturer's original packaging box in a dry closed ventilated premise with temperature range from +5 °C to + 40 °C and relative humidity up to 70 %.
- Storage environment must not contain aggressive vapors and chemical mixtures provoking corrosion, insulation, and sealing deformation.
- Use suitable hoist machinery for handling and storage operations to prevent possible damage to the unit.
- Follow the handling requirements applicable for the particular type of cargo.
- The unit can be carried in the original packaging by any mode of transport provided proper protection against precipitation and mechanical damage. The unit must be transported only in the working position.
- Avoid sharp blows, scratches, or rough handling during loading and unloading.
- Prior to the initial power-up after transportation at low temperatures, allow the unit to warm up at operating temperature for at least 3-4 hours.

MANUFACTURER'S WARRANTY

The product is in compliance with EU norms and standards on low voltage guidelines and electromagnetic compatibility. We hereby declare that the product complies with the provisions of Electromagnetic Compatibility (EMC) Directive 2014/30/EU of the European Parliament and of the Council, Low Voltage Directive (LVD) 2014/35/EU of the European Parliament and of the Council and CE-marking Council Directive 93/68/EEC. This certificate is issued following test carried out on samples of the product referred to above.
The manufacturer hereby warrants normal operation of the unit for 24 months after the retail sale date provided the user's observance of the transportation, storage, installation, and operation regulations. Should any malfunctions occur in the course of the unit operation through the Manufacturer's fault during the guaranteed period of operation, the user is entitled to get all the faults eliminated by the manufacturer by means of warranty repair at the factory free of charge. The warranty repair includes work specific to elimination of faults in the unit operation to ensure its intended use by the user within the guaranteed period of operation. The faults are eliminated by means of replacement or repair of the unit components or a specific part of such unit component.

The warranty repair does not include:

- routine technical maintenance
- unit installation/dismantling
- unit setup

To benefit from warranty repair, the user must provide the unit, the user's manual with the purchase date stamp, and the payment paperwork certifying the purchase. The unit model must comply with the one stated in the user's manual. Contact the Seller for warranty service.

The manufacturer's warranty does not apply to the following cases:

- User's failure to submit the unit with the entire delivery package as stated in the user's manual including submission with missing component parts previously dismounted by the user.
- Mismatch of the unit model and the brand name with the information stated on the unit packaging and in the user's manual.
- User's failure to ensure timely technical maintenance of the unit.
- Damage to the unit casing and internal components caused by the user.
- Redesign or engineering changes to the unit.
- Replacement and use of any assemblies, parts and components not approved by the manufacturer.
- Unit misuse.
- Violation of the unit installation regulations by the user.
- Violation of the unit control regulations by the user.
- Unit connection to power mains with a voltage different from the one stated in the user's manual.
- Unit breakdown due to voltage surges in power mains.
- Discretionary repair of the unit by the user.
- Unit repair by any persons without the manufacturer's authorization.
- Expiration of the unit warranty period.
- Violation of the unit transportation regulations by the user.
- Violation of the unit storage regulations by the user.
- Wrongful actions against the unit committed by third parties.
- Unit breakdown due to circumstances of insuperable force (fire, flood, earthquake, war, hostilities of any kind, blockades).
- Missing seals if provided by the user's manual.
- Failure to submit the user's manual with the unit purchase date stamp.
- Missing payment paperwork certifying the unit purchase.

FOLLOWING THE REGULATIONS STIPULATED HEREIN WILL ENSURE A LONG AND TROUBLE-FREE OPERATION OF THE UNIT

USER'S WARRANTY CLAIMS SHALL BE SUBJECT TO REVIEW ONLY UPON PRESENTATION OF THE UNIT, THE PAYMENT DOCUMENT AND THE USER'S MANUAL WITH THE PURCHASE DATE STAMP

CERTIFICATE OF ACCEPTANCE

Unit Type	Centrifugal fan for smoke extraction with direct drive
Model	
Serial Number	
Manufacture Date	
Quality Inspector's Stamp	

SELLER INFORMATION

Seller	
Address	
Phone Number	
E-mail	
Purchase Date	
This is to certify acceptance of the complete unit delivery with the user's manual. The warranty terms are acknowledged and accepted.	
Customer's Signature	

Seller's Stamp

INSTALLATION CERTIFICATE

The _____ unit is installed pursuant to the requirements stated in the present user's manual.		
Company name		
Address		
Phone Number		
Installation Technician's Full Name		
Installation Date:	**Signature:**	
The unit has been installed in accordance with the provisions of all the applicable local and national construction, electrical and technical codes and standards. The unit operates normally as intended by the manufacturer.		
Signature:		

Installation Stamp

WARRANTY CARD

Unit Type	Centrifugal fan for smoke extraction with direct drive
Model	
Serial Number	
Manufacture Date	
Purchase Date	
Warranty Period	
Seller	

Seller's Stamp



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