

**VS**



Duct centrifugal fan in sound insulated casing

**CONTENTS**

Safety requirements.....	3
Purpose.....	5
Delivery set.....	5
Designation key.....	5
Technical data.....	6
Design and functioning .....	9
Mounting and set-up.....	10
Connection to power mains .....	11
Commissioning.....	16
Technical maintenance.....	16
Troubleshooting.....	17
Storage and transportation regulations.....	17
Product sales .....	17
Manufacturer's warranty .....	18
Certificate of acceptance.....	19
Seller information .....	19
Installation certificate.....	19
Warranty card.....	19

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 VS 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 made 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.

**CAUTION:** In order to avoid a safety hazard due to inadvertent resetting of the thermal cut-out, this unit must not be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly switched on and off by the utility.

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

**WARNING:** If there are any unusual oscillating movements, immediately stop using the unit and contact the manufacturer, its service agent or suitably qualified persons.

The replacement of parts of the safety suspension system device shall be performed by the manufacturer, its service agent or suitably qualified persons.

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.

Fixing means for attachment to the ceiling such as hooks or other devices shall be fixed with a sufficient strength to withstand 4 times the weight of the appliance.

The mounting of the suspension system shall be performed by the manufacturer, its service agent or suitably qualified persons.

The appliance is to be installed so that the blades are more than 2.5m above the floor.

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.

Do not expose the unit to adverse atmospheric agents (rain, sun, etc.).

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.

**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 duct centrifugal fan in sound insulated casing is designed for supply and exhaust ventilation of domestic, public and industrial premises with high requirements to the noise level and with limited space for mounting.

The unit is rated for continuous operation.

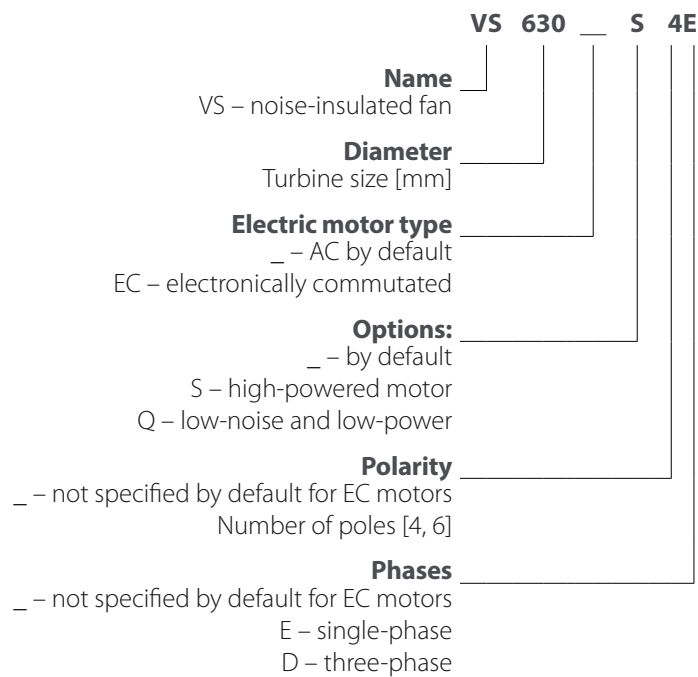
The unit is a component part and is not designed for stand-alone operation.

Transported air must not contain any flammable or explosive mixtures, evaporation of chemicals, sticky substances, fibrous materials, coarse dust, soot and oil particles or environments favourable for the formation of hazardous substances (toxic substances, dust, pathogenic germs).

## DELIVERY SET

NAME	NUMBER
Fan	1 pc.
User's manual	1 pc.
Packing box	1 pc.

## DESIGNATION KEY



**TECHNICAL DATA**

The fan is designed for operation in an enclosed area at ambient temperatures from -25 °C up to +60 °C.

The fan is rated as a class I electric appliance.

The fan design is regularly improved, thus some models may slightly differ from those ones described herein.

Ingress protection rating against access to hazardous parts and water ingress is IPX4.

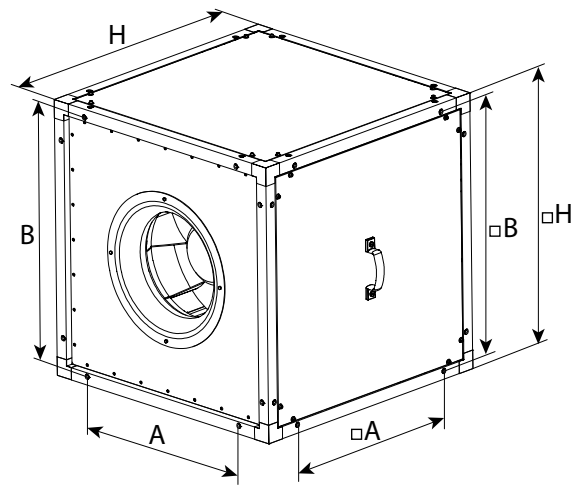
Parameter	VS 355 4E	VS 355 4D		VS 400 4E		VS 400 4D		
Voltage [V]	1~ 230	3~ 400 Y		1~ 230		3~ 400 Δ		
Frequency [Hz]	50	50	60	50	60	50	60	
Power [W]	245	230	235	480	700	515	750	
Current [A]	1.12	0.52	0.53	2.4	3.15	1.41	1.44	
Maximum air flow [m <sup>3</sup> /h]	perpendiculary	2890	2660	2815	3750	4310	3950	4310
	directly	2650	2380	2580	3535	4015	3740	4055
RPM [min <sup>-1</sup> ]	1420	1400	1600	1370	1460	1415	1610	
Sound pressure level at 3 m distance [dBA]	54	53	55	51	52	51	53	
Transported air temperature [°C]	-25...+50	-25...+70	-25...+65	-40...+80	-40...+55	-40...+60	-40...+60	

Parameter	VS 400 4D		VS 450 4E	VS 450 4D	VS 500 4E	VS 500 4D	VS 560 4D	
Voltage [V]	3~ 400 Y		1~ 230	3~ 400	1~ 230	3~ 400	3~ 400	
Frequency [Hz]	50	60	50	50	50	50	50	
Power [W]	385	515	680	740	1300	1430	2380	
Current [A]	0.7	0.93	3	1.5	5.7	3	5	
Maximum air flow [m <sup>3</sup> /h]	perpendiculary	3340	3525	5630	5700	7330	7940	11340
	directly	3110	3290	4930	5080	6680	7200	10490
RPM [min <sup>-1</sup> ]	1235	1220	1250	1350	1320	1375	1365	
Sound pressure level at 3 m distance [dBA]	47	49	53	54	55	58	56	
Transported air temperature [°C]	-40...+80	-40...+40	-40...+70	-40...+80	-20...+50	-40...+80	-40...+60	

Parameter	VS 560 6D	VS 630 4D	VS 630 S 4D	VS 630 6D	VS 710 6D	
Voltage [V]	3~ 400	3~ 400	3~ 400	3~ 400	3~ 400	
Frequency [Hz]	50	50	50	50	50	
Power [W]	780	3310	4250	1310	2000	
Current [A]	1.7	6.2	7.55	2.8	3.9	
Maximum air flow [m <sup>3</sup> /h]	perpendiculary	7970	15170	16870	12030	15830
	directly	7330	13740	14930	10440	14880
RPM [min <sup>-1</sup> ]	885	1170	1300	880	890	
Sound pressure level at 3 m distance [dBA]	49	67	69	55	59	
Transported air temperature [°C]	-40...+55	-40...+35	-40...+60	-40...+60	-20...+40	

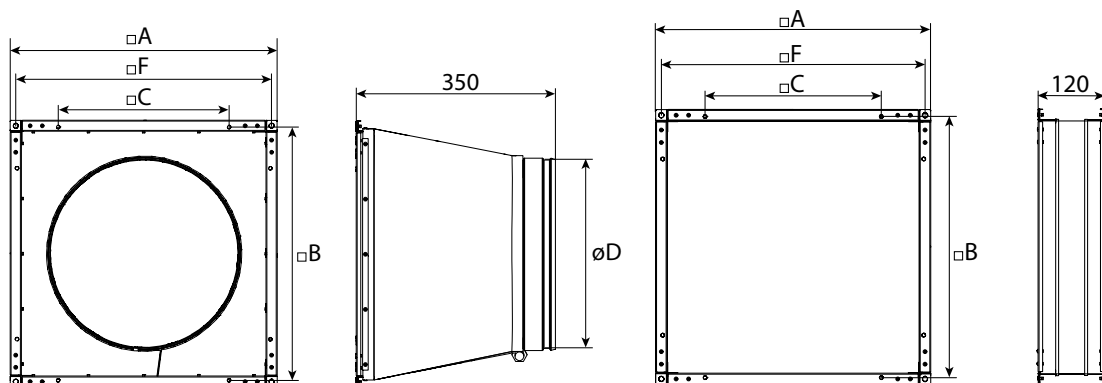
3~400 Δ – with delta connection. 3~400 Y – with star connection.

Parameter	VS 315 EC	VS 355 EC	VS 400 EC	VS 450 EC	VS 500 EC	VS 560 EC	VS 630 EC
Voltage [V]	1~200-240	1~200-277	1~200-277	1~200-277	3~380-480	3~380-480	3~380-480
Power [W]	150	250	500	750	1320	2360	2750
Current [A]	1.23	1.1	2.2	3.3	2.1	3.65	4.3
Maximum air flow [m <sup>3</sup> /h]	perpendicularly	2370	3830	5660	6800	10450	13600
	directly	2252	3639	5377	6460	9928	12920
RPM [min <sup>-1</sup> ]	1600	1450	1500	1440	1350	1540	1300
Sound pressure level at 3 m distance [dBA]	35	44	39	50	45	50	50
Transported air temperature [°C]	-40...+80	-25...+60	-25...+50	-25...+60	-20...+50	-25...+60	-25...+55

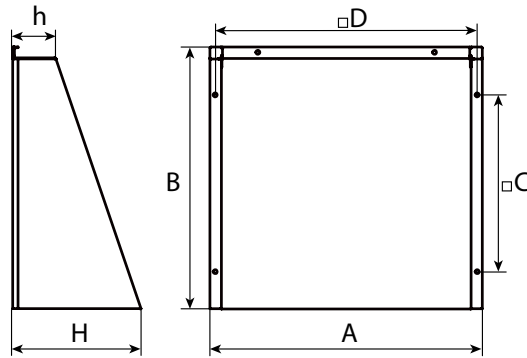


Model	Dimensions [mm]		
	H	A	B
<b>VS 315. 355</b>	500	310	460
<b>VS 400. 450. 500</b>	670	480	630
<b>VS 560. 630</b>	800	610	760
<b>VS 710</b>	1000	810	960

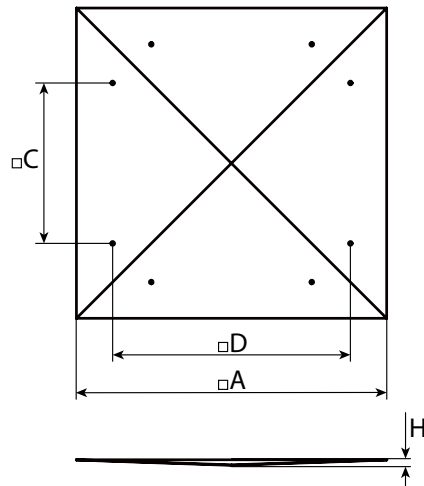
Options for fans		Dimensions [mm]				
VPG	VVG	A	B	C	∅D	F
VPG 500/355	VVG 500x500	490	460	310	354	470
VPG 670/400	VVG 670x670	660	630	480	399	640
VPG 670/450					449	
VPG 670/500					499	
VPG 800/560	VVG 800x800	790	760	610	559	770
VPG 800/630					629	
VPG 1000/710	VVG 1000x1000	990	960	810	709	970



Options for fans		Dimensions [mm]				
KN-VS	A	B	C	D	H	h
KN-VS 315-355	478	458	310	460	225	75
KN-VS 400-500	648	628	480	630	321	108
KN-VS 560-630	778	758	610	760	421	141
KN-VS 710	978	959	810	960	422	141



Options for fans		Dimensions [mm]			
VPR-VS	A	C	D	H	
VPR-VS 315-355	600	310	460	11	
VPR-VS 400-500	770	480	630	11	
VPR-VS 560-630	900	610	760	11	
VPR-VS 710	1100	810	960	11	





## DESIGN AND OPERATING PRINCIPLE

The fan casing is made of an aluminium frame, fastened with aluminium angles, and removable heat and sound insulating two-layer aluzinc panels.

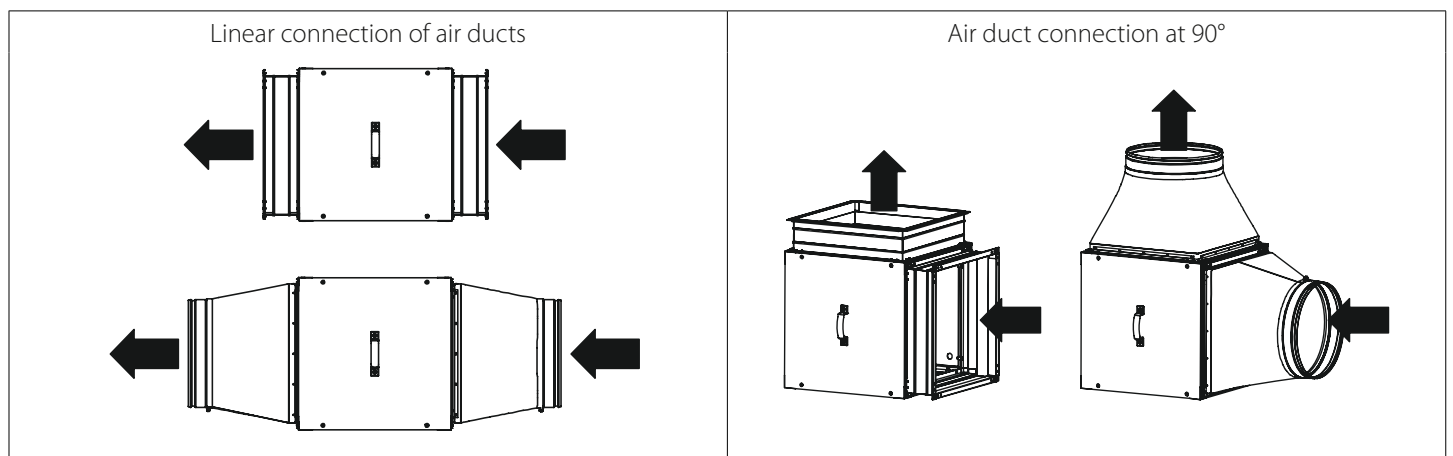
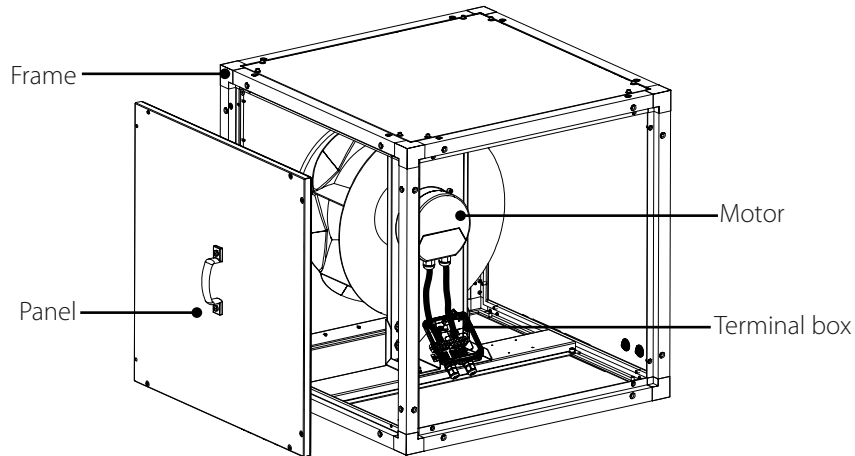
Due to a casing made of aluzinc with increased corrosion-resistant properties and a heat-insulating material, the fan can be used for outdoor installation.

The VS fan is equipped with a four- or six-pole AC motor with an external rotor and an impeller with backward curved blades.

The VS EC fan is equipped with a maintenance-free EC motor with an external rotor and an impeller with backward curved blades.

The fan has a special design that allows changing the position of the side panels for air supply in all directions, both linearly and at an angle of 90°.

The VS fans may be used for construction of various configurations of ventilation systems.



The spigots, which also function as vibration damping inserts, can be of square or round cross-section.

The round spigots are rubber sealed.

The connecting spigots are not included in the delivery set and can be ordered separately.

## MOUNTING AND SET-UP



**BEFORE MOUNTING MAKE SURE THE CASING DOES NOT CONTAIN ANY FOREIGN OBJECTS (E.G. FOIL, PAPER).**



**WHILE INSTALLING THE UNIT ENSURE CONVENIENT ACCESS FOR SUBSEQUENT MAINTENANCE AND REPAIR.**

Before installing the fan, make sure that there is no visible damage to the impeller, check the integrity of the insulation of the supply wires. Make sure the impeller rotates freely without touching the flange and the casing.

The fan shall be installed in the air duct with the same diameter.

Mount the fan in such a way that the arrow on the fan casing matches the air flow direction in the system.

The fans are installed between the air ducts.

The connection to the air ducts is carried out using an appropriately sized connecting spigot.

In case of mounting the fan on flexible joints, attach the fan to a structural unit by means of supports, suspension links or brackets.

The fan may be installed in any position in consideration of the air flow direction (as indicated by the arrow on the fan casing).

To attain the best performance of the fan and to minimize turbulence-induced air pressure losses while mounting, connect the straight air duct section to the fan spigots on both sides of the fan. The minimum straight air duct length is equal to 1 air duct diameter on the intake side and 3 air duct diameters on the exhaust side.

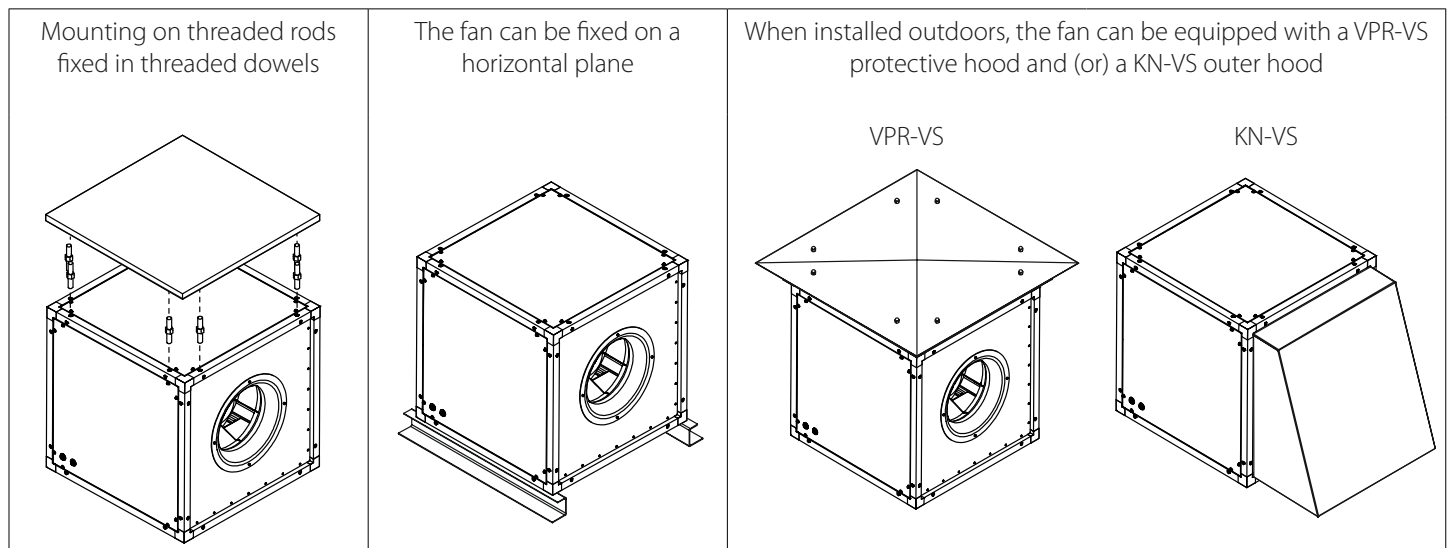
No filters or any other similar devices are allowed to be installed in these sections.

The fan is not a ready to use unit and requires connection to the air ducts.

Install the fan securely while ensuring free access for maintenance operations, the required distance to the walls of the room is at least 1 m.

Fan installation sequence:

- Before installation, lay the wires and cables necessary to connect the fan to power mains.
- Make sure that the fan is disconnected from power mains.
- Mark the positions for mounting the fixing brackets on the load-bearing surface.
- Fix the fan on the mounting brackets using the appropriate fasteners (for example, dowels).
- Connect the air ducts to the fan.



The VPR-VS protective hood and the KN-VS outer hood are not included in the delivery set and must be ordered separately.

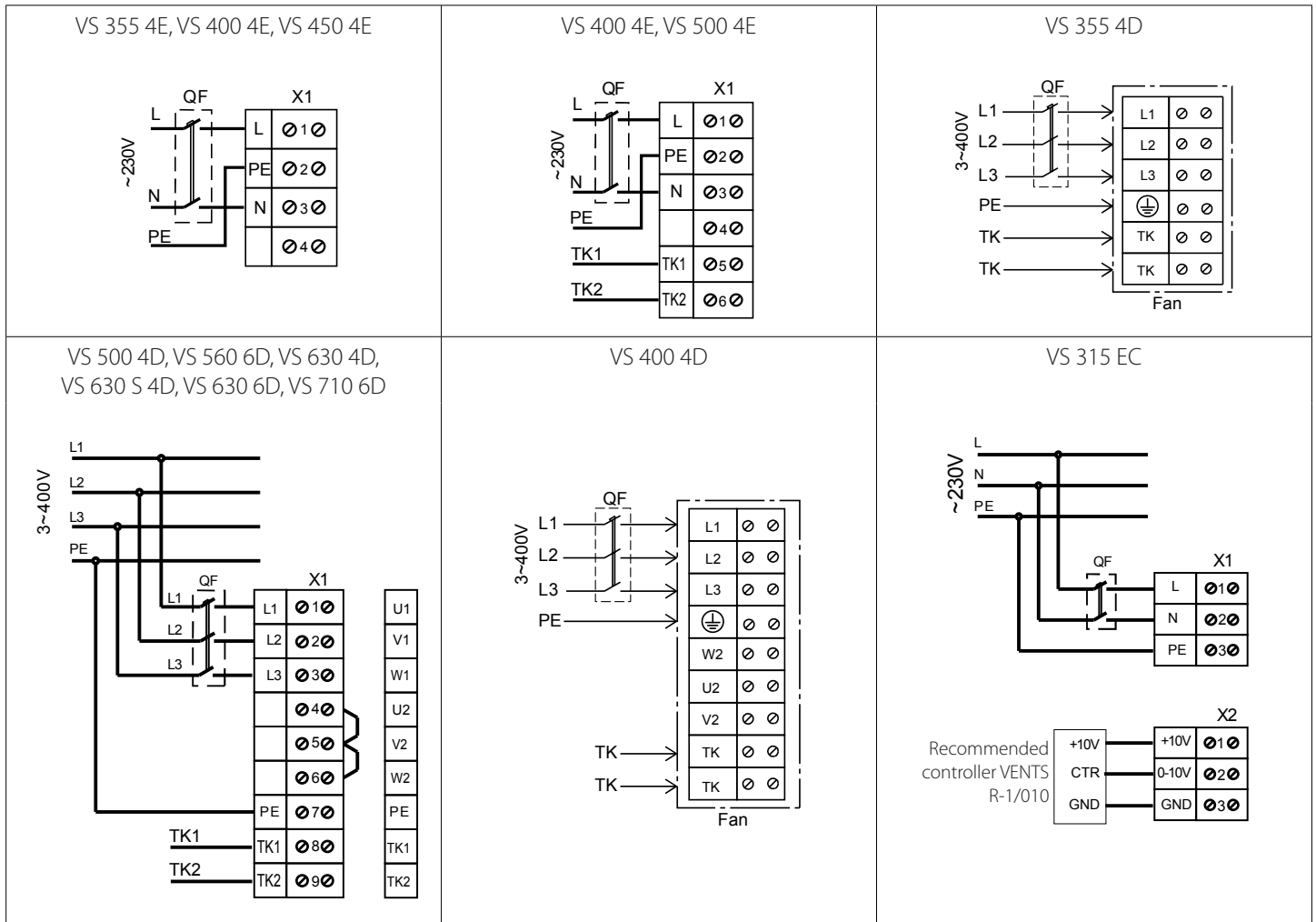
## CONNECTION TO POWER MAINS

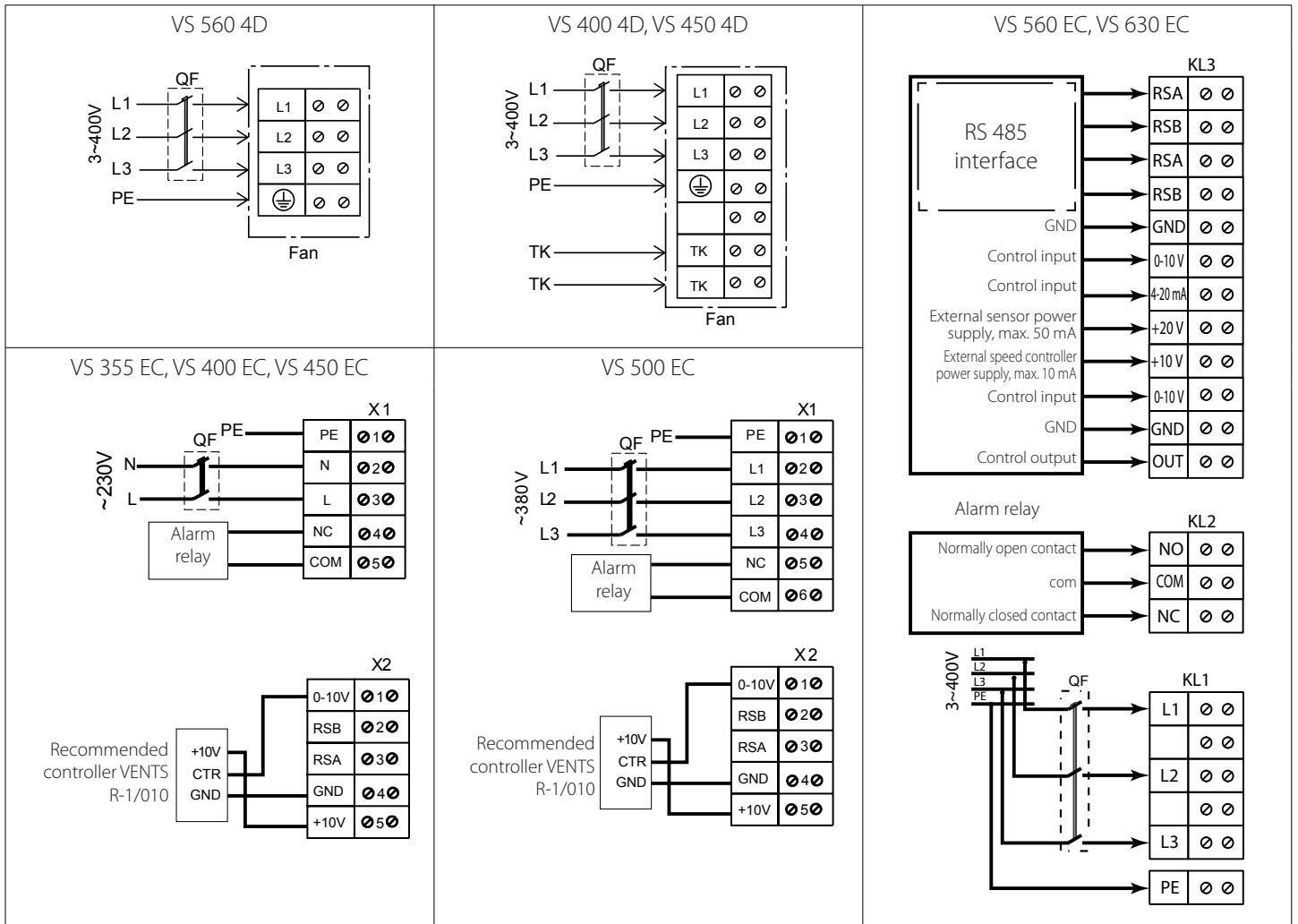
- The unit is rated for connection to 1~230 V/50 (60) Hz power mains according to the corresponding wiring diagram.
- The connection must be made using durable, insulated and heat-resistant conductors (cables, wires). The actual wire cross section selection must be based on the maximum load current, maximum conductor temperature depending on the wire type, insulation, length and installation method.
- Connection of the unit to the fixed power supply network must be carried out in accordance with the current regulations.

Connect the cables to the terminal block incorporated inside the terminal box located on the fan casing in compliance with the fan wiring diagram and the terminal designation.

The terminal designations are shown on the label inside the fan casing.

### Power supply parameters and examples of wiring diagrams depending on the unit model





### Designation:

L (x) – line; N – neutral; QF – circuit breaker; PE – grounding wire.

The VS EC fans are equipped with high-efficient electronically commutated motors, which are characterized by high performance and optimal control over the entire speed range.

The efficiency of such motors reaches 90%.

Fans with EC motors must be connected to the terminal block located in the external or integrated terminal box of the electric motor in strict accordance with the wiring diagram and terminal designation.

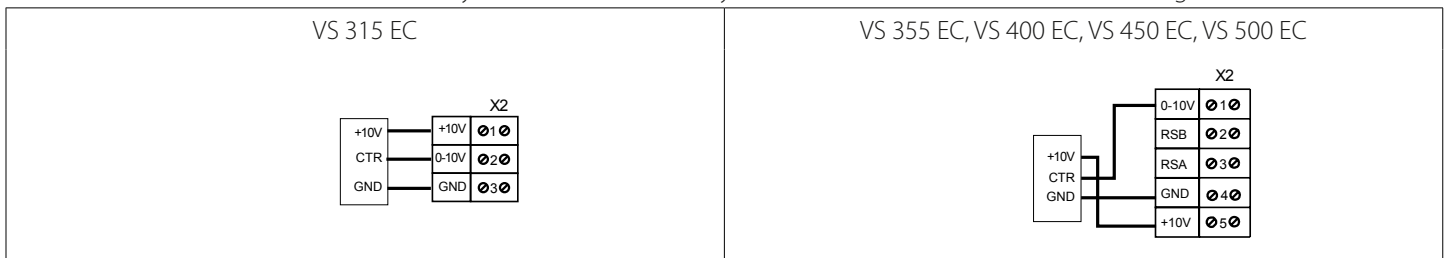
The terminal designations are shown on the label inside the fan casing.

The VS EC fans are controlled via various external control signals.

When the value of the control factor is changed, the EC fan changes the rotation speed and supplies as much air as is required for the ventilation system. For example, air flow control is carried out smoothly using the recommended R-1/010 controller (hereinafter referred to as the controller).

Speed control from zero to maximum, depending on the need.

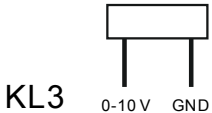
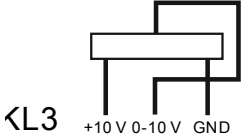
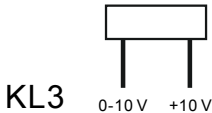
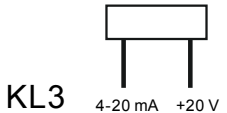
The controller is not included in the delivery set and is connected by the consumer in accordance with the diagrams.



The fan can be controlled using a CO<sub>2</sub> sensor (CO<sub>2</sub>-1, CO<sub>2</sub>-2 models are recommended), from the unit's analogue output (0-10 V) and from the discrete output (relay contact). In the first case, the fan will smoothly increase (or decrease) the rotation speed in case of air pollution, depending on the set CO<sub>2</sub> range.

In the second case, the NO contact of the relay will turn on the fan when the set ppm level is exceeded and turn off when the minimum set level is reached. A humidity sensor can be connected in the same way. The connection of external control devices in the integrated terminal boxes is carried out on the KL3 terminal blocks in strict accordance with the terminal designation.

### Wiring example of connecting various devices to EC motors

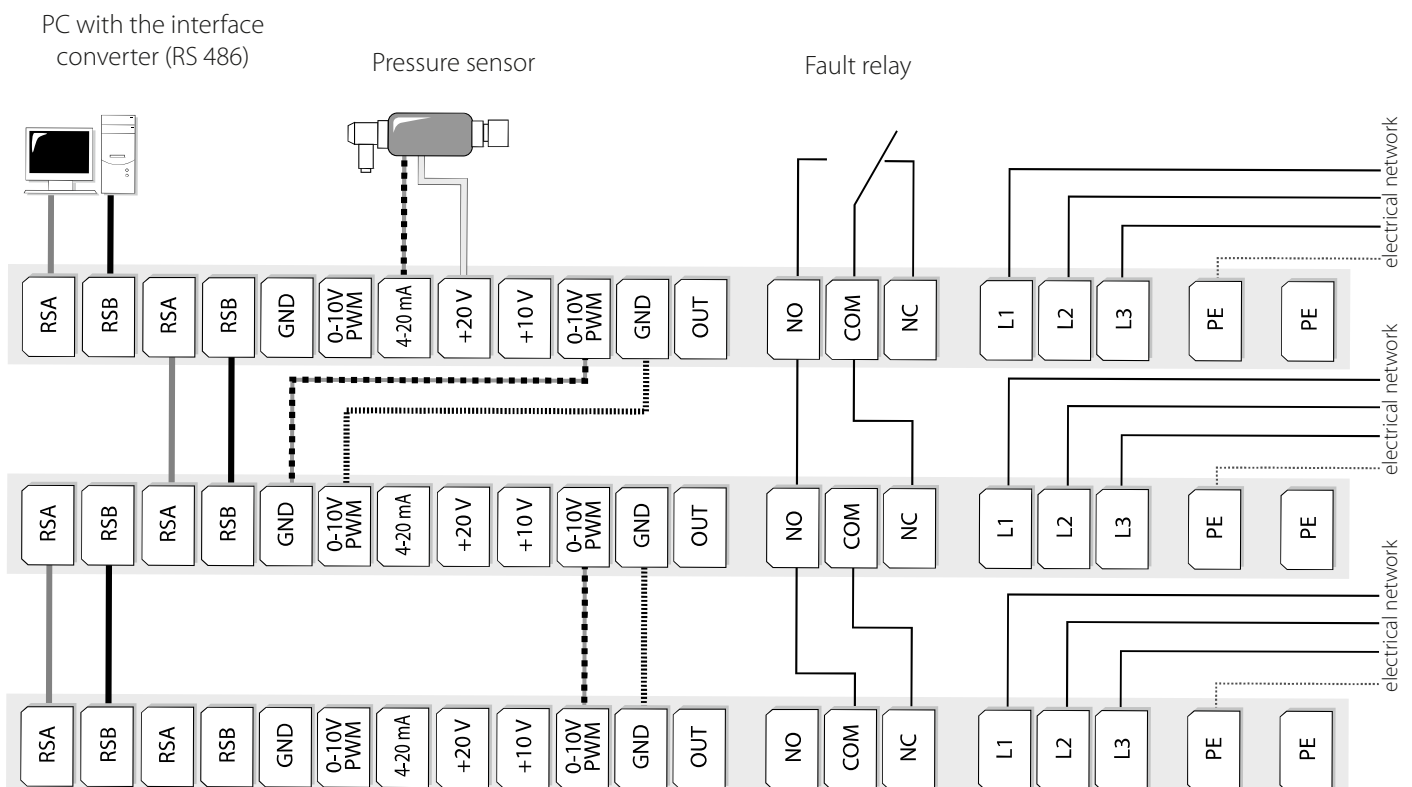
<p>Connection of a 0-10V analogue output of the control device</p> 	<p>Connection of a speed controller (potentiometer)</p> 	<p>Connection of a control unit relay output</p> 	<p>Connection of a 4-20 mA pressure sensor</p> 
--	---	---	--

Humidity sensors, pressure sensors, CO<sub>2</sub> sensors etc. are not included in the delivery set and are installed by the consumer.

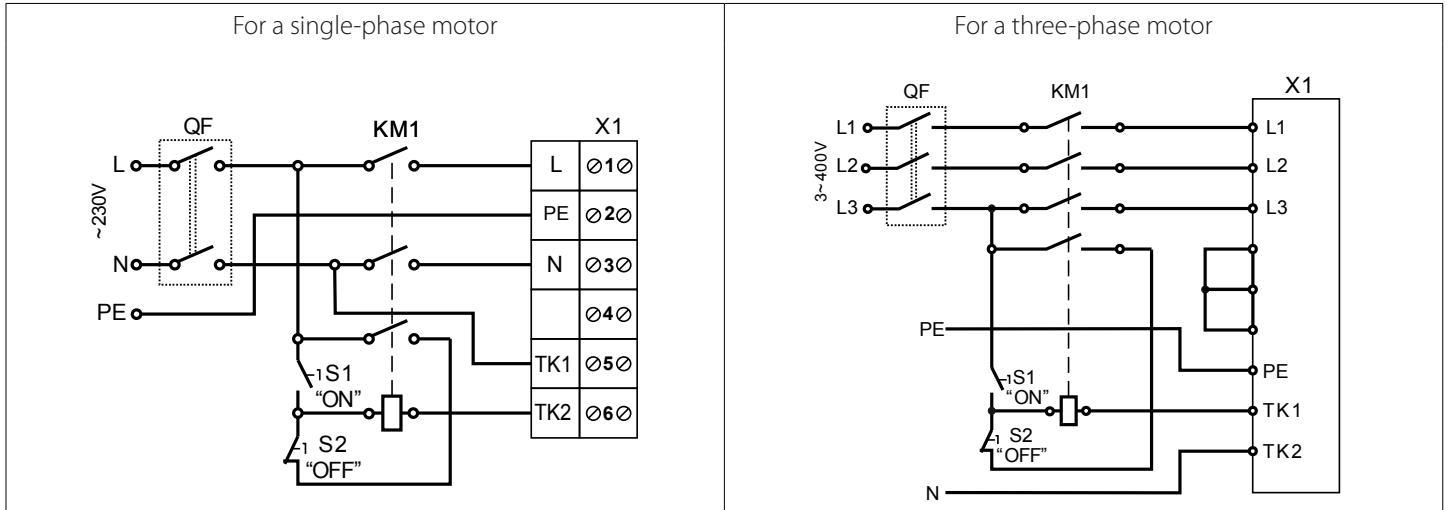
The connection of other external control devices to the fans with the integrated terminal box is carried out according to the protocols of the EC motor manufacturer.

Custom designed software provides high accuracy control of the fans integrated into a network.

### Diagram of external connections and universal connection of fans with EC motors into a single group



### The recommended wiring diagram example for connection of the VS fan using thermal motor protection



The TK1, TK2 terminals are the electrical leads of the normally closed contact of the motor overheating protection. Connect the contact in series to power circuit of the magnetic starter coil KM1 that starts the motor after pressing the S1 button. After the motor overheating the contact gets broken and switches the starter coil off to cut power off and stop the motor. The QF circuit breaker, the magnetic starter KM1, the control knobs S1 and S2 are not included in the delivery and must be installed by the user.



**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.**

### 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



**THE ORGANISATION RESPONSIBLE FOR THE COMMISSIONING SHALL BE RESPONSIBLE FOR PROPER MOTOR PHASING AND STARTING PATTERN SELECTION.**



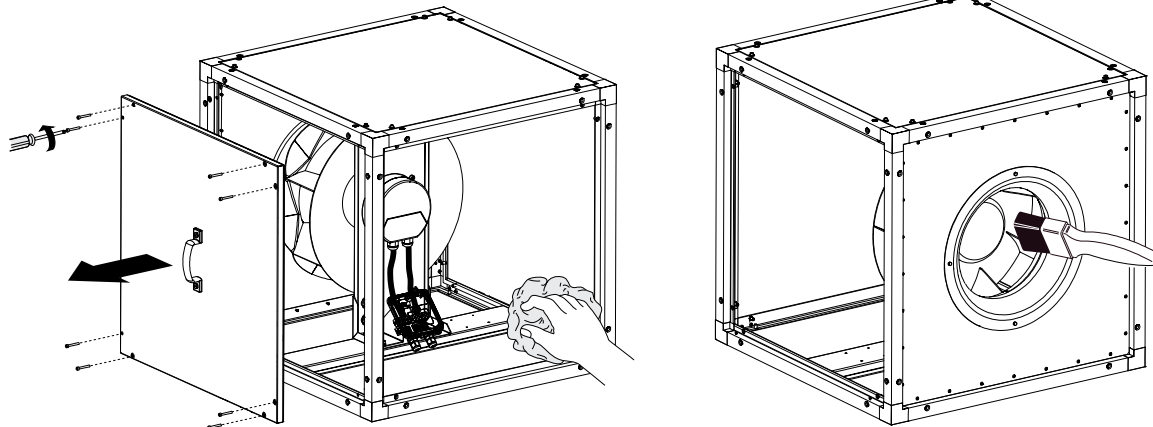
**DURING STARTING THE IN-RUSH CURRENTS OF THE FAN MAY SEVERAL TIMES EXCEED THE RATED VALUES.**

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

- After fan starting make sure that the electric motor rotates properly without undue vibration and abnormal noise.
- Make sure that the fan impeller rotates in the direction marked by the arrow on the fan casing. If necessary, change the rotation direction of the impeller by reversing the phase sequence (for a three-phase motor) or by rewiring according to the wiring diagram located inside the terminal box (for a single-phase motor).
- Make sure that the fan energy consumption complies with the value given on the equipment nameplate and check the motor for overheating.
- The phase current should be checked once the fan reaches the rated operating conditions.
- Do not switch the fan on and off several times without pauses as this may result in damage to the winding or insulation due to overheating.

## TECHNICAL MAINTENANCE

- The technical maintenance includes periodic cleaning of the surfaces from accumulated dust and dirt.
- When carrying out fan maintenance, it is necessary to partially disassemble it in order to access contaminated parts of the fan. To do this, you need to unscrew the screws and remove the cover from the casing. The impeller blades require thorough cleaning once in 6 months.
- Use a soft dry cloth, brush or compressed air to remove dust.
- Carry out wet cleaning using warm water and a mild household detergent. Protect the electric motor against liquid ingress. Do not immerse the unit in water!
- Do not use aggressive solvents, or sharp objects as they may damage the impeller.





## TROUBLESHOOTING

PROBLEM	POSSIBLE REASONS	TROUBLESHOOTING
The fan does not start.	No power supply.	Make sure that the power supply is connected correctly, otherwise resolve the connection error.
Low air flow.	The ventilation system is soiled or damaged.	Make sure the air ducts are clean and intact. Clean them if necessary.
Noise, vibration.	The impeller is soiled.	Clean the impeller.
	The screw connection is loose.	Tighten the fastening screws.

## 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 dismantled 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.
- External damage to the unit casing (excluding external modifications as required for installation) 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**



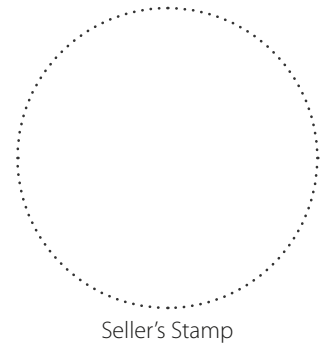
**USER'S WARRANTY CLAIMS SHALL BE SUBJECT TO REVIEW ONLY UPON PRESENTATION OF THE UNIT, THE PAYMENT DOCUMENT AND THE USER'S MANUAL WITH THE PURCHASE DATE STAMP**

### CERTIFICATE OF ACCEPTANCE

<b>Unit Type</b>	Duct centrifugal fan in sound insulated casing
<b>Model</b>	
<b>Serial Number</b>	
<b>Manufacture Date</b>	
<b>Quality Inspector's Stamp</b>	

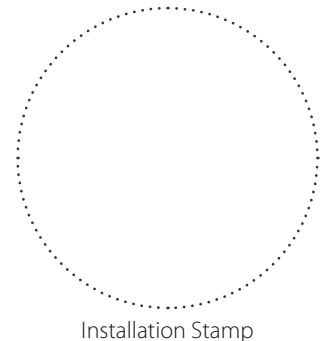
### SELLER INFORMATION

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



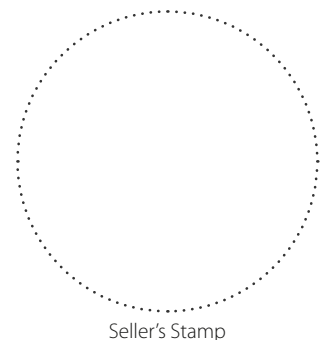
### INSTALLATION CERTIFICATE

The _____ unit is installed pursuant to the requirements stated in the present user's manual.	
<b>Company name</b>	
<b>Address</b>	
<b>Phone Number</b>	
<b>Installation Technician's Full Name</b>	
<b>Installation Date:</b>	<b>Signature:</b>
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.	
<b>Signature:</b>	



### WARRANTY CARD

<b>Unit Type</b>	Duct centrifugal fan in sound insulated casing
<b>Model</b>	
<b>Serial Number</b>	
<b>Manufacture Date</b>	
<b>Purchase Date</b>	
<b>Warranty Period</b>	
<b>Seller</b>	





**VENTS**

