

User's manual

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The centrifugal electric fan VENTS KSD enclosed in a metal sound-insulated casing with a double-inlet \varnothing 180 to 320 mm impeller and forward curved blades, hereinafter the fan, is designed for supply and exhaust ventilation of domestic, public and industrial premises with high sound attenuation requirements.

The fan is designed for horizontal installation on an even surface or horizontal suspended mounting and connection to \varnothing 250 and 315 mm round air ducts.

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).

The fan is rated for continuous operation.

The fan requires simple maintenance and is applicable for the transported air temperature from -20°C up to $+45^{\circ}\text{C}$.

Hazardous parts access and water ingress protection ratings is IP X4.

The delivery set includes:

- fan (1 item)
- user's manual
- packing box.

Specialty ordered accessories NOT INCLUDED in the delivery set:

- a set of mounting brackets
- s set of suspension eye bolts
- air filters
- metal grilles
- air ducts
- fittings
- electric accessories

Fan name designation, fan options, functioning and connecting dimensions are stated in the Tables 1, 2 and Fig. 1-6. The fan design undergoes continuous improvement. Therefore, some models may slightly differ from the ones described herein.

Prior to trial run and commissioning the fan make sure its air capacity and current consumption match the respective technical data for a specified fan standard size. The motor must be equipped with self-resettable overheating protection.

PURPOSE

DELIVERY SET

TECHNICAL DATA



WARNING

**FAN
DESIGNATION
KEY**

XXX XXX/XXX X - X X X X X

Casing insulation

_ : PU foam insulation.

K1: mineral wool insulation.

Power cable with IEC C14 plug.

R

Temperature and speed controller type

U: speed controller with electronic thermostat and temperature sensor integrated into the air duct. Equipped with a power cable and IEC C14 electric plug. Temperature-based operation logic.

Un: speed controller with electronic thermostat and external temperature sensor fixed on 4 m cable. Equipped with a power cable and IEC C14 electric plug. Temperature-based operation logic.

U1: speed controller with electronic thermostat and temperature sensor integrated into the air duct. Equipped with a power cable and IEC C14 electric plug. Timer-based operation logic.

U1n: speed controller with electronic thermostat and external temperature sensor fixed on 4 m cable. Equipped with a power cable and IEC C14 electric plug. Timer-based operation logic.

Power mains parameters

E: single-phase

Pole number

4; 6

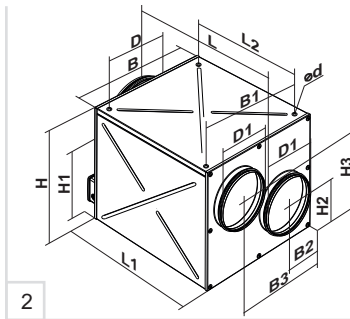
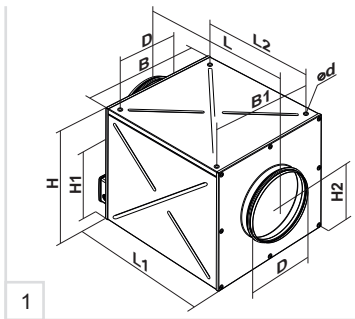
High-powered motor

S

Intake spigot diameter for two spigot modification, mm

Intake and exhaust spigot diameter, mm

Fan designation



1
Overall and connecting dimensions of KSD fan with one intake and one exhaust spigot

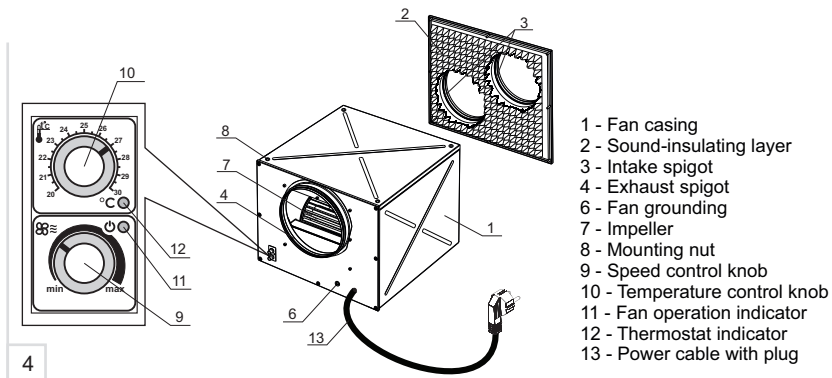
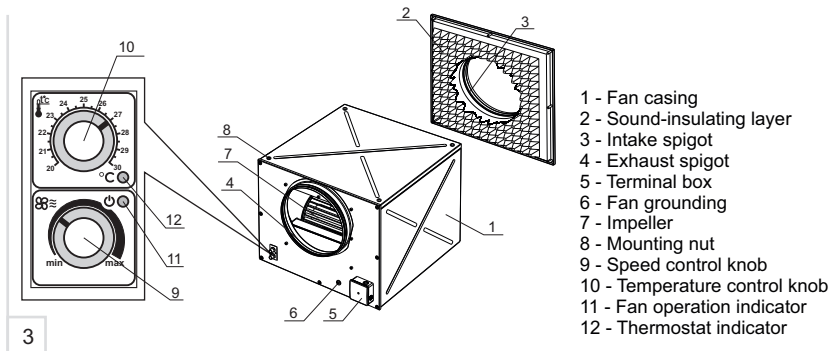
2
Overall and connecting dimensions of KSD fan with two intake spigots and one exhaust spigot

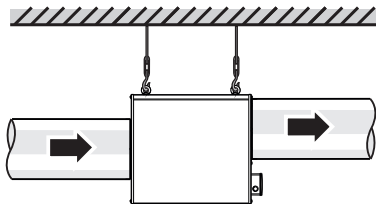
Modell	Dimensions [mm]										Weight [kg]
	ØD	ød	B	B1	H	H1	H2	L	L1	L2	
KSD 250-6E	248	M8	455	400	435	298	216	570	470	400	21,5
KSD 250-4E	248	M8	455	400	435	298	216	570	470	400	21,5
KSD 250 C-6E	248	M8	503	450	483	340	241	640	540	470	30,8
KSD 250 C-4E	248	M8	503	450	483	340	241	640	540	470	30,8
KSD 315-6E	313	M8	600	550	500	340	251	680	580	510	31
KSD 315-4E	313	M8	600	550	500	340	251	680	580	510	33
KSD 315 C-4E	313	M8	650	610	530	367	266	735	635	570	38
KSD 315 C-6E	313	M10	670	620	610	450	306	825	725	660	45

table 1

Modell	Dimensions [mm]												Weight [kg]		
	ØD	ØD1	ød	B	B1	B2	B3	H	H1	H2	H3	L		L1	L2
KSD 315/250*2-6E	313	248	M8	600	550	171	431	500	340	176	326	680	580	510	31
KSD 315/250*2-4E	313	248	M8	600	550	171	431	500	340	176	326	680	580	510	33
KSD 315/250*2 S-4E	313	248	M8	650	610	188	465	530	367	186	346	735	635	570	38
KSD 315/250*2 S-6E	313	248	M10	670	620	216	457	610	450	186	427	825	725	660	45

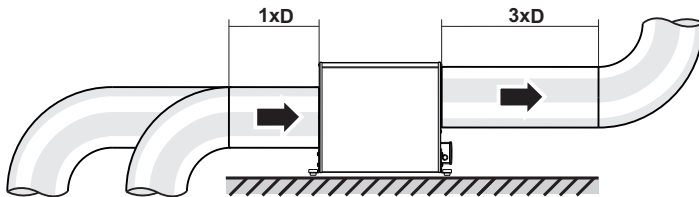
table 2





5

KSD fan mounting and operation example



6

General mounting recommendations for KSD fans

**DO NOT**

Do not operate the fan outside the temperature range stated in the user's manual.
Do not operate the fan in aggressive or explosive environments.

**SAFETY
REQUIREMENTS**

The fan must be mounted and connected to power supply only by properly qualified personnel in compliance with acting regulatory documents.

Disconnect the fan from power mains prior to any maintenance and repair operations. Check the fan for any visible damages of the impeller, casing and grille prior to connecting the fan to power mains. The fan casing must not contain any foreign objects which can damage the impeller blades. The power cable must not be in contact with any hot fan surfaces and air ducts.

**WARNING**

**Do not operate the fan in explosive or inflammable environments.
Transported air must not contain dust, solid particles, sticky substances and fibrous materials.**

**FAN
DESIGN**

The fan (Fig. 3, 4) consists of a metal casing 1 internally lined with a sound-insulating layer 2, an intake spigot and exhaust spigot 4 for the model with one intake and one exhaust spigot (Fig. 3) or two intake spigots 3 and one exhaust spigot 4 for the model with two intake spigots, Fig. 4. The fan spigot diameters match the connected air duct diameter. The fan connection to power supply to single-phase power mains is accomplished either via a terminal block 5 or a power cable with a plug 13 for R modification. The fan casing has a slot for connection of the fan grounding 6. The impeller 7 is fixed directly to the motor shaft. The mounting nuts 8 for horizontal suspended mounting by means of eye bolts are located on the casing top. The eye bolts are not included in the delivery set. The fan modifications with a speed and temperature controller are equipped with a speed control knob 9, a temperature control knob 10, an operation indicator 11 and a thermostat indicator 12.

The fan has two electric connection options:

- via a terminal block 5 (Fig. 3);
- via a power cable with a plug (R modification) (Fig. 4).

The model KSD...K1 with mineral wool insulation is designed for air exhaust only.

Electronic temperature and speed controller

Available in KSD U, KSD U1, KSD Un, KSD U1n.

The electronic speed and temperature control module is designed for duct temperature control and automatic variable speed control (air flow control) depending on the temperature.

KSD U, KSD U1 models are equipped with a built-in temperature sensor and the KSD Un, KSD U1n models are equipped with an external temperature sensor fixed on a 4 m cable.

The front panel of the fan (fig. 3, 4) has the following controls and indicators:

Speed control knob 9

Temperature control knob 10

Fan operation indicator 11

Thermostat indicator 12

The functioning logic of the electronic speed and temperature control module enable fan speed control depending on the air temperature in the air duct.

Depending on the fan model the return to pre-set lower speed has two delay patterns:

- temperature sensor-based feedback delay for KSD U and KSD Un models;
- timer-based feedback delay for KSD...U1 and KSD U1n models.

Operation of the electronic temperature and speed control module for KSD U, KSD Un models.

Set the desired air temperature (thermostat set point) by turning the thermostat control knob 10 and the minimum rotation speed (air flow rate) by turning the speed control knob 9.

The fan operation indicator 11 lights up as the fan is started.

If the air temperature increases above the thermostat set point the fan switches to the high speed (maximum air flow rate). Synchronously, the thermostat indicator 12 lights up.

If the temperature decreases below the thermostat set point the fan switches to the pre-set lower speed.

TSC MODULE DESCRIPTION AND FUNCTIONING

The motor switches to high speed as the air temperature exceeds 2 °C above the set thermostat set point. The motor reverts to the pre-set lower speed as the air temperature drops below the thermostat set point. This pattern is used to keep air temperature to within 2 °C. In this case the motor speed switches are rare.

Operation of the electronic temperature and speed control module for KSD U1, KSD U1n models.

Set the desired air temperature (thermostat set point) by turning the thermostat control knob 10 and the minimum rotation speed (air flow rate) by turning the speed control knob 9. The fan operation indicator 11 lights up as the fan is started.

If the air temperature increases above the thermostat set point the fan switches to the high speed (maximum air flow rate). Synchronously, the thermostat indicator 12 lights up.

If the temperature decreases below the thermostat set point the fan switches to the pre-set lower speed. As the air temperature exceeds the set thermostat set point, the motor switches to higher speed and the switch delay timer is activated for 5 min.

The motor reverts to lower speed as the air temperature drops down below the thermostat set point and only after 5 minutes countdown. This pattern is used for exact air temperature control.

The speed switches for the fan with U1 option are more frequent as compared to the operating logic of the fan with U option, however the minimum operating cycle at one speed is 5 minutes.

Example of the temperature-based feedback delay for the temperature and speed control module for KSD U, KSD Un models:

Initial Conditions:

Rated rotation speed is 60 % of the maximum speed.

Set temperature point is +25 °C.

Air duct temperature is +20 °C.

1. Fan impeller rotation speed is 60 %.
2. Air duct temperature increases, the fan impeller rotation speed is 60 %.
3. Air duct temperature reaches +25 °C, the fan switches to impeller rotation speed 100 %.
4. Air duct temperature starts falling. The fan impeller rotation speed is 100 %.
5. Air duct temperature reaches +23 °C. The fan switches to the pre-set lower speed 60 %.

Example of the timer-based feedback delay for the temperature and speed control module for KSD U1, KSD U1n models:

Initial Conditions:

Rated rotation speed is 60 % of the maximum speed.

Set temperature point is +25 °C.

Air duct temperature is +20 °C.

1. Fan impeller rotation speed is 60 %.
2. Air duct temperature increases, reaches +25°C and continues to grow.
3. The fan switches to impeller rotation speed 100 %. The delay timer is activated for 5 minutes.
4. Air duct temperature starts falling down. The fan operates with impeller rotation speed is 100 %.
5. The air duct temperature reaches +25 °C and continues to drop.
6. After the timer countdown is over, the fan switches to the pre-set lower speed (=60%). After the speed switches to 60% the timer starts 5 minutes countdown again.
7. Air duct temperature increases, reaches +25°C and continues to grow.
8. After the timer stops, the fan switches to the high speed 100%. After the speed switch the timer starts 5 minutes countdown.

Thus, in the timer delay pattern the delay timer activates each time the fan speed changes.



WARNING

Disconnect the fan from power mains prior to any mounting and repair operations.

MOUNTING AND SET-UP

After unpacking the fan check the power supply line for integrity.

No cuttings, cracks are allowed in the wire insulation. Make sure the fan casing has no surface dents and deformation. The impeller must not be in contact with the exhaust spigot and the casing during rotation.

Observe general and specific safety precautions during the fan set-up.

Safe grounding of the fan must be provided. The circuit breaker installation place must ensure free access for quick shutdown of the fan.

The fan is attached to the floor by means of the mounting brackets or suspended to a horizontal even surface by means of eye bolts.

The fan mounting options are shown in Fig. 7-18. While installing the fan ensure convenient access for subsequent maintenance and repair. To attain the best performance of the fan and to minimize turbulence-induced air pressure losses connect a 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.

Installation of rubber anti-vibration mounts is recommended for vibration absorption.

The air flow direction in the system must match the arrowhead on the fan casing.

Be sure to set the required impeller speed and temperature setpoint by turning the respective control knobs for the models equipped with the temperature and speed controller module.

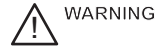
The set temperature range is +20 °C up to +30 °C.

Do not install the fan on a flammable material. Vertical fixation of the fan to the wall using the eye bolts is not allowed.



DO NOT

Disconnect the fan from power mains prior to any operations. Connection of the fan to power mains is allowed by a qualified electrician. The rated electrical parameters of the fan are stated on the manufacturer's label. Any tampering with the internal connections is prohibited and will void the warranty.



The fan is rated for connection to single-phase 230 V/50 Hz AC mains.

The fan is rated for continuous operation always connected to power supply.

Depending on the fan model there are two wiring options:

- via the terminal box, Fig. 19-22, 24;
- via the power cable with a plug for R modification, Fig. 25.

In case of connection to power mains via the terminal box the wires must be connected to the terminal block in compliance with the wiring diagram and terminal marking as shown in Fig. 23.

For electric installations use insulated, durable copper electric leads (cables, conductors) with the minimum cross section 0.75 mm² and 1.0 mm² for KSD 315 S-6E.

The above value is for reference.

While selecting the required cable cross section consider the cable type, its maximum heating temperature, insulation, length and installation method. The fan requires safe grounding.

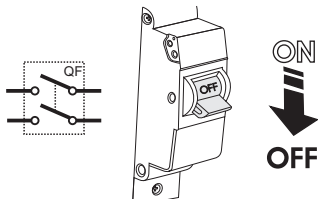
Connect the fan to 230 V / 50 Hz power mains through the external automatic circuit breaker with the minimum contact gap 3 mm installed at the power input and integrated into the house cabling. The circuit breaker installation place must ensure free access for emergency shutdown of the fan.

The trip current of the circuit breaker must be in compliance with the fan current consumption.

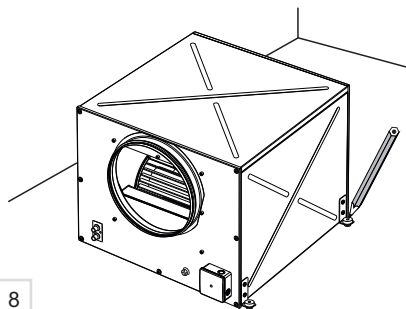
Recommended current consumption of the circuit breaker is stated in the Table 3.

**CONNECTION
TO POWER
MAINS**

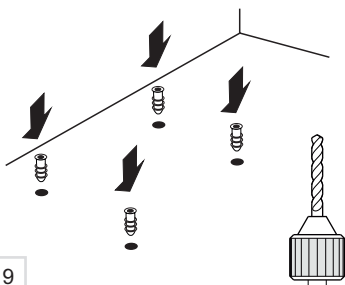
**MOUNTING
OPTIONS**



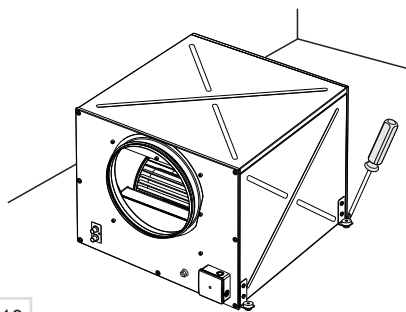
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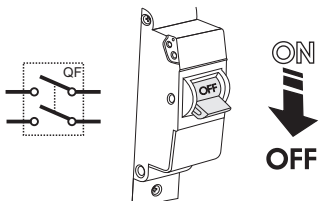
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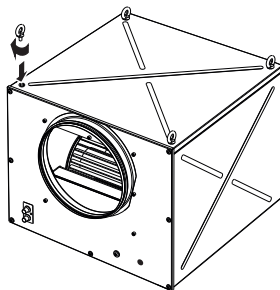
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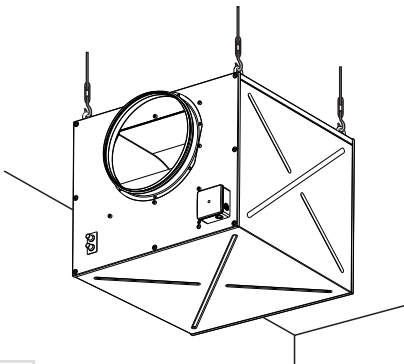
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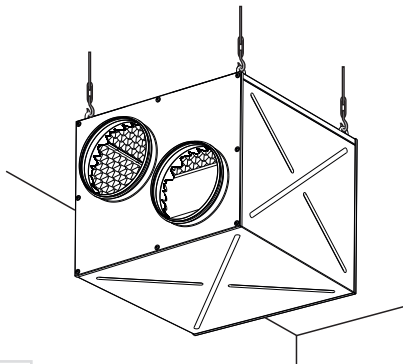
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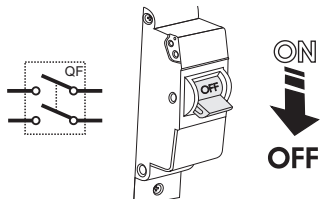
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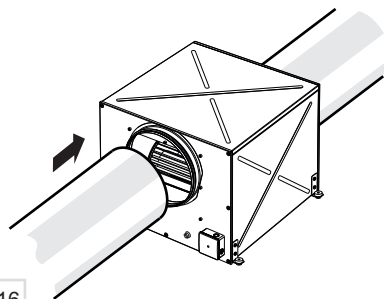
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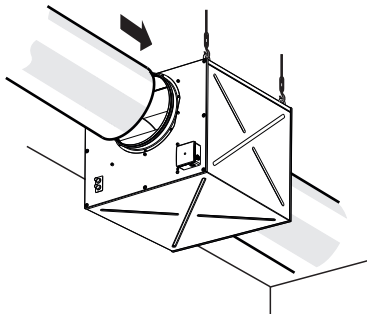
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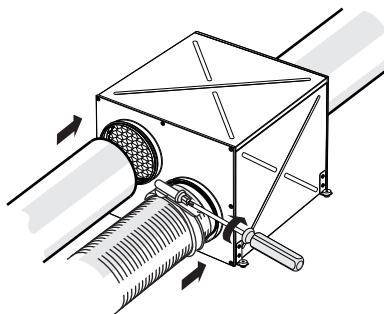
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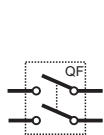
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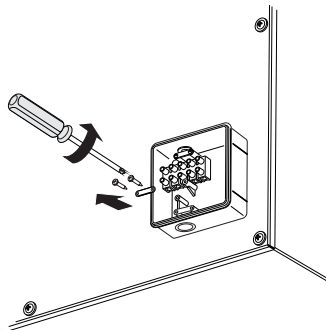
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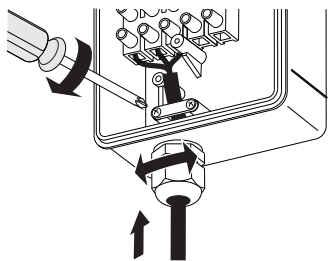
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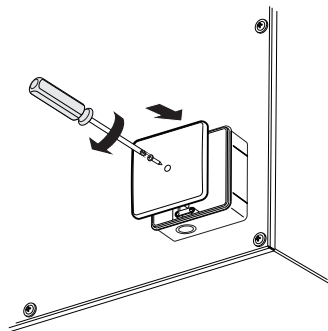
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20



21



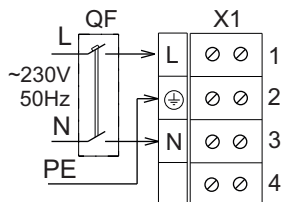
22

**Recommended trip current
of the automatic circuit breaker QF**

Model	Recommended current [A]
KSD 250-6E	2
KSD 250-4E	2
KSD 250 C-6E	3,15
KSD 250 C-4E	5
KSD 315-6E	4
KSD 315-4E	6,3
KSD 315 C-4E	8
KSD 315 C-6E	10
KSD 315/250*2-6E	4
KSD 315/250*2-4E	6,3
KSD 315/250*2 S-4E	8
KSD 315/250*2 S-6E	10

table 3

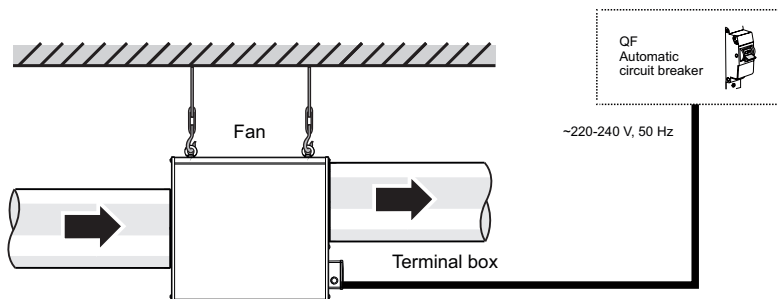
**WIRING
DIAGRAM**



23

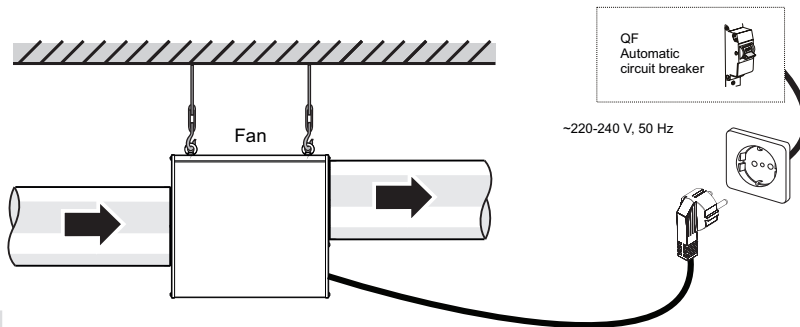
**Automatic circuit breaker QF (not included in the delivery set)
Terminal block X1**

**Wiring diagram for connection of KSD fan with a single-phase motor to
AC power mains via a terminal box**



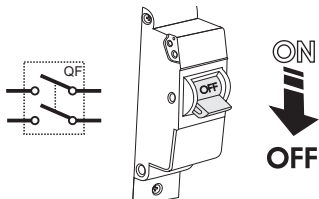
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Wiring diagram for connection of KSD fan to AC power mains via a terminal box

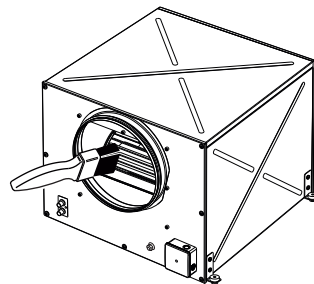


25

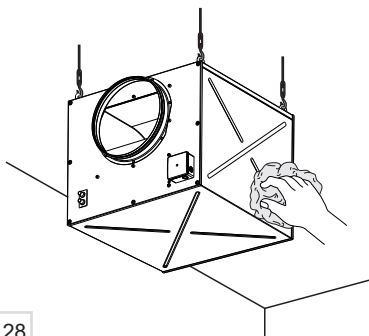
Wiring diagram for connection of KSD fan to AC power mains via a power cable and a plug



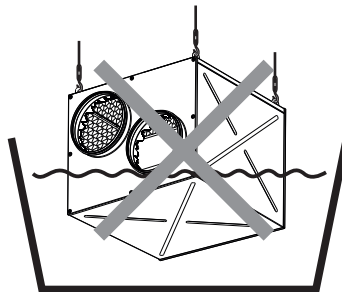
26



27



28



29

Disconnect the fan from power supply prior to any maintenance and repair operations. Make sure the rotating parts do not move, Fig. 26-29.
Maintenance means regular cleaning of the fan surfaces of dirt and dust.
Use a dry soft brush or compressed air to remove dust from the metal parts of the fan.
Use a vacuum cleaner to remove dust from sound-insulated surface.
The impeller blades require thorough cleaning every 6 months. First dismantle the air ducts. Then wipe the impeller blades with a mild detergent solution.
Protect the motor and the control circuit board from water ingress.
In case of any problems with turning on or operating the fan please refer to the troubleshooting table 4.

It is absolutely forbidden to perform maintenance operations with the fan connected to power supply.

Store the fan in the manufacturer's original packing box in a dry ventilated premise at ambient temperatures from +10°C up to + 40°C.
Storage environment must not contain aggressive vapours and chemical mixtures provoking corrosion, insulation and sealing deformation.

Use suitable hoist machinery for handling and storage operations to prevent possible damage to the fan. Follow the handling requirements applicable for the particular type of cargo.

The fan can be carried in the original packing by any mode of transport provided proper protection against precipitation and mechanical damage. Avoid sharp blows, scratches or rough handling during loading and unloading.

The manufacturer, Ventilation Systems PrJSC, hereby warrants warranty period of the product for 24 months after the retail sale date provided the user's observance of the transportation, storage, mounting and operation regulations.
Should any malfunctions occur during the fan operation due to manufacturer's fault during the warranty period the user is entitled for an exchange fan.
Contact the Seller for warranty service.

MAINTENANCE**DO NOT****STORAGE REGULATIONS****MANUFACTURER'S WARRANTY**

table 4

Problem	Possible Reasons	Troubleshooting
The fan does not get started.	Wrong connection to power supply. No power supply to the terminal block.	Make sure that the fan is properly connected to the power mains and make any corrections, if required. Disconnect the fan from power supply. Check reliability of the electric connection in the terminal block, switch or electric outlet. Connect the fan in compliance with the wiring diagram.
	The motor/impeller is jammed or slow.	Turn the circuit breaker off. Rotate the impeller manually. Make sure there are no foreign objects preventing the impeller rotation.
	The air temperature supplied to the fan is not sufficient to activate the temperature and speed control module (applicable for the models with TSC temperature and control module).	Low set speed in the temperature and speed controller (applicable for the models with TSC module). The speed control knob is set to OFF position (leftmost position). Increase speed setpoint.
Circuit breaker tripping during the fan start.	Excessive electric current consumption caused by a short circuit resulting in tripping of the circuit breaker.	Turn the fan off. Contact the fan Seller.
Low air flow	The ventilation system components as diffusers, grilles, air ducts are contaminated. The fan components as the impeller or the spigot are contaminated. The air ducts are damaged. The dampers or diffusers are damaged.	Clean the ventilation system components as diffusers, grilles, air ducts. Clean the fan components as impeller and spigot. Make sure the ventilation system components are not damaged and the air dampers are opened.
High noise and vibration.	Contaminated fan. Loose screw connection.	Clean the fan. Check the screw connection and tighten the screws if required.
	No anti-vibration mounts. Installation of the fan on a metal surface.	Use anti-vibration mounts for installation of the fan (not included in the delivery set). First fasten the mounting brackets to the fan casing and attach the anti-vibration mounts to those. Install the fan on a non-metallic surface.
	Loose connection of the air ducts. Connection of rigid metal air ducts.	Replace the rigid metal air ducts with the flexible air ducts. Tighten the clamp screws to ensure proper fixation of the air ducts.

The MANUFACTURER is not responsible for any mechanical or physical damages resulting from the manual requirements violence, the fan misuse or gross mechanical effect.

Observe the operation requirements stated in the user's manual.



	250	<input type="text"/>										
KSD	315	<input type="text"/>	S	<input type="text"/>	-4E	<input type="text"/>	U	<input type="text"/>	n	<input type="text"/>	R	<input type="text"/>
					-6E	<input type="text"/>	U1	<input type="text"/>				
	315/250*2	<input type="text"/>										

**ACCEPTANCE
CERTIFICATE**

The fan is recognized as serviceable.

We hereby declare that the product complies with the essential protection requirements of Electromagnetic Council Directive 2004/108/EC, 89/336/EEC and Low Voltage Directive 2006/95/EC, 73/23/EEC and CE-marking Directive 93/68/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

This certificate is issued following test carried out on samples of the product referred to above.

Quality Inspector's Stamp

Date of manufacture

Sold by

Name of trade company, retailer's stamp

Date of sale

**WARRANTY
CARD**
