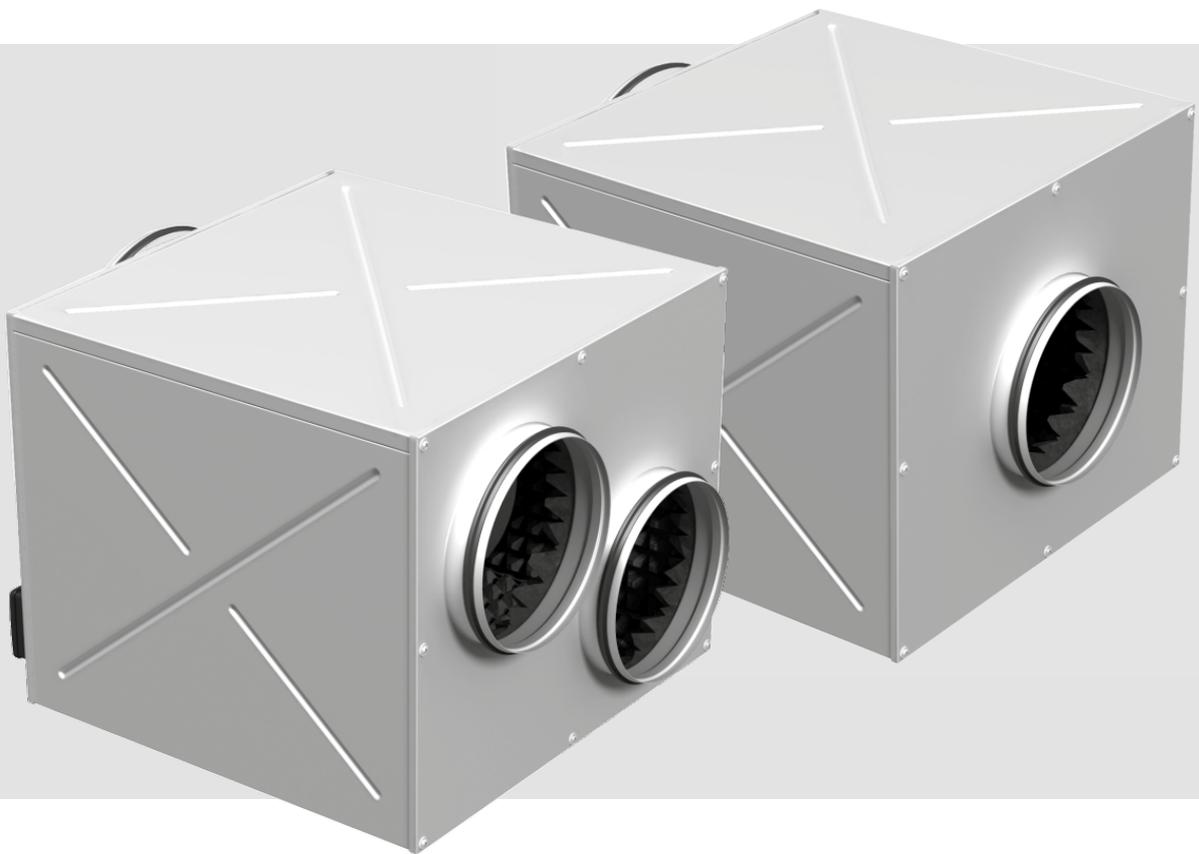


USER'S MANUAL

KSD



The centrifugal electric fan enclosed in a metal sound-insulated casing

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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 KSD 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. The appliance is only to be used with the power supply unit provided with the appliance.

The appliance is only to be used with the power supply unit provided 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.

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent, or similarly qualified persons in order to avoid a safety hazard.

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.

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 2.3m (2,1 m AU) 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 The centrifugal electric fan enclosed in a metal 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

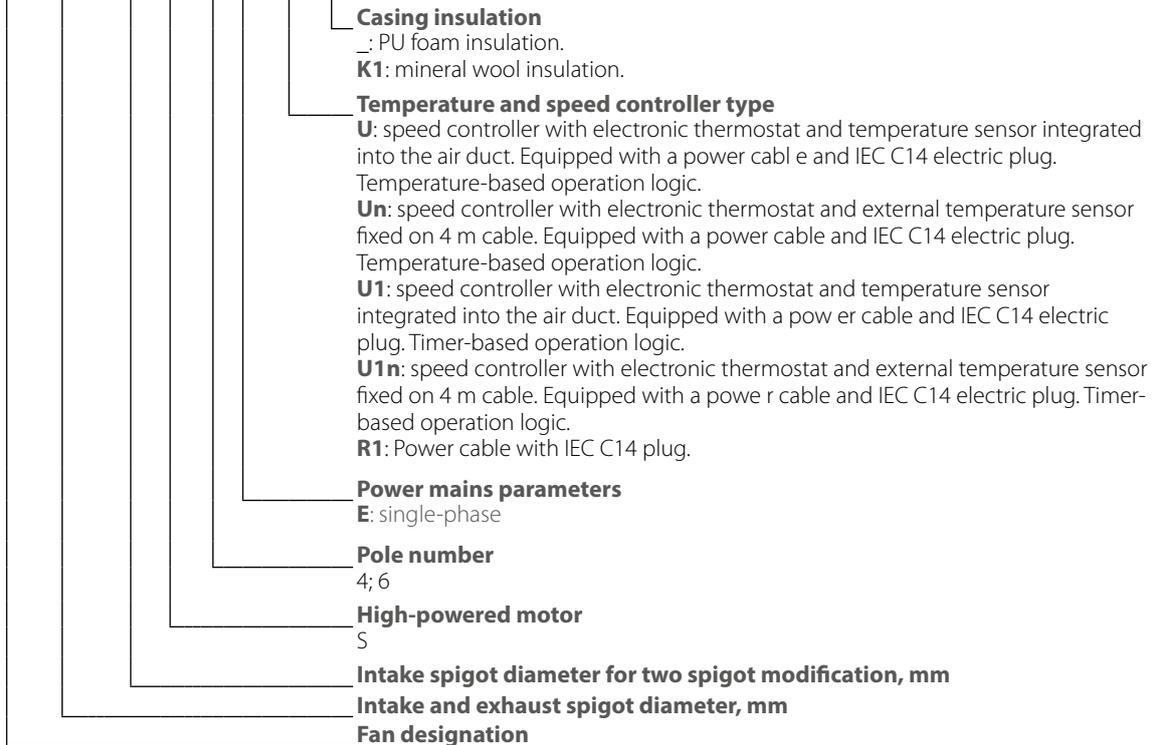
NAME	NUMBER
Fan	1 pc.
User's manual	1 pc.
Packing box	1 pc.

Specially 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.

DESIGNATION KEY

KSD 315 / 250 S - 6 E Un K1



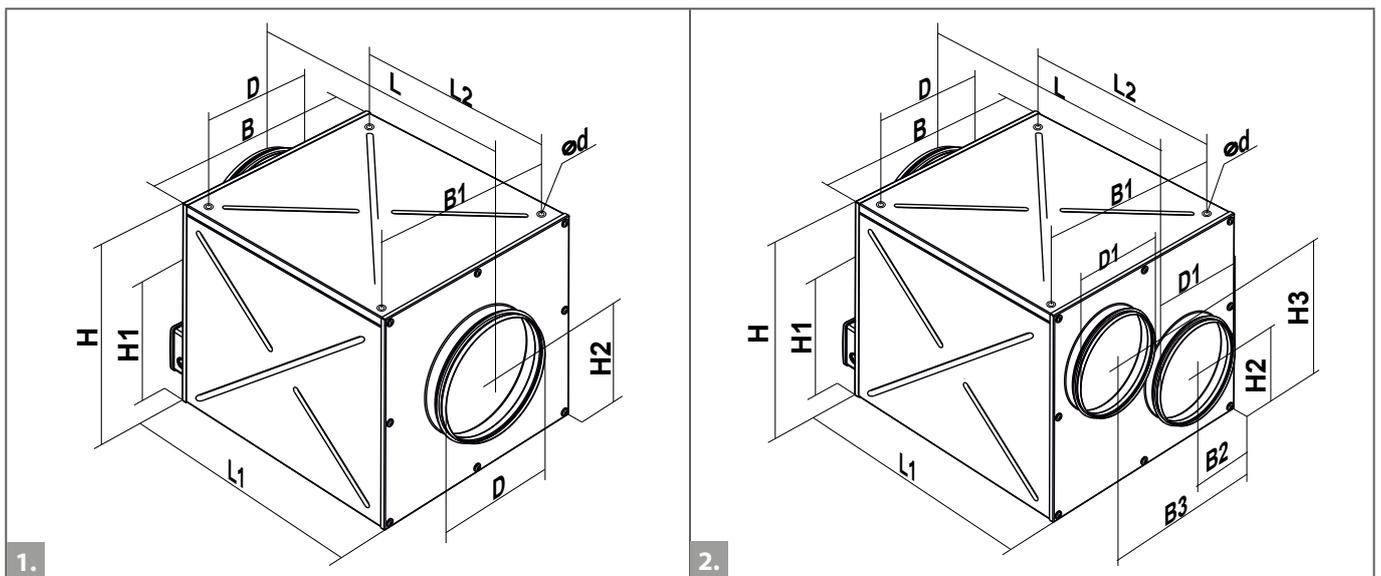
TECHNICAL DATA

Technical characteristics of a specific model are indicated on the label on the product body.



The unit is rated as a Class I electrical appliance.

The unit design is constantly being improved, thus some models may be slightly different from those described in this manual.



1. KSD with one intake and one exhaust spigot (table 1)

2. KSD with two intake spigots and one exhaust spigot (table 2)

Overall and connecting dimensions, mm

Table 1

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 S-6E	248	M8	503	450	483	340	214	640	540	470	30,8
KSD 250 S-4E	248	M8	503	450	483	340	214	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 S-4E	313	M8	650	610	530	367	266	735	635	570	38
KSD 315 S-6E	313	M10	670	620	610	450	306	825	725	660	45

Table 2

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

DESIGN AND OPERATING PRINCIPLE

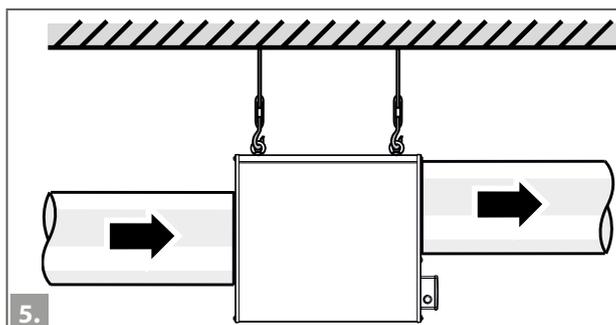
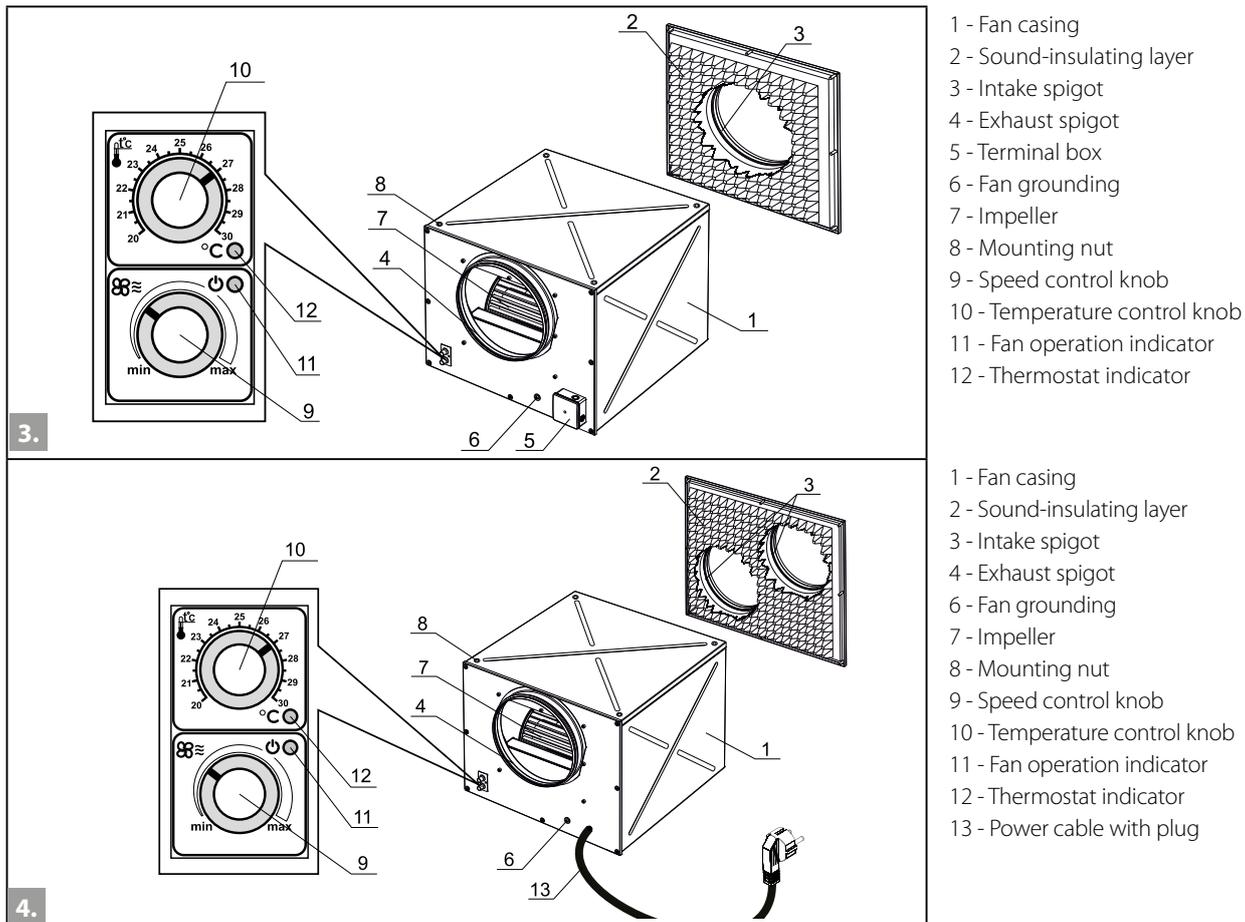
The fan (Fig. 3, 4) consists of a metal casing 1 internally lined with a sound-insulating layer 2, an intake spigot and exhaust spigot 4 for the model with one intake and one exhaust spigot (Fig. 3) or two intake spigots 3 and one exhaust spigot 4 for the model with two intake spigots, Fig. 4. The fan 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 R1 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.

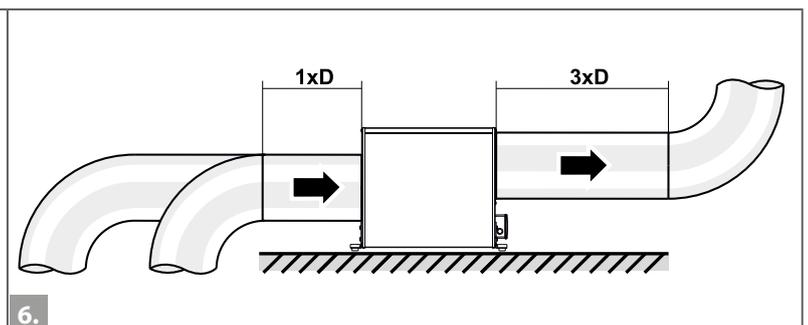
The fan has two electric connection options:

- via a terminal block 5 (Fig. 3);
- via a power cable with a plug (R1 modification) (Fig. 4).

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



KSD fan mounting and operation example



General mounting recommendations for KSD fans

TSC MODULE DESCRIPTION AND FUNCTIONING

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.

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.

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.

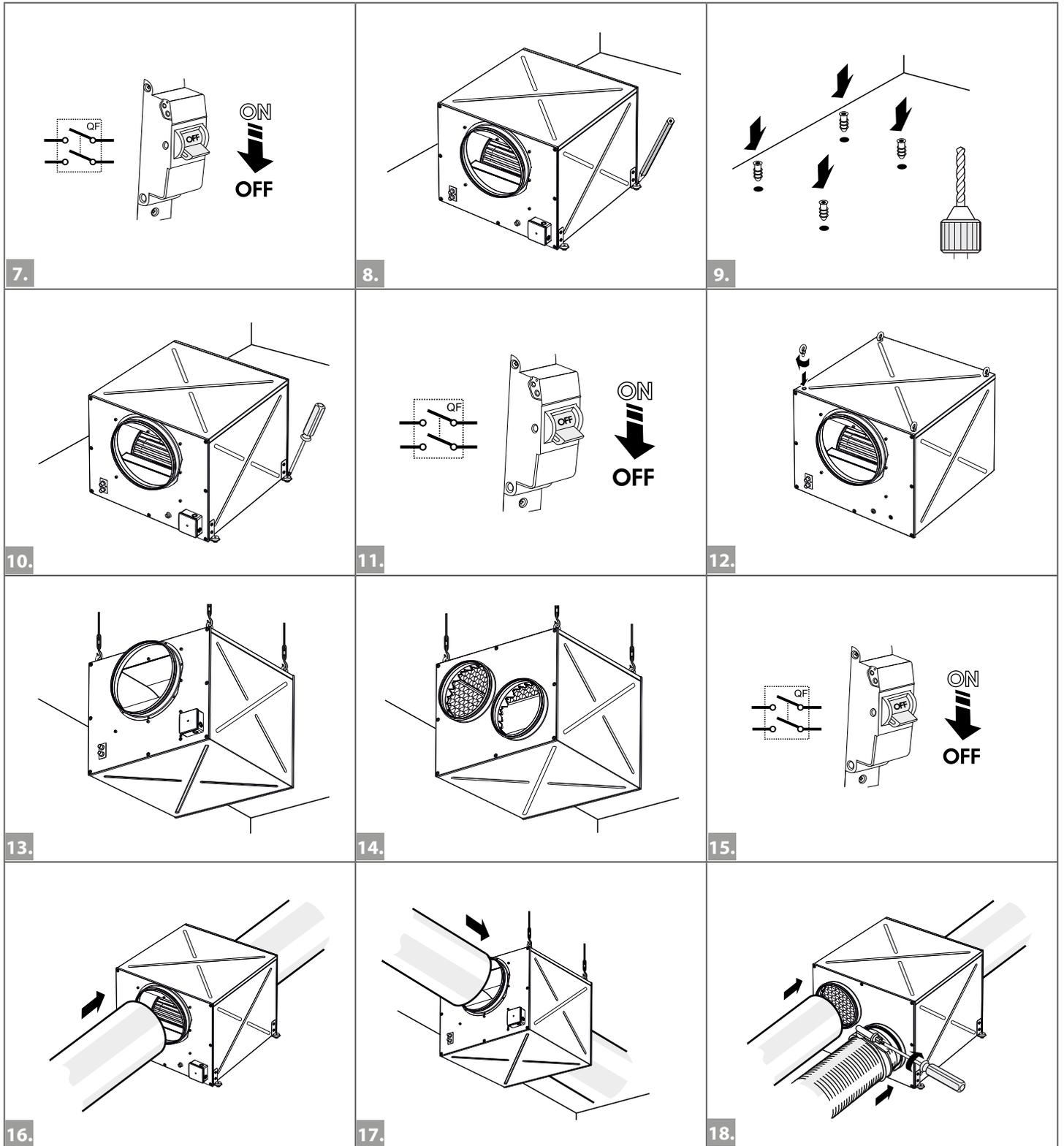
Be sure to set the required impeller speed and temperature setpoint by turning the respective control knobs for the models equipped with the temperature and speed controller module. The set temperature range is +20 °C up to +30 °C.



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.



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.**

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.

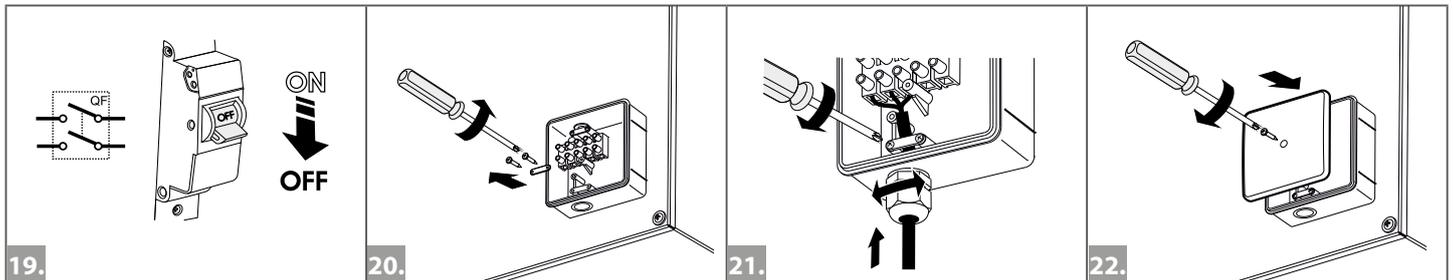
The above value is for reference.

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.

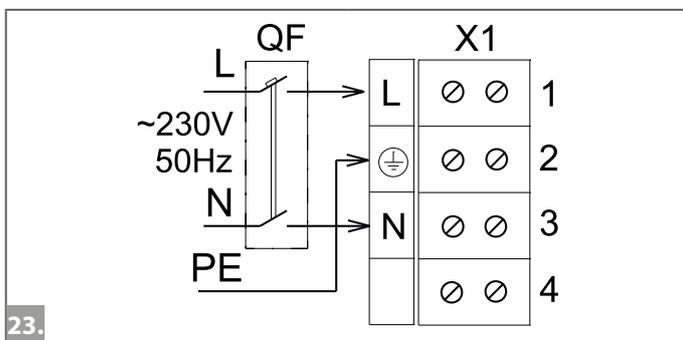
Connect the fan to 230 V / 50 Hz power mains through the external automatic circuit breaker with the minimum contact gap 3 mm installed at the power input and integrated into the house cabling. The circuit breaker installation place must ensure free access for emergency shutdown of the fan.

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.



Wiring diagram



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

Recommended trip current of the automatic circuit breaker QF

Table 3

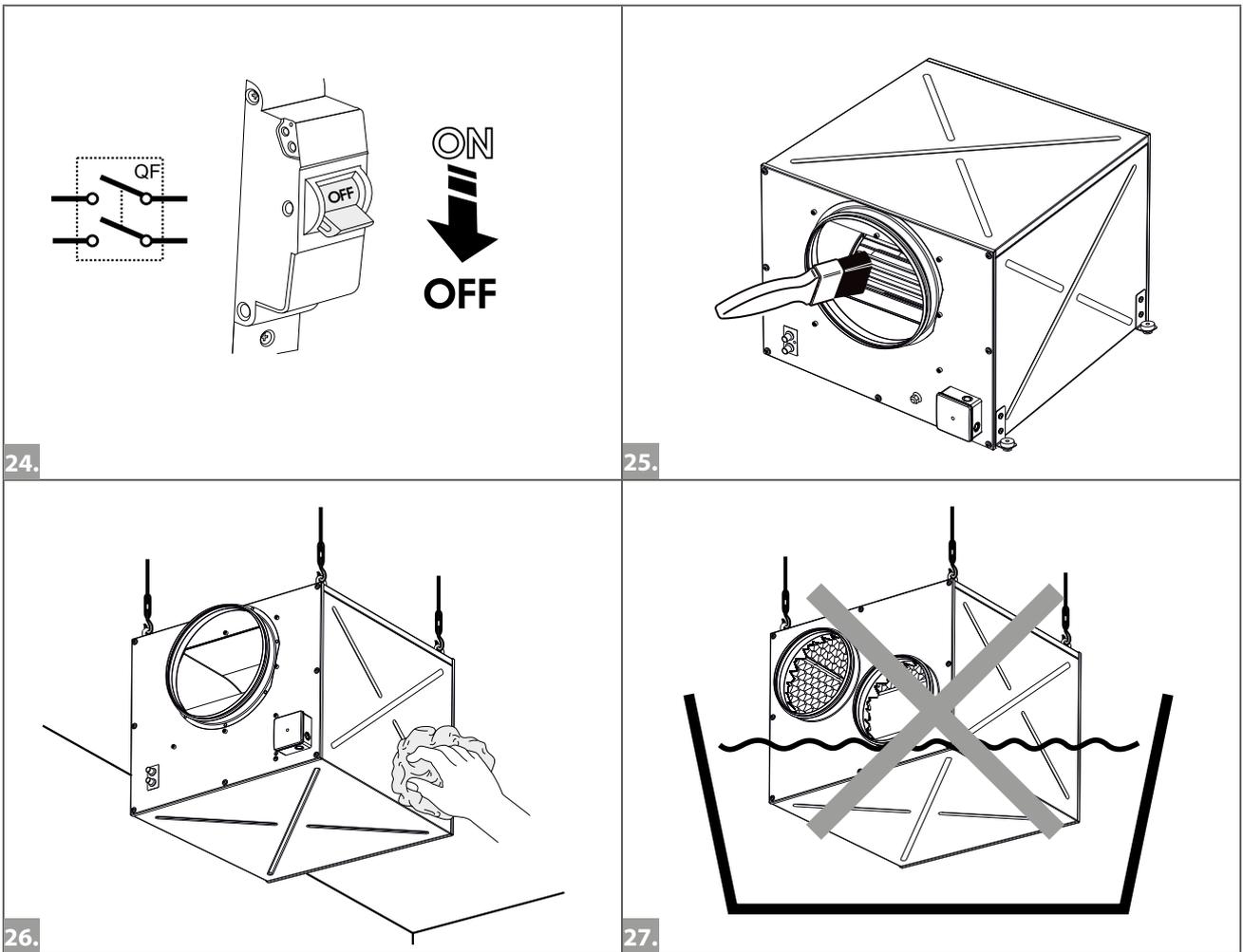
Model	Recommended current [A]
KSD 250-6E	2
KSD 250-4E	2
KSD 250 S-6E	3,15
KSD 250 S-4E	5
KSD 315-6E	4
KSD 315-4E	6,3
KSD 315 S-4E	8
KSD 315 S-6E	10
KSD 315/250*2-6E	4
KSD 315/250*2-4E	6,3
KSD 315/250*2 S-4E	8
KSD 315/250*2 S-6E	10

TECHNICAL MAINTENANCE



**DISCONNECT THE UNIT FROM POWER SUPPLY BEFORE ANY MAINTENANCE OPERATIONS!
MAKE SURE THE UNIT IS DISCONNECTED FROM POWER MAINS BEFORE REMOVING THE
PROTECTION.**

Disconnect the fan from power supply prior to any maintenance and repair operations. Make sure the rotating parts do not move, Fig. 24-27. 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.



TROUBLESHOOTING

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.

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



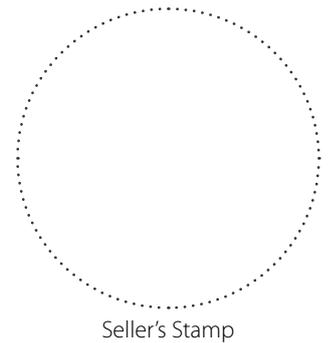
USER'S WARRANTY CLAIMS SHALL BE SUBJECT TO REVIEW ONLY UPON PRESENTATION OF THE UNIT, THE PAYMENT DOCUMENT AND THE USER'S MANUAL WITH THE PURCHASE DATE STAMP

CERTIFICATE OF ACCEPTANCE

Unit Type	The centrifugal electric fan enclosed in a metal sound-insulated casing
Model	
Serial Number	
Manufacture Date	
Quality Inspector's Stamp	

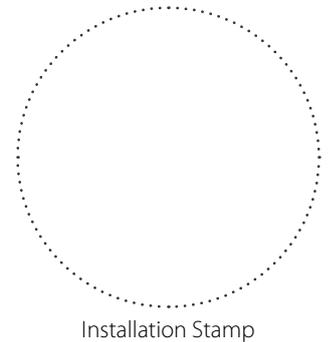
SELLER INFORMATION

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	



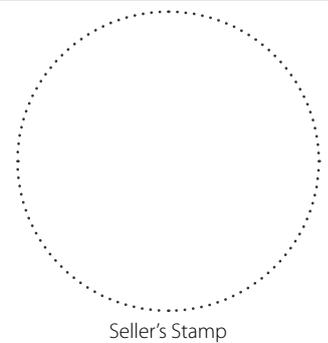
INSTALLATION CERTIFICATE

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:	



WARRANTY CARD

Unit Type	The centrifugal electric fan enclosed in a metal sound-insulated casing
Model	
Serial Number	
Manufacture Date	
Purchase Date	
Warranty Period	
Seller	





VENTS

