



ROOF-MOUNTED CENTRIFUGAL SMOKE EXTRACTION FAN



Tower-SV-K2

EN

USER'S MANUAL

CONTENTS

Safety requirements.....	2
Purpose.....	4
Delivery set.....	4
Designation key.....	5
Technical data.....	6
Mounting and set-up.....	9
Connection to power mains	11
Commissioning.....	13
Technical maintenance.....	14
Storage and transportation regulations.....	16
Manufacturer's warranty	17
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 Tower-SV-K2 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

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.

This unit is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the unit by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the unit.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Cleaning and user maintenance shall not be done by children without supervision.

Children shall not play with the appliance.

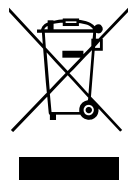
Connection to the mains must be made through a disconnecting device, which is integrated into the fixed wiring system in accordance with the wiring rules for design of electrical units, and has a contact separation in all poles that allows for full disconnection under overvoltage category III conditions.

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.

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.



THE PRODUCT MUST BE DISPOSED SEPARATELY AT THE END OF ITS SERVICE LIFE.

DO NOT DISPOSE THE UNIT AS UNSORTED DOMESTIC WASTE.

PURPOSE

The Tower-SV-K2 series fan is designed for roof mounting in industrial, public, residential, administrative, and other premises (except for categories A and B of explosive fire hazard in accordance with the NPB 105-03) and is used for forced removal of smoke, heated gases and the simultaneous removal of heat generated in a fire outside the premises where the fire occurs.



THE UNIT SHOULD NOT BE OPERATED BY CHILDREN OR PERSONS WITH REDUCED PHYSICAL, MENTAL, OR SENSORY CAPACITIES, OR THOSE WITHOUT THE APPROPRIATE TRAINING.

THE UNIT MUST BE INSTALLED AND CONNECTED ONLY BY PROPERLY QUALIFIED PERSONNEL AFTER THE APPROPRIATE BRIEFING.

THE CHOICE OF UNIT INSTALLATION LOCATION MUST PREVENT UNAUTHORISED ACCESS BY UNATTENDED CHILDREN.

The fan is intended to protect the building structure and equipment against high temperature influence, remove combustion gases outside the serviced space and prevent fire propagation to neighbouring premises and areas.

The fan can be designed for moderate (U), cold (CL), tropical (T) or maritime (M) climate conditions of the first placement category.

The fan handles smoke and air mixtures with temperatures up to +600 °C for 60 minutes.

A characteristic feature of Tower-SV-K2 roof fans is an impeller with backward curved blades and an electric motor with an insulated cover, a powder-coated welded body, and an insulated cover and galvanized steel outer casing.

Several fans are allowed to be installed on one roof close to each other.

DELIVERY SET

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

DESIGNATION KEY

Tower-SV-K2 - 630 - 6 D / 1.5 - K - U1 - 600/2 - Zn

Casing material and paint colour

_ – casing material: steel with powder painting, default colour: blue RAL5007

RALxxxx – casing material: steel with powder coating, paint colour according to RALxxxx

Zn – casing material: galvanized steel

Fire resistance

600/2 – 600 °C, 2 hours.

Climatic modification (outdoor installation)

U1 – temperate climate

HL1 – cold climate

T1 – tropical climate

M1 – marine moderately cold climate

Options

K – with a terminal box

S1 – built-in external switch

1.5 – motor power [kW]

Motor phase and operation modes

E – single-phase across-the-line motor

EP – single-phase motor with variable frequency start

D – three-phase motor

DP – three-phase motor with variable frequency start

6 – number of motor poles

630 – impeller size [mm]

Tower-SV-K2 – roof-mounted centrifugal smoke extraction fan with vertical air discharge in an octagonal casing

TECHNICAL DATA

The fans are rated for connection to 3~400 V/50 Hz power mains.

Both a direct connection to power mains and a connection via a soft starter are possible. The recommended connection type for each model is specified in the table.

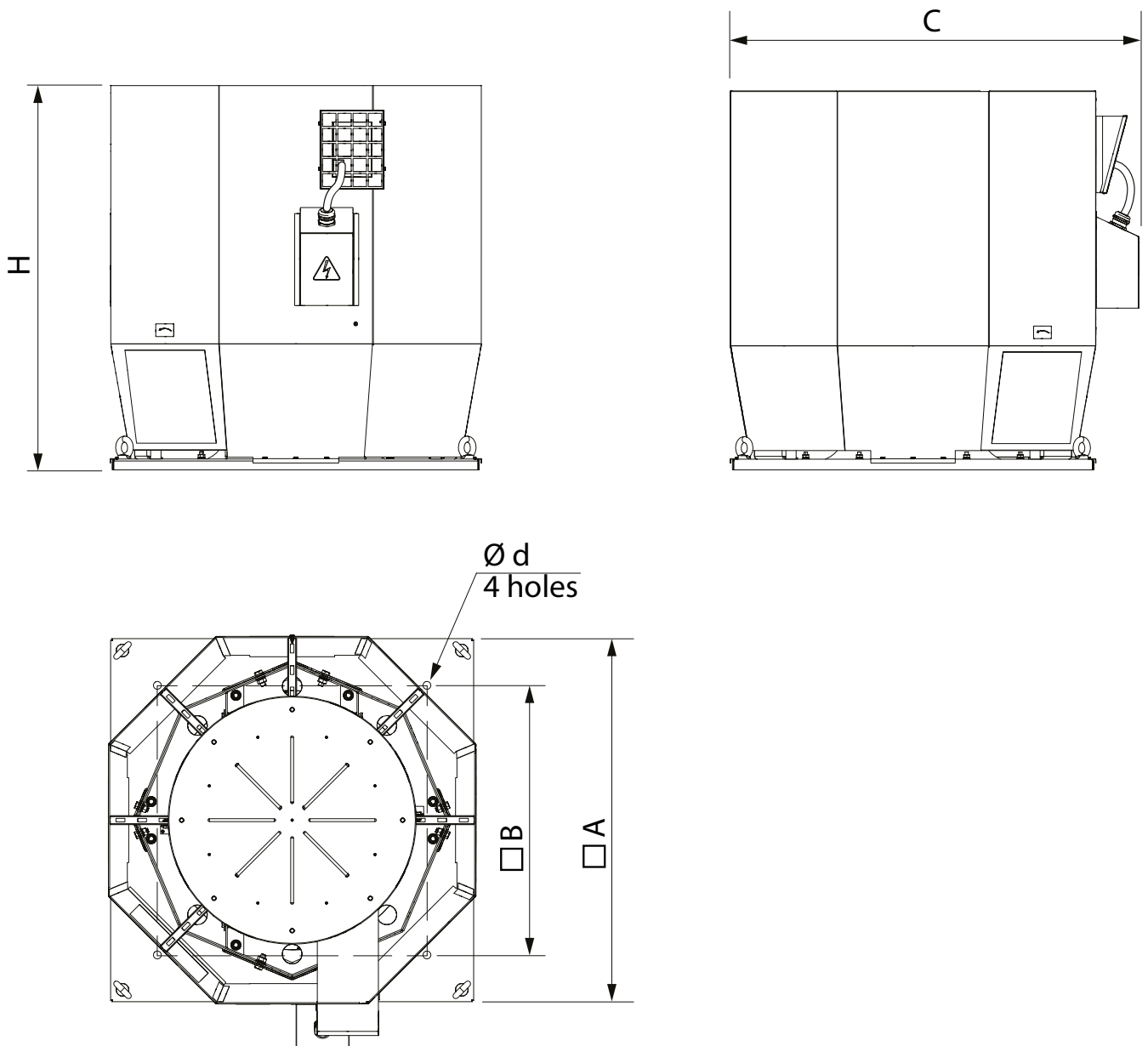
The unit is rated as a Class I electrical appliance.

IP55 protection class.

Fan model	Installed capacity [kW]	Current [A]	Rated RPM [min ⁻¹]	Maximum air flow [m ³ /h]	The recommended connection type
Tower-SV-K2-315-2D/1.1-X-XX-600/2-XXX	1.10	2.55	2770	4250	DOL / Soft Starter
Tower-SV-K2-355-4D/0.25-X-XX-600/2-XXX	0.25	0.83	1340	3200	DOL / Soft Starter
Tower-SV-K2-355-2D/2.2-X-XX-600/2-XXX	2.2	4.69	2800	6500	DOL / Soft Starter
Tower-SV-K2-400-6D/0.25-X-XX-600/2-XXX	0.25	1.02	880	3200	DOL / Soft Starter
Tower-SV-K2-400-4D/0.55-X-XX-600/2-XXX	0.55	1.51	1360	4600	DOL / Soft Starter
Tower-SV-K2-400-2D/4-X-XX-600/2-XXX	4.0	7.9	2840	9300	DOL / Soft Starter
Tower-SV-K2-450-6D/0.25-X-XX-600/2-XXX	0.25	1.02	880	4250	DOL / Soft Starter
Tower-SV-K2-450-4D/1.1-X-XX-600/2-XXX	1.10	2.75	1380	6800	DOL / Soft Starter
Tower-SV-K2-450-2D/7.5-X-XX-600/2-XXX	7.50	14.3	2860	13500	DOL / Soft Starter
Tower-SV-K2-500-8D/0.25-X-XX-600/2-XXX	0.25	1.36	680	4000	DOL / Soft Starter
Tower-SV-K2-500-6D/0.55-X-XX-600/2-XXX	0.55	1.68	900	7000	DOL / Soft Starter
Tower-SV-K2-500-4D/1.5-X-XX-600/2-XXX	1.5	3.55	1400	9500	DOL / Soft Starter
Tower-SV-K2-560-8D/0.37-X-XX-600/2-XXX	0.37	1.76	690	6500	DOL / Soft Starter
Tower-SV-K2-560-6D/0.75-X-XX-600/2-XXX	0.75	2.15	910	8500	DOL / Soft Starter
Tower-SV-K2-560-4D/3-X-XX-600/2-XXX	3.0	6.48	1420	13000	DOL / Soft Starter
Tower-SV-K2-630-8D/0.75-X-XX-600/2-XXX	0.75	2.64	700	9000	DOL / Soft Starter
Tower-SV-K2-630-6D/1.5-X-XX-600/2-XXX	1.50	3.84	940	12500	DOL / Soft Starter
Tower-SV-K2-630-4D/5.5-X-XX-600/2-XXX	5.50	11.3	1430	17500	DOL / Soft Starter
Tower-SV-K2-710-8D/1.1-X-XX-600/2-XXX	1.1	3.46	700	13500	DOL / Soft Starter
Tower-SV-K2-710-6D/2.2-X-XX-600/2-XXX	2.2	5.38	940	17500	DOL / Soft Starter
Tower-SV-K2-710-4D/11-X-XX-600/2-XXX	11.0	22.3	1460	26500	DOL / Soft Starter
Tower-SV-K2-800-8D/2.2-X-XX-600/2-XXX	2.2	5.8	710	19500	DOL / Soft Starter
Tower-SV-K2-800-6D/4-X-XX-600/2-XXX	4.0	9.4	960	25000	DOL / Soft Starter
Tower-SV-K2-800-4D/15-X-XX-600/2-XXX	15.0	30	1460	37500	Soft Starter
Tower-SV-K2-900-10D/2.2-X-XX-600/2-XXX	2.2	8	590	21000	DOL / Soft Starter
Tower-SV-K2-900-8D/4-X-XX-600/2-XXX	4.0	10.2	710	27500	DOL / Soft Starter
Tower-SV-K2-900-6D/7.5-X-XX-600/2-XXX	7.5	16.5	960	36000	DOL / Soft Starter
Tower-SV-K2-900-4D/30-X-XX-600/2-XXX	30.0	57.4	1470	53500	Soft Starter
Tower-SV-K2-1000-10D/3-X-XX-600/2-XXX	3.0	9.5	590	30000	DOL / Soft Starter
Tower-SV-K2-1000-8D/7.5-X-XX-600/2-XXX	7.5	17.7	710	38000	DOL / Soft Starter
Tower-SV-K2-1000-6D/15-X-XX-600/2-XXX	15.0	31.5	950	52000	Soft Starter
Tower-SV-K2-1120-10D/7.5-X-XX-600/2-XXX	7.5	21	590	47000	DOL / Soft Starter
Tower-SV-K2-1120-8D/11-X-XX-600/2-XXX	11.0	25.1	730	55000	DOL / Soft Starter
Tower-SV-K2-1120-8D/15-X-XX-600/2-XXX	15.0	34	730	62500	Soft Starter
Tower-SV-K2-1120-6D/22-X-XX-600/2-XXX	22.0	44.6	950	71000	Soft Starter
Tower-SV-K2-1120-6D/30-X-XX-600/2-XXX	30.0	59.3	960	80000	Soft Starter

DOL (direct on line) — direct connection to power mains. Soft Starter — connection using a soft starter.

Overall dimensions



Fan model	Overall and connecting dimensions [mm]					
	H	A	B	C	d	
Tower-SV-K2-315-2D/1.1-K-U1-600/2-Zn	779	680	480	820	16	
Tower-SV-K2-355-4D/0.25-K-U1-600/2-Zn	744	680	480	820	16	
Tower-SV-K2-355-2D/2.2-K-U1-600/2-Zn	801					
Tower-SV-K2-400-6D/0.25-K-U1-600/2-Zn	772	760	580	866	16	
Tower-SV-K2-400-4D/0.55-K-U1-600/2-Zn				880		
Tower-SV-K2-400-2D/4-K-U1-600/2-Zn				897		
Tower-SV-K2-450-6D/0.25-K-U1-600/2-Zn	794	760	580	864	16	
Tower-SV-K2-450-4D/1.1-K-U1-600/2-Zn	794			933		
Tower-SV-K2-450-2D/7.5-K-U1-600/2-Zn	929	810				
Tower-SV-K2-500-8D/0.25-K-U1-600/2-Zn	888	830	640	950	16	
Tower-SV-K2-500-6D/0.55-K-U1-600/2-Zn						
Tower-SV-K2-500-4D/1.5-K-U1-600/2-Zn						
Tower-SV-K2-560-8D/0.37-K-U1-600/2-Zn	921	1000	750	1082	16	
Tower-SV-K2-560-6D/0.75-K-U1-600/2-Zn				1094		
Tower-SV-K2-560-4D/3-K-U1-600/2-Zn				991		
Tower-SV-K2-630-8D/0.75-K-U1-600/2-Zn	1060	1010	750	1121	16	
Tower-SV-K2-630-6D/1.5-K-U1-600/2-Zn						
Tower-SV-K2-630-4D/5.5-K-U1-600/2-Zn						
Tower-SV-K2-710-8D/1.1-K-U1-600/2-Zn	1105	1180	980	1257	16	
Tower-SV-K2-710-6D/2.2-K-U1-600/2-Zn				1267		
Tower-SV-K2-710-4D/11-K-U1-600/2-Zn				1264		
Tower-SV-K2-800-8D/2.2-K-U1-600/2-Zn	1237	1180	980	1311	16	
Tower-SV-K2-800-6D/4-K-U1-600/2-Zn						
Tower-SV-K2-800-4D/15-K-U1-600/2-Zn						1387
Tower-SV-K2-900-10D/2.2-K-U1-600/2-Zn	1297	1340	1050	1494	16	
Tower-SV-K2-900-8D/4-K-U1-600/2-Zn	1448					
Tower-SV-K2-900-6D/7.5-K-U1-600/2-Zn						1524
Tower-SV-K2-900-4D/30-K-U1-600/2-Zn						1600
Tower-SV-K2-1000-10D/3-K-U1-600/2-Zn	1595	1550	1340	1686	16	
Tower-SV-K2-1000-8D/7.5-K-U1-600/2-Zn						
Tower-SV-K2-1000-6D/15-K-U1-600/2-Zn						1680
Tower-SV-K2-1120-10D/7.5-K-U1-600/2-Zn	1829	1640	1340	1876	16	
Tower-SV-K2-1120-8D/11-K-U1-600/2-Zn	1753					
Tower-SV-K2-1120-8D/15-K-U1-600/2-Zn	1866					
Tower-SV-K2-1120-6D/22-K-U1-600/2-Zn	1789					
Tower-SV-K2-1120-6D/30-K-U1-600/2-Zn	1956					

MOUNTING AND SET-UP



READ THE USER'S MANUAL BEFORE INSTALLING THE UNIT

Prior to mounting the fan:

- Read the present User's manual carefully.
 - Check the fan for any mechanical damages caused by wrong transportation.
 - Manually check the impeller for smooth rotation.
 - Make sure there is no condensate on the motor
 - Check the electrical resistance of insulation between the motor windings and between each winding and the motor casing
- Follow the safety regulations during the make-ready procedures and fan operation.

Fan mounting:

- Install the fan on the building roof, out of possible fire areas.
- Check the roof frameworks for sufficient rigidity in installation places.
- The fan is designed for vertical installation only (vertical fan shaft) on a concrete or steel base plate of min 250 mm height (with respect to possible level of precipitation).
- Remove the side shields and fix the fan to the mounting frame with four anchor bolts at the frame corners.
- Check that the fan components do not get deformed during mounting.
- Provide free and unhampered air extraction from the fan.

The fan delivery set may include a mounting frame (available separately). Install the mounting frame on a load carrying roof section true-vertical inside a prepared opening. The opening size must be sufficient to ensure free passage of air ducts with connecting flanges of the corresponding diameter in accordance with the DIN 24154 Series 3.

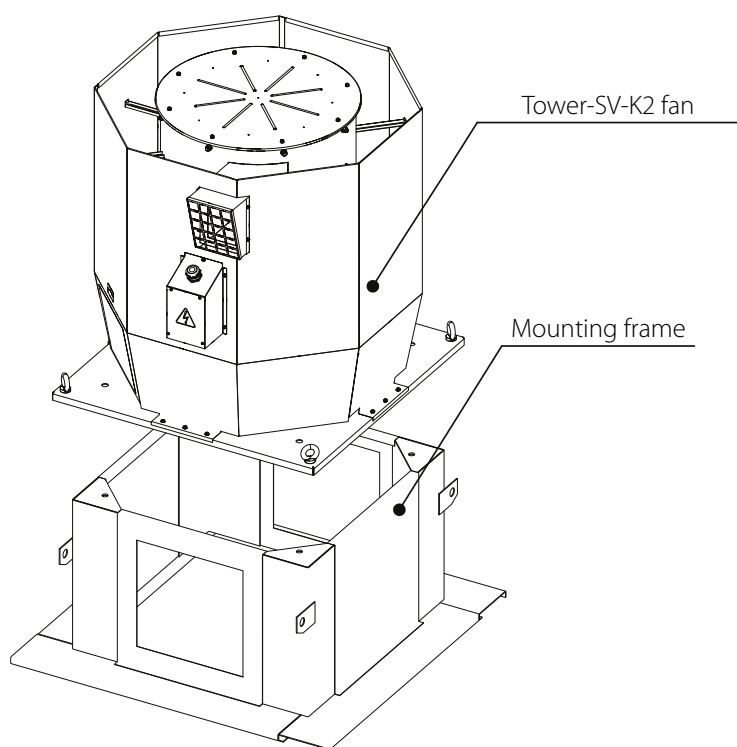
Fix the mounting frame to the load-carrying roof surface in compliance with construction norms and standards applicable for standard building designs.

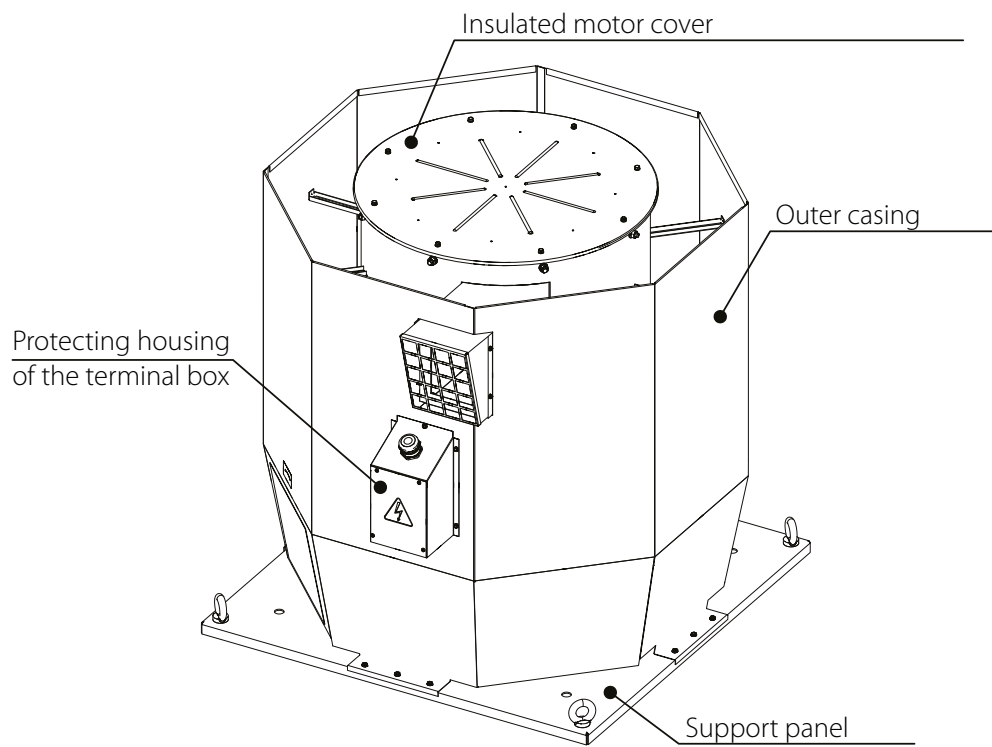
Attach the backdraft damper or the first air duct section directly to the fan prior to its installation. The backdraft damper is delivered separately. Provide additional fixing of the air ducts to the building structures to avoid load transfer from the air ducts to the fan.

Do not put the fan on the air duct while mounting to avoid its deformation.

Fastening the fan to the mounting frame is carried out with bolts and washers of the appropriate size.

After installing the unit, you need to make sure that the fan impeller rotates freely.





The roof-mounted smoke extraction fan consists of the welded support panel to which are attached:

- electric motor covered with an insulated cover
- terminal box located on the outer casing of the fan
- impeller located inside the support panel

The motor with the impeller is rigidly fixed to the support panel.

Welded sheet steel construction. The hub and clamping screw are connected directly to the motor shaft.

Motor: standard fan models are equipped with three-phase electric motors rated for 400 V, 50 Hz, protection class: IP55, insulation class: F (IEC).

CONNECTION TO POWER MAINS



DISCONNECT THE POWER SUPPLY PRIOR TO ANY OPERATIONS WITH THE UNIT.

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.

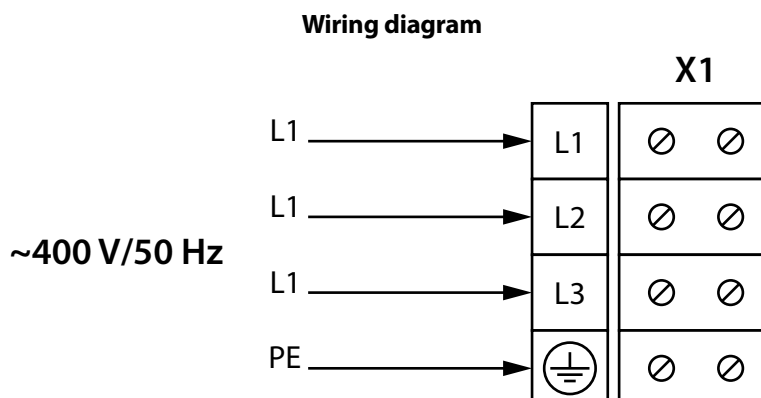
THE RATED ELECTRICAL PARAMETERS OF THE UNIT ARE GIVEN ON THE MANUFACTURER'S LABEL



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

- The unit is rated for connection to 3~400 V 50 Hz power mains according to the 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.

Caution! The type of electrical connection is indicated in the technical data table.



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. The electric parameters of the fan are shown on the label on the fan casing.

The fan motor is not equipped with an integrated thermal protection. Consider that while selecting a starter or a closing relay.



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



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



PRIOR TO COMMENCING ANY TECHNICAL MAINTENANCE PUT UP A PROHIBITORY SIGN ON THE FAN STARTING PANEL:
“DO NOT SWITCH ON! MEN AT WORK!”



AVOID LIQUID SPILLS ON THE MOTOR! DO NOT USE AGGRESSIVE SOLVENTS AND SHARP OBJECTS FOR CLEANING!

Technical maintenance and repair of the fan may commence only after its disconnection from the power mains and after all rotating parts are at a complete standstill. Prior to commencing any technical maintenance put up a prohibitory sign on the fan starting panel: «Do not switch on! Men at work!» The technical maintenance includes periodic cleaning of the surfaces from accumulated dust and dirt.

Technical maintenance must be carried out at least once a year.

- Check the grounding screw terminals and electric connectors for proper tightness and tighten them up if necessary.
- Check the fastening screws for tightness and tighten them up if necessary.
- Check the bolt connecting the motor shaft to the hub for proper tightness and tighten it up if necessary.
- Check the fan impeller for contamination and clean it up if necessary. To clean the impeller, the outer lining segment must be removed.

Cut off power supply when doing work related to the safety of maintenance. Other work related to electrical characteristics must be performed with the power supplied.

TROUBLESHOOTING

Problem	Possible reasons	Elimination
The fan will not start.	No power supply.	Check the mains switch. Check the electrical connections according to the wiring diagram.
	Jammed motor.	Carefully check the fan impeller for possible seizure and eliminate it, if necessary. If the impeller is in order, replace the electric motor.
The switching equipment activates upon fan start-up.	Short circuit in the fan or the electric circuit between the fan and the switching equipment.	Eliminate the cause of a short circuit.
	Excessive current consumption due to an overload in the electric mains.	Eliminate the cause of excessive current consumption.
	Improper fan starting method.	Use a soft starter or frequency converter to start the motor (see "Asynchronous Electric Motor Starting Methods" in the "Connection to power mains" section) .
	Improper switching equipment.	Re-select the switching equipment in accordance with the current regulations and equipment specifications.
	The installed switching equipment is of poor quality or its actual performance falls short of the rated values stated by the manufacturer.	Re-select the switching equipment by choosing a unit which successfully passed commutation and load tests and has a technical compliance certificate. The selection should be limited to the top five foreign switching equipment manufacturers.

The fan fails to reach the required rotation speed due to serious overheating of the fan motor.	Fan motor overloaded.	Eliminate the overload.
	Improper fan starting method.	Use a soft starter or frequency converter to start the motor (see "Asynchronous Electric Motor Starting Methods" in the "Connection to power mains" section) .
The fan motor runs at overload capacity with current consumption in excess of the rated value.	The fan supplies more air than expected upon motor capacity selection.	Measure network resistance. Throttle down the network (add aerodynamic resistance to the air duct network).
	Wrong motor phasing. The impeller rotates in the opposite direction of the arrow on the fan casing.	If necessary, change the impeller rotation direction by changing the phase sequence on the electric motor terminals.
	Air ducts clogged.	Clean the air duct or the impeller.
The fan supplies more air than expected.	The resistance values used during the ventilation network calculations are too conservative.	Check the air ducts for proper shape and cross section as well as for any dampers present.
	The cross section of air ducts increased and their number reduced during the installation.	Throttle down the network (add aerodynamic resistance to the air duct network).
	Wrong choice of the fan.	Replace the fan with a unit of proper standard size.
The fan supplies less air than expected.	Wrong calculation of the ventilation network and wrong selection of the fan.	Re-calculate the network parameters and select a matching fan.
	The network resistance exceeds the design calculations.	Re-arrange the ventilation network to decrease its aerodynamic resistance.
	Wrong direction of the impeller rotation.	If necessary, change the impeller rotation direction by changing the phase sequence on the electric motor terminals (see the "Commissioning" section) .
	Air leak through a loose air duct connection.	Eliminate the air leak. Seal the air duct connection.
	Impeller or air duct contamination with foreign objects or debris.	Clean the impeller or the air ducts from foreign objects or debris.
Excessive noise or vibration both inside the fan and in the circuit.	Loose screw connections.	Check the screw connections for proper tightness.
	No flexible joints between the fan and the ventilation network on the suction and discharge sides.	Install flexible joints.
	Loose connection of valves and dampers to the air ducts.	Tighten up the fasteners of valves and dampers.
	Impeller or air duct contamination with foreign objects or debris.	Clean the impeller or the air ducts from foreign objects or debris.
	Worn bearings.	Replace the bearings.
	Unstable power supply, unstable motor operation.	Check the stability of power supply parameters and electric motor operation.

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.



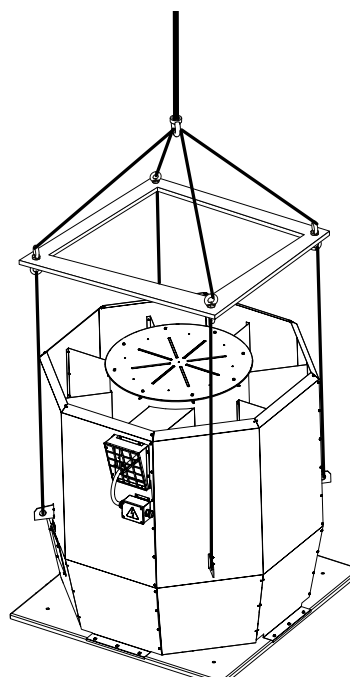
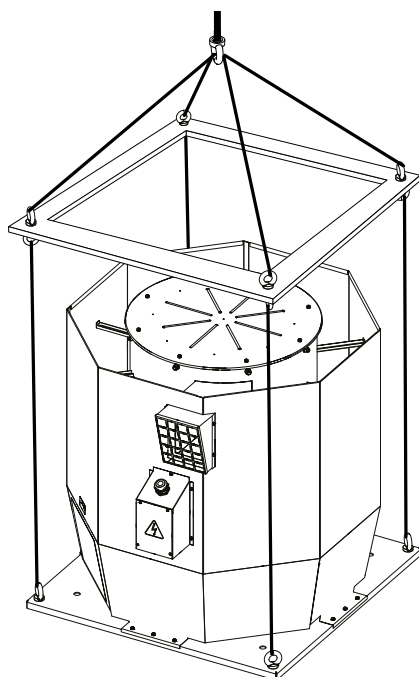
RISK OF UNIT DAMAGE.
ROTATE THE MOTOR ROTOR BY HAND TO A NEW POSITION EVERY 3 MONTHS DURING STORAGE.

SAFETY INSTRUCTIONS FOR LOADING, UNLOADING AND INSTALLATION WORK



CAUTION!
EXERCISE CAUTION DURING HANDLING AND TRANSPORTATION OPERATIONS!

- Be sure to consider the weight of the unit and the capacity of the handling equipment.
- Transport the fan using suitable means of transport: crane, lifting beam or forklift.
- In all cases, the side panels must be protected from damage by a forklift or cables.
- Select lifting accessories of sufficient length to ensure that the load is evenly distributed.
- Wear protective gloves and safety shoes when working.
- Avoid blows and mechanical during transportation.
- Manipulations should only be carried out with suitable lifting equipment.
- Never stand underneath a suspended fan!
- Depending on the standard size, the Tower-SV-K2 fans are equipped with either eyebolts or lifting lugs for hooking with lifting accessories.



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 (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.

The manufacturer shall not accept any claims with regards to the condition of the paint-and-lacquer coating (hereinafter PLC) in the following cases:

- Dents, cracks, scratches and abrasions of the PLC sustained during handling, mounting and assembly operations.
- Progress of corrosion on areas damaged with stones, sand, and roof coat tar during the performance of roofing work.
- Signs of direct exposure of the PLC to excessive temperatures, which occurred during the performance of roofing work.
- Violation of regulations on transportation, storage, installation, and operation of the unit.
- Presence of damage caused by exposure to industrial and chemical emissions, acidic or alkaline pollution, sap or other factors not related to normal operating conditions.



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



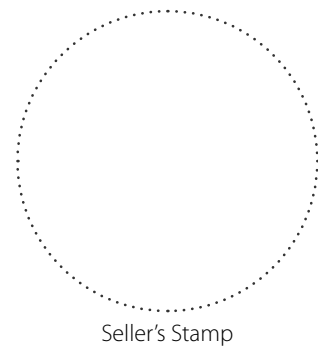
USER'S WARRANTY CLAIMS SHALL BE SUBJECT TO REVIEW ONLY UPON PRESENTATION OF THE UNIT, THE PAYMENT DOCUMENT AND THE USER'S MANUAL WITH THE PURCHASE DATE STAMP

CERTIFICATE OF ACCEPTANCE

Unit Type	Roof-mounted centrifugal smoke extraction fan
Model	
Serial Number	
Manufacture Date	
Quality Inspector's Stamp	

SELLER INFORMATION

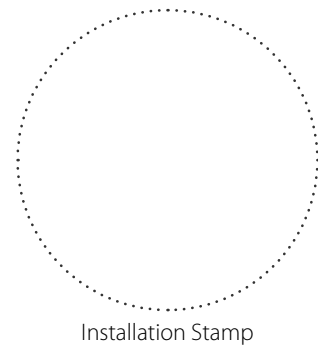
Seller	
Address	
Phone Number	
E-mail	
Purchase Date	
This is to certify acceptance of the complete unit delivery with the user's manual. The warranty terms are acknowledged and accepted.	
Customer's Signature	



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	Roof-mounted centrifugal smoke extraction fan
Model	
Serial Number	
Manufacture Date	
Purchase Date	
Warranty Period	
Seller	

