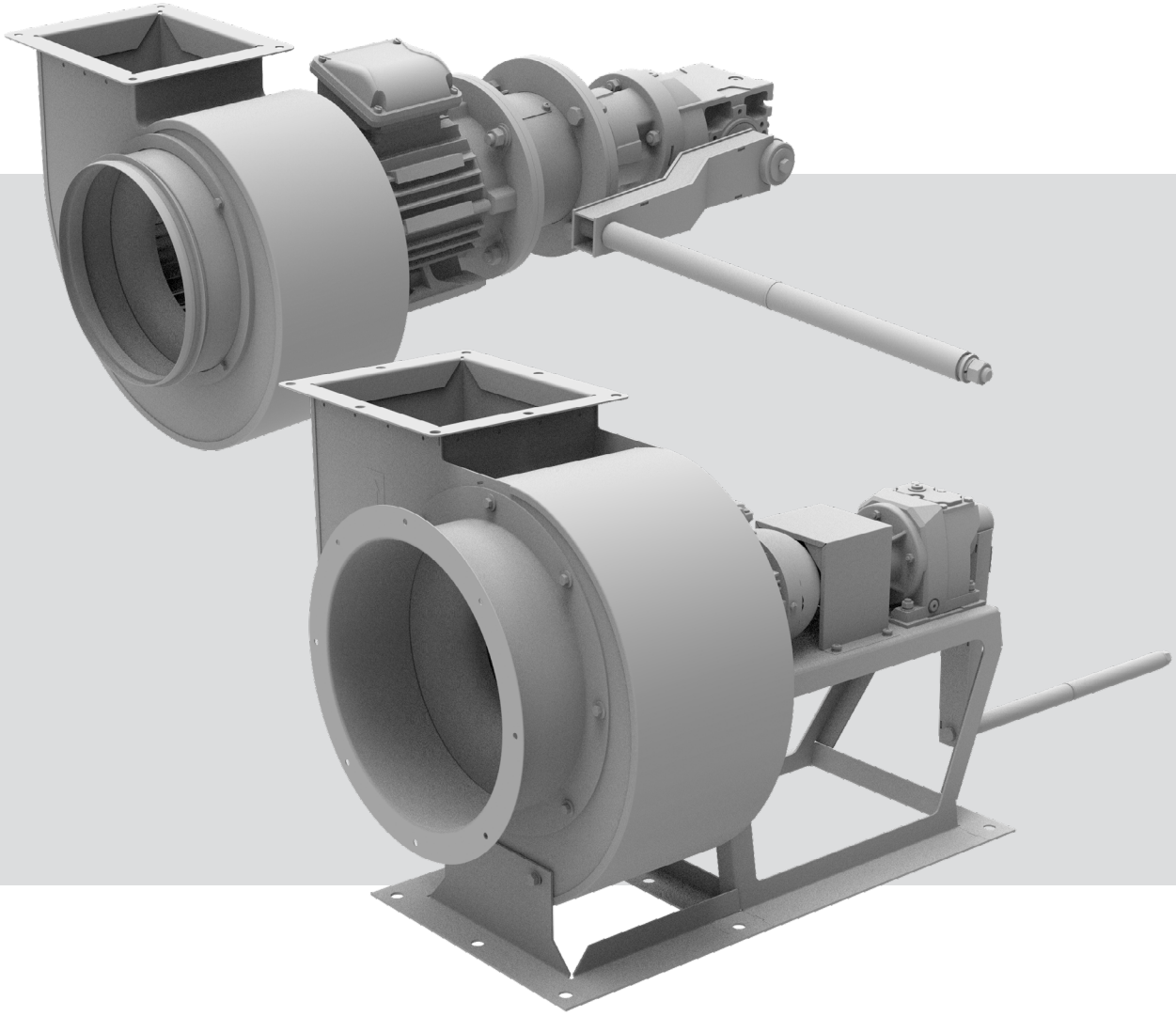
USER'S MANUAL

ERV
ERV-M



Electrically and manually driven fan

VENTS

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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 ERV/ERV-M unit and all its modifications.
Technical and maintenance staff must have theoretical and practical training in the field of ventilation systems and should be able to work in accordance with workplace safety rules as well as construction norms and standards applicable in the territory of the country.

SAFETY REQUIREMENTS

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

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.

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.

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

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

PURPOSE

The fan is designed to supply air to various structures in a clean ventilation mode and can be operated either from mains or manually.
The fan is mainly used in civil defence structures, can be used for ventilation of wells and other structures in case of a power outage.
The fan is rated for continuous operation.
Transported air must not contain any flammable or explosive mixtures, evaporation of chemicals, sticky substances, fibrous materials, coarse dust, soot and oil particles or environments favourable for the formation of hazardous substances (toxic substances, dust, pathogenic germs).

DELIVERY SET

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

DESIGNATION KEY

Designation example: **ERV - 280 - 2D**

Series
Electrically and manually driven fan

Impeller standard size

Pole number

Phases

Designation example: **ERV-M - 200 - P**

Series
Small electrically and manually driven fan

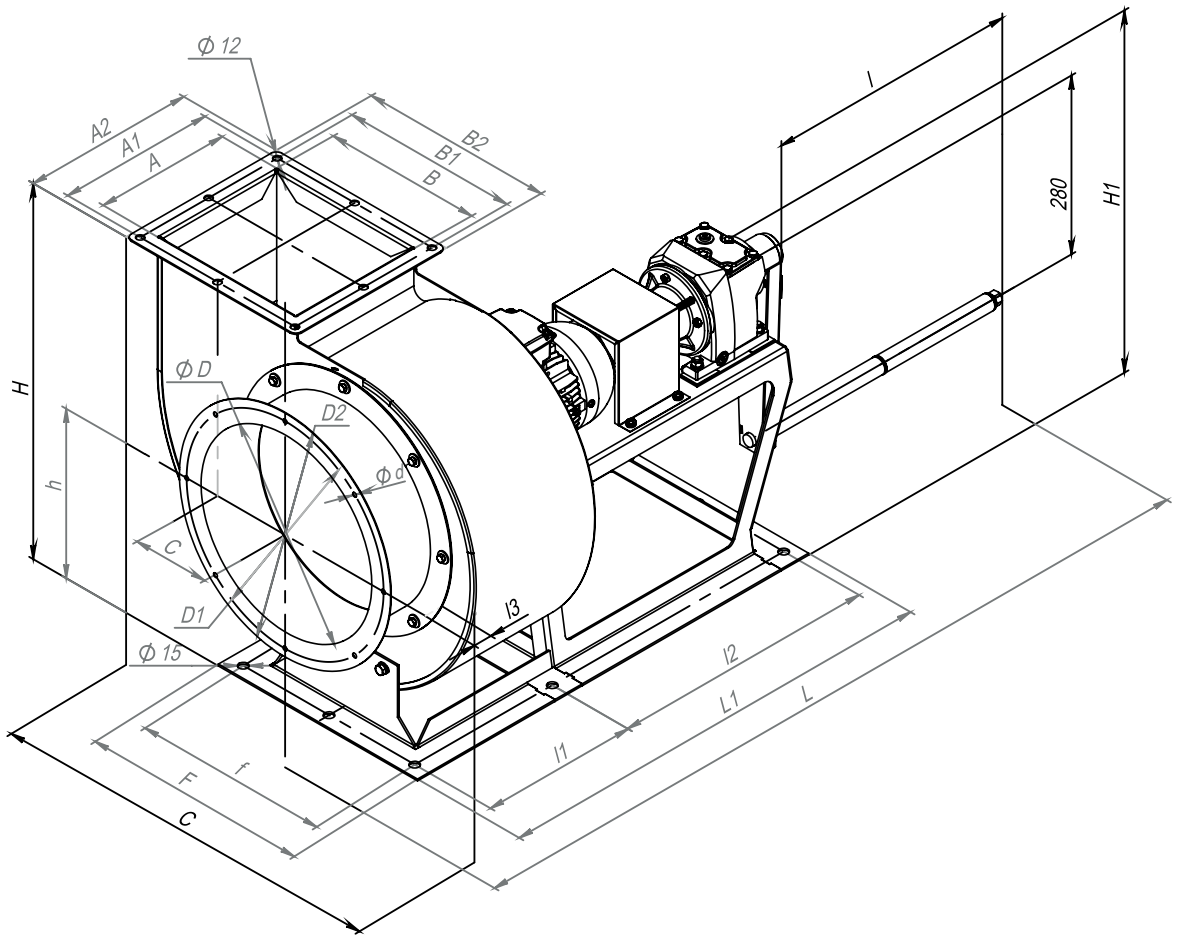
Impeller standard size

Casing version
P – right-hand

TECHNICAL DATA

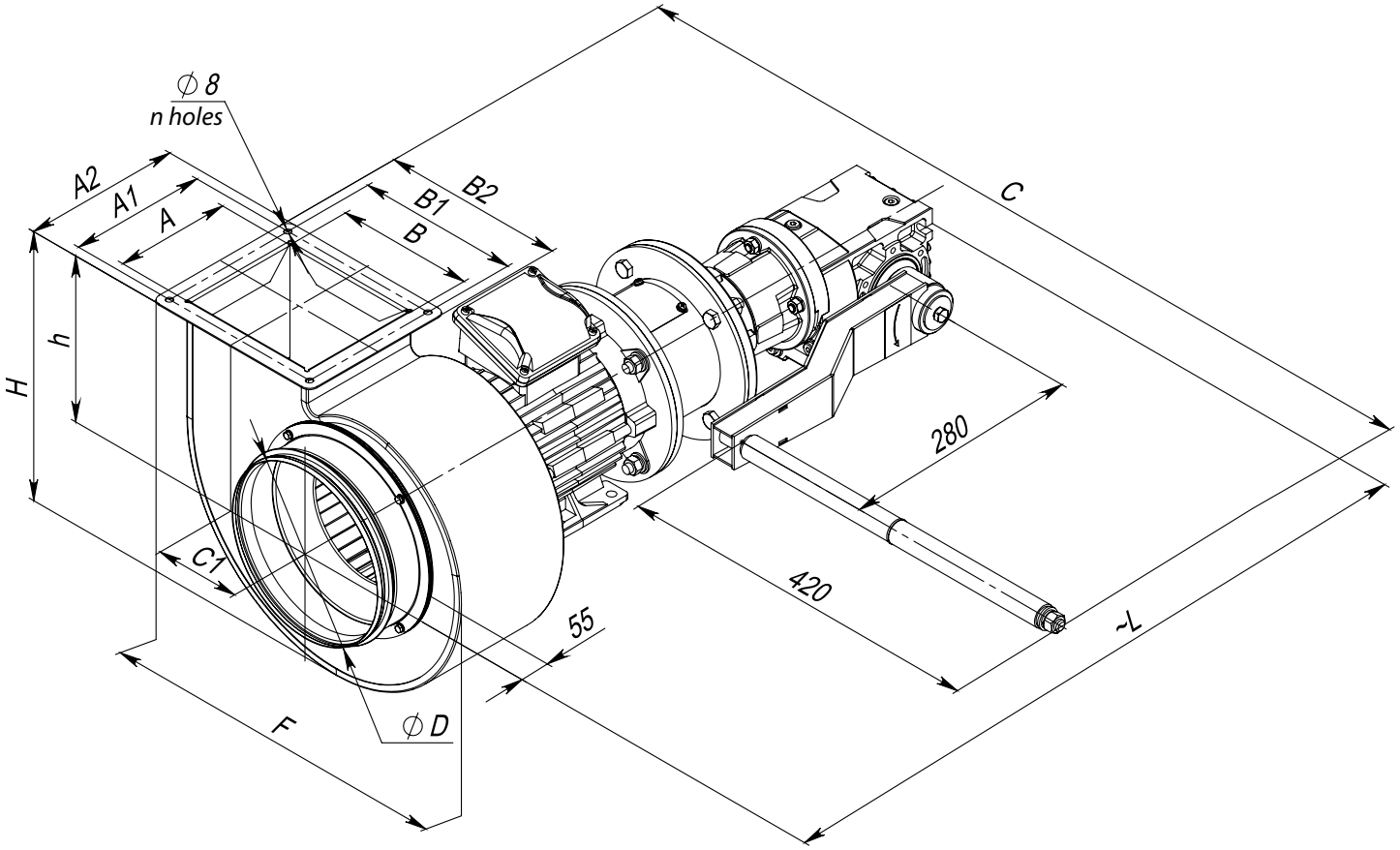
The fan is designed for application with the ambient temperature ranging from -20 °C up to +40 °C and relative humidity up to 80 %.
The fan design is constantly being improved, thus some models may be slightly different from those described in this manual.
Ingress protection rating against access to hazardous parts and water ingress is IP55.

Rated technical characteristics	Model					
	ERV-280-2D	**ERV-315-4D**	**ERV-315-2D**	**ERV-355-2D**	**ERV-400-6D**	**ERV-400-4D**
Weight [kg]	49	49	57	75	64	63
Voltage [V]	400	400	400	400	400	400
Motor power consumption [kW]	0.55	0.25	1.1	2.2	0.25	0.37
Current Input [A]	1.27	0.81	2.3	4.45	0.83	1.15
RPM [min^{-1}]	3000	1500	3000	3000	1000	1500
Force at the handle at the moment of starting [kgf]	<35	<30	<35	<35	<30	<30



Model	**Dimensions [mm]**																							**Weight [kg]**
	A	**A1**	**A2**	**B**	**B1**	**B2**	**C**	**C1**	**D**	**D1**	**D2**	**d**	**n**	**F**	**f**	**H**	**H1**	**h**	**L**	**L1**	**l**	**l1**	**l2**	**l3**	
ERV-280-2D	181	210	230	222	245	265	535	193	260	286	306	7	8	360	310	480	370	295	1295	710	400	220	450	110	50
ERV-315-4D	212	248	272	247	280	307	602	215	310	356	382	7	8	360	310	565	395	325	1295	710	400	250	420	110	50
ERV-315-2D	212	248	272	247	280	307	602	215	310	356	382	7	8	360	310	580	410	340	1350	770	400	250	480	110	58
ERV-355-2D	232	268	292	277	312	338	675	242	310	356	382	7	8	400	350	665	460	385	1410	835	400	270	525	110	75
ERV-400-6D	265	301	325	318	354	380	760	270.5	362	395	421	9.5	8	400	350	730	490	420	1550	760	600	300	420	110	64
ERV-400-4D	265	301	325	318	354	380	760	270.5	362	395	421	9.5	8	400	350	730	490	420	1550	760	600	300	420	110	63

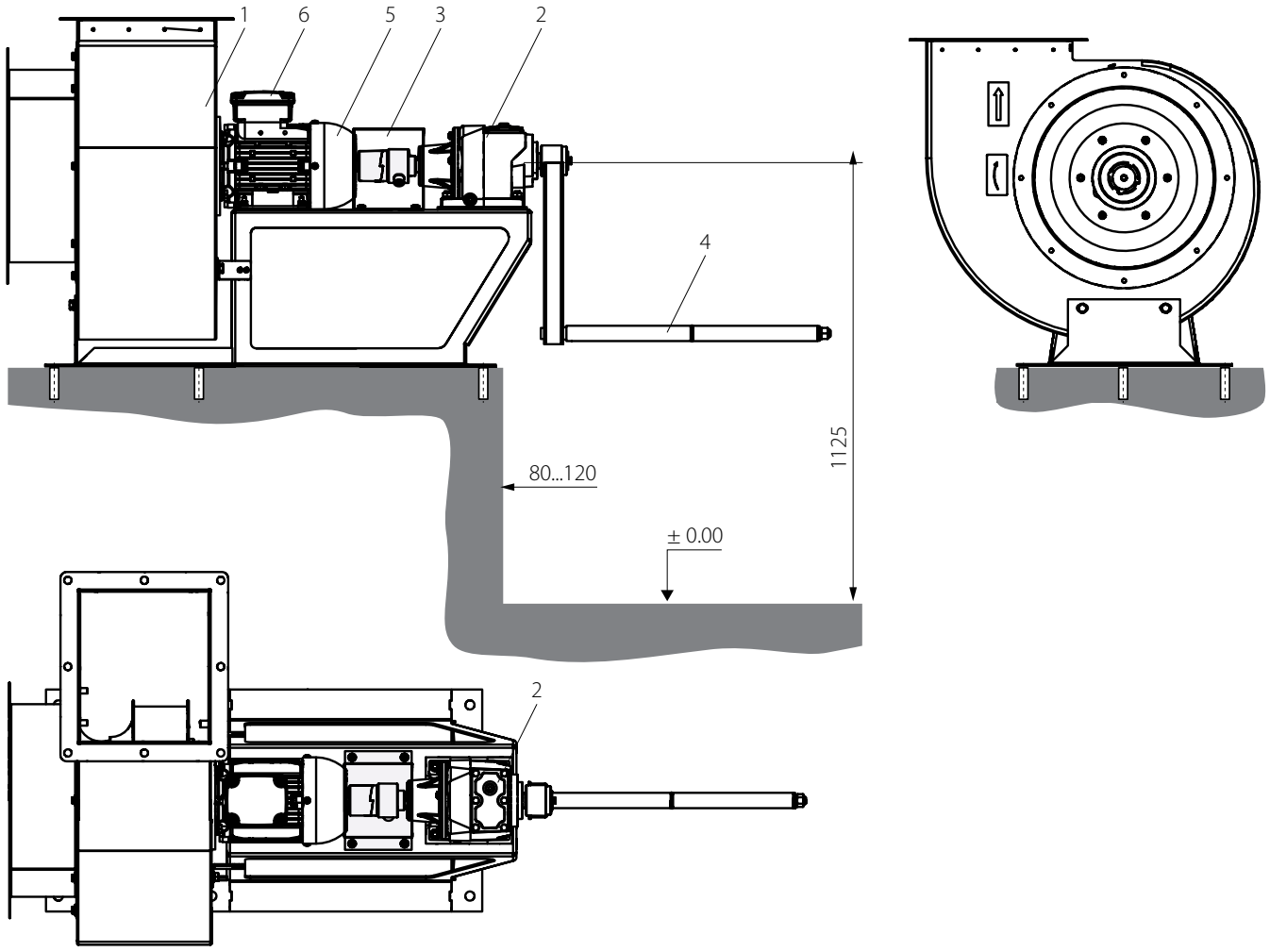
Rated technical characteristics	Model				
	ERV-M-160-P	**ERV-M-180-P**	**ERV-M-200-P**	**ERV-M-225-P**	**ERV-M-240-P**
Voltage [V]	400	400	400	400	400
Power consumption [kW]	0.18	0.25	0.55	1.1	1.5
Current Input [A]	0.57	0.68	1.31	2.45	3.21
RPM [min^{-1}]	1500				
Force at the handle at the moment of starting [kgf]	<35				



Model	Dimensions [mm]														Weight [kg]
	A	**A1**	**A2**	**B**	**B1**	**B2**	**C**	**C1**	**D**	**n**	**F**	**H**	**h**	**L**	
ERV-M-160-P	101	127	151	128	156	180	760	110	157	4	320	275	132	715	37
ERV-M-180-P	119	146	170	144	171	195	780	123	177	4	355	305	143	740	37.5
ERV-M-200-P	135	158	182	160	187	211	800	137	197	4	390	335	155	785	41
ERV-M-225-P	160	191	221	180	211	241	835	154	222	4	445	375	175	830	49
ERV-M-240-P	171	202	232	200	231	261	860	171	237	8	490	415	190	870	52

DESIGN AND OPERATING PRINCIPLE

Design of the ERV fan

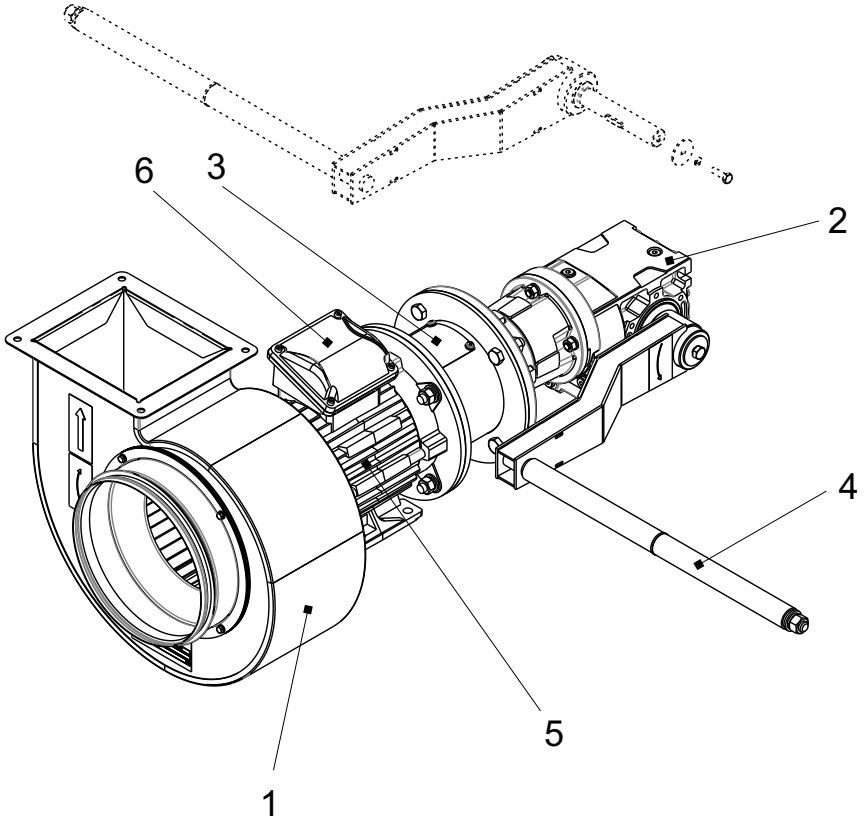


Electrically and manually driven fan is an electromechanical unit.
If the fan is driven by an electric motor, the fan is automatically disconnected from the gear unit via a clutch coupling.
If the fan is driven manually, the fan is automatically connected to the gear unit via a clutch coupling.
The fan is usually installed at a height of 1125 mm from the floor to the motor axis.

Designations:
1. Fan
2. Gear unit
3. Clutch
4. Handle
5. Motor
6. Terminal box

The fans are available in right-sided and left-sided versions. In the first case, the impeller will rotate in a clockwise direction, while in the second case it will rotate in a counter-clockwise direction.

Design of the ERV-M fan



Design of the ERV-M fan
1. Fan
2. Gear unit
3. Clutch mechanism
4. Handle
5. Motor
6 Terminal box

The ERV-M series fans allow the user to change the position of the handle. To do this, do the following:
- unscrew the bolt on the side of the locking washer;
- detach the handle with the shaft from the gearbox;
- align the key on the shaft with the groove in the gearbox and attach the handle to the required side of the gearbox;
- tighten the bolt with the locking washer.

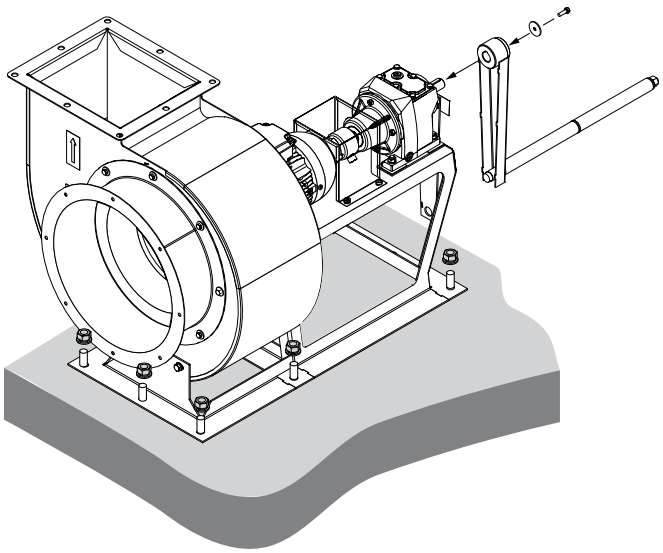
MOUNTING AND SET-UP

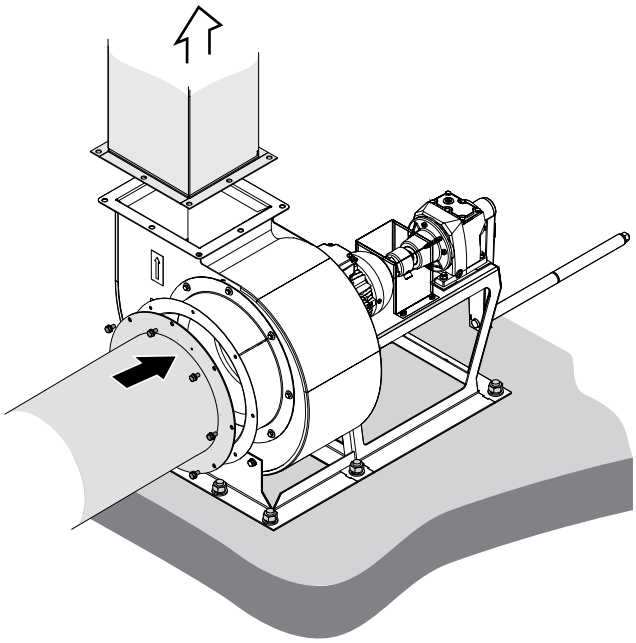
BEFORE MOUNTING MAKE SURE THE CASING DOES NOT CONTAIN ANY FOREIGN OBJECTS (E.G. FOIL, PAPER).

Preparing for use and getting started

- Remove the fan's transport fasteners to the pallet (bolts or studs).
- Carefully read the instructions for installation, start-up, operation and maintenance of the fan.
- Inspect the fan to make sure it was not deformed or damaged during transportation.
- Install the fan at the place of operation.
- Connect the motor (the wiring diagram is located on the inside of the terminal box cover).
- Secure the mounting frame with a suitable fasteners.
- Ground the fan.
- Attach the handle to the gear unit by sliding the handle onto the gear unit shaft and aligning it with the groove on the gear unit shaft. Secure the handle to the gear unit shaft with a nut and washer at a torque of 35-45 Nm.

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





Use the fan in accordance with the protective structure documentation.

In case of power outage, use the manual backup drive to operate the fan.

Rotate the handle attached to the gear unit at a rate of 32 or 40 revolutions per minute.

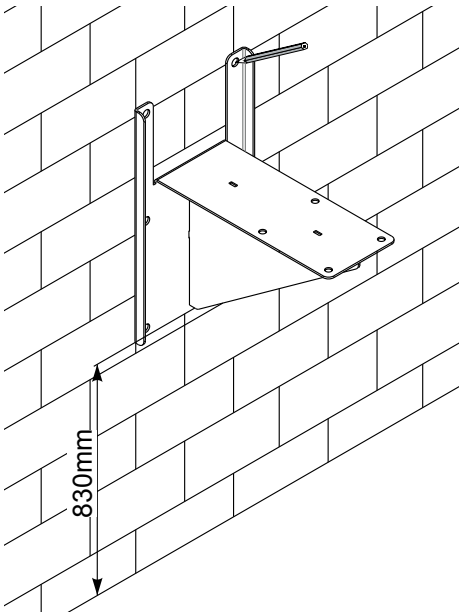
Actual airflow depends on many factors (size of air ducts upstream and downstream of the fan, condition of the filter and fan, operating parameters of the operator, etc.) and is determined during commissioning.

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

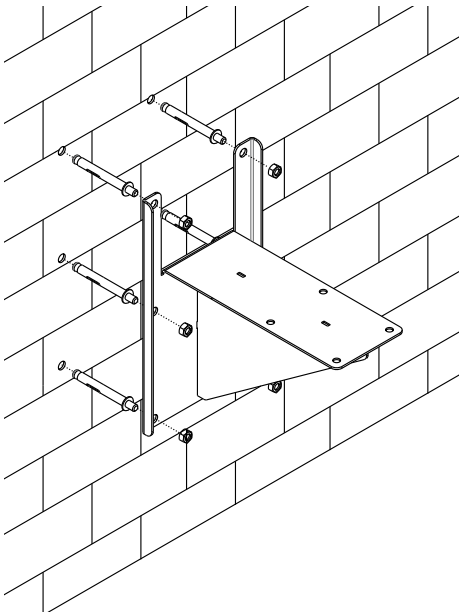
MOUNTING THE ERV-M FAN ON A VERTICAL SURFACE

The fan can be mounted on a concrete, aerated concrete, or solid brick ≥120 mm thick wall using the RM-M-(160, 180, 200, 225, 240)-V mounting kit.

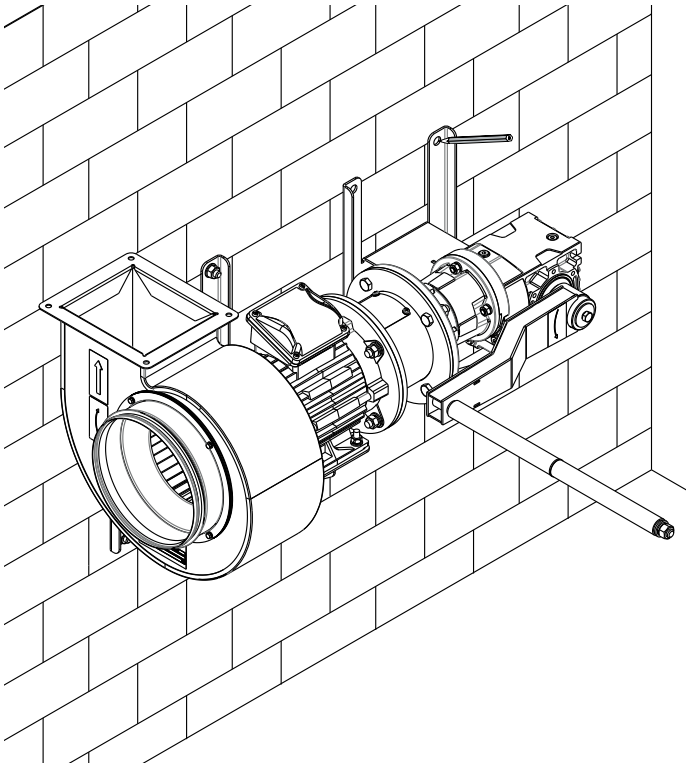
1. Place the motor bracket from the mounting kit (with round holes on the plate) on the wall at a distance of ~830 mm from the floor, ensuring that the plate is horizontal using a spirit level.
Mark the holes from the bracket onto the wall.



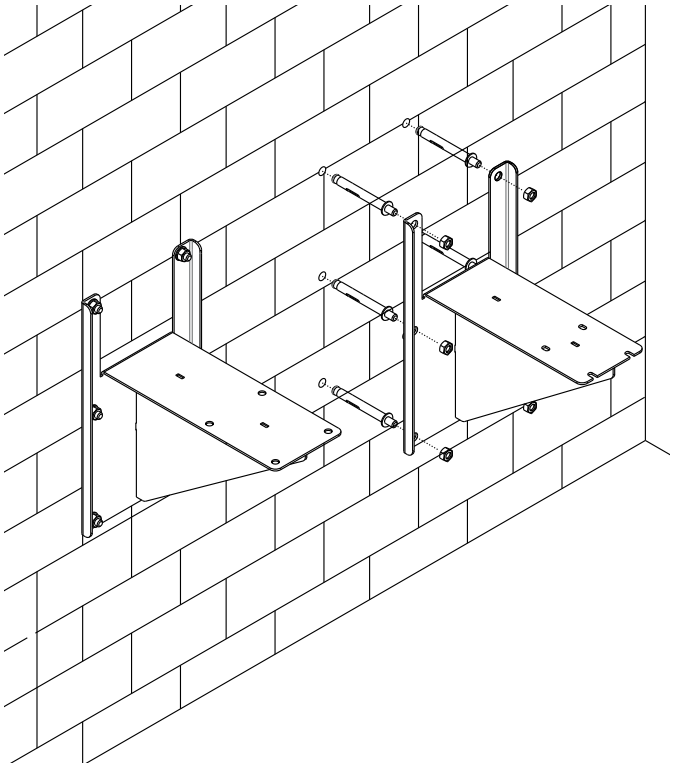
2. Drill Ø 12 mm holes in the marked locations, insert the dowel for the REDIBOLT-N 12x100/M10 anchor nut (included in the kit) into the holes, install the motor bracket on the rods and tighten with M10 nuts with a torque of 50 Nm.
Ensure that the plate is horizontal using a spirit level.



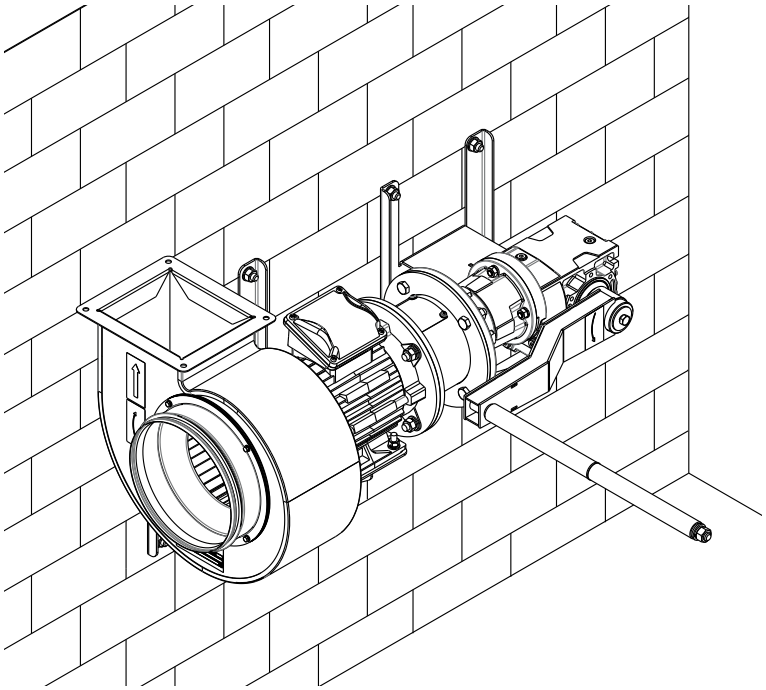
3. Using the fasteners from the mounting kit, attach the gearbox bracket (with grooves on the plate) to the fan gearbox.
Mount the fan onto the motor bracket and secure it with the fasteners from the mounting kit.
Keep the fan horizontal using a spirit level.



4. Re-mark the holes from the gearbox bracket onto the wall, then detach the fan from the brackets.
To attach the gearbox bracket, follow the steps in point 2.



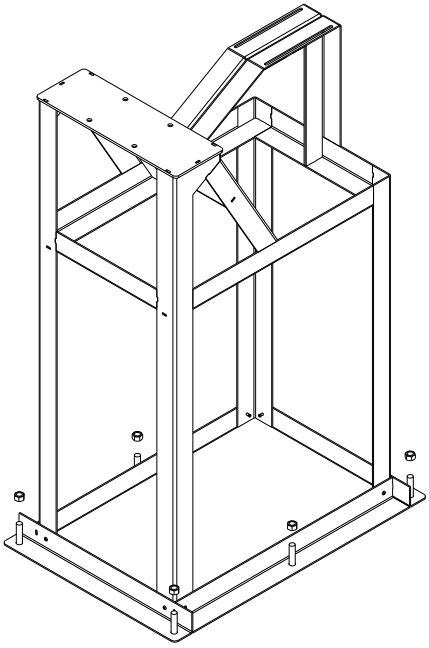
5. Install the fan on the brackets and secure it with the fasteners from the kit.



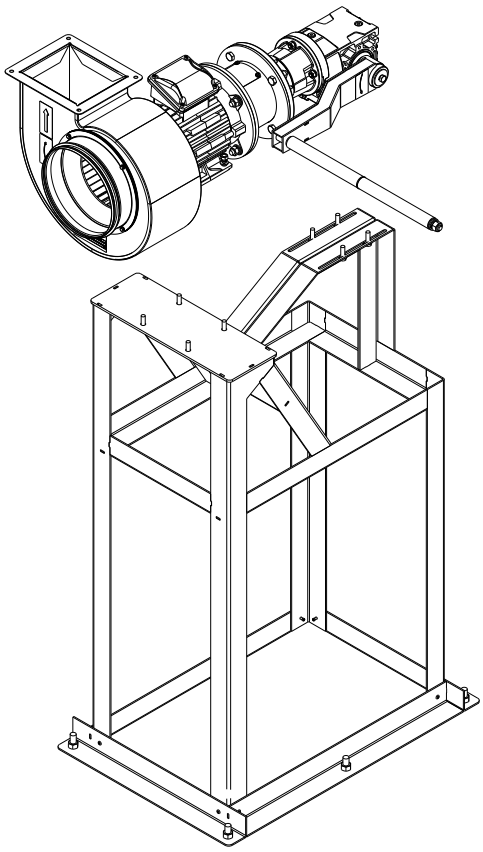
MOUNTING THE ERV-M FAN ON A HORIZONTAL SURFACE

The fan is mounted using the RM-M-(160, 180, 200, 225, 240)-H mounting frame.

Mount the mounting frame where the fan will be used.



Attach the fan to the frame using the fasteners from the kit.



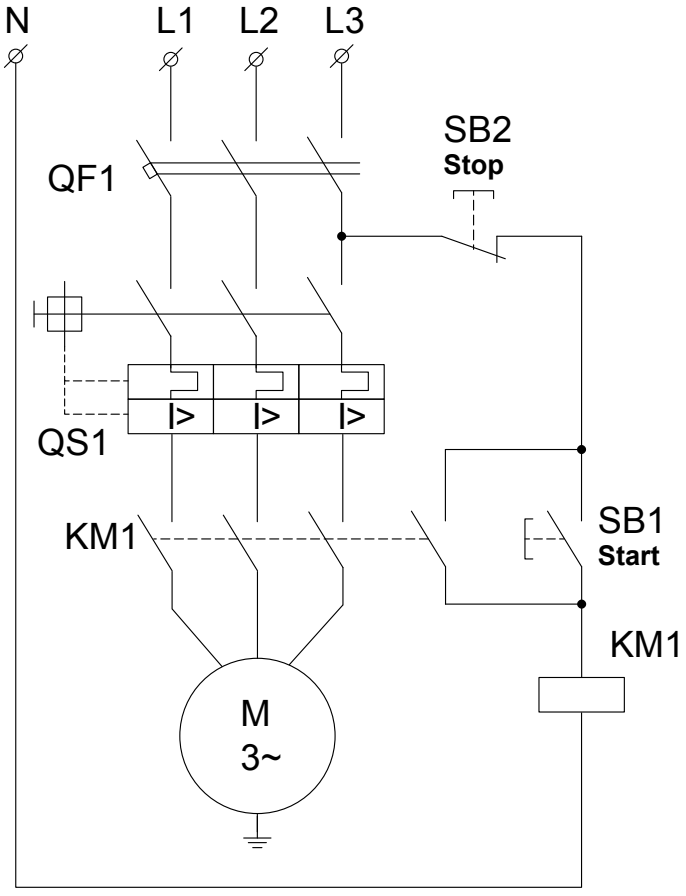
CONNECTION TO POWER MAINS

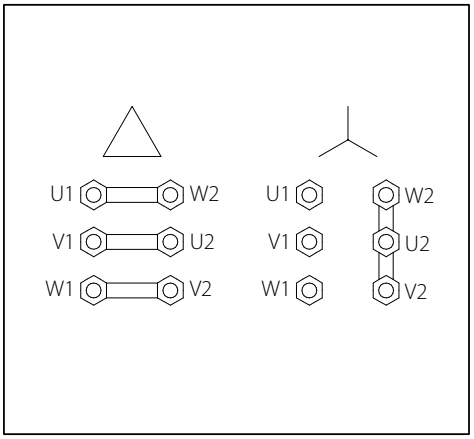
DICONNECTION OF THE UNIT TO POWER MAINS IS ALLOWED BY A QUALIFIED ELECTRICIAN WITH A WORK PERMIT FOR THE ELECTRIC UNITS UP TO 1000 V AFTER CAREFUL READING OF THE PRESENT USER'S MANUAL

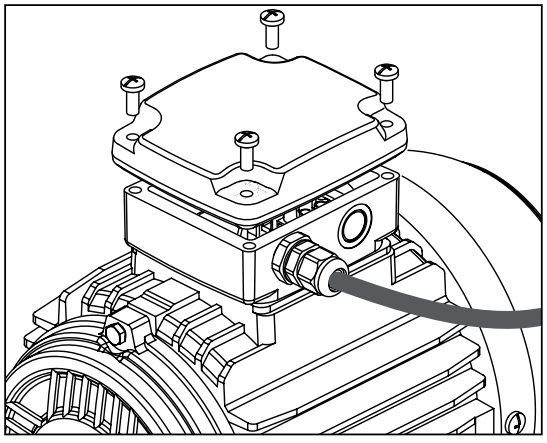
The fan is designed for connection to a three-phase 400 V AC/50 Hz power supply. The connection must be made using durable, insulated and heat-resistant conductors (cables, wires). The conductor cross-section selection must account for the maximum permissible wire heating temperature which depends on the wire type, its insulation, length and installation method (i.e. overhead, in cable channels or inside walls). The external lead-in must be equipped with a circuit breaker built into the stationary wiring. The position of the circuit breaker must ensure free access for quick unit power-off. The rated current of the circuit breaker must correspond to the current consumption of the product (see «Technical data»).

Connect the fan motor via the terminal block according to the electrical mains wiring diagram using a durable insulated cable. The terminal block with the terminal markings is housed inside the terminal box.

The circuit includes a circuit breaker **QF1**.
Use a circuit breaker with trip characteristic **D**.
The motor protection circuit breaker **QS1** is used to protect the motor from overheating.
To set up the motor protection circuit breaker, follow the recommendations below:
1. Determine the rated current of the motor. The current is indicated on the motor nameplate.
2. Select the motor protective device so that the rated motor current is within the adjustment range of the protective device.
3. Set the setpoint on the circuit breaker so that it is equal to the rated current. Refer to the documentation of the protective device for the adjustment method.
4. Turn on the motor and measure the current consumption on any of the phases after 20 minutes of operation.
5. Change the trip limit setting so that it is 15% higher than the measured current value, but not more than 5% of the rated motor current.
6. Turn on the motor, the circuit breaker should not trip in the operating mode of the equipment.
Connect the fan motor through the terminal block according to the wiring diagram using an insulated cable. The terminal label is located inside the motor terminal box.
The installation location of all elements of the start-up circuit must provide free access for quick disconnection of the product.







Fan model	Minimum conductor cross-section [mm²]	Rated current of the circuit breaker [A]	Current adjustment range of the motor circuit breaker thermal switch [A]
ERV-280-2D	1.5	2	1-1.6
ERV-315-4D	1.5	2	1-1.6
ERV-315-2D	1.5	3	1.6-2.5
ERV-355-2D	1.5	6.3	4-6.3
ERV-400-6D	1.5	1	0.63-1
ERV-400-4D	1.5	2	1-1.6
ERV-M-160-P	1.5	1	0.4-0.63
ERV-M-180-P	1.5	1	0.63-1
ERV-M-200-P	1.5	1.6	1-1.6
ERV-M-225-P	1.5	3	2.5-4
ERV-M-240-P	1.5	4	2.5-4

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.

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.

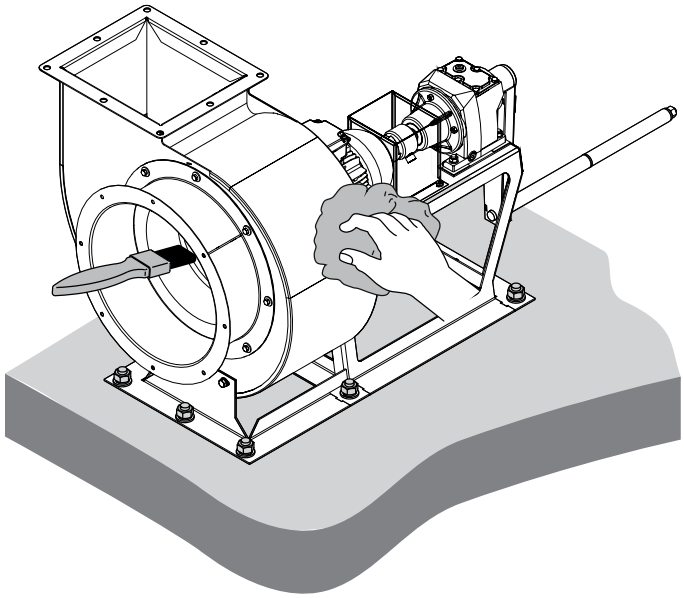
Technical maintenance of the fan is required to ensure safe and reliable operation of the fan throughout its entire service life.
Technical maintenance includes the following:

- external inspection of the fan, electric motor, gear unit, clutch coupling and wiring;
- checking the reliability of the power supply and grounding wire connection;
- switching on the fan for a short time in the electrical and manual modes;
- necessary preventive maintenance (painting, cleaning, etc.).

Prior to performing any technical maintenance and repair disconnect the fan from the electric mains and wait until its rotating parts come to a complete stop.
The technical maintenance includes periodic cleaning of the surfaces from accumulated dust and dirt.

The impeller blades require thorough cleaning once in 6 months.
Technical maintenance steps are as follows:

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



Gear unit maintenance:

- fill and drain the oil only after the gear unit has come to a complete stop;
- when disassembling the gear unit, remove the cantilever loads at the shaft ends and disconnect the clutch coupling;
- after completing the works, cover the clutch coupling and shaft ends with a protective cover.

Gear unit maintenance involves regular checking the oil condition. Fill the oil through the opening in the gear unit cover with the oil level plug open until the oil flows out of the oil level plug. Check the oil level and refill it every 90 days of fan operation.
Properly adjust the bearings while the gear unit is in service.

TROUBLESHOOTING

Problem	Possible reasons	Troubleshooting
The fan does not start.	No power supply.	Make sure the power supply line is connected correctly, otherwise troubleshoot the connection error.
	Jammed motor.	Turn off the fan. Troubleshoot the motor jamming. Turn on the fan again.
When the device is switched on, the circuit breaker protection is activated.	Overcurrent as a result of short circuit in the electric circuit.	Turn off the fan. Contact the Seller.
Noise, vibration.	The fan impeller is soiled.	Clean the impellers.
	Loose tightening of screw connections.	Check and tighten the screw connections if necessary.
The manual drive does not rotate the fan shaft.		Rotate the manual drive handle 90 degrees against the arrow indicated on the clutch coupling casing and rotate the handle again in the direction of the arrow to engage the manual mode clutch coupling.
The manual mode handle rotates when the fan is running in electric mode.	The clutch coupling is jammed.	Stop the fan, remove the manual mode handle and start the fan again. If you need to use the manual mode, first repair the clutch coupling or disconnect the fan switch at the electrical panel to prevent possible injury from self-rotation of the handle when the power is restored.
	The fan motor is not properly connected.	Connect the motor correctly. Refer to the appropriate section of the VC 4-75 fan operating instructions for additional troubleshooting information not listed above.
Noise or clicks coming from the clutch coupling when running in electric or manual mode.	The gear unit shaft lost its alignment with the motor shaft during transportation or installation.	Stop the fan, restore the correct position of the gear unit and check the clutch coupling operation in manual mode. Slight vibration and slight noise coming from the clutch coupling when operating in a manual mode is not a malfunction.

In case of other malfunctions, contact the manufacturer.

STORAGE AND TRANSPORTATION REGULATIONS

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

MANUFACTURER'S WARRANTY

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

The warranty repair does not include:
- routine technical maintenance
- unit installation/dismantling
- unit setup

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

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

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

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

CERTIFICATE OF ACCEPTANCE

Unit Type	Electrically and manually driven 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	

Seller's Stamp

INSTALLATION CERTIFICATE

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

Installation Stamp

WARRANTY CARD

Unit Type	Electrically and manually driven fan
Model	
Serial Number	
Manufacture Date	
Purchase Date	
Warranty Period	
Seller	

Seller's Stamp

Manufacturer: Ventilation Systems LLC,
Ukraine, Kyiv, 1 M. Kotsyubynskoho Street
Address of production facilities:
Ukraine, Kyiv Region, Fastiv District, Boyarka,
36 Sobornosti Street

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