

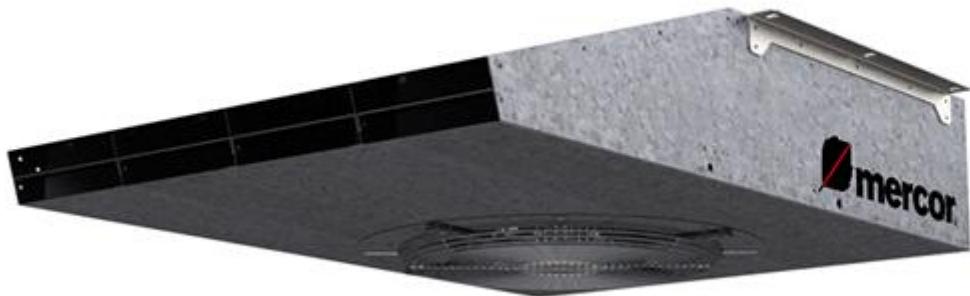


Ul. Grzegorza z Sanoka 2
80 – 408 Gdańsk
phone: +48 58 341 42 45
phone/fax +48 58 341 39 85

OPERATION AND MAINTENANCE MANUAL

Long-range smoke exhaust fan

mcr FEN C F400/F300
mcr FEN C/BO
mcr FEN EC



Version: 26.01.26.2

FIRE VENTILATION SYSTEMS

TABLE OF CONTENTS:

| | |
|---|----|
| 1. FOREWORD | 3 |
| 2. MANUFACTURER'S DISCLAIMER | 3 |
| 3. SUBJECT OF DOCUMENTATION | 3 |
| 4. INTENDED USE | 4 |
| 4.1. Application | 4 |
| 4.2. Fire resistance | 4 |
| 4.3. Versions | 5 |
| 5. DESIGNATION | 4 |
| 6. DESIGN AND OPERATING PRINCIPLE | 5 |
| 6.1. Design | 5 |
| 6.2. Operation | 5 |
| 6.3. Dimensions and technical data | 5 |
| 7. ASSEMBLY | 7 |
| 7.1. Pre-assembly inspection | 7 |
| 7.2. Location and assembly | 7 |
| 7.3. Electrical connections | 7 |
| 7.4. Start-up | 8 |
| 8. TRANSPORT AND STORAGE CONDITIONS | 8 |
| 9. OHS MANUAL | 8 |
| 10. MAINTENANCE AND SERVICING | 9 |
| 11. WARRANTY TERMS & CONDITIONS | 9 |
| FAN MEASUREMENT REPORT | 11 |

CAUTION:

Risk of injury from sharp edges, sharp corners and thin sheet metal elements.
Be careful when handling and working with the device.
Wear protective gloves, safety shoes and a helmet.



Risk of electric shock. Do not touch live parts. Only employees with the appropriate qualifications and certificates may perform electrical connections. Disconnect the power supply before starting work on electrical equipment.

NOTE

**All previous issues of this Technical Manual expire on the date of issue hereof.
This O&MM does not apply to fans manufactured before the date of its issue.**

1. FOREWORD

This O&MM is intended for users of mcr FEN C long-range fans. Its purpose is to provide guidance on the application, construction, commissioning and operation of the above-mentioned product.



Read this document thoroughly before installing this device at its operating site and its start-up.



In the event of faulty operation or defects, please contact the manufacturer or its authorised representative.



Due to the constant improvement of our products, we reserve the right to make design changes that increase the performance and safety of the device.

The design of the fans meets the essential requirements of the PN-EN 12101-3:2015 standard. It also meets the requirements of the current state of technology and ensures safety and health protection.

2. MANUFACTURER'S DISCLAIMER

- The manufacturer shall not be liable for any consequences of misuse of the device.
- Do not install additional elements on the device that are not its component or accessory.
- Any unauthorised alterations or modifications to the device are prohibited.
- The device housing must be protected from mechanical damage.
- Before installing the device, check the load-bearing capacity of the structural elements to which the device will be attached. Unreliable attachment may result in damage or destruction of the device, and may also pose a risk to people nearby.
- This fan is not intended for forcing air with viscous pollutants that may settle on the device, and especially on its rotor.
- This fan is not intended for forcing air with corrosive pollutants that may be detrimental to the device.
- During use, the maximum speed of the rotor should not be higher than the rated speed.
- The manufacturer shall not be liable for any injuries, trauma or other bodily harm caused by misuse of this device.

3. SUBJECT OF DOCUMENTATION

The subject of this O&MM is:

- mcr FEN C F400 long-range smoke exhaust fan
- mcr FEN C F300 long-range smoke exhaust fan
- mcr FEN C/BO long-range fan without fire resistance
- mcr FEN EC long-range fan without fire resistance

4. INTENDED USE

4.1. Application

mcr FEN long-range fans are designed to remove smoke and heat generated in rooms during a fire (FEN C version). They facilitate evacuation of persons from the area on fire, protect the building structure and its furnishing from high temperature, facilitate firefighting, and inhibit spreading of fire to adjacent fire zones. The fans can also be made in a version without fire resistance (mcr FEN C/BO version) and in a version without fire resistance on a 230V AC voltage (FEN EC version).

The fans are installed inside the buildings, in a horizontal position on appropriate supports.



**The fan in the general ventilation system can operate in the ambient temperature range from -20 °C to +40 °C.
It can force dry air with dust content no greater than 0.3 g/m³.**



This fan is not intended for forcing air with viscous pollutants that may settle on the device, and especially on its rotor.



This fan is not intended for forcing air with corrosive pollutants that may be detrimental to the device.



During use, the maximum speed of the rotor should not be higher than the rated speed.



A fan that has been operating in extreme fire conditions is not suitable for further operation.

4.2. Fire resistance

- Class F400 – fire resistance at 400°C for 120 minutes
- Class F300 – fire resistance at 300°C for 60 minutes
- Class BO, EC – without fire resistance

4.3. Versions

- unidirectional, with two-speed motor

5. DESIGNATION

| mcr FEN | 50N | F400 | Temperature class |
|---------|-----|------|--------------------|
| | | | Nominal size in cm |
| | | | Fan type, version |

6. DESIGN AND OPERATING PRINCIPLE

6.1 Design

The mcr FEN C long-range smoke exhaust fan consists of an electric motor made in an appropriate insulation class, a radial rotor and an external housing.

The motor is connected directly to the steel rotor, on which the profiled blades are placed. The angle and number of blades depend on the required thrust and efficiency of the fan. The motor bearings are resistant to high temperatures. The forced medium flows through the housing, motor and rotor – fire gases and smoky air or clean air in the case of BO or EC versions.

The fan has a junction box installed on the housing. Each type of fan has mounting brackets or frames depending on the size of the rotor.

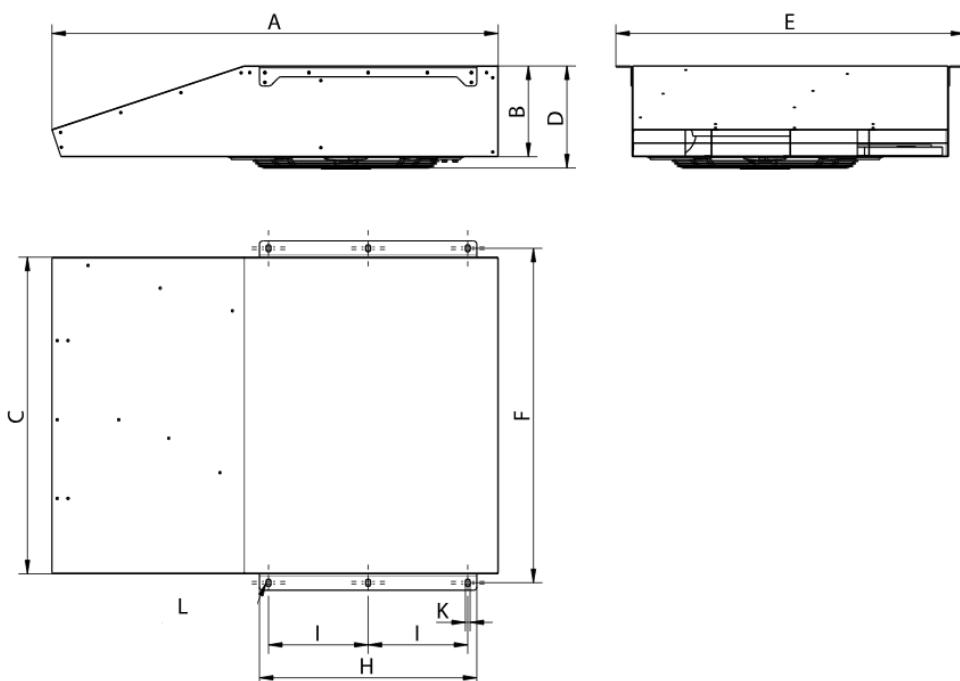
6.2 Operation

The fan does not run in standby. The fan starts up and operates after applying the supply voltage to the terminals of the junction box of the device.

Dimensions and technical data

The basic dimensions and technical data and parameters of the fans are given below.

mcr FEN C/ FEN C/BO fan

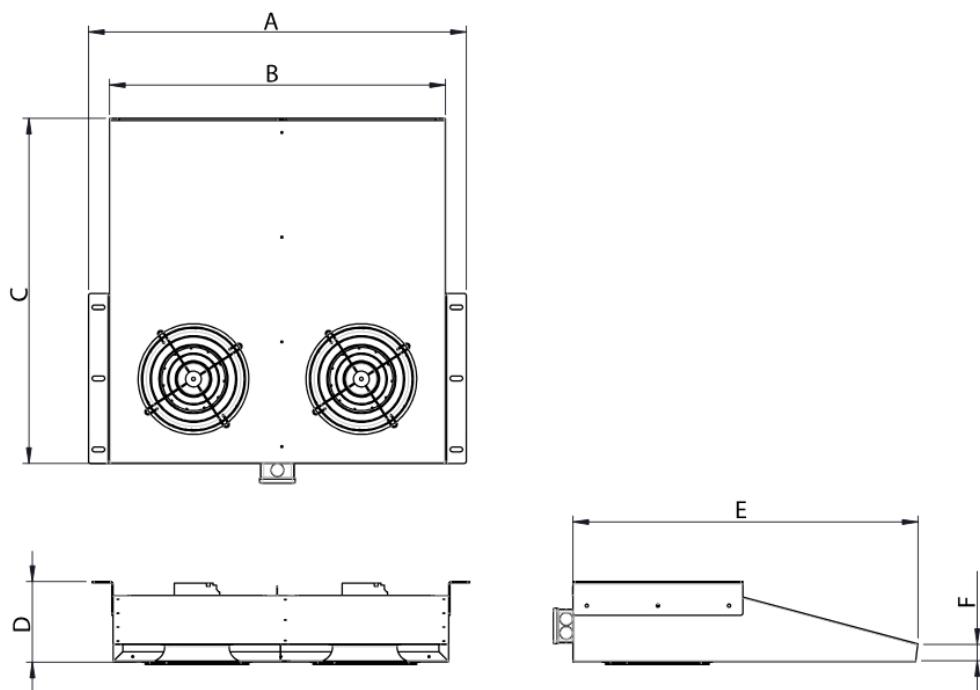


| Fan | A | B | C | D | E |
|---------------|------|-----|------|-------|------|
| mcr FEN C 50N | 1230 | 250 | 870 | 281 | 963 |
| mcr FEN C 75N | 1600 | 300 | 1000 | 351.5 | 1093 |
| mcr FEN C100N | 1600 | 300 | 1000 | 351.5 | 1093 |

| Fan | F | H | I | K | L |
|---------------|------|-----|-----|----|---|
| mcr FEN C 50N | 922 | 600 | 275 | 13 | 3 |
| mcr FEN C 75N | 1052 | 800 | 250 | 13 | 4 |
| mcr FEN C100N | 1052 | 800 | 250 | 13 | 4 |

| Fan | Thrust force | Q max | Electric power | Motor speed [rpm] | Weight |
|---------------|--------------|--------|----------------|-------------------|--------|
| | [N] | [m3/h] | [kW] | | [kg] |
| mcr FEN C 50N | 50/13 | 5800 | 1.1 / 0.18 | 1420 / 710 | 83 |
| mcr FEN C 75N | 75/19 | 8280 | 2.2 / 0.37 | 1430 / 715 | 130 |
| mcr FEN C100N | 97/25 | 9200 | 2.2 / 0.37 | 1430 / 715 | 130 |

mcr FEN EC fan



| Fan | A | B | C | D | E | F |
|----------------|-----|-----|-----|-----|-----|----|
| mcr FEN EC 18N | 956 | 850 | 873 | 204 | 573 | 42 |

| Fan | Thrust force | Q max | Electric power | Motor speed [rpm] | Weight |
|----------------|--------------|--------|----------------|-------------------|--------|
| | [N] | [m3/h] | [kW] | | [kg] |
| mcr FEN EC 18N | 18 | 2500 | 0.15x2 | 2500 | 28 |

Motor parameters – mcr FEN C F400 or F300

- Class H insulation, designed for continuous (S1) and emergency (S2) operation, with ball bearings, IP-55 protection, two-speed.
- Three-phase Dalhander motor 400V 4/8-pole.
- Maximum operating temperature:
- S1 mode: from -20°C to +60°C.
- S2 mode: 400°C for 2 hours.

Motor parameters – mcr FEN C/BO

- Class F insulation, S1 continuous work, ball bearings, IP-55 protection.
- Two-speed models: Dalhander three-phase motor, 4/8 poles 400V 50Hz or 400-460V 60Hz.
- Single-speed models: three-phase motor, 4 poles 230/400-460V 60Hz.
- Operating temperature range: from -20°C to +60°C.

Motor parameters – mcr FEN EC

High efficiency (IE5) and low noise motor. Speed control via 0-10V or PWM signal. Single-phase power supply 230V 50/60Hz. Motor with IP44 protection and class B insulation.

7. ASSEMBLY

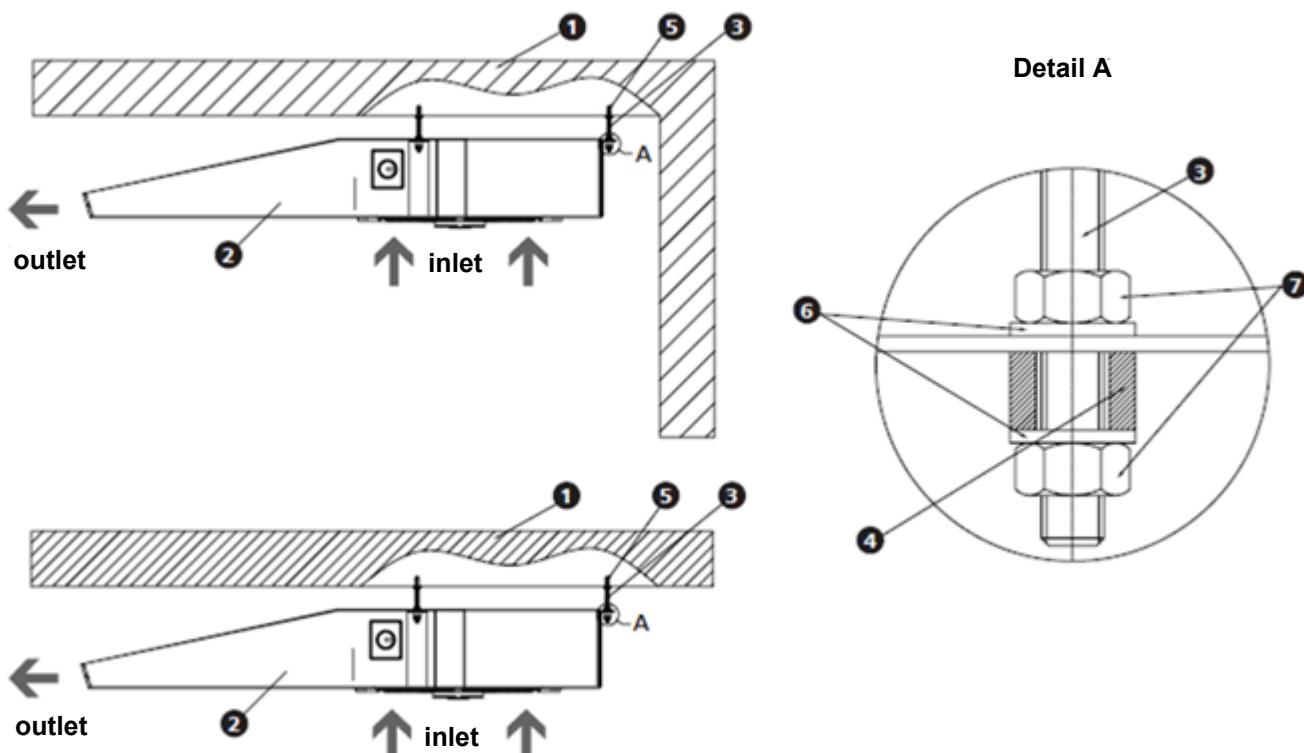
The mcr FEN C long-range fan is designed for installation in rooms where air and fire gases are to be removed (FEN C F400/F300). If clean air is required, the FEN C/BO or FEN EC version is used (fans without fire resistance).

7.1. Pre-assembly inspection

Each smoke exhaust fan is inspected by the manufacturer prior to packing and shipping. Upon unpacking the delivered smoke exhaust fan, visually examine it for any damage in transport. The motor shaft with rotor should rotate without noticeable resistance or grinding.

7.2. Location and assembly

The mcr FEN C fan is designed for horizontal installation. Before installing the fan, check the load-bearing capacity of the ceiling structure or other structural element where the device is to be suspended. The mounting frame or brackets supplied with the fan (being its integral part) are used for installation. The device is mounted to the structure using screws or mounting hangers (not supplied in the set) using the above-mentioned element.



Example of fan mounting method

- | | |
|---|------------------------------------|
| 1- Ceiling | 5 – mounting anchor (not supplied) |
| 2- mcr FEN fan | 6 – steel washers (not supplied) |
| 3- Mounting bracket (not supplied) | 7 – mounting screws (not supplied) |
| 4- Shock absorber, e.g. rubber (not supplied) | |

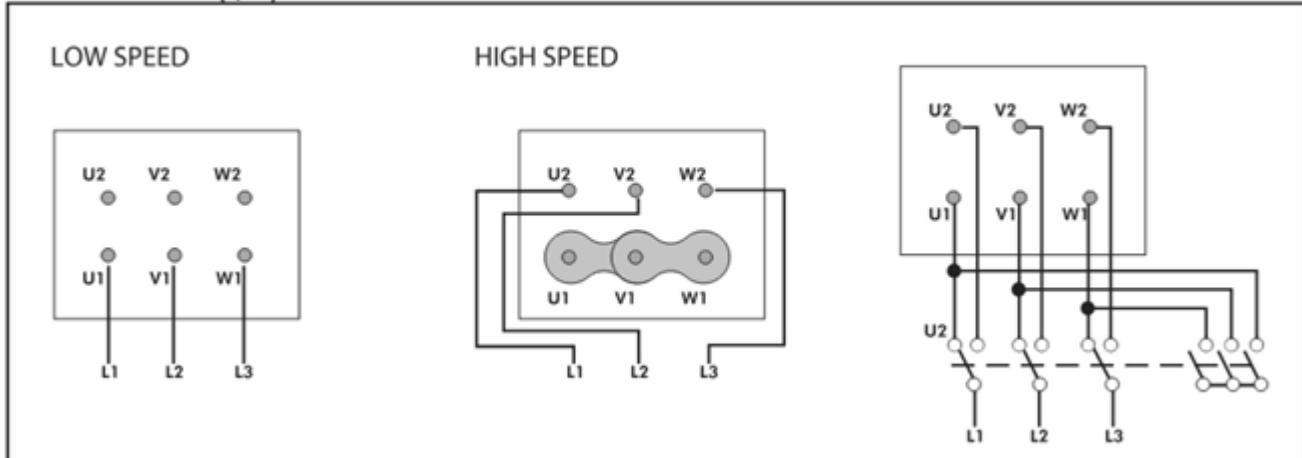
7.3. Electrical connections

After the fan has been properly installed, the electrical wiring should be properly connected to the device. The wires should be fed through the glands into the junction box located on the fan housing and connected in accordance with the description in the box. The motor of each fan should be connected to the grid via a circuit breaker. The protection level should be set according to the motor's rated current. Grounding should be performed in accordance with standards.

After starting the fan in the ventilation system, the current consumption should be measured and checked for compliance with the motor nameplate. The current consumed by the fan during set operation must not exceed 1.1 times the rated current.

Wiring diagram – mcr FEN C F400/F300, mcr FEN C/BO

400V DAHLANDER (Y,YY)



Wiring diagram – mcr FEN EC

Power supply 230V AC

| No. | Power supply | Wire colour | Specification |
|-----|--------------|--------------|-----------------|
| 1 | L | brown | AC 220V / 50 Hz |
| 2 | N | blue | AC 220V / 50 Hz |
| 3 | PE | yellow-green | Grounding |

0-10V signal power supply

| No. | Power supply | Wire colour | Specification |
|-----|--------------|-------------|---------------|
| 1 | GND | blue | Grounding |
| 2 | V sp | yellow | 0-10V / PWM |
| 3 | V cc | red | DC 10V |
| 3 | FG | white | 1 pulse/R |

7.4. START-UP

Before start-up of the installed fan, do the following:

- check the correctness and stability of the fan mounting.
- check all seals
- check that all electrical wiring is properly and firmly connected
- check that the phase connection sequence and PE/neutral wiring is properly connected.
- check that there are no foreign objects in the fan

- check that the protective elements are attached
- after the completed inspection, switch on the fan and check the operating properties
- when switching on the fan, also check the direction of the motor rotation by verifying the correct rotation with the direction of the arrow placed on the housing

8. TRANSPORT AND STORAGE CONDITIONS

The mcr FEN C fans are placed on pallets for transport and storage. Do not topple or throw the packaging during loading and transport. Fans may be transported by any means of transport, provided they are protected against the effects of weather conditions. Fans placed on means of transport should be protected against changing their position during transport. A visual inspection of each device should be carried out after each transport operation.

Storage should take place in rooms where:

- there is no access to dust, gases, corrosive fumes and other aggressive chemical fumes that have a destructive effect on insulating elements, motor and fan construction elements,
- the maximum relative humidity does not exceed 80% at a temperature of + 20 °C,
- the ambient temperature is between – 20 °C and + 40 °C,
- there are no vibrations.

9. OHS MANUAL

Read this O&MM before fan start-up and operation. The fan does not pose a hazard provided it is carefully secured in the ventilation system and to the supporting structure. The electrical connection must be made precisely according to the attached diagram and in accordance with the instructions presented in point 7.3 of this manual. It should be performed by a person with confirmed qualifications, in accordance with applicable regulations. During use, the fan connection to the PE protective conductor should be checked. All inspection work on the fan should be performed only after disconnecting the device from the power supply.

CAUTION:

1. High-pressure and steam washers should not be used to clean the fan from deposits.
2. Leaks in connections and flexible nozzles may lead to hazards related to the release of the forced medium and should be replaced immediately.

In the event of a faulty operation of the device (excessive noise, vibrations, uneven operation), disconnect the fan from the power supply, notify the manufacturer's service or a company with the appropriate authorisation from the manufacturer to perform inspections and repairs.

10. MAINTENANCE AND SERVICING

MERCOR L&V devices should undergo periodic technical inspections and maintenance activities at least every 12 months during the entire period of use, i.e. during the warranty period, as well as after the warranty period. Inspections and maintenance should be carried out by the manufacturer or by companies authorised to service MERCOR L&V devices.

The obligation to perform regular service inspections of fire protection devices results from Article 3(3) of the Regulation of the Minister of Internal Affairs and Administration of 7 June 2010 on fire protection of buildings, other construction facilities and areas (Journal of Laws 2010, No. 109, item 719).

It is recommended to perform the following between inspections:

- Check the condition of electrical connections, paying particular attention to mechanical damage.
- Check the condition of the device body, paying particular attention to mechanical damage.
- Checking whether there are no obstacles that could affect the correct operation of the devices.

In order to perform activities falling within the scope of service inspections as well as service and warranty activities such as inspections or repairs, it is required for the User to provide physical access to the devices by, for example, dismantling thermal insulation, dismantling suspended ceilings, dismantling other installations if they prevent free access to the device, etc.

If the device is used for smoke exhaust during a fire only, it should be periodically run for approx. 10 minutes every 3 months.

For matters related to technical inspections, maintenance and service of the devices, please contact the representatives of the MERCOR L&V Service Department serwis@mercor.com.pl, phone +48 58 341 42 45 ext. 170 or fax +48 58 341 39 85 from 8:00 a.m. to 4:00 p.m. (Mon-Fri).

11. WARRANTY TERMS & CONDITIONS

1. MERCOR L&V provides a 12-month quality guarantee and warranty for the equipment, counting from the date of purchase, unless the contract stipulates otherwise.
2. The purchaser is obliged to check the Products in terms of quality and quantity upon receipt.
3. Any defects, shortages or damage noticed must be entered in the receipt documents or on the consignment note and reported in writing to MERCOR L&V, with all damage to the shipment or product documented with photographs.
4. Reports of damage to the shipment, product or quantity shortages must be sent in writing to MERCOR L&V within 24 hours of the date of receipt of the shipment.
5. Defects not visible at the time of delivery must be reported immediately to MERCOR L&V together with photographic documentation, and reports of quality defects must be made no later than within 5 working days of the date of receipt of the Products.
6. MERCOR L&V reserves the right not to consider the above-mentioned reports in the event of failure to provide (receive) photographic documentation or after the above-mentioned deadlines have been exceeded.
7. Complaints can be made by telephone: 58/341-42-45, by fax: 58/341-39-85, by e-mail: reklamacje@mercor.com.pl or by sending a letter to the following address: MERCOR L&V, ul. Grzegorza z Sanoka 2, 80-408 Gdańsk.
8. If, during the warranty and guarantee period, physical defects covered by the warranty and/or guarantee become apparent, MERCOR L&V undertakes to remove them as soon as possible, counting from the date of receipt of a written notification and delivery of proof of purchase (contract, invoice, delivery document), subject to point 14.
9. MERCOR L&V reserves the right to extend the repair time in the case of complex repairs or repairs requiring the purchase of non-standard components or spare parts.
10. Liability under the warranty and guarantee covers only defects arising from causes inherent in the equipment sold.
11. In the case of defects arising as a result of improper use of the equipment (not in accordance with the technical documentation) or other reasons specified in point 14, the Buyer/warranty holder may be charged with the costs of their removal.
12. The condition for the removal of defects is that the reporting party provides full access to the work site, in particular ensuring: a lift in the case of devices installed at a height of more than 3 m, free access to the rooms where the devices are installed and the necessary inspections, removal of thermal insulation, removal of suspended ceilings, removal of other installations if they prevent free access to the device.
13. If it is not possible to repair the device at the place where it is installed, MERCOR L&V reserves the right to dismantle it, deliver it to the address indicated by MERCOR L&V and reassemble it. The cost of this operation shall be borne by the purchaser/warranty holder.
14. The warranty and guarantee do not cover:
 - damage and failure of devices caused by improper operation (not in accordance with the technical documentation), interference by the user or persons not authorised by MERCOR L&V, lack of periodic technical inspections, failure to perform maintenance activities described in the 'MAINTENANCE AND SERVICE' section of this document;
 - damage to equipment caused by reasons other than those attributable to MERCOR L&V, in particular: random events such as torrential rain, flooding, hurricanes, flooding, lightning strikes, power surges, explosions, hail, aircraft crashes, fire, avalanches, landslides and secondary damage resulting from the above causes. Torrential rain is defined as rain with a yield coefficient of at least 4, as determined by the Institute of Meteorology and Water Management (IMiGW). If it is not possible to determine the coefficient referred to in the preceding sentence, the actual condition and extent of damage at the place where it occurred, which will indicate the effect of torrential rain, will be taken into account. A hurricane is

- considered to be wind with a speed of not less than 17.5 m/s (damage is considered to have been caused by a hurricane if hurricane activity has been confirmed in the immediate vicinity);
- damage resulting from failure to comply with the obligation to immediately report a discovered defect;
- deterioration in the quality of coatings caused by natural ageing processes;
- defects caused by the use of abrasive or aggressive cleaning agents;
- damage caused by aggressive external factors, in particular chemical and biological factors, or whose origin is related to production processes and activities carried out in the facility or in its immediate vicinity, where the equipment was installed;
- parts subject to natural wear and tear during operation (e.g. seals), unless they have a manufacturing defect;
- damage caused by improper transport, unloading or storage of the equipment;
- damage caused by installation that does not comply with the technical documentation and good construction practice;
- devices or their parts in the event of breakage or damage to the nameplate or warranty seals.

15. The warranty and guarantee shall expire with immediate effect if:

- The buyer/warranty and guarantee beneficiary makes structural changes on their own without prior agreement with MERCOR L&V,
- periodic technical inspections and maintenance activities were not performed on time or were performed by unauthorised persons or a service provider not authorised by MERCOR L&V, or if the equipment was operated incorrectly,
- there has been any interference by persons not authorised by MERCOR L&V – apart from activities falling within the scope of normal operation of the equipment.

16. The purchaser/warranty and guarantee holder is obliged to operate the equipment properly (in accordance with the technical documentation) and to carry out periodic technical inspections and maintenance activities in accordance with the rules described in this document in the section 'MAINTENANCE AND SERVICE'.

In matters not covered by these warranty and guarantee conditions, the relevant provisions of the Civil Code shall apply.

FAN MEASUREMENT REPORT

| | |
|-------------------|--|
| FAN TYPE | |
| SERIAL NO. | |
| INSTALLATION SITE | |
| RATED CURRENT | |

After installing the fan in its intended place and making the appropriate electrical connections, immediately measure the current consumption during steady operation.

MEASUREMENT RESULTS [A]

| U1 | V1 | W1 | U2 | V2 | W2 |
|----|----|----|----|----|----|
| | | | | | |

NOTES:

| Full name of the person performing the measurements | Measurement date | Signature |
|---|------------------|-----------|
| | | |

Return this Report immediately after completion of measurements to:

MERCOR Light&Vent Sp. z o.o. (MERCOR L&V)
Fire Ventilation Systems
Ul. Grzegorza z Sanoka 2
80-408 Gdańsk

within a maximum of 8 weeks from the date of purchase of the device (the date of purchase is the date of the VAT invoice).

SENDING THE MEASUREMENT REPORT IS THE BASIS FOR THE VALIDITY OF THE WARRANTY/GUARANTEE GIVEN FOR THE DEVICE