Ventservice

# Technical Passport
# Radial smoke exhaust fans with backward-curved blades
# SEF-R Series 35…SEF-R 112
# Fire resistance class F600 (120)

2023

## Content:

## Preface

This passport serves as a consolidated operational document for fans of the SEF-R series (hereinafter referred to as "fans"). The passport contains information necessary for the proper and safe operation of fans and for maintaining them in good working condition.

The company "LLC Vent-Service" continually works on improving equipment, expanding the product range, and optimizing operations. Therefore, the company reserves the right to make changes and corrections to the current instructions, manuals, and technical passport for this product.

"LLC Vent-Service" is not obligated to inform third parties or clients about such changes. For the most up-to-date information regarding the equipment, clients can visit the official website: https://aerostar.ua/en/catalogue

## 1. Purpose:

Depending on the operating conditions, the fans can be manufactured in the following configurations:

SEF-R standard fans for removing combustion products generated during fires and for moving air and other non-aggressive gas mixtures in general ventilation systems.

SEF-R-E explosion-proof fans.

Fans are used in accordance with the requirements of DBN V 2.5.67 and DBN V 1.1-7 in smoke extraction ventilation systems to remove combustion products (smoke and gases) that occur during fires in buildings and structures of various purposes.

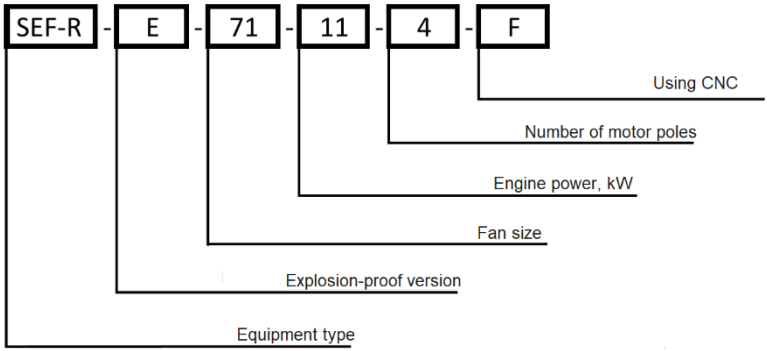
Depending on their configuration, fans can move gases with temperatures up to 400°C for a minimum of 120 minutes or with temperatures up to 600°C for a minimum of 120 minutes.

The fan should be installed in vent chambers equipped with an independent supply and exhaust ventilation system that ensures an air temperature in the vent chamber not exceeding 40°C.

The root mean square value of vibration resistance from external sources of vibration at the fan installation locations should not exceed 2 mm/s. The fan is installed outside the area of prolonged human presence.

## 2. Main Technical Data and Characteristics of SEF-R Fans

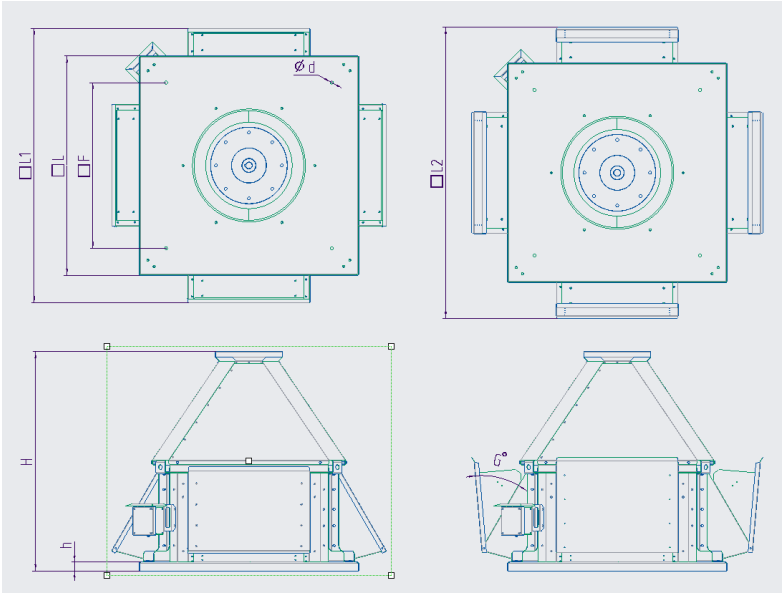
The characteristics depend on the fan's size, power, and motor type. The tables below provide all the characteristics according to the code.




1. The dimensions and sizes of the fans are provided in Picture 1 and Table 1.
2. Technical characteristics of the fans are presented in Tables 2 and 3.

***ATTENTION!***
*For the proper operation of the fans with a frequency converter, when connecting and configuring the VFD, it is necessary to set the maximum speed and frequency in accordance with the tabulated values.*

**Picture 1**



Ventservice

**Table1**

| Fan type and size | | 35 | 40 | 45 | 50 | 56 | 63 | 71 | 80 | 90 | 100 | 112 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size | H, мм | 661 | 750 | 830 | 750 | 847 | 937 | 1064 | 1217 | 1402 | 1343 | 1615 |
| | h, мм | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| | L1, мм | 792 | 876 | 1003 | 1131 | 1228 | 1360 | 1516 | 1778 | 1970 | 2210 | 2514 |
| | L2, мм | 831 | 921 | 710 | 1076 | 1168 | 1290 | 1437 | 1684 | 1862 | 2095 | 2374 |
| | L, мм | 620 | 670 | 720 | 820 | 880 | 950 | 1100 | 1250 | 1300 | 1470 | 1600 |
| | F, мм | 480 | 530 | 580 | 630 | 690 | 755 | 840 | 1005 | 1050 | 1220 | 1350 |
| | F, мм | 480 | 530 | 580 | 630 | 690 | 755 | 840 | 1005 | 1050 | 1220 | 1350 |
| | d, мм | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| | G, град | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |

**Table 2**

* - Optional: There is the possibility to install a frequency converter to existing equipment.

| Fan type and size | Number of poles | Nnom,kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 35 | 2 | 2,2 | 4,85 | 2855 | 6800 | 62 |
| | 4 | 0,55 | 1,34 | 1431 | 3200 | 56 |
| 40 | 2 | 4 | 8,2 | 2880 | 9800 | 96 |
| | 4 | 0,55 | 1,34 | 1431 | 4800 | 67 |
| 45 | 2 | 7,5 | 14,9 | 2895 | 14300 | 126 |
| | 4 | 1,1 | 2,75 | 1390 | 6700 | 92 |
| 50 | 4 | 1,5 | 3,72 | 1400 | 9800 | 102 |
| 56 | 4 | 3 | 6,8 | 1410 | 13500 | 146 |
| 63 | 4 | 5,5 | 11,7 | 1440 | 19500 | 206 |
| 71 | 4 | 11 | 22,5 | 1460 | 28000 | 286 |
| 80 | 4 | 15 | 30 | 1460 | 40000 | 403 |
| 90 | 4 | 30 | 57,6 | 1470 | 58000 | 524 |
| | 6 | 11 | 24,5 | 970 | 42000 | 465 |
| 100 | 6 | 15 | 31,6 | 970 | 55500 | 580 |
| 112 | 6 | 30 | 59,3 | 980 | 85500 | 892 |

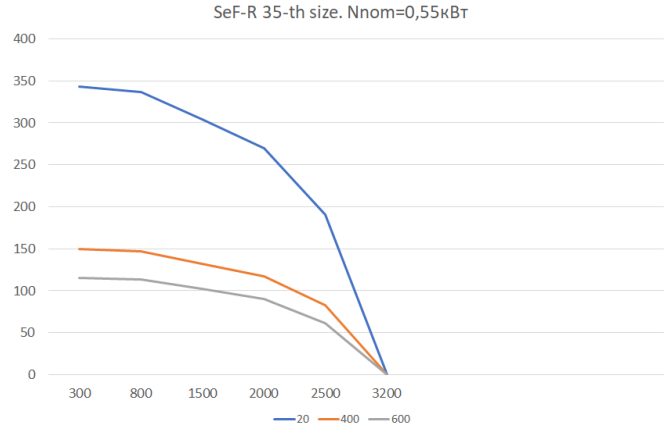
## 3. Equipment

| Name | Quantity | Note |
|---|---|---|
| Fan Assembly | 1 | |
| Fan Passport | 1 | |

**Note:** Spare parts and tools are not included in the supply kit.

## Appendix A - Summary of Aerodynamic Characteristics for Fan **"SEF-R 35…SEF-R 125"**

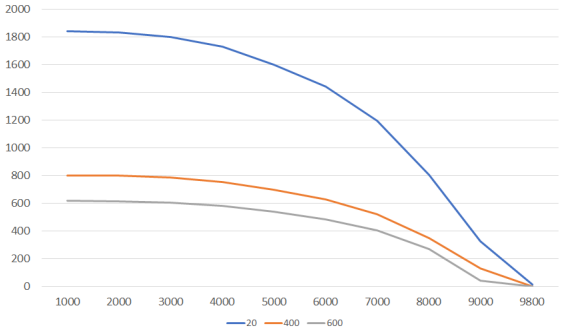
| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 35 | 4 | 0,55 | 1,34 | 1431 | 3200 | 56 |




| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 35 | 2 | 2,2 | 4,85 | 2855 | 6800 | 62 |

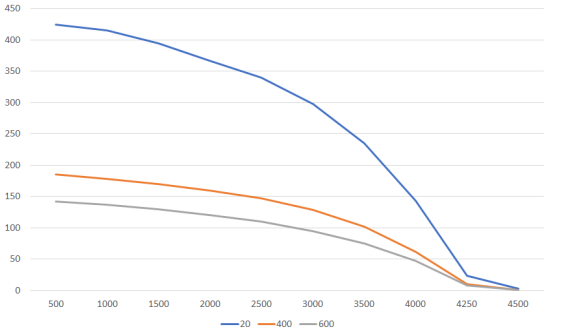
| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 40 | 2 | 4 | 8,2 | 2880 | 9800 | 96 |

SeF-R 40-th size. Nnom=4кВт



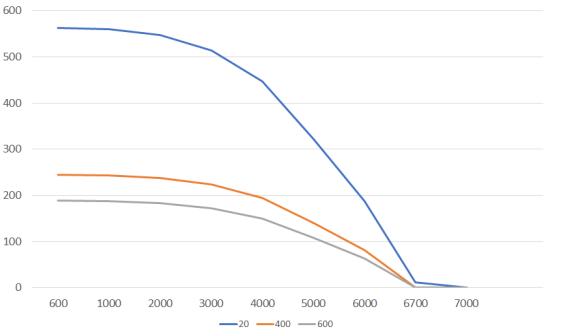

| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 40 | 4 | 0,55 | 1,34 | 1431 | 4800 | 67 |

SEF-R 40-th size. Nnom=0,55кВт



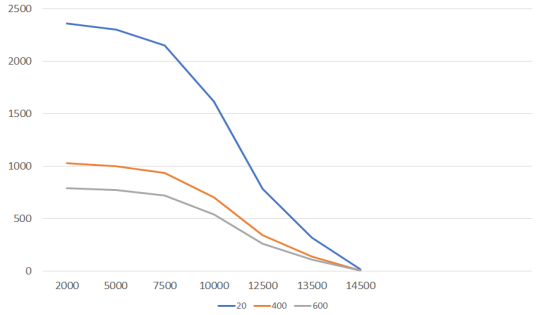

| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 45 | 4 | 1,1 | 2,75 | 1390 | 6700 | 92 |

SeF-R 45-th size. Nnom=1,1кВт



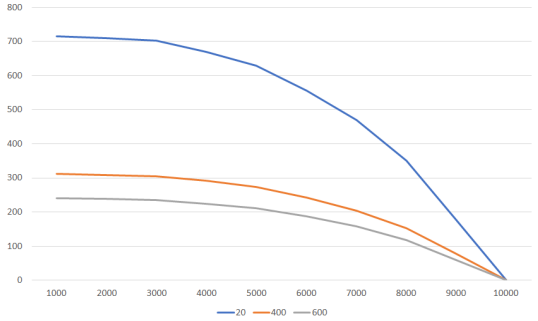
| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 45 | 2 | 7,5 | 14,9 | 2895 | 14300 | 126 |

SeF-R 45-th size. Nnom=7,5кВт



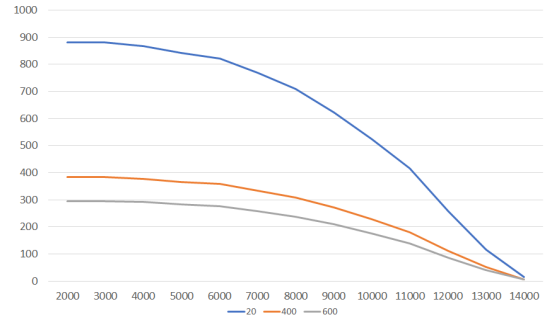

| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 50 | 4 | 1,5 | 3,72 | 1400 | 9800 | 102 |

SeF-R 50-th size. Nnom=1,5кВт



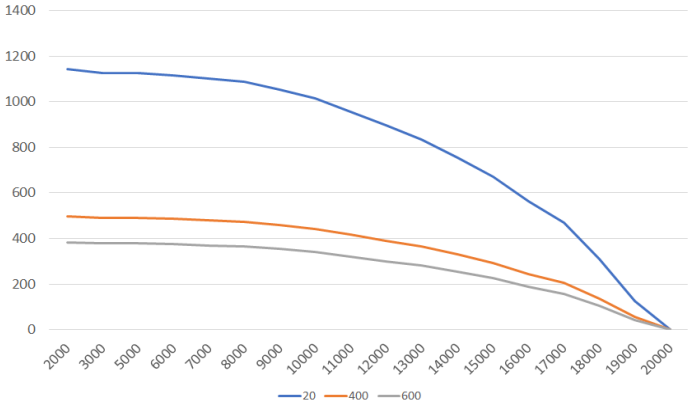

| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 56 | 4 | 3 | 6,8 | 1410 | 13500 | 146 |

SeF-R 56-th size. Nnom=3,0кВт



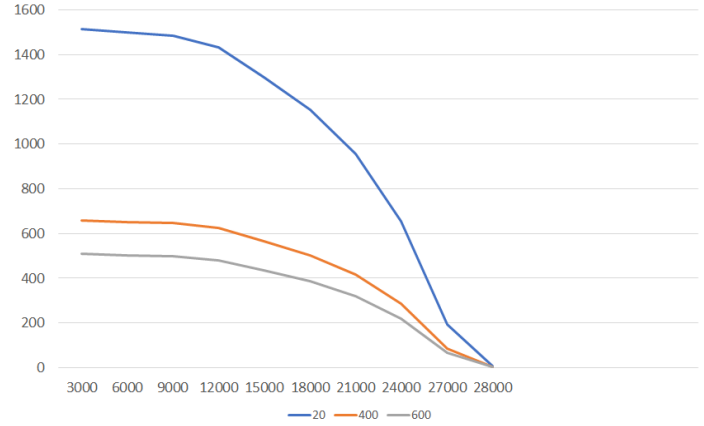
| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 63 | 4 | 5,5 | 11,7 | 1440 | 19500 | 206 |

SeF-R 63-th size. Nnom=5,5кВт




| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 71 | 4 | 11 | 22,5 | 1460 | 28000 | 286 |

SeF-R 71-th size. Nnom=11кВт

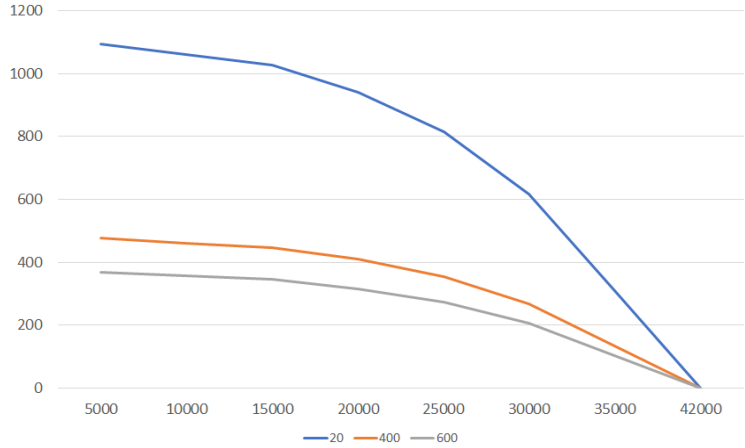


| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 80 | 4 | 15 | 30 | 1460 | 40000 | 403 |


| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 90 | 4 | 30 | 57,6 | 1470 | 58000 | 524 |

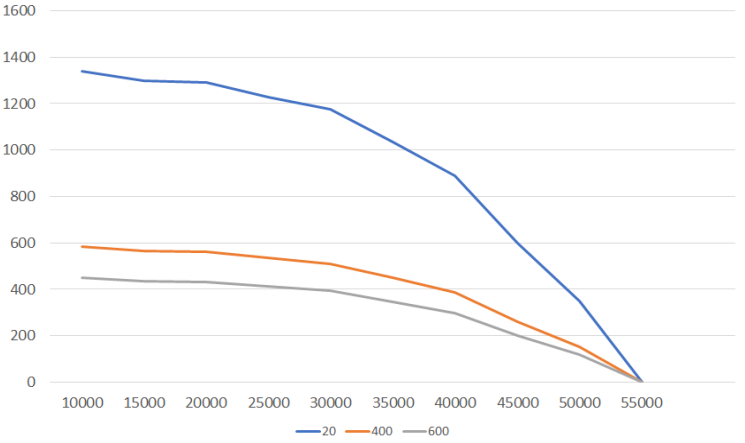
| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 90 | 6 | 11 | 24,5 | 970 | 42000 | 465 |

SeF-R 90-th size. Nnom=11кВт



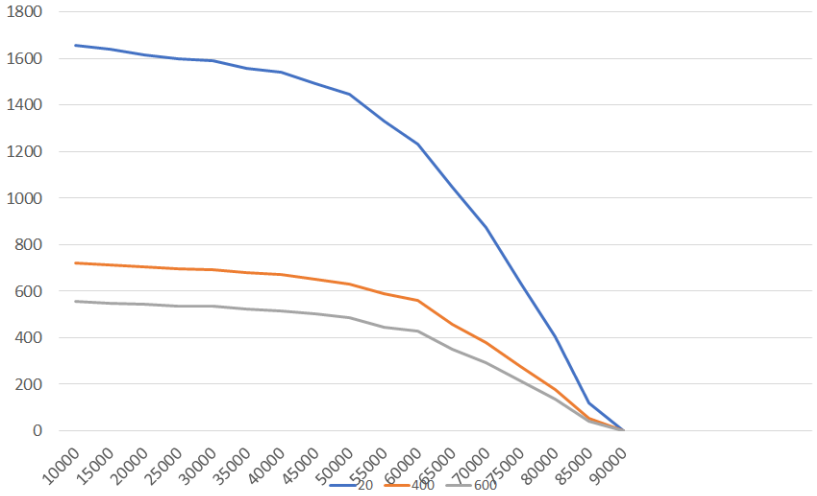

| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 100 | 6 | 15 | 31,6 | 970 | 55500 | 580 |

SeF-R 100-th size. Nnom=15кВт



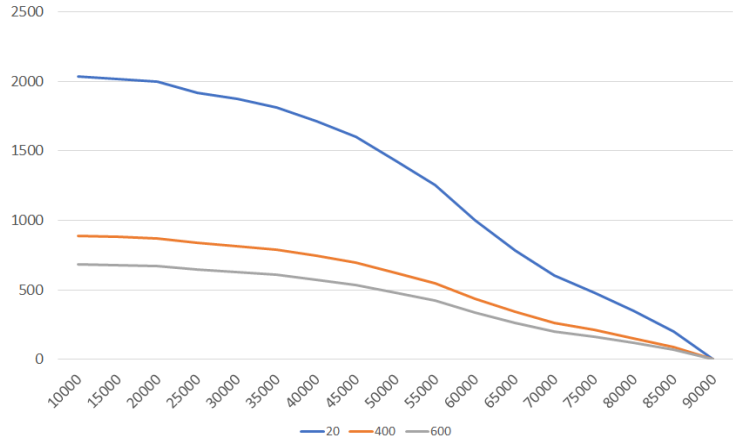
| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 112 | 6 | 30 | 59,3 | 980 | 85500 | 892 |

SeF-R 112-th size. Nnom=30кВт




| Fan type and size | Number of poles | Nnom, kW | Rated current, A | Speed (RPM) | Airflow (air volume) m³/h | Weight, kg |
|---|---|---|---|---|---|---|
| 125 | 6 | 45 | 59,3 | 980 | 85500 | 1060 |

SeF-M 125-th size. Nnom=45кВт



## 4. Structure and Operating Principles of Fans

1. The construction of the fans includes the following main components:
- Spiral casing
- Impeller
- Collector
- Electric motor
- Frame
- Vibration isolators (supplied separately)

2. The spiral casing is a non-detachable rotary assembly. The side walls are assembled on the flange. A round inlet flange is attached to the front wall. The fan casing can be installed in any position upon the customer's request in accordance with DSTU 2522.

3. The drum-type impeller with backward-curved blades is installed on the motor shaft.

4. Fans are designed for rotation in the following directions:
- Clockwise rotation with an impeller that turns clockwise when viewed from the suction side.
- Counterclockwise rotation with an impeller that turns counterclockwise when viewed from the suction side.

5. The collector is used to direct air to the impeller.

6. The frame is made of sheet steel and long products. The base of the frame is intended for mounting it to the foundation.

7. The electric motor is installed on the frame, powered by a three-phase network with a voltage of 380 V and a frequency of 50 Hz.

8. The fan's operation principle involves moving the air by the energy of the impeller's rotation. When the impeller rotates, the air entering through the collector moves into the channels between the impeller blades. Under the action of centrifugal force, it moves towards the periphery of the impeller and exits through the outlet nozzle.

## 5. Safety Measures

1. When preparing fans for operation and during their use, it is essential to adhere to safety requirements as outlined in DSTU B A.3.2-12:2009, "Safety Rules for the Operation of Electrical Installations by Consumers," and "Rules for the Technical Operation of Electrical Installations by Consumers."

2. Only individuals who have familiarized themselves with this passport and have been instructed in safety procedures are allowed to install and operate the fans.

3. The installation of fans should provide free access to their maintenance points during operation.

4. The fan installation location and ventilation system should have devices that prevent foreign objects from entering the fan.

5. Maintenance and repairs of fans should only be carried out when they are disconnected from the electrical network and when all rotating parts are fully stopped.

6. Fan grounding should be performed in accordance with the "Rules for the Arrangement of Electrical Installations" (PUE). The resistance value between the grounding terminal and any accessible, non-insulated metal part of the fan that may come into contact with voltage should not exceed 0.10 Om.

7. When working with electrical hazards (including static electricity), protective measures should be applied.

8. During testing, commissioning, and operation of the fans, the inlet and outlet openings must be protected to prevent injury to individuals from the airflow and rotating parts.

9. An employee responsible for starting the fan must take measures in advance to cease all work on the fan (repairs, cleaning, etc.), its motor, and notify personnel before starting.

## 6. Preparing the Product for Use

*Installation:*

1. Fan installation should be carried out in accordance with the requirements of DSTU B A.3.2-12:2009, DSTU-N B V.2.5-73:2013, project documentation, and this passport.

2. Inspect the fan. If any damages or defects are found as a result of improper transportation or storage, the fan should not be put into operation without prior approval from the selling company.

3. During fan installation, it is necessary to:

1). Ensure that the impeller rotates smoothly and freely.

2). Check the tightness of bolted connections, paying special attention to the attachment of the impeller (motor to the plate in the casing).

3). Verify the insulation resistance of the motor and, if necessary, dry it (if the fan has been exposed to water).

4). Make electrical connections to the motor in accordance with the wiring diagram. Electrical diagrams and terminal markings are provided below.

5). Ground both the fan and the motor.

6). Ensure there are no foreign objects inside the fan. Verify the voltage compatibility with the power supply and the motor.

7). Connect the suction and discharge openings of the fan to the ductwork using flexible inserts, ensuring an airtight seal. The fan casing can be installed in any position during installation.

## 7. Startup:

1. Prior to the trial startup, it is necessary to:

a) Stop all work on the fan and ducts and remove any foreign objects from them.

b) Verify the secure connection of the power cable to the terminal box and ensure that the grounding conductor is properly connected to the grounding terminals.

2. Start the motor and observe the fan's operation for one hour. If there are no foreign noises, unusual sounds, excessive vibration, or other defects, the fan can be put into normal operation.

3. During the operation of the fan, comply with the requirements of GOST 12.3.002-75, DSTU B A.3.2-12:2009, and this passport.

## 8. Technical Maintenance

1. To ensure the reliable and efficient operation of the fans and extend their lifespan, proper and regular technical maintenance is required.

2. The following types of technical maintenance are established for the fans:

a) Technical Maintenance No. 1 (TM-1) every 150-170 hours.

b) Technical Maintenance No. 2 (TM-2) every 600-650 hours.

c) Technical Maintenance No. 3 (TM-3) every 2500-2600 hours.

3. All types of technical maintenance are performed according to the schedule regardless of the technical condition of the fans.

4. It is not allowed to reduce the established scope or change the frequency of technical maintenance.

5. Operation and technical maintenance of the fans should be carried out by personnel with the appropriate qualifications.

6. During TM-1, the following activities are carried out:

a) Visual inspection of the fan to detect mechanical damage.

b) Inspection of the condition of welded and bolted connections.

c) Verification of the grounding reliability of the fan and motor.

7. During TM-2, the following activities are carried out:

a) TM-1 procedures.

b) Inspection of the condition and attachment of the impeller with the motor to the casing.

c) Verification of vibration levels (the average quadratic vibration velocity of the fan should not exceed 6.3 mm/s).

8. During TM-3, the following activities are carried out:

a) TM-2 procedures.

b) Inspection of external coatings and, if necessary, their renewal.

c) Cleaning of the internal cavity of the fan and impeller from contaminants.

d) Verification of the fan's attachment to flexible inserts and the building structure.

9. Engine maintenance is performed according to the volume and schedule specified in the engine's technical description and operating instructions.

10. The consumer enterprise should keep a record of technical maintenance using the form provided in Appendix B.

## 9. Possible Malfunctions and Remedies

| Fault | Probable cause | Remedy of elimination | Notes |
|---|---|---|---|
| Insufficient fan performance | 1. Pressure loss in the network above the calculated value.<br>2. The fan wheel rotates in the reverse direction.<br>3. Air leakage due to a lack of tightness. | 1. Reduce pressure loss in the network.<br>2. Swap the phases on the motor terminals.<br>3. Eliminate air leaks. | |
| Excessive fan performance | Loss of pressure in the network below the calculated value. | Install a damper in the system. | |
| Increased vibration | 1. Motor-wheel imbalance.<br>2. Insufficiently tightened bolt connections. | 1. Balance the motor wheel.<br>2. Clean the motor wheel from dirt.<br>3. Tighten the bolt connections. | |
| Loud noise during fan operation | 1. Absence of flexible inserts between the fan and the air duct.<br>2. Insufficiently tightened bolt connections. | 1. Equip the system with flexible inserts.<br>2. Tighten the bolt connections. | |

## 10. Storage and Transportation of the Product

1. Fans are not subject to conservation.
2. Fans are transported fully assembled without packaging.
3. Fans can be transported by any means of transportation that ensures their preservation and prevents mechanical damage, following the rules for transporting cargo applicable to the type of transportation used.
4. Fans should be stored in an indoor space where temperature and humidity fluctuations are insignificantly different from those in open air conditions (e.g., tents, uninsulated metal storage sheds).

## 11. Warranty Terms for Equipment

### 11.1 WARRANTY PERIOD

The warranty period for the equipment is 36 calendar months from the date of shipment of the Equipment, but not more than 42 calendar months from the date of manufacture.

## 11.2 SCOPE OF WARRANTY

The Supplier independently decides on the replacement of faulty equipment parts. The warranty period for equipment elements is extended for the duration during which repairs to rectify malfunctions hindered its normal operation.

## 11.3 EXCLUSIONS FROM WARRANTY

Parts of the equipment and consumables subject to natural physical wear and tear (filters, seals, V-belts, light bulbs, fuses, etc.).

Defects in the equipment arising from causes not related to the properties and characteristics of the equipment itself are not covered by the warranty.

Damage to the equipment caused by environmental factors, transportation, and improper storage by the Buyer, as well as all mechanical damage and breakdowns resulting from poor equipment operation and maintenance or non-compliance with recommendations and requirements of technical and operational documentation (hereinafter - TED).

## 11.4 WARRANTY TERMS FOR MOTORS/FANS

Warranty terms do not apply if the fan has:

Mechanical damage incurred during loading and unloading, transportation, installation, commissioning, storage, and operation, as well as other actions after the equipment is shipped.

Traces or odors associated with motor overheating.

Damaged power supply cables, grounding, thermal fuses, and connections to the appropriate rated start capacitor.

Signs of corrosion, salt deposits, sticky/fibrous substances on the blades of the impeller, as well as signs of dust accumulation exceeding 80 g/m³.

Cases mentioned in Section 3.

Warranty for the equipment is not maintained in the absence of servicing in accordance with the maintenance schedule for this type of equipment (Appendix No. 1 to the installation and operation manual).

## 12. COMPLAINTS

Complaint forms can be obtained from the Supplier's manager or technical expert.

Complaints in writing should be sent to the Supplier's technical expert.

A complaint will only be considered if all mandatory fields in the complaint form are filled out.

In case of a complaint regarding motors/fans, photographs of the fan/motor and the location where it is installed, clearly showing the installed fan and its position, must be included with the completed complaint form.

## 13. WARRANTY SERVICES

Warranty services are provided within the following timeframes:

No later than 5 working days after the arrival of the technical expert.

In case of the unavailability of spare parts in the supplier's stock, no more than 30 working days.

In exceptional cases, this period may be extended, particularly when additional time is needed for parts delivery or if it is impossible to perform service work on-site.

The parts that the service personnel remove from the equipment as part of warranty service and replace with new ones remain the property of the supplier.

Expenses incurred due to unjustified warranty claims or due to interruptions in service work at the request of the complainant are the responsibility of the complainant. Repair work is priced according to the service price list.

The supplier has the right to refuse warranty work or service if the Buyer delays payment for the equipment or for previous service work.

The Buyer assists the service personnel when performing warranty services at the location of the equipment as follows:

a) Provides timely access to the equipment and its documentation.

b) Ensures the security of the service personnel's property and compliance with all occupational health and safety requirements at the location where warranty service is provided.

c) Creates conditions for an immediate start of work upon the arrival of service personnel and allows work to proceed without any hindrances.

d) Provides any necessary assistance for the execution of services, such as providing lifting equipment, scaffolding, free sources of electricity, etc.

## 14. INFORMATION ON COMPLAINTS

14.1 The acceptance of products is carried out by the consumer in accordance with the "Procedure for Acceptance of Products for Production and Technical Use and Consumer Goods for Quality."

14.2 If a quality discrepancy is detected, the consumer is obligated to send a Complaint to the Distributor, which serves as the basis for considering the legitimacy of the claim being made. The list of Distributors and their contact information can be found on the website www.ventservice.com.ua.

14.3 Complaints should be submitted in writing to the Distributor. Sending a complaint via fax or email is also acceptable. The Complaint should include the type, serial number, invoice number, and date of transfer of the Fan, as well as the address of the Fan's installation, contact phone numbers, and the full name of the responsible person.

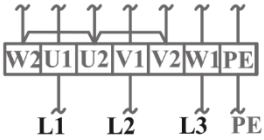
The Complaint should also include a description of the issues with the Fan and, if possible, the names of damaged parts.

14.4 If the consumer (purchaser) violates the rules of transportation, acceptance, storage, installation, and operation of the product, claims for quality will not be accepted.

## Appendix B

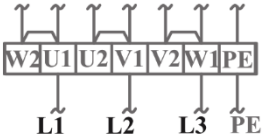
### 2p/4p 400V

Y - connection



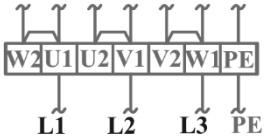

### 2p/4p 220V

▲ - connection




### 6p 400V

▲ - connection



| Date | Number of operating hours from the beginning of operation | Type of maintenance | Remarks on the technical condition of the product | Position, surname and signature of the responsible person |
|---|---|---|---|---|
| | | | | |

## Certificate of Acceptance

Fan SEF-R_____, serial number_____,

manufactured and accepted in accordance with the requirements of
TU U 28.2-35851853-007:2021

Certificate of Connection

Fan SEF-;

serial number (№) connected to the network in accordance with item 7

Passport by an electrician specialist

Full Name:_____

who has ____electrical safety group, confirming document

_____ _____
(Signature) (Date)

Ventservice

**For note**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office@ventservice.com.ua

Виробничі потужності:
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