Operation and Installation Manual

Radial Smoke Exhaust Fans with Backward Curved Blades

SEF-R Series 35...SEF-R 112

With Fire Resistance Class F600 (120)

2023

Ventservice

Content:

Preface

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

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

LLC "Vent-Service" is not obliged to inform third parties or customers about such changes.

For the most up-to-date information regarding the equipment, customers can visit the official website: https://aerostar.ua/en/catalog

The production of fans is carried out in accordance with TU U 28.2-35851853-007:2021. The smoke exhaust fans, hereinafter referred to as "fans," are designed and manufactured by LLC "Vent-Service."

1.Purpose:

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

- SEF-R standard fans for removing combustion products generated during a fire, as well as for air movement and other non-aggressive gas mixtures in general ventilation systems.
- SEF-R-E explosion-proof fans.

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

Depending on their configuration, fans can handle gases with temperatures up to 400°C for at least 120 minutes or with temperatures up to 600°C for at least 120 minutes.

Fans should be installed in ventilation chambers equipped with an autonomous inflow-exhaust ventilation system that maintains the air temperature in the fan chamber at no more than 40°C.

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

2. Equipment Description, Structure, and Operating Principle:

The fan consists of a working wheel located inside a housing, which is rotated by an electric motor. The electric motor is mounted inside the housing, attached to the base panel, and positioned vertically.

The base panel is mounted to the framework of the housing, consisting of supports and struts.

The working wheel is directly installed on the motor shaft.

During operation, the smoke-air mixture, under the influence of the draft produced by the electric motor and the blades of the working wheel, enters the wheel from the general ventilation system or its branches from below, changes direction to radial, and, receiving an increase in pressure in the interblade space, is discharged through side openings in the housing pockets into the external environment.

The structural rigidity is achieved through the supporting frame, struts, and supports located at the corners of the structure and around its perimeter. In some models, the frame structure may be modified to meet specific customer requirements.

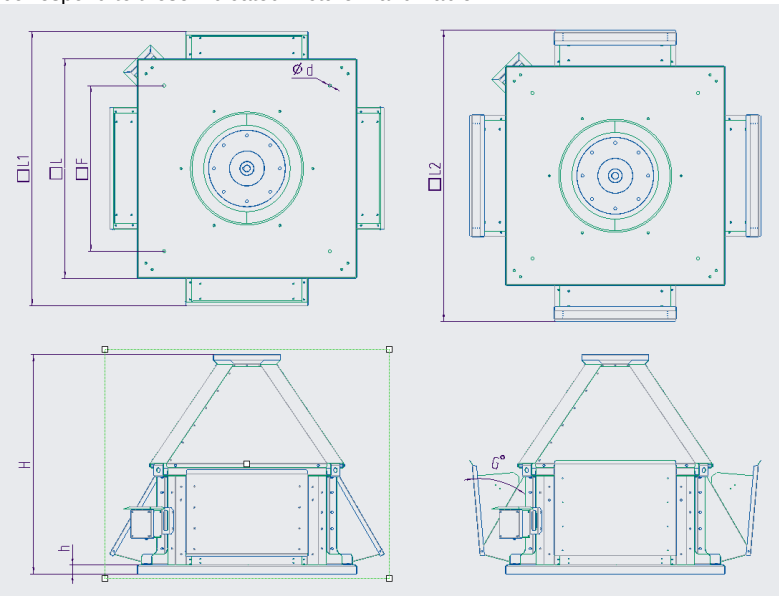
A diffuser is located between the base panel and the working wheel, creating additional pressure and directing the movement of the smoke-air mixture.

The electric motor is asynchronous and can vary depending of the fan's size and have different characteristics.

Note: In the design of the fan may be added the changes what are not included in this manual and do not deteriorate it properties and it constructions

3. MAIN TECHNICAL DATA

The general appearance, overall dimensions, connection, and installation dimensions of the fans should correspond to those indicated Picture 1 and Table 1.



Picture 1

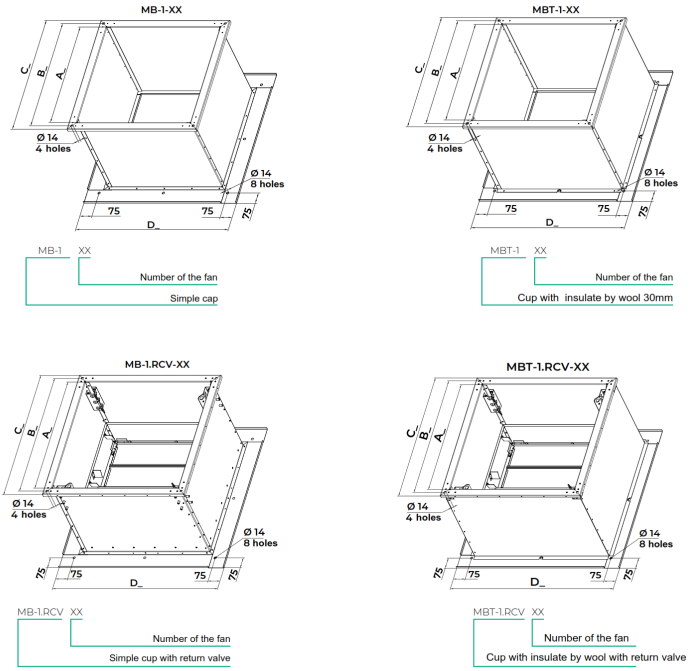
Table 1

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

3.2 Mounting brackets for fan installation.

Table 2

Sizes	Dimensions				
	A	B	C	D	H
35	430	480	530	675	600
40	480	530	580	725	
45	530	580	630	775	
50	580	630	680	825	
56	640	690	740	885	
63	705	755	805	950	
71	790	840	890	1035	
80	955	1005	1055	1200	
90	1000	1050	1100	1245	
100	1170	1220	1270	1415	
112	1300	1350	1400	1545	



Picture 2

4. Configuration

Item	Quantity	
Fan 1	1	
Passport 1	1	
Manual 1	1	

Accessories for the fan are supplied separately and are not included in the delivery package.

5. Storage and Transportation

5.1. Fans are transported in an assembled state. Fan transportation should be carried out in accordance with the rules applicable to the respective modes of transport. Tilting, overturning, or changing the position of the fan relative to the support surface is prohibited.

5.2.The fan should be Loading by using lifting equipment.

5.3. Fans should be stored in locations protected from atmospheric precipitation and direct sunlight.

The fan is shipped wrapped in thermal shrink film and/or PE film. It should be stored in enclosed spaces where:

• Maximum relative humidity does not exceed 85%;

• Condensation of moisture does not occur;
• The temperature fluctuates between -20 to +40°C;
• Dust, gases, and corrosive vapors from chemicals that promote corrosion of the structure and internal equipment should not penetrate under the fan's packaging;
• The fan can be stored only at the position in which it will be operated.

6. Safety Requirements

6.1. Installation and operation should be carried out by individuals who have studied the equipment's structure, equipment rules, and have received safety training in accordance with the requirements of NPAOP 0.00-4.12.

6.2. Maintenance, repair, and performance checks should be conducted only with the ventilation system, to which it is connected, turned off.

When preparing the fan for operation and performing maintenance, only functional tools should be used.

Maintenance and repair of the fan should be carried out only after disconnecting it from the power supply network and ensuring the complete stoppage of rotating parts.

During assembly, maintenance, and repair work, the following actions are prohibited:

- Inspection without prior disconnection.
- Touching moving elements of the structure and electrical parts of its electrical equipment during performance checks.
- Cleaning the interior using scrapers or metal brushes that can damage the sealing material.
- Using malfunctioning tools during setup and repair.
- Striking the fan.
- Storing flammable substances and flammable items near the fan.

6.3. Electrical equipment installation should be comply with the requirements of "Rules for the Technical Operation of Electrical Installations of Consumers" and "Safety Regulations for the Operation of Electrical Installations of Consumers."

6.4. When working with a risk of electrical shock (including static electricity), protective measures should be applied.

6.5. Maintenance and repair of the electric motor should be carried out in accordance with the requirements of "Rules for the Safe Operation of Electrical Installations" DNAOP 0.001.21-98, NPAOP 40.1-1.21, NPAOP 40.1-1.32, NPAOP 40.1-1.01-97.

6.6. The motor and fan should be reliably grounded according to the requirements of the section "Grounding and Protective Measures Against Electrical Shock" according to the "Rules for Electrical Installations" (PUE). The resistance between the grounding clamp and any accessible non-current-carrying part of the fan that may be under voltage should exceed 0.1 Om.

6.8. During the fan startup, all maintenance work at the fan (repairs, cleaning, etc.) should be stopped, and the servicing personnel should be informed about the fan's startup.

6.9. In case of unusual noises, strange sounds, increased vibration, etc., the fan should be immediately stopped. Restarting is only allowed after identifying and rectifying the causes of abnormal operation.

7. Preparation and Operating Instructions for the Fan

7.1. Conduct an external inspection of the fan. In case of any damages or defects resulting from incorrect transportation and storage, using the fan without prior coordination with the manufacturer is not allowed.

7.2. Check the tightening of all screw connections, paying special attention to the attachment of the impeller and the motor. Ensure of smooth and effortless rotation of the impeller without sticking or rubbing.

7.3. Prepare the motor according to its manual, measure the insulation resistance, and, if necessary, dry the electric motor. Check the smoothness of the impeller's rotation.

7.4. Use the designated holes in the supports for hoisting the fan.

7.5. Ground the fan and the motor. Ensure that there are no foreign objects inside the fan. Before mounting the fan on the appropriate mounting bracket, remove the transport screws from the fan base. When installing, align the four holes on the fan base with the threaded holes in the mounting bracket. Secure the fan to the bracket using the previously removed screws. Seal the mounting screws.

7.6. Verify the compatibility of the power supply voltage with the motor. Temporarily start the motor to check the direction of impeller rotation. If the rotation is incorrect, change the direction of impeller rotation by switching the phases at the terminals of the distribution box.

7.7. Start the fan. Before the trial run, you should:

a) Stop all work on the fan to be started and clean it of foreign objects. Notify the personnel about the start.

b) Ensure the secure connection of the power cable to the terminal blocks and the grounding conductor to the grounding terminals.

c) Perform acceptance tests in accordance with the requirements of the Electrical Code and this manual.

All tests should be documented with appropriate acts and protocols following the Electrical Code.

During the trial run, turn on the motor and monitor the fan's operation for one hour. If there is no motor overheating or excessive vibration of the fan during this time, it can be put into operation.

7.8. Safe fan operation is ensured through proper organization of inspections and regular checks, as well as timely resolution of any malfunctions in the fan's operation.

7.9. All types of maintenance should be carried out according to a schedule, regardless of the fan's technical condition.

7.10. Operation and maintenance of the fan should be performed by personnel with the appropriate qualifications.

8. Technical Maintenance

8.1. To ensure reliable and cost-effective operation throughout the entire service life, regular maintenance work is required to maintain the fan's normal technical condition.

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

a) Technical Maintenance #1 (TM-1) every 150-170 hours;

b) Technical Maintenance #2 (TM-2) every 600-650 hours;

c) Technical Maintenance #3 (TM-3) every 2500-2600 hours.

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

8.4. Reducing the established scope and changing the frequency of technical maintenance is not allowed.

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

8.6. During TM-1, the following tasks are performed:

a) External inspection of the fan to identify mechanical damage;

b) Checking the condition of welded and bolted connections;

c) Verifying the grounding of the fan and the motor.

8.7. During TM-2, the following tasks are performed:

a) TM-1;

b) Checking the condition and attachment of the impeller with the motor to the housing;

c) Vibration level check (the root mean square vibration velocity of the fan should not exceed 6.3 mm/s).

8.8. During TM-3, the following tasks are performed:

a) TM-2;

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

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

d) Checking the reliability of the fan's attachment to flexible inserts, cup and the building structure.

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. 2. The fan wheel rotates in the reverse direction. 3. Air leakage due to a lack of tightness.	1. Reduce pressure loss in the network. 2. Swap the phases on the motor terminals. 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. 2. Insufficiently tightened bolt connections.	1. Balance the motor wheel. 2. Clean the motor wheel from dirt. 3. Tighten the bolt connections.	
Loud noise during fan operation	1. Absence of flexible inserts between the fan and the air duct. 2. Insufficiently tightened bolt connections.	1. Equip the system with flexible inserts. 2. Tighten the bolt connections.	

10. Warranty Conditions for Equipment

10.1 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.

10.2 WARRANTY SCOPE

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

10.3 ITEMS NOT COVERED BY WARRANTY

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

Defects in equipment that arise from causes not determined by the properties and characteristics of the equipment itself are covered by the warranty.

Damage to equipment resulting from environmental factors, transportation, and improper storage by the purchaser, all mechanical damage and breakdowns resulting from poor equipment operation and maintenance or failure to comply with the recommendations and requirements of the technical and operational documentation (hereinafter referred to as TED).

10.4 WARRANTY CONDITIONS FOR MOTORS/FANS

The warranty does not apply if the fan has:
Mechanical damage that occurred during loading and unloading, transportation, installation, commissioning, storage, and other actions after the equipment was shipped.
Traces or odors related to motor overheating.
Damaged power connection wires, grounding, thermal fuses, and connection of the starting capacitor with the appropriate rating.
Traces of corrosion, salt deposits, sticky/fibrous substances on the fan blades, as well as traces of dust exceeding 80 g/m³.
Cases described in section 3.
Warranty on the equipment is not preserved in the absence of maintenance according to the maintenance schedule for this type of equipment (Appendix No. 1 to the installation and operation manual).

11. CLAIMS

A claims form can be obtained from the supplier's manager or technical expert.
Claims in writing should be sent to the supplier's technical expert.
A claim will only be considered if the mandatory sections of the claims form are completed.

In the event of a claim regarding motors/fans, clear photos of the fan/motor and its installation location must be included in the completed claims form.

12. WARRANTY SERVICES

Warranty services are provided within:
No later than 5 working days after the arrival of the technical expert.
In case of absence of spare parts in the supplier's warehouse, no more than 30 working days.
In exceptional cases, this period may be extended, in particular when the necessary time is required for the delivery of parts or in case the service cannot work on-site.
Parts that the service removes from the equipment as part of warranty service and replaces with new ones are the property of the supplier.
The costs incurred due to unjustified submission of a claim or due to interruptions in service work at the request of the claimant are borne by the claimant. Repair work is priced according to the service price list.
The supplier has the right to refuse warranty work or service if the customer delays payment for the equipment or for previous service work.
The customer assists the service workers in carrying out warranty services in the city where the equipment is located by:
a) Preparing timely access to the equipment and its documentation.
b) Providing security for the service property, as well as compliance with all labor protection and safety requirements at the location where the warranty service is performed.
c) Creating conditions for an immediate start of work right after the arrival of the service employees and conducting work without any obstacles.
d) Providing free assistance as necessary for the provision of services, such as providing a lift, scaffolding, free sources of electrical power.

13. INFORMATION ABOUT COMPLAINTS

14.1 Product acceptance is carried out by the consumer in accordance with the "Procedure for Acceptance of Products of Industrial and Technical Purpose and Consumer Goods by Quality."
14.2 In case of identifying quality discrepancies, the consumer is obliged to send a Complaint to the Distributor, which serves as the basis for determining the legitimacy of the claim. The list of Distributors and their contact information is provided on the website www.ventservice.com.ua.
14.3 Complaints should be submitted to the Distributor in written form. Submission of complaints by fax or email is allowed. The complaint must include the type, serial number, invoice number, and date of transfer of the Fan, as well as the address of the Fan's installation location, contact phone numbers, and the full name of the responsible person.
The complaint should also include a description of the problems with the Fan and, if possible, the names of the damaged parts.
14.4 If the consumer (purchaser) violates the rules of transportation, acceptance, storage, installation, and operation of the product, claims regarding quality will not be accepted.

Routine Maintenance Journal

№ Замовлення	ПІБ особи, яка здійснює регламентні роботи	Дата	Вид робіт	Підпис або печатка

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Routine Maintenance Journal

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Complaint form

Company name	
Contact (responsible) person	
Product name (type)	
Serial (factory) number	
Date of shipment and invoice number	
Place and address of the product application	
Date of the malfunction	
Circumstances under which the malfunction was detected	
Faulty component	
Description of the problem (nature of the fault, events that preceded the fault – natural phenomena, power voltage drops, etc.). Type, connection diagram, currents on the phases, mains voltage. Rotation direction. Temperature, pressure and composition of the heat-and-cooling agent. Air temperature that is transferred. Place of installation and location in the system	
Measures taken (your actions to identify and solve the problem)	
Note	

Responsible person /_____/

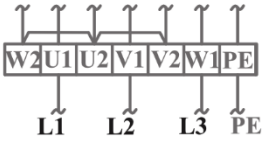
Attention:

If the complaint is found to be unreasonable (the product has no defects, or it is found that the defects resulted of circumstances for which the Distributor/ Manufacturer is not responsible) the Customer/Buyer shall compensate the Distributor/Manufacturer the costs incurred during the consideration of the complaint, including the costs of expert examination.
The cost of claim works is calculated by the following formula:
X= S*Y + Q*Z+M, where
S – cost per man-hour of the Employee for the type of work performed;
Y – the number of man-hours as a measure of the labor intensity of the work performed;
Q – rate per kilometer;
Z – actual number of kilometers;
M – cost of materials used to perform the work.
The cost per man-hour for the work performed is $7.5.
Guarantee obligations do not apply to:
- Equipment parts and operating materials which are subject to natural physical wear and tear (filters, seals, belts, light bulbs, fuses, etc.).
- Damages to the Equipment resulting from:
a) foreign objects or liquids entering the Equipment,
b) natural phenomena,
c) environmental impact,
d) animal activity,
h) unauthorized access to the units and parts of the Equipment by persons not authorized to perform the abovementioned actions,
h) all mechanical damages and breakdowns that occurred as a result of non-compliance with the recommendations and requirements of the documentation, including the "Installation and Operation Manual", passport, norms, standards and rules of works conductions.
- Various modifications, adjustments in operating parameters, alterations, repairs and replacement of parts of the Equipment, carried out without the consent of the Manufacturer or his representative.
- Current routine works, inspections of equipment, configuration and programming of controllers, which are carried out in accordance with the requirements of the "Installation and Operation Manual" within the normal functioning of the Equipment.
- Damages caused by downtime of the Equipment during the waiting period of guarantee service and any damage caused to the client's property, except for the Manufacturer's Equipment, are not subject to compensation.

Schemes of electric motor connections

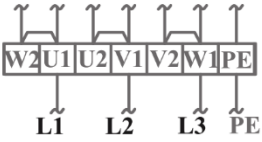
2p/4p 400V

Y- connection



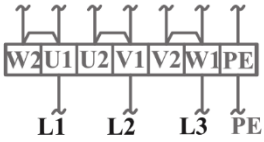
2p/4p 220V

▲- connection



6p 400V

▲- connection



Acceptance Certificate

Fan SEF-R_____, serial number_____, manufactured and accepted in accordance with the requirements of
TU U 28.2-35851853-007:2021
Connection Certificate
Fan SEF-R _____;
Serial number (№)_____
connected to the network in accordance with item 7 of the Passport by an electrician specialist
Full Name:_____
holding the _____electrical safety group, confirmed by document
_____

_____ _____
(Signature) (Date)

For note

Ventservice

For note

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office@ventservice.com.ua

Виробничі потужності:
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