Ferroplast UV Air Disinfection Unit

Versions:

Ferroplast UV Air Disinfection Unit 2L

Operation Manual.
Data Sheet.

CONTENTS

1. INTRODUCTION

1.1. This Manual is a combined document with the technical description and operation manual.

1.2. The Manual is intended for familiarization with the Ferroplast UV Air Disinfection Unit 2L two-lamp UV germicidal recirculation unit with forced air flow circulation for indoor air disinfection (hereinafter referred to as the recirculation unit).

1.3. The recirculation unit can be used to disinfect indoor air in the presence of people.

1.4. The Manual specifies rules for recirculation unit operation (use, maintenance, current repairs, transportation and storage).

1.5. Do not use children or people with disabilities

2. PURPOSE

2.1. The recirculation unit is intended for air disinfection of Category I-V premises up to 75 m3 in medical and preventive institutions in the presence and absence of people by air flow disinfection during its forced circulation through the body with two 30 W low-pressure germicidal lamps placed inside:

in the presence of people - in Category I-V premises to prevent an increase of the microbial air contamination level (especially in cases of a high risk of the spread of diseases transmitted by airborne droplets and by air).

in the absence of people - in Category I-III premises to reduce the air microbial contamination (as the final link in the complex of sanitary and hygienic measures).

3. MAIN TECHNICAL DATA

3.1. The recirculation unit operates from 230±10% VAC voltage with a frequency of 50 Hz.

3.2. Power consumed by the chamber from AC voltage is not more than 80 VA.

3.3. Irradiance from a UV radiation source at a distance of 1 m at a wavelength in the range of 253.7 nm is at least 2 W/m3. The UV radiation source is two 30 W low-pressure mercury germicidal lamps that do not form ozone during the combustion process.

A special glass with high transmittance of germicidal ultraviolet rays is used for lamp manufacturing. At the same time, this glass absorbs radiation below 200 nm that forms ozone from the air. Due to this, the extremely small ozone formation is recorded which disappears completely after about 100 hours of lamp operation. The average service life of lamps subject to proper operation and maintenance is at least 9,000 hours.

3.4. Continuous running time of the recirculation unit is not more than 7 days. Break between start-ups is not regulated.

3.5. Recirculation unit warm-up time must not exceed 1 minute.

3.6. Recirculation unit overall dimensions are 1200x175x145 mm.

3.7. Recirculation unit weight is not more than 6 kg.

3.8. Mean time between failures is at least 1,500 hours.

3.9. Mean life time is at least 5 years.

3.10. The outer recirculation unit surfaces are made of metal coated with powder paint and impact-proof chemically resistant polycarbonate and allow disinfection by wiping with disinfectants registered and permitted in the Russian Federation for surface disinfection according to the modes regulated by the current documents on the use of disinfectants approved in the prescribed manner.

3.14. Total output power of the air-flow (capacity) at nominal voltage is 90 m3/hour. The measurements were carried out by the "TESTO-435" thermoanemometer in order to provide the necessary output power of the air flow. A fan with a sound power level of not more than 40 dBA is used.

5. DEVICE AND PRINCIPLE OF OPERATION

5.1. The recirculation unit is a closed-type irradiator where UV germicidal flux from the non-ozone forming UV lamps is distributed in a small confined space. Air disinfection in this process is carried out during its pumping by a fan through an area with ultraviolet radiation sources.

5.2. The irradiation zone is made using materials with high reflective properties to ensure effective germicidal treatment of the air flow (75% UV reflectivity aluminum).

5.3. The recirculation unit consists of:

- Body that can be fastened using a suspension system (lugs) on a vertical surface (wall) or recirculation unit moving stand with wheel supports.
- Lighting equipment (30 W UV germicidal lamps in amounts of two pieces, a fan with air flow output power of 90 m3/hour and sound power level of not more than 40 dBA, start-up control equipment, control unit).

5.4. Start-up control equipment is made according to the scheme with ECG.

5.5. The recirculation unit is connected to the mains using a three-wire cable. One of cable wires is grounding.

5.6. There is a power switch on the side wall of the recirculation unit body.

5.7. The recirculation unit front panel comprises a multifunctional button box containing:

5.7.1. Two-color indicator located in the middle of the button box showing the total operating time of germicidal lamps (**green color** - lamp service life is not over; **red color** - lamp service life is over).

5.7.2. Button No. **1** - "**Permanent operation in the presence of people**"- is intended for continuous air disinfection in the presence of people.

5.7.3. Button No. **2** - "**Category I up to 30 m3**", Button No. **3** - "**Category I from 31 to 75 m3**", Button No. **4** - "**Category II-V up to 30 m3**", Button No. **5** - "**Category II-V from 30 to 75 m3**" are intended to set the recirculation unit operating time depending on the volume and category of the processed room during preparation for its operation.

5.7.4. Button No. **6** - "**Program start/reset**" is intended to start the recirculation unit operation program. Press this button after turning on the button power switch or to reset the recirculation unit operating modes. Button No. **6** supports the presence sensor control function (for RB-06-"Ya-FP"-02 only, see "Presence sensor").

5.8. The Ferroplast UV Air Disinfection Unit 2L front panel comprises:

Digital display intended to show the current time/operating time of germicidal lamps. After switching on the power switch, the current time is displayed (readings require correction after each deenergization). When activating any of the above programs, the current time changes to the operating time of germicidal lamps. The operating time is calculated in hours without minutes and is not reset when power is turned off. Press Button No. **6** to return to the current time display.

"**Hours**" and "**Minutes**" buttons intended to correct (set) the current time on the display. The correction must be carried out when power supply is on and the recirculation unit is off.

6. PREPARATION FOR OPERATION

6.1. Remove the recirculation unit from the shipping container and release from polyethylene. Wipe the preserved surfaces with a gauze swab moistened with alcohol or gasoline (ample wetting is not recommended).

6.2. Check recirculation unit completeness.

6.3. After recirculation unit transportation under conditions of negative temperatures, it is kept indoors at room temperature for 24 hours before being plugged into the mains.

7. OPERATING PROCEDURE

7.1. The recirculation unit must be placed in the room in such a way that the air intake and discharge occur freely and coincide with the main air flow directions.

7.2. Place the recirculation unit in the specified location.

7.3. **Recirculation unit operation in the mode of room preparation for operation**:

7.3.1. Plug the power cable to the 220 V outlet. Turn the power switch to the "**ON**" position.

7.3.2. Set the current time on the display using the "**Hours**" and "**Minutes**" buttons.

7.3.3. Press Button No. **6** "**Program start/reset**".

7.3.4. Recirculation unit operating time is set depending on the category and volume of the room to be processed. The time to be spent on the processing of premises of different volumes during their preparation for operation is shown in Table No. 3.

Table No. 3

Name of the recirculation unit	Advisable volume of the premises m3	Processing time (min) at efficiency (*)		
		99,9 % 1 category	99.0 % Category 2 95.0 % Category 3	95,0 % Category 3,4,5
Ferroplast UV Air Disinfection Unit 2L	up to 30	30	20	20
	from 31 to 75	60	45	45

* Germicidal efficiency is calculated for S. aureus.

10.3.5. Button No. **2** - "**Category I up to 30 m3**", Button No. **3** - "**Category I from 31 to 75 m3**", Button No. **4** - "**Category II-V up to 30 m3**", Button No. **5** - "**Category II-V from 30 to 75 m3**" switch on the recirculation unit operating time depending on the volume and category of the room to be processed.

10.4. **Recirculation unit operation in the presence of people**:

10.4.1. Plug the power cable to the 220 V outlet. Turn the power switch to the "**ON**" position.

10.4.2. Set the current time on the display using the "**Hours**" and "**Minutes**" buttons.

10.4.3. Press Button No. **6** "**Program start/reset**"

10.4.4. Press Button No. **1** "**Permanent operation in the presence of people**". The recirculation unit is intended for room air disinfection in the presence of people in continuous mode (up to 8 and more hours of continuous operation).

10.4.5. Press Button No. **6** to finish operation.

10.4.6. If there is no need to display the current time, turn the power switch to the "**OFF**" position to switch off the recirculation unit. The current time is not stored.

10.5. After 7 days of operation, the recirculation unit must be treated in accordance with Paragraph 8.4.

10.6. In the presence of people, the recirculation unit is rated for 8-hour or longer continuous operation.

10.7. The air microbial contamination level is reduced in rooms with a volume up to 75 m3.

10.8. If it is necessary to process rooms larger than 75 m3, the number of recirculation units must be increased at the rate of 1 recirculation unit for 75 m3.

11. MAINTENANCE

11.1. Carry out timely maintenance in order to ensure reliable operation of the recirculation unit. Use this Manual for maintenance.

11.2. Check conditions.

11.2.1. Technical specifications are checked at nominal supply voltage and normal conditions accepted as:

Supply voltage is 230 V±10%, ambient temperature is 25±10°C, relative humidity is 65±15%, atmospheric pressure is 84 – 106,7 kPa, 630-800 mm Hg.

11.2.2. Before checking the recirculation unit, it is necessary to: carry out an external inspection, examine technical documentation for the recirculation unit and devices used to check it.

11.3. Checking.

11.3.1. Check the following during external inspection:

- Any mechanical damage affecting performance
- Availability and fastening security of controls and switching devices, accuracy of their position lock as well as power cord and plug condition
- Any joined or poorly fixed circuit elements
- When using the stand-mounted recirculation unit, make sure that fasteners are secure (no cracks on the parts, hooking method) and stable (no clearance between connecting elements of the moving stand, wheel support are functional).

11.3.2. When opening the recirculation unit and performing preventive maintenance, keep in mind security measures listed in Section 6.

11.3.3. Before checking technical specifications, test recirculation unit efficiency.

11.4. The list of the main technical condition checks is given in Table No. 4.

Table No. 4

Types of maintenance	Monthly periodic maintenance	Periodic maintenance Every 6 months
Responsible person	Specialists involved in recirculation unit operation	Specialists involved in recirculation unit operation
Scope of works, methods and means of maintenance	Functional test	Checking the condition and strength of power cord sealing by means of external examination by its accurate wiggling and twisting near the seal without special tools and equipment. External inspection of recirculation unit fasteners securing it to the wall or moving stand for mechanical damage. Check the moving stand when it is used with the recirculation unit.
Technical requirements	Recirculation unit operation in accordance with Section 9 "Operating procedure"	The cord surface must be free from breaks through which conducting cores are seen. Cord sealing must be durable and eliminate movement into the sealing hole. Mains plug pins must not be bent Recirculation unit mounting systems must be free from mechanical damages and cracks. The moving stand must have no clearance of mating parts at the fastened joints. Wheel supports must rotate without biting and excessive force.

11.4.1 All measuring instruments used in tests must be certified.

11.5. If the recirculation unit or its components fail to meet technical data specified in Section 3, further operation of the recirculation unit is not allowed and it must be repaired or replaced.

11.6. The lamp must be replaced after 9,000 hours of lighting.

12. CURRENT REPAIRS

12.1. General.

12.1.1. Current repairs are carried out by specialists of repair companies.

12.1.2. When repairing, observe safety measures specified in Section 6 of this Manual.

12.2. Current repair procedure

12.2.1. Current repairs include the following steps:

- Trouble detection
- Troubleshooting

- Checking equipment performance after repair.

12.3. Trouble detection

12.3.1. Trouble detection is carried out in accordance with Section 11 of this Operation Manual.

12.4. Current repairs during the warranty period are carried out by the manufacturer specialists.

12.5. After performing current repairs, check the technical condition.

12.6. If the power cord is damaged, it should be replaced with a special cord or kit obtained from the manufacturer or customer service.

13. TROUBLESHOOTING

13.1. A list of the most common or potential troubles, probable causes and methods of their elimination are given in Table No. 5.

Table No. 5

Name of faults, external manifestation and additional signs	Probable causes	Methods of elimination
Lamp fails to illuminate. There is a message on the display.	Lamp is faulty	Replace lamp
	ECG (electronic ballast) is faulty	Replace ECG (electronic ballast)
	Fuse is faulty	Replace fuse
Fan fails to operate. There is the "FAN DISABLED" message on the display.	Fan is faulty. Poor contact of fan connector.	Replace fan. Check connector.
Presence sensor fails to operate	Low sensitivity is set. Control board malfunction.	Perform setup according to Section 6. Replace control board
Recirculation unit is not securely mounted on the wall	Damaged suspension systems	Repair suspension systems.
Recirculation unit is unsteadily located on moving stand	Damaged suspension systems Loose fasteners (bolts and nuts)	Repair suspension systems. Tighten fasteners until clearances between components are eliminated.