

UVR-M, UVR-Mi UV Cleaner-Recirculator



If you have any feedback on our products or services, we would like to hear from you.
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1. About this edition of user instructions

1.1 The current edition of the user instructions applies to the following models:

Model	Version
UVR-M , UV Cleaner-Recirculator	V.4AA, V.4AB, V.4AC, V.4A3
UVR-Mi , UV Cleaner-Recirculator	V.3AA, V.3AB, V.3A3

2. Safety precautions



Caution! Make sure you have fully read and understood the present instructions before using the equipment. Please pay special attention to sections marked by this symbol.



Caution! Do not switch on the unit with the cover removed or without filters! UV lamp must be covered at all times during operation. Otherwise, UV lamp can expose the operator and other people to dangerous levels of UV light.

2.1 General safety

- The unit is designed only for decontamination.
- The protection provided can be ineffective if the operation of the appliance does not comply with the manufacturer's requirements.
- Save the unit from shocks and falling.
- Store and transport the unit as described in section **9. Storage and transportation** on page 10.
- Before using any cleaning or decontamination methods except those recommended by the manufacturer, check with the manufacturer that the proposed method will not damage the equipment.
- Do not make modifications in design of the unit.
- The unit is not moisture resistant.

2.2 Electrical safety

- Connect only to the mains with voltage corresponding to that on the serial number label.
- Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
- Ensure that the power plug is easily accessible during use.
- Disconnect the unit from the mains before moving.
- If liquid penetrates into the unit, disconnect it from the mains and have it checked by a repair and maintenance technician.
- Do not operate the unit in premises where condensation can form. Operating conditions of the unit are defined in section 6. **Specifications** on page 8.

2.3 During operation

- Do not operate the unit in environments with aggressive or explosive chemical mixtures. Please contact manufacturer for possible operation of the unit in specific atmospheres.
- Do not operate the unit if it is faulty or has been installed incorrectly.
- Do not use outside laboratory rooms.

2.4 Biological safety

- The user is responsible to carry out appropriate decontamination if hazardous material spills on or penetrates into the equipment.

3. General information

UV DNA/RNA cleaner-recirculators **UVR-M** & **UVR-Mi** are compact airflow exchange chambers with built-in UV lamp and a fan unit equipped with dust filters and a control unit. UV DNA/RNA recirculators provide active constant airflow in close vicinity to UV lamp, ensuring maximum efficiency of disinfection, as shown in figure 1. Low ozone 25 W G13 lamps with 9000-hour lifetime are used, one in the **UVR-M** model and two in the **UVR-Mi** model.

The **UVR-Mi** model provides the scheduling option for switching on and off and the estimation of lamp overall operating time and condition.

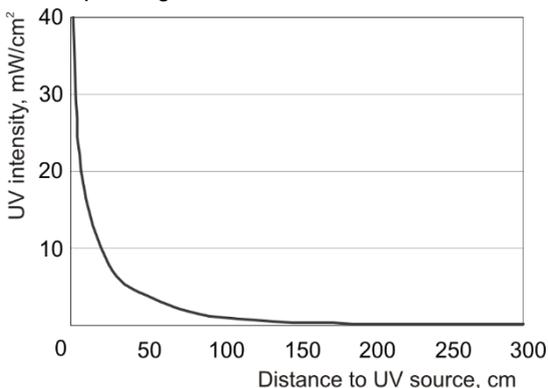


Figure 1. Dependence of UV radiation intensity from distance to UV source (25 W lamp, 254 nm)

UV radiation affects viability of microorganisms by causing photochemical reactions in the structure of DNA and RNA. Adjacent pyrimidine molecules form dimers and block the reproduction of microorganisms, as a result, causing their death. The diagram on figure 2 shows the process of formation of pyrimidine dimers, using thymine as an example.

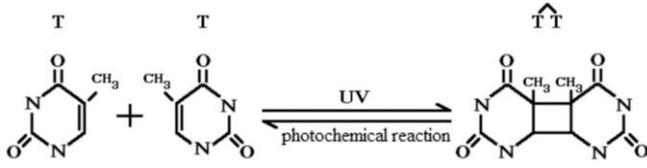


Figure 2. Photochemical reaction, the formation of pyrimidine dimers, thymine taken as an example
(source <http://www.photobiology.info>)

4. Getting started

4.1 **Unpacking.** Remove packing materials carefully and retain them for future shipment or storage of the unit. Examine the unit carefully for any damage incurred during transit. The warranty does not cover in-transit damage. Warranty covers only the units transported in the original package.

4.2 **Complete set.** Package contents:

4.2.1 Standard set:

- UVR-M / UVR-Mi, UV Cleaner-Recirculator 1 pce.
- Spare dust filters 2 pcs.
- Spare fuse 1 pce.
- Screw with dowel 1 pce.
- User instructions, declaration of conformity 1 copy

4.2.2 Optional accessories, on request:

- UVR-S movable support stand 1 set

4.3 **Setup.**

- Choose recirculator location so that the air intake and discharge operate unimpeded, providing the best air circulation in the room.



Caution! UV recirculator must be used only in clean rooms! Dust accumulation on the electrical parts of the device can cause a short circuit.

- Fix the unit on the wall with the screw and dowel, or on a UVR-S movable support stand (figure 3).
- Position the unit so that the access to the mains plug is unobstructed.

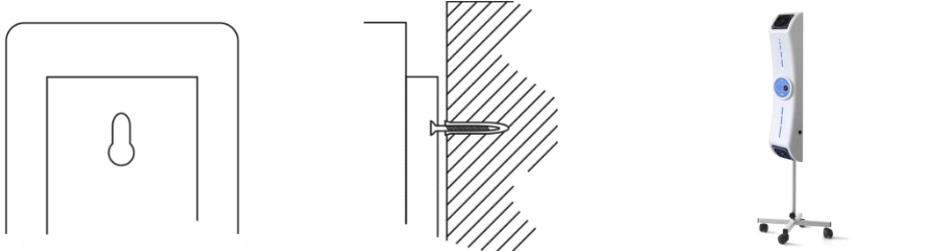


Figure 3. Unit attachment methods

4.4 **Effective air recirculation.** Table below lists room area and volume where air effectively recirculated by one unit.

Model	UVR-M	UVR-Mi
Room with active ventilation (working air conditioner or air hood)	10 square metres / 30 cubic metres	15 square metres / 45 cubic metres
Ordinary ventilated room	20 square metres / 60 cubic metres	30 square metres / 90 cubic metres



Note. For larger rooms, increase unit count or type accordingly.

5. Operation



Caution! Bactericidal lamp properties reduce by ~12% after 5000 hours of operation (data given by the manufacturer), so lamp replacement or air recirculation time extension by 12% is recommended in order to achieve the desired air cleaning result.



Figure 4. UVR-M overview

5.1 Working with model UVR-M.

- 5.1.1 Plug the power cord into a grounded mains socket. Switch on the power switch (fig. 4/1).
- 5.1.2 Unit starts the recirculator automatically. Lit indicator (fig. 4/2) shows that the UV lamp is working.
- 5.1.3 After finishing the operation, switch off the power switch and unplug the power cable from the mains.
- 5.1.4 **Lamp failure.** In case of UV lamp failure, unit terminates operation and does not resume until the lamp is replaced. Check the indicator (fig. 4/2) to see if the lamp is working. To replace the lamp, see **8.3**.

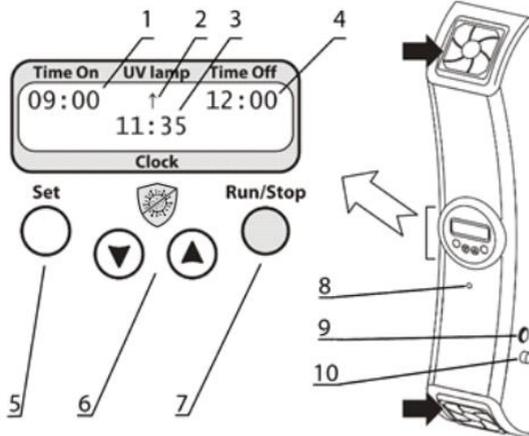


Figure 5. UVR-Mi control panel and overview

5.2 Working with model UVR-Mi.

5.2.1 Plug the power cord to a grounded mains socket. Switch on the power switch (fig. 5/9) on the side to the right.

5.2.2 The following parameters appear on the display:

- Air flow recirculation start time in the automatic mode - Time On (fig. 5/1);
- Air flow recirculation end time in the automatic mode - Time Off (fig. 5/4);
- UV-recirculator operating indicator - UV lamp (fig. 5/2);
- Real time clock (fig. 5/3).

5.2.3 **Parameter setting.** Hold the **Set** key (fig. 5/5) pressed for more than 6 seconds to activate parameter setting mode.

5.2.3.1 Change the currently flashing parameter using the ▼ and ▲ keys (fig. 5/6). Pressing the key down longer than 2 seconds makes the values change quicker.

5.2.3.2 Press **Set** key to switch to the next parameter.

5.2.3.3 If no key is pressed for more than 10 s, the changes will be saved.

5.2.4 The unit can operate in automatic or manual modes.

5.2.4.1 **Manual mode.** Press the **Run/Stop** key (fig. 5/7) to start or stop recirculation. While recirculator is working, symbol “↑” indication is shown on the display (fig. 5/2).



Note. Automatic mode time interval has priority over the manual mode.

5.2.4.2 **Automatic mode.** Set recirculation start (**Time On**, fig. 5/1) and end (**Time Off**, fig. 5/4) times, as described in 5.2.3. Unit saves the parameters after unplugging. On set start time, a powered unit starts recirculator, if it was not started already. On reaching the end time, unit turns off the recirculator.

5.2.5 Recirculation can be stopped at any time by pressing the **Run/Stop** key.

5.2.6 Press the **Set** key once to display total lamp runtime (fig. 6). Display reverts to timers after some time.



Caution! Holding the **Set** key pressed for more than 10 s in this screen resets the UV lamp runtime timer.



Figure 6. Lamp runtime

- 5.2.7 **End of lamp lifetime and lamp failure.** At the end of lamp lifetime (9000 h) or in case of UV lamp failure, unit terminates operation and does not resume until lamps are replaced. Display shows “END OF UV LAMP LIFETIME” or “ERROR UV LAMP FAILURE” messages, respectively. Additionally, check the indicator (fig. 5/8) to see if the lamps are working. To replace the lamps, see **8.3**.
- 5.2.8 After finishing the operation, switch off the power switch and unplug the power cable from the mains.

6. Specifications

The unit is designed for operation in cold rooms and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

Biosan is committed to a continuous programme of improvement and reserves the right to alter design and specifications of the equipment without additional notice.

Model	UVR-M	UVR-Mi
UV radiation source	Low ozone, bactericidal, TUV 25W G13 UV-C	
	1 lamp	2 lamps
Wavelength	253.7 nm	
Airflow speed	21 m ³ /h	29 m ³ /h
Protection from direct UV light	Full	
Lamp service life	9000 h	
Lamp operation indicator	Yes	
Display	No	LCD, 2x16 characters
Lamp service life counter	No	Yes
Lamp fault detection	No	Yes
Timer	No	1 min - 24 h / non-stop
Clock and on/off scheduler	No	Yes
Dimensions	130x110x660 mm	
Weight, accurate within ±10%	2.74 kg	2.38 kg
Nominal operating voltage, frequency	220 V~, 50/60 Hz / 120V~, 60 Hz	220 V~, 50/60 Hz
Power consumption	125 W (0.54 A) / 160 W (1.3 A)	110 W (0.5 A)

7. Ordering information

7.1 Models and versions available:

Model	Version	Description	Catalogue number
UVR-M	V.4AA	230 V, 50 Hz, EU plug (type E/F)	BS-040105-AAA
	V.4AB	230 V, 50 Hz, UK plug (type G)	
	V.4A3	230 V, 50 Hz, AUS plug (type I)	
	V.4AC	120 V, 60 Hz, US plug (type B)	
UVR-Mi	V.3AA	230 V, 50 Hz, EU plug (type E/F)	BS-040110-AAA
	V.3AB	230 V, 50 Hz, UK plug (type G)	
	V.3A3	230 V, 50 Hz, AUS plug (type I)	

7.2 To inquire about or order the optional accessories, contact Biosan or your local Biosan representative.

7.3 Optional accessories:

Optional accessory	Catalogue number
UVR-S movable support stand	BS-040105-AK

8. Care and maintenance

8.1 Service.

8.1.1 If the unit is disabled (e.g., lamp or fans not working, no reaction to key presses, etc) or requires maintenance, disconnect the unit from the mains and contact Biosan or your local Biosan representative.

8.1.2 All maintenance and repair operations (except listed below) must be performed only by qualified and specially trained personnel.

8.1.3 Operating integrity check. If the unit follow the procedure described in section 5. **Operation**, then no additional checks are required.

8.2 Cleaning and disinfection.

8.2.1 Use mild soap and water with a soft cloth or sponge for cleaning the exterior. Rinse remaining washing solution with distilled water. Wipe dry the excess water with clean, soft cloth or sponge.

8.2.2 Dust filter control/replacement. The dust filters on either end of the UV-recirculator should be checked monthly and cleaned or replaced when they become clogged. To check, replace or clean the filters, simply unclip the covers (fig. 4/➡ and 5/➡), if necessary, fit a new one; otherwise rinse in water, dry, and set up existing filters. Clip covers back in place.

8.2.3 To disinfect the exterior plastic parts, use 75% ethanol or DNA/RNA removing solution (e.g., Biosan **PDS-250**). After disinfecting it is necessary to wipe the surfaces dry.

8.2.4 Cleaning of the interior. Cleaning of the interior must be performed only by qualified and specially trained personnel. In order to ensure proper efficiency in the long run, it is recommended to clean the UV-recirculator once a month.

8.2.5 The unit and its accessories are not autoclavable.

- 8.3 **UV-lamp replacement.** Replacement must be performed only by qualified and specially trained personnel. UV lamp replacement is necessary after lamp stops functioning or at the end of manufacturer specified lifetime. Use the indicator in the centre of recirculator (fig. 4/2 or 5/8) to check UV lamps inside the recirculator. If the indicator is alight while the switch is ON, then the UV lamps are functioning. If it is not, replace the lamp, single lamp in case of **UVR-M**, both - in case of **UVR-Mi**.



Caution! Do not switch on the unit with the cover removed or without filters! UV lamp must be covered at all times during operation. Otherwise, UV lamp can expose the operator and other people to dangerous levels of UV light.

- 8.4 **Fuse replacement.** Disconnect the unit from the mains and unscrew the fuse holder cap (fig. 4/3 or 5/10). Check the fuse and replace, if necessary, with a correct one:

Model, version	Voltage	Fuse
UVR-M: V.4AA, V.4AB, V.4A3	220 V	M 1 A
UVR-M: V.4AC	120 V	M 1.6 A
UVR-Mi: V.3AA, V.3AB, V.3A3	220 V	M 2 A

Fuse type M – time delay Medium.

- 8.5 **Decommissioning of the unit.** The user is responsible for the decontamination of the unit before decommissioning. Dispose of the appliance as electronic equipment in accordance with the relevant national laws.

9. Storage and transportation

- 9.1 Store and transport the unit at ambient temperatures between -20°C and +60°C and maximum relative humidity of 80%.
- 9.2 After transportation or storage and before connecting it to the electric circuit, keep the unit under room temperature for 2-3 hrs.
- 9.3 For extended storage, the unit does not require special procedures.

10. Warranty

- 10.1 The Manufacturer guarantees the compliance of the unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.
- 10.2 The warranted service life of the unit from the date of its delivery to the Customer is 24 months. For extended warranty, see **10.5**.
- 10.3 Warranty covers only the units transported in the original package.
- 10.4 If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment report shall be compiled, certified and sent to the local distributor address. To obtain the claim form, visit **Technical support** page on our website at link below.

- 10.5 Extended warranty.
- For **UVR-Mi**, the *Premium* class model, one year of extended warranty is available free of charge after registration, during 6 months from the date of sale. Online registration form can be found in section **Warranty registration** on our website at the link below.
 - For **UVR-M**, the *Basic Plus* class model, extended warranty is a paid service. Contact your local Biosan representative or our service department through the **Technical support** section on our website at the link below.
- 10.6 Description of the classes of our products is available in the **Product class description** section on our website at the link below.

Technical support



biosan.lv/en/support

Registration



biosan.lv/register-en

Product class description



biosan.lv/classes-en

- 10.7 The following information will be required in the event that warranty or post-warranty service comes necessary. Complete the table below and retain for your records.

Model	Serial number	Date of sale
UVR-M / UVR-Mi, UV Cleaner-Recirculator		

- 10.8 **Production date.** Production date is placed in the serial number, on the label of the unit. Serial number consists of 14 digits styled XXXXXXYYMMZZZZ, where XXXXXX is model code, YY and MM – year and month of production, ZZZZ – unit number.

11. EU Declaration of conformity

- 11.1 UV Cleaner-Recirculators **UVR-M** and **UVR-Mi** are in conformity with the following relevant Union legislations:

LVD 2014/35/EU	LVS EN 61010-1:2011 Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements.
EMC 2014/30/EU	LVS EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements.
RoHS3 2015/863/EU	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
WEEE 2012/19/EU	Directive on waste electrical and electronic equipment.

- 11.2 Declaration of Conformity is available for download on the page for the relevant model on our website, in the **Downloads** section:

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