

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.4AA, V.4AB, V.4A3

1.2 Edition 4.02 – April of 2023.

2. Safety precautions

2.1 Symbols used in these instructions:



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



Caution! The UV cleaner-recirculator contains a powerful source of UV radiation. Do not switch on the unit with the cover removed or without filters! UV lamp must be covered at all times during operation.

2.2 Icons used on the unit and packaging:

	CE marking, manufacturer affirms conformity with European health, safety, and environmental protection standards, see 12.1
	WEEE directive marking, see 12.1
	Polarity of the power connector
	Equipment uses direct current

2.3 General safety precautions

- 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 **Storage and transportation**.
- Use only original parts and accessories, provided by manufacturer for this product.
- 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.

2.4 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 **Specifications**.

2.5 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.

2.6 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.

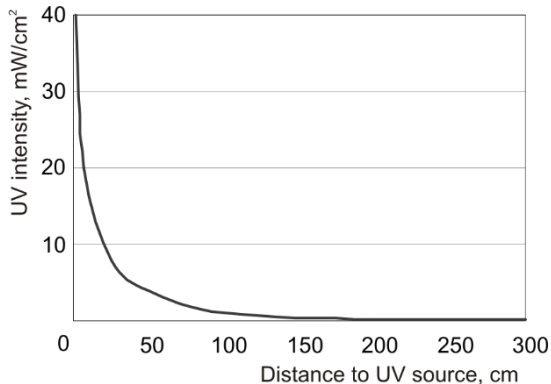


Figure 1. Dependence of UV radiation intensity from distance to UV source (25 W lamp, 254 nm)

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.

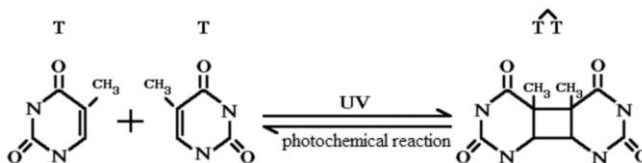


Figure 2. Photochemical reaction, the formation of pyrimidine dimers, thymine taken as an example
(source <http://www.photobiology.info>)

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

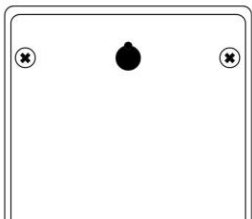
4.3 **Setup.**

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

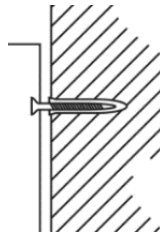


Caution! UV recirculator must be used only in clean rooms! Dust accumulation on the electrical parts of the device can cause a short circuit.

- 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.



Attachment point



Screw and dowel



Attachment on UVR-S stand

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.

5.1 Working with model UVR-M.



Figure 4. UVR-M overview

- 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**.

5.2 Working with model UVR-Mi.

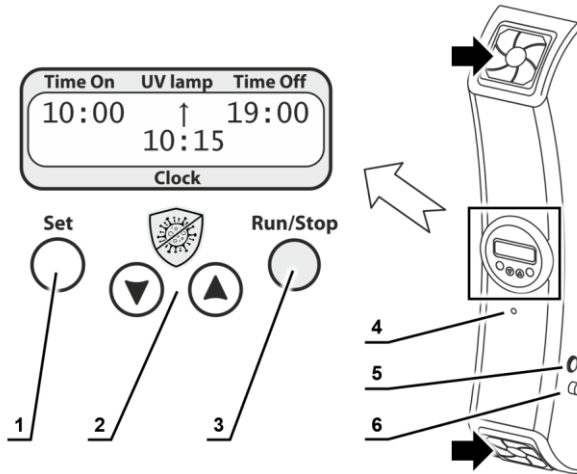


Figure 5. UVR-Mi control panel and front view

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



Note. UVR-Mi stores the settings when unpowered. Unit continues recirculation after power loss and restoration.

5.2.2 To start or stop the recirculation manually at any time, press the **Run/Stop** key (fig. 5/3). The ↑ icon appears in the middle of the top line, and the indicator below the control panel lights up (fig. 5/4).

5.2.3 **Parameter setting.** To set up the parameters, press and hold the **Set** key (fig. 5/1) for 8 seconds. You will be prompted to choose between the three modes (figure 6).

- **Auto mode.** Recirculator has a starting and ending time in this mode. Powered, switched on and idle unit automatically starts recirculation, continues and ends recirculation, on schedule, on a daily basis.
 - **Timer mode.** Recirculator has a timer in this mode. Switched on and idle unit can be started with one press of the **Run/Stop** key (fig. 5/3), and automatically ends recirculation when the timer expires.
 - **Manual mode.** Recirculator in this mode is controlled manually by the **Run/Stop** key.
- 5.2.4 Choose the mode using the ▼ and ▲ keys (fig. 5/2), then press **Set** to accept. Display switches to parameter setting, which is unique to each mode, see below.

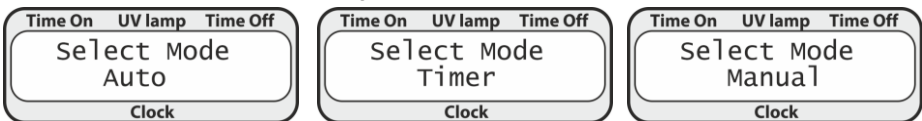


Figure 6. Choosing the mode.

5.2.5 While parameter setting is active, following actions are available:

- Press Set to cycle through parameters. Selected parameter is blinking.
- Press ▼ and ▲ keys to change the parameters. Hold the key to change faster.
- Press the **Run/Stop** key to apply changes and exit to default screen.



Note. All parameters are set in hours and minutes, 24-hour clock.

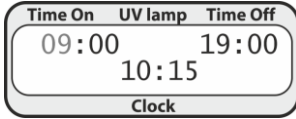


Figure 7. Auto mode setup

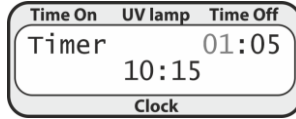


Figure 8. Timer mode setup

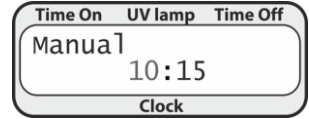


Figure 9. Manual mode setup

5.2.6 **Auto mode (figure 7, figure 10).** Select the mode (see 5.2.2-3). Setup the starting time (top line, left), ending time (top line, right) and current time (bottom line). Press **Run/Stop** to apply the changes (see 5.2.4).

- In Auto mode, recirculator follows the schedule, e.g. on figure 10, if started after 19:00, it will work until 19:00 next day; and if stopped after 9:00, it will remain idle until 9:00 next day.



Note. Auto mode does not require user input after setting up.

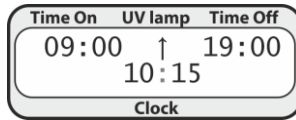


Figure 10. UVR-Mi in Auto mode, recirculator is on (↑ icon).

5.2.7 **Timer mode (figure 8, figure 11).** Select the mode (see 5.2.2-3). Setup the timer (top line) and current time (optional, bottom line). Press **Run/Stop** to apply the changes (see 5.2.4).

- In Timer mode, recirculator starts by pressing the **Run/Stop** key and operates until the timer expires. While the timer is running, press the ▲ key to switch between elapsed and remaining time (figure 11).



Note. Timer is displayed in hours and minutes for values above 1 hour, and in minutes and seconds – below 1 hour.

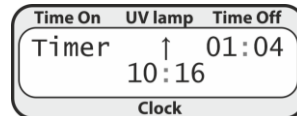
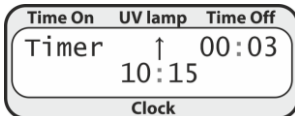


Figure 11. UVR-Mi in Timer mode.

Recirculator is running, with elapsed (left) and remaining (right) timers active.

5.2.8 **Manual mode (figure 9, figure 12).** Select the mode (see 5.2.2-3). Optionally, setup the current time. Press **Run/Stop** to apply the changes (see 5.2.4).

- In Manual mode, recirculator is controlled by pressing the **Run/Stop** key, see fig. 12.

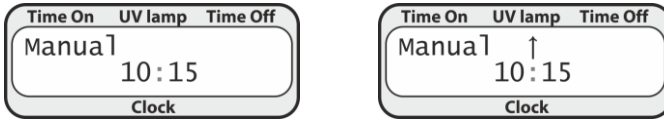


Figure 12. UVR-Mi in Manual mode.
Recirculator is idle (left) or running (right, ↑ icon).

5.2.9 **UV lamp run time.** In default screen, press the ▼ key once to display the run time of the UV lamp (fig. 13). Display reverts back to default after 5 s or any key press.



Caution! Holding the ▼ key pressed for more than 5 s from the default screen resets the UV lamp runtime timer (fig. 14). This action is reserved for service engineers and maintenance.

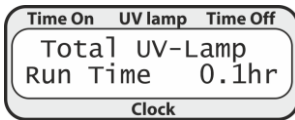


Figure 13. UV lamp run time

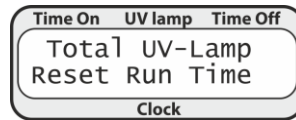


Figure 14. Reset run time

5.2.10 **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 relevant error messages. To replace the lamps, see 8.3.

5.2.11 After finishing the operation, switch off the power switch and unplug the power cable from the mains.

6. Specifications

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

6.2 Recirculation specifications

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	

6.3 General specifications

Model	UVR-M	UVR-Mi
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 $\pm 10\%$	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)

6.4 Workroom requirements

Workroom description	Cold rooms and closed laboratory rooms
Temperature range	+4 °C ... +40 °C
Humidity requirements	Maximum of 80% RH at 31 °C, decreasing linearly to 50% RH at 40 °C. Non-condensing atmosphere.
Operating height, maximum	2000 m ASL

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.4AA	230 V, 50 Hz, EU plug (type E/F)	BS-040110-AAA
	V.4AB	230 V, 50 Hz, UK plug (type G)	
	V.4A3	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 **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.4AA, V.4AB, V.4A3	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:



[UVR-M](#)



[UVR-Mi](#)

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