

MR-1 & MR-12 Rocker-shaker



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1. About this edition of the operating manual

The current edition of the user instructions applies to the following models and versions of rocker-shakers:

- MR-1 V.3AW
- MR-12 V.3AW

2. Safety precautions



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

GENERAL SAFETY

- 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.
- After transportation or storage and before connecting it to the electric circuit, keep the unit under room temperature for 2-3 hrs.
- Store and transport the unit in a horizontal position (see package label) at ambient temperatures between -20°C and +60°C and maximum relative humidity of 80%.
- 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.

ELECTRICAL SAFETY

- Connect only to external power supply with voltage corresponding to that on the serial number label.
- Ensure that the external power supply and plug are easily accessible during use.
- Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
- 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 the **Specifications** section.

DURING OPERATION

- Do not impede the platform motion.
- Do not place objects between the platform and the unit.
- 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 use outside the laboratory rooms.
- Do not operate the unit if it is faulty or has been repaired incorrectly.
- Do not place a load exceeding the maximum load value mentioned in the **Specifications** section of this manual.

BIOLOGICAL SAFETY

- It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on or penetrates into the equipment.

3. General information

MR-1 and MR-12 Rocker-shaker is designed for mixing solutions or growth media in vessels or single use plastic bags (MR-12) on the platform of the unit. Platform is equipped with a non-slip heat resistant silicone mat that provides vessel stability while rocking. Additional dimpled mat PDM provides fixation of tubes of different diameter (MR-1).

The device can be used for washing gels after electrophoresis, for performing Southern, northern and western blotting, for biomolecule hybridization on strips and for staining and washing of strips and slides.

Model MR-1 is a compact and noiseless unit for individual use. Maximum load on the platform is 1 kg. Direct drive mechanism and brushless motor provide non-stop operation for up to 7 days and over 2 years of trouble-free operation are guaranteed.

Model MR-12 provides option of both soft and intensive shaking. Maximum load on the platform is 5 kg. When placed in a bioincubator, the rocker-shaker is ideal for growing cell cultures in single use bioreactor bags (working volume up to 5 L)

MR-1 / MR-12 Rocker-shaker provides:

- Soft rocking of the platform with a constant (MR-1) or adjustable (MR-12) amplitude;
- Smooth regulation of the rocking speed;
- Indication and setting of the operating time;
- Automatic stop of platform movement after the set time expires;
- Interruption of the operation at any moment;
- The display of the current operation time;
- Automatic platform overload recognition with sound signal (MR-12).

Temperature range of operation of the rocker-shaker from +4°C to +40°C allows using it both in cold rooms and in incubators.

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. MR-1

- Mini-rocker-shaker **MR-1** 1 pce.
- Detachable platform Bio PP-4S with silicone mat 1 pce.
- External power supply 1 pce.
- Operating manual, certificate 1 copy
- PDM Dimpled mat on request

4.2.2. MR-12

- Rocker-shaker **MR-12** 1 pce.
- Detachable platform PP-480 with silicone mat 1 pce.
- 4 screws and a hex key 1 set
- External power supply 1 pce.
- Power cable 1 pce.
- Operating manual, certificate 1 copy



Bio PP-4S
with silicone mat



Bio PP-4S
with dimpled mat PDM



PP-480
with silicone mat

4.3. **Setup:**

- Place the unit upon firm stable even horizontal surface;
- Remove protective film from the display;
- Connect the power cord to the external power supply;
- Plug the external power supply into the 12 V socket at the rear side of the unit.

4.4. **Platform setup.**

4.4.1. Model **MR-1**. Install the platform on the moving base by fitting the pins on the platform with openings on the base.

4.4.2. Model **MR-12**. Install the platform on the unit and remove the silicone pad. Secure the platform on the supporting platform on top of the unit with the four supplied screws. Cover the platform with the silicone mat.

5. Operation

5.1. Working with the model MR-1.

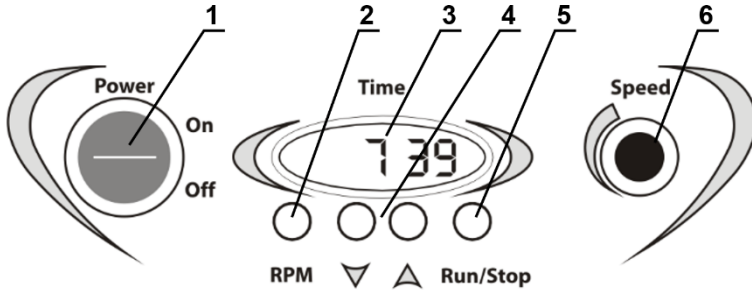



Figure 1. MR-1, control panel

- 5.1.1. Connect the external power supply to a grounded mains outlet. Switch **on** the **Power** switch (fig. 1/1). Display powers up (fig. 1/3)
- 5.1.2. Place the samples on the platform, balancing the load equally in relation to the axle.
 **Caution!** It is forbidden to place any items between platform and body of the unit.
- 5.1.3. **Setting time.** Using ▲ and ▼ keys (fig. 1/4), set the necessary time interval in hours and minutes (step 1 minute), as shown on the display (fig. 1/3). If a key is held down for long time, values change faster.
- 5.1.4. **Setting speed.** Using the **Speed** knob (fig. 1/6), set the necessary shaking speed. When turning the knob or pressing the **RPM** key (fig. 1/2), the display (fig. 1/3) shows speed in rockings per minute (RPM).
- 5.1.5. Press the **Run/Stop** key (fig. 1/5). Platform begins movement and timer starts counting elapsed time, for values below 1 hour- in minutes and seconds (mm:ss), above 1 hour – in minutes (hh:mm). Speed can be changed during operation.
- 5.1.6. If the time interval is set to 0:00, then pressing the **Run/Stop** key puts the unit in continuous operation mode, until the **Run/Stop** key is pressed again.
- 5.1.7. Platform stops after the set time interval elapses.
- 5.1.8. The operation can be stopped at any time before time interval elapses by pressing the **Run/Stop** key. The platform reaches horizontal position and stops. Display shows elapsed time for 20 seconds, then changes back to set time interval.
- 5.1.9. To repeat the operation with the same time interval, press the **Run/Stop** key.
- 5.1.10. To reset the time interval, press and hold the **Run/Stop** key for more than 3 seconds.
- 5.1.11. After finishing the operation, switch **off** the **Power** switch and disconnect the external power supply from the mains outlet.

5.2. Working with the model **MR-12**

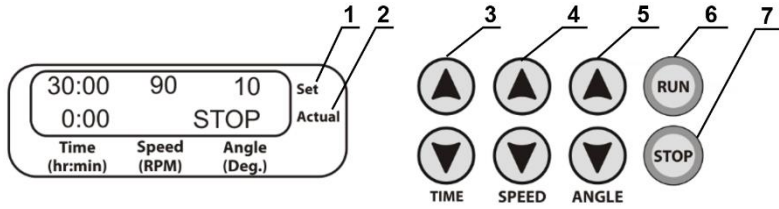


Figure 2. MR-12, control panel

- 5.2.1. Connect the external power supply to a grounded mains outlet.
- 5.2.2. Place the samples on the platform, balancing the load equally in relation to the axle.
- ⚠ **Caution!** It is forbidden to place any items between platform and body of the unit.
- 5.2.3. Display shows previously set time, speed and angle in the upper **Set** line (fig. 2/1), and elapsed time and mode indication in the lower **Actual** line (fig. 2/2).
- 5.2.4. **Setting time.** Using ▲ and ▼ **TIME** keys (fig. 2/3), set the necessary time interval in hours and minutes (step 1 minute).
- 5.2.5. **Setting speed.** Using ▲ and ▼ **SPEED** keys (fig. 2/4), set the necessary mixing speed in rockings per minute (step 1 RPM).
- 5.2.6. **Setting angle.** Using ▲ and ▼ **ANGLE** keys (fig. 2/5), set the necessary angle in degrees (step 1°).
- ⚠ **Note.** If a key is held down for long time, values change faster.
- 5.2.7. Press the **RUN** key (fig. 2/6). Platform begins movement and timer starts counting elapsed time. Speed and angle can be changed during operation (but not time).
- 5.2.8. If the time interval is set to 0:00, then pressing the **RUN** key puts the unit in continuous operation mode, until the **STOP** key (fig. 2/7) is pressed.
- 5.2.9. Platform stops after the set time interval elapses. Display shows indication STOP and the unit sounds a repeating signal. Press the **STOP** key to stop the signal.
- 5.2.10. The operation can be stopped at any time before time interval elapses by pressing the **STOP** key. The platform reaches horizontal position and stops.
- 5.2.11. To repeat the operation with the same time interval, press the **RUN** key.
- 5.2.12. To reset the time interval, press and hold the **STOP** key for more than 3 seconds.
- 5.2.13. If the platform is overloaded, the device will make three attempts to restart the operation (display indication: DRIVER ERROR). If attempts fail, flashing OVERLOAD indication shows on the display, accompanied by a repeating sound signal, until the **STOP** key (fig. 2/7) is pressed. Eliminate causes of overload before restarting operation.
- 5.2.14. After finishing the operation, disconnect the external power supply from the mains outlet.

6. Specifications

The unit is designed for operation in cold rooms, incubators (excluding CO₂ incubators) 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 program of improvement and re-serves the right to alter design and specifications of the equipment without additional notice.

	MR-1	MR-12
Mixing frequency range	5–30 RPM	1–99 RPM
Mixing frequency setting step	1 RPM	
Tilt angle	Fixed 7°	1–10° (at 1–50 RPM)
		Fixed 10° (>50 RPM)
Motor	Brushless	
Drive	Direct	Synced belted
Digital time setting	1 min. - 23 h 59 min. / non-stop	1 min. - 99 h 59 min. / non-stop
Digital time setting step	1 min.	
Maximum continuous operation time	168 h	
Maximum load	1 kg	5 kg
Platform working area	200×200 mm	480×380 mm
Dimensions	220×205×120 mm	430×480×210 mm
Working current / power consumption	12 V, 320 mA / 3.8 W	12 V, 1.1 A / 13 W
External power supply	in AC 100-240 V, 50/60 Hz, out DC 12 V	
Weight ¹	2.1 kg	11.9 kg

7. Ordering information

7.1. Models and versions available:

Model	Version	Catalogue number
MR-1	V.3AW	BS-010152-AAG
MR-12	V.3AW	BS-010130-AAI

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

7.2.1. Optional accessories:

Description	Catalogue number
PDM for MR-1 , dimpled mat for securing differently sized tubes	PDM

7.3. Replacement parts:

Description	Catalogue number
PP-480 for MR-12 , detachable platform with heat-resistant non-slip silicon mat	BS-010130-AK
Bio PP-4S for MR-1 , detachable platform with heat-resistant non-slip silicon mat	BS-010125-AK

¹ Accurate within ± 10%

8. Maintenance

- 8.1. If the unit requires maintenance, disconnect it from the mains and contact Biosan or your local Biosan representative.
- 8.2. All maintenance and repair operations must be performed only by qualified and specially trained personnel.
- 8.3. Standard ethanol (75%) or other cleaning agents recommended for cleaning of laboratory equipment can be used for cleaning and decontamination of the unit.

9. Warranty

- 9.1. The Manufacturer guarantees the compliance of the unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.
- 9.2. The warranted service life of the unit from the date of delivery to the Customer is 24 months. For extended warranty, see **9.5**.
- 9.3. Warranty covers only the units transported in the original package.
- 9.4. 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 section **Technical support** on our website at link below.
- 9.5. Extended warranty.
 - For **MR-12**, a *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 **MR-1**, a *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.
- 9.6. 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

Warranty registration



biosan.lv/register-en

Product class description



biosan.lv/classes-en

- 9.7. 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
MR-1, MR-12 Rocker-shakers		

10. EU Declaration of conformity

EU Declaration of Conformity

Unit type Rockers, shakers, rotators, vortexes

Models **MR-1, MR-12;**
3D, Multi Bio 3D, PSU-10i, PSU-20i, MPS-1, PSU-2T;
Bio RS-24, Multi Bio RS-24, Multi RS-60;
V-1 plus, V-32, MSV-3500

Serial number 14 digits styled XXXXXXYYMMZZZZ, where XXXXXX is model code, YY and MM – year and month of production, ZZZZ – unit number.

Manufacturer SIA BIOSAN
Latvia, LV-1067, Riga, Ratsupites str. 7/2

The objects of the declaration described above is in conformity with the following relevant Union harmonization legislations:

LVD 2014/35/EU	LVS EN 61010-1:2011 Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements. LVS EN 61010-2-051:2015 Particular requirements for laboratory equipment for mixing and stirring.
EMC 2014/30/EU	LVS EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements.
RoHS2 2011/65/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.

I declare that the Declaration of Conformity is issued under sole responsibility of the manufacturer and belongs to the above-mentioned objects of the declaration.

Svetlana Bankovska

Signature

Managing director

Date

Edition 3.02 — July of 2020

how to choose

A PROPER SHAKER, ROCKER, VORTEX

bioSan

Medical-Biological
Research & Technologies

Sample volume
 $10^3 \dots 10^2$ ml

Erlenmeyer flask
and Cultivation flask



Sample volume
 10^1 ml

Petri dishes, vacutainers
and tubes up to 50 ml



Sample volume
 $10^0 \dots 10^{-3}$ ml

PCR plates, microtest plates
and Eppendorf type tubes



PSU-20i,
Orbital Shaker

ES-20/80,
Orbital Shaker-Incubator



Applications:

- Microbiology
- Extraction
- Cell cultivation



PSU-10i,
Orbital Shaker



ES-20,
Orbital
Shaker-Incubator

Applications:

- Agglutination
- Gel staining/destaining



MR-12,
Rocker-Shaker



Multi RS-60,
Programmable rotator

Bio RS-24,
Mini-Rotator



RTS-1 and RTS-1C,
Personal bioreactor



MR-1,
Mini Rocker-Shaker



Multi Bio 3D,
Mini Shaker

Applications:

- Agglutination
- Extraction
- Blot hybridisation
- Gel staining/destaining



Multi Bio RS-24,
Programmable rotator

Applications:

- Microbiology
- Extraction
- Cell cultivation
- Hematology



V-1 plus,
Vortex



MSV-3500,
Multi Speed Vortex

Applications:

- Nucleic acid Analysis
- Molecular Analysis
- Protein Analysis
- Genomic Analysis



PST-60HL-4,
Thermo-Shaker

PST-60HL,
Thermo-Shaker



PST-100HL,
Thermo-Shaker

TS-DW,
Thermo-Shaker
for deep well
plates



Applications:

- ELISA Analysis
- Genomic Analysis
- Hybridization
- Immunology



MPS-1,
Multi Plate Shaker



PSU-2T,
Mini-Shaker



CVP-2,
Centrifuge vortex for PCR plates

TS-100, TS-100C,
Thermo-Shakers



V-32,
Multi-Vortex

