

# MR-1 / MR-12 Rocker-shaker



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## 1. About this edition of the operating manual

The manual applies to following models and versions of rocker-shakers:

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

## 2. Safety precautions

The following symbols mean:



**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

- Use only as specified in the operating manual provided.
- Do not use the unit if dropped or damaged.
- 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%.
- After transport or storage in humid conditions and before connecting to the mains, keep the unit under room temperature for 2-3 hrs.
- 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 to the 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 / 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. Operation of model MR-1.

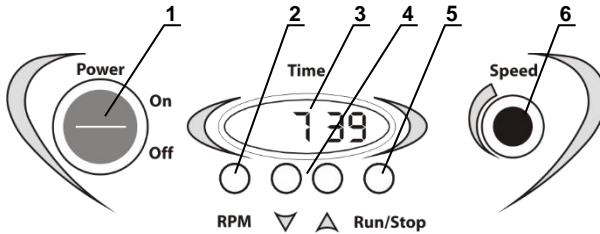

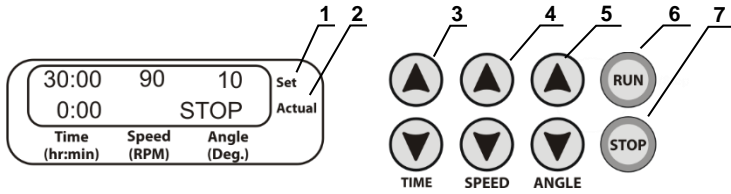


Figure 1. MR-1, control panel

- 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. Operation of 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 CO<sub>2</sub> 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.

	<b>MR-1</b>	<b>MR-12</b>
Mixing frequency range	5 – 30 RPM	1 - 99 RPM
Mixing frequency setting step	1 RPM	
Tilt angle	Fixed 7°	0° - 10°
1 - 50 RPM range		10°
50 - 99 RPM range		
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*	2.1 kg	11.9 kg

<b>Optional accessory</b>	<b>Description</b>	<b>Catalogue number</b>
<b>PDM for MR-1</b>	Dimpled mat to prevent different size tubes from rolling	PDM

<b>Replacement parts</b>	<b>Description</b>	<b>Catalogue number</b>
<b>PP-480 for MR-12</b>	Detachable platform with heat resistant non-slip silicon mat	BS-010130-AK
<b>Bio PP-4S for MR-1</b>	Detachable platform with heat resistant non-slip silicon mat	BS-010125-AK

\* Accurate within ± 10%.



## **7. Maintenance**

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

## 8. Warranty and claims. Registration

- 8.1. The Manufacturer guarantees the compliance of the unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.
- 8.2. The warranted service life of the unit from the date of delivery to the Customer is 24 months. For extended warranty, see **8.5**.
- 8.3. Warranty covers only the units transported in the original package.
- 8.4. 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.
- 8.5. 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.
- 8.6. 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](https://biosan.lv/en/support)

### Warranty registration



[biosan.lv/register-en](https://biosan.lv/register-en)

### Product class description



[biosan.lv/classes-en](https://biosan.lv/classes-en)

- 8.7. 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	MR-1 / MR-12, Rocker-shaker
Serial number	
Date of sale	

## 9. EU Declaration of conformity

# EU Declaration of Conformity

<b>Unit type</b>	Rockers, shakers, rotators, vortexes
<b>Models</b>	<b>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</b>
<b>Serial number</b>	14 digits styled XXXXXYYMMZZZZ, where XXXXXX is model code, YY and MM – year and month of production, ZZZZ – unit number.
<b>Manufacturer</b>	SIA BIOSAN Latvia, LV-1067, Riga, Ratsupites str. 7/2
<b>Applicable Directives</b>	EMC Directive 2014/30/EU LVD Directive 2014/35/EU RoHS2 2011/65/EU WEEE 2012/19/EU
<b>Applicable Standards</b>	<u>LVS EN 61326-1: 2013</u> Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements. <u>LVS EN 61010-1: 2011</u> Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements. <u>LVS EN 61010-2-051: 2015</u> Particular requirements for laboratory equipment for mixing and stirring.

We declare that this product conforms to the requirements of the above Directives

  
\_\_\_\_\_  
Signature

Svetlana Bankovska  
Managing director

19.07.2016.  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Signature

Aleksandr Shevchik  
Engineer of R&D

19.07.2016  
\_\_\_\_\_  
Date

# HOW TO CHOOSE

## A PROPER SHAKER, ROCKER, VORTEX

**bioSan**

Medical-Biological  
Research & Technologies

**Sample volume**  
**10<sup>3</sup> ... 10<sup>2</sup> ml**

Erlenmeyer flasks and  
Cultivation flasks



**Sample volume**  
**10<sup>1</sup> ml**

Petri dishes, vacutainers  
and tubes up to 50 ml



**Sample volume**  
**10<sup>0</sup> ... 10<sup>-3</sup> ml**

PCR plates, microtest plates  
and Eppendorf type tubes



PSU-20i, Orbital Shaker

ES-20/60, Orbital  
Shaker-Incubator



Applications:  
Microbiology  
Extraction  
Cell cultivation

PSU-10i,  
Orbital Shaker



ES-20, Orbital  
Shaker-Incubator



MR-12,  
Rocker-Shaker

Applications:  
Agglutination  
Gel staining/  
destaining



Multi RS-60,  
Programmable rotator

Bio RS-24,  
Mini-Rotator



**NEW**

RTS-1 and RTS-1C,  
Personal bioreactors



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



MPS-1,  
Multi Plate Shaker



PSU-2T,  
Mini-Shaker



CVP-2, Centrifuge  
vortex for PCR  
plates



V-32, Multi-Vortex



PST-100HL,  
Thermo-Shaker

TS-DW, Thermo-Shaker  
for deep well plates



**NEW**

Applications:  
ELISA Analysis  
Genomic Analysis  
Hybridization  
Immunology

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



**NEW**