

3D, Multi Bio 3D Mini-shakers



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
3D , sunflower mini-shaker	V.4AW
Multi Bio 3D , programmable mini-shaker	V.3AW

1.2 Edition 3.-4.01 – February of 2022

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.

2.1 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

2.2 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.
- Store and transport the unit as described in section **10. Storage and transportation** on page 13.
- 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.

2.3 Electrical safety

- Connect only to the mains with voltage corresponding to that on the serial number label.
- Use only the external power supply provided with this product.
- 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 the section **7. Specifications** on page 11.

2.4 During operation

- Do not impede the platform motion.
- Do not place a load exceeding the maximum load value mentioned in the section **7. Specifications** on page 11.
- 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.

2.5 Biological safety

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

3. General information

3D mini-shaker series are designed for a variety of applications: hybridization reactions, cell growth, gel staining and destaining, mixing blood samples, soft extraction and homogenization of biological components in solutions. Use of direct drive and brushless motor allows continuous mixing during up to 7 days (model 3D) and guarantees reliable operation for more than 2 years. They are compact devices with low energy consumption.

A versatile dimpled PDM mat for different size tubes can be placed on the platform, for additional stability and fixation.

Mini-Shaker provides adjustable three-dimensional smooth rotation of the platform (model 3D), whereas Multi Bio 3D provides three types of motion:

3D Orbital Shaking



Combination of 3D shaking and orbital shaking with adjustable speed from 1 to 100 rpm, with 7° pitch

3D Reciprocating Shaking



Combination of 3D shaking and reciprocating shaking with adjustable turning angle from 0 to 360° (increment 30°), with 7° pitch, with adjustable speed from 1 to 100 rpm

3D Vibro Shaking



Combination of 3D shaking and intensive vibrating shaking with adjustable turning angle from 0 to 5° (increment 1°), with 7° pitch

These 3 motions are consecutively combined into a cycle and can be used:

- separately
- in combinations by two
- all three in one cycle (see figure 1)

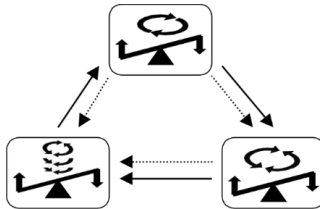


Figure 1. Innovative mixing cycle

3D Reciprocating and 3D Vibro motion types can be replaced with a pause. Each cycle can be repeated up to 125 times or run continuously.

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:

- **3D / Multi Bio 3D**, 3D mini-shakers 1 pce.
- Bio PP-4S platform with non-slip silicone mat 1 pce.
- External power supply 1 pce.
- Operating instructions, declaration of conformity 1 copy

4.2.2 Optional accessories:

- PDM optional dimpled maton request



**Non-slip silicone mat
on Bio PP-4S platform**



**Dimpled mat for tubes PDM on
Bio PP-4S platform**

4.3 **Setup.**

- Place the unit on horizontal even working surface.
- Remove the protective film from the display.
- Connect the external power supply unit into the socket at the rear side of the unit and position the unit for an easy access to the external power supply and the power switch.

4.4 **Platform installation.** Install the platform to the movable base by inserting the pins on the underside of the platform into the holes on the supporting platform on the movable base.

5. Operation

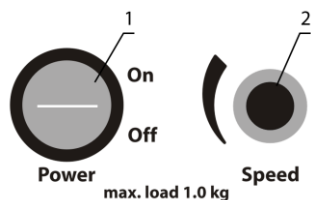


Figure 2. 3D, control panel

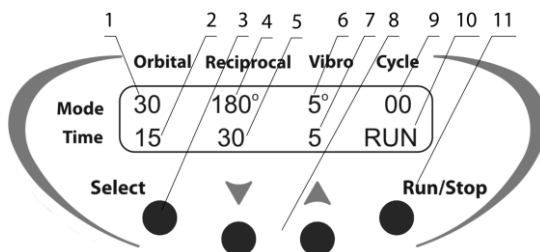


Figure 3. Multi Bio 3D, control panel

5.1 Working with model 3D.

- 5.1.1 Connect the external power supply to the electric circuit.
- 5.1.2 Place samples on the unit platform.
- 5.1.3 Switch on the **Power** switch (fig. 2/1).
- 5.1.4 Use the speed control knob (fig. 2/2) to adjust the shaking speed to the required setting.
- 5.1.5 After finishing the operation, set the shaking speed to a minimum by turning the regulator knob counter clockwise to the limit. Switch off the **Power** switch. Disconnect the external power supply from electric circuit.

5.2 Working with model Multi Bio 3D.

- 5.2.1 Connect the external power supply to the mains.
- 5.2.2 Place samples on the unit platform.
- 5.2.3 Set the required program and number of cycle repetitions (see section 6. **Program setting**).
- 5.2.4 Press the **Run/Stop** key (fig. 3/11) to start the program.
- 5.2.5 The platform motion begins, and the corresponding indications are shown on the display: operation mode - RUN (fig. 3/10), cycle countdown (fig. 3/9) and the time countdown of current cycle (fig. 3/2, 3/5 or 3/7).
- 5.2.6 The unit stops after performing the set number of cycles (flashing indication STOP on the display) and give a sound signal about the end of operation. Press the **Run/Stop** key to stop the signal.
- 5.2.7 Press the **Run/Stop** key again to repeat the pre-set program.
- 5.2.8 The unit can be stopped at any time during operation before the set number of cycles is performed, if necessary, by pressing the **Run/Stop** key. Pressing the **Run/Stop** key again will start the program from the beginning and cycle countdown will be re-started.
- 5.2.9 If the number of cycles is not set (i.e., cycle number indicator, fig. 3/9 shows zero), pressing the **Run/Stop** key starts continuous operation of the unit until the **Run/Stop** key is pressed again.
- 5.2.10 Unplug the external power supply from the mains to turn off the unit.

6. Program setting



Note. This section is applicable to the model **Multi Bio 3D**.

- 6.1 The program of the unit consists of cycles. Each cycle includes three different types of platform motion (3D orbital, 3D reciprocating and 3D vibro), set one after another with the duration from 0 to 250 seconds for 3D orbital and 3D reciprocal motion types and from 0 to 5 seconds for 3D vibro motion. The set cycle can be repeated from 1 to 125 times or non-stop.
- 6.2 Table 1 shows different possible cycle options.

Table 1. Possible combinations

Orbital	Reciprocal	Vibro
ON	ON	ON
ON	OFF	ON
ON	Pause	ON
ON	OFF	OFF
ON	Pause	OFF
ON	OFF	Pause
ON	Pause	Pause

Orbital	Reciprocal	Vibro
ON	ON	OFF
ON	ON	Pause
OFF	ON	ON
OFF	Pause	ON
OFF	ON	Pause
OFF	OFF	ON
OFF	ON	OFF

- 6.3 Press the **Select** key (fig. 3/3) to choose the parameter to change (the active parameter is blinking).
- 6.4 Use the **▼** and **▲** keys (fig. 3/8) to set the necessary value. Pressing the key down for more than 2 s will make the values change quickly.
- 6.5 The program can also be changed during operation: microprocessor automatically will enter the last changes into the working memory as the working program when the new cycle begins.
- 6.6 Set the speed (fig. 3/1), turning angle (fig. 3/4, fig. 3/6), time for each motion type (fig. 3/2, 3/5 and 3/7) and number of cycle repetitions (fig. 3/9).
- 6.7 If the time for a motion is set to zero, this type of motion will be skipped in the cycle.
- 6.8 You can set a pause instead of 3D reciprocal (0-250 s) or 3D vibro (0-5 s) motion. To set a pause, set the turning angle of 3D reciprocal or 3D vibro motion to zero and set the time for this motion, which will be the time of pause duration. During the operation, the platform will not move in this mode, but the time will be counted down.
- 6.9 Further examples illustrate program setting for four different cycles.
- 6.9.1 **3D orbital** (figure 4). Most popular kind of motion. Set the speed (**A**, 1–100 rpm) and time (**B**, 1–250 s) of 3D orbital motion. Turn off 3D reciprocal motion by setting time of 3D reciprocal motion to zero (**C**, OFF). Turn off 3D-Vibro type motion by setting time of 3D vibro motion to zero (**D**, OFF). Figure 5 shows 3D orbital motion run in cycles.

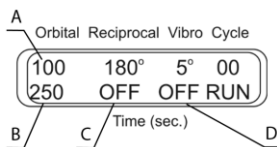


Figure 4

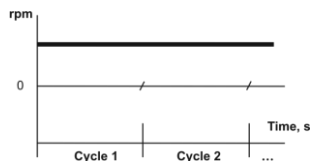


Figure 5

6.9.2 **3D orbital + 3D reciprocal + 3D vibro** (figure 6). Set the speed (A, 1–100 rpm) and time (B, 1–250 s) of 3D orbital motion. Set the angle (C, 0–360°) and time (D, 1–250 s) for 3D reciprocal motion. It is performed at the same speed as the orbital motion. Set the turning angle (E, 0–5°) and time (F, 1–5 s) for 3D vibro type motion. Figure 7 shows 3D orbital, 3D reciprocal and 3D vibro motions run one after another in cycles.

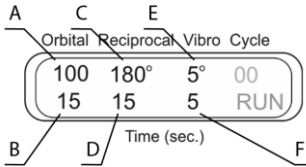


Figure 6

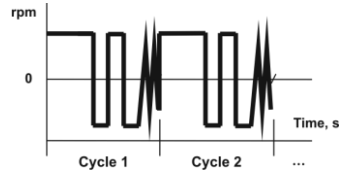


Figure 7

6.9.3 **3D orbital + 3D reciprocal + pause** (figure 8). Set the speed (A, 1–100 rpm) and time (B, 1–250 s) of 3D orbital motion. Set the turning angle (C, 0–360°) and time (D, 1–250 s) for 3D reciprocal motion. Set the angle of (E) 3D vibro type motion to zero. Set the time for 3D vibro motion (F, 1–5 s), this is the duration of the pause. Figure 9 shows 3D orbital and 3D reciprocal motions and pause run one after another in cycles.

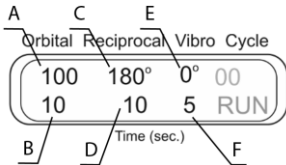


Figure 8

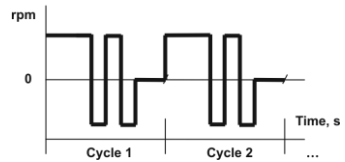


Figure 9

6.9.4 **3D vibro + pause** (fig. 10). Turn off 3D orbital motion by setting time of 3D orbital motion to zero (A, OFF). Set the angle of 3D reciprocal type motion to zero (B). Set the time for 3D reciprocal motion (C, 1–250 s), this is the duration of the pause. Set the turning angle (D, 0–5°) and time (E, 1–5 s) for 3D vibro type motion. Figure 11 shows 3D vibro motion and pause run one after another in cycles. Figure 11 shows 3D vibro motion and pause run one after another in cycles.

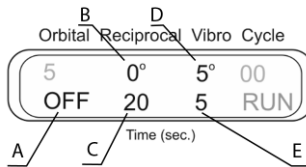


Figure 10

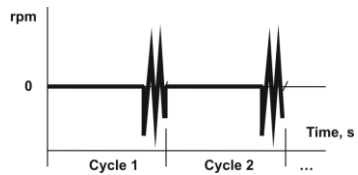


Figure 11

7. Specifications

The unit is designed for operation in cold rooms, incubators (except 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 programme of improvement and reserves the right to alter design and specifications of the equipment without additional notice.

Model		3D	Multi Bio 3D
Speed control range	Orbital motion	5–60 rpm	1–100 rpm
	Reciprocating motion	–	1–100 rpm
Speed increment	Orbital motion	Linear	1 rpm
	Reciprocating motion	–	1 rpm
Turning angle	Reciprocating motion	–	0–360°
	Vibro motion	–	0–5°
Angle increment	Reciprocating motion	–	30°
	Vibro motion	–	1°
Single cycle time setting	Orbital and reciprocating motion	–	0–250 s
	Vibro motion	–	0–5 s
Number of cycles		–	0–125 times
Maximum continuous operation time		168 hours	
Fixed tilt angle		7°	
Orbit		–	22 mm
Maximum load		1 kg	
Platform working area		200x200 mm	
Dimensions (without platform)		235x235x120 mm	235x235x140 mm
Weight, accurate within ±10%		1.2 kg	1.8 kg
Input current		12 V ₌ , 260 mA	12 V ₌ , 380 mA
Power consumption		3.1 W	4.6 W
External power supply		input 100–240 V _~ , 50/60 Hz, output 12 V ₌	

8. Ordering information

8.1 Models and versions available:

Model	Version	Catalogue number
3D , sunflower mini-shaker	V.4AW	BS-010151-AAG
Multi Bio 3D , programmable mini-shaker	V.3AW	BS-010125-AAG

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

8.2.1 Optional accessories:

Optional accessories	Catalogue number
PDM , dimpled mat for fixation of differently sized test tubes	PDM

8.2.2 Replacement parts:

Replacement parts	Catalogue number
Bio PP-4S , detachable platform with heat-resistant silicone mat	BS-010125-AK
Heat-resistant silicone mat	BS-010125-S14

9. Care and maintenance

9.1 Service.

- 9.1.1 If the unit is disabled (e.g., no platform motion, no reaction to key presses, etc) or requires maintenance, disconnect the unit from the mains and contact Biosan or your local Biosan representative.
- 9.1.2 All maintenance and repair operations (except listed below) must be performed only by qualified and specially trained personnel.
- 9.1.3 Operating integrity check. If the unit follow the procedure described in sections **5. Operation** and **6. Program setting**, then no additional checks are required.

9.2 Cleaning and disinfection.

- 9.2.1 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.
- 9.2.2 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.
- 9.2.3 The platform and mats are autoclavable, 15 min at 121 °C. The unit itself is not autoclavable.

10. Storage and transportation

- 10.1 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%.
- 10.2 After transportation or storage and before connecting it to the electric circuit, keep the unit under room temperature for 2-3 hrs.
- 10.3 For extended storage, the unit does not require special procedures.

11. Warranty. Production date.

- 11.1 The Manufacturer guarantees the compliance of the unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.
- 11.2 The warranted service life of the unit from the date of its delivery to the Customer is 24 months. For extended warranty, see **11.5**.
- 11.3 Warranty covers only the units transported in the original package.
- 11.4 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.
- 11.5 **Extended warranty.**
 - For **Multi Bio 3D**, 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 **3D**, 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.
- 11.6 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

- 11.7 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
3D, Multi Bio 3D, Mini-Shakers		

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

12. EU Declaration of conformity

12.1 Mini-shakers **3D** & **Multi Bio 3D** 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. 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.
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.

12.2 Declaration of Conformity is available for download on the page for the relevant model on our website by links below, in the **Downloads** section:



[3D](#)



[Multi Bio 3D](#)

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



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