



Medical–Biological
Research & Technologies

PSU - 2T

Mini-Shaker

for immunology



**Operating Manual
Certificate**

for version
V.2AW

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1. 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 Instructions provided.
- The unit should be saved from shocks or falling.
- The unit must be stored and transported in a horizontal position (see package label).
- After transportation or storage keep the unit under room temperature for 2-3 hrs before connecting it to the electric circuit.
- Use only cleaning and decontamination methods recommended by the manufacturer.
- Do not make modifications to the design of the unit.

ELECTRICAL SAFETY

- Connect only to an external power supply unit with voltage corresponding to that on the serial number label.
- Use only the external power supply unit provided with this product.
- Ensure that the power switch and external power supply unit are easily accessible during use.
- Disconnect the unit from the electric circuit before moving.
- Turn off the unit by disconnecting the external power supply from the power socket.
- If liquid penetrates into the unit, disconnect it from the external power supply unit 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 5. Specifications.

DURING OPERATION

- Do not impede the platform motion.
- 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.
- 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.

2. General Information

PSU-2T Mini-shaker provides regulated shaking for two or four 96-well microtest plates. It is a compact instrument with low profile and small footprint for personal application including immunoassays and colouration tests.

The current upgraded model provides reliable continuous operation and smooth platform motion at lower speed. Non-stop mode up to 7 days and over 2 years of trouble-free operation are guaranteed due to direct drive mechanism and brushless motor.

PSU-2T Mini-shaker provides:

- Gentle shaking of samples
- Smooth regulation and stabilization of rotation speed
- Even shaking amplitude throughout shaker platform
- Setting and indication of the necessary working time
- Automatic stop of platform movement after the set time expires
- Indication of the current operation time.

The unit is applicable in all the areas of the medicine, biotechnology and microbiology laboratory research.

3. Getting started

3.1. 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.

3.2. Complete set. Package contents:

Standard set

- PSU-2T Mini-Shaker for immunology with IPP-2 platform ❶ 1 piece
- external power supply unit. 1 piece
- Operating Manual; Certificate 1 copy

Optional accessories

- additional IPP-4 platform for 4 immunoplates ❷ on request



3.3. Set up:

- place the unit on the horizontal even working surface;
- remove protective film from the display;
- plug the external power supply unit into the 12 V socket at the rear side of the unit.

3.4. 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 shaker.

4. Operation

- 4.1. Connect the external power supply to electric circuit.
- 4.2. Place the microtest plates on the platform and fix them with the two screws. Using the IPP-4 platform fix the microtest plates with the special holder by pressing it against the microtest plates with two screws.
- 4.3. Turn the **Power** switch (fig. 1/1) into On position, located on the front panel of Shaker (the display (fig.1/3) will light). In standby mode the display shows set time or set speed (when **RPM** key is pressed). In run mode the display shows operation time or actual speed (when **RPM** key is pressed).
- 4.4. Using the **▲** and **▼** keys (fig. 1/4) set the operation time using the display readings. The set time is indicated on the display in hours and minutes (hh:mm).
- 4.5. Set the shaking speed with the **Speed** knob (fig. 1/6) using set speed readings on the display. Speed readings are indicated on the display while the **Speed** knob is being turned.
- 4.6. Press the **Run/Stop** key (fig. 1/2). The platform will start shaking and the timer will start counting up the operation time.

The display shows actual time: till 1 hour - in minutes and seconds (mm:ss), after 1 hour - in hours and minutes (hh:mm).

Press and hold the **PRM** key while platform is shaking to display the actual speed of the platform motion on the display.

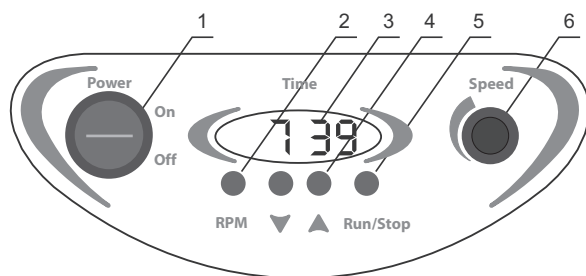


Fig.1 Control panel

- 4.7. After the set time expires platform shaking will stop and the set working time will be shown on the display.
- 4.8. The shaker can be stopped before the set time elapses if necessary by pressing the **Run/Stop** key (fig. 1/5). For 2 s the display will be showing the time the shaker has worked, and after that the set time.
- 4.9. If the working time is not set and the display shows 0:00, pressing the **Run/Stop** key will start time count up and will cause the shaker to operate non-stop until the **Run/Stop** key is pressed. The timer will be counting up until 99 hrs 59 min and then will restart from 0:00.
- 4.10. After finishing the operation turn the **Power** switch into Off position.
- 4.11. Disconnect the external power supply unit from electric circuit.

5. Specifications

The unit is designed for operation in cold rooms, 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.

- 5.1. Speed control range 150-1200 rpm
(150-1000 rpm using the platform IPP-4)
- 5.2. Orbit 2 mm
- 5.3. Digital time setting 1 min - 24 hr / non-stop
- 5.4. Maximum continuous operation time 168 hrs
- 5.5. Maximum load 0.3 kg
- 5.6. Dimensions 220x205x90 mm
- 5.7. Input current/power consumption 12V, 280mA / 3.4W
- 5.8. External power supply in AC 100-240V 50/60Hz; out DC 12V
- 5.9. Weight* 2.0 kg

* Accurate within $\pm 10\%$.

Optional accessories	Description	Catalogue number
IPP-4	platform for 4 microtest plates, dimensions 266x170 mm	BS-010102-AK

Replacement parts	Description	Catalogue number
IPP-2	platform for 2 microtest plates, dimensions 184x132 mm	BS-010102-BK

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. Maintenance

- 6.1. If the unit requires maintenance, disconnect the unit from the mains and contact Biosan or your local Biosan representative.
- 6.2. It is allowed to perform the maintenance and all types of repair operations only to the persons who have completed special training.
- 6.3. Standard ethanol (75%) or other cleaning agents recommended for cleaning of laboratory equipment can be used for cleaning and decontamination of the unit.

7. Warranty and Claims

- 7.1. The Manufacturer guarantees the compliance of the unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.
- 7.2. The warranted service life of the unit from the date of its delivery to the Customer is 24 months. Contact to your local distributor to check availability of extended warranty.
- 7.3. If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment claim shall be compiled, certified and sent to the local distributor address. Please visit www.biosan.lv, Technical support section to obtain the claim form.
- 7.4. The following information will be required in the event that warranty or post-warranty service comes necessary. Complete and retain for your records.

Model	PSU-2T Mini-Shaker for immunology
Serial Number	
Date of sale	

8. Declaration of Conformity

Declaration of Conformity

Equipment name:	PSU-2T
Type of equipment:	Mini-Shaker
Directive:	EMC Directive 2004/108/EC Low Voltage Directive 2006/95/EC RoHS 2011/65/EC WEEE 2002/96/EC & 2012/19/EU
Manufacturer:	SIA BIOSAN Ratsupites 7, build.2, Riga, LV-1067, Latvia
Applied Standards:	EN 61326-1: Electrical equipment for measurement, control and laboratory use EMC requirements. General requirements EN 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements EN 61010-2-051: Particular requirements for laboratory equipment for mixing and stirring

We declare that this product conforms to the requirements of the above Directive(s)


Signature
Svetlana Bankovska
Managing director

12.06.2013
Date


Signature
Aleksandr Shevchik
Engineer of R&D

12.06.2013
Date

How to choose a proper Shaker, Rocker, Vortex



PSU-20i

ES-20/60
(with heating)



Applications:
• Microbiology
• Extraction
• Cell growing

PSU-10i



ES-20
(with heating)

MR-12



Multi RS-60

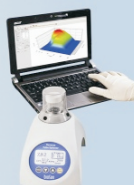


Multi Bio RS-24

Applications:
• Microbiology
• Extraction
• Cell growing



RTS-1



V-1

Applications:
• DNA-analysis
• Genome sequence



MR-1

Applications:
• Agglutination
• Extraction
• Gel staining/
destaining



Multi Bio 3D

• Applications:
• Agglutination
• Extraction
• Blot hybridisation
• Gel staining/destaining



PST-60HL
PST-100HL
(with heating)

PST-60HL-4
(with heating)



PSU-2T

Applications:
• ELISA analysis
• Hybridization

MPS-3500



TS-100 (with heating)
TS-100C (with heating
and cooling)



V-32



Volume of liquids

$10^3 \dots 10^2$ ml

Erlenmeyer flasks, Cultivation flasks
and 50 ml tubes

10^1 ml

Petri dishes, vacutainers
and tubes up to 15 ml

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

PCR plates, microtest plates
and Eppendorf type tubes