

Multi function 3D rotator PS-M3D

Operating instructions

For version V.2GW



Contents

1	Safety.....	4
2	General Information.....	5
3	Getting Started.....	7
4	Operation of PS-M3D.....	8
5	Specifications.....	12
6	Guarantee and service.....	13

1. Safety

The following symbol means:



Caution! Make sure you have fully read and understood the present operating instructions 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 not be used if dropped or damaged.
-  The unit must be stored and transported in an 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 the 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 external power supply unit is easily accessible during use.
-  Disconnect the unit from electric circuit before moving. Disconnect the external power supply unit from power socket to turn off the unit.
-  If liquid penetrates into the unit, disconnect it from the external power supply unit and have it checked by a repair and maintenance technician.

DURING OPERATION

-  Do not impede the platform motion.
-  Do not operate the unit in environments with aggressive or explosive chemical mixtures.
-  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.

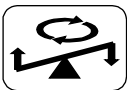
2. General Information

Areas of application

Multi function 3D rotator PS-M3D is designed for laboratory studies in the areas of biochemistry, immunochemistry, microbiology and genetic engineering. It can be used for:

- gel washing, blot-hybridization, electrophoretic analysis of proteins and nucleic acids;
- preliminary preparation of blood samples before analyses to prevent blood coagulation;
- tissue and cell lysis: different mixing modes will facilitate getting the best extraction results;
- cell cultivation in trays and other flat vessels during the preparation of growth media in Petri dishes (microbial antibiotic resistance investigations).
- PS-M3D Programmable Shaker provides 3 types of motion:

3D Orbital Shaking



Combination of:

- 3D shaking;
- orbital shaking
 - with adjustable speed from 1 to 100 rpm.
 - with 7° pitch.

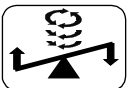
3D Reciprocating Shaking



Combination of:

- 3D shaking;
- 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



Intensive mixing. Combination of:

- 3D shaking;
- vibro 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 of two;
- all three in one cycle (Fig. 1).

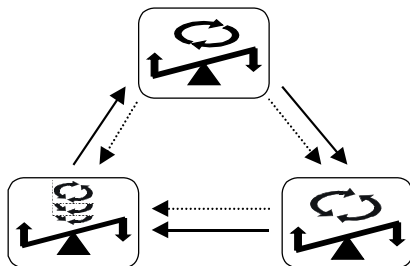


Fig.1. Innovative mixing cycle

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.

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 The unit set includes:

Standard set

- PS-M3D1 piece
- External power supply unit1 piece
- Operating instructions; Declaration of Conformity.....1 copy

Optional accessory

- PDM dimpled maton 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 by inserting the pins on the underside of the platform into the holes on the supporting platform on the unit.

4. Operation of PS-M3D

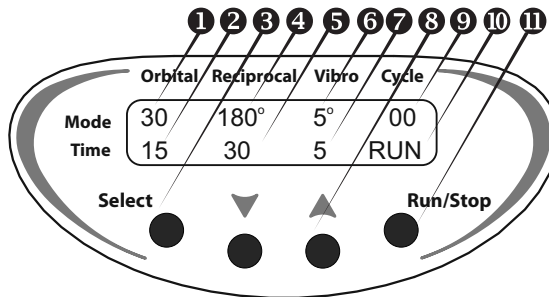


Fig.2. Front panel

- 4.1. Connect the external power supply to electric circuit.
- 4.2. Place samples on the unit platform.
- 4.3. Set the required program and number of cycle repetitions (see 4.11.).
- 4.4. Press the **Run/Stop** key (Fig.2/ 8) to start the program.
- 4.5. The platform motion will begin and the corresponding indication (operation mode – RUN (Fig.2/10), cycle countdown (Fig.2/9) and the changing time values) will be shown on the display.
- 4.6. The unit will stop 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).
- 4.7. Press the **Run/Stop** key to repeat the preset program.
- 4.8. 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 (cycles countdown will be restarted).
- 4.9. If the number of cycles is not set (cycle number indicator (Fig.2/9) shows zero), pressing

the **Run\Stop** key will start continuous operation of the unit until the **Run\Stop** key is pressed again.

- 4.10. Unplug the external power supply unit from the electric circuit to turn off the unit.

4.11 Program setting

The program 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.

- 4.11.1 Press **Select** key (Fig.2/⑨) to choose the parameter to change (the active parameter is blinking).
- 4.11.2 Use the **▲** and **▼** keys (Fig.2/⑩) to set the necessary value (pressing the key down for more than 2 sec will make the values change quickly).
- 4.11.3 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.
- 4.11.4 It is necessary to set speed (Fig.2/①), turning angle (Fig.2/②, Fig.2/③), time for each motion type (Fig.2/④, Fig.2/⑤, and Fig.2/⑦) and number of cycle repetitions (Fig.2/⑧).
- 4.11.5 If the time for a motion is set to zero, this type of motion will be skipped in the cycle.
- 4.11.6 It is possible to set a pause instead of 3D Reciprocal (0–250 sec) or 3D Vibro (0–5 sec) 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).

4.12 Table below shows different cycle variants.

			
	ORBITAL	RECIPROCAL	VORTEX
1	On	On	On
2	On	OFF	On
3	On	Pause	On
4	On	OFF	OFF
5	On	Pause	OFF
6	On	OFF	Pause
7	On	Pause	Pause
8	On	On	OFF
9	On	On	Pause
10	OFF	On	On
11	OFF	Pause	On
12	OFF	On	Pause
13	OFF	OFF	On
14	OFF	On	OFF

4.13 Further examples illustrate program setting for four different cycle variants.

4.13.1 Example A

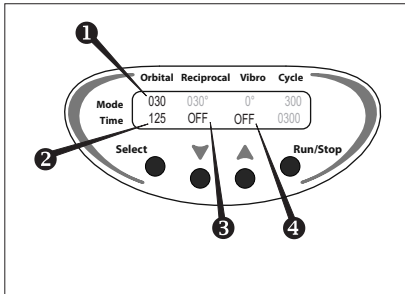
3D Orbital

Most popular sunflower kind of motion

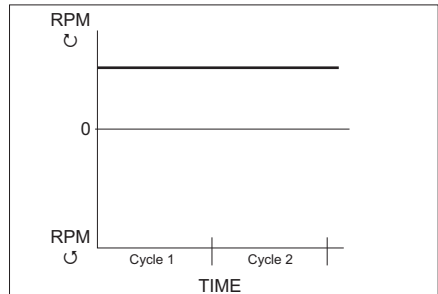
Set the speed (❶) and time (❷) of 3D Orbital motion.

Turn off 3D Reciprocal motion by setting time of 3D Reciprocal motion to zero (❸ OFF).

Turn off 3D Vortex type motion by setting time of 3D Vortex motion to zero (❹ OFF).



LCD Display



Graph shows 3D Orbital motion run in cycles.

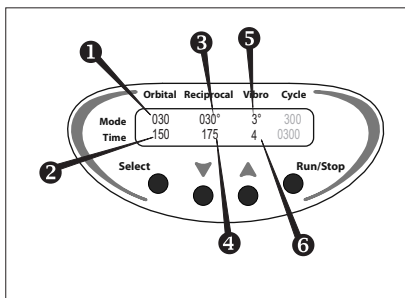
4.13.2 Example B

3D Orbital + 3D Reciprocal + 3D Vortex

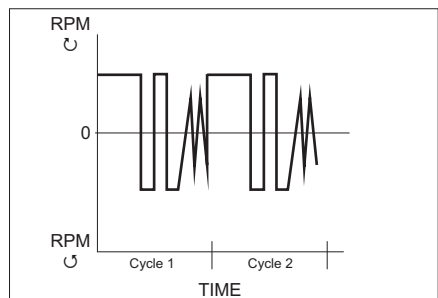
Set the speed (❶) and time (❷) of 3D Orbital motion.

Set the angle (❸) and time (❹) for 3D Reciprocal motion.

Set the turning angle (❺) and time (❻) for Vortex type motion.



LCD Display



Graph shows 3D Orbital, 3D Reciprocal and 3D Vortex motions run one after another in cycles.

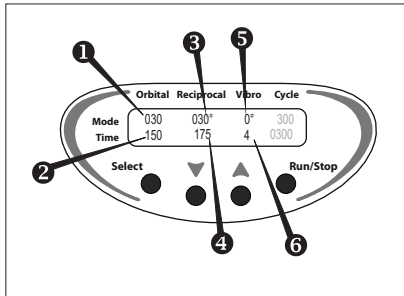
4.13.3 Example C

3D Orbital + 3D Reciprocal + Pause

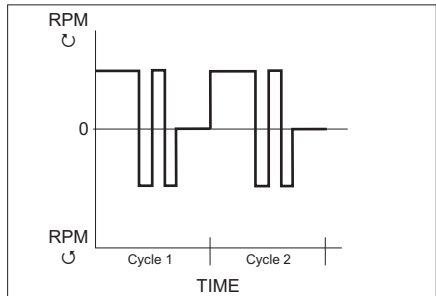
Set the speed (❶) and time (❷) of 3D Orbital motion.

Set the turning angle (❸) and time (❹) for 3D Reciprocal motion.

Set the angle of 3D Vortex type motion to zero(❺). Set the time for 3D Vortex motion (❻), this will be the time of pause duration.



LCD Display



Graph shows 3D Orbital and 3D Reciprocal motions and pause, run one after another in cycles.

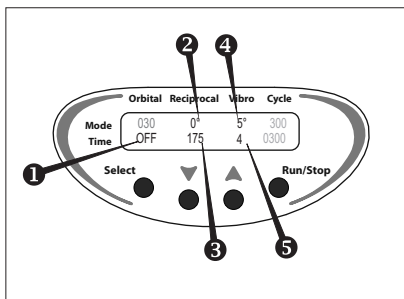
4.13.4 Example D

3D Vortex + Pause

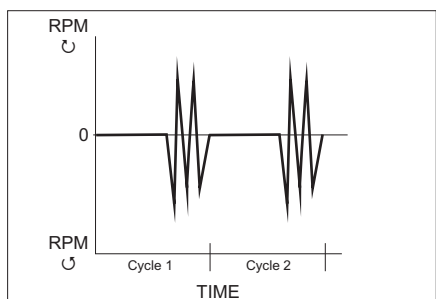
Turn off 3D Orbital motion by setting the time of 3D Orbital motion to zero (❶ OFF).

Set the angle of 3D Reciprocal type motion to zero (❷). Set the time for 3D Reciprocal motion (❸), this will be the time of pause duration.

Set the turning angle (❹) and time (❺) for 3D Vortex type motion.



LCD Display



Graph shows 3D Vortex motion and pause, run one after another in cycles.

5. Specifications

• Operating conditions

The unit is designed for operation in cold rooms, incubators and closed laboratory rooms at ambient temperature from +4°C to +40°C and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

• Speed control range

Orbital and reciprocating motion1–100 rpm

• Turning angle

Reciprocating motion0°–360° (increment 30°)

Vibro motion0°–5° (increment 1°)

• Fixed tilt angle7°

• Orbit22 mm

• Time setting range

Orbital and reciprocating motion0–250 sec

Vibro motion0–5 sec

• Number of cycles0–125 times

• Maximum continuous operation time24 hours

• Maximum load1 kg

• Platform working area200x200 mm

• Dimensions (w/out platform)220x165x125mm

• Input current/power consumption12 V, 380 mA / 4.6 W

• External power supply unit input AC 100–240 V 50/60 Hz, output DC 12 V

• Weight*1.8 kg

* Accurate within $\pm 10\%$.

Optional accessory	Description
Dimpled mat PDM	different size tubes prevents from rolling

Grant is committed to a continuous programme of improvement, specifications may be changed without notice.

6. Guarantee and Service

6.1 Guarantee

When used in laboratory conditions and according to these working instructions, this product is guaranteed for TWO YEARS against faulty materials or workmanship.

6.2 Service

For service, return for repair to our Service Department in the UK or, in other countries, to our distributor.

6.3 Cleaning & disinfection

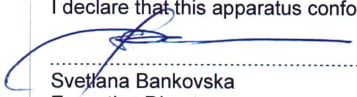
Standard ethanol (75%) or other cleaning agents recommended for cleaning of laboratory equipment can be used for cleaning and disinfection of the unit.

Declaration of Conformity

Manufacturer:	BIOSAN LTD. Ratsupites 7, build.2, Riga, LV-1067, Latvia
Equipment name/type number:	PS-M3D
Description of Equipment:	Multi function 3D Rotator
Directives:	EMC Directive 2004/108/EC Low Voltage Directive 2006/95/EC

Applied Standards	
Harmonized Standards:	<u>EN 61326-1:</u> Electrical equipment for measurement, control and laboratory use General requirements <u>EN61010-1:</u> Safety requirements for electrical equipment for measurements, control and laboratory use General requirements <u>EN61010-2-051:</u> Particular requirements for laboratory equipment for mixing and stirring

I declare that this apparatus conforms to the requirements of the above Directive(s)


.....
Svelana Bankovska
Executive Director
Biosan Ltd.

Dated 06.09.2011



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