

**Grant-bio**

# Multi function 3D rotator PS-M3D

*Operating instructions*





# Contents

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

# 1. Safety














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The following symbols mean:-



**Caution:** Read these operating instructions fully before use and pay particular attention sections containing this symbol

Always observe the following safety precautions

-  Use only as specified by the operating instructions, or the intrinsic protection may be impaired.
-  After transport or storage in humid conditions, dry out the unit before connecting it to the supply voltage. During drying out the intrinsic protection may be impaired.
-  As the unit is producing shaking or rotational movement, be aware of the surface that the unit will be placed upon.
-  Connect only to a power supply with a voltage corresponding to that on the serial number label.
-  Ensure that the mains switch and isolating device (power supply connector) are easily accessible during use.
-  Connect only to a power supply which provides a safety earth (ground) terminal.
-  Before moving, disconnect at the power supply socket.
-  If liquid is spilled inside the unit, disconnect it from the power supply and have it checked by a competent person.
-  It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilled on or inside the equipment.
-  Do not place a load exceeding 1kg on shaker.
-  Before using any cleaning or decontamination method except those recommended by the manufacturer, user should check with the manufacturer that the proposed method will not damage the equipment.
-  Clean the unit only with a damp cloth, do not use chemical cleaning agents.
-  The unit must be stored and transported only in a horizontal position (see marking on the package).

# 2. General Information

## 2.1 Areas of application:

PS-M3D is designed for laboratory work in the areas of biochemistry, immunochemistry, microbiology and genetic engineering.

It can be used for:

- Gel washing (staining and de-staining), blot-hybridisation; electrophoretic analysis of proteins and nucleic acids (DNA, RNA);
- Preliminary preparation of blood samples before the analysis to prevent blood coagulation;
- Tissue, cell lysis - different mixing modes will facilitate getting best extraction results (forensic investigation);
- Cell cultivation in plates and other flat vessels during the preparation of nutrient media in Petri dishes (microbial antibiotic resistance investigations).

## 2.2 PS-M3D provides 3 types of motion:

### 3D - Orbital Shaking

Combination of:



- 3D Shaking
- Rocking Shaking (7° to the horizontal)
- Orbital Shaking with adjustable speed from 1 to 100 RPM

### 3D - Reciprocating Shaking

Combination of:



- Gentle 3D Shaking
- Gentle Rocking Shaking (7° to the horizontal)
- Gentle Orbital Shaking with adjustable speed from 1 to 100 RPM
- Gentle Reciprocating Shaking with adjustable turning angle from 0° to 360°

### 3D - Vortexing Shaking

Combination of:

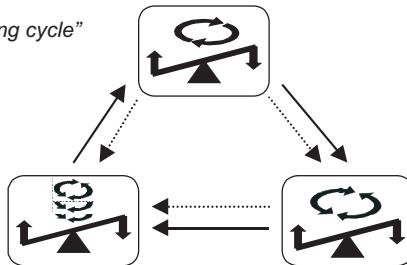


- 3D Shaking
- Rocking Shaking (7° to the horizontal) constant
- Orbital Shaking
- Reciprocating Shaking with adjustable turning angle from 0 to 5°

2.3 **These 3 motions are combined in a cycle and can be used**

- Separately;
- In combinations of two;
- All three in one cycle (see below).

*Innovative "mixing cycle"*



2.4 3D - Reciprocating and 3D - Vortexing motion types can be replaced with a **pause**.

2.5 Each cycle can be repeated up to 125 times or run continuously.

2.6 PS-M3D is designed for operation in bioincubators or cold rooms at temperatures from +5° to +40°C.

# 3. Getting started

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## 3.1 Unpacking

Remove packing materials carefully, and retain for future shipment or storage of the unit.

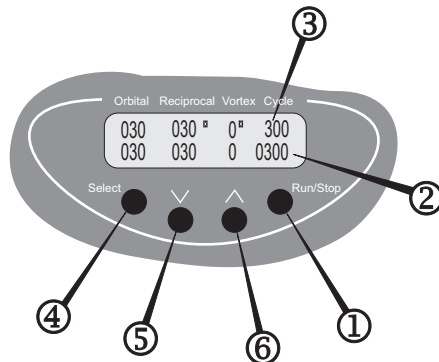
## 3.2 The Shaker set includes:

- PS-M3D ..... 1 piece
- External AC/DC adapter ..... 1 piece
- Specifications; Operating Manual; CE Certificate ..... 1 copy

## 3.3 Optional extras

- PTP-26 ..... Tube adaptor
- PDM ..... Dimpled mat

## 4. Operation of PS-M3D



- 4.1 Connect the PS-M3D to the AC/DC adapter and the adapter to the main power supply.
- 4.2 Place plates or tubes on the Shaker platform.
- 4.3 Set the appropriate program and number of cycles (see 4.11).
- 4.4 Press **Run/Stop** key (①) to start the program.
- 4.5 The platform motion begins and the corresponding indication (operation mode - RUN (②), cycle countdown (③) and the changing time values) is shown on the display.
- 4.6 Shaker stops after the set number of cycles is performed (flashing indication STOP on the display) and gives a sound signal at the end of the operation (press **Run/Stop** key to cancel the signal).
- 4.7 For a repeated operation of the previous program press **Run/Stop** key.
- 4.8 If necessary the PS-M3D can be stopped at any time during operation by pressing **Run/Stop** key. In this case the platform motion stops when the platform achieves a horizontal position. Pressing **Run/Stop** key again will start the program from the beginning (countdown timer will be restarted).



- 4.9 If the number of cycles is not set (cycle number indicator (③) shows zero), pressing **Run\Stop** key cause continuous operation of the Shaker until the **Run\Stop** key is pressed again.
- 4.10 Once you have finished using the unit, unplug the AC\DC adapter from the main power supply to turn off the device.




#### 4.11 Program setting

The program consists of cycles. Each cycle includes three different types of platform motion (3D-Orbital, 3D-Reciprocating and 3D-Vortexing) set one after another with the duration from 0 to 250 seconds for 3D-Orbital and 3D-Reciprocal motion types and from 0 to 6 seconds for 3D-Vortexing motion.

The set cycle can be repeated from 1 to 125 times or continuously.

- 4.11.1 Press Select key (④) to choose the parameter to change (the active parameter is blinking). Use ^ and v keys (⑤/⑥) to set the necessary value, (note: if the key is pressed for more that 2 sec the display changes quickly).
- 4.11.2 The program can also be changed during the operation - the microprocessor automatically enters the last changes into the memory during the program operation.
- 4.11.3 It is necessary to set speed, turning angle, and time parameters for each motion type and how many times the cycle is repeated.
- 4.11.4 If the time for a specific motion is set to zero, this type of motion will be skipped in the cycle.
- 4.11.5 It is possible to set a pause instead of 3D-Reciprocal (0-250 sec) or 3D-Vortexing (0-5 sec) motion. To set a pause, set the turning angle of 3D-Reciprocal or 3D-Vortexing motion to [0] 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.

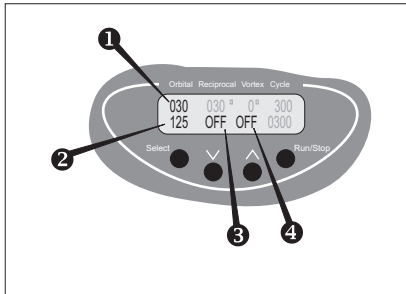




	ORBITAL	RECIPROCAL	VORTEX
1	On	On	On
2	On	OFF	On
3	On	Pause	On
4	On	OFF	OFF
5	On	Pause	OFF
6	On	OFF	Pause
7	On	Pause	Pause
8	On	On	OFF
9	On	On	Pause
10	OFF	On	On
11	OFF	Pause	On
12	OFF	On	Pause
13	OFF	OFF	On
14	OFF	On	OFF

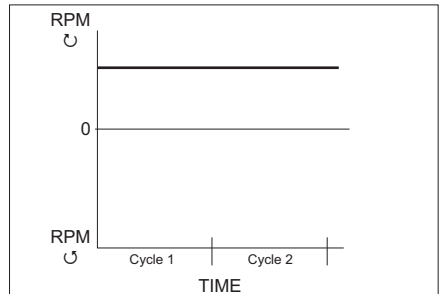
4.13 Further examples illustrate program setting for four different cycle variants.

4.13.1 *Example A*  
**3D-Orbital**

Most popular “Ballet Dancer” kind of motion  
 Set the speed (1) and time (2) of 3D-Orbital motion.  
 Turn off 3D-Reciprocal motion by setting time of 3D-Reciprocal motion to zero (3 OFF).  
 Turn off 3D-Vortex type motion by setting time of 3D-Vortex motion to zero (4 OFF).



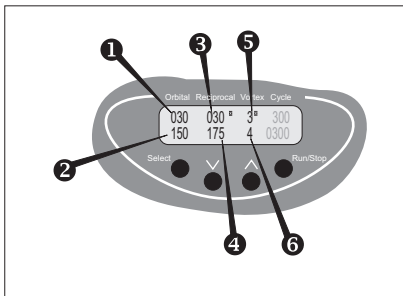
LCD Display



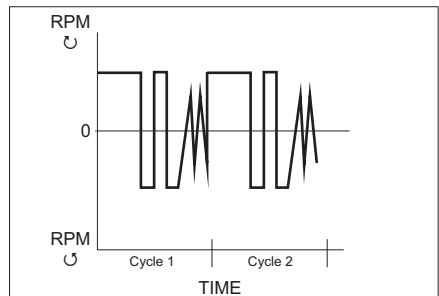
Graph shows 3D-Orbital motion run in cycles.

4.13.2 *Example B*  
**3D-Orbital + 3D-Reciprocal + 3D-Vortex**

Set the speed (1) and time (2) of 3D-Orbital motion.  
 Set the angle (3) and time (4) for 3D-Reciprocal motion.  
 Set the turning angle (5) and time (6) for Vortex type motion.



LCD Display



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

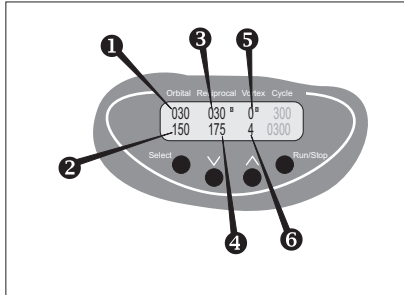
#### 4.13.3 Example C

##### 3D-Orbital + 3D-Reciprocal + Pause

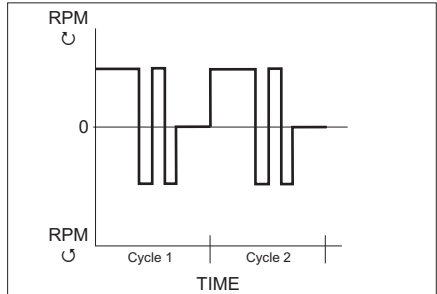
Set the speed (❶) and time (❷) of 3D-Orbital motion.

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.

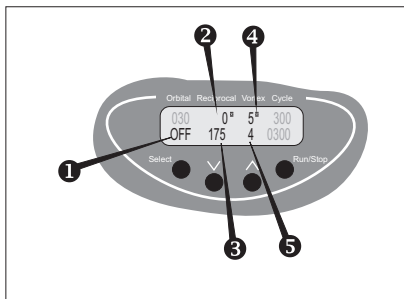
#### 4.13.4 Example D

##### 3D-Vortex + Pause

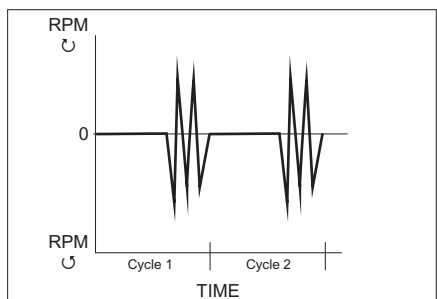
Turn off 3D-Orbital motion by setting time of 3D-Orbital motion to zero (❶ OFF).

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

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- **Speed range** .....1 - 100 RPM (orbital and reciprocating motion)
  - **Turning angle** (Reciprocating motion).....0° - 360° (increment 30°)
  - **Turning angle** (Vortexing motion) .....0° - 5° (increment 1°)
  - **Platform tilt angle** (to the horizon) .....7°
  - **Orbit diameter** .....22 mm
  - **Timer for Orbital and reciprocating motion** .....0 - 250 sec
  - **Timer for Vortex motion** .....0 - 5 sec
  - **Number of cycles**.....0 - 125 times
  - **Continuous operation time of Shaker** .....24 hours (max)
  - **Platform dimensions** .....238x238 mm
  - **Device dimensions** (WxDxH).....170x220x125mm
  - **Maximum load** .....1 kg
  - **Power**.....external power 12 V, 500 mA
  - **Weight with power supply** .....1.85 kg
  - The product is designed for operation indoors in a laboratory at altitudes up to 2000m, with ambient temperature from +5°C to +40°C and maximum relative humidity 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40°C.

To improve the design manufacturer reserves the right to make changes in specification without prior notice.

# 6. Guarantee and Service

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## 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.

# Declaration of Conformity

Manufacturer:	BIOSAN LTD. Ratsupites 7, build.2, Riga, LV-1067, Latvia
Equipment name/type number:	ES-20
Description of Equipment:	Shaker Incubator
Directive:	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 EMC requirements General requirements <u>EN 61010-1:</u> Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements <u>EN 61010-2-010:</u> Particular requirements for laboratory equipment for the heating of materials. <u>EN 61010-2-051</u> Particular requirements for laboratory equipment for mixing and stirring

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

  
.....  
Svetlana Bankovska  
Executive Director  
Biosan Ltd.

Dated 06.04.2011 .....



# Grant-bio

**Grant Instruments  
(Cambridge) Ltd**  
Shepreth,  
Cambridgeshire  
SG8 6GB

Tel: +44 (0)1763 260811  
[www.grant.co.uk](http://www.grant.co.uk)  
[sales@grant.co.uk](mailto:sales@grant.co.uk)  
Fax: +44 (0)1763 262410

Multi function 3D rotator/PS-M3D/17998/5