

Rotator PTR-35

Operating instructions

For version: V3GW



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1. Safety

The following symbols mean:



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 a power supply with voltage corresponding to that on the serial number label.
- ☞ Use only the external power supply unit provided with this product.
- ☞ Ensure that the external power supply connector is 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.

DURING OPERATION

- ☞ 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 these operating instructions.

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

Rotator PTR-35 provides:

- Orbital rotational motion,
- Reciprocal motion,
- Vibrating motion of the platform in different planes.

The protocol enables not only programs that include mixing motion of one particular type, but also programs that alternate mixing motions of different types cyclically.

The setting options are:

- Speed and time of ordinary ROTATIONAL MOTION (360°) of the platform for a time period 0–250 sec, or non-stop with the speed of 1–100 rpm.
- Segment of RECIPROCAL MOTION when the direction of the platform rotational motion from the vertical plane is changing in turns within the limits of the set segment (turning angle 1–90° for a time period 0–250 sec, or non-stop);
- Segment and time of VIBRO MOTION of the platform (turning angle 1–5° for a time period 1–5 sec) run at the end of each reciprocal motion segment. It is available only when the reciprocal motion is ON;
- PAUSE duration for temporary platform motion stops (1–5 sec) when the vibro motion is off (the turning angle of vibro motion is set to zero) run at the end of each reciprocal motion segment. It is available only when the reciprocal motion is ON;
- Working period from 1 min to 24 hours, or non-stop.

Applications

- Rotator PTR-35 is designed for mixing biological solutions, cell suspensions, magnetic particles conjugated with specific antibodies as well as incubation and cultivation of biological liquids according to the operator set program.
- The device is applicable in all areas of laboratory research in biotechnology, microbiology, chemistry, and medicine.

3. Getting started

3.1 Unpacking

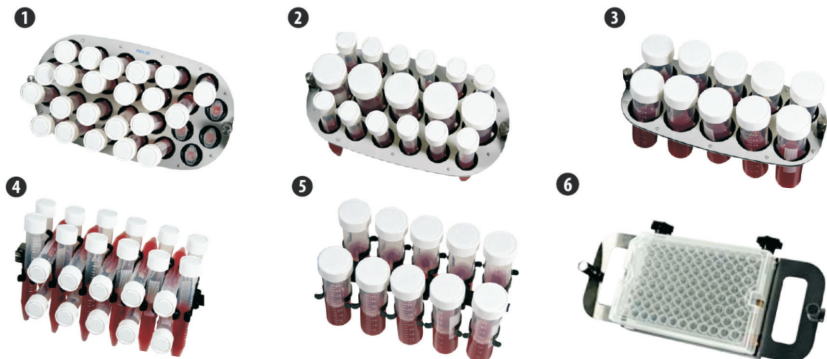
Remove packaging carefully, and retain for future shipment or storage of the unit. Examine the unit carefully for any damage incurred during transit. The warranty does not cover in-transit damage.

3.2 Rotator PTR-35 set includes:

- Rotator PTR-351 piece
- PRS-26 platform ❶1 piece
- External power supply unit.....1 piece
- Operating instructions; Declaration of Conformity1 copy

Optional accessories:

- PRS-5-12 platform ❷on request
- PRS-10 platform ❸on request
- PRSC-22 platform ❹on request
- PRSC-10 platform ❺on request
- PRS-1DP platform ❻on request



3.3 Set up:

- Place the unit on an even horizontal 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 replacement:

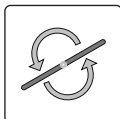
- Unscrew the two fixing screws on the platform.
- Replace the platform and install the new platform securing it with the screws.
- Fix the screw tightly.

3.5 Principle operation

The principle of operation of the PTR-35 is based on the creation of rotational movement of the platform in the vertical plane providing effective mixing of biological liquids in tubes or microplates. The control keys on the front panel provide program setting and operation control.

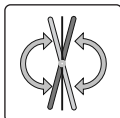
3.6 The three types of motion

- 3.6.1 The PTR-35 provides 3 types of motion, which can be used separately (except for vibration mode, which works in conjunction with reciprocal motion mode) and consecutively in a cycle:



Rotating motion (Orbital)

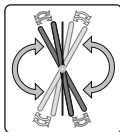
Simple even circular motion – common type of motion used in Rotators. Adjustable speed from 1 to 100 RPM.



Reciprocating Rotating motion (Reciprocal)

Vertical rotation with changing direction of rotation.

Adjustable turning angle (from 1° to 90°, increments of 1°) sets the limits for this type of motion. The speed is the same as set for rotational motion from the vertical plane (from 1 to 100 RPM). In this type of motion there is a pause function (from 1 to 5 seconds, in increments of 1 second), this can be set in the vibration/pause mode.



Vibration motion (Vibro)

Intensive mixing of samples at high speed with small amplitude requires a vibrating motion. The vibration mode decreases adhesion of liquids to the tube surface, this is especially important when using micro quantities when the sample weight may be equal to the surface adhesion force. The choice of vibration mode depends on a number of parameters, namely viscosity, surface adhesion, volume and specific gravity of the bio-sample.

4. Operation of PTR-35

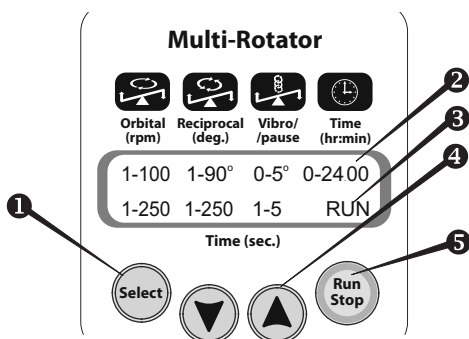


Fig. 1 Control panel

Recommendation during operation

Arrange the tubes symmetrically to the rotation axis when loading.

- 4.1. Connect the external power supply unit to the electric circuit.
- 4.2. Place samples on the platform: microtubes – up to full; vacutainers and tubes with caps – up to half full.
- 4.3. Set the appropriate program and operation time (see the Program Setting Section of these operating instructions) according to the method required.
- 4.4. Press the **Run/Stop** key (Fig. 1/5) to start the program.
- 4.5. The platform motion will begin and the corresponding indication (RUN (Fig. 1/4) and the changing time values) will be shown on the display.
- 4.6. If the operation time is not set and the timer indicator (Fig. 1/2) shows 0:00, pressing the **Run/Stop** key will cause continuous operation of the rotator until the **Run/Stop** key is pressed again.
- 4.7. If the operation time is set the platform movement will stop after its expiring (flashing indication STOP will be shown on the display) and will start giving a sound signal about the end of operation (press the **Run/Stop** key to stop the signal).

- 4.8. Press the **Run/Stop** key to repeat the set program.
- 4.9. The rotator can be stopped at any time during operation before the set time expires if necessary by pressing the **Run/Stop** key. In this case the platform motion stops when the platform achieves horizontal position. Pressing the **Run/Stop** key again will start the program from the beginning (countdown timer will be restarted).
- Note:** A step motor is used in this model. Stopping the platform with hand briefly is allowed and will not damage the mechanical parts of the device. If the platform is stopped with hand during operation, the program does not stop and the platform motion is automatically resumed after the platform is released.
- 4.10. Disconnect the external power supply unit from electric circuit to turn off the unit.

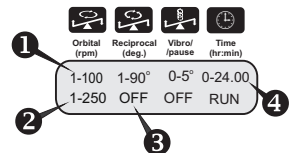
5. Program setting

When setting program parameters please mind that the unit may be unable to operate properly in reciprocal and vibration modes with maximum load. The recommended load is indicated in table 1 on page13.

- 5.1. Press the **Select** (Fig. 1/❶) key to choose the parameter to change (the active parameter is flashing).
- 5.2. Use the **▲** and **▼** keys (Fig. 1/❷) to set the necessary value (note: if the key is pressed for more than 2 sec the numerical changes quickly).
- 5.3. Saving the program doesn't require additional operations: the microprocessor saves the last parameter changes as the working program automatically.
- 5.4. The countdown timer is used to control the operation time. The timer can be set for the period from 1 min to 24 hours.
- 5.5. The examples below show separate motion types and their available combinations in cycles. The data to the right show the possible parameter values for each type.

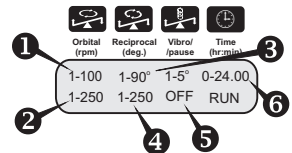
5.5.1. Orbital Rotation

Set the speed (❶ 1–100 rpm), time of Orbital rotation (❷ 1–250 sec) and time for Reciprocal motion to zero (❸ OFF). Set the general timer (❹ 0:00 time set cause continuous operating).



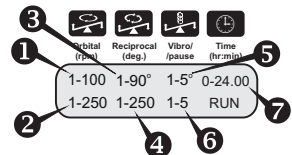
5.5.2. Orbital + Reciprocal Rotation

Set the speed (❶ 1–100 rpm) and time (❷ 1–250 sec) of Orbital rotation. Set the turning angle from vertical plane (❸ 1–90°) and time (❹ 1–250 sec) for Reciprocal motion. Switch off the Vibro motion (❺ OFF). Set the time of Vibro motion to 0 (OFF). Set the general timer (❻ 0:00 time set cause continuous operating).



5.5.3. Orbital + Reciprocal + Vibro

Set the speed (❶ 1–100 rpm) and time (❷ 1–250 sec) of Orbital rotation. Set the angle (❸ 1–90°) and time (❹ 1–250 sec) for Reciprocal motion. Set the turning angle (❺ 0–5°) and time (❻ 1–5 sec) for Vibro motion. Set the general timer (❼ 0:00 time set cause continuous operating).

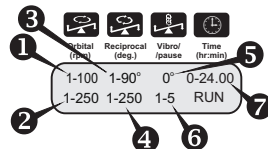


Note that if the set time of Reciprocal motion is shorter or equal to the set time of Vibro motion then the Reciprocal motion will be omitted (Orbital + Vibro).

5.5.4. Orbital + Reciprocal + Pause

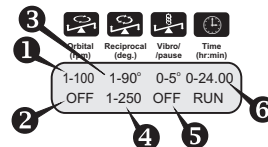
Set the speed (1 1–100 rpm) and time (2 1–250 sec) of Orbital rotation. Set the turning angle (3 1–90°) and time (4 1–250 sec) for Reciprocal motion. Set the angle of Vibro motion mode to zero (5). Set the time for Vibro/pause mode (6 1–5 sec), which is the time of pause duration. Set the general timer (7 0:00 time set cause continuous operating).

Note that if the set time of Reciprocal motion is shorter or equal to the set time of Vibro/pause mode, the Reciprocal motion mode will be omitted (Orbital + Pause).



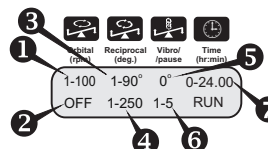
5.5.5. Reciprocal Rotation

Set the speed (1 1–100 rpm) for Orbital rotation. Set time for Orbital rotation to zero (2 OFF). Set the turning angle (3 1–90°) and time (4 1–250 sec) of Reciprocal motion. Set the time for Vibro motion to zero (5 OFF). Set the general timer (6 0:00 time set cause continuous operating).



5.5.6. Reciprocal + Pause

Set the speed (1 1–100 rpm) of Orbital rotation. Set time of Orbital rotation to zero (2 OFF). Set the angle (3 1–90°) and time (4) (1–250 sec) of Reciprocal motion. Set the angle of Vibro type motion to zero (5). Set the time for vibro motion type (6 1–5 sec), which is the time of pause duration. Set the general timer (7 0:00 time set cause continuous operating).



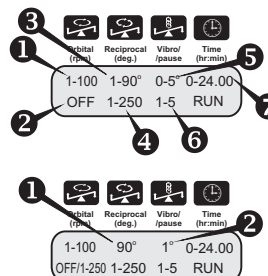
5.5.7. Vibro + Reciprocal Rotation

Set the speed (1 1–100 rpm) of Orbital rotation. Set the time of Orbital rotation to zero (2 OFF). Set the angle (3 1–90°) and time (4) (1–250 sec) of Reciprocal motion. Set the angle (5 0–5°) and time (6 1–5 sec) of Vibro type motion. Set the general timer (7 0:00 time set cause continuous operating).

Note that normally rotator performs soft vibration (Vibro motion). However there is a mode for hard vibration.

To perform hard vibration set the turning angle of Reciprocal motion to 90° (1) and the angle of Vibro type motion to 1° (2 Hard Vibro).

When working with the unit in vibro motion mode for long period nonstop and using the platform with rubber clamps, choose the tubes not longer than 7 cm from cap till bottom.



6. 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.

Rotating motion

- Speed range1–100 rpm
- Timer0–250 seconds
- Vertical rotation movement360°

Reciprocal motion

- Turning angle1° to 90° (increment 1°)
- Timer0 to 250 seconds

Vibration motion / pause

- Turning angle0° to 5° (increment 1°)
- Timer0 to 5 sec
- Pause0 to 5 sec

General specifications

- Program timer1 to 24 hours (increment 1 min) or non-stop
 - Maximum load0.5 kg
 - Dimensions (W x D x H)365 x 195 x 155 mm
 - Input current/power consumption12 V, 660 mA / 8 W
 - External power supply unitinput AC 100–240 V 50/60 Hz, output DC 12 V
 - Weight*1.7 kg
- * Accurate within ±10%.

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

Optional accessories	Capacity	Tube volume	Tube diameter
Platform PRS-5-12*	5/12	max. 50/2-15 ml	20–30/10–16 mm
Platform PRS-10*	10	50 ml	20–30 mm
Platform PRSC-22*	22	15 ml	10–16 mm
Platform PRSC-10*	10	50 ml	20–30 mm
PRS-1DP platform	Platform for microplates and racks for tall tubes 0.5 and 1 ml (e.g. Thermo 3741MTX, 3742MTX, 3744MTX)		

Replacement parts	Capacity	Tube volume	Tube diameter
Platform PRS-26*	26	from 2 to 15 ml	10–16 mm

**PRS* platforms are equipped with universal rubber clamps for different size tube fixation;
PRSC platforms have metal clamps able to hold heavier solutions (e.g.soil,sand).

Motion type	Recommended load	
	Tubes	Weight
Rotation	Full load	Up to 450 g.
Reciprocal rotation	26 Microtube type tubes; 8–15 ml Falcon tubes, 2–50 ml Falcon tubes	Up to 100 g. for platform with rubber clamps; or 200 g. for platform with metal clamps
Vibro motion	Microtube type tubes only	Up to 100 g.

Table 1. Recommended load depending on motion types

7. Guarantee and Service

7.1 **Guarantee**

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

7.2 **Service**

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

7.3 **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:

PTR-35

Description of Equipment:

Rotator

Directives:

EMC Directive 2004/108/EC
Low Voltage Directive 2006/95/EC

Applied Standards

Harmonized Standards:

EN 61326-1:2006:

Electrical equipment for measurement,
Control and laboratory use -
EMC requirements

Part 1: General requirements

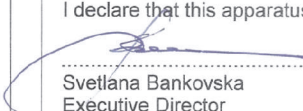
EN 61010:

Safety requirements for electrical equipment for
measurement, control
and laboratory use.

EN 61010-2-051:2003

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 30.07.2010.



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