Grant bio

Thermo shaker
PHMP-100

Operating instructions

For version V.1GW

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1. Safety

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.

Caution! Hot surface! Platform surface becomes very hot during use. Always use protective cotton gloves to install or remove microtest plates and to fix or release fixation holder when set temperature is higher than 60ºC.

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 2-3hrs 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 the switch and external power supply unit are easily accessible during use.
- ☞ Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.

- ☞ 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.
- ☞ Do not operate the unit in premises where condensation can form. Operating conditions of the unit are defined in the Specifications section.

DURING OPERATION

- ☞ Do not leave the operating unit unattended.
- ☞ 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 check the temperature by touch. Use a thermometer.

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

The Thermo-Shaker PHMP-100 is designed for shaking a special platform that holds 2 standard microplates, and controlling the set temperature in the range of 25°C to 100°C (if the room temperature is less than 25°C).

The main features of theThermo-Shaker are

❶ Additional heating source, in the lid of the device, which allows:

- faster heat-up times;
- increase of temperature range;
- reduces condensation in the plate.

❷ Compact size.

❸ Informative LCD, which allows instant control over both **set** and **current** temperatures of the aluminium block, as well as the shaking intensity and duration.

The Thermo-Shaker was designed using the multi-system principle, which allows use as three independent devices:

❶ Incubator – for incubation without shaking of microplates;

❷ Microplate Shaker – for operation in the cold room or other conditions, which do not require temperature stabilisation;

❸ Thermo-Shaker – for immunochemistry and molecular diagnostics, where stringent requirements of repeatability and precision are necessary.

An external 12 V power supply unit is used to power the unit. This makes it safe for use in the cold room, where condensation may cause leakage current from the electric circuit. The device can be used in:

- cytochemistry – for in situ reactions;
- immunochemistry – for immunofermentative reactions;
- biochemistry – for enzyme and protein analysis;
- molecular biology – for matrix analysis.

The maximum guaranteed number of diagnostic cycles in the Thermo-Shaker mode, which require 15–30 min work in one cycle, is 7000–14000 times.

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 Thermo-Shaker set includes:

- Thermo-Shaker PHMP-100.....1 piece
- Spare rubber belt.....2 pieces
- External power supply.....1 piece
- Power cord .....1 piece
- Operating instructions; Declaration of Conformity.....1 copy

3.3 Set up

Place the unit onto an even horizontal non-flammable surface away from any flammable materials (not less than 30 cm);

Remove protective film from the display;

Plug the external power supply unit into the socket at the rear side of the PHMP-100 and position the unit so that there is easy access to the power switch and the external power supply unit.

4. Operation of PHMP-100

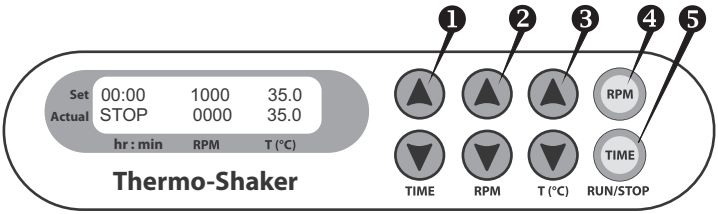


Fig. 1 Control panel

Recommendations during operation

- Please check the plates before using. Don't heat the plates over the melting point of the material they are made of.

⚠ **Caution!** Surfaces of the platform become very hot during the use over 60ºC. To place or remove the microplate use the protective cotton gloves.

4.1. Connect the external power supply unit to a grounded power socket and set the power switch located on the rear panel of the unit to position I ("ON").

4.2. The display will turn on with the upper line (**Set**) showing time, speed and temperature set earlier and the lower line (**Actual**) showing current readings of the same parameters (thermoblock temperature °C, which automatically starts rising according to the temperature set in the upper line). The time of temperature stabilisation depends on the initial temperature.

4.3. **Setting the parameters.** Use the readings in the upper line of the display (**Set**), while setting the required parameters.

4.3.1. **Setting time (TIME).** Using the ▲and ▼keys (Fig. 1/1) set the required working time interval in hours and minutes (increment 1 min). Pressing the key for more than 3 s will increase the increment.

4.3.2. **Setting speed (RPM).** Using the ▲ and ▼ keys (Fig. 1/2) set the required shaking speed (increment 10 RPM). Pressing the key for more than 3 s will increase the increment.

4.3.3. **Setting temperature (T,ºC).** Using the ▲and ▼keys (Fig. 1/3) set the necessary temperature (increment 0.1ºC). Pressing the key for more than 3 s will increase the increment.

Caution! The planform heating can be turned off only by setting the required temperature below 25°C (the display will show OFF - T(°C) - **Set**). It can be used in cold rooms as a mixing device without thermal regulation in this mode.

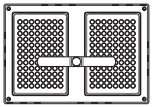
4.4. **Program execution.** After the thermal stabilisation of the unit (when the set and current temperature readings become the same):

4.4.1. Place microplates on the platform and fix it with the special holder by pressing it against the plate covers.

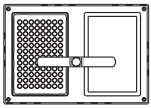
Caution! The microplate fixation screw must always be tightened to avoid damage. Tighten the fixation screw completely when microplates are removed from or placed on the platform. Do not close the lid if the microplate fixation screw is not tightened to avoid damage.

Caution! Load only pairs of microplates for best fixing.

✓ Correct loading



✗ Wrong loading



4.4.2. Press the **RPM-RUN/STOP** key (Fig. 1/4). The platform will start rotating and the timer indicator will start counting up the time interval (with 1 min precision).

4.4.3. After finishing the program the platform motion will stop and the timer will be showing the flashing reading STOP accompanied by the repetitive sound signal until the **RPM-RUN/STOP** key is pressed.

Caution! At the end of the set time period the platform movement is stopped automatically, but the heating has to be stopped by reducing the temperature using the ▼ T(ºC) key (Fig. 1/3 lower key) till the OFF sign appears in the upper part of the display.

4.5. If the working time is not set (or is reset) and the timer indicator in the upper line shows 00:00, pressing the **RPM-RUN/STOP** key will start continuous operation of the Thermo-shaker (timer indicator will start counting up the time interval in the lower line (Actual)) until the **RPM-RUN/STOP** key is pressed again.

Note. The platform temperature will be constantly maintained in accordance with the set temperature. This allows using the device again without pre-heating.

4.6. The timer can be reset during operation if required. Press the **TIME-RUN/STOP** key once (Fig. 1/5) to stop the timer. Press the **TIME-RUN/STOP** key again to restart the timer.

4.7. The platform motion can be stopped at any time by pressing the **RPM-RUN /STOP** key. In this case the program realisation and the platform motion will stop and the timer will switch into the STOP mode saving previously set time. Press the **RPM-RUN/STOP** key to repeat the operation with the same time and speed.

4.8. When lid is open the platform and lid heating surfaces will remain hot. Please, take necessary care and use protective cloth gloves at temperatures over 60°C.

4.9. After finishing the operation set the power switch, located on the rear panel of the unit, in position O (Off) and disconnect the external power supply from electric circuit.

5. Specifications

The unit is designed for operation in cold rooms, incubators and closed laboratory rooms at ambient temperature from +4ºC to +40ºC 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. Temperature specifications

- Setting range .....+25°C ... +100°C
- Ccontrol range .....5°C above RT to +100°C
- Setting resolution 0.1ºC
- Stability (from +25°C to +60°C) .....±0.1°C
- Uniformity over the platform at +37ºC .....±0.2ºC
- Time of thermoblock heating from +25ºC till +100ºC .....60 min

5.2. General specifications

- Speed regulation .....250-1200 rpm
- Speed setting resolution ..... 10 rpm
- Orbit .....2 mm
- Timer with sound signal .....1 min … 96 hrs / non-stop
- Time setting resolution .....1 min
- Display .....16x2 signs, LCD
- Max. height of microwell plates .....18 mm
- Number of microwell plates 2
- Platform dimensions .....250 x 150 mm
- Dimensions .....270x260x125 mm
- Input current / power consumption.....12 V, 5 A / 60 W
- External power supply.....input AC 100-240 V 50/60Hz, output DC 12 V
- Weight* .....5.9 kg

* Accurate within ±10%.

Grant retains the right to make changes and supplements in product design aimed at enhancement of consumer performance and operation quality without prior 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. For full Details of the Grant Bio Warranty policy please contact Grant Instruments.

6.2 Service

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

6.2.1 Replacing Drive belt

For the maintenance of reliable operation of the device Grant recommends to replace the rubber belts after 1.5 years or 2000 hours of operation time.

1. Disconnect the external power supply unit from the device.
2. Remove 4 fixation screws on the device base and remove the bottom plate.
3. Replace the rubber drive belt (fig. 2).
4. Re-assemble the device.

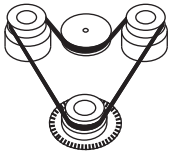


Fig. 2 Drive belt

6.2.2 Spare parts:

- Rubber drive belt (122x6x0.6 mm);
- External power supply unit (part no. 18020) input AC 100–240 V, 50–60 Hz; output DC 12 V.

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

Equipment name:	**PHMP-100**
Type of equipment:	Plate Shaker-Thermostat
Directive:	EMC Directive 2014/30/EC Low Voltage Directive 2014/35/EC RoHS 2011/65/EC WEEE 2002/96/EC & 2012/19/EU
Manufacturer:	BIOSAN SIA 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 61010-2-010:** Particular requirements for laboratory equipment for the heating of materials **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

28.01.2015
Date

Signature

Aleksandr Shevchik
Engineer of R&D

28.01.2015
Date

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