

**Grant bio**

# Digital dry block heating system BTD

*Operating instructions*

*For versions: V.1GD  
V.1GE*





# Contents

---

1	<b>Safety</b> .....	4
2	<b>General Information</b> .....	6
3	<b>Getting Started</b> .....	7
4	<b>Operation of BTD</b> .....	8
5	<b>Fault diagnosis</b> .....	10
6	<b>Maintenance</b> .....	11
7	<b>Specifications</b> .....	12
8	<b>Guarantee and service</b> .....	13
9	<b>Declaration of Conformity</b> .....	14

# 1. Safety

---

The following symbols mean:








**Caution!** Make sure you have fully read and understood the operating instructions before using the equipment. Please pay special attention to sections marked by this symbol.









**Caution!** Surfaces can become hot during use.







## GENERAL SAFETY

-  Use only as specified in the operating instructions provided.
-  The unit should not be used if dropped or damaged.
-  After transportation or storage keep the unit under room temperature for 2–3 hrs before connecting to 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 electric circuit with voltage corresponding to that on the serial number label.
-  Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
-  Ensure that the switch and the plug are easily accessible during use.
-  If liquid penetrates into the unit, disconnect it from electric circuit and have it checked by a repair and maintenance technician.
-  Disconnect the unit from the electric circuit before moving.
-  Do not operate the unit in premises where condensation can form.

## DURING OPERATION

-  Use only tubes of standard size.
-  Do not check the temperature by touch. Use a thermometer.
-  Do not operate the unit in environments with aggressive or explosive chemical mixtures. Please contact the 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 leave the operating unit unattended.

## BIOLOGICAL SAFETY

-  It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilled on or penetrates into the equipment.

## 2. General Information

---

BTD is a compact easy-to-use thermostat for microtubes. It is specially designed for long incubation at different temperatures.

Universal aluminum block accommodates 3 types of tubes (24 x 2/1.5 ml tubes, 15 x 0.5 ml tube, 10 x 0.2 ml tubes).

The BTD device is applicable in:

- MOLECULAR AND GENETIC ENGINEERING, CELL BIOLOGY – for PCR analysis, for temperature stabilisation in DNA/RNA restriction and denaturation reaction;
- BIOCHEMISTRY – for enzyme processes analyses;
- MICROBIOLOGY – for anaerobic microorganism cultivation,
- CHEMISTRY – for the preliminary heating of reagents in chromatography (especially when analysing chemical and biological components of fatty acids, which condense in cold microsyringes).

# 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 Package contents

- Dry Block Heating System BTD .....1 piece
- Power cord.....1 piece
- Spare fuse (inside fuse holder).....1 piece
- Operating instructions, Declaration of Conformity .....1 copy

## 3.3 Set up

- place the unit on an even horizontal non-flammable surface at least 20 cm away from any flammable materials;
- remove protective film from the display;
- plug the power cord into the socket on the rear side, and position the unit so that there is easy access to the power switch and plug.

# 4. Operation of BTD

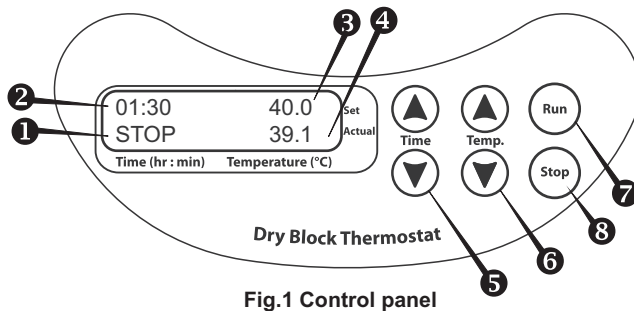


Fig.1 Control panel

## Recommendations during operation

- Please check the tubes before using, be sure that tubes are thermoresistant. Don't heat the tubes over the melting point of the material they are made of. Remember that thin-walled tubes have a higher thermoconducting factor.
  - Tube caps can open under the action of high temperature ( $> 85^{\circ}\text{C}$ ), thus causing sample volume shrinkage or potential health risk when working with infected material. To prevent such cases it is recommended to use tubes with cap lock of Safe-Lock® type.
  - Do not fill tubes more than 3–5 mm over the level they are immersed in the heater block.
- 4.1. Connect the power cord to a grounded power socket and switch ON (position I) the power switch located on the rear panel of the unit.
  - 4.2. The unit will turn on and the following readouts will be shown on the display:
    - previously set time and temperature in the upper line (**Set**);
    - timer indication *STOP* and current temperature in the lower line (**Actual**).
  - 4.3. **Temperature setting.** Use the ▲ and ▼ **Temp.** keys (Fig.1/⑤) to set the required temperature (Fig.1/⑥). Pressing the key for more than 2 sec will increase the increment.
  - 4.4. The heat block heating. The actual temperature will be shown in the lower line of the display (Fig.1/⑥).



- 4.5. After thermal stabilisation of the unit (i.e. after the set and the current temperature become equal) place tubes into the block.
- 4.6. **Time setting.** The unit is equipped with an independent timer for convenient control over the sample incubation time.  
Use the ▲ and ▼ **Time** keys (Fig.1/⑤) to set the required sample incubation time in hours and minutes (hr:min). Pressing the key for more than 2 sec will increase the increment. The set time value will be shown in the upper line of the display (Fig. 1/②).
- 4.7. Press the **Run** key (Fig.1/⑦) to start the timer. The elapsed time will be indicated in the lower line of the display (Fig.1/⑧).
- 4.8. After the set time interval elapses, the timer will give a sound signal and a blinking STOP indication will be shown on the display. Press the **Stop** key (Fig.1/⑨) to stop the signal.



**Attention!** Stopping the timer does not stop the heating/temperature maintenance process. The heating can be stopped by reducing the temperature below 25°C using the ▼ T, C key (Fig. 1/⑥) (OFF indication will be shown on the display, fig.1/③).

- 4.9. The timer can be stopped before the set time interval elapses if necessary by pressing the **Stop** key. Press the **Run** key to restart the timer with the same time interval.
- 4.10. The set time interval can be changed at any time during the timer operation - just stop the timer and make the changes required.
- 4.11. If the working time is set to 00:00, the unit will operate non-stop.
- 4.12. After finishing the operation switch OFF (position O) the unit with the power switch, unplug the power cord from electric circuit.

## 5. Fault diagnosis

<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>ACTION REQUIRED</b>
<b>NO DISPLAY</b>	Unit not switched on. Unit not connected to power supply. Power supply failure. Fuse blown in unit or plug (UK units only).	Switch on. Connect to power supply. Check that other electrical appliances on the same circuit are working. Check and replace (see 6.2).
<b>TEMPERATURE DOES NOT RISE WHEN EXPECTED</b>	Set temperature is lower than block temperature. Set temperature is too close to ambient. Thermal fuse has operated. Temperature control circuit fault.	Check set temperature. Raise set temperature. Have BTB thermal fuse replaced by a competent person. Have unit checked by competent person.
<b>TEMPERATURE CONTINUES TO RISE WHEN NOT EXPECTED</b>	Set temperature is higher than the block temperature. Temperature control circuit fault.	Check setting. Have unit checked by competent person.

# 6. Maintenance

---

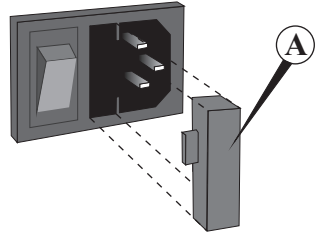
Where applicable all Grant laboratory products are designed to comply with IEC61010-1 and can be flash tested. Some are fitted with radio frequency interference suppressers. Therefore it is recommended that only a D.C. test be performed.  
No other routine service is required.

## 6.1 Cleaning

The cases can be cleaned with a damp cloth after disconnection. Do not use solvents. Before using any decontamination or cleaning method except that recommended, check with our Service Department, or in other countries with our distributor, that the proposed method will not damage the equipment.

## 6.2 Replacement of fuses

Disconnect from the mains outlet.  
Remove the power plug from the rear of the unit.  
Pull out the fuse holder by applying leverage in recess (A). Remove the fuse from the holder.  
Check and replace with the correct fuse if necessary (2 A for 230 V or 3.15 A for 120 V).



# 7. Specifications

---

The product is designed for operation indoors in a laboratory at altitudes up to 2000 m, with 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.

## 7.1 Temperature specifications

- Temperature setting range .....+25°C to +100°C
- Temperature control range .....5°C above ambient ... +100°C
- Setting resolution .....0.1°C
- Temperature stability at +37°C.....±0.1°C
- Temperature uniformity at +37°C .....±0.1°C
- Over temperature protection .....internal thermal breaker

## 7.2 General specifications

- Digital time setting range .....1 min – 96 hrs or non-stop
- Display .....LCD, 2 x 16 signs
- Block diameter / depth .....130 mm / 45 mm
- Dimensions (WxDxH) ..... 210x230x115 mm
- Working voltage .....120 V, 50/60 Hz or 230 V, 50/60 Hz
- Consumed power 120/230 V .....200 W (1.7 A) / 200 W (870 mA)
- Weight\* .....2.8 kg
- Block capacity .....24 x 2/1.5 ml +15 x 0.5 ml + 10 x 0.2 ml tubes

\* Accurate within ±10%.

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

# 8. Guarantee and Service

---

## 8.1 Guarantee

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

## 8.2 Service

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

## 8.3 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:	BTD
Description of Equipment:	Digital Block Heater
Directives:	EMC Directive 2004/108/EC Low Voltage Directive 2006/95/EC

Applied Standards	EN 61326: Electrical equipment for measurement, control and laboratory use - EMC requirements Part 1: General requirements
Harmonized Standards:	EN 61010: Safety requirements for electrical equipment for measurement, control and laboratory use. Part 1: General requirements Part 2-010: Particular requirements for laboratory equipment for the Heating of materials

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

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

Dated ..... 31.01.2011 .....

# Other **Grant bio** products



**PHMP • PMS-1000i • PHMT  
PSU-10i**

SHAKERS and THERMO SHAKERS



**PV1 • PCV-2400 • PCV-3000  
PCV-6000**

VORTEXER and  
CENTRIFUGE/VORTEXER



**PTR-30 • PTR-60**

360° MULTI-FUNCTION ROTATOR



**PMR-30**

PLATFORM ROCKER



**PS-3D • PS-M3D**

3D ROTATOR



**PCH-1**

COOLER/HEATER



**BTD**

DIGITAL DRY BLOCK HEATING SYSTEM

# Grant bio

**Grant Instruments  
(Cambridge) Ltd**

Shepreth  
Cambridgeshire  
SG8 6GB  
UK

Tel: +44 (0) 1763 260811

Fax: +44 (0) 1763 262410

Email: [scientificsales@grantinstruments.com](mailto:scientificsales@grantinstruments.com)

[www.grantinstruments.com](http://www.grantinstruments.com)