

Bio TDB-100 Dry Block Thermostat



**Operating Manual
Certificate**

for versions:
V.2AD
V.2AE

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1. Safety Precautions

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!

Surfaces can become hot during use.

GENERAL SAFETY

- Use only as specified in the Operating Manual provided.
- The unit should be saved from shocks or falling.
- After transportation or storage keep the unit under room temperature for 2-3 h before connecting to electric circuit.
- Before using any cleaning or decontamination methods except those recommended by the manufacturer, check with the manufacturer that the proposed method will not damage the equipment.
- 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 electric circuit before moving.
- Do not operate the unit in premises where condensation can form. Operating conditions of the unit are defined in the Specification section.

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 manufacturer for possibility of unit operation in specific atmosphere.
- 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 spilt on or penetrates into the equipment.

2. General Information

Bio TDB-100 is a compact easy-to-use thermostat for microtest tubes. 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 Bio TDB-100 device is applicable in:

**MOLECULAR AND GENE
ENGINEERING, CELL
BIOLOGY**

for PCR analyses, for temperature stabilisation in DNA/RNA restriction and denaturation reaction;

BIOCHEMISTRY

for the enzyme processes analyses;

MICROBIOLOGY

for the 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 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.

Warranty covers only the units transported in the original package.

3.2. Complete set. Package contents:

- Bio TDB-100 Dry Block Thermostat with aluminium block..... 1 pce
- power cord..... 1 pce
- spare fuse (inside fuse holder) 1 pce
- Operating manual, Certificate 1 copy

3.3. Set up:

- place the unit upon 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

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°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 heat block slot.
- 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.1/6) to set the required temperature (Fig.1/3). 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.1/4).
- 4.5. After thermal stabilisation of the unit (i.e. after the set and the current temperature become equal) place tubes into the block sockets.
- 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.1/1).
- 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.1/8) to stop the signal.



Caution!

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 ▼ **Temp** 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.

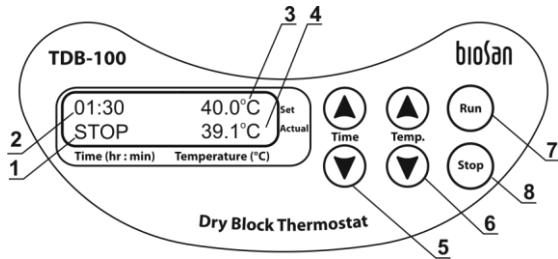


Fig.1 Control panel

5. Calibration

- 5.1. The device is pre-calibrated at the factory (calibrating coefficient is 1.00) for operation with temperatures, measured by a sensor, installed in the heating block.
- 5.2. To enter the calibration coefficient, hold the **Stop** key (fig. 1/8) pressed for more than 8 s to activate calibration mode. The calibration coefficient will be shown on the display (fig. 2/1).
- 5.3. **Restoring factory settings.** Set 1.000 value using the **▲** and **▼ Temp** keys (fig. 1/6) as shown on Fig. 2/1 to restore the factory settings. Press the **Run** key (fig. 1/7) once to save the changes and exit the calibration mode.



Note. Coefficient value changes are recommended after the unit has reached 30°C temperature.

- 5.4.1. **Calibration procedure.** Install independent sensor (0.5°C accuracy) into microtubes placed into the block sockets.
- 5.4.2. Set the required temperature in operation mode (e.g. 40°C).

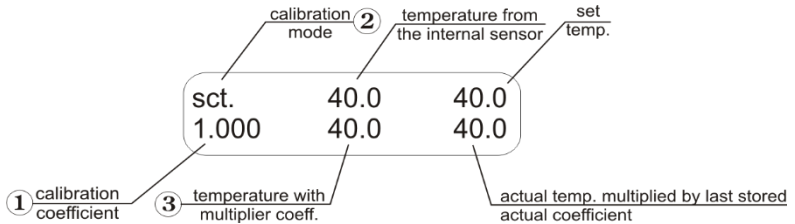


Fig.2 Control panel in calibration mode

- 5.4.3. After the unit reaches the set temperature (when the set and current temperature readings equal) leave the unit for 30 min for thermal stabilization.
- 5.4.4. Let us assume that the readings of independent sensor is 39°C, but the display's actual temperature is 40°C (fig. 1/4). Then it is necessary to add 1°C correction.
- 5.4.5. Hold **Stop** key (fig. 1/8) pressed for more than 8 s to activate calibration mode. The following parameters will be shown on the display (fig. 2).
- 5.4.6. Using the **Temp ▲** and **▼** keys (fig. 1/6), change the calibration coefficient (fig. 3/1) so that the new temperature value (fig. 3/2) corresponds to the independent sensor temperature. In our example, the calibration coefficient will be 0.974.



Note. Calibration coefficient can be changed in range from 0.936 up to 1.063 with increment 0.001. This calibrating coefficient will correct temperature through all the operation range.



Note. Coefficient value changes are recommended after the unit has reached 30°C temperature.

- 5.4.7. After finishing the calibration, press the **Run** key (fig. 1/7) once to save the changes and exit the calibration mode.
- 5.4.8. The display will show calibrated temperature as shown on fig. 4/1 and the unit will continue thermal stabilization according to the previously set temperature.

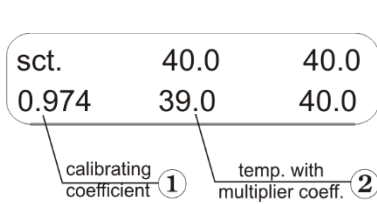


Fig. 3. Control panel in calibration and operation mode

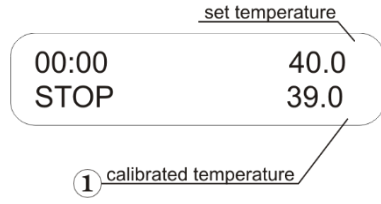


Fig. 4. Control panel in operation mode after calibration

6. Specification

The unit is designed for operation in cold rooms, incubators and closed laboratory rooms at ambient temperature from +4C 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.

6.1. Temperature specifications

Setting range	+25°C to +100°C
Control range	5°C above ambient ... +100°C
Setting resolution	0.1°C
Stability at +37°C	±0.1°C
Uniformity at +37°C.....	±0.1°C
Over temperature protection	internal thermal breaker
Temperature calibration option	
Calibration coefficient range	0.936 ... 1.063 (± 0.063)

6.2. 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 V/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

Biosan is committed to a continuous programme of improvement and reserves the right to alter design and specifications of the equipment without additional notice.

* Accurate within ±10%.

7. Maintenance

- 7.1. If the unit requires maintenance electric circuit, disconnect the unit from electric circuit and contact Biosan or your local Biosan representative.
- 7.2. All maintenance and repair operations must be performed only by qualified and specially trained personnel.
- 7.3. Standard ethanol (75%) or other cleaning agents recommended for cleaning of laboratory equipment can be used for cleaning and decontamination of the unit.
- 7.4. **Fuse replacement**

Disconnect from electric circuit. Remove the power plug from the rear of the unit. Pull out the fuse holder by applying leverage in recess (fig. 5/A). Remove the fuse from the holder. Check and replace with the correct fuse if necessary, M 2 A for 230 V or M 3.15 A for 120 V (type **M** – time lag: **Medium**).

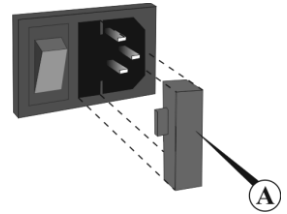


Fig. 5. Fuse replacement

8. Warranty and Claims

- 8.1. The Manufacturer guarantees the compliance of unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.
- 8.2. The warranted service life of unit from date of delivery to the Customer is 24 months. Contact your local distributor to check availability of extended warranty.
- 8.3. Warranty covers only the units transported in the original package.
- 8.4. If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment claim shall be compiled, certified and sent to the local distributor address. Please visit www.biosan.lv, Technical support section to obtain the claim form.
- 8.5. The following information will be required in the event that warranty or post-warranty service comes necessary. Complete the table below and retain for your records.

Model	Bio TDB-100 Dry Block Thermostat
Serial number	
Date of sale	

9. Declaration of Conformity

Declaration of Conformity

Equipment name:	Bio TDB-100
Type of equipment:	Dry Block 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:	SIA BIOSAN 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.

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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