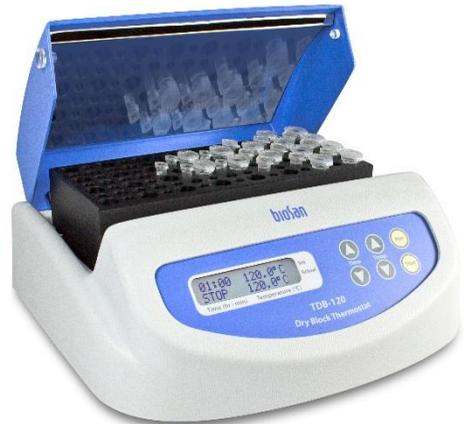
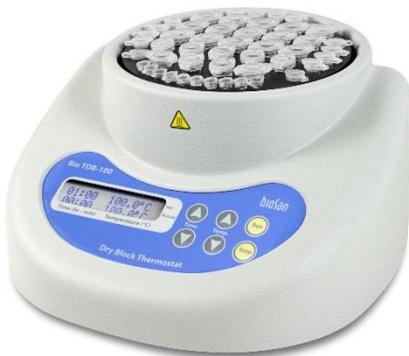


# Bio TDB-100 & TDB-120 Dry Block Thermostats



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## 1. About this edition of user instructions

The current edition of the user instructions applies to the following models and versions of dry block thermostats:

- **Bio TDB-100**            versions V.3AD and V.3AE
- **TDB-120**             versions V.7AD, V.7AE, V.8AD and V.8AE

## 2. 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. Always use protective cotton gloves to install or remove samples when the temperature is set higher than 60°C

### GENERAL SAFETY

- The protection provided can be ineffective if the operation of the appliance does not comply with the manufacturer's requirements.
- The unit should be saved from shocks or falling.
- Store and transport the unit at ambient temperatures between -20°C and +60°C and maximum relative humidity of 80%.
- 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 the mains 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.

### 3. General information

Bio TDB-100 / TDB-120 – compact, easy-to-use thermostat for Eppendorf type microtubes. It is specially designed for long incubation at different temperatures. Thermostat has undeniable advantage working with microquantities of reagents in microtubes. The thermostat possesses unprecedentedly high precision and uniformity of temperature distribution over the block.

With the help of the software-enabled temperature calibration function, the user can calibrate the unit in the range of several percent of the selected temperature to compensate differences in the thermal behaviour of tubes from different manufacturers.

The thermostat can be used 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).

Depending on the model, different quantities of microtubes of different volumes can be placed in the thermostat.

**Table 1. Block capacity, by model**

Thermostat model	Microtube			
	0.2 ml	0.5 ml	1.5 ml	2.0 ml
Bio TDB-100	10	15	24*	
TDB-120 with A-53	-	21	32	-
TDB-120 with A-103	100	21	32	-

\* Microtubes of 1.5 ml in volume fit in the sockets for 2.0 ml microtubes

## 4. Getting started

- 4.1. **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.
- 4.2. **Complete set.** Package contains:
- Dry block thermostat with aluminium block ..... 1 pce.
  - Spare fuse (inside fuse holder) ..... 1 pce.
  - Power cable ..... 1 pce.
  - Operating manual, Certificate ..... 1 copy
- 4.3. **Setup.**
- 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 cable into the socket on the rear side of the unit, and position it with easy access to the power switch and plug.

## 5. Operation

### Recommendations during operation



Please check the tubes before using, be sure that tubes are heat resistant. 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<sup>®</sup> type.
- Do not fill tubes more than 3-5 mm over the level they are immersed in the heat block slot.

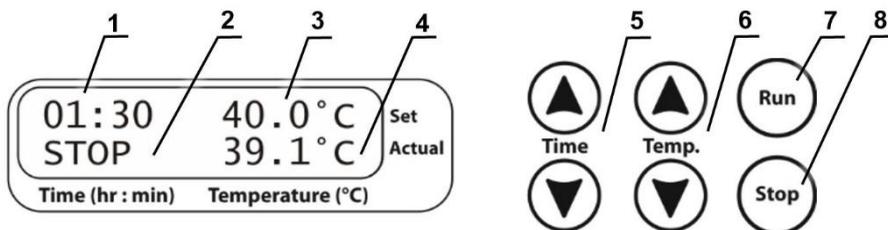


Figure 1. Control panel

- 5.1. 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.
- 5.2. 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).
- 5.3. **Temperature setting.** Use the ▼ and ▲ **Temp.** keys (fig. 1/6) to set the required temperature. Pressing the key for more than 2 s makes values change faster. Set temperature is displayed in the upper line of the display (fig. 1/3)
- 5.4. The heat block starts the heating. The actual temperature will be shown in the lower line of the display (fig. 1/4).
- 5.5. After thermal stabilisation of the unit (i.e. after the set and the current temperature equalize), place tubes into the block sockets.
- 5.6. **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 (hh:mm). Pressing the key for more than 2 s makes values change faster. Set time is displayed in the upper line of the display (fig. 1/1)



**Caution!** (For model TDB-120) To avoid deformation of the lid, do not set the time longer than 8 h when setting the temperature above +100°C.

- 5.7. 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. 1/2). After the set time interval elapses, unit begins beeping and a blinking STOP indication shows on the display. Press the **Stop** key (fig. 1/8) to stop the signal.

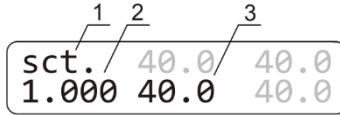


**Caution!** Stopped timer does not stop the heating / temperature maintenance process. The heating can be stopped by lowering the temperature below 25°C using the ▼ **Temp** key (OFF indication shows on the display, fig.1/3).

- 5.8. 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.
- 5.9. The set time interval can be changed at any time during the timer operation - just stop the timer and make the changes required.
- 5.10. If the working time is set to 00:00, the unit will operate non-stop.
- 5.11. After finishing the operation, switch OFF (position O) the unit with the power switch, unplug the power cord from electric circuit.

# 6. Calibration

- 6.1. The device is precalibrated at the factory (calibrating coefficient is 1.000) for operation with temperatures measured by a sensor in the heating block.
- 6.2. To change the calibration coefficient, hold the **Stop** key (fig. 1/8) pressed for more than 8 s to activate calibration mode. The calibration coefficient appears on the display (figure 4).



**Figure 2. Display in calibration mode: 1. Calibration mode indicator; 2. Calibration coefficient; 3. Temperature with current coefficient**

 **Note.** Values marked in grey on figures 2 and 3 are not used in calibration and are meant for service engineers.

- 6.3. **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.

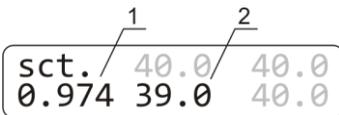
- 6.4. **Calibration procedure.** To calibrate the unit, use an independent sensor with 0.5°C accuracy, which can fit in the cell in the block.

- 6.4.1. Install the sensor into a cell in the block.
- 6.4.2. Set the required temperature in operation mode (e.g. 40°C).
- 6.4.3. After the unit reaches the set temperature (when the set and current temperature readings equal), leave the unit for 30 min for thermal stabilization.
- 6.4.4. Let us assume that the readings of independent sensor is 39°C, but the display's actual temperature is 40°C. Then, it is necessary to add 1°C correction.
- 6.4.5. Hold the **Stop** key pressed for more than 8 s to activate calibration mode (figure 2).
- 6.4.6. Using the **▲** and **▼ Temp** keys, 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.

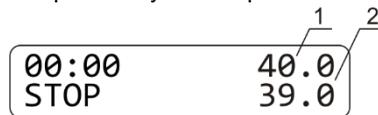
 **Note.** Calibration coefficient can be changed in range from 0.936 to 1.063 (±0.063, for model **Bio TDB-100**) or from 0.968 to 1.031 (±0.031, for model **TDB-120**), with increment of 0.001. This calibrating coefficient will correct temperature through all the operation range.

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

- 6.4.7. Press the **Stop** key once to save the changes and exit the calibration.
- 6.5. 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.



**Figure 3. Changing the coefficient:**  
1. Calibration coefficient; 2. Temperature with current coefficient



**Figure 4. Display after calibration:**  
1. Set temperature; 2. Current calibrated temperature

## 7. Specification

The unit is designed for operation in cold rooms, incubators (excluding CO<sub>2</sub> incubators) and closed laboratory rooms at 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.

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

	<b>Bio TDB-100</b>	<b>TDB-120</b>
Temperature setting range	+25°C ... +100 °C	+25 °C ... +120 °C
Temperature regulation range	5°C above RT <sup>1</sup> ... +100°C	5°C above RT <sup>1</sup> ... +120°C
Temperature increment	0,1°C	
Stability at +37°C	±0,1°C	
Uniformity at +37°C	±0,1°C	
Heat up time, from +25°C to +37°C	4 min	
Internal thermal breaker	Yes	
Calibration option	Yes	
Calibration coefficient range	0.936 – 1.063 (±0.063)	0.968 – 1.031 (±0.031)
Digital time setting	1 minute - 96 hours or non-stop	
Display	2x16 digit, LCD	
Dimensions	210x230x115 mm	230x210x110 mm
Working current	230 V, 50/60 Hz	
Power and current consumption	870 mA, 200 W	
Weight <sup>2</sup>	2.8 kg	

## 8. Ordering information

8.1. Models and versions available:

<b>Model</b>	<b>Block capacity</b>	<b>Version</b>	<b>Voltage, frequency</b>	<b>Catalogue number</b>
Bio TDB-100	Cylindrical/conical tubes, 10x0.2 ml, 15x0.5 ml, 24x1.5/2.0 ml	V.3AD	230 V, 50 Hz	BS-010111-AAA
		V.3AE	120 V, 60 Hz	
TDB-120	Block <b>A-53</b> for conical tubes, 21x0.5 ml, 32x1.5 ml	V.7AD	230 V, 50 Hz	BS-010135-AAA
		V.7AE	120 V, 60 Hz	
	Block <b>A-103</b> for conical tubes, 50x0.2 ml, 21x0.5 ml, 32x1.5 ml	V.8AD	230 V, 50 Hz	
		V.8AE	120 V, 60 Hz	

<sup>1</sup> Room temperature

<sup>2</sup> Accurate within 10%

## 9. Care and maintenance

- 9.1. If the unit requires maintenance, disconnect the unit from the mains and contact Biosan or your local Biosan representative.
- 9.2. All maintenance and repair operations must be performed only by qualified and specially trained personnel.
- 9.3. Cleaning and disinfection.
  - 9.3.1. Standard ethanol solution (75%) or other cleaning agents recommended for cleaning of laboratory equipment can be used for cleaning and decontamination of the unit.
  - 9.3.2. For decontamination, it is recommended to use a special DNA/RNA removing solution (e.g. Biosan PDS-250, DNA-Exitus Plus™, RNase-Exitus Plus™).
- 9.4. Fuse replacement.
  - Disconnect from electric circuit.
  - Remove the power plug from the rear side 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**).

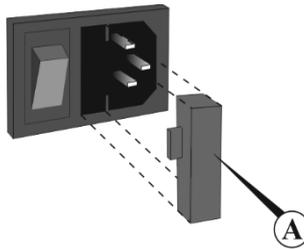


Figure 5. Fuse replacement

# 10. Warranty

- 10.1. The manufacturer guarantees the compliance of unit with the requirements of specifications, if the customer follows the operation, storage and transportation instructions.
- 10.2. The warranted service life of unit from date of delivery to the customer is 24 months. For extended warranty, see **10.5**.
- 10.3. Warranty covers only the units transported in the original package.
- 10.4. If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment report shall be compiled, certified and sent to the local distributor address. Please visit the **Technical support** section on our website at the link below to obtain the claim form.
- 10.5. Extended warranty. For **Bio TDB-100** and **TDB-120**, the *Basic Plus* class models, extended warranty is a paid service. Contact your local Biosan representative or our service department through the **Technical support** section on our website at the link below.
- 10.6. Description of the classes of our products is available in the **Product class description** section on our website at the link below.

**Technical support**



[biosan.lv/en/support](https://biosan.lv/en/support)

**Product class description**



[biosan.lv/classes-en](https://biosan.lv/classes-en)

- 10.7. 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.

<b>Model</b>	<b>Serial number</b>	<b>Date of sale</b>
Bio TDB-100 / TDB-120, dry block thermostats		

## 11. EU Declaration of conformity

# EU Declaration of Conformity

**Unit type** Dry block thermostats

**Models** **Bio TDB-100, TDB-120, CH-100, CH3-150, DB-4S, DB-10C**

**Serial number** 14 digits styled XXXXXYYMMZZZZ, where XXXXXX is model code, YY and MM – year and month of production, ZZZZ – unit number.

**Manufacturer** SIA BIOSAN  
Latvia, LV-1067, Riga, Ratsupites 7 k-2

The objects of the declaration described above is in conformity with the following relevant Union harmonization legislations:

<b>LVD 2014/35/EU</b>	<b>LVS EN 61010-1:2011</b> Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements. <b>LVS EN 61010-2-010:2015</b> Particular requirements for laboratory equipment for the heating of materials.
<b>EMC 2014/30/EU</b>	<b>LVS EN 61326-1:2013</b> Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements.
<b>RoHS3 2015/863/EU</b>	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
<b>WEEE 2012/19/EU</b>	Directive on waste electrical and electronic equipment.

I declare that the Declaration of Conformity is issued under sole responsibility of the manufacturer and belongs to the above-mentioned objects of the declaration.

Svetlana Bankovska  
Managing director



\_\_\_\_\_  
Signature

07.02.2020.  
\_\_\_\_\_  
Date

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