

Dry Bath Incubator with Cooling

Cat. No. BT1109

Thank you for choosing BT Lab Systems' Dry Bath Incubator with Cooling. This operation manual describes the function and operation of the instrument. In order to use the instrument properly, please read this manual carefully.

IMPORTANT SAFETY INFORMATION

- Please read this operation manual carefully before using the instrument.
- The operation, maintenance and repair of the instrument should comply with the basic guidelines and warning below. Ignoring these instructions will affect the life of the instrument and safety precautions.
- This product is an indoor Instrument.
- These units are designed for laboratory use by persons knowledgeable in safe laboratory practices.
- The operator should never open or repair the instrument. Opening or repairing the instrument will void the guarantee and can cause accidents.
- The power plug should safeguard against an electric shock. The 3-pin plug supplied with the instrument should be matched with a suitable grounded socket.
- The temperature of the metal block will be very high during the normal operation. This will produce scalding or boiling liquid. Do not touch any part of the body to the instrument to avoid scalding.
- Close the test tube lid before putting the tube into the block. Liquids may spill out in the block or onto the device if the tube lid is open, which will damage the block or the device.
- Make sure the outlet voltage complies with the voltage required. Make sure there is nothing else plugged into the same outlet. Hold the plug when pulling out the power line. Do not plug the cord in where it is a tripping hazard.
- The instrument should be used in an area with low temperature, little dust, no water, no sunshine or hard light and with good air circulation. Do not use where there is corrosive gas or a strong magnetic field. Keep far away from central heating, camp stove and other hot sources. Do not put the instrument in a wet and dusty area. The vent on the instrument is designed for aeration. Do not wall up or cover the vent. The distance between each device should be more than 100cm when there is more than one instrument.
- Main switch is on the rear of the device. Push "I" to power on the device, and push "O" to power off the device.
- Power off when not in use. If the instrument will not be used for a long period, unplug, and cover with a piece of cloth to protect it from dust.
- In case of the following, unplug the instrument at once and contact BT Lab Systems. o The instrument comes into contact with liquid
 - The instrument gets soaked or burned
 - The instrument emits an abnormal sound or smell
 - The instrument is dropped or the outer shell damaged
 - The instrument functions abnormally.

MAINTENANCE

The well in the block should be cleaned with a cloth dampened with alcohol. If there are smudges on the instrument, clean it with a dry cloth.

Turn the power off before cleaning the instrument. Do not put cleaning fluid into the well of the block.

Do not use corrosive cleaning fluid.

INTRODUCTION

The Dry Bath Incubator with Cooling is designed with a microprocessor controller. It is used for preservation and reaction of samples, DNA amplification and electrophoresis and blood serum coagulation.

KEY FEATURES

- Temperature and time is digitally displayed in LCD and digitally controlled.
- Displays program and current temperature.
- The time and temperature is adjustable.
- Metal block prevents product pollution.
- Easy replacement, cleaning and disinfecting of metal block.
- Buzzer sounds at end of temperature program.

NORMAL OPERATING CONDITIONS

Ambient temperature: 5°C-30°C

Relative humidity: ≤ 70%

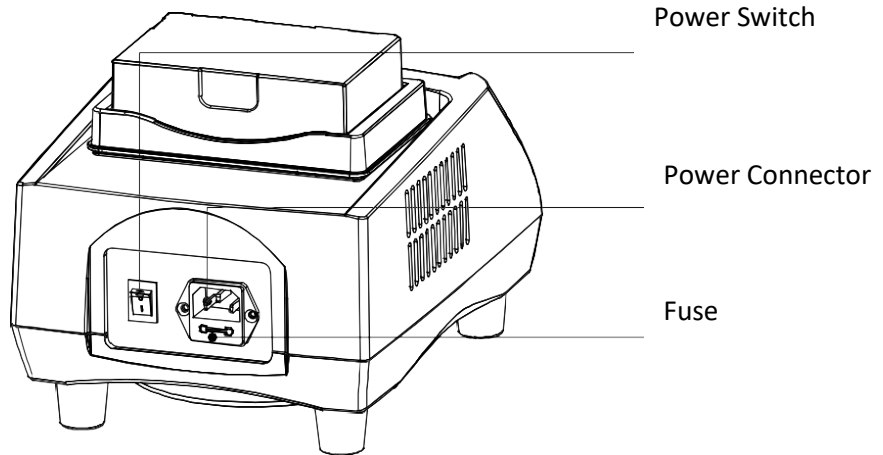
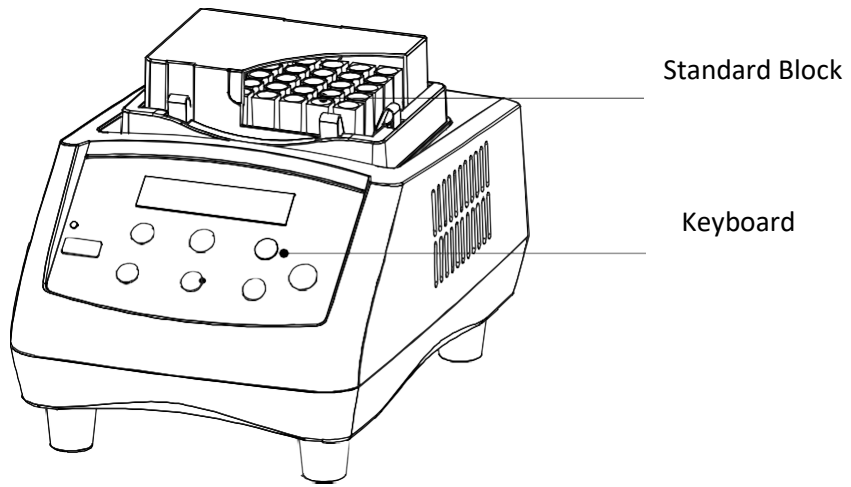
Power supply: 100-230V~ 50/60Hz

TECHNICAL SPECIFICATIONS

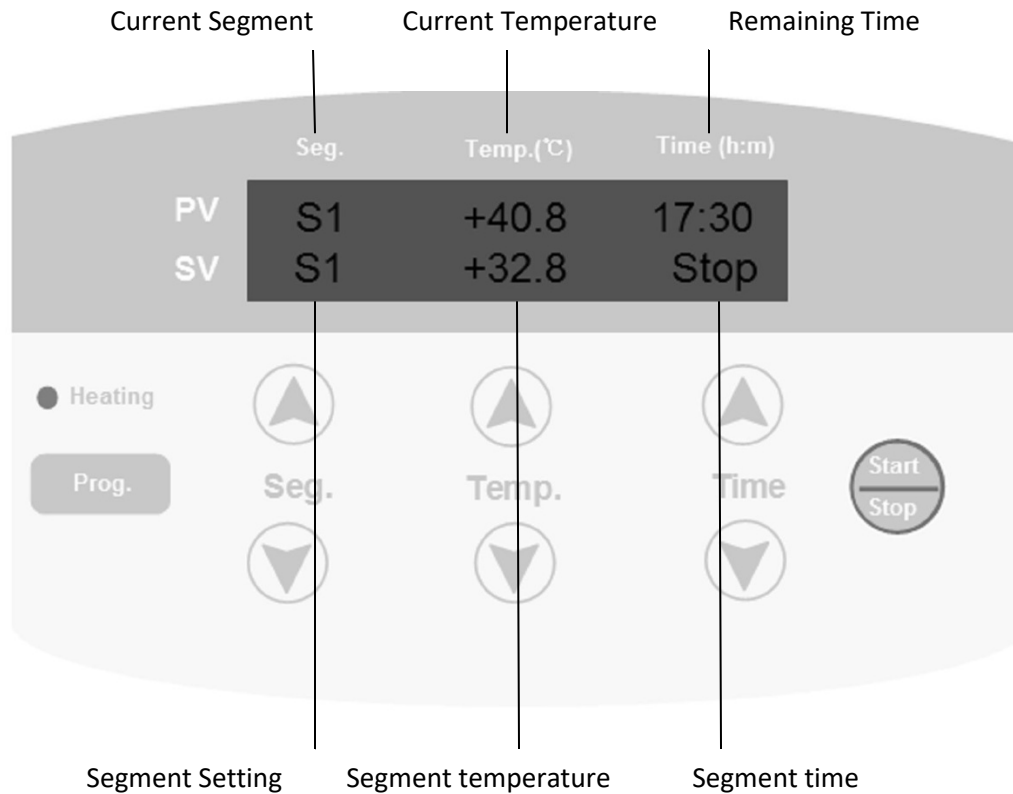
- Temperature range: 10 -100°C
NOTE: This dry bath can reach -10°C when the ambient temperature less than 25°C.
- Time range: 1 min - 99h59min
- Accuracy of the temperature: ≤ 0.5°C
- Display Accuracy: 0.1°C
- Heating time: (from 20°C to 100°C) ≤ 15min
- Cooling time: (from RT to RT-30°C) ≤30min (@ambient temperature of 26°C)
- Heating mode: TE Module
- Cooling mode: TE Module
- Power supply: 150W
- Fuse: 250V 3A Φ5×20
- Dimension: (mm) 270(D)×196(W)×170(H)
- Net weight: (kg) 4.2

OVERVIEW

This section describes the instrument's mechanical structure, the keyboard and functions of each key, as well as preparation before turning the power on. Please learn this section well before operating the instrument for the first time.



KEYBOARD AND DISPLAY PANEL



KEY FUNCTIONS

1. SEG "UP" or "DOWN" arrow - Key for selecting segment. Five segments can be selected (S1, S2, S3, S4, S5)
2. Temp. "UP" or "DOWN" arrow -Key for temperature setting. Press "UP" or "DOWN" arrow to set the target temperature. Holding "UP" or "DOWN" arrow will quickly set the temperature.
3. Time. "UP" or "DOWN" arrow -Key for time setting. Press "UP" or "DOWN" arrow to set the target time. Holding "UP" or "DOWN" arrow will quickly set the time.
4. PROG - Key for programming. Press "PROG" to select segment. Default starting segment is S1. The instrument can implement 4 programs: S1-S2, S1-S2-S3, S1-S2-S3-S4, S1-S2-S3-S4-S5.
5. Start/Stop - Press Start/Stop key to start or stop the program. To stop the program while operating hold the start/stop key for around 2 seconds.

OPERATION

Single Temperature and Time Setting

1. The LCD reads "System-Testing" when the instrument is powered on. A beep sounds.
2. Example: After 6 seconds, the LCD displays the program. "S1" is the segment run in the last operation. "30.0" indicates current temperature of the block. "37.0" is the setting temperature,
3. "10:00" is the setting time of the last operation. Temperature unit is °C and time unit is hour:minute.

4. 3. Pressing the TEMP “UP” or “DOWN” arrow will increase or reduce the temperature and the setting value units.
5. Pressing the Time “UP” or “DOWN” arrow will increase or reduce the time the same way.
6. The program will auto confirm and save the setting.
7. 4. After finishing setting the segment, press “stop/start” key to run the segment.
8. 5. Press SEG. “UP” or “DOWN” arrow. to select Segment. Set the segment’s values according to step 3 above. A total of five segments can be set.

Multi-program Setting

1. Press “PROG” key to connect segments as S1-S2, S1-S2-S3, S1-S2-S3-S4, or S1-S2-S3-S4-S5.
2. Note: the start segment is always segment S1.
3. Press “PROG” key to enter program display. “Start:S1” means the first section of the multi-program is segment S1. It cannot be changed. “End:S2” means the last operation segment is segment S2. Example: Press the “UP” arrow key of Seg. to change it to “S4”. Press “PROG” key to confirm. The multi-program setting is S1-S2-S3-S4.
4. Press “Start/Stop” key to run the multi-program.

Note: Press “Start/Stop” key to run the multi-program after changing the segments.

TEMPERATURE CALIBRATION

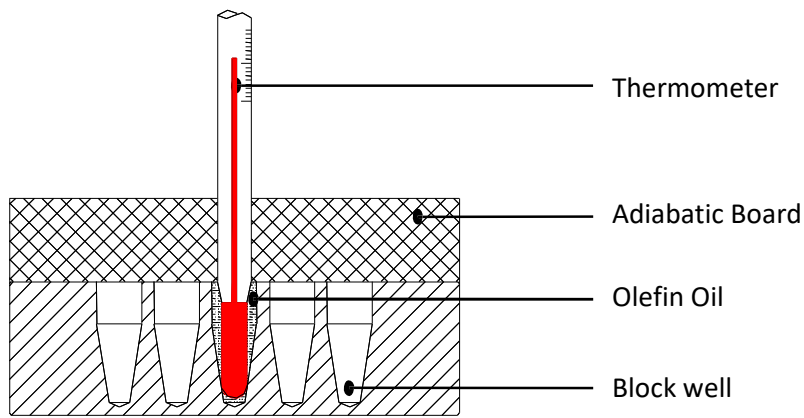
The temperature of the instrument has been adjusted before it is sold. If there is deviation between the actual temperature and the displayed temperature, you can do as follows to calibrate it.

NOTICE:

The instrument uses two temperature adjustments to ensure its accuracy. It is linearly adjusted on 40°C, and 100°C. The temperature accuracy will be within $\pm 0.5^\circ\text{C}$ after the temperature calibration. Both the environmental and the block temperature should be lower than 35°C when calibrated.

Adjustment Methods

1. Start up the instrument, it enters waiting interface. Make sure the current temperature in display is below 35°C. If the temperature is higher than 35°C please wait until it is below 35°C.
2. Inject olefin oil into one of the block wells. Put a thermometer into this well (the precision of the thermometer should be 0.1. The temperature ball should be immersed into the block well). Adiabatic material is needed on the block to separate it from the oil. Refer to the figure below.



NOTICE: To ensure the calibration precision, read the actual temperature and allow 20 minutes for the temperature to reach calibration point.

3. Press the “UP” and “DOWN” arrow of Seg. simultaneously when the instrument is not operating. The program shows interface. Example: Practical temperature is behind “P” which shows 20.5, and the program automatically controls the temperature to 40°C. In the meantime, the sign “*” flickers. The value behind “AdjTemp” is the calibration temp. When temperature achieves 40°C, “ADJ” and “*” flicker together, the value behind “P” is still the practical temperature.

Press Stop/Start

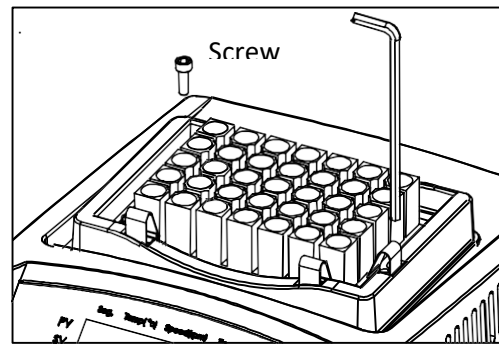
4. Wait for 20 minute. The actual temperature of thermometer is 38.8°C. Press “UP” or “DOWN” arrow of Temp. to change the value behind “AdjTemp” to 38.8. Press “Start/Stop” to confirm. The program saves the value. Temperature rises to 100°C automatically. The sign “*” flickers.
5. When practical temperature reaches 100°C, “ADJ” and “*” flicker together.
6. Wait for 20 minutes, the actual temperature of thermometer is 98°C. Press “UP” or “DOWN” arrow of Temp. to change the value behind “AdjTemp” to 98.0. Press “Start/Stop” to confirm.
7. Program turns to interface for operation. After temperature calibration, the temperature display is the same as the practical temperature of block.

NOTICE:

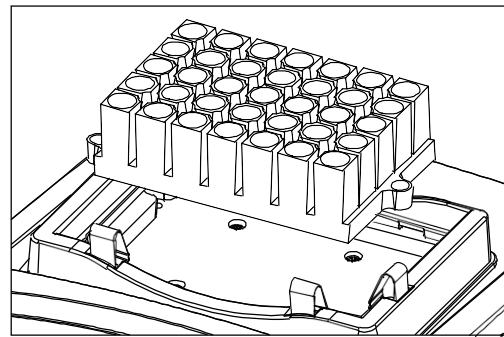
During temperature calibration, press “UP” and “DOWN” arrow of Seg. simultaneously to cancel the calibration. The system keeps the former calibration. Do not simultaneously press “UP” and “DOWN” arrow of Seg. unless calibration is really needed.

Exchange of Block

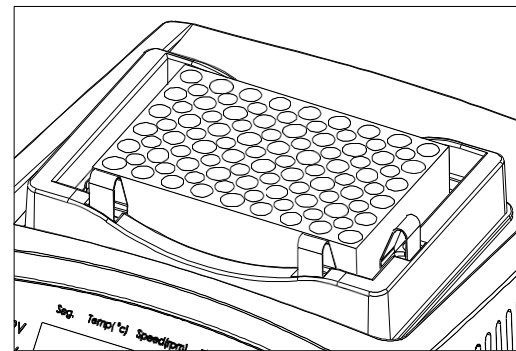
1. Pull out the four screws which attach the block to the heating board with the screwdriver.



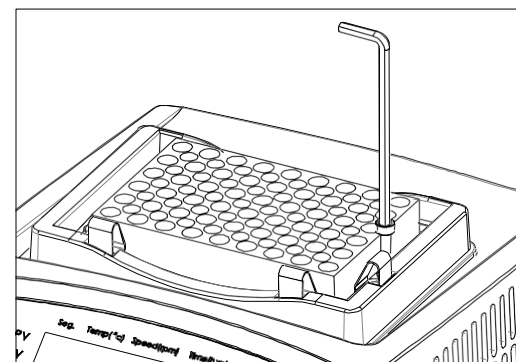
2. Pull out the block



3. Insert another block



4. Attach the block with screws



TROUBLESHOOTING

Issue	Possible Causes	Solution
Display window doesn't respond after power-is turned on.	No power	Check the power connection.
	Bad Fuse	Exchange fuse (250V 3A Φ 5x20)
	Switch Failure	Contact BT Lab Systems
	Other	
The actual and displayed temperatures are different.	Broken sensor or loose module contact.	
"OPEN" in the display with an alarm sound.	The sensor is disconnected.	
"SHORT" in the display with an alarm sound.	Short in the sensor.	
Block is not heating or cooling.	Switch power failure	
	Bad TE model	
Key does not work.	Keyboard failure	
The decreasing of the block temperature is slowed or block can't drop below room temperature.	Fan failed or stopped	
	Bad TE model	

TECHNICAL SUPPORT

BT Lab Systems offers technical support for all of its products. If you have any questions about the product's use or, operation, please contact BT Lab Systems at the following:

E-Mail: info@BTLabSystems.com