Operation Manual

BSTH-203

Thermo Shaker Incubator

Thank you for Choosing Biolab products. Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation.

Index

Safety Warnings and Guidelines

1. Important operation information of the security:

Before the users' operation, they should have a perfect conception of how to use the Instrument. Therefore, read this Manual carefully before using it.
Operation before reading the Manual is forbidden. Read the guidelines and directions below and carry out the countermeasure according to them.

2. Security:

The operation, maintenance and repair of the Instrument should comply with the basic guidelines and the remarked warning below. If you don't comply with them, it will have effect on the scheduled using life of the Instrument and the protection provided.

This product is a normal and an indoorInstrument.

The operator should not open or repair the Instrument by himself, which will result in losing the qualification of repair guarantee or occur accident. If there is some wrong with the Instrument, the company will repair it.

A.C. power's grounding should be reliable to safeguard against an electric shock. The 3-pin plug supplied with thermo-shaker's power cable is a safety device that should be matched with a suitable grounded socket.

During the normal operation, the temperature of metal blockwill be very high. There will be scald or boiling of the liquid. Therefore strictly prohibit any part of the body to touch the Instrument from scald.

Close the test tube lids before put the test tubes into the block. Liquids maybe spill in the block or onto the device if tube lids opened, that will damage the block or the device.
Before power on, guarantee the voltage used should be accordant to the voltage needed, and the rated load of electrical outlet should not lower than the demand. If the electric line is damaged, you should replace it with the same type. You should assure there's nothing on the electric line and you should not put the electric line in the ambulatory place. Hold the jack when you pull out the electric line, and don't pull the electric line.

The Instrument should be put in the place of low temperature, little dust, no water and no sun or strong lamp. What's more, the place should be good aeration, no corrosively gas or strong disturbing magnetic field, far away from central heating, camp stove and other hot resource. Don't put the Instrument in wet and dusty place. The vent on the Instrument is designed for aeration. Don't wall up or cover the vent in order to keep from high temperature. If you use the more than one Instrument the same time, the distance between them should be more

than 100cm.

Mains 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 you finish your work. Pull off the connector plug when there’s long time no use of the Instrument and cover it with a cloth or plastic paper to prevent from dust.

Pull the connector plug from the jack at once in the following case, and contact the vendor:

- There is some liquid flowing into the Instrument;
- Drenched or fire burned.
- Abnormal operation: such as abnormal sound or smell.
- Instrument dropping or outer shell damaged.
- The function has obviously changed.

3. The maintenance of Instrument

The well in the block should be cleaned by the cloth stained with alcohol to assure good heat translation between the block and the test tube and no pollution. If there are smutches on the Instrument, clean them with cloth.

Power off when cleaning the Instrument.
When cleaning the well, don’t drop the cleaning liquid in the well. Corrosive cleaning liquid is strongly prohibited.

01 Introduction

The Thermo-shaker for Micro-tubes is an ideal instrument for intensive mixing of samples in the regulated temperature conditions.
Mixing and heating modes can be used both simultaneously and independently i.e, the device can work as shaker and as a thermostat. The main body of the Mixing Block can be used with different kinds of blocks. BSTH-203 is applicable for DNA analysis, extraction of lipids and other cell components, DNA library creation, PCR amplification, pre-denaturation in electrophoresis, serum solidification etc.

Features of this product as follows:

1. As it is equipped with various optional mixing blocks, the instrument can adapt to different tubes & wells to cope with experimental needs. It is easy to replace the metal blocks and is very simple to clean and sterilize. Customized blocks are available to suit your specific demands
2. LCD display. It Easy to setup and use
3. Simultaneous display of set and actual time, temperature and speed
4. Over heating protection device ensures safety & reliability
5. Temperature can be calibrated to meet user's needs
6. Beep-signal / Stop after program completion
7. Can be produced for OEM customers

02 Specifications

1. The normal operating condition Ambient temperature: 5#C ~ 30#C The relative humidity:≤70%
Power supply: 200-240V ~ 1.5A 50-60Hz
2. The basic parameters and performance

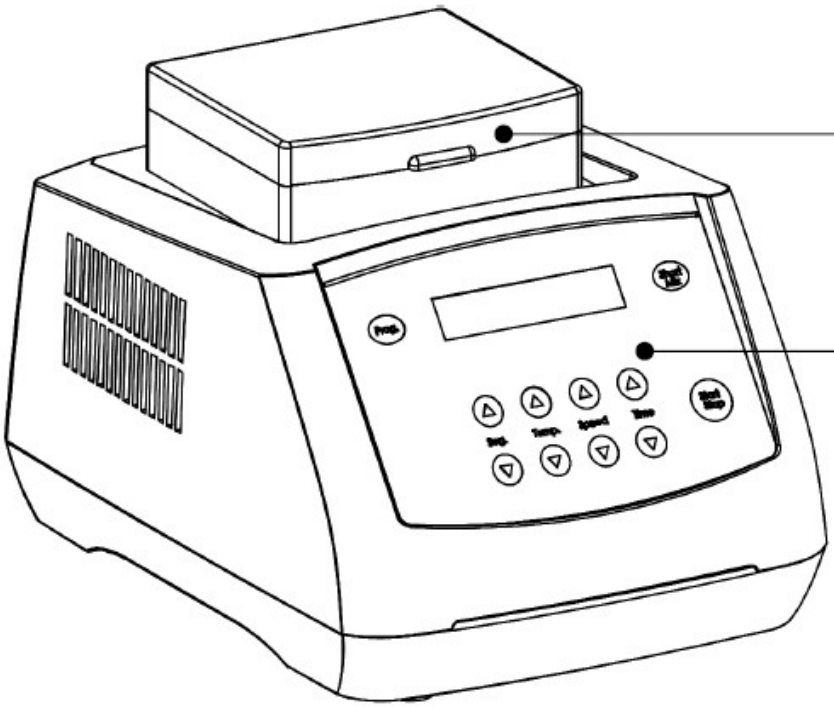
Model Parameter	BSTH-203
Mixing rate	200~1500 rpm
Orbit	2mm
Temperature setting range	0°C~100°C

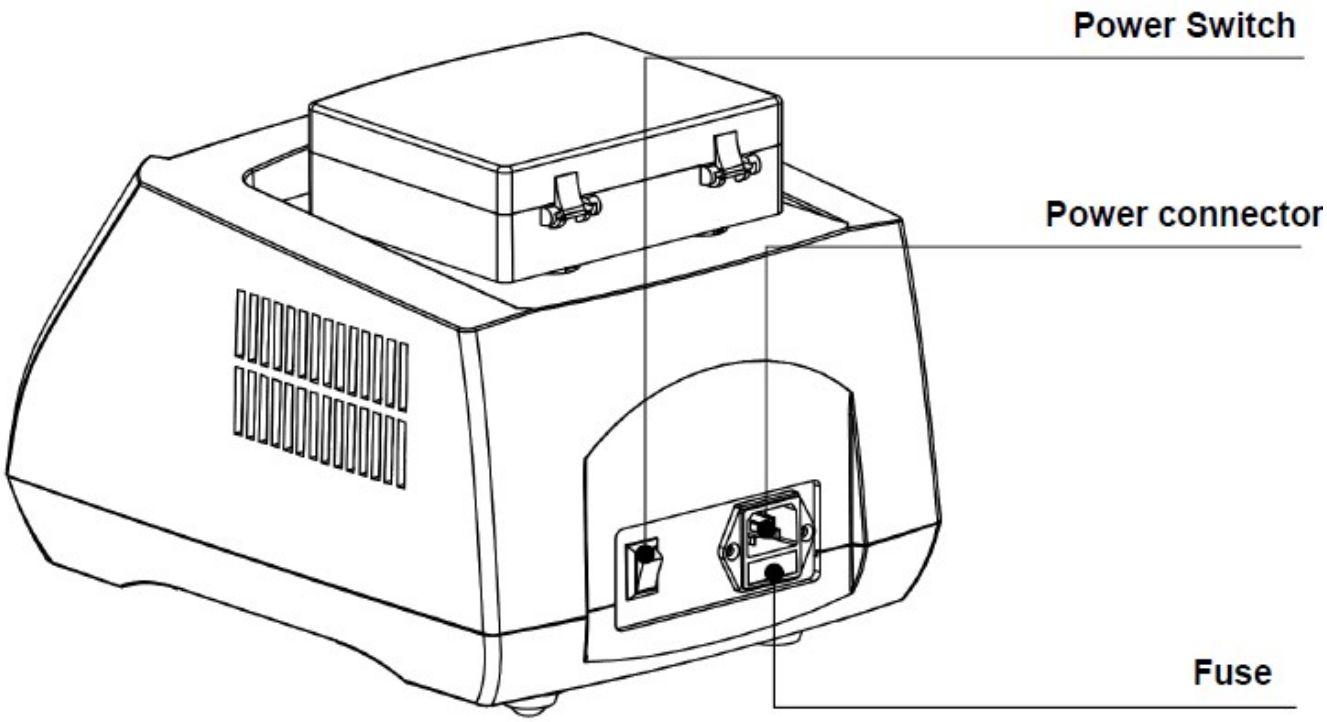
Temperature control range	0°C~100°C@ Room temp.≤20°C4°C~100°C@ Room temp.≤25°C 10°C~100°C@ Room temp.≤30°C
Timing range	1min ~ 99h59min
Accuracy of the temperature	≤0.5°C
Heating time	≤15min（From 20°CTO 100°C）
Cooling time	≤30min（From room temp. TO room temp.-20°C）
Standard Block	A-BLOCK: 96x0.2 ml F-BLOCK:24x ≤Φ12mmtube B-BLOCK: 54x0.5ml G-BLOCK:12x15mlFalcon C-BLOCK: 35x1.5ml H-BLOCK: 6x50ml Falcon D-BLOCK: 35 x2.0ml E-BLOCK: 20 x 1.5ml + 15 x 0.5ml
Fuse	250V 3.0A Φ5×20
Dimension (mm)	300(D)×225(W)×195(H)
Net weight (kg)	8.5

03 Preparations

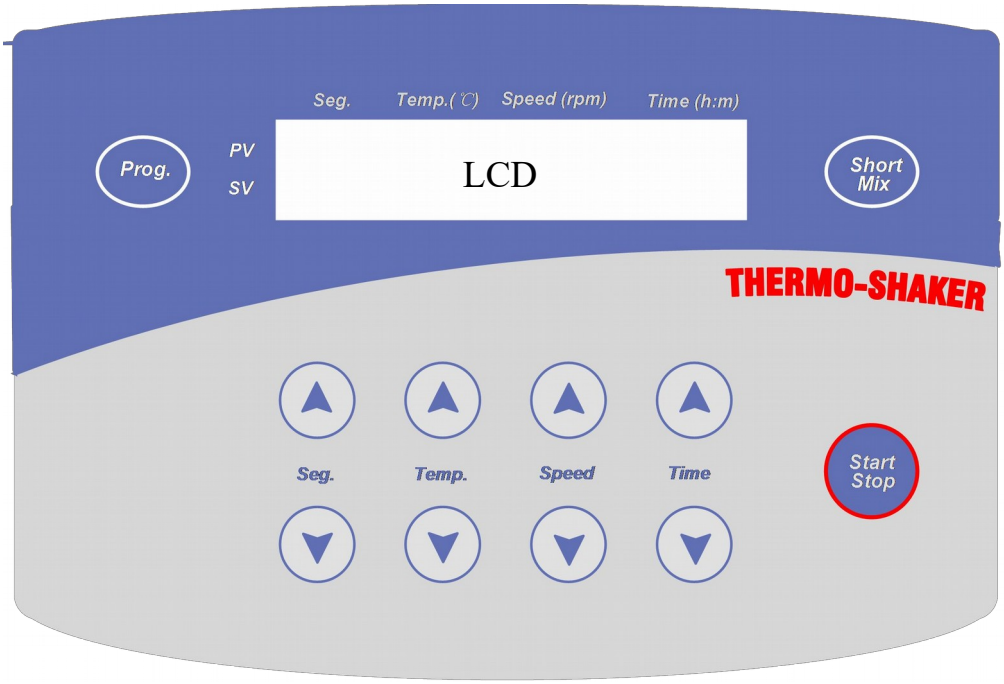
This chapter is introduces Thermo Shaker's mechanical structure, the keyboard and each key's functions and some preparations before power-on. You should be familiar with this chapter before the Thermo Shaker is first operated.

Structure Description





2. Keyboard and Display panel



3. KeyFunctions

Seg▲▼

Temp▲▼
To select procedure section: five segment points as S1,S2,S3,S4,S5.

Temperature setting key. Pressing" ✕ "or" ? "to set running temperature · To set temperature though pressing "✕"or"?"continuously, which is more fast and conveniently.

Speed▲▼ Speed setting key. Pressing"✕"or"?"to set mixing speed · To set mixing speed though pressing "✕"or"?"continuously, which is more fast and conveniently. Each time the key is pressed , the mix speed changes by10rpm.

Time▲▼ Timing setting key. Pressing"✕"or"?"to set timing hours · To set timing hours though pressing"✕"or"?"continuously, which is more fast and conveniently.

Prog Programmable setting key. Pressing "prog" to make section from S1to S2,or S1 to S2 to S3,or S1 to S2 to S3 to S4, or S1 to S2 to S3 to S4 to S5 running continuously.

Short Mix The device mixes at the frequency visible in the display for as long as the Short Mix key is held down. The time is counted in seconds until 999S has expired.

Start/Stop Stop/start key. Pressing this key to stop or start the procedure. Pressing momentary to start, Pressing continuously to stop.

04 Operation Guide

1. Single temperature, speed and timing setting

a) The LCD will display the picture as the chart when the instrument powers on and the instrument goes into the initial state with the sound of"du...".

b) About 6 seconds, the display window for practical temperature shows 30.0, which is the practical temperature of the block. Setting temperature shows 37.0, which is the establishment temperature. While 10:00 is the former timing time, and S1 is the former temperature section. The temperature unit is "°C", the speed unit is "RPM" and the time unit is "hour:minute". **Temp** ▲ ▼

c) Pressing Temp's"✕"or"?" · the value of display windows for setting temperature will increase or reduce from decimal digit, unit digit, tens digit to hundreds digit. **Speed** ▲ ▼

Pressing Speed or Time's "✕"or"?" to set mix speed or timing time according to the same transformation rule above. **Time** ▲ ▼

Besides, pressing "✕"or"?" for 2 seconds continuously to amend the digit from decimal to unit ,from unit to tens digit ,from tens digit to hundreds digit quickly.

If you want to set temperature to 40.0℃, mix speed to 1200 rpm ,timing time to 2 hour, pressing temp's "✕" continuously to let the temperature reach 40.0, it will be confirmed and stored at once. Press Speed's "✕" continuously to let the mix speed reach 1200rpm ,Meanwhile pressing time's "?" continuously to let the timing time reach 02:00, it will be confirmed and stored at once too. After finishing setting section S1, pressing "stop/start" key to run S1 program.
Heating begins after
Start/Stop has been pressed or one of the Temp. curor keys has been pressed.

d) Pressing seg's "✕" or "?"to select one section ofS1 · S2 · S3 · S4 · S5.Then set the values of temperature, speed and time according to step (C). You can set these five points as usual segment point, whenever you want to use, you can transfer one of them.

Seg

▲

▼

2. Multi-points programs setting

a) Pressing "prog" key , can connect S1-S2, S1-S2-S3, S1-S2-S3-S4, S1-S2-S3-S4-S5 into two-points or multi-points program.
Note ! the first section in the multi-points program is only for S1
b) If set S1-S2-S3-S4 multi-points program · pressing
"prog" Key , the display window show "Star:S1 End:S2", "Start:S1" means the first section of the multi-points program is S1,it can not amend, "End
:S2" means the end section of the multi-points program is S2, it can amend , then pressing seg's "✕", let S2 reach S4, pressing "prog" to confirm. Then the multi-points program S1-S2-S3-S4 is setting finish. Now the setting section shows S14.

Seg▲▼ Prog

c) Pressing "stop/start"key to run S1-S2-S3-S4 multi-points program ◦
Note !
We also can press "stop/start" key to run the multi-points program
after we have selected the end section.

3. How to shut off the temperature, speed and timing function

a) Press seg's"✕" "?"keytoSelectonesectionoftheS1,S2,S3,S4,S5.
b) Press Temp's" ? " key , the lowest value displayes "OFF" , and the device remains at room temperature. Also press Speed or Time's" ? "key, the lowest value display's "OFF", Speed display's "OFF", it means no mixing function. Time
display's "OFF" , it means no timing function, timing time is∞, if start/stop key is
pressed, it will display "CON" with flickering .
c) In multi-points program, do not set the time to "OFF" in any section.
4. ShortMix
The device mixes at the frequency visible in the display for as long as the Short Mix key is held down. The time is counted in seconds until 999 seconds has expired.
The max. short mix speed can be set according to your requirement at the current section.

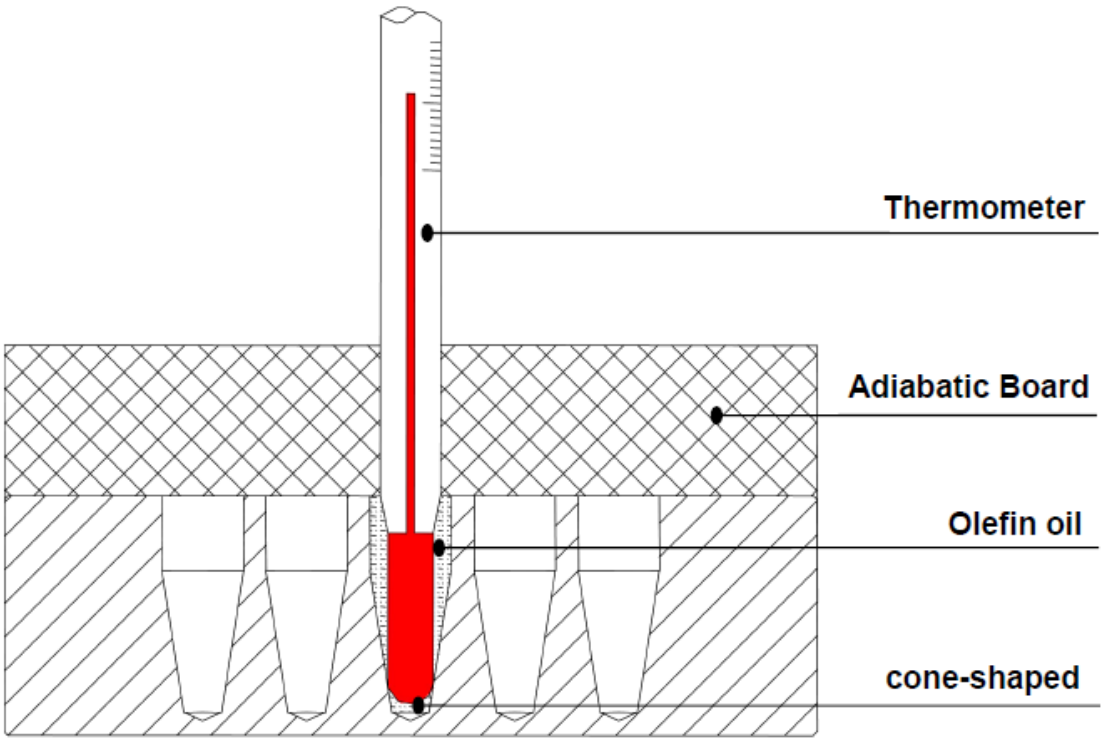
5. Temperature calibration

The temperature of the Instrument has been adjusted before it is sold out. But if there is deviation between the actual temperature and the displayed temperature due to some reasons, you can do as follows to correct the error.

Notes: The Instrument uses three temperatures adjustment to ensure its veracity. This means it is linearly adjusted on 10°C, 40°C and 100°C three points. The temperature veracity will be within ±0.5°C after the double temperature adjustment.
Both the circumstances and the block temperature should be lower than 25°C.

Adjustment methods as follows:
a) After the startup of the Instrument, it enters waiting interface. Make sure the temperature in display is below 25°C. If the temperature is higher than 25°C, you should wait until the temperature is below25°C.

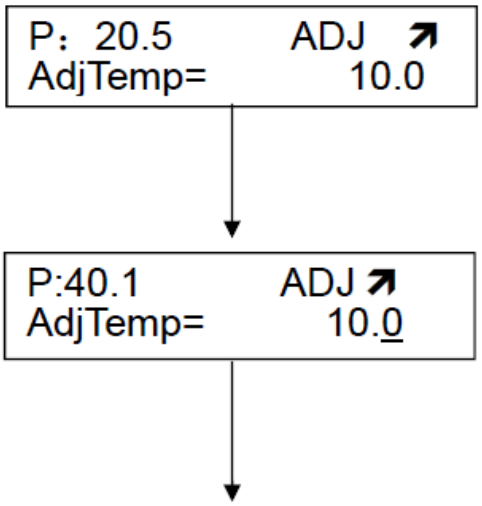
b) Inject olefin oil into one of the cone-shaped wells, and then put a thermometer into this well (Make sure the precision of the thermometer should be within 0.1℃ and the temperature ball should be absolutely immerged into the cone-shaped well). Heat insulation material is needed on the block to separate it from the circumstance.
Seeing from Fig a.:



Notes: Please read the actual value after 20minutes' constant temperature to ensure the

adjustment precision.

Pressing seg's" ✕ "and" ? "simultaneously, practical temperature shows 20.5, and rise to 10.0 at once,at the same time the sign " *" flicker ceaselessly. When the practical temperature reach 10.0, the sign "ADJ" and "*" flicker ceaselessly together



d) After 20 mintues，the actual temperature of Thermometer is 9.8℃.Pressing temp's"✕"or " ? "key ,amend the value of "Adjtemp" to reach 9.8, then pressing "stop/start"key to confirm.

Then rise to 40.0℃ automatically and "*" flicker ceaselessly.

e) When the practical temperature reach 40.0, the sign "ADJ" and "*" flicker ceaselessly together.

f) After 20 mintues，the actual temperature of Thermometer is 38.0℃.Pressing temp's"✕"or " ? "key ,amend the value of "Adjtemp" to reach 38.0. then pressing "stop/start"key to confirm.

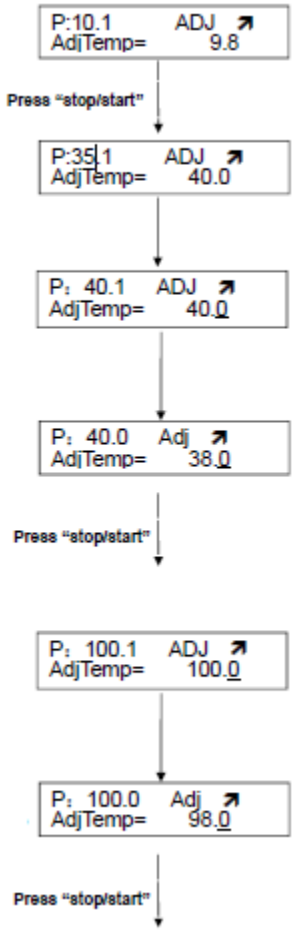
Then rise to100.0℃ automatically and "*" flicker ceaselessly.

g) When the practical temperature reach 100.0, the sign "ADJ" and "*" flicker ceaselessly together.

h) After 20 mintues，the actual temperature of Thermometer is 98.0℃.Pressing temp's"✕"or " ? "key ,amend the value of "Adjtemp" to

reach 98.0. then pressing “stop/start”key to confirm.

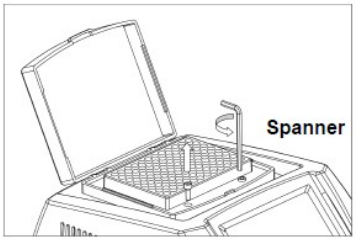
After Temperature calibration, the temperature displayed is the same with the practical temperature of block.



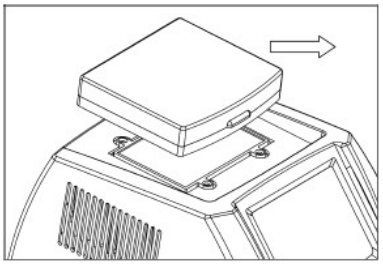
After Temperature calibration, the temperature displayed is the same with the practical temperature of block.

6 · Exchange of block

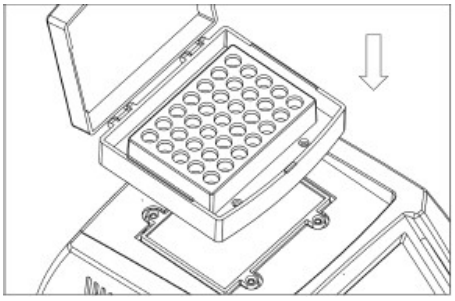
a) Opens the transparent lid and pull out the four screws which fix the block to the heating board with the screwdriver.



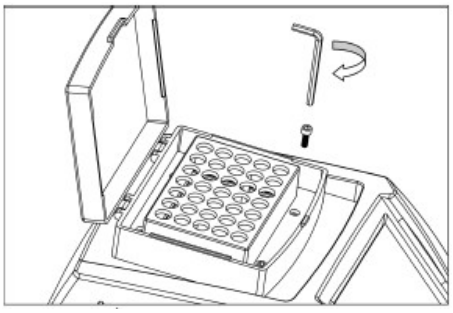
b) Takes out the screws, closes the lid, puts out the block from the main engine



c) Takes another model block, steadily lays aside on the main engine. The block installment holes aim consistently with the main engine installment holes.



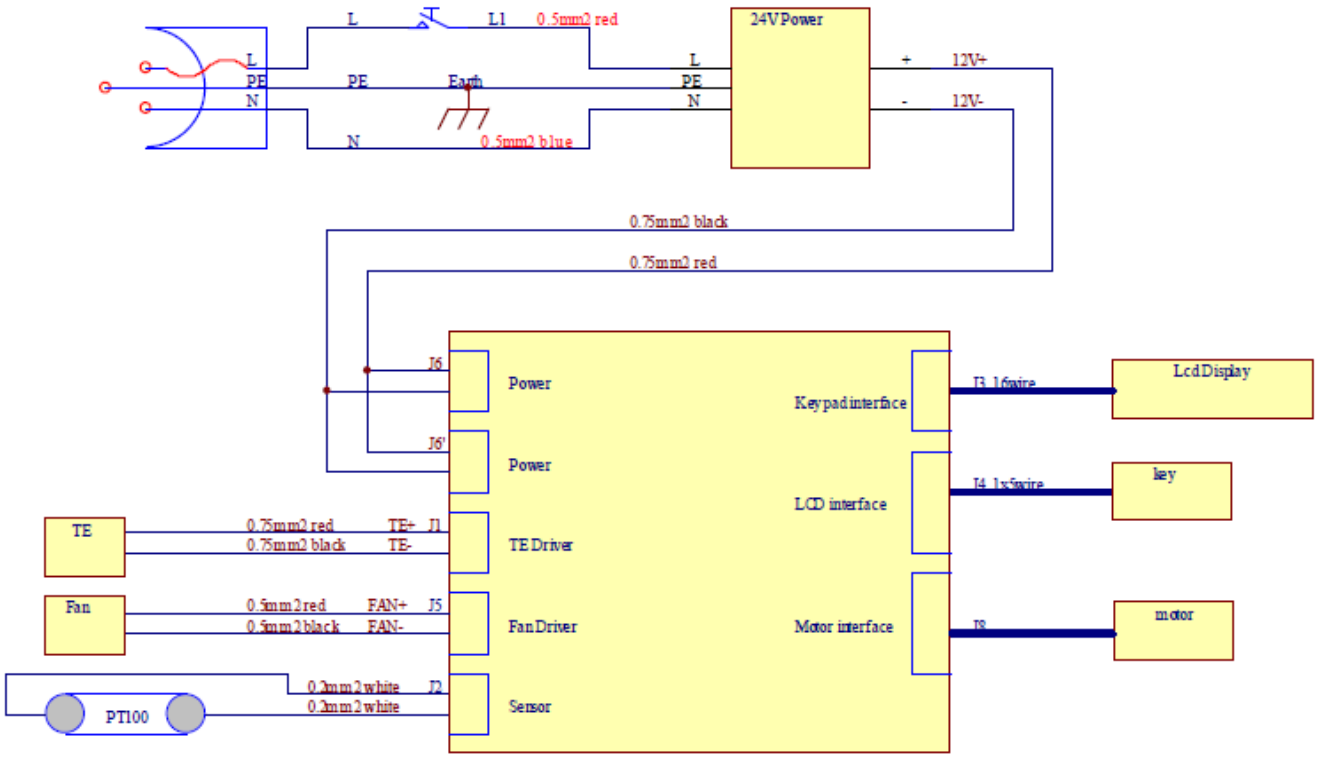
d) Puts the screws into the installment hole, fixes the metal block on the instrument with the spanner.



05 Failure analysis and troubleshooting

Failure analysis and processing procedures

No.	Phenomenon	Possible Causes	Processing Procedure
1	No signals on the display when it is powered on.	No power	Check the power
		Broken Fuse	Exchange fuse（250V 3.0A 5X20）
		Broken switch	Exchange the switch
		Others	Contact to the seller
2	The actual and displayed temperatures are quite different.	Broken sensor	Contact to the seller
3	"OPEN" in the temperature display with the alarm of "du..."	Temperature sensor are broken or the environmental temperature is below zero	Contact to the seller
4	"SHORT" in the temperature display with the alarm of "du..."	Temperature sensor are broken or the environmental temperature is below zero	Contact to the seller
5	No heating or cooling	Broken sensor or Broken TE module	Contact to the seller
6	Press invalid	Broken film switch	Contact to the seller


L
L1
0.5mm2 red
24V Power
L
PE
N
PE
Earth
N
0.5mm2 blue
+
12V+
-
12V-
0.75mm2 black
0.75mm2 red
J6
Power
J6'
Power
TE
0.75mm2 red
0.75mm2 black
TE+
TE-
J1
TE Driver
Fan
0.5mm2 red
0.5mm2 black
FAN+
FAN-
J5
Fan Driver
0.2mm2 white
0.2mm2 white
J2
Sensor
PT100
Keypad interface
J3 16wire
Lcd Display
LCD interface
J4 1x5wire
key
Motor interface
J8
motor

BIOLAB SCIENTIFIC LTD.
3660 Midland Avenue, Suite 300, Toronto, Ontario M1V 0B8 Canada
Email: contact@biolabscientific.com Tel: +1 707 533 1445
Website: www.biolabscientific.com