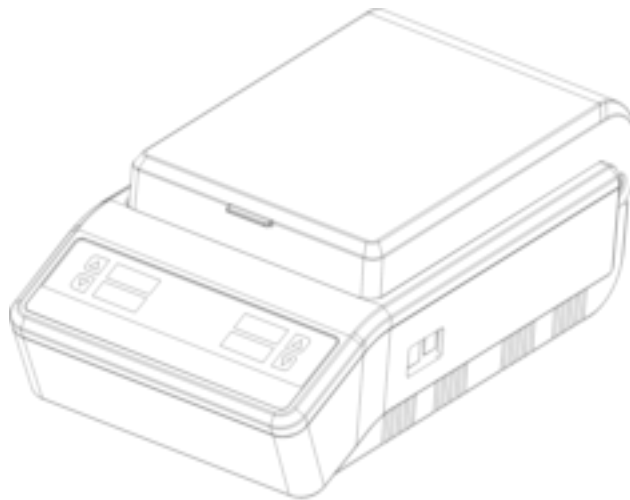


User Manual

Version 1.2

Neo  **Biotech**

NB-12-0006A/B/C/D Dry Bath Incubator



Neo-Biotech

74 rue des Suisses – 92000 Nanterre

Foreword

Thank you for purchasing our Products: Dry Bath. This manual for users contains function and operation of the instrument. In order to use the instrument properly, please read this manual carefully before using the instrument.

Opening Check

Please check the instrument and Appendix with the packing list when you first open the instrument packing case. If you find there is something wrong with the instrument and the Appendix, do contact the vendor or the producer.

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Chapter 1 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 indoor Instrument which conforms to Standard B style- I type- GB9706.1.



Before using the device, read the Manual carefully. These units are designed for use in laboratory environments. The device must be used by skilled personnel with the appropriate training.



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.

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, the user should replace it with the same type. The user should assure there's nothing on the electric line and the user should not put the electric line in the ambulatory place.

Hold the jack when the user 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.



Power off when the user finishes the 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 cases, 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 wells on the block should be regularly cleaned by soft clean cloth stained with a little alcohol, to ensure the tubes fully contact with tubes, and has good thermal conductivity without pollution.

If there are smutches on the instrument, clean them by soft cloth stained with cleaning cream.



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.

Chapter 2 Introduction

The dry bath is a new product controlled by the miniature computer, which can be widely used for the preservation and reaction of the samples, the amplification of DNA, the pre-denaturation of the electrophoresis and blood serum coagulation.

Features of this product are as follows:

- Temperature and time digital displayed in LED;
- Display of setting temperature and the count down time to the constant temperature;
- Using metal blocks to avoid sample pollution;
- Easy replacement, cleaning and disinfecting of metal blocks;
- Built-in over-temperature protection, more reliable for using;
- Calibrating temperature discrepancy;
- Buzzer alarm at the end of temperature control duration.

Chapter 3 Specifications

1. The normal operating condition:

Ambient temperature: 5°C ~ 35°C

Relative humidity: ≤70%

Power supply: AC200-240V~ 50-60Hz

2. The basic parameters and characteristics

Basic parameters :

Parameter \ Type	NB-12-0006
Temperature range	RT+5°C ~ 105°C
Timing time	Max. 99h59min.
Temperature control accuracy	≤ ±0.5 °C
Display accuracy	±0.1 °C
Temperature uniformity	≤ ±0.5 °C
Heating time	25°C ~ 105°C ≤20 min (Ambient Temperature 20°C ~ 30°C)
Temperature stability@100°C	±0.5°C
Temperature uniformity@100°C	±1°C
Block	2pcs
Power	240W
Fuse	250V 3A Φ5x20
Meas.(mm)(LxWxH)	365x210x150
Weight (kg)	4.5

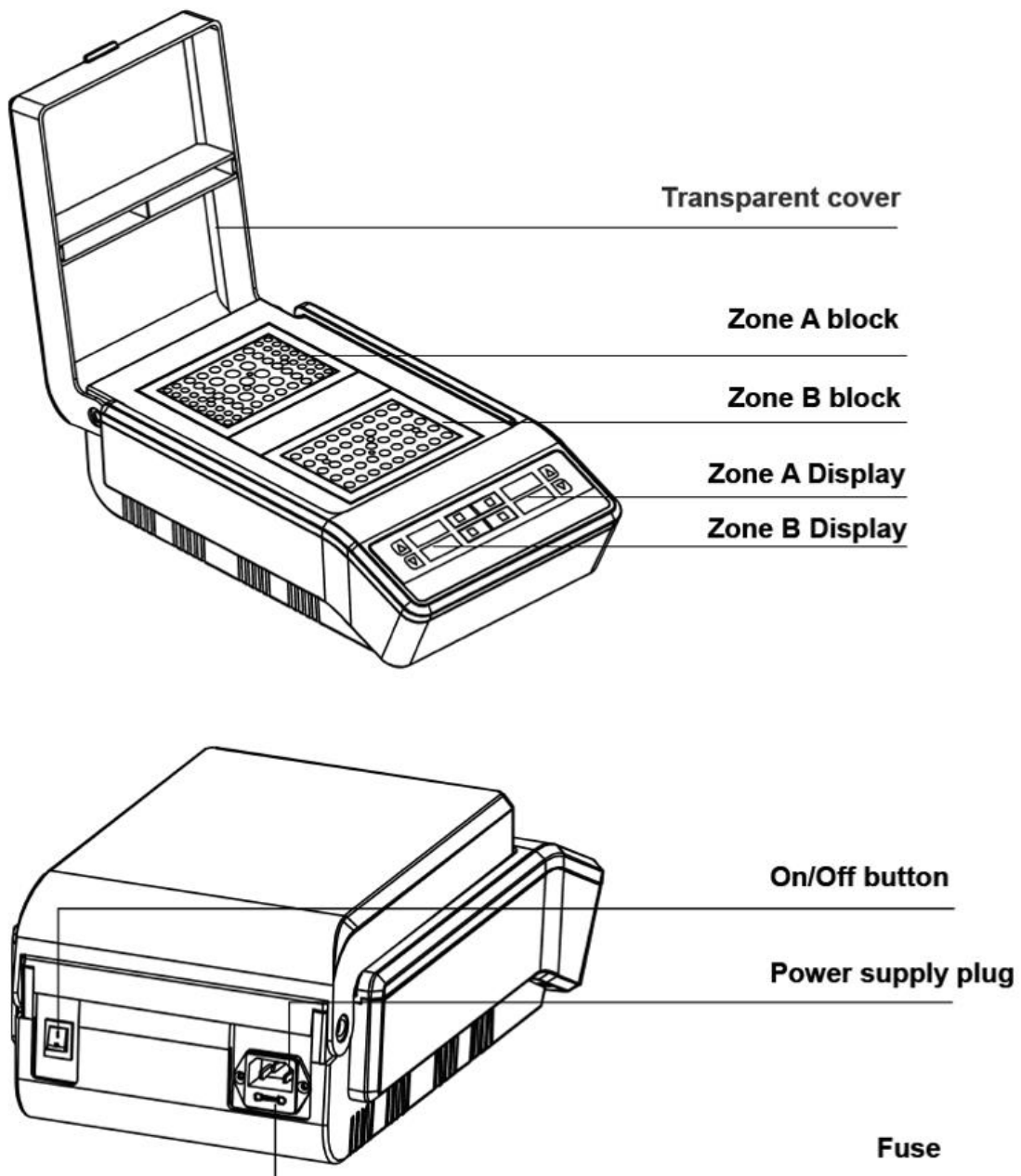
Item No.	Type	Capacity + Diameter	Meas.(mm)
NB-12-0006-01	BH01	96x0.2ml or 96 PCR plate	108 x 72 x 60
NB-12-0006-02	BH02	45x0.5ml	108 x 72 x 49
NB-12-0006-03	BH03	35x1.5ml	108 x 72 x 49
NB-12-0006-04	BH04	35x2.0ml	108 x 72 x 49
NB-12-0006-05	BH05	15x0.5ml + 20x1.5ml	108 x 72 x 49
NB-12-0006-06	BH06	20x1.5ml + 15x2.0ml	108 x 72 x 49
NB-12-0006-07	BH07	32x0.2ml + 22x0.5ml + 9x1.5ml	108 x 72 x 49
NB-12-0006-08	BH08	20x5ml	108 x 72 x 49
NB-12-0006-09	BH09	20x10ml	108 x 72 x 49
NB-12-0006-10	BH10-TALL	12x15ml Falcon	108 x 72 x 60
NB-12-0006-11	BH11-TALL	6x50ml Falcon	108 x 72 x 60
NB-12-0006-12	BH12	96 wells microplate	116.5 x 75 x 60
NB-12-0006-13	BH13	Plate	108 x 72 x 60
NB-12-0006-14	BH14	384 PCR plate	108 x 72 x 60
NB-12-0006-15	BH15	40x6mm tube	108 x 72 x 49
NB-12-0006-16	BH16	28x10mm tube	108 x 72 x 49
NB-12-0006-17	BH17	24x12mm tube	108 x 72 x 49
NB-12-0006-18	BH18	24x13mm tube	108 x 72 x 49
NB-12-0006-19	BH19	14x15mm tube	108 x 72 x 49
NB-12-0006-20	BH20	14x16mm tube	108 x 72 x 49
NB-12-0006-21	BH21	12x19mm tube	108 x 72 x 49
NB-12-0006-22	BH22	11x20mm tube	108 x 72 x 49
NB-12-0006-23	BH23	6x26mm tube	108 x 72 x 49
NB-12-0006-24	BH24	6x28mm tube	108 x 72 x 49
NB-12-0006-25	BH25	2x40mm tube	108 x 72 x 49
NB-12-0006-26	BH26	2x7 (Cuvette)	108 x 72 x 49

Note: The tubes should be less than 83mm in case of incubation with lid closed.

Chapter 4 Basic Instructions

This chapter focuses on the introductions of the structure, keypads and key-functions of the instrument, as well as preparatory work before starting. Please read this chapter before starting when uses this instrument for the first time.

1. Structure overview



2. Keypads



3. Display

Set

Setting key: Used in conjunction with Drop key or Up key to set the temperature and time.



Drop key: For number decreasing.



Up key: For number increasing.

Start

Stop

Start/Stop key. After the temperature and time setting well, press this key for starting. Also, press this key for stopping when running.

Tips: The keys in Zone A and Zone B will respectively control their own zones.

Chapter 5 Operation Guide

1. Temperature and time setting

- a) Press the On/Off button; the display flashes 3 times, the instrument goes into the initial state with the sound of “beep”.



- b) After about 3 seconds, the temperature automatically goes up to the setting temperature, the 28.5 in display is the real-time temperature of the block (It indicates that the temperature now is 28.5°C).



The 00:35 in display is the running time set previously. (It indicates that the running time is 35min).

- c) Press “Set” key, then release immediately, the displayed temperature is the value setted last time, see the right, displayed 40.0°C, decimal digits flashes at the same time. If temperature is setted at 55.5°C, operate as follows:



The digits flashing indicates that it can be modified, press ▼ or ▲ to modify the temperature.



- d) Press “Set” key again, then release immediately, the displayed temperature is the value setted last time, see the right, displayed 00:35(35min), decimal digits in rightmost position flashes at the same time. If temperature is setted at 1h 20min, operate as



follows:

The digits flashing indicates that it can be modified, press ▼ or ▲ to modify the time.



Press "Set" again, wait 6 seconds to confirm the input temperature and time, and they flash simultaneously and disappear, then the temperature automatically goes up to the setting temperature.

2. Running/Stop

- a) After the temperature and time setting completed, the instrument automatically goes up to the setting temperature, press "Start" key and immediately release, then the thermostat countdown begins with the sound of "beep".



Tips: Decimal point regularly flashing, which indicates that the instrument still in the status of temperature control, the timing has not yet begin.



Decimal point kept stationary, which indicates that the instrument has had constant temperature already, timing begins.

When timing ends, running stopped and the buzzer alarms. Now the temperature remains setting temperature, and displays "over". It indicates that the running is over.



- b) After running ends, the instrument will wait for further instruction at ending interface, then the user can reset the temperature and time. Press "Start/Stop" key directly, the program will runn according to setted temperature and time.
- c) Press "Start/Stop" key to stop when running. Press the key again for re-running.

3. Temperature Calibration

The temperature of the instrument has been calibrated before it is sent out. But if there is deviation between the actual temperature and the displayed temperature due to some reasons, the user can do as follows to correct the error. There are 2 testing tools for this instrument to do temperature calibration: 1. By thermostate, 2. By External sensor. (External sensor is optional part, it needs to be ordered separately.)

Caution: the instrument uses double temperatures adjustment to ensure its veracity.

This means that it is linearly adjusted on 40°C and 100°C two points. The temperature veracity will be within $\pm 0.5^{\circ}\text{C}$ after the double temperatures adjustment.

Both the circumstance temperature and the block temperature should be lower than 35°C.

3.1. Calibrated with a thermometer, specific methods are as follows (The following are calibrating temperature deviation in Zone A, so the keys operated are in Zone A) :

- a) After the startup of the instrument, it enters into waiting interface. Make sure the temperature in display is below 35°C. If the temperature is higher than 35°C, the user should wait until the temperature is below 35°C.
- b) Inject olefin oil into one of the cone-shaped wells, and then put a thermometer into this well (make sure that the precision of the thermometer should be within 0.1°C and the temperature ball should be absolutely immersed into the cone-shaped well). See Fig a.

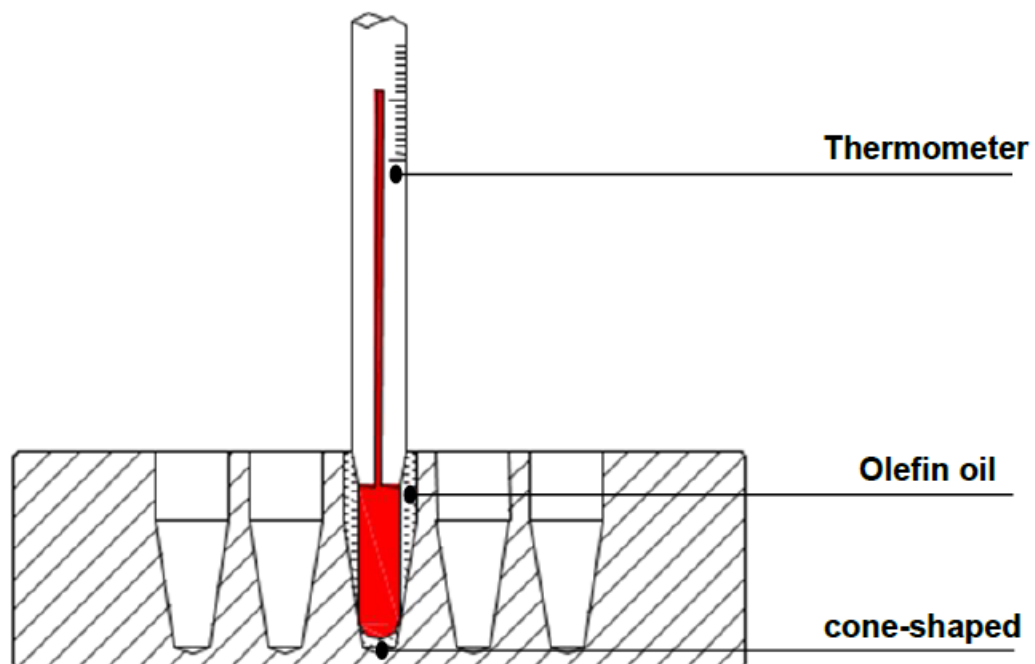
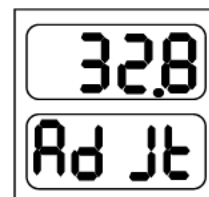
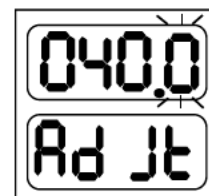


Fig a

- c) Press “Stop” key without releasing, then press ▲ key at the same time for 3 seconds, it will enter into temperature calibration interface, see the right. At this point, “Ad Jt” displayed, which indicates entering into temperature calibration program. The temperature displayed is current temperature and begins to rise to 40.0°C automatically.



When the temperature reaches to 40°C constant temperature, the decimal digit begins to flicker, waiting for the calibrated value of 40°C. Read out the actual value from the thermometer after 20 minutes.

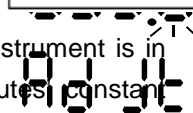


Notes: Please read the actual value after 20 minutes' constant temperature to ensure the calibration accuracy.

If the actual read out of thermometer is 39.6°C, modify the temperature to 39.6 by pressing ▲ or ▼. Then press “Start/Stop” to confirm the input value.



- d) Then the instruments will heat to 100°C automatically, waiting till the instrument is in 100°C thermostat, input temperature calibration value. After 20 minutes constant temperature, the user can read the actual value from thermometer.



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

If the actual readout is 101.5°C, modify the temperature in display to 101.5 by pressing ▼ or ▲. Then press “Start/Stop” to confirm the input value.



Use the same method to calibrate the temperature deviation in Zone B.

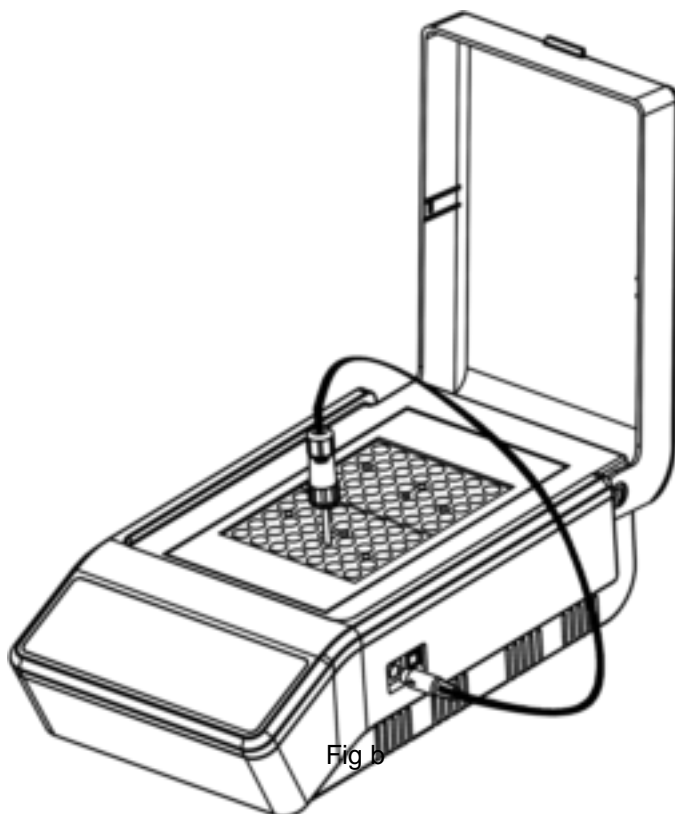
Notes: Pressing “Set” and “▼” simultaneously during the temperature calibration indicates exiting the temperature calibration program. The changed value will be of no effect.

3.2. Calibrated with a External sensor, specific methods are as follows (The following are calibrating temperature deviation in Zone A, so the keys operated are in Zone A) :

- a) After the startup of the instrument, it enters into waiting interface. Make sure that the

temperature in display is below 35°C. If the temperature is higher than 35°C, the user should wait until the temperature is below 35°C.

b) Put External sensor into a block well. See Fig b.



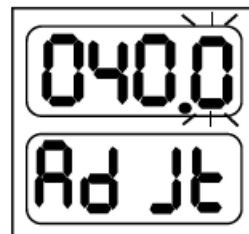
c) Press “Set” key without releasing, then press “Start/Stop” key at the same time for 3 seconds, it will enter into temperature calibration interface, see the right. At this point, “ **EAdJ** ” displayed, which indicates entering into external temperature calibration program. The temperature displayed is External sensor’s current temperature and it begins to rise to 40.0°C automatically.



It will automatically display “ **Ad Jt** ” six seconds later. The upper displayed 32.0 is the current temperature of the External sensor.

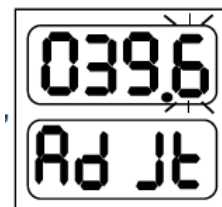


When the temperature reaches to 40°C constant temperature , the decimal digit begins to flicker, waiting for the calibrated value of 40°C. After incubating 20mins,the user can make the calibration.



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

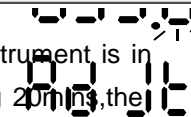
Press "Set" key to view the temperature value of External sensor, if displayed 39.6°C.



Press "Set" again, or wait for 6 seconds, then display "Ad Jt" , modify the displayed temperature to 39.6 by pressing ▼ or ▲. Then press ▲ to confirm the input value.

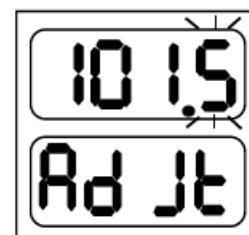


- d) Then the instrument will heat to 100°C automatically, waiting till the instrument is in 100°C thermostat, input temperature calibration value. After incubating 20mins,the user can make the calibration.



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

If the actual readout of External sensor is 101.5°C, modify the temperature in display to 101.5 by pressing ▼ or ▲ Then press "▲" to confirm the input value.



Use the same method to calibrate the temperature deviation in Zone B.



Notes: Pressing "Set" and "Start/Stop" simultaneously during the temperature calibration indicates exiting the temperature calibration program. The changed value will be of no effect.

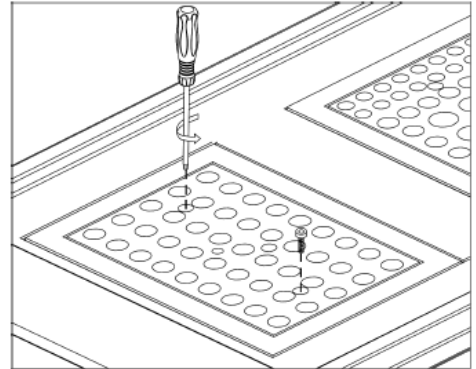
4. Temperature control by external sensor

- a) Insert the external sensor into a fixed well.
- b) Press "Stop" without releasing, then simultaneously press "▲" at time for 3 seconds, the external indicator light goes on to indicate that it has entered into the temperature control mode of external Sensor.
- c) Press "Run" for Program running.

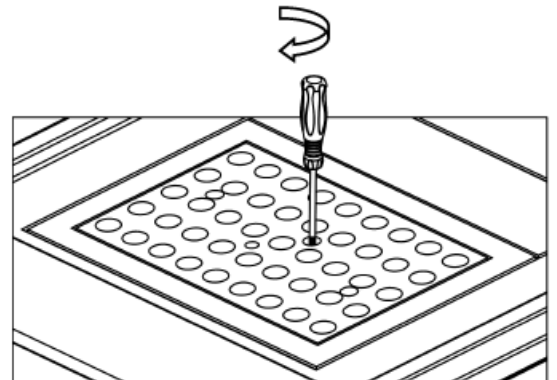
Tips: After entering into the external temperature control mode, the user can simultaneously press "Stop" and "▲" on time to exit, while the external indicator light goes off.

5. The exchange of metal block

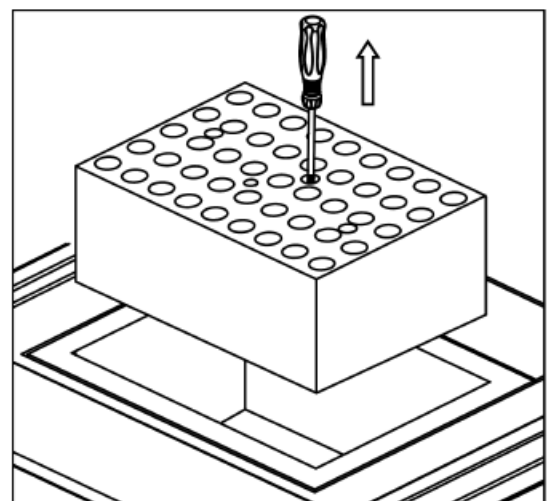
- a) Completely screw out the 2 screws which were used for fixing metal blocks by combination wrench in an anticlockwise direction.



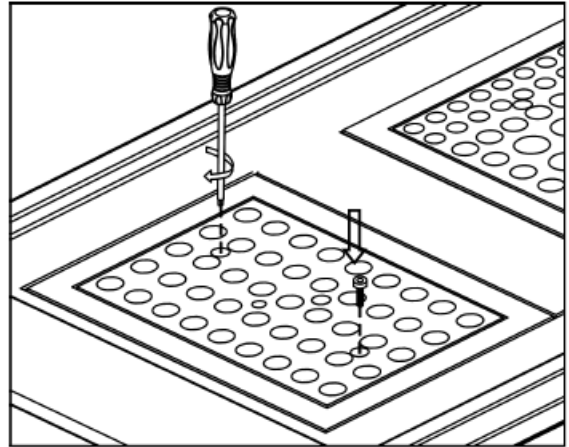
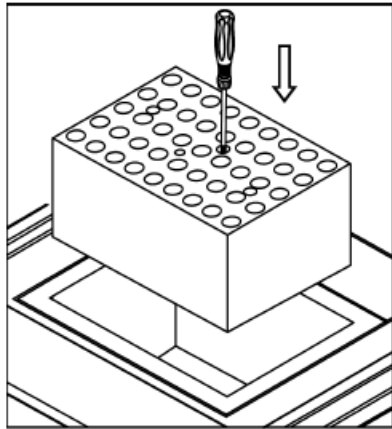
- b) Fix the wrench in the center well of the block .



- c) Pull out the wrench with the block .



- d) Screw the wrench out of the block, and fix it to another replaced block. Then put it onto the instrument and fix it well by the wrench.



Chapter 6 Failure Analysis and Troubleshooting

Problems and actions

No.	Common problem	Possible cause	Action(s)
1	No display on the screen	No power on the main power plug	Check power supply and plugged properly
		Faulty fuse	Change fuse
		On/Off button broken	Change button
		Others	Contact the supplier
2	The actual and displayed temperatures are quite different	Broken sensor or loose contact of the block	Contact the supplier
3	“OPEn” displayed, alarming “beep”	Sensor disconnect	Contact the supplier
	“SHOr” displayed, alarming “beep”	Sensor short-circuit	
	“HHHH” displayed, alarming “beep”	Sensor broken, or block temperature is too high	
4	No heating	Sensor broken	Contact the supplier
		Heating tube broken	
5	Keys don't work	Faulty key	Contact the supplier

Annex : Wiring Diagram

(for reference only)

