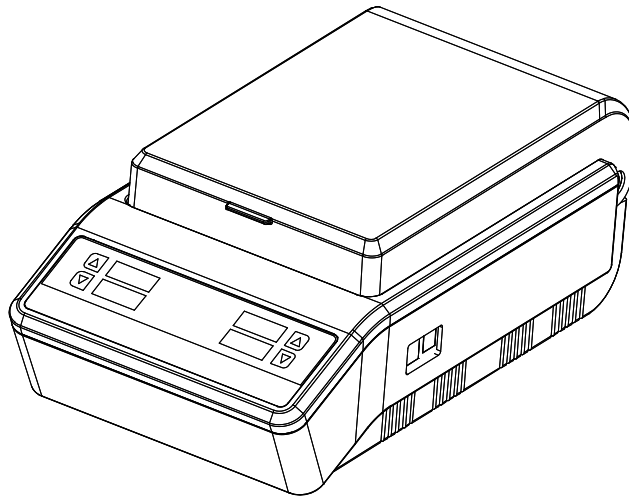# Operation Manual

NB-12-0006

Dry Bath Incubator
N10 Series

NeoBiotech

Foreword

Thank you for purchasing our product: 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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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 the user uses 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.

Contents

Chapter 1 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 2 Specifications

1. **The normal operating condition:**

   Ambient temperature：5°C ~ 35°C
   Relative humidity：≤70%
   Power supply：AC220V～　50-60Hz

2. **The basic parameters and characteristics**

   Basic parameters：

Parameter Type	NB-12-0006A	NB-12-0006B NB-12-0006C
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（20-105°C）	≤20 min	
Block	1pc	2pcs
Power	120W	240W
Fuse	250V 1.5A　Φ5×20	250V 3A　Φ5×20
Meas.(mm)(L×W×H)	250x190x130	365x210x150
Weight（kg）	2.5	4.5

3. Optional block

| Item No.	Capacity + Diameter	Meas.(mm)
NB-12-0006-01	96x0.2ml or 96 PCR plate	108 x 72 x 60
NB-12-0006-02	45x0.5ml Falcon	108 x 72 x 49
NB-12-0006-03	35x1.5ml Falcon	108 x 72 x 49
NB-12-0006-04	35x2.0ml Falcon	108 x 72 x 49
NB-12-0006-05	15x0.5ml + 20x1.5ml Falcon	108 x 72 x 49
NB-12-0006-06	20x1.5ml + 15x2.0ml Falcon	108 x 72 x 49
NB-12-0006-07	32x0.2ml + 22x0.5ml + 9x1.5ml Falcon	108 x 72 x 49
NB-12-0006-08	20x5ml Falcon	108 x 72 x 49
NB-12-0006-09	20x10ml Falcon	108 x 72 x 49
NB-12-0006-10	12x15ml Falcon	108 x 72 x 60
NB-12-0006-11	6x50ml Falcon	108 x 72 x 60
NB-12-0006-12	96 wells microplate	116.5 x 75 x 60
NB-12-0006-13	Plate	108 x 72 x 60
NB-12-0006-14	384 PCR plate	108 x 72 x 60
NB-12-0006-15	40x6mm tube	108 x 72 x 49
NB-12-0006-16	28x10mm tube	108 x 72 x 49
NB-12-0006-17	24x12mm tube	108 x 72 x 49
NB-12-0006-18	24x13mm tube	108 x 72 x 49
NB-12-0006-19	14x15mm tube	108 x 72 x 49
NB-12-0006-20	14x16mm tube	108 x 72 x 49
NB-12-0006-21	12x19mm tube	108 x 72 x 49
NB-12-0006-22	11x20mm tube	108 x 72 x 49
NB-12-0006-23	6x26mm tube	108 x 72 x 49
NB-12-0006-24	6x28mm tube	108 x 72 x 49
NB-12-0006-25	2x40mm tube	108 x 72 x 49
NB-12-0006-26	2x7 (Cuvette)	108 x 72 x 49
NB-12-0006-27	PT1000	
NB-12-0006-28	M4	

Chapter 3 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

Transparent cover

Block

Keypad

On/Off button

Power supply

Fuse
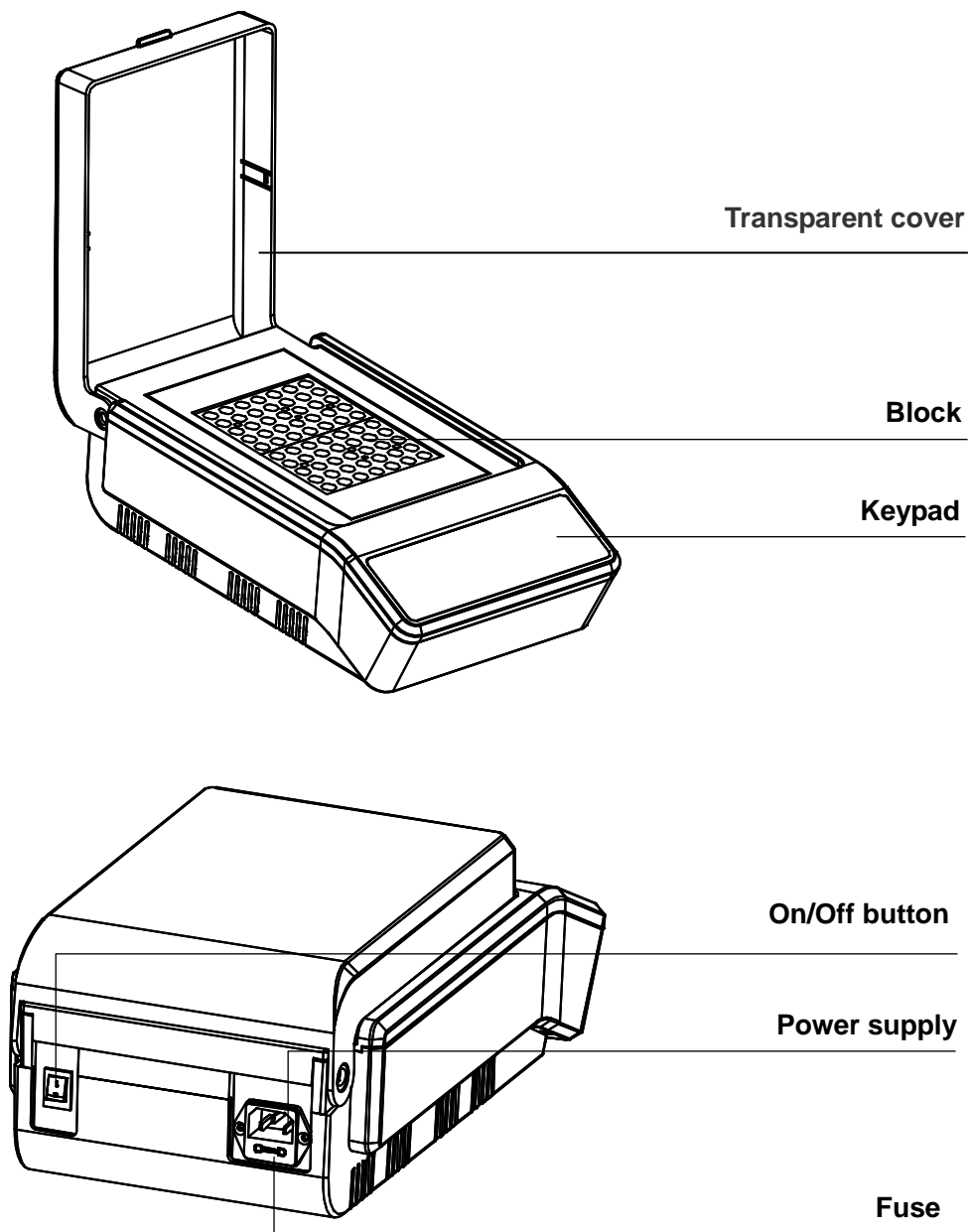
2. **Keypads**
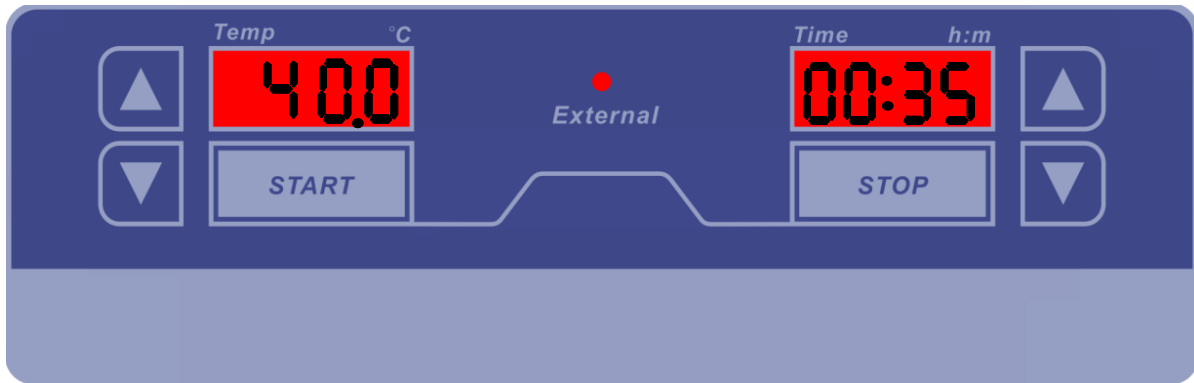
3. **Display**

▼   **Drop key: For number decreasing.**

▲   **Up key: For number increasing.**

Start   **For running, timing begins.**

Stop   **For stopping, timing ends.**

Chapter 4 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".**

[8888] [88:88]
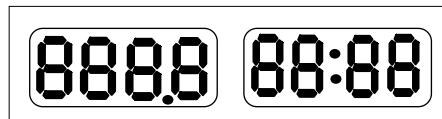
b) **After about 3 seconds, the temperature automatically goes up to the setting temperature, the 28.5 in display is the real-time temperature of the block (It indicates the temperature now is 28.5°C). The 00:35 in display is the running time set previously.(It indicates the running time is 35 min).**

[28.5] [00:35]
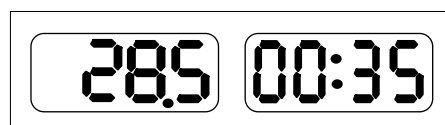
c) **Press ▲ or ▼ in Temp to modify the temperature.**

[040.0] [00:35]
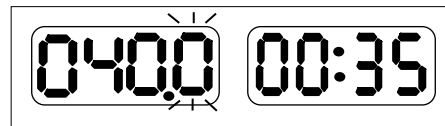
d) **Then press ▲ or ▼ at Time to modify the time.**

[055.5] [00:35]
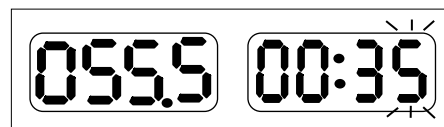
Wait 6 seconds to confirm the input temperature and time, and they flash simultaneously and disappear, then the temperature automatically goes up to the setting temperature.

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**

[35.5] [01:20]
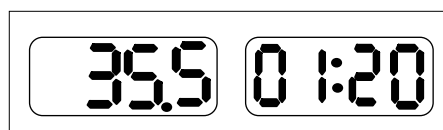
thermostat countdown begins with the sound of "beep".

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

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

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

b) After running ends, press any key return.

c) When running, press "Stop" key to stop.

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, you can do as follows to correct the error.

Caution: the instrument uses double temperatures adjustment to ensure its veracity. This means that it is linearly adjusted on 40℃ and 100℃ two points. The temperature veracity will be within ±0.5℃ after the double temperatures adjustment.

Both the circumstance temperature and the block temperature should be lower than 35℃

3.1. Calibrated with a thermometer, specific methods are as follows：

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

temperature in display is below 35℃. If the temperature is higher than 35℃, you should wait until the temperature is below 35℃.

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℃ and the temperature ball should be absolutely immerged into the cone-shaped well). See Fig a.
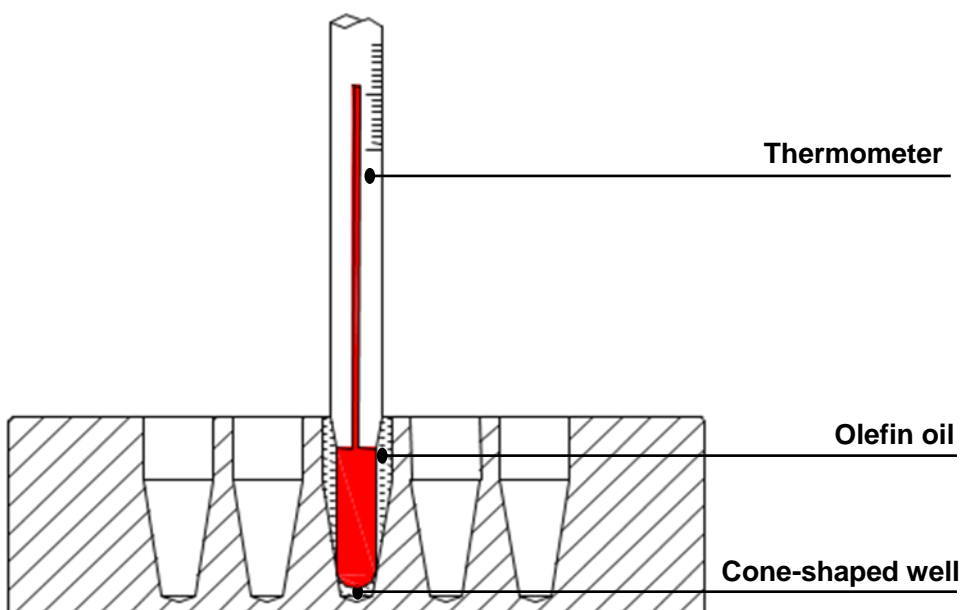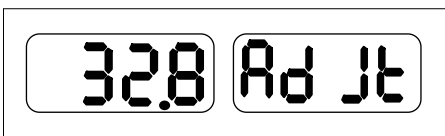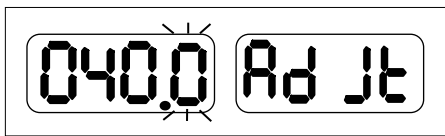

Thermometer

Olefin oil

Cone-shaped well

Fig a

c) Press "Stop" key without releasing, then press ▼ key of temperature 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℃ automatically.

$$\boxed{32.8} \boxed{Ad\ Jt}$$

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

$$\boxed{040.0} \boxed{Ad\ Jt}$$

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℃,
Modify the temperature to 39.6 by pressing ▼ or
▲. Then press "Start" to confirm the input value.

`039.6` `Ad Jt`
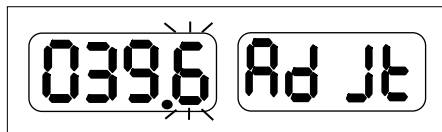
d) Then the instrument will heat to 100℃ automatically, waiting till the instrument is in
100℃ thermostat, input temperature calibration value. After 20 minutes' constant
temperature, the user can read the actual value from thermometer.

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

If the actual readout is 101.5 ℃, modify the
temperature in display to 101.5 by pressing ▼ or ▲.
Then press "Start" to confirm the input.

`101.5` `Ad Jt`
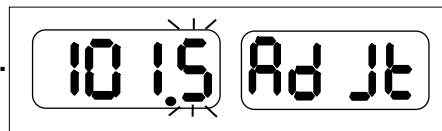
Notes: Pressing "Stop" and "▼" simultaneously during the temperature calibration
indicates exiting the temperature calibration program. The changed value will
be of no effect.

3.2. Calibrated with an external sensor, specific methods are as follows：
Tips：External sensors are optional parts, it needs to be ordered separately.

a) After the startup of the instrument, it enters into waiting interface. Make sure that the
temperature in display is below 35℃. If the temperature is higher than 35℃, the user
should wait until the temperature is below 35℃.

b) Put one end of the external sensors into a block well, and insert the other end to the
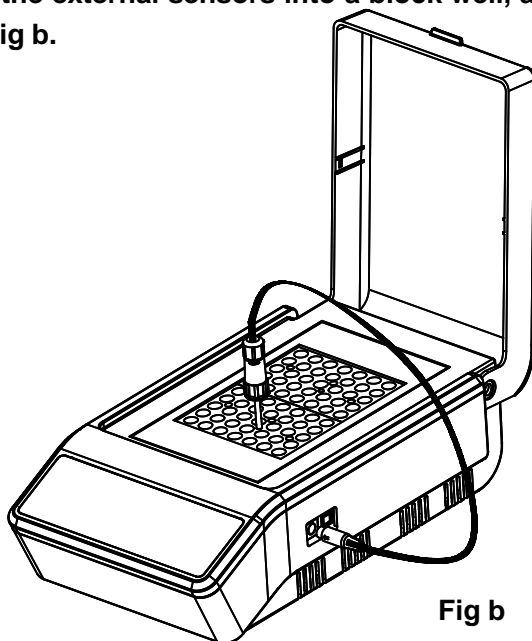interface. See Fig b.

Fig b

c) **Press "Stop" key without release, then press ▲ 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 begins to rise to 40.0℃ 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℃ constant temperature, the decimal digit begins to flicker, waiting for the calibrated value of 40℃. Read out the actual value from the thermometer after 20 minutes.
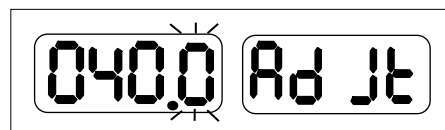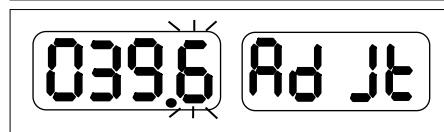
Notes: Please read the actual value after 20 minutes' constant temperature to ensure the calibration accuracy.

Press "Stop" key to view the temperature value of external sensor, if displayed 39.6 ° C.
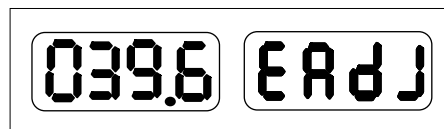
Press "Stop" again, or wait for 6 seconds, then displayed " Ad Jt ", modify the displayed temperature to 39.6 by pressing ▼ or ▲. Then press ▲ to confirm the input value.

d) **Then the instruments will heating to 100℃ automatically，waiting till the instrument is in 100℃ 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 of sensor is 101.5℃, modify the temperature in display to 101.5 by pressing ▼ or ▲. Then press "▲" to confirm the input value.

Notes: Pressing "Stop" and "▲" 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 release, 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.
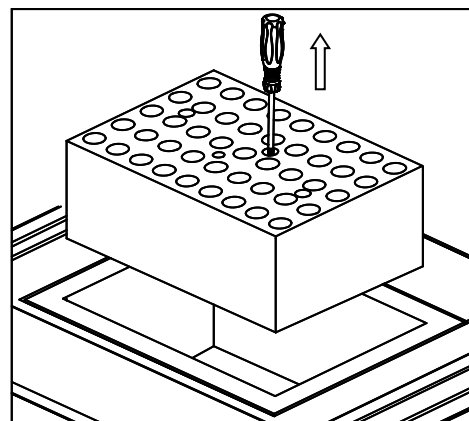
5．The exchange of metal block

a) Completely screw out the 2 screws which were used for fixing metal blocks by combination wrench in an anticlockwise direction.
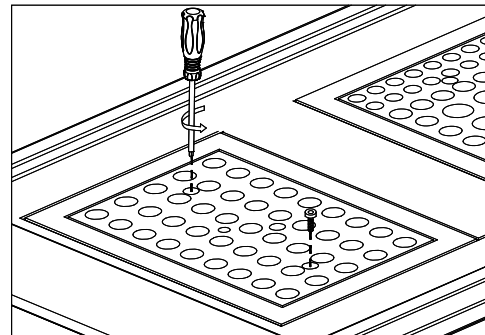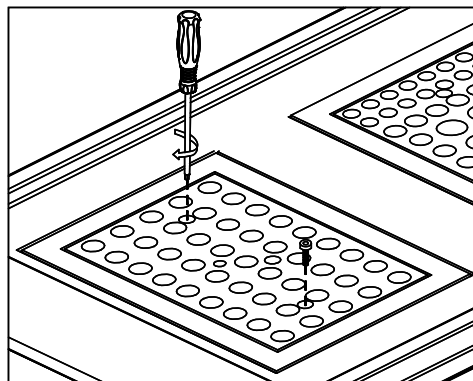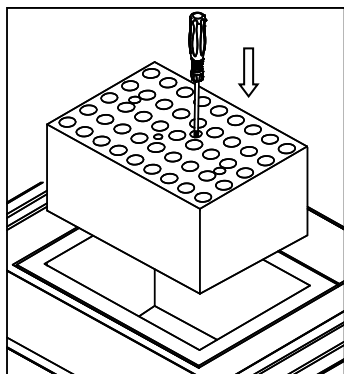
b) Fix the wrench in the center well of the block.
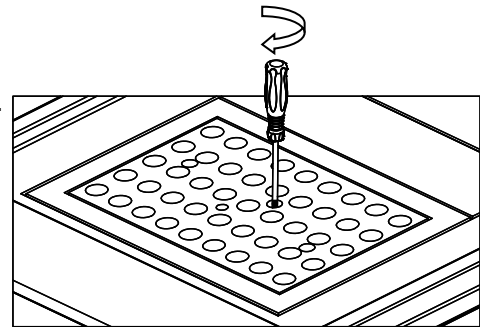
c) Pull out the wrench with the block.

— 12 —

   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.**
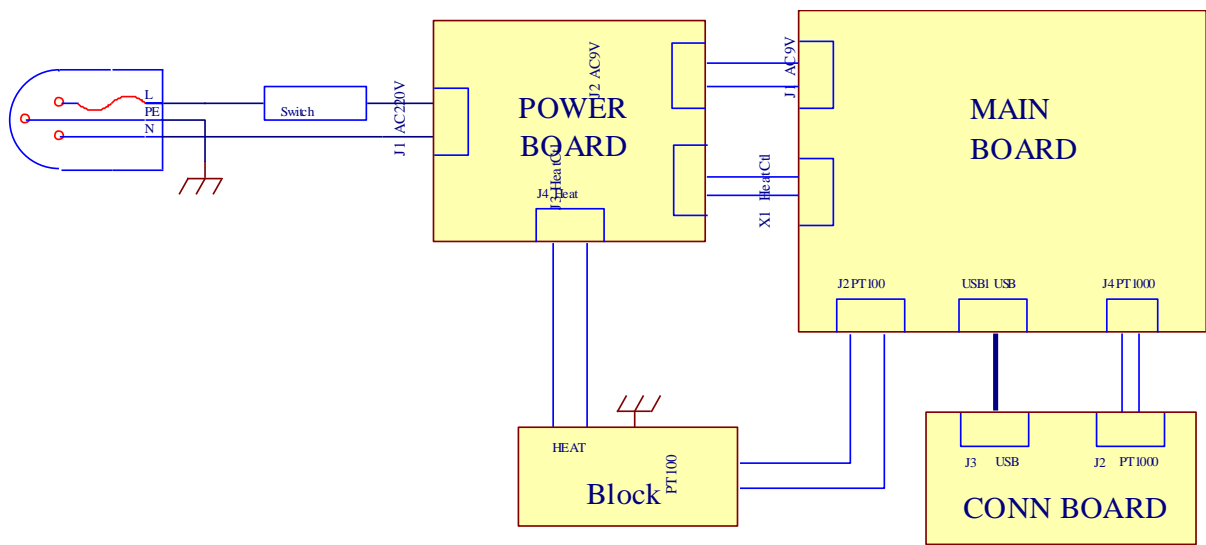
Chapter 5 Failure Analysis and Troubleshooting

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 us
2	The actual and displayed temperatures are quite different	Broken sensor or loose contact of the block	Contact us
3	"OPEn" displayed, alarming "beep"	Sensor disconnect	Contact us
	"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 us
		Heating tube broken	
5	Keys don't work	Faulty key	Contact us

Annex：Wiring Diagram

（*for reference only*）

Memo