

# Operation Manual



**BDIB-101**

## Dry Bath Incubator

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

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## PREFACE

**Thanks for choosing dry bath incubator. This operation manual describes function and operation of the instrument. In order to use the instrument properly, please read this manual carefully before operating the Instrument.**

### Opening Check

**Please check the instrument and appendix with the packing list when you first open the packing case. If anything does not match with the packing list, please contact with the vendor or the producer.**

# Safety Warnings and Guidelines

## 1 Important Operation Information of the Security

Users should have an entire conception of how to use the instrument properly before operating it. Please read this operation manual carefully before using the instrument.



It is forbidden operating before read the operation manual. Read the guidelines and directions below and carry out the countermeasure according to them.

## 2 Security

To operation, maintenance and repair the instrument, please comply with the basic guidelines and the remarked warnings below. Otherwise, the instrument will suffer effect on the scheduled working life and also on the protection provided.



This product is a normal and an indoor using instrument.



Before operation, read the manual carefully. These units are designed for using in the laboratory environments by who're knowledgeable in safe laboratory practices.



The operator should not open or repair the instrument by himself. Otherwise, the instrument will lose the qualification of repair guarantee or cause accidents. The company will repair the instrument based on warranty description.



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



The temperature of metal block will be very high during the normal operation. There will be scald or boiling of the liquid. It is strictly prohibited any part of the body touching the instrument from scald.



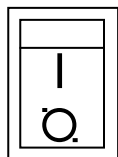
Close the test tube lid before put the tube into the block. Liquids may spill out in the block or onto the device if the tube lid is opened, which will damage the block or the device.



Make sure the voltage is complying with the voltage required. Make sure the rated electrical outlet loads no lower than the demand. Power line should be replaced with the same type if it any damage. Make sure there is nothing on the power line. Hold the jack when pull out the power line. Do not pull the power line. Do not put the power line in ambulatory place.



The instrument should be put in the place where of low temperature, little dust, no water, no sunshine or hard light, and of good aeration, no corrosively gas or strong disturbing magnetic field, and far away from central heating, camp stove and other hot resource. Do not put the instrument in wet and dusty place. 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. Turn to "I" to power on the device, and Turn to "O" to power off the device.



Power off when operation finished. Pull off the connector plug when instrument is not in use for long period and cover the instrument with a cloth 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 Instruments Maintenance

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.  
Do not drop the clean fluid in the well when cleaning.  
Corrosive clean fluid is strongly prohibited.

# 01 Introduction

The dry bath Incubator is a best designed product controlled by the micro-processor. It 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:

- Temperature and time digital displayed in LCD and digital controlled;
- Display of the set and current temperature contemporary;
- The time of temperature-control can be set.
- Using of metal block to avoid product pollution;
- Easy replacement, cleaning and disinfecting of metal block;
- Temperature adjustment;
- Buzzer alarm in the end of temperature control duration.

## 02 Specifications

### 1. Normal Operating Conditions

Ambient temperature: 5°C~30°C

Relative humidity: ≤ 70%

Power supply: 110-230V~50/60Hz

### 2. Basic Parameters and Performance

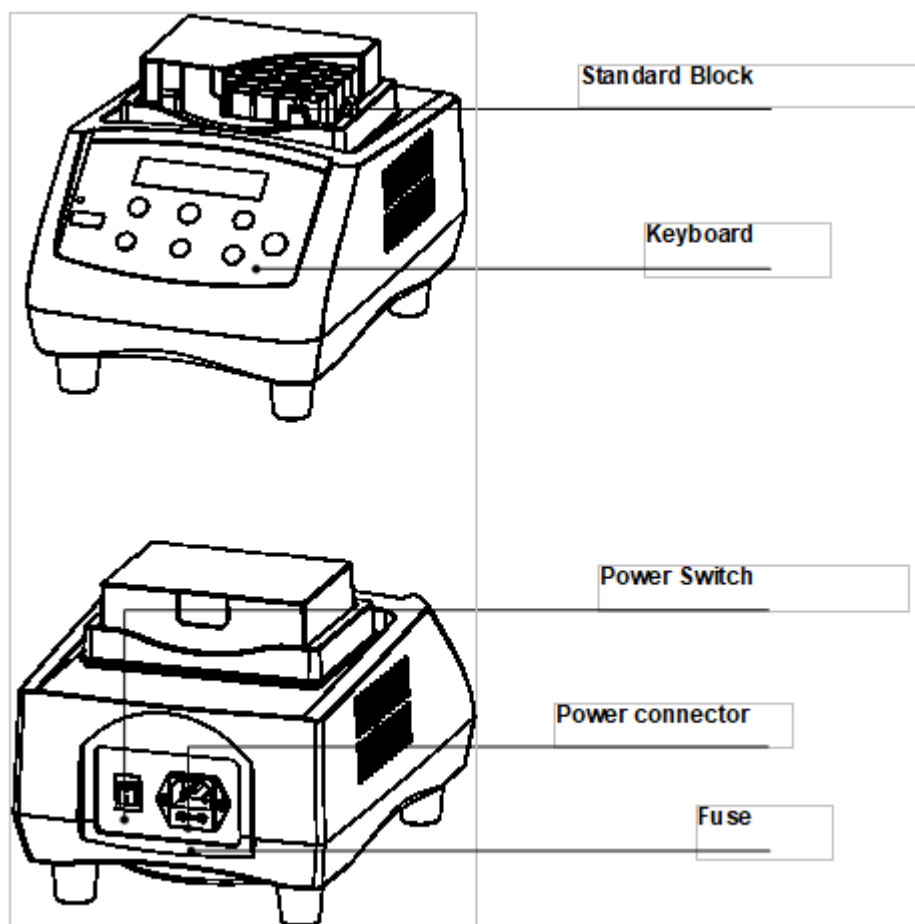
<b>Model Parameters</b>	<b>BDIB-101</b>
<b>Temperature range</b>	<b>R.T.+5°C ~100°C</b>
<b>Time range</b>	<b>1 min ~ 99h59min</b>
<b>Accuracy of the temperature</b>	<b>≤ 0.5°C</b>
<b>Display Accuracy</b>	<b>0.1°C</b>
<b>Heating time (from 20°C to 100°C)</b>	<b>≤ 15min</b>
<b>Heating mode</b>	<b>Heater</b>
<b>Power supply</b>	<b>150W</b>
<b>Fuse</b>	<b>250V 3A Φ5×20</b>
<b>Dimension (mm)</b>	<b>270(D)×196(W)×170(H)</b>
<b>Net weight (kg)</b>	<b>3.2</b>



## 03 Preparations

This chapter mainly describes the instrument's mechanical structure, the keyboard and functions of each key, as well as preparations before power on. Please learn this chapter well before the Thermo Shaker to be operated the first time.

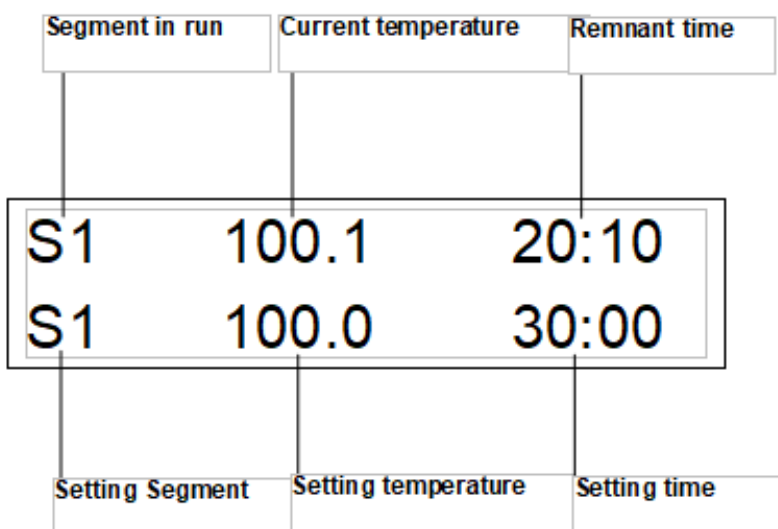
### 1. Structure Description



## 2. Keyboard and Display panel



### Display Panel:



### 3. Key Functions

**Seg** ▲ ▼

Key for selecting procedure segment. Five segments can be selected (S1, S2, S3, S4, S5).

**Temp** ▲ ▼

Key for temperature setting. Press ▲ or ▼ to set the target temperature. Press ▲ or ▼ continuously can quickly set temperature conveniently with x10 speed.

**Temp** ▲ ▼

Key for timing setting. Press ▲ or ▼ to set the target timing value. Press ▲ or ▼ continuously can quickly set timing conveniently with x10 speed.

**Prog**

Key for programming. Press "PROG" to select segment. Default starting segment is S1. The instrument can implement 4 programs as S1-S2, S1-S2-S3, S1-S2-S3-S4, S1-S2-S3-S4-S5.

**Start/Stop**

Key for start or stop. Press Start/Stop key to start or stop the program. To stop the program in operation, need to keep pressing the start/stop key for around 2 seconds.

# 04 Operation Guide

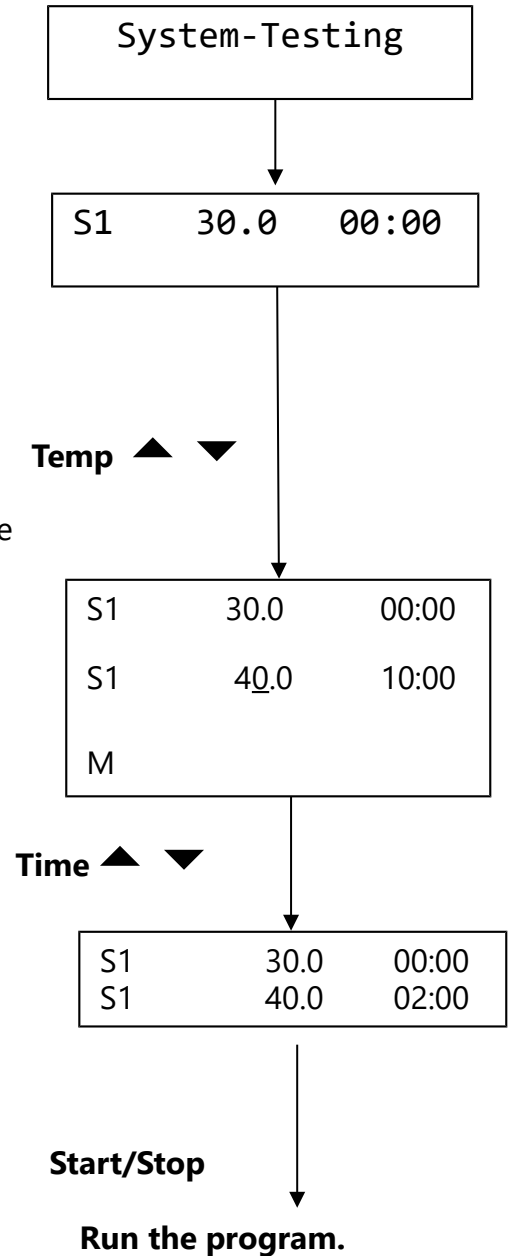
## 1. Single temperature and timing setting

- a) The LCD enter into initial interface as the right chart when the instrument powers on with the sound of “du...”.
- b) After 6 seconds, the display window for current temperature shows 30.0 which indicates the block current temperature. Setting temperature shows 37.0 which indicates the target temperature value. 10:00 is the former timing time, and S1 is the former program segment. Temperature unit is “°C”. Time unit is “hour:minute”.
- c) Pressing “▲” or “▼” of Temp, the setting temperature value will increase or reduce. Continuously pressing will lead the value increase or reduce from decimal digit, unit digit, tens digit to hundreds digit. Program auto confirm and save the value.

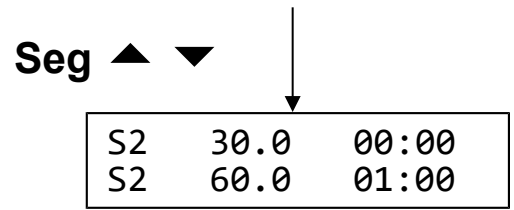
Pressing “▲” or “▼” of Time to set timing value according to the same transformation rule as temp setting above.

Program auto confirm and save the value.

- d) Press Start/Stop to run the program.



- e) Press  $\Delta$  or  $\nabla$  of Seg. to select Segment.  
Set the segment's values according to c).  
Total five segments can be set for operation.

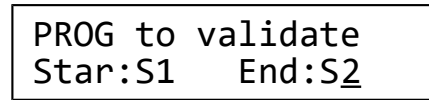


## 2. Multi-Program Setting

- a) Pressing "prog." key to connect segments as S1-S2, S1-S2-S3, S1-S2-S3-S4, or S1-S2-S3-S4-S5 multi-program.

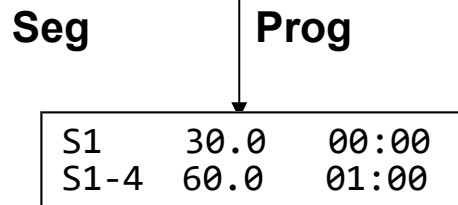
Note! the start segment is always segment S1.

- b) Press "prog." key to enter program display. Refer to right chart. "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.



Press  $\Delta$  of Seg. to change it to "S4".

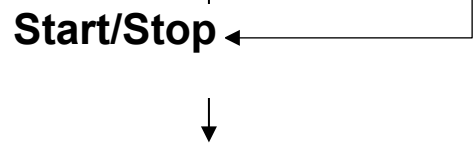
Press "prog." key to confirm. The multi-program set as S1-S2-S3-S4.



- c) Press "Start/Stop" key to run the multi-program.

Note!

Press "Start/Stop" key directly to run the multi-program when the last segment is changed to the required.



### 3. Temperature calibration

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

#### NOTICE:

- 1) The instrument has 2 calibration temperature points to ensure the veracity. It is linearly adjusted on 40°C and 100°C. The temperature accuracy will be within  $\pm 0.5^{\circ}\text{C}$  after temperature calibration.
- 2) Both the environmental and the block temperature should be lower than 35°C when calibration.

#### Adjustment Methods:

- a) Power on the instrument, it enters into 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 down below 35°C.
- b) Inject olefin oil into one of block well, and then put a thermometer into this well (the precision of the thermometer should be 0.1°C and the temperature ball should be absolutely immersed into the olefin oil in the block well). Adiabatic material is needed on the block to separate it from the circumstance. (refer to below Figure A)

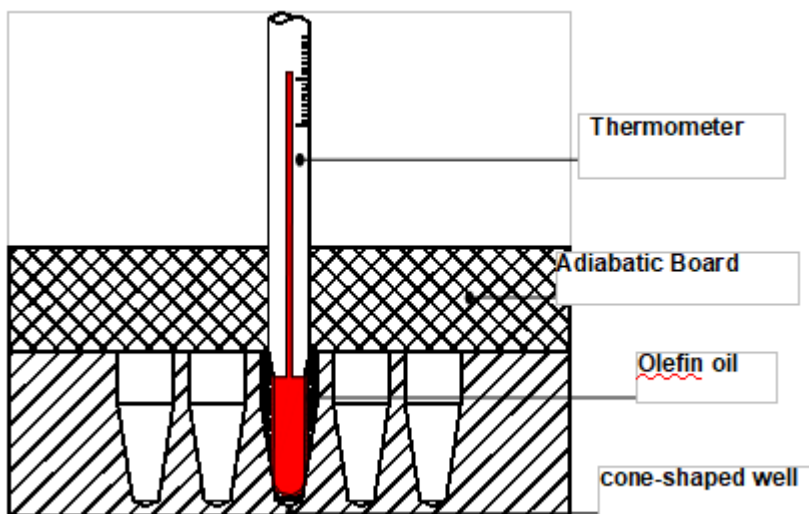


Figure A

**NOTICE:** To ensure the calibration precision, read the actual temperature value after the temperature reaches calibration points for at least 20 minutes.

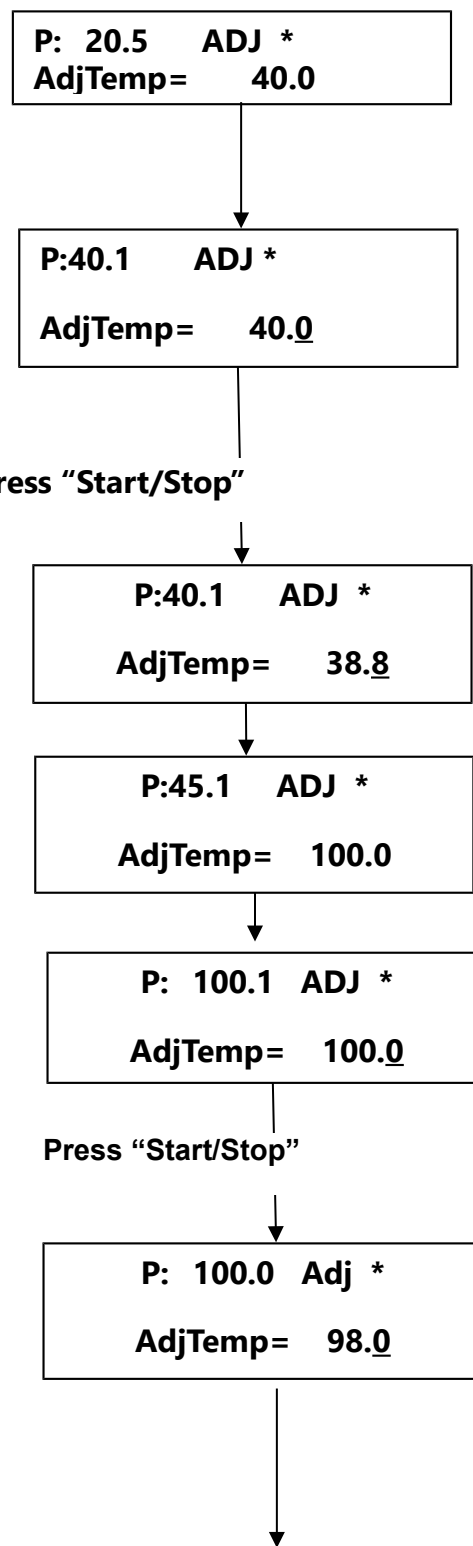
- a) Press  $\Delta$  and  $\nabla$  of Seg. simultaneously when the instrument is not operating. The program turns to interface as the right chart. Practical temperature is behind "P:" which shows 20.5, and the program auto control the temperature to 40°C. At the meantime, the sign "⓪" flickers ceaselessly. The value behind "AdjTemp" is the calibration temp. When temperature achieves 40°C, "ADJ" and "⓪" flicker ceaselessly together, the value behind "P:" is still the practical temperature.

- b) Wait for 20 minutes, the actual temperature of thermometer is 38.8°C. Press  $\Delta$  or  $\nabla$  of Temp. to amend the value behind "AdjTemp" to 38.8. Press "Start/Stop" to confirm.

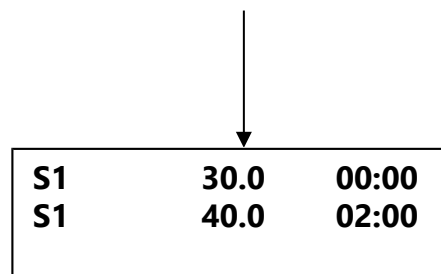
Program saves the value.  
Temperature rises to 100°C automatically.  
The sign "⓪" flickers ceaselessly.

- c) When practical temperature reaches 100°C, "ADJ" and "⓪" flicker ceaselessly together.

- d) Wait for 20 minutes, the actual temperature of thermometer is 98°C. Press r or s of Temp. to amend the value behind "AdjTemp" to 98.0. Press "Start/Stop" to confirm Program saves the value.  
Temperature rises to 100°C automatically.  
The sign "⓪" flickers ceaselessly.



- e) When practical temperature reaches 100°C, "ADJ" and "U" flicker ceaselessly together.
- f) Wait for 20 minutes, the actual temperature of thermometer is 98°C. Press r or s of Temp. to amend the value behind "AdjTemp" to 98.0.  
Press "Start/Stop" to confirm
- g) Program turns to interface for operation as the right chart.



S1	30.0	00:00
S1	40.0	02:00

After temperature calibration, the temperature display is the same as the practical temperature of block.

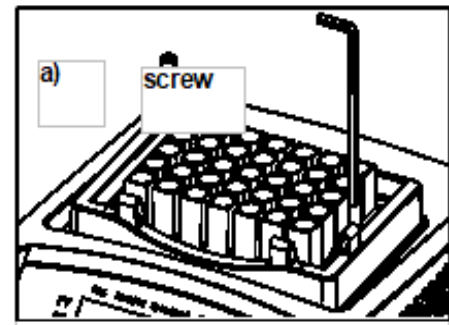
**NOTICE:**

- 1) During temperature calibration, press Δ and ∇ of Seg. simultaneously to cancel the calibration. The system keeps the former calibration.
- 2) Do not simultaneously press Δ and ∇ of Seg. unless calibrate is really needed.

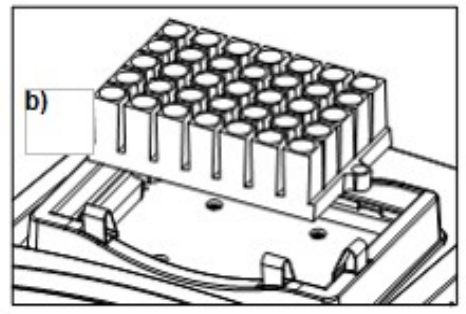


#### 4 Exchange of Block

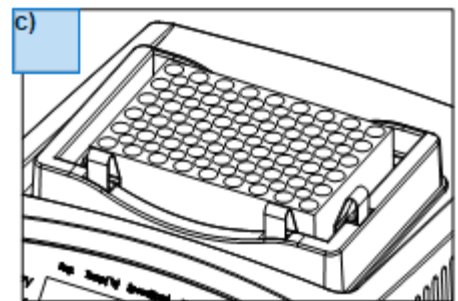
a) Pull out the four screws which fix the block to the heating board with the screw driver.



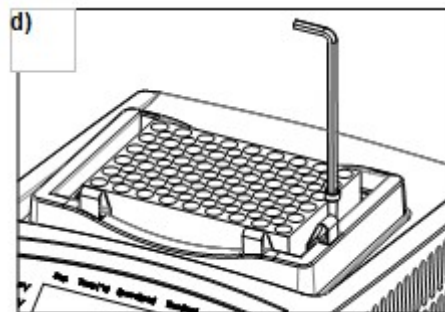
b) Pull out the block



c) Place another block needed



d) Fix it with the screws



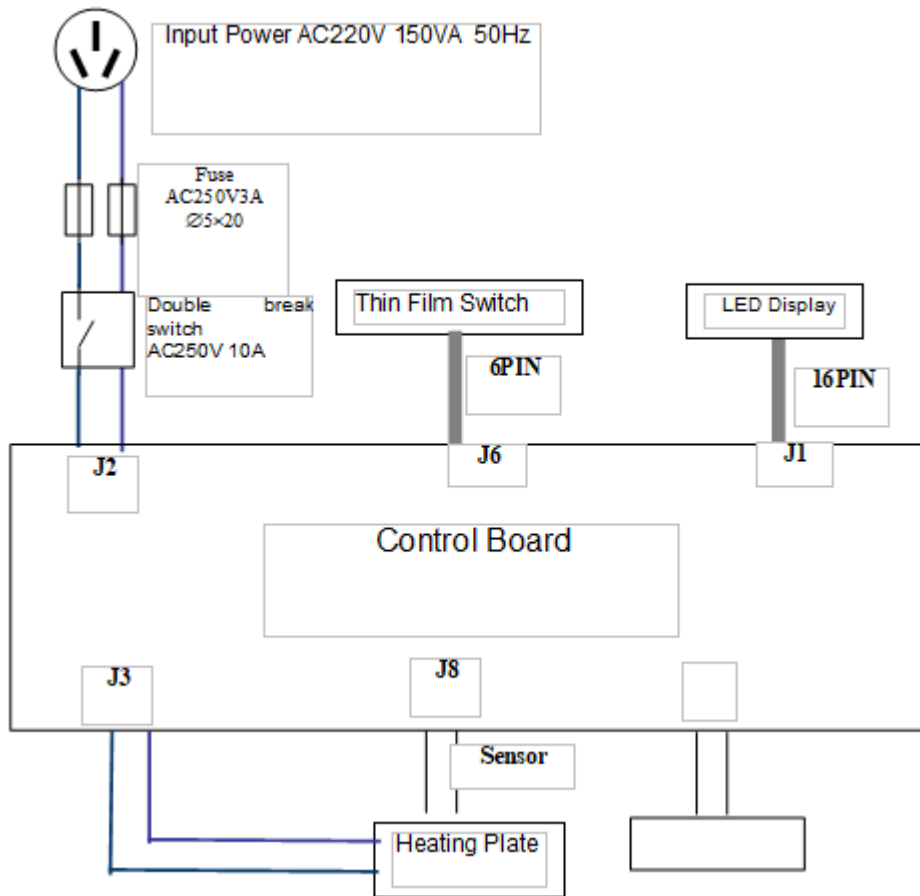
## 05 Failure Analysis And Troubleshooting

### Failure analysis and processing procedures

No.	Phenomenon	Possible Causes	Processing Procedure
1	Display window doesn't response after power-on	No power	Check the connection of power
		Bad Fuse	Exchange fuse (250V 3A Φ5x20)
		switch Failure	Exchange the switch
		Others	Contact to the seller
2	The actual and displayed temperatures are quite different.	Broken sensor or loose contact of the module	Contact to the seller
3	"OPEN" in the display with the alarm of "du..."	The sensor is disconnection	Contact to the seller
4	"SHORT" in the display with the alarm of "du..."	The sensor is short	Contact to the seller
5	No heating of the block	Switch power failure	Contact to the seller
		Bad heater	
6	Press invalid	Keyboard failure	Contact to the seller

# 06 Annex 1

## Wiring Diagram for BDIB-101 Dry Bath Incubator





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