

# Operation Manual



BIAJ-103

## Air Jacketed Incubator

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# 01 Summary

WPL incubator is the ideal testing equipment for bacteria and microorganism culturing and scientific research, it is widely used in modern medicine, food, pharmacy, biology, and biochemistry industry.

## 02 Structure features

1. High-quality cold rolling steel case with electrostatic spraying surface ensures the aesthetics and longevity of the product.
2. Stainless steel working room; foursquare semicircle transition; adjustable shelf, airduct lateral plate and bottom heater covering are knock-down construction, which is convenient for cleaning.
3. PID digital intelligent temperature controller with function of temperature setting, time dual screen displaying, over-temperature alarming and timing.
4. The heater and fan are reasonably constructed by placing under the working room.
5. Independent temperature limiter alarm, which can auto-switch with temperature controller and alarm when over temperature limit.
6. Air-tightness adjustable buckle lock door to ensure good sealability.

Optional accessories:

- a. RS485/232 interface for connecting computer by principal computer software to control temperature switch.
- b. Micro type printer, which can continuously print the temperature record of the running machine.
- c. Independent power cut alarm system to help the user process sample immediately.
- d. Independent temperature limit alarm system; auto-break-off when over temperature limit.

# 03 Product structure diagram and parameters

## i . Structure diagram

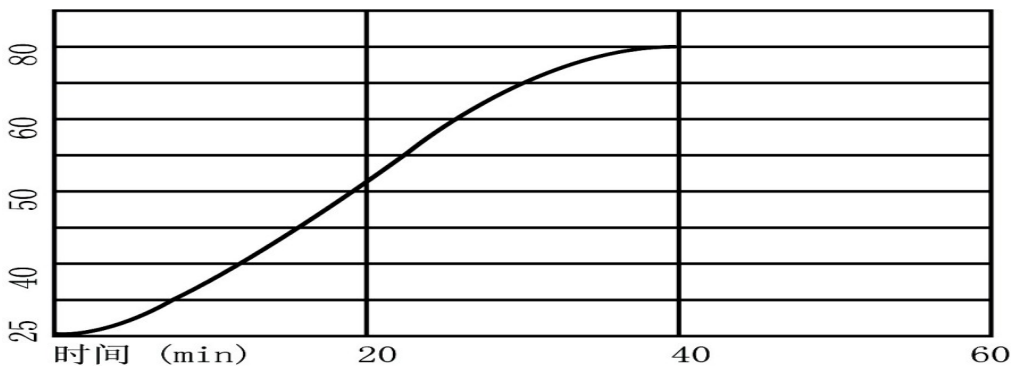


## ii .Main technical parameters

		BIAJ-101	BIAJ-102	BIAJ-103	BIAJ-104	BIAJ-105
Cycle Mode		Forced convection				
Function	Temp. range	RT+5-120°C				
	Temp. Resolution Ratio	0.1°C				
	Temp. Motion	±1°C				
	Temp. Uniformity	±1.0°C				
Structure	Inner Chamber	Mirror Stainless Steel				
	Outer Shell	Cold rolling steel electrostatic spraying exterior				
	Insulation layer	Compound silicate heat preservation board				
	Heater	Stainless steel heater				
	Power rating	0.4kW	0.5kW	0.7kW	1.1kW	1.5kW
	Exhaust hole	φ28mm top( with function of test hole)				
	Timer	0-9999min(with timing wait function)				
Sensor	pt100					

Specification	Inner Chamber size(W*L*H)(mm)	310*310*310	350*350*350	400*360*450	500*450*550	600*500*750
	Exterior size (W*L*H)(mm)	460*510*695	500*550*735	550*550*840	636*680*915	730*680*1250
	Packing size (W*L*H)(mm)	550*585*845	590*625*885	640*635*985	740*725*1085	860*790*1400
	Volume	30L	45L	65L	125L	230L
	Shelf number	6	7	9	13	17
	Load per rack	15kg				
	Shelf space	35mm				
	Current rating	220V/3.6A	220V/5.5A	220V/7.2A	220V/10.5A	220V/13.6A
	NW/GW (kg)	33/37	37/43	44/49	60/66	94/120
	Shelf	2				

### iii .Temperature profile












**Note:** according to the different model type, the time of warming up is different

## 04 Working conditions

The Incubator works under the following conditions:

1. Temperature ranges between 5~40°C;
2. Relative humidity less than 85% RH;
3. Power: voltage 220±10v, frequency 50-60±1Hz;
4. No violent vibrations and corrosive gas surround the oven.

## 05 Attentions

	Install the outer ground protection to ensure safety of machine and experiment; ensure power as the machine required.
	This equipment is forbid to use in inflammable and explosive, poisonous and strong corrosive experiments.
	Make sure horizontal installation.
	Non-professionals are not allowed to disassemble and repair this machine.
	Pay attention to the setting temperature when dealing with inflammable matters.
	Make sure dry the resin container, if the temperature is setting too high by accident, the container would be dissolved and then fall on the heater, which will cause fire.
	Overfilled of sample will lead to overheat of working room under part, which will dissolve the inflammable material and cause fire.
	While the machine is working, don't touch the device top, as well as observation window and exhaust port to keep away from high-temperature burns.
	Read the instruction book before operation.

## 06 Operation instruction

Put the sample into container (advice: size of sample should not over 2/3 of the shelf); then close the container door and switch power.

### Heating

Set the temperature as needs (see details in meter instruction), then the temperature starts to rise; when temperature inside working room reaches the set point, the indication light will go out, after constant temperature for 30min, the working room goes into constant temperature state.

**Note: don't close blower when the temperature is rising, or else it will accelerate ageing of heater.**

**Working time:**

Decide the working time according to different sample need. Use for a long time set to 0. After finishing culture, turn off power, and then bring the sample out.

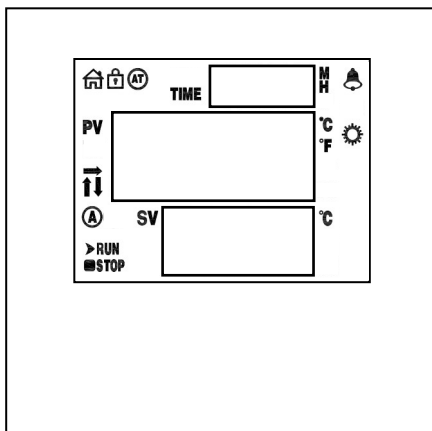
Keep the incubator clean, wipe the container sealing rubber strip by soft cloth and clear the dirt out; avoid cleaning it by chemical solution to prevent chemical reaction damage on sealing rubber strip.

If the incubator is unused for a long time, daub neutral grease or Vaseline on galvanized parts to prevent corrosion; cover the oven with plastic dust cap, and store it in the dry room to keep the electric device against wet.

## 07 Temperature controller instruction

### 1. Panel Instructions

#### IV. The panel indication



## Key defines

1. **【Set】**: Set key, in the main screen state, click this key to enter the temperature and time target value Setting state, long press this key for 3 seconds to enter the internal parameter Setting state.
2. **【◀/AT】**: Shift / Auto-tuning, in the Setting state, click this key to change the Setting value. In the main screen state, long press this key for 6 seconds to temperature auto-tuning selection state.
3. **【▼/RST】**: Decrease / rerun key. In the Setting state, click or long press this key to decrease the Setting value. In the main screen state, long press this key for 3 seconds to restart the run.
4. **【▲/🔒】**: Increase / lock screen key. In the Setting state, click or long press this key to increase the Setting value. In the main screen state, click this key to lock or unlock the screen.

## PC-D9000 VA LCD indicator Defines

1. **【Main】** indicator : In the normal working state (non-Setting state), the lamp will be on, otherwise it will be off.
2. **【Lock】** indicator: It will be on when the screen is locked, otherwise it will be off.
3. **【AT】** indicator: The lamp flashes during temperature self-adjustment and goes out instead.
4. **【Alarm】** indicator: The lamp will be on when there is temperature deviation alarm or abnormal temperature measurement. It will flash when there is temperature deviation alarm. Under normal condition, it will be off.
5. **【Heating】** indicator: The lamp will be on when there is heating output, otherwise it will be off.
6. **【A】** indicator: The lamp will be flash in reservation timing, otherwise it will be off.
7. **【RUN/STOP】** indicator: Only STOP lights up at the end of timing, and RUN lights up in other states.
8. **【↑/→/↓】** indicator: It will flash when heating, constant temperature and cooling.

2) Type PC-E9000 : After all the display are on for about 3 seconds, PV area displays **【P(K) – E9】**, SV displays version number for about 1 second and then enters the normal display state.

## 2. Reference and Setting of temperature and time

### 1) No-timing function:

In the main screen state, click the **【Set】** to enter the temperature Setting state, the PV area displays prompt SP, and the SV area displays the temperature Setting value, which can be modified to the required Setting value through the **【shift】**、**【increase】**、**【decrease】**, then click the **【Set】** to exit the Setting state, and the Setting value will be saved automatically.

### 2) Timing function:

In the main screen state, click the **【Set】** to enter the temperature Setting state, the PV area displays the prompt SP, the SV area displays the temperature Setting value, and the modification method is the same as above; then click the **【Set】** to enter the time Setting state, the PV area displays the prompt ST, TIME area displays the time Setting value; then click **【Set】** to exit the Setting state, and the Setting value will be saved automatically.

When the Setting time is "0", it means continuous operation. When the Setting time is not "0", before the timing starts, if the timing direction is count-down, the TIME area will display the timing time; if the timing is count-up, the TIME area will display "0". When the timing starts,



"indicator" will flash. When the time is up, the operation will end. The TIME area will display End, and the buzzer will beep for EST seconds (see 7. Parameter TABLE-1). At this time, long press the **[decrease]** for 3 seconds, the operation can be restarted.

**Description: PC-D9000 type, "indicator" is "time unit";  
PC-E9000 type, the "indicator" is "TIME displays decimal point of single digits."**

### 3. Reservation function (see 7. Parameter TABLE-6)

When an reservation time is Set, heating operation is prohibited.

1) PC-D9000 type: In reservation timing, A indicator flashes, and the count-down TIME area displays the reservation running time.

2) PC-E9000: In reservation timing, TIM indicator flashes, and the count-down TIME area displays the reservation running time.

### 4. Abnormal temperature measurement alarm

If the PV area displays "----", it means that the temperature sensor is faulty or the temperature exceeds the measuring range or the controller itself is faulty. The controller will automatically disconnect the heating output, the buzzer will sound continuously and the alarm light will be on. Please check the temperature sensor and its wiring carefully.

### 5. Deviation over temperature alarm (see 7. Parameter TABLE-1)

When the upper deviation over temperature alarm occurs in process, the buzzer beeps, the alarm light is continuously on, and the heating output is disconnected. When the lower deviation over temperature, the alarm will occur and flash. If the over temperature alarm is generated due to changing the temperature Setting value, the alarm light will be on, but the buzzer will not sound.

### 6. Lock screen function.

Three screen locking modes are provided. See [7. Parameter TABLE-1] for details.

Password unlocking: In the lock screen state, click the **[increase]**, the input password prompt PA is displayed in PV area, and the password is displayed in SV area. After entering the correct password, click the **[Set]** to unlock.

7. When the buzzer sounds, press any keys to silence.

## VI. Auto-tuning system

When the temperature control effect is not ideal, the system can be auto-tuning. There will be a large overshoot in the process of auto-tuning. Please take this factor into consideration before system auto-tuning.

In the running state and the main screen state, long press the **[shift]** for 6 seconds to enter the system auto-tuning selection state. The PV area displays the auto-tuning prompt AT, and the SV area displays "0". You can click the **[increase]** or **[decrease]** to select the display "1", and then click the **[Set]** to enter the system auto-tuning state. The AT light flashes. After the auto-tuning is completed, the AT light stops flashing. The controller will get a better set of PID parameters and save them automatically. In the process of system auto-tuning, long press the **[shift]** for 6 seconds to stop the auto-tuning program.

In the process of system auto-tuning, if there is an over temperature alarm of upper deviation, the alarm light will not be on and the buzzer will not sound, but the alarm relay will be automatically disconnected. In the process of system auto-tuning, the **[Set]** is invalid.

## VII.Seven The internal parameters of the temperature are seen and Set.

In the main screen state, long press the【Set】for 3 seconds, the password prompt LC will be displayed in PV area, and the password will be displayed in SV area.Modify the required password through【increase】、【decrease】 and 【shift】, and then click the 【Set】. If the password is incorrect, the instrument will automatically return to the main screen state. If the password is correct, enter the internal parameter setting state, and then click the 【Set】 to modify each parameter in turn. In this process, long press the【Set】for 3 seconds to exit this state, and the parameter value will be saved automatically. See the table below for details:

### Description:

1) In the parameter TABLE, the temperature setting is referred to as SP,the temperature measurement is referred to as PV.

2)In the TABLE below, PT100, M=400.0°C, Type K, M =600.0°C

Parameter TABLE-1

The Indicator	Parameter Name	Description of the parameter function	(Range) Initial
Lc	Password.	Lc=3,parameter values can be viewed and modified	0
ALH	Upper Deviation Over-temperature Alarm	PV>SP+ALH, over-temperature alarm of upper deviation	(0~100.0°C) 20.0
ALL	Lower Deviation Over-temperature Alarm	PV < SP-ALL,over-temperature alarm of upper deviation <b>Description:ALL=0,the lower deviation alarm is invalid</b>	(0~100.0°C) 0
Pb	Temperature Measurement Deviation Correction	Used to correct errors in temperature measurement. Pb = Actual temperature – PV	(-50.0~50.0°C) 0
PL	Temperature Measurement Slope Correction	It is commonly used to correct errors arising from high temperature measurement. $PL = 1000 * \frac{(\text{Actual temperature} - PV)}{PV}$ <b>Description: n Parameter[TABLE - 4],En = 1 This feature is invalid.</b>	(-999~999) 0
ndT	Timing Mode	0:No-timing; 1:Constant temperature timing; 2: Run timing.	(0~2) 1
Tdn	Timing Direction.	0:Count-up; 1:Count-down	(0~1) 0

<b>Hn</b>	Time Unit.	0:Minute ; 1:Hour	(0~1) 0
<b>SPd</b>	Constant Temperature Deviation	$SP - SP_d \leq PV \leq SP + SP_d$ , Enter a constant temperature state.	(0.1~50.0°C) 0.5
<b>EST</b>	End Timing Prompt Time	When the timing is over, the buzzer will prompt the time. Note: EST = 9999, indicates a permanent prompt.	(0~9999s) 60
<b>EH</b>	End Timing Constant Temperature Controller	0: Turn off the heating output after timing; 1: Keep constant temperature controlling after timing	(0~1) 0
<b>LF</b>	Lock Screen Function	0: Lockless screen function; 1: Lock screen function, unlock without password. 2: Lock screen function, need password to unlocked.	(0~2) 0
<b>LdT</b>	Lock Screen Delay	In the main screen state, if no key is pressed in the delay LDT time, the controller will automatically lock the screen. <b>Description: LDT = 600, the delay screen locking function is invalid</b>	(10~600s) 30
<b>PAd</b>	Unlock Password	The password must be entered to unlock it.	(0~9999) 1
<b>Add</b>	Mail Address	Local Address <b>Description:</b> PC-E9000 has no communication function.	(1~32) 1

Argument TABLE -2.

The Indicator	Parameter Name	Description of the parameter function	(Range) Initial value
<b>Lc</b>	Password	Lc=6,parameter values can be viewed and modified	0
<b>dP</b>	Demarcation Point	High and low temperature PID control demarcation point.When $SP \leq DP$ , it is low temperature control, otherwise it is high temperature control.	(0~M°C) M

<b>T</b>	Control period	Heating control period.	(1~30s) 5
<b>P1</b>	Proportional Band 1	The time proportion regulation in low temperature control. <b>Description: P1 = 0, it is digit controlling.</b>	(0~300.0°C) 35.0
<b>I1</b>	Integral time 1	Integral regulation in low temperature control.	(1~2000s) 300
<b>d1</b>	Differential time 1	Differential regulation in low temperature control.	(0~1000s) 200
<b>nP1</b>	Power Output 1	Maximum power percentage of heating output at low temperature control.	(0~100%) 100
<b>nH1</b>	Heating Off Deviation 1	In low temperature control, if $PV \geq SP + nh1$ , it will turn off the heating. <b>Description: please use this parameter with caution!</b>	(0~50.0°C) 50.0
<b>P2</b>	Proportional Band 2	The time proportion regulation in high temperature control. <b>Description: P2 = 0, it is digit controlling.</b>	(0~300.0°C) 35.0
<b>I2</b>	Integral Time 2	Integral regulation in high temperature control.	(1~2000s) 300
<b>d2</b>	Differential Time 2	Differential regulation in high temperature control.	(0~1000s) 200
<b>nP2</b>	Power Output 2	Maximum power percentage of heating output at high temperature control.	(0~100%) 100
<b>nH2</b>	Heating Off Deviation 2	In high temperature control, if $PV \geq SP + nh2$ , it will turn off the heating. <b>Description: please use this parameter with caution!</b>	(0~50.0°C) 50.0

Argument TABLE -3

The Indicator	Parameter Name	Description of the parameter function	(Range) Initial value
<b>Lc</b>	Password.	Lc=9,parameter values can be viewed and modified	0

<b>doT</b>	Display Decimal point	0: No decimal point for temperature measurement and set value; 1: The temperature measurement and the set value have 1 decimal point.	(0~1) 1
<b>oPn</b>	The Door Control Function	0 : No use ; 1 : Use <b>Note1</b>	(0~1) 0
<b>SPL</b>	Minimum. Set value	The minimum value of the temperature setting.	(-50.0~ 20.0°C) 0
<b>SPH</b>	Maximum Set value	The maximum value of the temperature setting.	(20.0~M°C) 300.0
<b>ouT</b>	Heating. Output Mode	0: normal state ; 1: The alarm relay output (normally opening point) is changed to heating output, and the original heating output is invalid. <b>Note2</b>	(0~1) 0
<b>db</b>	Nonsense Region	The nonsense region of the temperature measurement.	(0~5.0) 0.0
<b>ndo</b>	Switch Output Mode	0: At the end of timing; 1: Over-temperature alarm; Enter the constant temperature state <b>Note3</b>	(0~2) 1
<b>ndA</b>	Temperature Alarm Mode	0: Only the temperature deviation over-temperature alarm; 1: Temperature up and down deviation over-temperature alarm concurrently.	(0~1) 0

**Note 1:** In order to avoid misjudgment, please select to turn off the open door judgment function for the equipment that does not need to open the door or the temperature drops quickly.

**Note 2:** When the ouT value changes from 0 to 1, the heating control T period automatically changes to 20 seconds and saves; when the ouT value changes from 1 to 0, the heating control T period automatically changes to 5 seconds and saves. This function is only applicable to PC-9x01 (driving solid-state SSR output) . It is forbidden to change the initial value of other types of instruments, otherwise the control will be abnormal!

**Note 3:** Only PC-D9201 (driving solid-state SSR with switch output) has this function. Switch output means that the normally opening point of switch relay is closed.

Argument TABLE -4.

The Indicator	Parameter Name	Description of the parameter function	(Range) Initial value
Lc	Password.	Lc=12,parameter values can be viewed and modified.	0
En	Correction Enable	0: disable multi-segment correction function; 1: Enable <b>Note: when En = 1, [parameter TABLE-1] is invalid.</b>	(0~1) 0
U1	Correction Point 1	If $PV \leq U1$ , use E1 to correct the temperature slope.	(0-MMC)) M
E1	Correction Point 1	$E1 = \text{Actual temperature} - PV$	(Note4) 0
U2	Correction point 2	If $PV \leq U2$ , use E2 to correct the temperature slope.	(U1-M-C)) M M
E2	Correction point 2	$E2 = \text{Actual temperature} - PV$	(Note4) 0
U3	Correction point 3	If $PV \leq U3$ , use E1 to correct the temperature slope.	(U2-M-C)) M M
E3	Correction point 3	$E3 = \text{Actual temperature} - PV$	(For4) 0

**Note4** : Temperature Unit is Celsius : -180.0~180.0; Temperature Unit is Fahrenheit : -180.0~324.0

Description: Before adopting this correction, Pb in 【parameter TABLE-1】 should be equal to 0, the measured value of temperature display should be equal to the corrected value + Pb

Argument TABLE -5.

The Indicator	Name	Description of the parameter function	(Range) Initial value
Lc	Password	Lc=27,parameter values can be viewed and modified modified at Lc s27.	0
Fc	Temperature unit	0: Celsius; 1: Fahrenheit.	<b>Note5</b>

**Note 5** : Type PT100 : (0~1) 0 ; K-type thermocouple : (0~0) 0

Argument TABLE -6

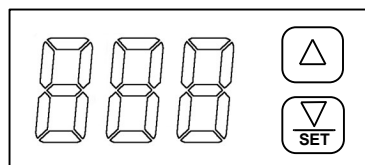
The Indicator	Name	Description of the parameter function	(Range) Initial value
---------------	------	---------------------------------------	-----------------------

<b>Lc</b>	Password	Lc=81,parameter values can be viewed and modified	0
<b>APT</b>	Reservation Time	Set power-up time <b>Description:APT = 0, this function is invalid.</b>	(0~9999min) 0

### Argument TABLE -7

The Indicator	Name	Description of the parameter function	(Range) Initial value
<b>Lc</b>	Password	Lc=567,parameter values can be viewed and modified	0
<b>rST</b>	Factory Reset	0:Cancel ; 1 : Conform.	(0~1) 0

### Digital Temperature Limiter Panel Instructions



#### Button function

- 1) **【▲】** : “INC” button. In the setting state, click this button to increase the set value. If you keep pressing this button, the value will increase continuously.
  - 2) **【▼/SET】** : “DEC” button. In the setting state, click this button to reduce the set value. If you keep pressing this button, the value will reduce continuously.
- It has the setting function when modifying internal parameters.

#### 1. Operation and using

1-1. When the controller is switched on, display window shows the version number for 2 seconds, then it starts running.

1-2. Alarm temperature setting

Under the normal state, window displays temperature alarm set value. Click the “INC” or “DEC” button, the set value starts flashing, at this point, the required temperature alarm setting can be modified through the “INC” and “DEC” button. About 2 seconds after stopping operation, the controller will return to the normal state, the set value will be saved automatically.

1-3. View temperature measurement

In the normal state, press the “INC” and “DEC” button for about 3 seconds, The right decimal point will light up. At this point, the window displays the measured temperature value. Click the “INC” or “DEC” button again, the controller will return to the normal state.

1-4. Over temperature alarm

In the normal state, when the temperature measurement exceeds the alarm temperature setting value, the window alternately displays " - A - " and alarm setting value, the controller

will cut off the output automatically.

## 1-5. Abnormal temperature measurement alarm

If the window show the prompt “---”, it indicates that the temperature sensor has faults or temperature exceeds the measuring range or the controller itself is faulty, the controller will cut off the output automatically. Please check the temperature sensor and its wiring carefully.

## 2. View and set internal parameters

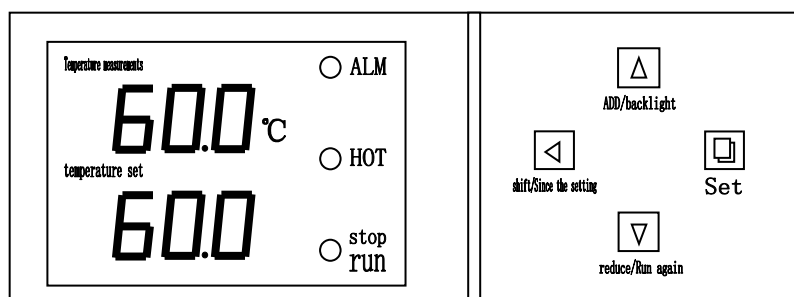
In the normal state, press the “INC” and “DEC” button for about 6 seconds, the window alternately displays "Lc" and password value, the required password value can be modified only by the “INC” button. Then click the “DEC” button, the controller will enter the internal parameters setting state. Press the “DEC” button for 3 seconds, it will return to the normal state, the set value will be saved automatically.

### Parameter table

Pro mpt	Name	Function description	(Setting range)Factory value
Lc	Password key	When “Lc=3”, enter the next parameters.	0
Pb	Temperature deviation correction	It is usually used to correct errors in low temperature measurement. $Pb = \text{Actual value} - PV$	(-50~50°C) 0
PL	Temperature Slope correction	It is usually used to correct errors in high temperature measurement. $PK = 1000 \times (\text{Actual value} - PV) \div PV$	(-199~199) 0
SPH	Max set value	The maximum temperature set point value.	(0~400) 400

## BIAJ-103 Controller operation manual:

### 1. Panel Instructions





### Indicator definition

- 1) "STOP/RUN: This indicator is bright when the controller is running, when the runtime is over, this indicator is not bright. When the controller enters the auto-tuning of PID, this indicator is flashing.
- 2) "HOT" indicator: If the heater output turns on, this indicator is bright, else this indicator is not bright.
- 3) "ALM" indicator: When the over-temperature alarm occurs, this indicator is bright.

## 2.. Operation and using

1) When the controller is switched on, display windows show "In index ( P, C, K, S )" and the value of temperature range for 3 seconds, then it starts running.

2) Temperature and time settings:

Press the "Set" button, the controller runs into the temperature setting state. Re-press the "Set" button, the controller runs into the time setting state. In setting state, you can use the "◀", "▼" and "▲" buttons to get the required settings. Press the "set" button again, it returns from the setting state and the settings are saved automatically.

If the time is set as "0", the controller will run continuously, the display window of "SV" will display the set point temperature. If the time set value is not equal "0", timers start time when the measuring temperature reaches the set point temperature, the display window of "SV" will display the runtime.

If En = 0, when the runtime is over, the "sV" window will display "End", the buzzer will sound for 30s, off all outputs;

If En = 1, when the runtime is over, the "sV" window don't show "End", the buzzer sounds for 30 seconds, temperature Continue to constant temperature; After the end of operation, long press" shift / run" button for 3 seconds can restart the timer operation.

3) When temperature alarm, the buzzer will sound, "ALM" lights. If a change in temperature setting and over-temperature alarm, "ALM" lights up, but no songs buzzer.

4) When the buzzer sounds, it can be muted by pressing any button.

5) "◀" button: In the setting state, it can shift the set value by pressing the button.

6) "▼" button: In the setting state, it can reduce the set value by pressing the button. If press and hold the button, the set value will reduce continuously.

7) "▲" button: In the setting status, it can increase the set value by pressing the button. If press and hold the button, the set value will increase continuously.

8) In setting state, the controller will return to run status if without any key press in one minute.

9) If the display window shows "----", it indicates the fault of temperature.

## 3. AT function

When the temperature control effect is not ideal for system tuning. Self tuning process temperature can have bigger overshoot, the users in a system setting before please consider this factor.

In not running state, the controller will enter the auto-tuning of PID by pressing the "◀" button for 6s, "RUN/AT" indicator flashes, it will be not bright when the auto-tuning of PID is completed. In the state, compressor into normally open mode, when the auto-tuning of PID after the end of a group of PID parameter, parameter automatic save and return to the normal mode of operation. When running the auto-tuning of PID, it can be stopped by pressing the "◀" button for 6s again.

In the auto-tuning of PID state, if emperature alarm, no songs buzzer and "ALM" don't light, but heating alarm relay automatic disconnect. And "set" keys to effective. In the system self tuning process regardless of whether there is a constant temperature time setting,

controller display window lower always display the temperature setting value.

#### 4. Internal parameters settings

Press the “Set” button for 3 seconds, controller will display the password prompt “Lc”. Adjust the password to the required value, then press the “Set” button again, it will run into the internal parameter setting state. if press the “Set” button for another 3 seconds, it will return to the running state.

##### Parameter list-1:

Parameter indicator	Name	Instruction of the Parameter's function	(Setting range) factory set value
Lc-	Password	when Lc=3 ,then we can see and modify parameters	0
AL-	Alarming setting	When temperature is beyond “SP+AL”, the Alarm indicator turns on. The buzzer sounds and the heater output turns off.	(0~100°C) 5
T-	Control cycle	The heat control cycle of temperature	(1~60S) Note 1
P-	Proportional band	Adjustment of proportional parameter.	(1.0~rH) 30
I-	Integration time	Adjustment of integration parameter.	(1~1000S) 400
d-	Differential time	Adjustment of differential parameter.	(0~1000S) 200
Pb-	Zero point adjust	When the zero error comparatively larger, to update this value should be needed. Pb=measure value –actual value	(-50~50°C) 0
PK-	Full point adjust	When the full point error also comparatively larger, to update this value should be needed. PK=1000× (measure value – actual value) / actual value.	(-999~999) 0
Et-	Timing function	When ET = 0, no timing function; 1 electric start timing, 2 to the value set start timing.	(0~2) 2

**Note 1** : If the selection of relay output, heating control cycle should be selected in 20 seconds, the other models for 5 seconds.

## Parameter list-2:

Parameter indicator	Name	Instruction of the Parameter's function	(Setting range) factory set value
Lc-	Password	when Lc=9, then we can see and modify parameters	0
Co-	Turn off the heat output deviation	when "PV $\geq$ SP+Co", Turn off the heating output.	(0.0~50.0°C) 5.0
Hn-	Constant temperature time mode	0 : minutes time ; 1 : hours time	(0~1) 0
En-	End of operation temperature	En = 0 end of run off output; En = 1 end run to constant temperature;	(0~1) 0
Lt-	Maximum power output	The heating output maximum power percentage;	(0~100)100
rH-	Range of temp setting	The value of temperature setting.	400

Parameter list-3:( LCD series this parameter table as the standard, digital series this parameter table for matching)

Parameter indicator	Name	Instruction of the Parameter's function	(Setting range) factory set value
Lc-	Password	when Lc=23, then we can see and modify parameters	0
bd	internal parameters	Customers should according to the Initial value	(0~1)0
Ad	Address	Communication address	(0~32)1
p-t	Print interval	When p-t=0, no print	(0~9999s)0s

## English name and parameter indicating the symbol table

Parameters indicating	SP	St	Lc	AL	Γ	P	I	d
English Name	SP	St	Lc	AL	T	P	I	d
Parameters indicating	Pb	PE	Co	Hn	oP	rH		
English Name	Pb	Pk	Co	Hn	oP	rH		

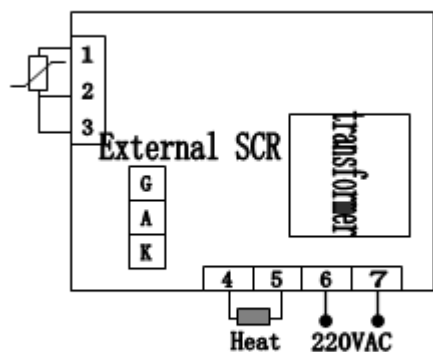


Figure 2 (FCH-3xx3)

## 08 Fault treatment

Phenomena	Causation	Treatment Method
1.No power supply	a. poor plug contact or line broke	a. Connect the plug and line.
	b. Fuse protector is broken.	b. Change the fuse protector.
2.No temperature rising inside container	a. Low setting temperature	a. Readjust and set temperature
	b. Heater is broken.	b. Change the heater
	c.Temp. controller is broken	c. Change the temperature controller
	d. Temp. sensor is loose.	d. Screw up the sensor nut.
	e. Temp. sensor is broken	e. Change the temperature sensor.
3. No temperature rising alarm	a. Set temp. of Detached temp. limiter is low	a. Readjust the temperature 30°C above setting temperature.
	b. Detached temp. limiter sensor is broken.	b. Change the detached temperature limiter sensor
4. Temperature cannot reach the setting point.	a. Exhaust port is fully opened	a. Shut off the exhaust port.

	B.The container is overfilled, no hot air convection.	b. Decrease amount of sample to improve convection condition.
5. The fan doesn't work.	The fan motor is broken	Stop work and check electric capacity and motor
6.Displaying-----	The sensor is broken	Change the sensor
7.Display STOP	Time-up	Press the program key for 3s to start



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