BPS-250CL

Constant Temperature and Constant Humidity Incubator

Operating instruction

A prompt for safety assurance

Items enclosed here are extremely important, and must be observed faithfully.

I. Prompt for safety:

！Dangerous（It might cause serious loss of property or personnel casualty）

1. The product must be earthed reliably and keep far from the interruption of electromagnetism (be sure not taking the zero line and neutral line as earthing line).
2. Before putting into use, confirm that the voltage of power supply is in conformity with the specification of the product.
3. An individual power socket shall be provided for this product, and ensure the earthing for plug and socket is all right.
4. It is not allowed to pull out or plug in the power plug without turning off the power switch during the operation of the product.
5. It is forbidden to extend or cut short the power cable at will.
6. It is not allowed to make bold to repair the product. In case of entrusting repair by our company, the work must be done by professional staff.

! Warning（It might cause heavy loss of property or personnel casualty）

1. It can be operated only after the instruction manual is fully read and understand.
2. Please do not draw the power cable when pulling out the plug.
3. The power plug of this product must be pull out in case of one the following cases:

3.1 Replacing fuse tube;

3.2 The product goes wrong and standing by for inspection and repairing;

3.3 The product will not be used for long time;

3.4 When moving the product;

！Notice It might affect the service life and lead to malfunction of the product）

1. In case of handling the product, the obliquity should not be large than 45°, so as not to damage the refrigeration system.
2. When the product is transferred to the position, it shall be shelved for one to two days before operation, so as to allow the refrigeration system working in normal condition and extend its service life.
3. The product shall be set on rigid and firm plane to keep it at level status.
4. Enough space shall be remained around the product.
5. The product must be used under a certain condition.
6. Don't open/close the door rudely, or it will result in fall off of the door, damage of the product and injury accident.
7. In case the product is shelved for a long time, the humidity elimination shall be done regularly to prevent relevant parts from damaging.

II. Product Profile

1. Outlook

①.Temp & humid control ②Observation window ③Pull

④Base wheel ⑤control panel ⑥Pump power source

⑦Water output pipe from submersible pump

2. Overview of Structure and Function

The Products is composed of case, chamber (operating room), temperature and humidity controller, heating and cooling systems and humidifying and air-circulating devices.

1) The machine is of the vertical frame structure, while the case is made of fine-quality of plasticized steel sheets by punching, with bright color and nice outlook. Controllers, switches, buttons and displayers are all installed on the top of the case for convenient and visual operation.

2) The mirror-face stainless steel chamber is used with the four corners being semi-arc for easy cleaning. The internal shelves can be adjusted, while the polyester foaming materials are filled between the outer case and chamber to ensure the heat-insulation performance of the equipment;

3) The equipment is provided with the independent temperature controller (optional), which will automatically suspend the heating when the temperature exceeds the limits, to ensure the safe operation of testing without any accident;

4) Microcomputer temperature controller and humidity control are used to ensure the stable and reliable operation of the equipment;

5) The case is internally equipped with cooling and heating air ducts, while the fan runs to enhance the smooth circulation of air and keep the even temperature and humidity in the chamber;

6) At the back top of the equipment are the power inlet wires and fuse stand, while at the back bottom are the water drain valve and overflow gap; on the left top are the special power socket and communication interface for the printing; on the right center is the water inlet, the water box and the pump power sockets for the water;

7) With the functions of over-temperature warning, compressor delay and over-heat protection;

8) On the left side of the case is an instrument connection with a diameter of φ50mm, for the convenience of the user in the relevant tests;

9) With the temperature set at above 50℃, the cooling unit can be switched off automatically or manually.

III. Use of Product

1. Preparation for Operation

The product should be used in the normal conditions:

1) Ambient temperature: (15~35)℃;

2) Relative humidity: not greater than 85%;

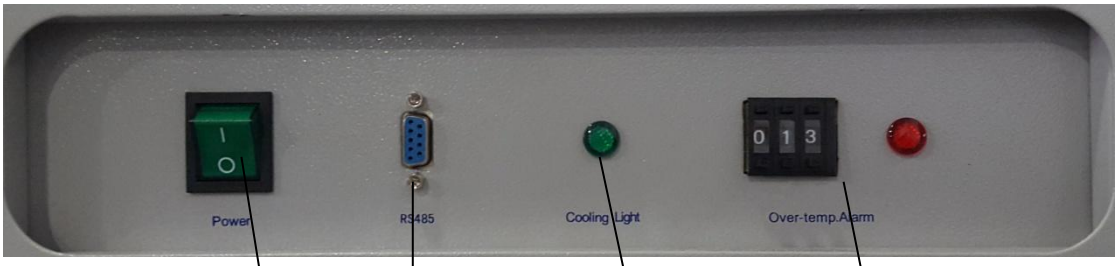
3) Power supply: (220±22)V (50±1) Hz;

4) Placed steadily and horizontally indoors, without any surrounding magnetic field, strong vibration, dust and flammable gas and with fine ventilation;

5) Distance between the equipment and the surrounding articles or walls: ≥900mm (front),≥300mm (left, right, top and behind)

2. Power On

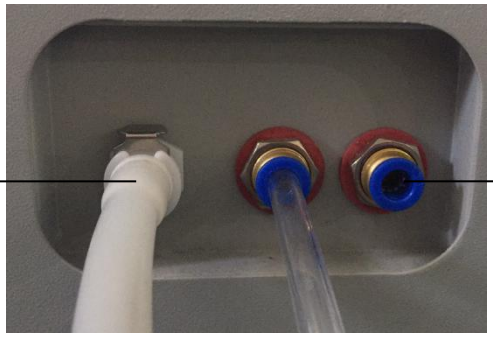
1) Illustration for Control Penal



POWER RS485 (optional) Cooing light Over-tem alarm lamp

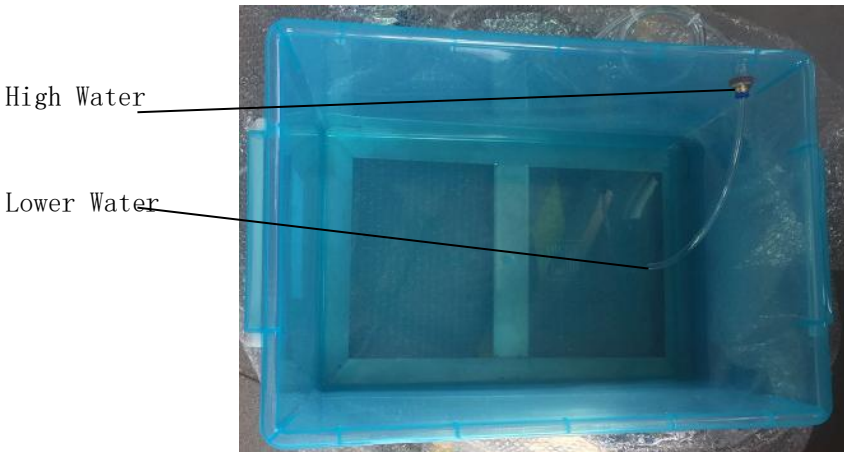
2) Operating procedure

①Lift the water box with supports and place the same on the right of the equipment. Put the submergible pump inside the water box and insert the plastic outlet/inlet pipe of the pump slightly into the water inlet on the right side of the equipment. (Instant-connector is used here for connection. To take it off, push the blue ring at the water intake to the case and then pull out the water feeding pipe);



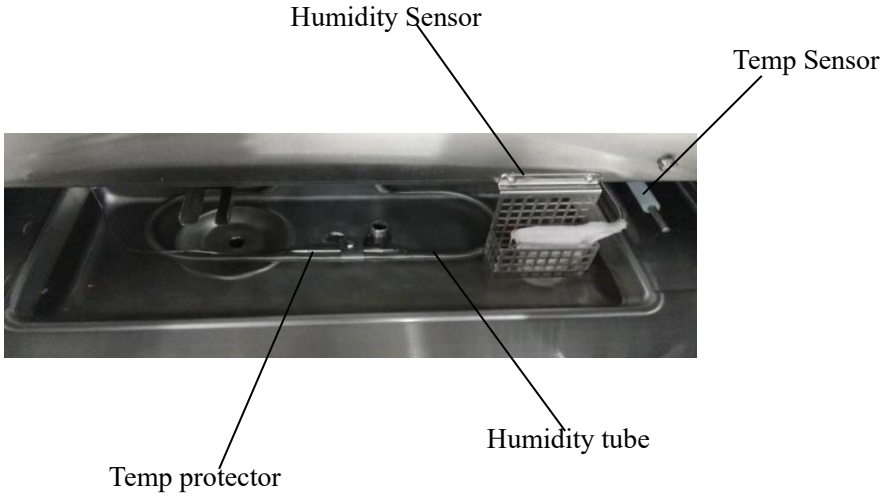
② ⚠ When the first use of the boot, in order to ensure that the workplace humidification sink is not due to air plug and smooth automatic water, please connect the drain pipe (white) and the water pipe connection, and insert it into the drain (hear "carbazole" sound Card in place), until the water out and then close the drain valve (press the discharge valve switch, drain pipe and connector out). Overflow into the overflow pipe (transparent), and put the water tray or ditch way drainage.

③ Open the water box cover and add in purified water. (Control of the water level: low level should submerge the water pump and the high level should not exceed the rubber ring of the connection pipe on the water box).



a. To ensure the flexibility of the water cup floater in the equipment, **make sure to add the purified water**. (The client can use the water purifier instead of the water box)
b. At the high water level, the water volume should be sufficient to keep the equipment operating for at least 12 hours.

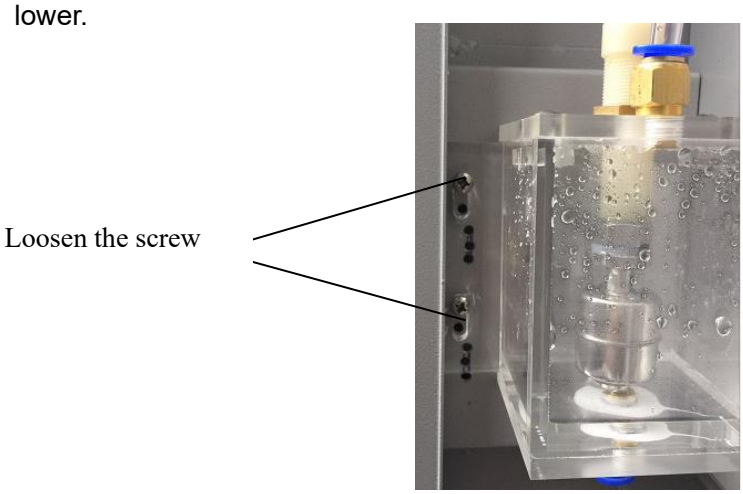
④ Open the box door, cover the gauze on the humidity sensor, pay attention to distinguish between temperature and humidity sensors, humidity sensor close to the sink must be covered gauze, and gauze into the lower end of the wet sink



⑤ Connected to the power, turn on the device power switch, temperature and humidity controller into the electrical display light

⑥ open the door when the power is connected half an hour, please take the bottom of the inner chamber to take down , check the Humidifying evaporator water tank ,should be the humidity tube in the water, if the water over flow, please open the device after the board, and adjust the level of the cups.

⑦ Water cup height adjustment: Open the rear sealing plate, can be fixed to the fixed cup of the screw, through the plate on the waist groove, the overall movement of the cup level, if the water level is shallow, adjust the water cup position to higher; if the water level overflow, adjust the cup position lower.



⑧**Make sure the water level of the water tank is horizontal; otherwise, resolve it by adjusting the ground level or leveling the caser.**

⑨As per needs, set the temperature and humidity (see the user instructions for temperature and humidity controller)

⑩After using, open the water drain valve (with its handle in parallel with the orifice), drain out the water from the humidifying water tank in the work chamber and water cup. **It is necessary to clear away the water scale and other pollutants for the humidifying pipe; otherwise it will affect the use effect and useful life.**

3) Limited-temperature Controller (optional)

The equipment has an independent limiting-temperature alarming system. When the equipment's actual temperature exceeds the limiting temperature, the system will automatically suspends the heating system inside the case to ensure the safety of testing without any accident.

Usage of "Over-temperature Protector" (optional)

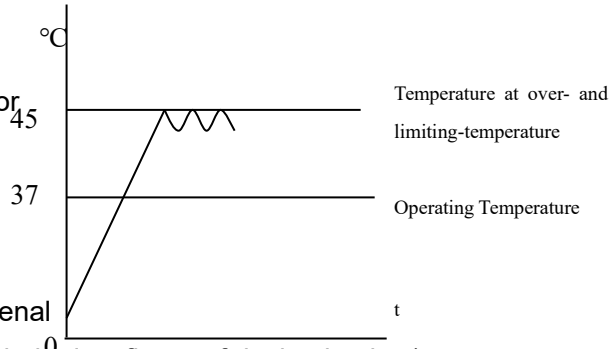
The over-temperature protector is an independent protection system. When the temperature is out of control due to the failure of the thermal controller and the room temperature of the chamber reaches the set value of limiting temperature in the over-temperature driving plate, the over-temperature protector will automatically cut off heating and alarms. (As shown in the left diagram) when the room temperature of the chamber is lower the limiting temperature value, the protecting system will be off and the meter resumes to normal. It will repeat like this till the breakdown is eliminated.

The particular operation is as follows:

① The set value of limiting-temperature should be greater than or equivalent to (SV+ **AL**)+(5~10)℃

② Set the required limiting temperature as per need by using the "+" "-" buttons on the over-temperature setting plate of the penal

For example: SV=37℃, **AL**=5, then set 45℃ (i.e., 45.0, with the last figure of decimal points)



4) Check Accuracy of Thermal Control

4.1 Put the 0.1℃ graduation mercury thermometer (or resolution 0.1℃ digital thermo-detector) in the chamber of the product;

The temperature probe of the thermometer should be in the geometric center of the effective space of the chamber

4.2 At any point within the thermal control range of the product thermal control, set SV thermal control value. When PV measuring value equals to the set value, keep the constant temperature for about 1~2) hours (the time of constant temperature depends on the specification of the product) and observe that the difference between the actual temperature value measured by the mercury thermometer and the measured value PV displayed by the thermal controller should be lower than or equivalent to ±0.5℃.

IV. Technical Specifications

1. Constant-temperature and Humidity Box

Sr. No.	Model/Specification	BPS-100CL（A.B）	BPS-250CL（A.B）	BPS-500CL（A.B）
1	Power supply	CL:(220±22) V, (50±1)Hz CA CB:(380) V, (50±1)Hz		
2	Input power (W)	1900/2300/7050	2300/2700/7100	4150/4150/7850
3	Temperature & humidity Control Range	（L-10 A-20 B-40 -100)℃, (35-95)%RH		
4	Temperature & humidity resolution	0.1℃, 0.1%RH		
5	Temperature & humidity fluctuation	±1.0℃, ±3.0%RH		
6	Timing range	(1~9999)min		
7	Chamber dimension(mm)	500×400×550	600×500×820	800×700×900
8	Outer dimension (mm)	650×800×1330	750×900×1580	1000×1100×1860

V. Maintenance and Instructions

1. To move the equipment, the dip shall not be greater than 45 degrees to avoid any damage to the cooling system.

2. With the equipment positioned, keep it as it is for 1~2 days before the start-off so that the cooling system can operation normal and have a longer lifetime.

3. **Before opening the case for the first time, make sure to open the rear panel of the equipment, loose the screws on the water cap, take out the sponge or cut off the binder and put down the floater; otherwise, the equipment will not work .**

4. The equipment must be connected with the power socket well grounded.

5. Set the equipment in balance

With the equipment positioned, add the purified water into the water box up to a proper level, turn on the power switch of the equipment so that the water cup in the case will automatically charge water. After about half of an hour, open the case door and observe the water level in the water trough (evaporative humidifier) on the chamber bottom that should be in parallel with the bottom plate and cover the evaporator but will not overflow into the chamber. If the requirement is not satisfied, level the case or open the rear penal to adjust the level of water cup (for more, see the Operating Procedure) so as to ensure the evaporative humidifier is submerged in the water and will not heat up directly the temperature in the case while humidifying.

6. When the temperature inside the case is below the dew point, upon opening the case, the humidity sensor can easily collect steams and the humidity displays as 99.9%. In this regard, heat up the inside of the case and dry the humidity sensor. Only when the humidity is below 99.8% as displayed can the operation start.

7. When the equipment runs at a low temperature (lower than the ambient temperature) for a long period, it shall run at 40℃ for about 2 hours every half of a month for “defrost” before it may be operated again.

8. To stop the use of the equipment, dehumidifying should be applied in the following particular method: drain out the water in the case, set the temperature at 40℃ and run for 5 hours and open the door every 2 hours to let the moisture. Afterwards, pull out the power plug and store the equipment.

9. The equipment should be maintained by the qualified personage. Before such maintenance, make sure to contact our post-sales service center.

VI. Appendix

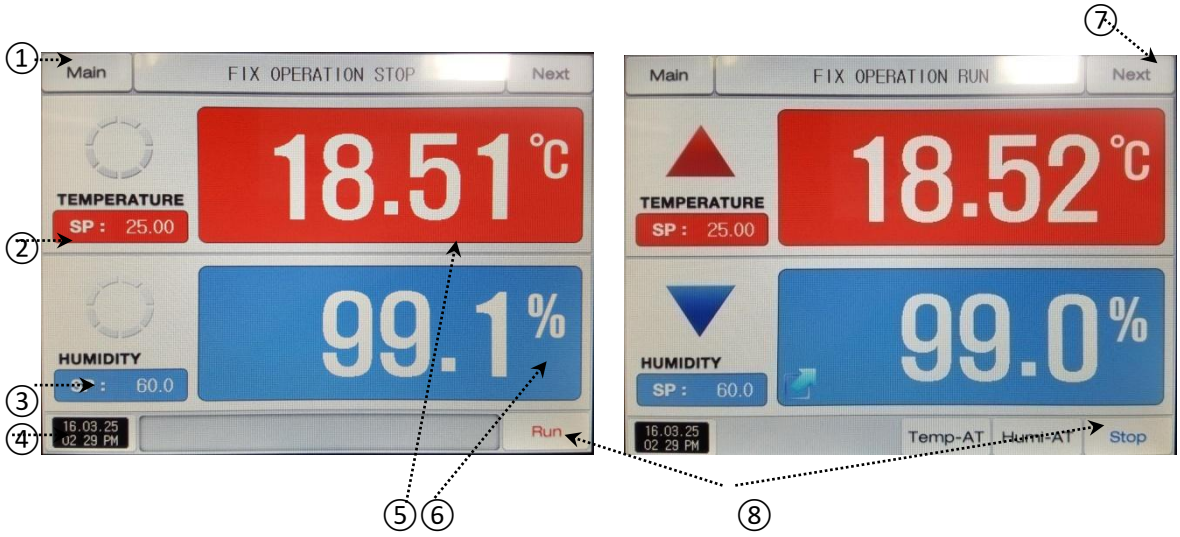
Appendix: Operating Instructions for BC1300 Controller

1. Startup Main Screen

Screen 1

No.	Descriptions
①	Click for Run Stop screen.
②	Click for Function and Value Setting screen.
③	Click for Present Time and Appointed Startup Time screen
④	Click for Program Curve View screen
⑤	Click for Program Setting screen.
⑥	Click for Display Setting Screen.

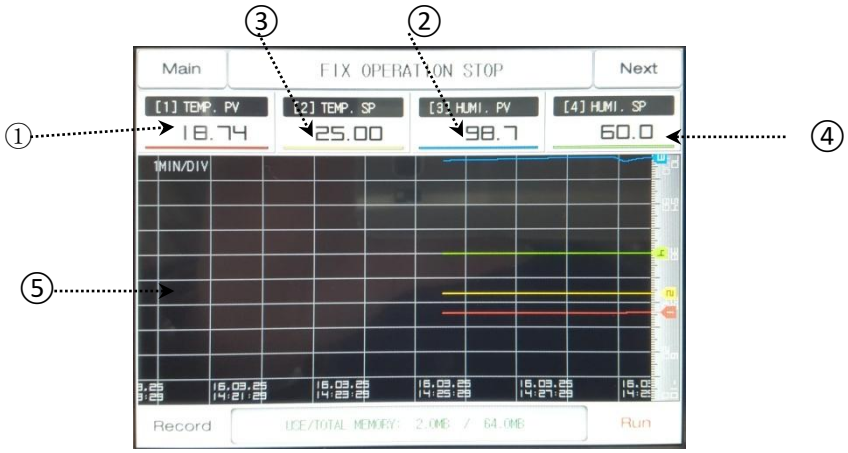
2. Run Stop Screen



Screen 2

No.	Descriptions
❶	Click for Main Screen (Screen 1)
❷	Set temperature target value
❸	Set humidity target value
❹	Display present time
❺	Display present actual temperature
❻	Display present actual humidity
⑦	In STOP state, click for Set RUN STOP screen(Screen 3)
⑦	In RUN state, click for Set RUN screen (Screen 4)
⑧	Run/Stop shift

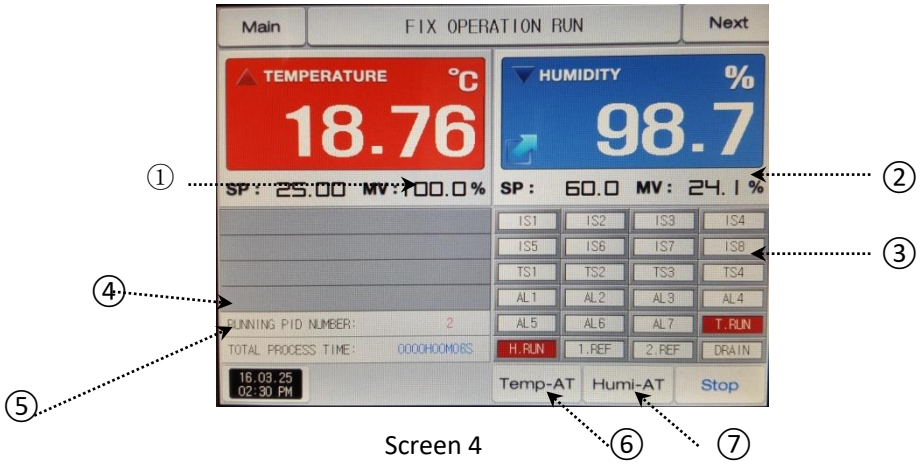
3. Curve Screen



Screen 3

No.	Descriptions
❶	Display present actual temperature, indicated with red curve
❷	Display present actual humidity, indicated with blue curve
❸	Display temperature target value, indicated with yellow curve
❹	Display humidity target value, indicated with green curve
❺	Display temperature/humidity curve recorded from time to time

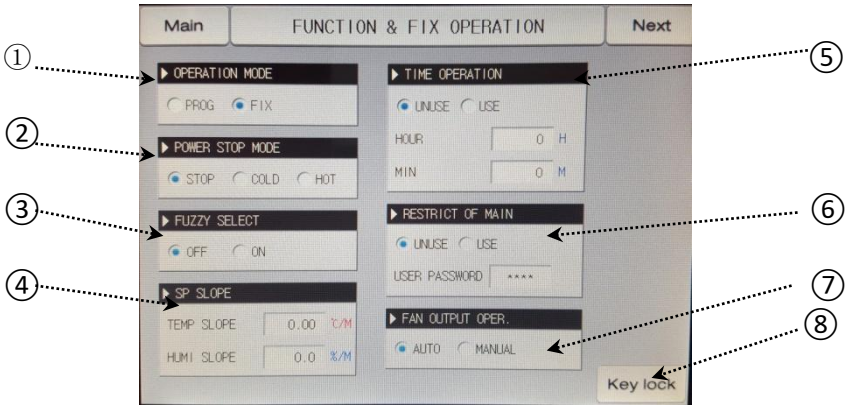
RUN Screen



Screen 4

No.	Descriptions
①	Display present temperature control output
②	Display present humidity control output
③	ON state in red and OFF state in dark gray.
④	Display PID set number applied in present RUN.
⑤	Display total time of RUN
⑥	When temperature fluctuates sharply, temperature PID calculation can be carried out
⑦	When humidity fluctuates sharply, humidity PID calculation can be carried out

4. Operating Setup Screen



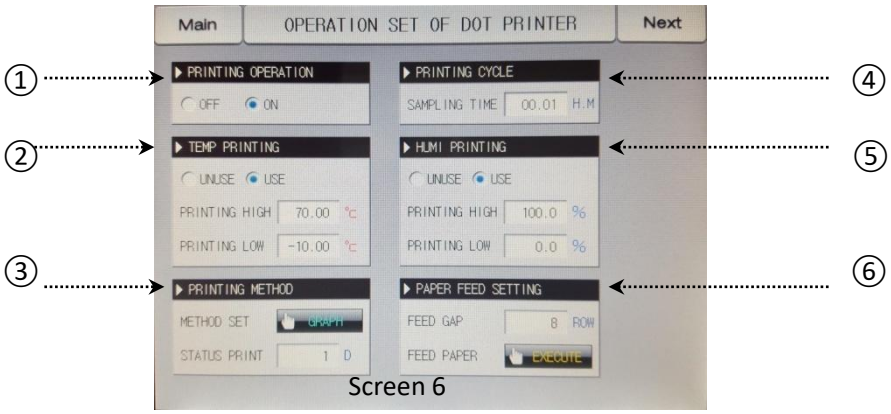
Screen 5

No.	Descriptions
①	Select program mode and fixed-value mode
②	Select STOP, Cold Startup and Warm Startup after power-off
③	Select Action or Non-action
④	Gradient for temperature/humidity rising/dropping per minute

⑤	Enable or Disable; with Enable selected, set time up to RUN/STOP
⑥	Select Enable or Disable, with password
⑦	Automatic or manual; manually, fan speed can be selected as High, Medium and Low
⑧	When the key is locked, the font is red, while other keys cannot be operated

Note: in Screen 5, press the toggle key to the screen for operating setup of stylus printer

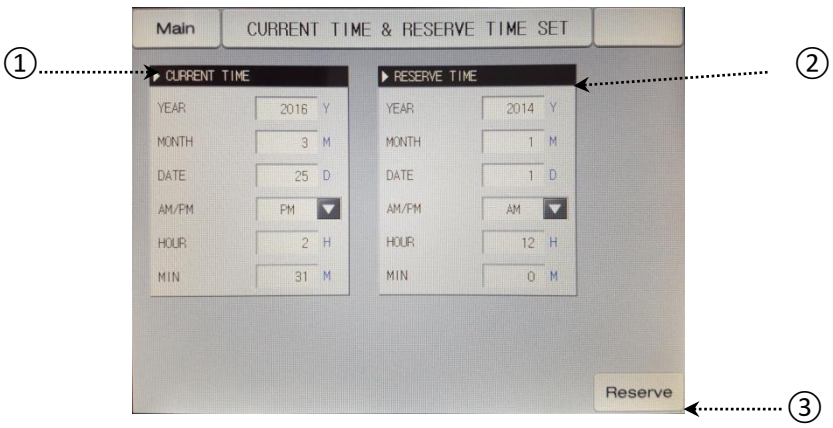
5. Operating Setup of Stylus Printer



Screen 6

No.	Descriptions
①	Select Non-action or Action
②	Select Enable or Disable, for setting the upper and lower limit of temperature printing
③	Select Curve or Text mode, with the status printing time range of 0~255 days
④	Set the time for printing interval of each line: 0~99.59H
⑤	Select Enable or Disable, for setting the upper and lower limits of humidity printing
⑥	Set paper supply interval: 1~255 lines; press Execute key after revising
⑦	When humidity fluctuate sharply, humidity PID calculation can be carried out

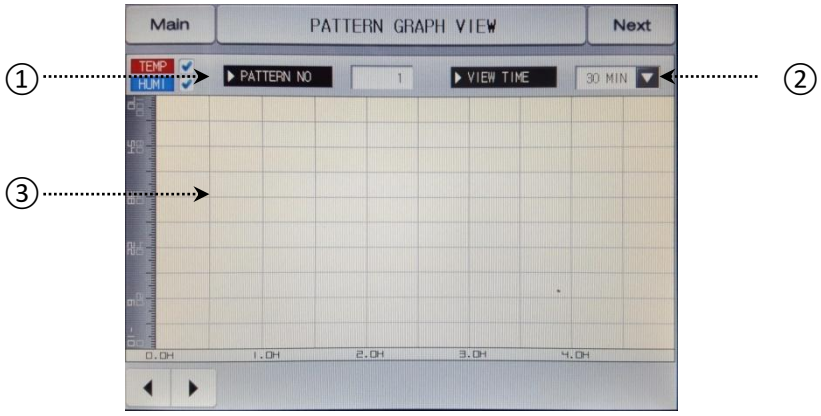
6. Presetting



Screen 7

No.	Descriptions
①	Setting of present time
②	Setting of to starting time for controller
③	When Preset key in red fonts, it indicates the success of Start-up Presetting

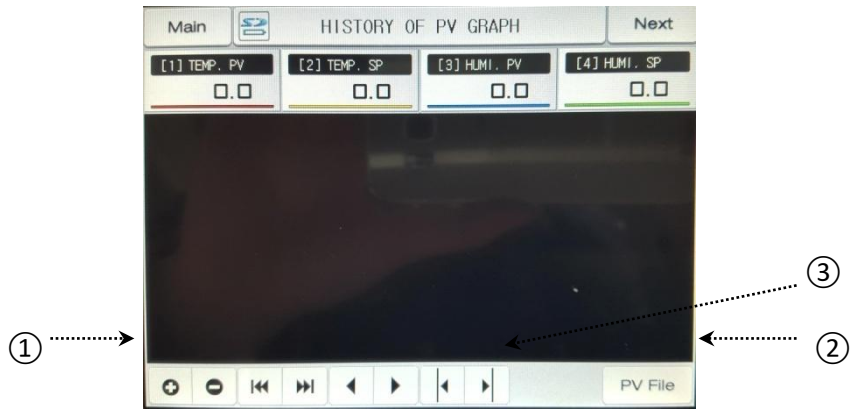
7. Curve Display



Screen 8

No.	Descriptions
①	View the curve of program with different numbers
②	When viewing the program curve, select different time
③	Red curve indicates temperature and blue curve indicates humidity

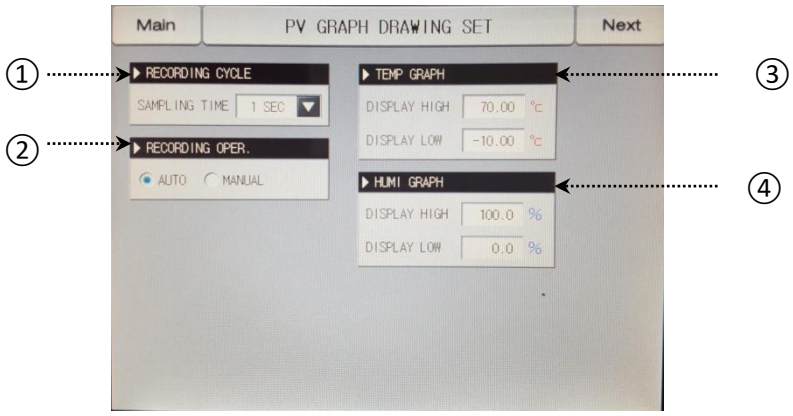
On Screen 8, press the toggle key to enter Screen 9.



Screen 9

No.	Descriptions
①	When viewing curves, the time can be zoomed out or in
②	Click PV File to view the previous curves
③	When viewing curves, shift the cursor to view the temperature/humidity value of different time quantum

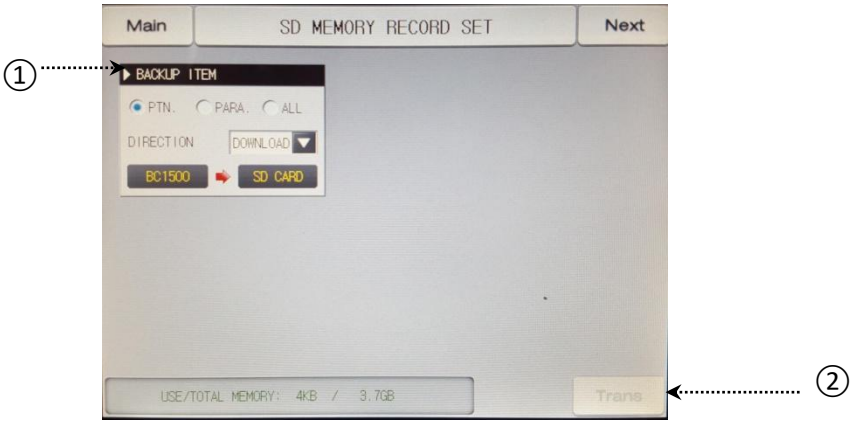
On Screen 9, press the toggle key to enter Screen 10



Screen 10

No.	Descriptions
①	Time interval for recording PV curves, from 1s to 1min
②	Automatic or manual
③	Set the upper and lower limits of PV temperature curves
④	Set the upper and lower limits of PV humidity curve

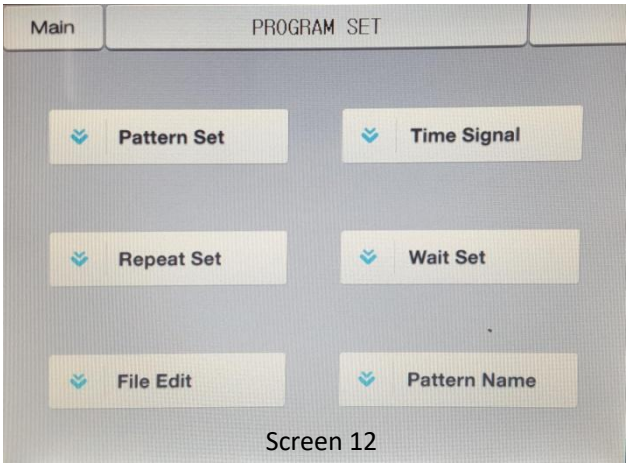
On Screen 10, press the toggle key to enter Screen 11.



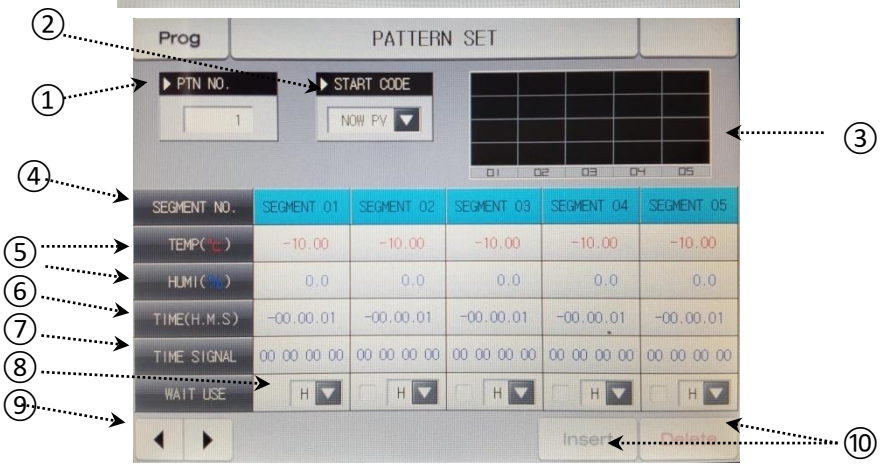
Screen 11

No.	Descriptions
①	Download or upload the necessary backup items
②	Upon completion of item backup, press SEND key, which shall be operated in STOP state

8. Program Setting

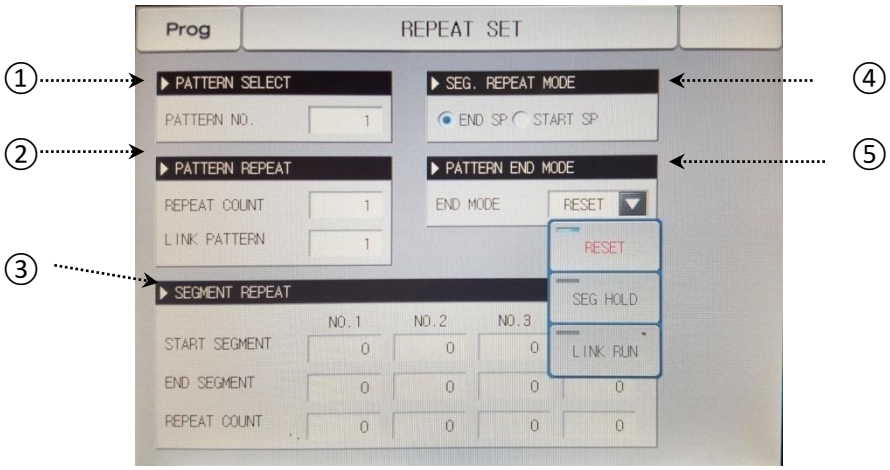


Screen 12



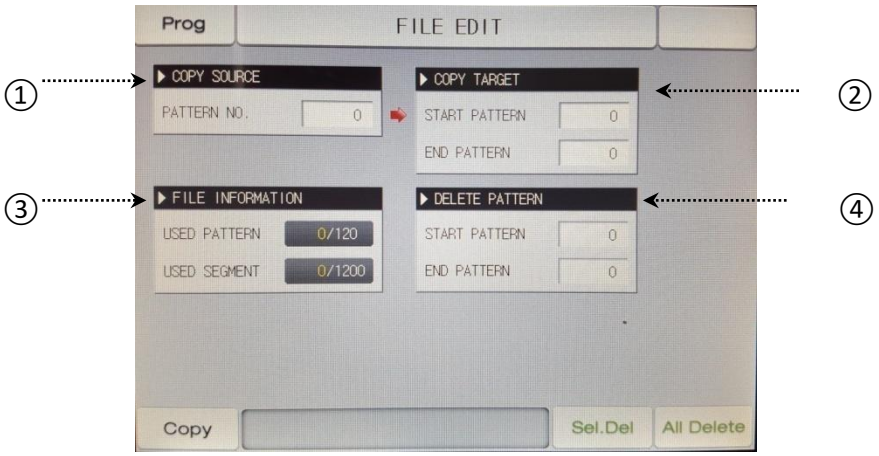
Screen 13

No.	Descriptions
❶	Set program groups of 1~120
❷	Conditional actual value, temperature SSP or humidity SSP for the program group to start running
❸	Display the analog curve of edited program group
❹	Display editable program segment: 1~99
❺	Display temperature/humidity value of edited program group
❻	Display the time of edited program group segments
⑦	Display the time signal of edited program group segments
⑧	Fan speed for segments of program group can be selected as High, Medium and Low
⑨	For editing the program, click the key for turning pages forward and backward
⑩	For editing the program, first click “Segment” and then click “Insert/Delete” key



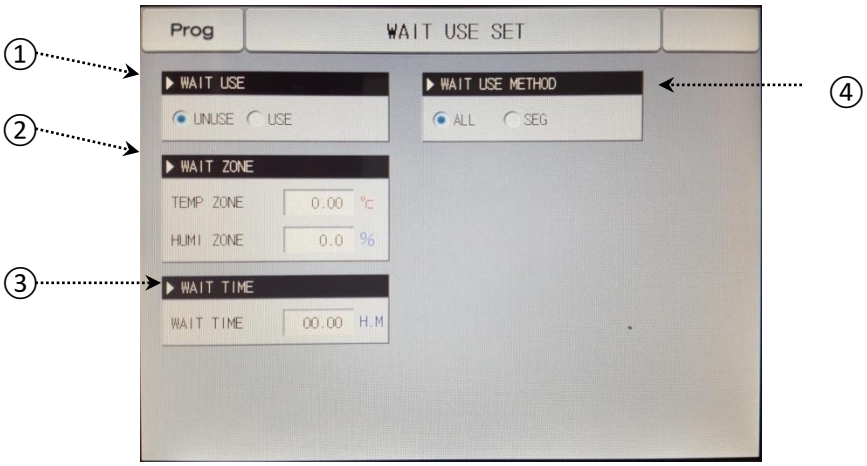
Screen 14

No.	Descriptions
❶	Select program group
❷	Frequency of program group circulation, connectable with other program groups
❸	Circulations of program group segments
④	Circulating mode of program group segments, optional for final SP or initial SP
⑤	Termination of whole program group, optional for STOP, SUSPEND or LINK RUN



Screen 15

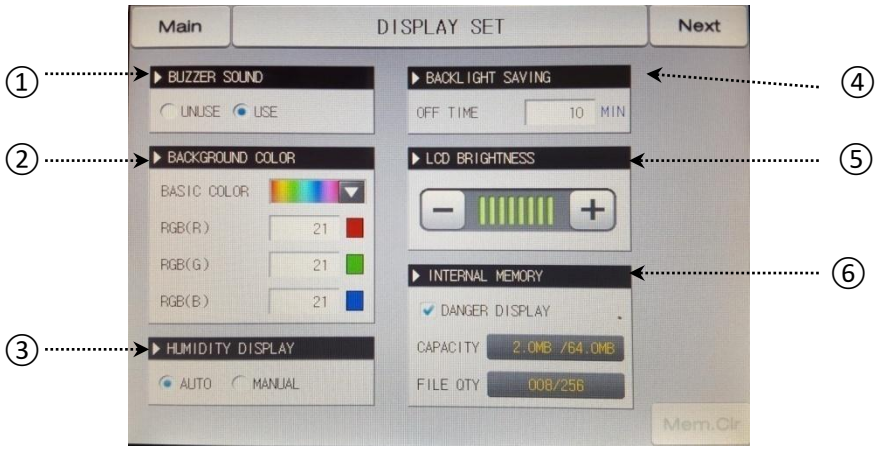
No.	Descriptions
❶	Input the existing program groups
❷	Input the number of program group to be copied, from starting to ending group, then click Copy key
❸	All the edited program group file information will be then displayed
④	Input the number of program group to be deleted and then click Delete Selectively or Delete All



Screen 16

No.	Descriptions
❶	Wait for setting Enable or Disable
❷	When temperature/humidity enters the range of waiting, the program will start timing
❸	Waiting time starts only after temperature/humidity enters the range of waiting,
④	Optional for program group or segment waiting

1. Screen Setting



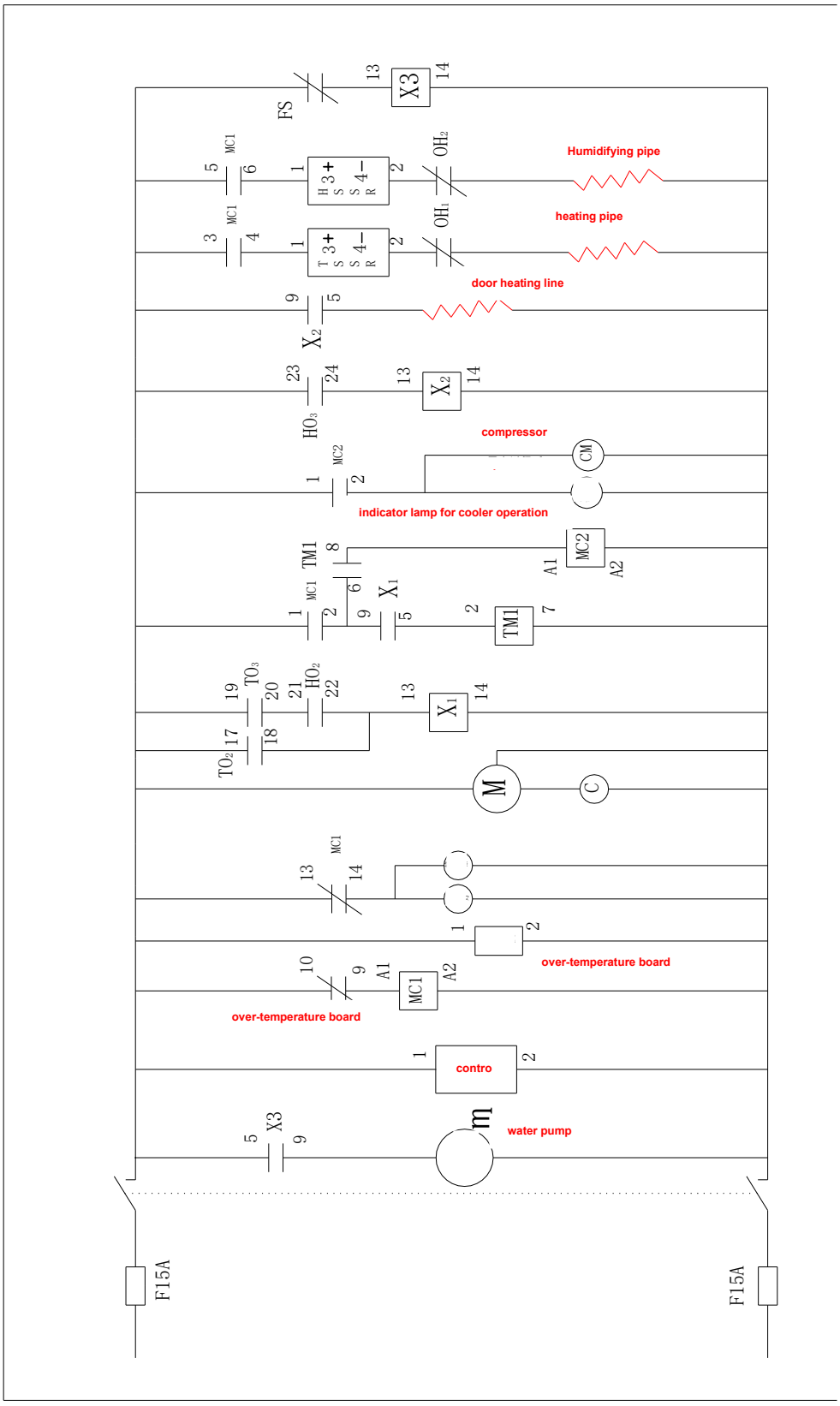
No.	Descriptions
①	Automatic or manual
②	Optional for the prime color of controller
③	utton controlling the buzzer switch
④	Backlight time can be set for 0~99min
⑤	Adjust the controller brightness
⑥	Display the internal storage of controller

Click the toggle key for checking the record of previous faults

IX Reason and Handling for Breakdown

Sr. No.	Description of Breakdown	Assumption of reasons for breakdown	Method for troubleshooting
1.	No power supply upon start-off	There is no electricity at the power socket or the plug cable is not well connected	Check power supply and check or replace the power socket
		Power switch is out of order or is not on	Turn on or adjust the switch or re-weld the connector
		Fuse tube broken	Install or adjust the fuse tube. If it is burnt off upon starting, check the reason before installing the fuse tube.
2.	Thermal controller displays L--- or H---	Temperature sensor is broken or the connector is off or the temperature exceeds the range	Change the sensor or connector or revise the measuring range.
3.	Humidity controller displays LL or 99.9% and alarms	A. Display LL has excessively low humidity or sensor cable is off b. Display 99.9% and alarm, due to the steam in the humidity sensor	a. If humidity increase cannot be resumed, fix the sensor connector b. Switch off the freezer and heat up to dry the humidity sensor.
4.	Failure to heat up or out of control	Thermal controller's light-beam indicator is not lit and the temperature goes up	3041 trigger is out order or silicon control BAT16 is out of order; change the trigger or silicon control
		Thermal controller has no power and the light-beam indicator is not lit	Thermal controller is out of order. Replace
		Timing is used (rising is stopped after several or dozens of degrees)	Cancel the timing function and keep T1=0
		The heater is out of order or the connector is off	Replace or repair
		Temperature sensor is not well connected	Re-connect
5.	Thermal control has major error or net difference	Thermal (humidity) control is normal but with steady-state error	Revise P and COLD value
		Unsuitable application environment	Improve the environmental conditions
		Fan is out of order	Change the fan
6.	No cooling (no dehumidifying)	Compressor is in frequent ON/Off and the compressor's thermal protector is on	Recover naturally when the compressor's temperature is down
		Compressor's protector is burnt out (with burning smell)	Change the protector
		Change-over switch is in a wrong position	Re-set for a correct position
		Condenser is excessively iced and has small cooling capacity	Heat up for defrosting; shorten the running time
7.	Humidity out of control (or unable to set)	Humidity is over high and cannot be reduced	If the humidity is high in the humidity, dehumidify and dry the case
		Low humidity	Revise P
8.	Big noise (more than 70dB(A)) or abnormal sound in operation	Fan is out of order or is in friction with the wind-hole	Change the fan or increase the wind-hole gap
		Compressor's (discharge) fan is out of order	Eliminate the varia if any or change the fan
		Constant temperature and humidity box is unevenly placed	Level up for a steady position
		Compressor is not properly fixed	Fasten the "ground screws"
9.	Printer does not print parameters or atlas	D1 in Printer setting PRIN is 0 or in error	Reset D1
		Printer cable is not well connected or is broken	Re-plug or change the cable
		Thermal paper is installed upside down	Re-install
10	Printer prints measured value of temperature with errors	The measured value of temperature is lower or higher than the upper and lower-limit value of printing range	Reset the printing range value of D2 temperature in PRIN

X：Electric wiring diagram



Packing list

Serial number	Category	Name	Unit	Quantity	Memo
1	Document	User’s manual	Copy	1	
2	Document	Packing list	Copy	1	
3	Components	Shelf	Piece	2	
4	Components	Bearing plate	Piece	4	
5	Components	Water plate	Piece	1	