

LI Electrothermal Incubator

(With Intelligent Timing)

User Manual



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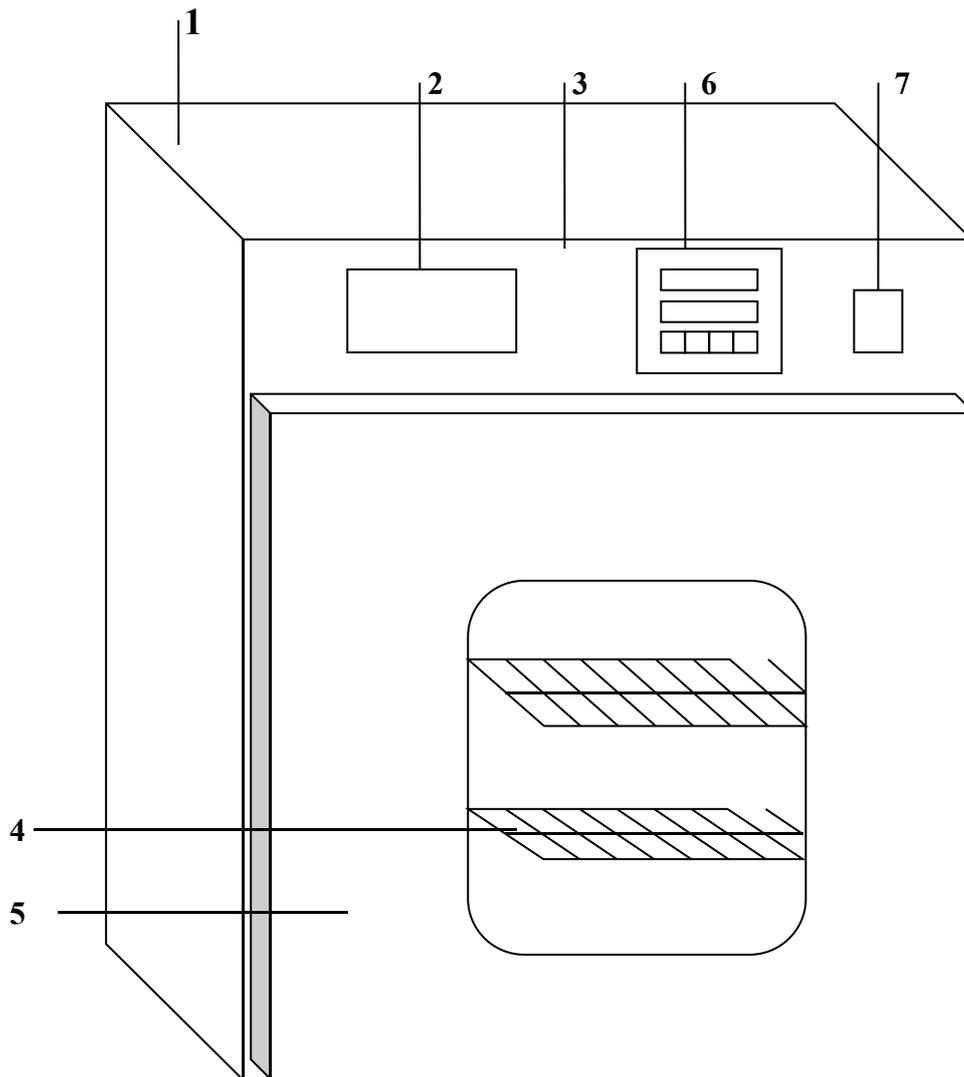
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I. Schematic diagram



1. Box body 2. Name plate 3. Control panel 4. Shelf 5. door
6. Temperature controller 7. Power switch.

II. Application range:

This equipment is applied in the plant cultivation, breeding, reproduction in the factories, research institute, and laboratories.

III. Technical parameters

Model	DW-LI-90 22	DW-LI-903 2	DW-LI-90 52	DW-LI-908 2	DW-LI-91 62	DW-LI-92 72
Power supply	AC220V 50Hz					
Temperature range	RT+5~66℃					
Temperature fluctuation	±0.5℃					
Rated power	150W	210W	250W	350W	550W	700W
Inner chamber size	250×250×3 20	300×300×3 50	350×350× 410	400×400× 500	500×500× 650	600×600× 750
G.W. (kg)	25	28	32	45	65	88

The measuring conditions for the parameters above: RT: 25℃, RH≤85%, without sample load.

Measure tool: standard mercury thermometer with the accuracy 0.1℃ (the measuring tip placed in the geometric center of the working room.)

IV. Structure overview

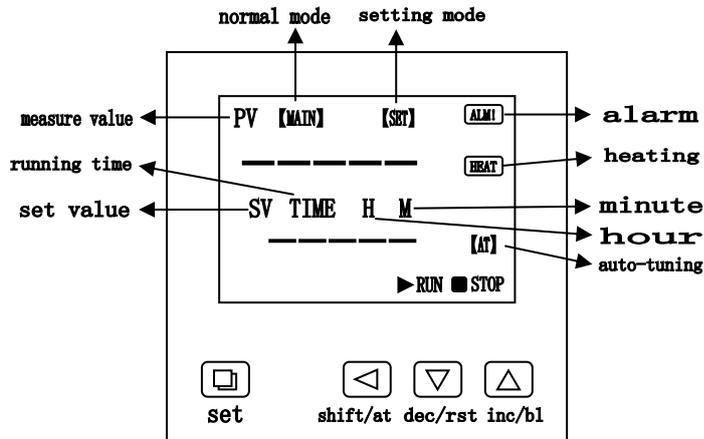
DHP series stand type thermostatic incubators adopt high quality steel plate with stoving varnish for outer shell and mirror surface stainless steel for work chamber. Two shelves are equipped in the work room and the medium layer between the shell and the chamber is thermal insulation material. Double layer hardened hollow glasses are adopted for the viewing window for easy observation of inner objects. The magnetic sealing is equipped in the connection of the working room and the outer door for well insulation. Power switch and temperature controller are fixed in the control panel at the left front side of the incubator. The thermostatic system is composed of electrical heater, proper gas passage and temperature controller. When connected to the power supply the heat is conducted from outside of the work room into the chamber evenly to keep a uniform temperature in the work room.

V. Operation procedures

1. Put the objects into the incubator and close the door.
2. Turn on the power then there's display in the controller.
3. Set the controller and the equipment will work automatically as required.
4. After finished working please switch of the power and bring the objects out.

IV Instrument operation instructions

Panel Instructions



Definitions of symbols:

1. **【MAIN】**: Only in normal state(not setting mode),this symbol appears
2. **【SET】**: Only in setting mode , this symbol appears
3. **RUN**: This symbol always appear unless the timing program is over.
4. **STOP**: This symbol appears to show you timing program is over.
5. **【AT】**: This symbol twinkles only when you start an Auto-tuning procedure
6. **ALM!**: This symbol appears to show you over-temperature alarm
7. **HEAT**: This symbol appears or twinkles to show you the heater is working.

3. Operation and using

- 1) When the controller is switched on, display windows show the version number and the value of temperature range for 3 seconds, then it starts running.
- 2) "◀" button: In the setting state, click on the button to shift the set value.
- 3) "▼" button: In the setting state, click on the button to reduce the set value. If you keep pressing on the button, the set value will reduce continuously.
- 4) "▲" button: In the setting status, click on the button to increase the set value. If you keep pressing on the button, the set value will increase continuously. In the Normal status, click on the button to open or close the backlight lamp.
- 5) In the setting mode, If no button is pressed within 60s, the controller will automatically return to normal display.

6) Temperature and time setting

● No timing function

Press the "SET" button in the non-set state, windows display the prompt "SP" and temperature set value. Using the "SHIFT"、"DEC" and "inc" buttons, user can modify the settings to the desired value, then press the "SET" button again, controller will return to the normal display, the setting value will be saved automatically.

● With timing function

Press the "SET" button in the non-set state, windows display the prompt "SP" and temperature set value. Re-press the "SET" button, windows display the prompt "ST" and time set value. Press the "SET" button again, controller will return to the

normal display, the setting value will be saved automatically.

When the time is set to "0", it indicates the timer is inoperative, the controller will run continuously. If there is time set, the under window of controller will display temperature setting value or the running time according to the value of "ndt" in Parameters table 2. When display the running time, the unit decimal point is lit, Start timing when the measured temperature reaches to the setting value, When the runtime is over, the under window of controller will display "End", the buzzer will sound for 60s, it can be muted by pressing any button, press the "RST" button for 3s at this time, the controller will restart.

7) When Over-temperature alarm, the buzzer beeps continuously, "ALM" warning light is lit.

8) When the buzzer sounds, press any key to mute.

9) If the controller upper display window displays "----", said temperature sensor or the controller itself fails, please carefully check the temperature sensor and wiring.

4. Auto-tuning of PID

Use auto-tuning function when the temperature control is not good.

In the non-set state, press the "AT" button for 6s, the window displays 'AT' and 'oFF', change 'oFF' to 'oN' by 'Inc' or 'Dec' button, then the controller will run the auto-tuning program, the "AT" symbol flashes, after auto-tuning end, the light stops flashing, parameter value is saved automatically. In the auto-tuning process, press the "AT" button for another 6s, the controller will stop the auto-tuning program.

In the auto-tuning process, the "SET" button is invalid, the under window always displays temperature set value.

Action please: the temperature is not precisely controlled when you start an auto-tuning program, there must be over-temp situation, please take out your stuffs from the oven before auto-tuning.

5. Internal parameters settings

In the non-set state, Press the "Set" button for 3s, 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 3s, it will return to the running state, the setting value will be saved automatically.

Parameter table 1

Parameter prompt	Name	Instruction of the function	(Setting range) factory set value
Lc-	Password key	When Lc=3, enter the next parameters.	0
ALH-	Over-temp alarm	If "SV>(SP+ALH)", the "ALM" light turns on. The buzzer sounds and the heating output turns off.	(0~100.0°C) 20.0
ALL-	Under-temp alarm	If "SV<(SP-ALL)", the "ALM" light flashes, the buzzer sounds.	(0~100.0°C) 0

P-	Proportional band	Adjustment of proportional function.	(1~400.0℃) 50.0
I-	Integration time	Adjustment of integration function.	(1~2000S) 700
d-	Differential time	Adjustment of differential function.	(0~1000S) 350
T-	Control cycle	The temperature control cycle.	(1~60S) 5
Pb-	Zero point adjust	When the zero error comparatively larger, to update this value should be needed. Pb= actual value – measure value	(-12.0~12.0℃) 0
PL-	Full point adjust	When the full point error also comparatively larger, to update this value should be needed. PK=1000× (actual value – measure value) / measure value.	(-999~999) 0
Addr	Address	The communication address. invalid	(1~32) 1
Loc	Setting lock	0:you are allowed to alter the set value of temperature and time; 1:the set value of temperature or time is not allowed to alter	0(0~1)

Parameter table 2

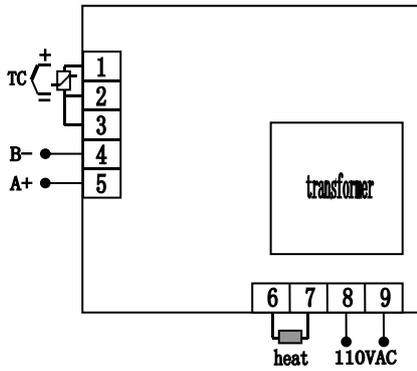
Parameter prompt	Name	Instruction of the function	(Setting range) factory set value
Lc-	Password key	When Lc=9, enter the next parameters.	0
ndA-	Temp alarm mode	0: With over-temp alarm only. 1: With over-temp alarm and under-temp alarm at the same time.	(0~1) 0
ndt-	Timer mode	0: No timer function. 1: The timer get to work as soon as the set temperature value is achieved.. 2: The timer start to work as soon as the instrument get to work.	(0~2) 1
Hn-	Timer unit	0: Minute. 1: Hour.	(0~1) 0
SPD	Timer parameter	When measured value of temperature >SPD+set value of temperature,timer get to work	(0.1~100.0℃) 0.5
SPT	Constant temperature tip time	In timing mode(set value of temperature is achieved),the buzzer reminds you when the tip time you've set is achieved.	(0~9999S) 0
EST	Tip after timing	When timing program is over,the buzzer reminds you as soon as the tip time you've set is achieved	(0~9999S) 0
EH-	Timer end mode	0: Continue to maintain the constant temperature when the running time is over.	(0~1) 0

		1: Stop the temperature control when the running time is over.	
ndo-	Switch-output	0: when timing program is over 1: when over-temperature alarm occurs	(0~2) 0
SPL-	Minimum set point	The minimum temperature set point.	(-50.0~50.0) 0
SPH-	Maximum set point	The maximum temperature set point.	(0~400.0) 300.0

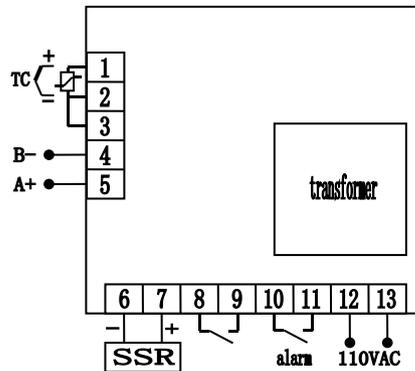
Parameter table 3

Parameter prompt	Name	Instruction of the function	(Setting range) factory set value
Lc-	Password key	When Lc=27, enter the next parameters.	0
FC	Temperature unit	0:Centigrade 1:Fahrenheit	(0~1)0

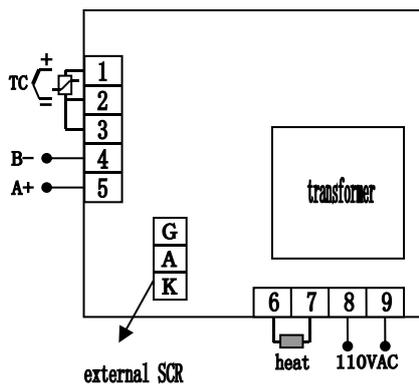
6. Wiring



1. PCD-C6000



2. PCD-C6001



3. PCD-C6003

VII. Important information:

1. The shell of the drying oven should be well earthed for safe.
2. Spare room for the applied samples inside for better thermal circulation.
3. Keep clean of the inner and outside of the equipment. Pack it in plastic dust shield if it's kept not used for long time. Place in dry indoor environment.
4. If there's any malfunction please cut off the power and contact with use in time!

VIII. Malfunction handling

Malfunctions	Principle	Handling
No power supply	No power of outlet	Change outlet
	Not plugged or wire broken	Plug well or connect wire well
	Fuse open circuit	Change fuse
No display when power on	Wire loose or temperature or controller error	Connect the wire or change temperature controller
PV display -----	Measured temperature overflow	Adjust set temperature
PV display ____	Measured temperature underflow	Adjust set temperature
PV display □□□	Temperature sensor error	Repair or change
No temperature increasing	Counting down over and equipment stops	Press SET
	Set temperature too low	Adjust set temperature
	Electric heater broke	Change electric heater
	Temperature controller error	Change controller
	Control parameter error	Revise controller parameter
	Temperature sensor broken	Repair or change temperature sensor
Big deviation of temperature	Temperature sensor broken	Change sensor
Temperature out of control	Thyristor broken	Change thyristor
	Temperature sensor detached	Fix the sensor
	Controller broken down	Change controller

IX. Packing list

Packing list

Item No.	Category	Description	Unit	Qty	Remarks
1	Document	User' s manual	Copy	1	
2	Document	Packing list	copy	1	
3	Document	Quality certificate	Copy	1	
5	Parts	Shelves	piece	2	

The listed items in this table are in accordance with the actual packed products.

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