



THERMOSTATIC HEATING INCUBATOR

INC83-130



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1. Application

INC series heating incubator is a constant temp. equipment. Widely used in biological chemistry, chemical pharmacy, medical institution, industrial and mining enterprises, university and colleges, scientific research, etc. can be used for seed, cell, bacteria culture, etc.

2. Working principle

Heating incubator transfers actual temperature detected from temperature sensor into signal, through microcomputer control to heater towards required temperature.

3. Features

- 1) The shell is made of steel plate, and outside surface is spray paint treatment.
- 2) Handle and controller are integrated, humanity design, easy to operate.
- 3) The inner chamber is made of stainless steel , heating way is air jacket type. heating wiring are evenly distributed around the inner chamber , and there is fan for air circulation to make sure uniform temperature.
- 4) Arc-design, easy to clean.
- 5) Adjustable shelf board.
- 6) The thermal insulation material is glass fiber. double-doors, magnetic silicone door seal, easy to operate and make sure good sealability .
- 7) INC heating incubator is a equipment with PID control, highly precise and advanced .
- 8) LCD display, with timing function, and the unit of timing is hour or minute.
- 9) If need timing function, you can stop heating output or keep present temperature after timing is over . beeper beeps after timing is over.

4. Product structure

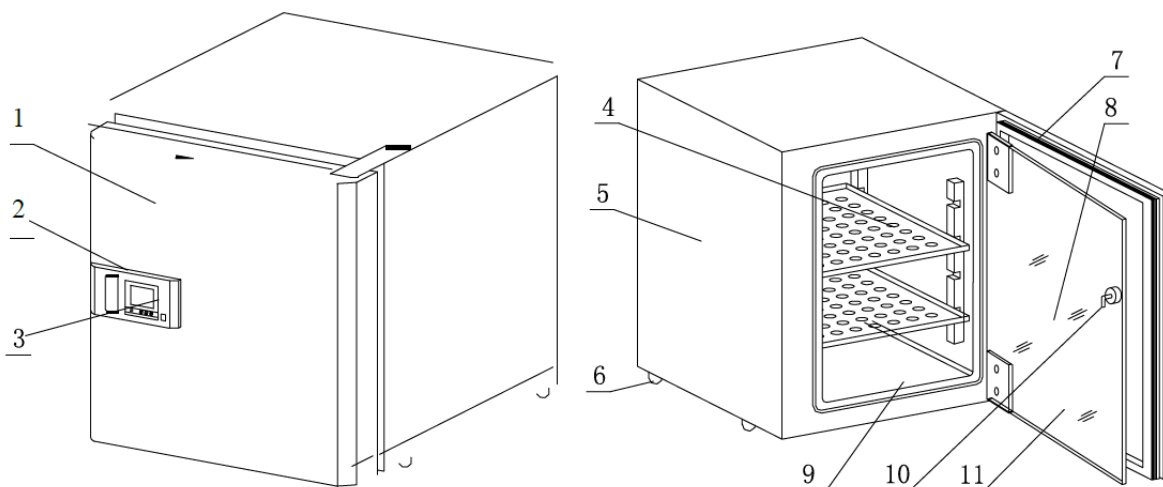


Figure 1

1. outer door

2. handle
3. power
4. shelf
5. incubator body
6. rubber feet
- 7 magnetic door seal
8. glass door
9. inner chamber
10. hook

5. Operation



Figure 2

- 1 Wind Fast: Show the percentage of fan output;
 - 2 Appointment time indicator light: it will be on when the appointment is turned on;
 - 3 Time: fixedValue timingTime;
 - 4 Key lock;
 - 5 Heating power;
 - 6 Measure the temperature;
 - 7 Set the temperature;
 - 8 Alarm indicator light: flash when it is down or abnormal;
 - 9 The operation is bright ;
 - 10 Stop Bright: It is on during down time;
 - 11 water indicator light (standby);
 - 12 lighting indicator light (standby);
 - 13 heating indicator light;
 - 14 refrigeration indicator light (standby);
 - 15 water level indicator light flashes when there is a shortage of water (standby);
 - 16 Fan indicator light: turn on when the fan is output;
- °C Symbol: When the temperature unit is Celsius °C Bright,

°FSymbol: Fahrenheit °FBright;

Button Explain



Set

Metal bolt  ;

Shift key  ;

Reduce the key  ;

6.Parameters

- 1 Temp control range : RT +5~65°C;
- 2 Temp. resolution: 0. 1°C
- 3 Temp fluctuation range : $\pm 0.5^{\circ}\text{C}$ (+3°C~50°C);
- 4 Temp uniform range : $\leq \pm 1.0^{\circ}\text{C}$ (+3°C~50°C);
- 5 Power voltage : AC 220V/50Hz;
- 6 Timing range: 0~99hour, 0~9999min
- 7 Equipment class: class I
- 8 Working ambient : ambient temp 10~40°C relative humidity 70% below ;

7. Installation

(一) In order to optimize the performance of equipment, please install the equipment in the following condition:

Attention: ambient temperature 10~30°C ;relative humidity less than 70%

1. Avoid exposure to the sunlight.

Do not place it in direct sunlight, or it won't reach predicted performance

2. An efficient ventilative place

If you operate this equipment in a narrow and concealed room, it may lead to over-heating and malfunctioning. Minimum safe distance between equipment and wall is 10CM

3. Keep away from heat source

Don't install the equipment near heating source. External excess heat will affect performance of the equipment and may cause malfunctioning

4. Flat and firm ground

Make sure to install it in flat and firm ground. Uneven surface or leaning installation may damage equipment or injure people. Proper installation can avoid shaking and noise

5. Avoid humid place

Install the equipment in a place where humidity is less than 70%. Otherwise it may cause creepage or electric shock.

 Warning

Do not place this equipment outdoors. If it exposed in the rain, it may cause creepage and electric shock. Do not place equipment in humid environment or a place with dripping water. Otherwise it may cause creepage or electric shock

Otherwise it may cause explosion or fire. Do not place equipment in the place where has acidic and corrosive gas, or corrosion will cause creepage, electric shock or equipment damage.

(二) Installation

1. Unpacking

Remove packing materials, open the door for ventilation. Please use neutral detergent to clean if the shell and panel is dirty. Then wipe with wet cloth and at last with dry clean cloth

2. Level equipment

Fix equipment with the front brake-wheel after installation in case equipment moves.

To prevent shaking on uneven ground, pads maybe needed.

3. Protective conductor thermal

 Warning

Please use power socket that has protective conductor terminal in case of electric shock. If it is not connected, has to install protective conductor terminal by licensed technician.

Do not connect protective conductor terminal through gas, water pipe, telephone line or lighting arrester which will cause electric shock.

moisture thoroughly. Be sure the inner chamber is dry and cool before closing the door .

4. Moving equipment

Before moving equipment, empty inner chamber to prevent objects falling off.

Preparation before hand

When equipment is running the first time, please operate according to following:

■ Take out the shelf boards and other accessories inside.

■ Clean the inner chamber with gauze

■ Insert the shelf boards into inner chamber according to your experiment and requirement

■ If you place samples on the same shelf, should keep space between samples for air circulation.



Attention : Do not use NaCl or other Halide solution to clean this equipment, or it will cause rust

8.Operation

8.1 The order of call-out of each function

Power-on work of the controller:

After the controller is powered on, the monitor Fully lit up, and then the upper limit of the range and the lower limit of the range are displayed. After another 2 seconds, the measurement value is displayed in the upper row, the set value is displayed in the lower row, and enters the standard display mode.

Temperature,Time, wind speed Settings:

Press the SET key, SV flashes, set the temperature, press orkey, make the display as the desired temperature value. Press the function key again, the time flashes (unit is minute), set the timing time (if the timing time is not required, the value is 0), press or to display the required time value, and press the function key again, show F(fan), press OR key, so that the display is the required value, then press the function key, the controller returns to standard mode.

8.2 Detailed description of each function

PV temperature measurement value; SV Temperature setting value

If " " is displayed, the sensor is open or the input signal exceeds the measurement upper limit. If" "is displayed, the sensor is short-circuited or the input signal is lower than the lower limit of the measuring range. When the input signal of the controller is not within the measuring range, the buzzer buzzes. Press any key to mute the buzzer.

Timer function:

When time is set to 0, the timing function of the controller is cancelled and the controller keeps running. When time is not set to 0, the controller provides the timing function. When the running time of the controller arrives, the lower row displays END, the buzzer chirps, the controller stops working, and press any key to silence, and at the same time Push downKey andKey 4 seconds,it can be restarted.

8.3 Self-toting function of the controller:

Long press the key for 4 seconds and then release, the instrument starts the self-setting function, and the running light flashes. When the temperature runs back and forth for several times, the lamp becomes steady on, and the instrument self-setting ends (set the setting time to 0, cancel the timing, and set the timing time again after the end of the self-setting).

8.4 Temperature control parameter setting:

In the standard state, long press the SET key, the LCD screen will display LK, adjust LK=18,click the SET key to enter the temperature setting.

groups of PID:

Related parameters: segmentation point F1~F4, PID1~PID5

Set the value $\leq$ F1, execute PID1

Set value [F1~F2], execute PID2

Set value [Fahrenheit~F3], execute PID3

Set value [Fahrenheit3~Fahrenheit4], execute PID4

Set value > F4, execute PID5

Multiple corrections:

Related parameters PK1 to PK8 are modified in more points.

Modified method, the measured value of the temperature point is directly input to the corresponding PK position.

If a pair of corrected points is no longer needed, the PK is adjusted to the minimum value, which is -1999.

Prompt	Name	Set the range	Explain	Initial value
Ot	Appointment to start up	0-9999 minutes	If the time is equal to ot, it will start automatically and start running.	0
rH	Upper range settings	0~400°C 0.0~400.0	By adjusting rH, the measuring range of the instrument can be 0 ~ rH(°C).	By user Demand
AL	FloorAlarm setting	0 ~ full range 0.0 ~ full range	When the temperature exceeds SP-At the AL value, the alarm light is on.Alarm output.	6.0
PK1	Target value 1	-1999-9999	Actual measured value1 (Input the mercury thermometer value is the actual measured value)	0
PK2	Target value 2	-1999-9999	Actual measured value2 (Input the mercury thermometer value is the actual measured value)	-1999
PK3	Target value 3	-1999-9999	Actual measured value3 (Input the mercury thermometer value is the actual measured value)	-1999
PK4	Target value 4	-1999-9999	Actual measured value4 (Input the mercury thermometer value is the actual measured value)	-1999
PK5	Goal 5	-1999-9999	Actual measured value5 (the input mercury thermometer value is the actual measured value)	-1999
PK6	Target value 6	-1999-9999	Actual measured value6 (Input mercury thermometer value is the actual measured value)	-1999
PK7	Target value 7	-1999-9999	Actual measured value7 (the input mercury thermometer value is the actual measured value)	-1999
PK8	Target value 8	-1999-9999	Actual measured value8 (Input mercury thermometer value is the actual measured value)	-1999
F1	Split point 1	-20.0-400.0	Temperature split point1:Set the temperature≤FF1 Use the first set of PID1 Control	50.0

F2	Split point 2	-20.0-400.0	Temperature split point2:Set the temperature $\leq$ FF2 Use the second group PID2 Control	100.0
F3	Split point 3	-20.0-400.0	Temperature segmentation point3:Set the temperature $\leq$ FF3Use the third group PID3 Control	
F4	Split point 4	-20.0-400.0	Temperature split point4:Set the temperature $\leq$ FF4 Use the second group PID4 Control;Set the temperature $\geq$ FF4 Use the second group PID5 Control;	200.0
P1	Proportional belt	0 ~ full range 0.0 ~ full range	Proportional action section, the larger the P, the smaller the proportion, the lower the system gain, P=0 is the bit control, and the insensitive area is 0.4.	25.0
I1	Integral time (Pre-adjustment time)	10~3600 Second	Integral action time constant, the larger the I, the weaker the integral effect.	240
D1	Differential time (Pre-adjustment time)	0~3600 Second	Differential action time constant, the larger d, the stronger the differential action, and it can overcome the overtune.	180
Ar1	Overshing suppression	0~200%	The smaller the value of Ar, the stronger the controller's ability to suppress temperature overtot.	100
T1	Heating cycle	1 to 100 second	Relay output $\nless$ 20s, SSR and SCR switch $\nless$ 2s, only on the heating side	5
P2	Proportional belt	0 ~ full range 0.0 ~ full range	Proportional action section, the larger the P, the smaller the proportion, the lower the system gain, P=0 is the bit control, and the insensitive area is 0.4.	25.0
I2	Integral time (Re-adjust the time	10~3600 Second	Integral action time constant, the larger the I, the weaker the integral effect.	240
Dimension2	Differential time (Pre-adjustment time)	0~3600 Second	Differential action time constant, the larger d, the stronger the differential action, and it can overcome the overtune.	180
Ar2	Overshing suppression	0~200%	The smaller the value of Ar, the stronger the controller's ability to suppress temperature overtot.	100
T2	Heating cycle	1 to 100 seconds	Relay output $\nless$ 20s, SSR and SCR switch $\nless$ 2s, only on the heating side	5
P3	Proportional belt	0 ~ full range 0.0 ~ full range	Proportional action section, the larger the P, the smaller the proportion, the lower the system gain, P=0 is the bit control, and the insensitive area is 0.4.	25.0
I3	Integral time (Re-adjust the time	10~3600 Second	Integral action time constant, the larger the I, the weaker the integral effect.	240

D3	Differential time (Pre-adjustment time)	0~3600 Second	Differential action time constant, the larger d, the stronger the differential action, and it can overcome the overtune.	180
Ar3	Overshing suppression	0~200%	The smaller the value of Ar, the stronger the controller's ability to suppress temperature overtot.	100
T3	Heating cycle	1 to 100 seconds	Relay output $\leq$ 20s, SSR and SCR switch $\leq$ 2s, only on the heating side	5
P4	Proportional belt	0 ~ full range 0.0 ~ full range	Proportional action section, the larger the P, the smaller the proportion, the lower the system gain, P=0 is the bit control, and the insensitive area is 0.4.	25.0
I4	Integral time (Re-adjust the time	10~3600 Second	Integral action time constant, the larger the I, the weaker the integral effect.	240
D4	Differential time (Pre-adjustment time)	0~3600 Second	Differential action time constant, the larger d, the stronger the differential action, and it can overcome the overtune.	180
Ar4	Overshing suppression	0~200%	The smaller the value of Ar, the stronger the controller's ability to suppress temperature overtot.	100
T4	Heating cycle	1 to 100 seconds	Relay output $\leq$ 20s, SSR and SCR switch $\leq$ 2s, only on the heating side	5
P5	Proportional belt	0 ~ full range 0.0 ~ full range	Proportional action section, the larger the P, the smaller the proportion, the lower the system gain, P=0 is the bit control, and the insensitive area is 0.4.	25.0
I5	Integral time (Re-adjust the time	10~3600 Second	Integral action time constant, the larger the I, the weaker the integral effect.	240
D5	Differential time (Pre-adjustment time)	0~3600 Second	Differential action time constant, the larger d, the stronger the differential action, and it can overcome the overtune.	180
Ar5	Overshing suppression	0~200%	The smaller the value of Ar, the stronger the controller's ability to suppress temperature overtot.	100
T5	Heating cycle	1 to 100 seconds	Relay output $\leq$ 20s, SSR and SCR switch $\leq$ 2s, only on the heating side	5
Dp	Decimal point Set up	0; 1	DP=0 display resolution is 1°C; DP=1 display resolution is 0.1°C,	1
CE	Time-based unit	0-1	0 is a unit of minutes; 1 is a unit of time.	0
CT	Refrigeration control Delay	0~3600 Second	The delay required to start the compressor twice adjacently, Ct=0 cancels the compressor function.	0

CH	Refrigeration control upper deviation setting	0~full range 0.0 to full range	When the temperature exceeds the CH value and meets the compressor refrigeration control delay, the refrigeration light is on, the refrigeration contact is turned on, and the compressor is started. That is, $SP+CH > \text{set value}$	0.5
CL	Refrigeration control is biased Poor setting	0 ~ full range 0.0 to full range	When the compressor is turned on, measure the temperature. $\leq$ When the temperature + CH-CL value is set, the refrigeration contact is disconnected and the compressor is turned off.	0.3
Drt	Open the door for testing	0.0-50.0	If the temperature drops within 10s, the drt is regarded as the door opening detection. If the value is set to 0, this function is not available. (refrigeration without this function, no parameters)	1
uF2	Automatic refrigeration by hand	0-1	0, automatic refrigeration; 1, manual refrigeration	0
Nct	Refrigerate Spot	0.0-99.9	1, when the measured value is less than the nct value, turn on the compressor; When the set value is greater than the nct value, shut down the compressor	40

Table 1

Long press the set key for 5 seconds, LK=168 will appear to enter: see the following table

Prompt	Name	Set the range	Explain	Initial value
ERt	Temperature filtering	0~9	Filter coefficient	0.2
RL	Lower range setting	-50.0~400.0	Minimum temperature range setting	0.0
Tm	Timing mode		See Table 1	4
CN	Sensor input type	0~6	Do not operate	1
Bm				standby

Co	Compressor selection	0~4	0: Refrigeration start-stop type; 1: Refrigeration balanced type. The program control is generally set to 1; 2: start-stop mode when the set value is less than Eu, do not start the compressor when the set value is greater than Eu; 3: When the set value is less than Eu, the compressor is normally turned on, and when the set value is greater than Eu, the compressor is not started. 4: The compressor is normally on when the set value is less than Eu, and the compressor is in start-stop mode when the set value is greater than Eu.	2
EU	Refrigeration balanced selection	0~1	If C0=1, 0: does not start the compressor. 1: starts the compressor.	0
CF	Celsius Fahrenheit choice	0~1	0: Celsius 1: Fahrenheit	0
Tc	Refrigeration shutdown zone	0~100	PID heating when the measured temperature is less than or equal to the set temperature -tc value (valid only when the compressor is normally open)	1.0

Table 2

FuL	Lower limit of fan speed	0~100	Lower limit of fan speed	40
FuH	The upper limit of fan speed	0~100	The upper limit of fan speed	60
tF	Automatic extreme adjustment fan	0.0~50.0	The set temperature is greater than Fn+tF or the set temperature is greater than Fn-tF as a fast fan, and for other values, it is a slow fan, which can adjust the speed from 0-100.	2.0

Table 3

Form 1:Tm

	Time to reach the set value	Power-up and zero ST	Key to start
0	Deny	Deny	Deny
1	Deny	Deny	Yes
2	Deny	Yes	Deny
3	Deny	Yes	Yes
4	Yes	Deny	Deny
5	Yes	Deny	Yes

6	Yes	Yes	Deny
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Table 4

8.5 Print control parameter setting:

In the standard state, press and hold the SET key, the upper row of the LCD screen shows LK, adjust LK= 16 Click the SET key to enter the temperature setting.

UT	Usb flash drive storage interval	0~9999	Set the storage interval of U disk (how long the U disk is saved once); Set 0 to not save.	0~9999Minute (0)
Pt	Print interval	0~9999	Set the printing interval (how often to print once); Set 0 to not print.	0~9999Minute (0)
Pn	Printer type	0~1	0: Rongzhong printer;1: WeihuangPrinter	0
PL	Printing Type	0~1	0:Digital printing;1:Curve printing	0
Yr	Year	0~9999	Year setting	0
Mon	Month	0~9999	Month setting	0
Day	Date	0~9999	Date setting	0
HR	Hour	0~9999	Hour setting	0
Min	Minute	0~9999	Minute setting	0
On	Update the settings	0~1	0 Do not update Settings; 1 Update Settings	0

Table 5

8.6 Communication parameter setting:

In the standard state, long press the SET key, the LCD screen will display LK, adjust LK=36, tap the SET key to enter the parameter setting.

dl d	Equipment Number	0~9999	Equipment Number	0
Ad	Correspondence address	0~99	Correspondence address	3
bA	Potter Strain	0~5	0: 1200; 1:2400; 2:4800; 3:9600; 4:19200; 5:38400	3
FO	Communication format	0~2	0: No verification (NONE) Connect the printer;1: Strange Check (ODD);2: Inspection;(EVEN upper computer)	0

Table 6

9. Alarm and safety functions

1. Temperature sensor failure alarm: Screen displays: “- - -”, that is temp. sensor or controller failure.
2. Temperature limit alarm : when test temp. is beyond 20 degrees, heating stops, “ALM” alarm indicator light is on. Alarm keeps beeping. Press any button to mute.

10. Routine using and maintenance

	Do not capsize when moving.
	Do not change the settings frequently during process, it may affect the life of use
	The machine is equipped with power switch and circuit breaker, if failure occurs during operation, please cut off the power and check the control circuit if it's intact, and then check the other parts. (See wiring diagram)
	Make sure the door is shut. If the door is not closed properly, the device may not be able to reach maximum performance. do not slam the door to avoid damage of the locking system.
	Do not use corrosive solution to wipe the exterior in order to maintain the appearance of equipment. Please use dry cloth or alcohol to wipe inner chamber
	If set the equipment aside, keep inner chamber dry, and cut off the power supply.
	In order to keep temperature uniform inside the chamber, check the axial fan in the chamber if it is functioning properly. During the experiment, in order to allow air circulation, samples should not be placed too crowded .Do not touch and collide temperature sensor, or it may cause failure of temperature control.
	Fix shelf. Otherwise it may damage the samples .
	Do not lean against the glass or apply pressure on the glass, it might cause injury.
	Do not lean against the door of the device. To prevent tipping of the equipments or equipment damage, personal injury by the damaged door.
	When failure occurs, please arrange professionals or contact with the factory sales department. User should not attempt to repair or fix it.
	Our company products have “Three Guarantees” from the date of original purchase. one year warranty, free to repair (exclude mis-operation and consumable items) when equipment has failure

Table 7

11. Trouble shooting

Trouble	handling
Sensor failure display (- - -)	Temperature sensor is abnormal, please check temperature sensor (model:PT100)
Temp. can't reach setting value	Check screen if it is heating, If yes, then heating wiring is damaged or control panel failure or circuit failure.
Temp. rises too slow	Check fan whether is working properly (Open the door). If it's not running, check according to the wiring layout
Screen can not display	· Please check if the power socket is ~220V · Please check if the power switch is on · Please check power switch, if it is tripping operation, please check wiring layout.

Table 8

12. Packing list

Thermostatic Heating Incubator

No.	Name	Quantity	Note
1	Equipment	1	
2	User manual	1	
3	Shelf	1	

Table 9

13. After-sales service

- (1) One year warranty, lifetime service . and this product is warranted for a period of twelve months from the date of original purchase, please retain your receipt to establish proof of purchase!
- (2) Don't dismantle, repair or refit equipment without authorization and guidance from our company. This warranty does not extend to the repair or refit of any products.
- (3) This warranty does not cover any damages which is caused by improper operation, improper power output, or improper cable connection.
- (4) If the product is located outside in china, during the warranty period, we will offer the parts for free. but not bear freight charge. If outside of warranty period, you need to pay for the parts and the freight charge as well.
- (5) The warranty does not cover consumable parts, such as light lamp or glass door and so on.

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