Laboratory Equipment Pty Ltd

INSTRUCTION MANUAL

FOR ECONOMY REFRIGERATED HUMIDITY CHAMBER

Laboratory Equipment Pty Ltd
"Proudly Australian Owned and Operated."
26 Farr Street, Marrickville NSW 2204
Phone +61 02 95602811 Fax +61 02 95606131
www.labec.com.au

Contents

I. Introduction

The HWS model Constant Temperature and Humidity Incubator is the ideal testing equipment for natural environment simulations. With 30 segments of program memory, it comes with functions of constant temperature, auto humidity control, day / night cycle, and over-temperature protection. Its applications range from seed germination, seedling raising, plant growth, microorganism cell culturing, and insects rearing to commercial medicinal, building and timber material performance testing, as well as industrial product quality inspection and constant temperature and humidity experiments.

II. Characteristics

1. Bright large screen liquid crystal display panel and light-touching operational key, in which cycle periods, segments, time, temperature, humidity are display clearly. It can be connected to a computer through RS232 interface, which ensures the whole experiments process is controlled in a safety state(optional).
2. Reliable security; the instrument has diverse of anti-jamming measures and has functions of over-temperature protection, thermal resistor short-circuit protection and delay protections.
3. The structure is made with advanced techniques. Cold rolling steel Surface with electrostatic spraying which is attractive and durable.
4. Advanced air flow circulation ensures balanced airflow rate in the chamber and prevents powdery substances and seeds from blowing around. Quality compressors; environmental safe refrigerant R134a .

Options:

1 RS-485/232 interface and supervisory computer control software.
2 Printer(miniature)
3 Power failure alarm
4 Leakage protection
5 Danfoss compressor

The above options must be ordered separately.

III. Main technical parameters

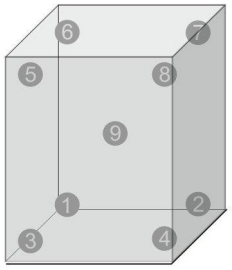
Model		HWS-70B	HWS-150B	HWS-250B
Cycle Mode		Forced convection		
Function	Temp. range	No humidification：0～65℃； humidification：10 ～65℃		
	Temp. Resolution	0.1℃		
	Temp. Motion	High Temp.：±0.5℃ Low Temp.：±1℃		
	Temp. Uniformity	±1℃		

	Humidity Range	45%～95%RH		
	Humidity Stability	±5%RH		
Structure	Inner Chamber	Mirror Stainless Steel		
	Outer Shell	steel electrostatic painted exterior		
	Insulation layer	Polyurethane		
	Heater	Stainless steel heater		
	Power rating	1.8kW	2.0kW	2.2kW
	Compressor	Air cooled hermetic compressor		
	Refrigerant	R134A		
	Defrost type	Automatic control intelligent defrosting		
	Humidifying method	External steam		
	Test hole	Plastic test hole ϕ43mm		
	Controlled external power supply	Universal socket (one)		
Controller	Temp control mode	30 section LCD program		
	Temp. setting mode	Touch button setting		
	Temp. display mode	Measuring temperature: LCD upper row； Setting temperature: the lower row		
	Humidity control mode	Automatic		
	Timer	0～99.9h×30 section （with timing wait function）		
	Operation function	Program operation, timing function ,auto stop.		
	Sensor	PT100		

	Additional function	LED light、Deviation correction、Menu key lock、Self-diagnosis of power failure parameter memory loop		
Safety device		Over temperature alarm, mechanical temperature limiter		
Specification	Inner Chamber size (W*L*H)(mm)	420*350*500	500*500*600	600*500*840
	Exterior size (W*L*H)(mm)	580*610*1190	660*760*1290	760*760*1530
	Packing size (W*L*H)(mm)	708*716*1368	788*866*1468	888*866*1708
	Volume	70L	150L	250L
	Load per rack	15kg		
	Shelf number	9	12	18
	Shelf space	35mm		
	Power Supply (50/60Hz) Current rating	AC240V/ 2.3A	AC240V/ 3.6A	AC240V/ 5.5A
	NW/GW (kg)	69/92	86/114	100/139
Accessory	Shelf	2		
Optional accessories		Shelf, Touch screen controller, RS485 interface, Printer, Recorder, Remote control, Wireless SMS alarm, USB data storage		

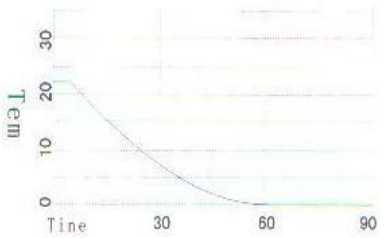
Chamber temperature profile

Probe	Temp (℃)	Probe	Temp (℃)
①	36.63	⑤	36.91
②	36.98	⑥	36.86
③	37.5	⑦	36.88
④	37.33	⑧	36.64
⑨	37.15		

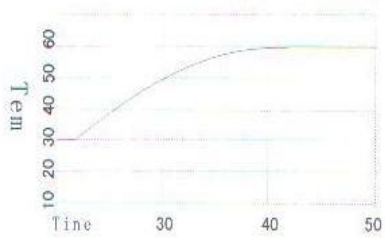


Diagram

Cooling down speed

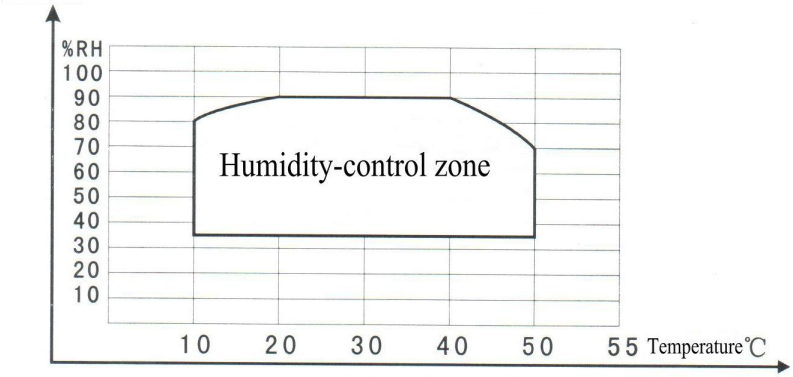


Heating up speed



Note: The ambient room temperature was ≤25℃, while testing, this is the preferred operating condition.

Temperature and humidity diagram



IV. Working Conditions

1. Ambient temperature: 5℃~32℃ (e.g. set temperature ≤10℃, ambient temperature≤28℃)
2. Relative humidity: ≤80%RH
3. Air pressure: 86-10Kpa
4. Keep the chamber away from vibrations and corrosive gas.
5. Keep the chamber away from direct sunlight and other cooling/heating sources.
6. Install the chamber horizontally and leave space between the unit and the walls.
7. Install it in a room with good air ventilation.

V. Attention

Safety Notice

1. Connect the device to an earthed power supply to ensure safety of machine and experiment; connect the power as the machine requires.

2. DO NOT use inflammable, explosive, poisonous or strong corrosive materials inside the chamber.

3. Make sure the chamber has been installed horizontally; if the machine is newly installed, keep it for 24 hours before the first use.

4. Non-professionals are not allowed to disassemble or repair the chamber.

5. When the temperature inside the chamber is being used at ≥ 50℃, don't set low temperature immediately; allow chamber to cool naturally before switching cooling on, to ensure long service life of compressor;

6. When the chamber is alarming, DO NOT continue to restart the machine; diagnose the fault or call for service.

7. Read the instruction book before operation.

Operational notice

1. If the machine is started up for the first time, don't change the factory .
2. Any light or humidifier should be shut off if not necessary.
3. If the humidifier is not being used while testing, set the humidifying parameters to 0%.
4. To ensure proper air circulation through the chamber DO NOT overload the chamber; DO NOT cover more than one third of the tray.
5. Don't use solvents to clean the inner and outer surface of the chamber. Use general household detergent, cleaning it periodically, and wiping it down with a clean, dry cloth.
6. Turn the power off when the chamber has finished being used; keep inside and outside of the chamber dry and clean.

VI.Operation Instruction

Operation manual

1 .Instructions for use

●Initial use; the humidifier should be at room temperature for half an hour before turning the power on.

●Humidifier suitable working environment: 5-40 ℃, relative humidity should be less than 80% RH

●Room temperature should be below 30°C. Always use clean, filtered water or distilled water.

●If the chamber is not being used for a long period of time, drain the water from inside the

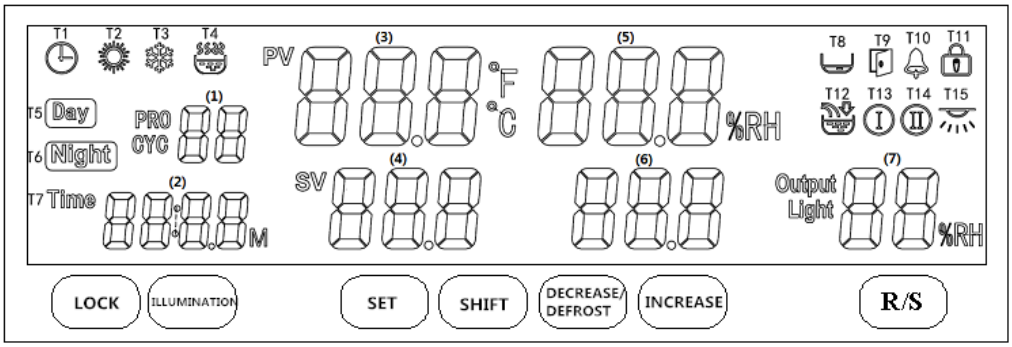
chamber.

2. Operation step

●Connect the water and overflow hoses through the stainless lid cover and into the plastic water supply tank to the side of the chamber. Close the drain valve unless cleaning the unit.

●Connect power, turn the power switch (anhydrous, non-boot), the power LED is light

3.Operation and display instructions of Controller



3.1 Definitions

T1 Reservation：T1 flashes when entering the reservation timing,【(2) display window】Display the reservation countdown;

T2 Heating：T2 lights up, when heating is on;

T3 Compressor：T3 lights up,When the compressor starts up;T3 flashes,when the compressor is waiting for the start-up delay;

T4 Humidification：T4 lights up,When humidification is output;

T5 Daytime：T5 lights up,When in daytime mode;

T6 Night：T6 lights up,when in night mode;

T7 Timer：T7 flashes,when timer is running,【(2) display window】display timing countdown time of timer；

T8 Water shortage：T8 lights,when there is water low;T8 flashes,When there is water low alarm;

T9 Open the door：T9 flashes,when the door is open；

T10 Alarm：T10 lights up, when there is a alarm of temperature and humidity;T10 flashes,When entering the low temperature or high temperature protection state;

T11 Lock the screen:T11 lights,When entering screen is locked;

T12 Addition of water：T12 lights up,When the water pump output;

T13 Defrost：T13 lights up,when defrosting;

T14 Magnetic valve：T14 lights up,when magnetic output;

T15 Illumination/sterilization：T15 lights up,when illumination output；T15 flashes,when sterilization output.

3.2. Display window

【(1) display window】display：period or segment values;

【(2) display window】display：timing or time setting；

【(3) display window】display：temperature measurement value；

【(4) display window】display： temperature setting value;

【(5) display window】display：humidity measurement value；

【(6) display window】display：humidity setting value;
【(7) display window】display：Illumination value or heating output power.

3.3. Definition of keys

【LOCK】key：	under normal display, press and hold on this button for 2 seconds to lock the screen manually or unlock the screen.
【ILLUMINATION】key：	Under normal display, click this button to switch the illumination.
【SET】key：	Under normal display, click the button to enter the setting value modification interface. Press and hold on this button for 3 seconds to enter the parameter table modification interface.
【SHIFT】key：	In the setting state, click this key to make the set value shift, flicker and modification. Under the normal display state, if running in [day/night] mode, you can switch the running state of day and night；If it is running in program mode, you can shift the segments or cycles displayed.
【 INCREASE 】key：	In setting state,click this button to increase the setting value. In normal displaying state,If there is water shortage alarm, press this button for a long time to cancel the alarm and continue to add water.
【DECREASE/DEFROST】key：	In setting state,click this button to decrease the setting value. In normal displaying state,long press this button to turn on defrost function manually .
【R/S】key：	In normal displaying state,click or press this button for a long time to turn on or off the controller.

3.4 Operation and Usage

3.4.1. Power on the controller, 【(3) display window】display"**PS**", 【(5) display window】display"**V06**", there is a short alarm, enter the normal display after 2seconds.

3.4.2. Modification of setting value

In normal displaying state,click【SET】button, "**TIME**""**SV**"flash at the same time,the flashing value can be changed through【SHIFT】【INCREASE】【DECREASE】, click【SET】again to shift the next value.After modification finished,press【SET】for 1seconds to exit setting.Or in constant value mode,Click【SET】 continuously to change a set of data and then exit.After a short alarm,enter the normal displaying interface and then keep the data automatically.
When controller run in in program mode,click【SET】,data of segment showing start to flashing.At this time, click【INCREASE】【DECREASE】 to change the segment,where you can see the time,temperature,humidity and illumination. Click【SET】again to change the data in the present segment.When the cursor returns to the segment value and flashes, modify the next segment value again .
When the controller running in【DAY/NIGHT】mode, click【SET】button,

and“DAY”will flash, and can shift to “NIGHT” through 【INCREASE】 【DECREASE】button,then “NIGHT”flashes.You can click 【SET】to check the setting value to modify the setting value in 【DAY/NIGHT】mode.

3.4.3. Set segment number or cycles.

Press and HOLD Set key until LC appears. Enter 3. Then set the number of programs and Cycles. (CYC= 0 is continuous) you require.

Press and Hold SET to return to the main screen. Then press Set and set the Program number and then scroll through (by pressing SET) each parameter (Time, Temp ,Humidity). Then when it returns to PRO press up arrow to Program 2 and continue. After you finish setting,press【SET】 for 3 seconds to exit,and the parameters will be stored.

In the mode of DAY/NIGHT,the total segment number can’t be set, only the cycle number can be set.

3.4.4. Start and Stop

Press 【R/S】button U7 second **(user parameters table –1 for details)** to start the controller, 【(2) display window】display the remaining time,when run；when time is up,the controller stops,the buzzer blared **U9 (user parameters table –1 for details)**, 【(2) display widow】 display“End”, or press【R/S】U7second for a long time to stop the controller,【(2) display window】display“OFF”。

When the controller run in programmable mode and the total segment number is more than 1,if the mode of constant temperature and humidity **(check the parameter table –1–u5 and U6 for details)** ,it is required to set each period of time before starting the operation.when setting time is 0,start is not available.

and the time is set to 0.

3.4.5. Reservation Function

When the reservation function AP(check the user parameters table –7 for details) is 1,click 【SET】 again to set the reservation time. The unit is minute, otherwise exit directly into the normal display interface.

After the reservation time is set,click 【R/S】 to run.When the reservation time is timing, you can enter the parameter table again to modify the reservation time.Or click 【R/S】 to stop the controller,and then the reservation time will be reset to 0 automatically and only valid once.

3.4.6. Fault Prompt

Temperature alarm：When there is temperature deviation alarm upper,“**℃**”flashes quickly.When there is temperature deviation alarm down,“**℃**”flashes slowly.

Humidity Alarm：When there is a humidity deviation alarm upper,“**%RH**”flashes quickly.When there is humidity deviation alarm down,“**%RH**”flashes slowly.

If 【(3) display window】display“---”, it means the temperature sensor or controller is broken.Please check the temperature sensor and its wiring carefully.

3.4.7. Defrost function

Defrost function can be turned on automatically or manually.Turn on

automatically (check parameters-4 for details),and then set the time of defrost interval time and defrost time.Turn on manually:in the main interface, click the 【DEFROST】 button manually to open defrost manually.Manual defrosting time still uses the time set in the parameter table,and delay time is up,and then defrost function is over.

3.4.8. Power off memory function

You can choose whether there is power off memory function,through modify the parameters of power off memory(check "U2"parameters :internal parameters table-1)

4. Check and set the internal parameters

In normal display state,press【SET】 for 3 seconds,and【(1) display window】 will display the password prompt"Lc"and【(2) display window】 will display password value.Input different password value to enter the setting mode of internal parameters,and then click 【SET】 to modify each parameters.After that,press 【SET】 for 3 seconds,and then the buzzer will give a short blast and exit.The parameters will be stored automatically.

4 Parameters' tables

User parameters table-1

Parameter indication	parameter name	Parameter function description	(range) factory value
Lc	password	when"**Lc=9**",you can check and modify the parameters.	0
U1	Running mode	0：Fixed value running mode； 1 : Day or night mode,0~99 cycle； 2：program mode, programmable 1~30 period, 0~99 cycle.	(0~2) 0
U2	Power off running mode	0：no run； 1：Run from the first paragraph (day)； 2：Run from outage time	(0~2) 2
U3	Timing correction	Correction of total timing error, corrected value=【 running time(second)-actual time(second)】*10 ÷ actual time (minute) .	(-999~999) 0
U4	Timing unit	1 : minutes 0~9999 ; 2 : hours0~9999	(1~2) 1

U5	timing deviation of Constant temperature	When start the timing function, The difference between the measured temperature and the setting value is within **U5.** **Note：0 means timing doesn't need to judge the temperature.**	(0～10.0℃) 0
U6	Timing deviation of constant humidity	Start timing if the humidity measurement value is within U6 with the set value. **Note：0 means timing doesn't need to judge the humidity.**	(0～50.0%) 0
U7	【R/S】 Available time	After press **U7** for a long time,【R/S】is available.	(0～10s) 0
U8	Lock screen time	Auto-lock screen time, 0 means no auto-lock screen time。	(0～300s) 0
U9	Prompt time of end of the running	When running finishes,the buzzer beep. **Note:0 means beep all the way.**	(0～300s) 0
UA	Illumination time	When the lighting is turned on,it can the lighting time is automatically turned off. **Note：0 means that the light must be turned off manually**	(0～9999min) 0
Ub	Temperature of starting sterilizing	The setting temperature ≤ Ub, the sterilization function is turned on.； he setting temperature > **Ub**, the sterilization function is turned on. **Note:** **According to Parameters-8,you can turn on or off the sterilization function.** **-0.1 alarm of output humidity for sterilization relay.**	(-0.1～50.0℃) 0
Uc	IP	IP of this machine	(1～16) 1

Temperature Parameter Table -2

Parameter indication	**parameter name**	**Parameter function description**	**(range) factory value**
Lc	password	"**Lc=103**",you can check and modify the parameters.	0

TH	Upper deviation Over temperature alarm	If“measured value > setting value+**TH**” , then the upper deviation alarm, turn off temperature and humidity output. When alarming,the temperature alarm relay has an output, the buzzer sounds, the alarm indicator lights up, the temperature unit flashes rapidly, and any button is clicked to cancel the buzzer.	(0～20.0℃) 8.0
TL	Lower deviation Over temperature alarm	If "measured value < set value + TL", the lower deviation alarm is issued When the alarm occurs, the temperature alarm relay has an output, the buzzer sounds, the temperature unit flashes slowly, and any button is clicked to cancel the buzzer. **Note: This function is invalid when “TL=0”.**	(−50.0 ～ 0℃) 0
Tb	Deviation correction	Correct the error generated when measuring the sensor (low temperature); **Tb** = Actual temperature value - meter measured value	(−99.9 ～ 99.9℃) 0
TA	Slope correction	Correct the error caused by sensor (high temperature) measurement. **TA = 1000 ***(actual temperature value - meter measurement value) ÷ meter measurement value	(−999～999) 0
TP	Heating ratio	Time proportional adjustment	(0.1 ～ 50.0) 8.0
TI	Heating integral	Integral action adjustment	(1 ～ 2000s) 500
TD	Heating differential	Differential action regulation	(0 ～ 2000s) 200
TT	Heating cycle	Heating control cycle	(1～60s) 5
Tc	Low temperature control Heat off	Non-heating point during low temperature control, valid only when the temperature setting is lower than the ambient temperature.	(−2.0～0℃) -0.5
To	heating power	Maximum power percentage of the heating output.	(0 ～ 100%) 100

Tu	Cooling on	When the compressor is in the manual start/stop mode and the compressor is in the off-type control, if the "measuring temperature ≥ set temperature + Tu", the compressor is turned on.	(-10.0 ~ 10.0℃) 0.6
Tn	Cooling off	When the compressor is in the manual start-stop mode and the compressor is in the off-type control, if the "measuring temperature ≤ set temperature + Tn", turn off the compressor.	(-10.0 ~ **uP**) 0.6
TE	High temperature control Heat off	Non-heating point during high temperature control, valid only when the temperature setting is higher than the ambient temperature.	(-10.0 ~ 10.0℃) 5.0

Humidity Parameter Table -3

Parameter indication	**parameter name**	**Parameter function description**	**(range) factory value**
Lc	password	View and modify parameter values when **"Lc=203".**	0
HH	Upper deviation Over humidity alarm	If "humidity measurement value > set value + **HH**", the upper deviation alarm, the super-wet alarm relay is turned off, and the humidity output is turned off. When the alarm is on, the humidity alarm relay has an output, the alarm indicator is on, and the humidity unit flashes rapidly.	(0 ~ 50.0%) 20.0
HL	Lower deviation Over humidity alarm	If the "humidity measurement value < set value + HL", the lower deviation alarm. The humidity alarm relay has an output when the alarm is issued, the alarm indicator is on, and the humidity unit flashes rapidly. **Note: This function is invalid when "HL=0".**	(-50.0 ~ 0%) 0
Hb	Deviation correction	Correct the error generated when measuring the sensor (low humidity); **Hb** = actual humidity value - meter measured value.	(-99.9 ~ 99.9%) 0

HA	Slope correction	Correct the error generated when measuring the sensor (high humidity); HA = 1000 * (actual humidity value - meter measurement value) ÷ meter measurement value.	(−999 ~ 999) 0
HP	Humidification ratio	Time proportional adjustment	(0.0 ~ 90.0) 55
HI	Humidification integral	Integral action adjustment	(1 ~ 999s) 200
Hd	Humidification differential	Differential action regulation.	(0 ~ 999s) 30
HT	Humidification cycle	Humidification control cycle	(0 ~ 60s) 6
Hc	Low humidity control Humidification off	Non-humidification point during low humidity control.	(−50.0 ~ 50.0%) 0.0
Ho	Humidification power	Maximum power percentage of humidified output.	(0 ~ 100%) 100
Hu	Dehumidification off	When the compressor is in the manual start/stop mode and the compressor is in the off-type control, if "measuring humidity ≥ set humidity + **Hu**", turn on the compressor.	(**Hn** ~ 20.0%) 10
Hn	Dehumidification on	When the compressor is in the manual start/stop mode and the compressor is in the off-type control, if "measuring humidity ≤ set humidity + **Hn**", turn off the compressor.	(−20.0% ~ **Hu**) 3.0
HE	No humidification point	When the compressor is working in the discontinuous mode, if the set value meets the condition, the value can be modified to close the humidification in advance.	(0.0 ~ 10.0) 2.0
HF	Low humidity No humidification point	When controlling low humidity, if the humidity measurement value ≥ humidity set value + HF, the controller will prohibit humidification.	(−10.0 ~ 10.0%) -5.0

Compressor Parameter Table -4

Parameter indication	parameter name	Parameter function description	(range) factory value
Lc	password	View and modify parameter values when "Lc=109".	0
C1	Prohibit compressor Working temperature point	Absolutely prohibit compressor operation when "temperature measurement ≥ C1"	(0 ~ 100.0℃) 45.0
C2	Do not open the compressor Working temperature point	When "temperature set value ≥ C2", the compressor is turned on only when the temperature measurement value is higher than the temperature set value.	(0~100.0℃) 42.0
C3	Normally open temperature point	When "temperature set value ≤ C3", the compressor operates in a balanced manner.	(-15.0 ~ 100.0℃) 40.0
C4	Normally open humidity point	When the "humidity set value ≤ C4", the compressor operates in a balanced manner. (The normal open temperature point and the normally open humidity point have one condition, and the compressor works in a balanced manner)	(0~100.0%) 10.0
C5	Way of working	0: Automatically obtain refrigeration and automatically obtain the dehumidification threshold; 1: Manually set the cooling and automatically obtain the dehumidification threshold; **Note: Only valid when the compressor is working in disconnected mode.**	(0~3) 3
C6	compressor start delay	Compressor start delay protection time, the minimum time interval from compressor stop to restart.	(0~600s) 180
C7	Defrosting method	0: no defrosting function; 1: electromagnetic valve defrosting; 2: heating tube defrosting; 3: independent heating tube defrosting.	(0~3) 1

C8	Defrost interval 1	Defrost time interval when "temperature set value ≤ 10.0 ° C". **Note: 0 means there is no automatic cream in this section, it can be opened manually.**	(0 ~ 9999min) 720
C9	Defrost interval 2	Defrost time interval when "10.0 ° C < temperature set value ≤ 20.0 ° C". **Note: 0 means there is no automatic cream in this section, it can be opened manually.**	(0 ~ 9999min) 720
CA	Defrost interval 3	Defrost time interval when "20.0 ° C < temperature set value ≤ 30.0 ° C". **Note: 0 means there is no automatic cream in this section, it can be opened manually**.	(0 ~ 9999min) 0
Cb	Defrost interval 1	Defrost on time when "temperature set value ≤ 10.0 ° C". **Note: 0 means no defrosting in this section.**	(0 ~ 200s) 60
Cc	Defrost time 2	Defrost opening time when "10.0 ° C < temperature set value ≤ 20.0 ° C". Note: 0 means no defrosting in this section.	(0 ~ 200s) 60
Cd	Defrost time 3	Defrost opening time when "20.0 ° C < temperature set value ≤ 30.0 ° C". Note: 0 means no defrosting in this section.	(0 ~ 200s) 0
CE	Solenoid valve function	-2: No Solenoid valve function; -1: When the compressor needs to be turned on, if the opening delay time is up, the Solenoid valve is first turned on, and after 10 seconds, the compressor is turned on again; 0: normally open solenoid valve mode; 1, 2: See the CF parameters below for details.	(−2 ~ 2) -2

CF	Solenoid valve on	If CE=0, when the “temperature measurement value <temperature set value-CF”, the solenoid valve is opened; when “temperature measurement value>temperature setting value+CF”, the solenoid valve is closed; If CE=1, the solenoid valve is opened when “temperature set value ≥CF”, and the solenoid valve is closed when “temperature set value <CF”. If CE=2, when the “temperature measurement value>temperature setting value+CF”, the solenoid valve is opened; otherwise, the solenoid valve is closed.	(-20.0 ~ 50.0℃) 0

Internal parameter table -5

Parameter indication	parameter name	Parameter function description	(range) factory value
Lc	password	The parameter values can be viewed and modified when **"Lc=209".**	0
P1	Illuminance selection	0: no light; 1: total 3 levels; 2: a total of 4; 3: a total of 5; 4: a total of 6 levels; 5: A total of 10 levels (cold light source 0~10V output).	(0~5) 0
P2	Humidity selection	0: no humidity; 1: only shows humidity; 2: humidity is controllable.	(0~2) 2
P3	Internal parameter	The reserved can be set	(0~9999) 0
P4	temperature Upper limit setting	Maximum temperature setting	(P5~99.9℃) 65.0
P5	The lower temperature limit setting	Minimum value of temperature set point	(-19.9 ~ P4℃) 0.0

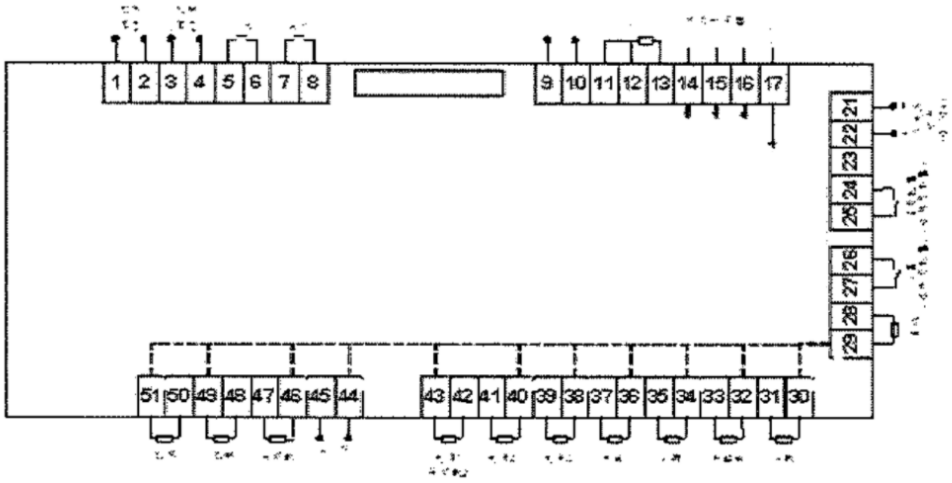
P6	Voltage upper limit of Humidity input	The corresponding input voltage value when the humidity is 100%.	(P7~5000 mV) 3600
P7	input Lower voltage limit of Humidity	Corresponding input voltage value when humidity is 0%.	(0~P6 mV) 1000
P8	Low temperature protection	When "temperature measurement value or temperature setting value ≤ P8", the humidity is not controlled, only the temperature is controlled, and the alarm light flashes slowly.	(-25.0 ~ 30.0℃) 0
P9	High temperature protection	When "temperature measurement value ≥ P9", the operation stops, all outputs are turned off, and the alarm light flashes quickly.	(0 ~ 105.0℃) 100.0
PA	temperature Filter coefficient	Adjust the temperature sensitivity.	(1~200) 20
Pb	humidity Filter coefficient	Adjust the humidity sensitivity.	(1~200) 20
PC	Input selection	0: If door controller is connected ,the door will open.If controller of water is connected,there will be water shortage. 1: If door controller is disconnected ,the door will open.If controller of water close,there will be water shortage. 2: If the controller of the door is connected ,the door will be open.If the controller of water level is disconnected ,there will be water shortage; 3：If the controller of the door is disconnected ,the door will be open.If the controller of water level is disconnected ,there will be water shortage;	(0~3) 2

Pd	Water level delay Adding water time	If Pd>0, extend the Pd time and close the water after adding water; If Pd < 0, water shortage is detected, and water is added after a delay of Pd time.	(−20～20s) 5
PE	humidity Decimal place selection	0 : No decimals ; 1: Decimal display	(0～1) 0
PF	temperature display insensitive area	temperature display insensitive area	(0～10.0℃) 0.1
PH	Humidity display Insensitive area	Humidity display insensitive area	(0～50.0%) 1.0

Reservation Settings -7

Parameter indication	**parameter name**	**Parameter function description**	**(range) factory value**
Lc	password	The parameter values can be viewed and modified when "**Lc=36**".	0
AP	Reservation setting	0 : reservation setting function off ; 1 : reservation setting function on.	(0～1) 0
T_	Reservation time	When the AP value is set to 1 to be turned on, click the Set button again to set the appointment time.	(0～9999min) 0

5. instrument wiring diagram



6. General faults and troubleshooting

Fault phenomenon	Failure analysis	Troubleshooting
Temperature control instrument display 0000 or ----	1.Sensor is broken. 2.Sensor wiring are off. 3.The controller is broken	1.Replace the sensor. 2.Check wiring and connect securely. 3.Replace the controller.
Temperature has been rising without control	1.Controller wiring board is bad.	1.Replace the controller wiring board .
The circulating fan does not work or has abnormal noise	1.Motor is bad 2.Motor capacitor is bad 3.Controller wiring board is bad 4.Leaves of Motor fans are damaged.	1.replace the motor 2.replace motor capacitor 3.Controller wiring board is bad 4.Replace the motor fan leaves
The temperature does not rise when the set temperature is higher than the measured temperature	1.heater is bad	1.replace the heater
Poor cooling after long-term use	1.Instrument condenser is too dusty 2.Not enough refrigerant,and you need to inject it.	1.Clean the dust on and below the condenser 2.Add refrigerant

No refrigerated or temperature can't be lowered	1.Whether the compressor is running or damaged 2.Whether the internal fan of the studio is running or damaged 3.The compressor is running normally,but without cooling 4.Instrument parameter confusion 5.Poor ventilation in the lower part of the instrument	1.Replace the compressor after damage 2.replace motor and fan blades after damage 3.Check whether the refrigerant leaks or not. 4.Adjust all parameters of the meter to factory values 5.Leave a gap of 10cm or more at the back and around the instrument
Temperature overshoot too much	1.Setting parameters of instrument is wrong.	1.Check the instructions and readjust
Culturing effect of sample is inconsistent	1.Excessive placement of the sample in the work chamber results in poor uniformity	1.Place the sample no more than 80% of the volume