

ECS-10HT1 Temperature controller instruction

1.Product Overview

ECS-01HT1 Universal temperature controller can convert Fahrenheit, Celsius display display, switching cooling / heating mode. The allocation of cabinet temperature sensor and defrosting control sensor. Optional defrost relay output and copy card function.

2.operation and display panel



3.Specifications and dimensions

Installation dimension : 71mm×29mm

Controller size : 78.5mm×34.5mm×74mm

4.Technical parameters

- 1) Measuring range : -50~99°C/°F (only refers to the sensor calibration value is set to 0)
- 2) Temperature resolution : 9.9~-9.9 , 0.1°C/°F , the others,1°C/2°F
- 3) Measurement accuracy : -40°C~50°C , ±1°C , 50°C~70°C , ±2°C , the others : ±3°C
or -40°F~99°F, ±2°F , the others : ±6°F
- 4) Temperature controlling range : -50~99°C/°F
- 5) Power supply : 220±10%(VAC) , 50/60Hz
- 6) power consumption : <3W
- 7) Rated current of the relays :
 - Refrigeration : 30A/220VAC , it can directly drive 1.5 HP (220VAC) compressor , single phase
 - 17A/220VAC , it can directly drive 1.0HP (220VAC) compressor , single phase
 - Defrost: 10A/220VAC(suggest connect the max 1.4 KW electric heating wire)
- 8) Front panel water proof : IP65
- 9) The back shell water proof : None
- 10) Operation condition : 0°C~55°C
- 11) Storage condition : -25°C~75°C,
- 12) Relative humidity : 20%~85% (relative humidity)

5.Indicator light status description

Indicator light	Symbol	Status	Meaning
Setting	set	On	Parameter settings
		Off	working order
Compressor		On	Cooling / heating
		Off	Cooling / heating stoped
		Flashing	Cooling / heating delay

Defrost		On	Defrost work
		Off	Defrost stop
Temperature unit	°C	On	Temperature unit is °C
Temperature unit	°F	On	Temperature unit is °F
Check the temperature setting		On	See the set point

6.Parameter Table

Menu	Functions	Setting range	Default	Level
St	Temperature setting value	Maximum ~Minimum Set Point	3	Pr0
Hy	Hysteretic value	0.1~10°C 1~25°F	2	Pr1
LS	Minimum set point	-50°C~St -50°F~St	-50	Pr2
US	Maximum set point	St~99°C St~99°F	99	Pr2
ot	Cabinet sensor calibration	-9.9~9.9°C -20~20°F	0	Pr1
P2	Evaporator sensor selection	y: Enable n: Forbidden	y	Pr1
oE	Evaporator sensor calibration	-9.9~9.9°C -20~20°F	0	Pr2
od	Outputs activation delay at start up	0~99min	0	Pr2
AC	Anti-short cycle delay	0~50min	1	Pr1
Cy	Compressor running time in the mode of “Run/stop in a proportional time”	0~99min	15	Pr2
Cn	Compressor stop time in the mode of “Run/stop in a proportional time”	0~99min	30	Pr2
CH	Cooling /Heating	CL: Cooling Ht: Heating	CL	Pr2
CF	°C/°F	C: °C F: °F	C	Pr2
Ld	Default Display	P1: Display the cabinet sensor P2: Display the evaporator sensor SP: Display the temperature setpoint	P1	Pr2

dE	Defrost termination temperature	-50~90°C -50~90°F	2	Pr1
id	Defrost cycle	0~99hour	8	Pr1
Md	The maximum time of defrost	1~99min	20	Pr1
dF	Defrost status display	rt : Display cabinet temperature lt : Display start-defrost cabinet temperature St : Display temperature setting value dF : Display "dF"	it	Pr2
AU	Cabinet temperature upper limit alarm value	(AL+1)~99°C (AL+1)~99°F	99	Pr1
AL	Cabinet temperature lower limit alarm value	-50°C~(AU-1) -50°F~(AU-1)	-50	Pr1
Ad	Temperature alarm delay	0~99min	15	Pr2
dA	Exclusion of temperature alarm at startup	0~99min	90	Pr2

7. FRONT PANEL COMMANDS

Key	Function	Button action	Indicator light
SET	To display target set point	Press and release immediately	 light
	Set point value	Push the key for more than 2 seconds	Set recording light
	Save the set point and exit the setting mode	Press the response	Set Light is off
	In programming mode it selects a parameter	Press the response	Set recording light
SET+▼	To enter in programming mode	Pressing the keys for 3s	Set recording light
SET+▲	To return to room temperature display	Press the response	Set Light is off
▲	In programming mode it browses the parameter codes or increases the displayed value	Press the response	Set recording light
	Upload the data to copy card	Pressing the keys for 1s	Success of "uP" 、 Failure of "Er"
▼	In programming mode it browses the parameter codes or decreases the displayed value	Press the response	Set recording light

	Download the copy card	pressing the keys for 1s	Success of “do” \ Failure of “Er”
	To display the Evaporator temperature	Press the response	
	Start manual defrost	pressing the keys for 2s	 light

HOW TO SEE THE SET POINT :

- 1) Push and immediately release the **SET** key, the set point will be showed and the “”LED starts lighting ;
- 2) Push and immediately release the **SET** key or wait about 15s to return to normal visualisation.

HOW TO CHANGE THE SET POINT :

- 1) Push the **SET** key for more than 2 seconds to change the set point value ;
- 2) The value of the set point will be displayed and the “set”LED starts lighting ;
- 3) To change the Set value press the ▲ or ▼ within 15s ;
- 4) To memorise the new set point value push the **SET** key again or wait 15s.

HOW TO CHANGE A PARAMETER VALUE :

To change the parameter’s value operate as follows: (first level Pr1)

- 1) Enter the Programming mode by pressing the **SET+ ▼** keys for 3s , the “set” LED starts to light ;
- 2) Select the required parameter. Press the **SET** key to display its value ;
- 3) Use ▲ or ▼ to change its value ;
- 4) Press **SET** to store the new value and move to the following parameter ;
- 5) **To exit** : Press **SET+▲** or wait 15s without pressing a key .

HIDDEN MENU (the second level Pr2)

(The hidden menu includes all the parameters of the instrument (Pr1 and Pr2))

- 1) Enter the Programming mode by pressing the **SET+ ▼** keys for 3s the “set” LED starts to light ;
- 2) Then push again the **SET+ ▼** keys for more than 7s. The L2 label will be displayed immediately followed from the Hy parameter ;
- 3) Select the required parameter ;
- 4) Press the **SET** key to display its value ;
- 5) Use ▲ or ▼ to change its value ;
- 6) Press **SET** to store the new value and move to the following parameter ;
- 7) **To exit**: Press **SET+▲** or wait 15s without pressing a key.

NOTE: If none parameter is present in L1, after 3s the “nP” message is displayed. Keep the keys pushed till the L2 message is displayed.

HOW TO MOVE A PARAMETER FROM THE HIDDEN MENU TO THE FIRST LEVEL AND VICEVERSA.

Each parameter present in the HIDDEN MENU can be removed or put into “THE FIRST LEVEL” (user level) by pressing **SET+ ▼**.

In HIDDEN MENU when a parameter is present in First Level the decimal point is on.

TO LOCK/ UNLOCK THE KEYBOARD

Keep pressed ▲+▼ for more than 3s,the “oF” message will be displayed and the keyboard will be locked.

Keep pressed ▲+▼ for more than 3s ,the “on” message will be displayed and the keyboard will be unlocked.

MANUAL DEFROST

Press  to view the current evaporator sensor measured temperature value.

Push the  key for more than 2 seconds and a manual defrost will start.

8.Output

1 Cooling/Heating :

Cooling :

Normal status : When the cabinet temperature is higher than the set point + hysteresis (Hy),and finish the Anti-short cycle delay time(AC), cooling will start ;

When the cabinet temperature is lower than the set point, cooling will stop.

For the first time the power on ,and the time up to (od) value , if the cabinet temperature is higher than the set point + hysteresis (Hy) , cooling will start.

Heating:

Normal status : When the cabinet temperature is lower than the set point , and finish the Anti-short cycle delay time(AC), heating will start ;

When the cabinet temperature is higher than the set point + hysteresis (Hy), heating will stop.

For the first time the power on ,and the time up to (od) value , if the cabinet temperature is lower than the set point , heating will start.

If the cabinet sensor is fault , the compressor will run and stop according to the set time.(running time Cy and stop time Cn).

2 Defrost:

1) If the defrost cycle (id=0) , the defrost will be forbidden .

2) id≠0:

① The Evaporator sensor start to work (P2=y), the evaporator's sensor temperature is higher than the defrost termination temperature(dE) , it can't open the defrost function .

② The Evaporator sensor start to work (P2=y) and the evaporator's sensor temperature is lower than the defrost termination temperature(dE) or (P2=n) , the defrost function will start when fit one of the next conditions :

a) The controller will start defrost according to the set defrost cycle.

b) Press  for 2s, start defrost.

3) Under the defrost state (Any of the following conditions can be closed defrosting) :

①The evaporator sensor start to work (P2=y) ,Evaporator sensor temperature > Defrost termination temperature (d7) ,defrost is closed

②Maximum time of defrost (Md) runs out, defrost is closed;

③ Press  for 2s, stop defrost;

3 Fault Alarm :

Mess.	Cause	Outputs
P1	Cabinet temperature sensor fault	Compressor output according to “Cy” e “Cn”
P2	Evaporator sensor fault	Defrost relay will working fellow the preset of “id”

Mess.	Cause	Outputs
		and "Md"
HA	Cabinet high temperature alarm	Outputs unchanged
LA	Cabinet low temperature alarm	Outputs unchanged
nP	Evaporator sensor is forbidden ,display screen show the evaporator's temperature	
Er	Hot key program failure	

1) When the temperature sensor is fault , it is display P1 or P2, it will recover when the problem is solved.

2) Cabinet over temperature alarm :

When the cabinet temperature is beyond the (AU) set point , Ad and (dA) all finished , it will display HA, when the temperature is lower than the (AU) , the alarm will stop.

When the cabinet temperature is below the (AL) set point , Ad and (dA) all finished , it will display LA, when the temperature is higher than the (AL) , the alarm will stop.

9.Hot key

1) Upload

- ① Program one controller with the front keypad.
- ② Insert the "Hot key" and push ▲key; the "uP" message appears.
- ③ Turn OFF the instrument remove the "Hot Key", then turn the controller ON again.

2) Download

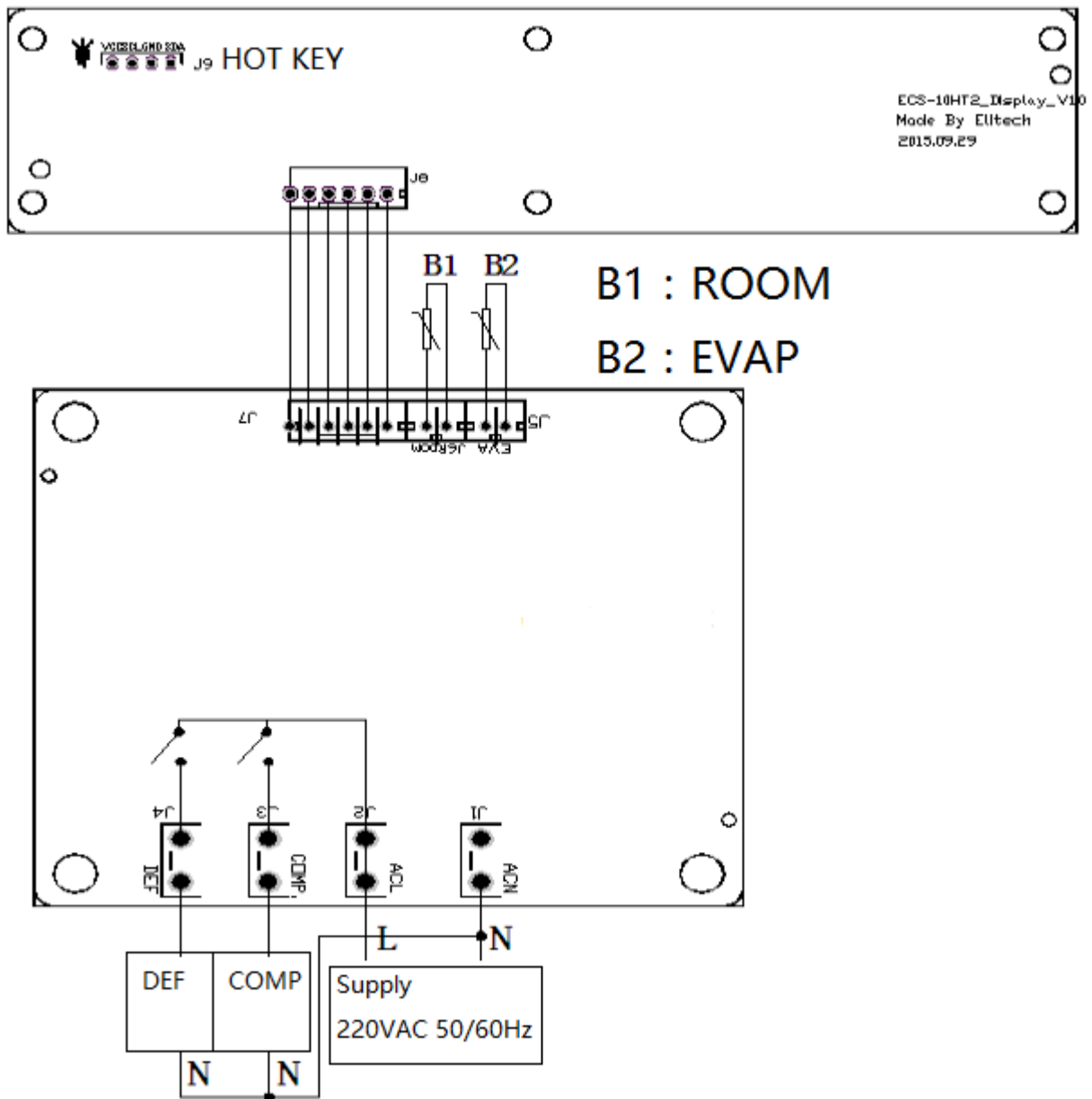
- ① Insert the "Hot key", push the ▼key, the controller will display "do".
- ② Turn OFF the instrument remove the "Hot Key", then turn the controller ON again.

NOTE: The "Er" message is displayed for failed programming.

In this case push again o key if you want to restart the upload again or remove the "Hot key" to abort the operation.

★ Please make sure that the power is stable during this time.

10.Wiring diagram



11.Safety rules

★Danger :

- 1) Strictly distinguish the power wire, relay output, sensor down-lead and data line, and the relay could not be overloaded.
- 2) Prohibit connecting the wire terminals without electricity cut-off.

★Warning :

Prohibit using this unit under the environment of over damp, high temp., strong electromagnetism interference or strong corrosion.

★Notice:

- 1) The power supply should conform to the voltage value indicated in the instruction, and make sure a steady power supply.
- 2) To avoid the possible interference, the sensor down-lead/data line and power wire should be kept in

a proper distance.

3) When evaporator sensor is installed, the sensor should be well connected with the copper tube which is 5cm away from evaporator inlet.