Elitech®

ECS-16 Temperature Controller User Manual

1. General

The temperature controller is specially designed for beverage cabinet. It has user menu and administrator menu. Control temperature could be set through user menu; and for administrator menu, it has password protection to avoid misoperation. It can switch between heating and refrigeration mode, and the relay capacity is 30A, which could directly drive a single phase 1.5HP compressor. Defrost output is optional and defrost mode could be either natural defrost or in electric defrost (defrost relay needs to be selected). Colorful LED display, and work status is displayed in symbols. It adopts plug-in quick connection terminal, which highly simplify the processing for manufacturers.

2. Operation and display panel

3. Specification：

Mounting size：71×29 (mm)
Product size：78.5 × 34.5 × 82 (mm)

4. Technical parameters

1) Measuring range：-50℃～+90℃；
2) Resolution: 1℃；
3) Accuracy：-50℃～50℃,±1℃，others,±2℃；
4) Cabinet temperature control range：-50℃～85℃；
5) Power supply：220VAC±10% 50/60Hz；
6) Power consumption：<3W
7) Output capacity：
　Refrigeration：30A/240VAC, directly drive a single phase 1.5HP compressor;
　Defrost：5A/250VAC (optional)
8) Front panel protection level: IP65
9) Ambient temperature: 0℃～55℃
10) Storage condition: temperature -25℃～75℃
11) Storage humidity: 20%～85%(non condensing)

5. Indicator light status description

Indicator light	Symbol	Status	Meaning
Setting	set	ON	Parameter setting
		OFF	Status of temperature measuring and controlling
Control load	out	ON	Control load works
		OFF	Control load stops
		FLASH	Control load in time delay
Heating mode	H	ON	Start heating mode
Refrigeration mode	C	ON	Start refrigeration mode
Defrost	def	ON	Start defrosting

6. Parameter list

Menu	Menu function	Setting range	H1	H2	Unit
		User Menu			
St	Set temperature	Min.set temperature C3～Max.set temperature C4	4	3	℃
Po	Menu password	0～99(password is 55, irreversible)	0	0	/
		Administrator Menu			
rd	Temperature hysteresis	1～15	3	6	℃
C1	Temperature sensor calibration	-10～10	-1	-3	℃
C2	Control load start delay	0～60	3	2	min
C3	Min.set temperature	-50～St	2	0	℃
C4	Max.set temperature	St～85	10	6	℃
A1	Periodical open time after sensor failure	1～60	15	45	min
A2	Periodical close time after sensor failure	0～60 0:close control load after sensor failure	10	15	min
d1	Defrost cycle	0～90 0:Defrost forbidden	6	12	hour
d2	Defrost time	1～90	20	20	min
d3	Display during defrost	0:Display cabinet temperature 1:Display dF during defrost 2:Display defrost start temperature during defrost	2	2	/
HC	Refrigeration/heating switch	0:Refrigeration 1:Heating	0	0	/

7. Keys function

7.1 Key description

Keys	Function
Set	Enter the status of parameter setting
	Switch between menu and parameter
☼	Adjust menu and parameters
↻	Adjust menu and parameters； Press 10s to execute parameter one-key recovery
Rst	Exit from parameter setting status
	Exit from one-key recovery status
	Force to start defrost

7.2 Key operation

1) User parameter setting

In the status of temperature measuring and controlling, press **Set** key for three seconds to enter user parameter setting state, it displays menu St in the digital tube. At this time, press **Set** key to display the corresponding parameter value, and press ☼ or ↻ to adjust the set temperature, and then press **Set** key to return to menu item St.

2) Enter to the administrator menu setting

In the state of user menu setting, when it displays menu item St in the digital tube, press ☼ to switch to the menu item Po, press **Set** key to display 00, and press ☼ and ↻ to adjust it to 55, then press **Set** key again to return to menu item Po. At this time, press ☼ key to display rd, indicating that it has entered to the administrator parameter setting status.

If it doesn't adjust to 55, press **Set** key to return to menu time Po, then press the key ☼ , it will exit from user parameter setting status and return to the temperature measuring and control status.

3) Administrator parameter setting

After enter to the administrator parameter setting, press ☼ and ↻ to select menu items (St、Po、rd……) ;

After select the item, press **Set** key to enter to the current parameter setting, press ☼ and ↻ to adjust parameters, and then press **Set** key to return to the menu item.

4) Exit from parameter setting

Under the status of parameter setting, press ∰ key or no key operation within 30s, or if Po is not set as 55, press ☼ key when it displays menu item Po (i.e. password input error), it will save the current parameter value and exit from parameter setting.

5) Manual defrost

In the status of temperature measuring and controlling, Press ∰ for three seconds to force the open or close of defrost(d1 is not 0, i.e. defrost is not forbidden).

6) Parameter recovery

In the status of temperature measuring and controlling，press key ↻ for 10S，display H0 in the digital tube, it will execute one key recovery operation. It could continue to select the parameter recovery items by pressing key ↻ ,and the selection range is H0～H7，press key∰ to execute the parameter recovery and then exit，if there is no parameter recovery operation within 30S,it will automatically exit from the mode without recovery of parameters.

Note: During the operation of one key recovery, it needs a stable power supply. If the power supply is not stable, please electrify the controller again then execute one key recovery.

H0	Give up parameter recovery，no change of each parameter, no display of parameter recovery success code **dr**
H1	Recovery parameter H1, recovery success display **dr**
H2	Recovery parameter H2, recovery success display **dr**
H3	Reserved
H4	Reserved
H5	Reserved
H6	Reserved
H7	Reserved

8.Control output

1) Refrigeration/heating：

Normal status：

HC=0, refrigeration mode:

When the cabinet temperature is higher than the set temperature+ hysteresis temperature, and finish the control load start delay time, the refrigeration will start；When the cabinet temperature is lower than the set temperature, the refrigeration will close.

HC=1, heating mode:

When the cabinet temperature is lower than the set temperature, and finish the control load start delay time, the heating will start；When the cabinet temperature is higher than the set temperature + hysteresis temperature, the heating will close.

Note: For the initial use of controller, the control output start delay time is calculated as 3s, and in the future, it is calculated as C2(Control load start delay).In heating model, it needs to set d1 to 0(Defrost forbidden)

Sensor failure：

A2=0, the function of "Run/stop in a proportional time" is canceled, the control output closes；

A2≠0, the function of "Run/stop in a proportional time" opens, the control output will run and stop periodically according to the set time after the sensor fails.

2) Defrost

If the defrost cycle is not 0, the controller will start defrost when it finishes defrost cycle or it can be manually started. Defrost stops when finish defrost time or it could be manually stopped.

Display during defrost:
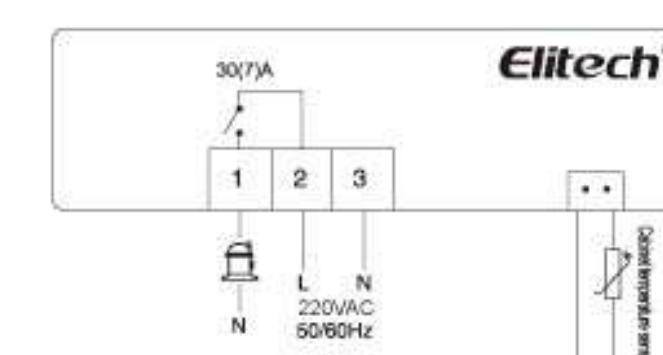
d3=0: Display real time cabinet temperature

d3=1: Display dF during defrost

d3=2: Display defrost start temperature during defrost

3) Code information

Code	Reason	Control output	Remark
E1	sensor failure	Run/stop control output in a proportional time	··
dF	Defrost	With defrost relay: output defrost	··
		Without defrost relay: off cycle defr···	
dr	Parameter recovery	The original parameters will be overwritten by the selected parameters.	Factory operation mode

9. Wiring diagram

10. 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.