Model: SF-102 Digital Temperature Controller

Dimension:77(Length) 35(Width) 60(Depth)mm

Mounting hole dimension:71(Length) 29(Width)mm

Features of Function

- It is a mini-sized and integrated intelligent controller and applicable to the compressor of one HP.
- The main functions are: Temperature Display/ Temperature Control/ Manual, automatic defrost by turning off／Light Control/ Value Storing/ Self Testing /Parameter Locking

Specifications

1. Output of the outside sealed transformer:12VAC(one transformer matched with one temp. controller)

2. Temperature sensor: NTC, double sensors (for cold-room temp. & defrost control),2m(L)

3. Range of temperature display:—45～45℃（—40～120 ℉);   Accuracy:±1℃（±2℉）

4. Range of set temperature:—45～45℃（—40～120 ℉);   Factory default : 0℃（32 ℉）

5. Temperature of the operating environment: —10～60℃（14～140℉);

   Relative Humidity:20%~90%(Non-condensing)

6. Relay output contact capacity

- Compressor: N.O. 20A/250VAC(applicable to one HP Compressor ,if more connected to AC contactor)

- Light: N.O. 5A/250VAC

Front Panel Operation

1 . Set temperature (compressor stop temperature) adjustment

- Press SET button, the set temperature is displayed.
- Press △ or ▽ button to modify and store the displayed value, Press SET button to exit the adjustment and display the cold-room temperature.
- If no more button is pressed within 10 seconds, the cold-room temperature will be displayed.

   (Set temperature adjustment range: parameter E1 E2)

2. Light: Press button, it lights; Press again, it stops.

3. Manual start/stop defrost: Press button and hold for 6 seconds to defrost or stop defrost.

4. Display the evap. Temperature: Press △ button and hold for 6 seconds, the evap. temp. is displayed, after 10 seconds the cold-room temp. is resumed to be displayed.

5. Refrigeration LED: During refrigeration, the LED is on; When the cold room temp. is constant, the LED is off; During the delay start, the LED flashes.

6. Defrost LED: during defrosting, the LED is on; When it stops defrosting, the LED is off.

During the delay display of defrost, the LED flashes.

7. Parameter setup

- Press [SET] button and hold for 6 seconds to enter the parameter setup mode while E1 flashes.
- Press again [SET] button to select sequentially from the parameters:E1,E2,E3,E4,E5,E6,F1,F2~F4,C1.
- Press △ or ▽ button, the value of parameter will be displayed and can be modified and stored.
- If no more button is pressed within 10 seconds, the cold-room temperature will be displayed.

Parameter	Function	Set range	Default	Parameter	Function	Set range	Default
E1	Lower setpoint limit	−45℃ −40℉ ~Set temp.	−35℃ −31℉	F1	Max. Defrost duration	1~60Min	20Min
E2	Higher setpoint limit	Set temp.~ 45℃ 120℉	20℃ 68℉	F2	Defrost interval time	0~24Hr	6Hr
E3	Temp. hysteresis	1~10℃ 1~18 ℉	4℃ 7 ℉	F3	Defrost termination temp.	0~20℃ 32~68 ℉	8℃ 46℉
E4	Comp.start delay time	0~10Min	2Min	F4	Display during defrost	0=Normal display 1=Last value before defrost	0
E5	Offset on room temp.	−5~5 ℃ / ℉	0	C1	Temperature unit	0=℃ 1=℉	0
E6	Offset on evap. Temp.	−5~5 ℃ / ℉	0				

8. The factory default resumption: press ▽ button for 1 second and then press △ button simultaneously for 6 seconds, the indicator flashes, all parameters will be resumed as same as factory defaults. After 10 seconds, it returns to the normal operation.

9. Parameters Locking

In normal operating, press ▽ button and hold for 10 seconds to lock the parameters if "OFF" is displayed

(No modification is allowed), or to unlock if "ON" is displayed. Parameter can be displayed only and can not be modified if locked, but the adjustment of the set temp. is active.(the factory default is "ON ")

Function details

1. Temperature Controlling
- After turning on for the delay time, the compressor starts operating when cold-room temperature ≥(set temperature+ Hysteresis), and will be off when cold-room temperature ≤set temperature.
- To protect the compressor, it can be re-started unless the time when the compressor stops every time is longer than the delay time(Parameter E4).

2. Defrosting Functions
- It defrosts only if the temp. of the evap. sensor is less than the defrost termination temp.(Parameter F3).
- Operating after a defrost interval time it will be automatically in the status of defrost. If the temperature of evap. sensor is less than the defrost termination temperature, the defrost LED will turn on, and the compressor will stop.
- When the temp. of the evap. Sensor is over the temp. of defrost termination; or the defrost duration ends, the compressor will exit the defrost status. After two minutes is will be in the normal status of refrigeration.
- When the defrost interval time is set 00, the function of automatic defrost will be cancelled.

3. Display during defrost
- When setting the parameter F4=1, the room temp. is locked during defrost, and the last value before defrost is displayed. When defrost ends, normal display will be resumed after 20 minutes delay of room temp. display. The defrost LED flashes during the delay.

4. Abnormal work mode

- When the room sensor is short circuit or overheated(more than 45℃ / 120℉)"HH" is displayed; When the room sensor is open circuit or too low temperature (less than —45℃ / 40 ℉)"LL" is displayed.

  At that time the compressor automatically by the cycle of 45 minutes on and 15 minutes off.
- When the Evap. sensor fails or over the display d range, the defrost termination will be just controlled by the defrost duration.(Parameter F1)
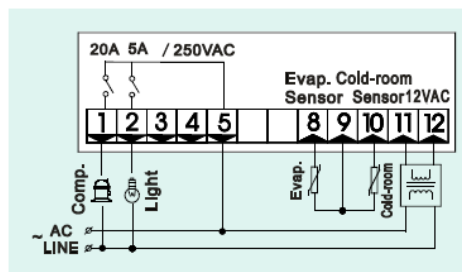
Notes for Installation

1. The sensor cable leads must be kept separately from main voltage wires in order to avoid high frequency noise induced. Separate the power supply of the loads from the power supply of the controller.
2. When install the sensor, it shall be placed with the head upward and the wire downward; The evaporator sensor must be installed between the fins of the evaporator in the area, where probably the ice is the thickest. Don't place the evaporator sensor near the electric heater.
3. In case of long-distance sensor installation from the controller, the sensor cable may be prolonged up to 100 m max. without any re-calibration.
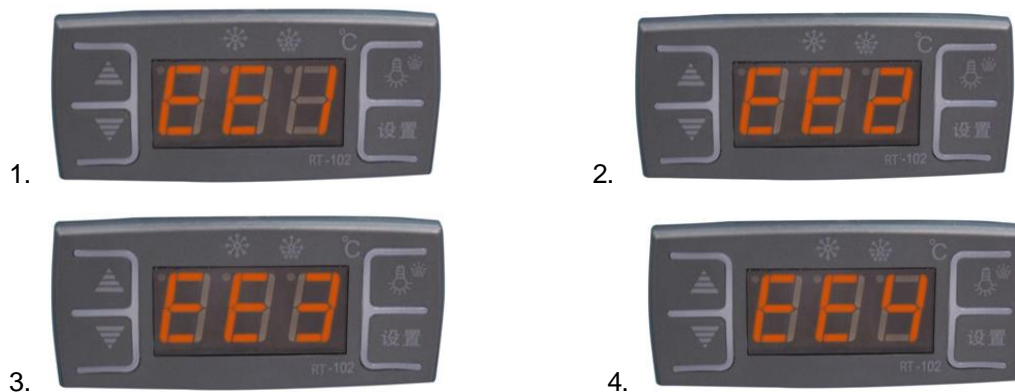4. The temperature controller cannot be installed in the area with water drops.

Accessories for the temperature controller

1. One attached transformer
2. Two temperature sensors
3. One installation stand
4. One cover panel and 1φ3×10mm screw

Circuit Diagram

Fault code

1.

2.

3.

4.

Fault code	Reason	Solution
EE1	Temperature probe is loose or broken	change the Temperature probe
EE2	Defrost probe is loose or broken	change the Defrost probe
EE3	Compressor Protect probe is loose or broken	change the Compressor protect probe
EE4	Compressor Protect probe(The temperature of dry filter is higher than 58℃)	1.Check air inlet is blocked? If yes, please clean the air inlet. 2.Check fan motor of evaporator is still working? If no, please replace new fan motor.
Press and hold the "-" button for 2Sec, then releasing, and then press and hold the "+" button immediately to display with 6S, the buzzer sounds, the current display number flashes with 3S, and all parameters are restored to factory set values.		