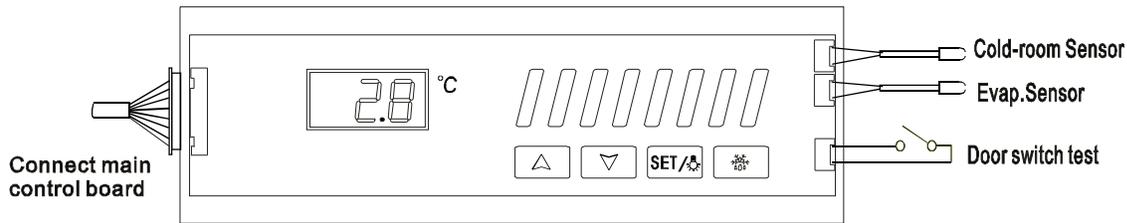


Model: SF-912A Digital Temperature controller



Features of Function

- Mini-sized and integrated intelligent control and applicable to the compressor of one HP.(Include 1 HP)
- Temperature Display/ Temperature Control/ Manual, automatic defrost/ Evap. Fan control/ Time, temp. To end defrost/ Light control/ Door control/Value Storing/ Parameter Locking/Self Testing

Specifications

1. Power supply:220VAC, 50/60Hz
2. Temperature sensor: NTC , two sensors(cold room & defrost control), 2m(L), Neither positive nor negative
3. Range of temperature displayed : $-50\sim 150^{\circ}\text{C}$ ($-50\sim 302^{\circ}\text{F}$); Accuracy: $\pm 1^{\circ}\text{C}$ ($\pm 2^{\circ}\text{F}$)
4. Range of set temperature: $01\sim 08^{\circ}\text{C}$ ($34\sim 46^{\circ}\text{F}$); Factory default : 04°C (39°F)
5. Dimension:230(Length) \times 75(Width) \times 37(Depth)mm
Mounting hole dimension:225(Length) \times 55(Width)mm
6. Temperature of the operating environment: $-10\sim 60^{\circ}\text{C}$ ($14\sim 140^{\circ}\text{F}$)
Relative Humidity:20%~90%(Non-condensing)
7. Relay output contact capacity:
 - Compressor relay: N.O. 30A/250VAC
 - Evap. Fan: N.O. 10A/250VAC
 - Light: N.O. 10A/250VAC

Front Panel Operation

1. Set temperature (compressor stop temperature) adjustment
 - Press \triangle or ∇ button, the set temperature is displayed.
 - Press \triangle or ∇ button to modify and store the displayed value.
 - Press **SET** button to exit the temperature adjustment and display the room temperature.
 - If no more button is pressed within 6 seconds, the cold room temperature will be displayed.
(Set temperature adjustment range: parameter E1~E2)
2. Light control (when L1=1): press **SET** button to turn on the light; press **SET** button again to turn off the light.
3. Manual enter/end defrost: Press **DEF** button and hold for 6 seconds can enter defrost status or end defrost.
4. Display the Evap. Sensor temperature: Press **DEF** button once, will flash display Evap. Sensor temperature, after 6 seconds will resume to display cold room temperature.
5. Parameter setup
 - Press **SET** button and hold for 6 seconds at the same time to enter the parameter setup mode while E1 flashes.
 - Then press **SET** button and change the parameter, sequentially display from the parameters: E2,E3~E6, F1~F4,L1,CF,E1.
 - Press \triangle or ∇ button, the value of parameter will be displayed and can be modified and stored.
 - If no more button is pressed within 6 seconds, it will return to normal operation mode.
6. Factory default resumption
Press \triangle button and ∇ button and hold for 6 seconds at the same time, will flash and display " 888" . At this time, all the parameters and set temperature will resume to factory defaults, after 6 seconds, it will return to normal operation mode.
7. Lock parameter: Press **SET** button then ∇ button and hold for 6 seconds to lock the parameter if " OFF" is displayed, or to unlock if " On" is displayed. Parameter can be displayed only and cannot be modified, but the adjustment of the set temperature is still active.(the factory default is " On" .)

Parameter	Function	Set range	Default	Parameter	Function	Set range	Default
E1	Lower setpoint limit	-08°C ~ Set temp. 18°F	-3°C 27°F	E9	Compressor force stop time	01~60Min	20Min
E2	Higher setpoint limit	Set temp.~08°C 46°F	08°C 46°F	F1	Max. Defrost duration	01~60Min	30Min
E3	Temp. Hysteresis	01~10°C 01~18°F	04°C 07°F	F2	Defrost interval time	00~24Hr	6Hr
E4	Comp.start delay time	00~10Min	2Min	F3	Defrost termination temp.	00~40°C 32~104°F	12°C 53°F
E5	Offset on room temp.	-20~20°C -36~36°F	00°C 00°F	F4	Display during defrost	00=Normal display 01=Last value before defrost	01
E6	Offset on room temp.	-20~20°C -36~36°F	00°C 00°F	L1	Light control select	00=Door switch control 01=Manual control	00
E8	Compressor continuously work time	00~24Hr	6Hr	CF	Temperature unit	°C=Celsius °F=Fahrenheit	°C

Function details

1. Temperature Control

- After turning on for the delay time parameter E4, the compressor starts operating when cold room temperature \geq (set temperature+ hysteresis), and will be off when cold room temperature \leq set temp..
- After turning on for the first time, it will enter normal work mode after compressor pass 2 minutes delay. (During delay time, press  button can cancel the delay.)
- It will return to normal work mode after compressor continuously work parameter E8 time, compressor force to stop parameter E9 time.
- To protect the compressor, it can not re-start unless the time when the compressor stops every time is longer than the delay time(Parameter E4)

2. Defrost by turning off compressor

- After working an defrost interval F2, if Evap. Sensor temperature is lower than defrost termination temperature F3, will automatic enter the defrost status. The defrost indicator on, compressor stops, the heater work, the Evap. Fan stops.
- When Evap. Sensor temperature is higher than defrost termination temperature F3, or defrost duration ends, will exit defrost status. After 2 minutes dripping time will enter normal temperature control mode. If room temperature is higher than (set temperature+ temperature hysteresis),the compressor starts.
- When defrost interval is set to be 00, the automatic defrost function will be cancelled.

3 Display during defrost

When setting parameter F4=1, the room temperature is locked during defrost, the last value before defrost is displayed. After defrost, the room temperature will display 20 minutes delay (or reach the set temp.) Then resume normal display. The defrost indicator flashes during delay.

4. Fan control

When refrigeration, the fan is synchronized with the compressor; when defrost, the fan run.

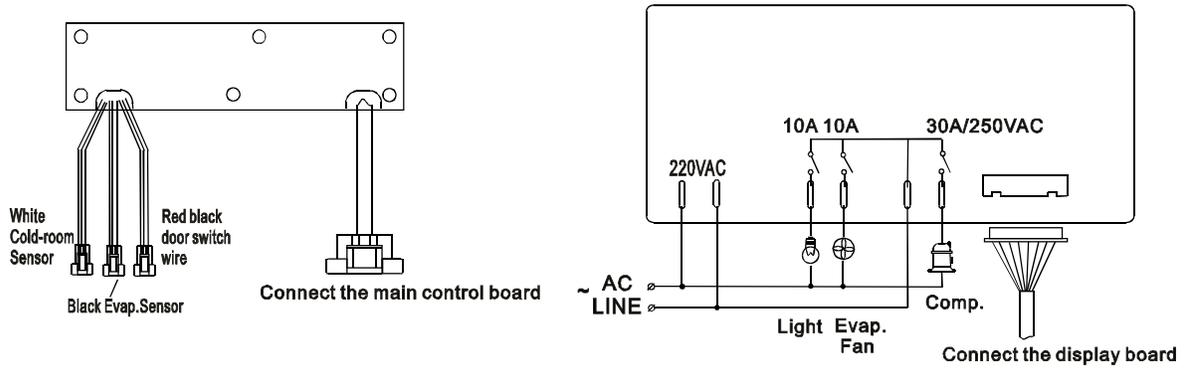
5. Door control

When L1=0,the door is open, the light relay closed; when the door is closed, light relay disconnected.

6. Abnormal work mode

- When room sensor is short-circuited or overheated (more than 150°C/302°F) "HH" is displayed; when room sensor is open-circuited or temperature is too low (less than -50°C/-50°F) "LL" is displayed. At that time the compressor work automatically by the cycle of 30 minutes on and 15 minutes off.
- When the Evap. Sensor is short-circuited or over limit(more than 150°C/302°F), press  button, will flash and display "HH"; when Evap. Sensor is open-circuited or low temperature over limit (less than -50°C/-50°F), press  button, "LL" will flash and display. At this time, the termination defrost status will only control by defrost duration.

7. Circuit Diagram



Notes for Installation

1. Sensor 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 installation the sensor shall be placed with the head upward and the wire downward. The evaporator probe must be installed between the fins of the evaporator in the area, where probably the ice is the thickest. Do not place the evaporator probe near the electric heater.
3. In case of long-distance probe installation from the controller, the probe cable may be prolonged up to 100 m max. without any re-calibration
4. The temperature controller can not be installed in the area with water drops.

Accessories for the temperature controller

1. Two temperature sensors
2. One installation panel
3. One door switch wire