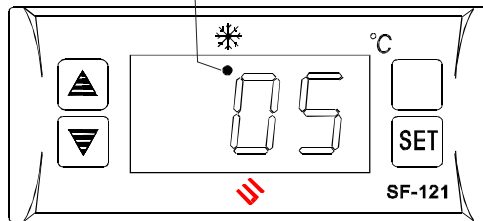


Model: SF-121 Digital Temperature Controller

Output LED



Features of Function

1. Control temperature automatically
As per the set temperature and temperature hysteresis to control the compressor refrigeration.
2. Delay protection function
To prevent the compressor start too frequently, the compressor can start only after the delay every time.
3. Parameter setting and value storing
Delay time, temperature hysteresis, sensor error correction and these parameters can be revised conveniently, and memorize permanently.
4. Failures self testing
If the temperature sensor defective or temperature over display range, the display window will display the error code.

Specifications

1. Power supply: 230VAC 50/60Hz
2. Temperature sensor: NTC, 1 pc, 2meters (Neither positive nor negative)
3. Range of temperature displayed: $-45^{\circ}\text{C} \sim +99^{\circ}\text{C}$; Accuracy: $\pm 1^{\circ}\text{C}$
4. Range of set temperature: $-45^{\circ}\text{C} \sim +99^{\circ}\text{C}$; Factory default: 0°C
5. Dimension: 77(Length) \times 35(Width) \times 60(Depth)mm
Mounting hole dimension: 71(Length) \times 29(Width)mm
6. Temperature of the operating environment: $-10^{\circ}\text{C} \sim 60^{\circ}\text{C}$
Relative Humidity: 20%~90% (Non-condensing)
7. Relay output contact capacity:
Compressor relay: N. O. 10A/250VAC (when overload it needs connect an AC Contactor)

Front Panel Operation

1. Set temperature
 - Press **SET** button, the set temperature is flash 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 6 seconds, the measured temperature will be displayed.
(Set temperature adjustment range: parameter E1~E2)
2. Output LED: During refrigeration, the output LED is on; When the cold room temp. is constant, the output LED is off; During the delay start, the output LED flashes.
3. Parameter setup
 - Press **SET** button and hold for 6 seconds to enter the parameter setting while E1 flashes.
 - Press again **SET** button to change the parameters, E2, E3, E4, E5, E1 will display in sequence.
 - Press **▲** or **▼** button, the value of parameters will be displayed and can be modified.
 - If no more button is pressed within 10 seconds, it will return to normal operation.
4. The factory default resumption: press **▲** button and **▼** button simultaneously for 6 seconds, 888 will flash display. At this time, all the parameters will be resumed as same as factory defaults. After 6 seconds, it returns to the normal operation.

Parameter	Function	Set range	Default
E1	Lower set point limit	-45°C ~ Set temp.	-30°C
E2	Higher set point limit	Set temp.~99°C	30°C
E3	Temp. Hysteresis	01~20°C	04°C
E4	Comp. start delay time	00~10min	2min
E5	Offset on room Temp.	-10~10°C	00°C

5. Lock parameters

In normal operating, press button and hold for 6 seconds to lock the parameters if "OFF" is displayed, or to unlock if "ON" is displayed. Parameters can be displayed only and cannot be modified if locked, but the adjustment of the set temp. is active.(the factory default is "ON")

Function detail

1. Temperature control

- After the delay time ,the compressor starts operating when cold room temperature \geq (set temperature+ hysteresis), and will be off when cold room temperature \leq set temperature.
- To protect the compressor, it can re-start unless the time when the compressor stops every time is longer than the delay time(Parameter E4).

2. Timing defrost by turning off compressor

- Operating after a defrost interval time(parameter F2), it will be automatically in the halt state, the compressor stops. After a certain time(parameter F1), will enter the refrigeration state automatically.
- When the defrost interval time is set to "00" , the function of defrost by turning off compressor will be cancelled.
- Press button and button and hold for 6 seconds will enter the parameter setting, flash display F1.
- Then press button to display F2, F1 in cycle; press button and button to display the parameters, the parameter values can be modified and stored.
- If no more button is pressed within 6 seconds, it will return to normal operation.

3. Display during defrost

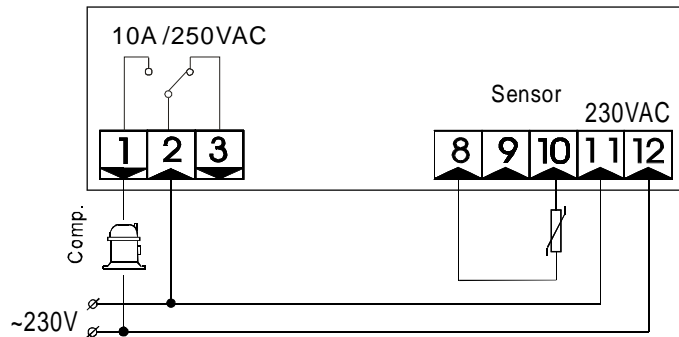
When setting the parameter F4=1, the room temp. is locked during defrost, and the last value before defrost is displayed. When defrost ends, normal display will be resumed after 20 minutes delay of room temp. Display(or lower than the set temperature). The defrost LED flashes during the delay.

Parameter	Function	Set range	Default
F1	Defrost duration	01~90min	20min
F2	Defrost interval	00~24hr	0hr
F4	Display during defrost	00=normal display 01=last value before defrost	01

4. Defective work mode

When sensor is short-circuited or overheated (more than 99°C) " HH" is displayed; when sensor is open-circuited or temperature is too low (less than -45°C) " LL" is displayed. At that time, the compressor operates automatically by the cycle of 45 minutes on and 15 minutes off.

5. 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. In case of long-distance probe installation from the controller, the probe cable may be prolonged up to 100m max. Without any re-calibration.
3. The temperature controller can not be installed in the area with water drops.

Accessories for the temperature controller

1. One temperature sensor
2. One installation stand
3. One cover panel