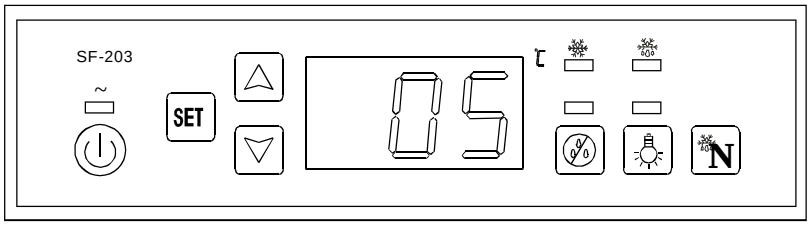
Model: SF-203 Digital Temperature Controller



Features of Function

- Mini sized and intelligent controller and applicable to the compressor of one HP.
- Temperature Display/ Temperature Control/ Automatic defrost by turning off compressor/ Light Control / Electric heater defog/ High,Low temperature alarm/ Value Storing/ Parameter Locking/ Self Testing

Specifications

1. Output of the outside sealed transformer:12VAC(one transformer matches with one temp. controller)
2. Temperature sensor: NTC, one sensor,2m(L)
3. Range of temperature display:—45～150℃ Accuracy:±1℃
4. Range of set temperature:—45～50℃ Factory default :0℃
5. Panel dimensions:142(Length)×40(Width)×40(Depth)mm
   Mounting hole dimensions:138(Length)×32.5(Width)mm
6. Temperature of the operating environment:—10～60℃; Relative Humidity:20%~90%(Non-condensing)
7. Relay output contact capacity
   - Compressor: N.O. 30A/250VAC
     (applicable to one HP Compressor,if more it needs to cornect an AC contactor)
   - Light: N.O. 5A/250VAC
   - Defog: N.O. 10A/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 6 seconds, the cold-room temperature will be displayed.
  (Set temperature adjustment range: parameter E1～E2)

2. Power ON/OFF:Press ⏻ button and hold for 6 seconds to turn off refrigeration mode and temperature display,"---" will be displayed, all the control outputs will be stopped(Light control still active). Press ⏻ button for 6 seconds again, measured temperature will be displayed, it will start refrigeration mode after delay time.
3. Refrigeration LED: During refrigeration, the LED is on; When the cold room temp. is constant, the LED is off; During the delay time, the LED flashes.
4. Defrost LED: during defrosting, the LED is on; When it stops defrosting, the LED is off.
5. Manual start/stop defrost: Press N button and hold for 6 seconds to defrost or stop defrost.
6. Defog: Press button to start defog, the LED is on; Press again, the LED is off.
7. Light: Press button, it lights; Press again, defog stops it stops.
8. 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: E2,E3,E4,E5,F1,F2~C4.
   - Press △ 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.

Parameter	Function	Set range	Default
E1	Lower setpoint limit	−45℃～Set temp.	−30℃
E2	Higher setpoint limit	Set temp.～50℃	30℃
E3	Temp. hysteresis	1～10℃	4℃
E4	Comp.start delay time	0～10Min	2Min
E5	Offset on room temp.	−10～10 ℃	0
F1	Max. Defrost duration	1～60Min	20Min
F2	Defrost interval time	0～24Hr	6Hr

Parameter	Function	Set range	Default
F4	Display during defrost	0=Normal display 1 = Last value before defrost	0
C2	High temperature alarm	C3~50℃	40℃
C3	Low temperature alarm	−45℃~C2	−40℃
C4	Alarm time delay	1～90～1Min	60Min

9. Parameters Locking
In normal operating,press ▽ button and hold for 6 seconds to lock the parameters if "LOC" is displayed (No modification is allowed),or to unlock if "OP" is displayed. Parameter can be displayed only and can not be modified if locked.(the factory default is "OP")
10. The factory default resumption:press △ and ▽ button simultaneously for 6 secnods,the indicator flashes, all parameters will be resumed as same as factory defaults.

Function details

1. Temperature Control
- After turning on for the delay time, the compressor starts operating when cold-room temperature≥ (set temperature+ Hysteresis E3), and will be off when cold-room temperature ≤ set temperature.
- To protect the compressor, it can not be re-started unless the time when the compressor stops every time is longer than the delay time(Parameter E4).

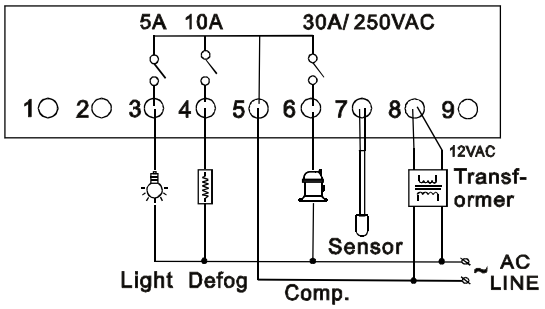
2. Defrosting Functions
- Operating after a defrost interval time,it will automatically enter the status of defrost. The defrost LED will turn on, and the compressor will stop. When the defrost duration ends, it will exit the defrost status. If the cold-room temp. > (set temp. + hysteresis E3), compressor starts.
- When the defrost interval time is set to "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 3 minutes delay or the cold-room temperature reaches the set temperature.

4. The alarm function
- When the compressor turns off for the first time. When the cold-room temperature is higher than C2 or lower than C3, it will flash after the delay time(Parameter C4). The buzzer will sound. The sound can be cancelled by pressing random key.

5. Abnormal work mode
- When the room sensor is short circuited or overheats (more than 150℃) " HH" is displayed ;When the room sensor is open circuited or temperature is too low (less than －45℃) "LL" is displayed. At that time the compressor enter the timing work mode operates automatically by the cycle of 45 minutes on and 15 minutes off.

6. Circuit Diagram



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. Separate the 12v voltage line from the high voltage line of the controller.
2. When install the sensor, it shall be placed with the head upward and the wire downward.
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 can not be installed in the area with water drops.

Accessories for the temperature controller

1. One external transformer
2. One sensor
3. One installation stand