Model: SF-283F Digital Temperature Controller

Refrigeration LED   Defog LED   Defrost LED   Light LED
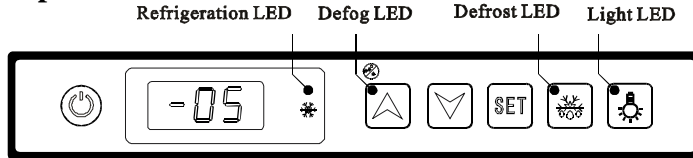
Features of Function
- It is an intelligent controller and applicable to the compressor of one HP. （Include 1HP）
- Temperature Display / Temperature Control / Defrost by turning off comp. / Light control / Fan control
  High, low temperature alarm/ Value Storing /Parameter Locking/Self Testing

When deliver: E1 adjust to -20℃(-04℉)
set temp. Adjust to -20℃(-04℉)

Specifications
1. Power supply input: 220~240VAC
2. Temperature sensor: NTC, one sensor, 3.5 meters long, neither positive nor negative
3. Range of temperature display:－45～99℃(-49~210℉)   Accuracy:±1℃ /±2℉
4. Range of set temperature: E1~E2   Factory default : 05℃ /41℉
5. Dimension:178(Length)×31(Width)×34(Depth)mm
   Mounting hole dimension:172(Length)×26(Width)mm
6. Temperature of the operating environment:－10～60℃(14~140℉)
   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 connect an AC contactor)
- Evap. Fan: N. O. 10A/250VAC •Light: N. O. 10A/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 for 3 seconds to turn off refrigeration work mode and temperature display,
   "---" will be displayed, and all the control outputs will be stopped(Except for the light). Press ⏻ button again
   for once, the measured temperature will be displayed, refrigeration work mode will be started after delay time.
3. Refrigerating LED: During refrigeration, the LED is on; When the cold room temp. is constant, the LED
   is off; During the delay process, the LED flashes.
4. Defrost LED: during defrosting, the LED is on; When it exit defrost, the LED is off.
5. Defog LED: During defog, the defog LED is on; When it exit defog, the LED is off.
6. Light LED: When it connects the light, the light LED is on. When it disconnects the light, the LED is off.
7. Manual start/stop defrost: Press ❄ button and hold for 6 seconds to defrost or stop defrost
8. Light: Press 🔆 button, the light is connected. Press the button again, the light is disconnected.
9. When first time power on, press ▽ button for once to cancel compressor delay and start the compressor.
10. Defog control: Press △ button for once, to connect or disconnect the defog heater. When power on, the
    defog will start automatically, when power off, it is disconnected.
11. Check the condenser cleaning accumulated time: Long press △ for 6 seconds, flash display the accumulated
    power on operation days.
12. Condenser alarm control: long press SET and △ for 6 seconds can turn on or turn off the alarm function, flash
    display OFF or ON. The factory default in ON.
13. 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 the parameters.
- 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	Parameter	Function	Set range	Default
E1	Lower set point limit	－49℉ －45℃ ～set temp.	32℉ 00℃	C1	High temp. alarm	C2～ 113℉ 45℃	59℉ 15℃
E2	Higher set point limit	Set temp.～ 113℉ 45℃	46℉ 08℃	C2	Low temp. alarm	－49℉ －45℃ ～C1	23℉ -05℃
E3	Temp. hysteresis	02～36 ℉ 01～20℃	05℉ 03℃	C3	Alarm delay time	00～90min	90min
E4	Comp. Start delay time	00～10min	3min	H1	Fan control	00=Parallel with comp.(stop when defrost) 01 = Continuous running (stop when defrost) 02= Parallel with comp. (Start when defrost) 03=keep running(start when defrost)	03
E5	Offset on room temp.	－18～18 ℉ －10～10℃	00℉ 00℃	H2	Fan retardant time when synchronized	00～120s	00s
				CF	Temperature unit	℃=Celsius ℉=Fahrenheit	℃
F1	Max. Defrost duration	01～60min	28min	P1	Condenser cleaning alarm time	01～120days	60days
F2	Defrost interval time	00～24hr	6hr	P2	Compressor continuous work time	01～120minutes 00=cancel force stop	00min
F4	Display during defrost	00=Normal display 01 = Last value before defrost 02=display DEF	01	P3	Compressor force stop time	00～90min	03min

14. Parameters Locking
- Press ▽ button and hold for 6 seconds to lock the parameters if "LOC" is displayed, or to unlock if "OP" is displayed. Parameters can be displayed only and can not be modified if locked. (The set temperature adjustment is still active) (The factory default is OP)
15. The customer default resumption: press ⌂ button and ▽ button simultaneously for 6 seconds, "888 " is displayed and flashes, at this time will resume to factory defaults.
16. When adjusting the inner parameters, long press SET button, COP will be displayed, the current parameters will be saved as factory defaults.
17. Resume factory defaults: Press SET ⌂ ▽ at the same time for 6 seconds, flash display CLE.

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. Defrost by turning off compressor
- After a defrost interval will automatically enter the defrost state. The defrost LED is on, the compressor stops.
- When defrost duration ends, will exit defrost state. When cold room temperature is more than (set temp. + temp. Hysteresis E3), the 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 20 minutes delay or (when the cold-room temperature is lower than the set temperature). When F4=2, dEF will be displayed.
4. Fan work mode
- The fan will work according to H1; when synchronized with comp., Delay H2 time and then start or stop.
5. Compressor force stop work mode: when first time power on or after stand by and start, it will start this work mode only when compressor reach the set temperature and stop or pass one defrost by turning off compressor. When the compressor continuously work time ≥ P2, the compressor will stop for P3 and then re countdown.
6. High, low temperature over limit alarm
- High temperature alarm: After the first time turning off, when cold room temperature is higher than high temperature alarm value C1, and duration more than alarm delay time (C3), will alternate display HI and the cold room temperature.
- When the cold room temperature is lower than high temperature alarm C1, will exit alarm, and the cold room temperature will resumed to be displayed.
- Low temperature alarm: When cold room temperature is lower than low temperature alarm value C2, and duration more than alarm delay time (C3), will alternate display L0 and cold room temperature. When cold room temperature is more than low temperature alarm value C2, will exit alarm and resume cold room temperature display.
- When alarm, the buzzer sound, press random button to cancel the sound.
7. Condenser cleaning alarm: When the accumulated power on time is more than P1, the buzzer will sound, alternate display cold room temperature and Cln. At this time, press random button to cancel the sound, after 2 minutes it will exit the alarm, the accumulated time will be cleared and will recount, it will resume normal display. During alarm state power off or shut down, when next time power on will keep alarming.
   Alarm test: When turning on the condenser cleaning alarm function, when power on within 10 seconds, long press ⌂ and ❄ for 6 seconds, flash display tes, the previous accumulated time will be cleared. After 5 minutes, will start the alarm.
8. Abnormal work mode
- When the room sensor is short-circuited or overheated (more than 99℃/210℉) "HH" will be displayed ; When the room sensor is open-circuited or temperature is too low (less than −45℃/-49℉) "LL" will be displayed. At that time the compressor works automatically by the cycle of 30 minutes on and 15 minutes off.
9. Circuit Diagram
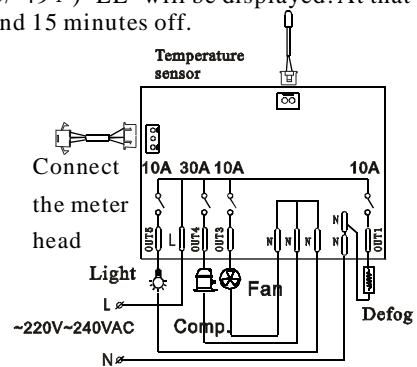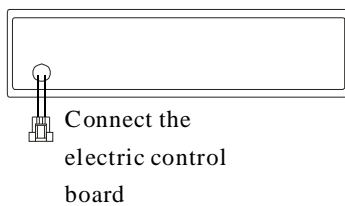
Notes for Installation
1. The sensor cable leads must be kept separately from main voltage wires in order to avoid high frequency noise induced. Separate the power supply of the loads from the power supply of the controller.
2. When install the sensor, it shall be placed with the head upward and the 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.
5. The temperature controller can not be installed in the corrosive and strong electromagnetic pulse interference places.

Accessories for the temperature controller
1. One temperature sensor   2. One connecting wire