blast freezer brochure
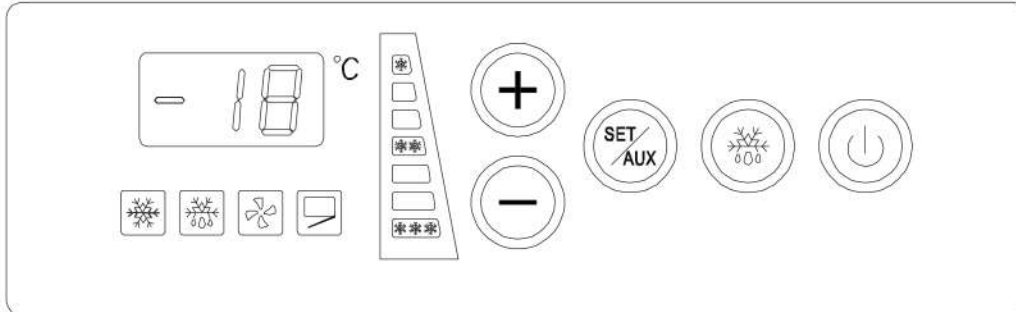
Model: Digital Temperature Controller

Features of Function

- Temperature display/Temperature control/Defrost type optional/Self testing/Defrost control /Automatic energy saving control/Power switch

Specifications

1. Power supply:220VAC
2. Temperature sensor: NTC, two sensors, 2 meters (Neither positive nor negative)
3. Condenser sensor: one sensor, 2 meters long (Neither positive nor negative, optional)
4. Range of temperature displayed:$-45℃\sim120℃(-49\sim248℉)$; Accuracy:$\pm1℃(1℉)$
5. Range of set temperature:$-45℃\sim45℃(-49\sim113℉)$;   Factory default: $-18℃(00℉)$
6. Dimension:208(Length)×64(Width)×72.5(Depth)mm
   Mounting hole dimension: 192.5(Length)×58(Width)mm
7. Temperature of the operating environment:$-10℃\sim60℃(14\sim140℉)$;
   Relative Humidity:20%~90%(Non-condensing)
8. Relay output contact capacity:
   - Compressor:N.O. 30A/250VAC
   - Defrost: N.O. 10A/250VAC
   - Fan: N.O. 8A/250VAC
   - Light: N.O. 8A/250VAC

Front Panel Operation

1. Set temperature adjustment
   Press ⊗ button to flash display the set temperature, then press ⊕ or ⊖ button to store and memorized. Press window ⊗ button to exit the adjustment status and display the cold-room temp. If no more button is pressed within 6 seconds, the cold room temperature will be displayed. (Set temperature adjustment range: parameter E1~E2)
2. Manual enter/stop defrost: Press ❄ button and hold for 6 seconds to enter the relevant defrost status or to stop defrost.
3. Display the evap. Temperature: Press ❄ button for once, flash and display the evap. sensor temperature for 6 seconds.
4. Light control: Press ⊗ button and ❄ button at the same time to start or stop the light.
5. Refrigeration LED: During refrigeration ,the ❄ LED is on. When the temperature is constant, the ❄ LED is off. During the delay, the ❄ LED flashes.
   - Defrost LED: When defrosting, the defrost LED ❄ is on. During dripping time and delay, LED ❄ flash, and ❄ it is off when defrost ends.
   - Fan LED: The LED ❋ is on when fan starts, and ❋ will be off when fan stops.
   - Refrigeration intensity LED: In E1~E2 section, the refrigeration set temperature lower, the refrigeration intensity greater.   LED gear means from weak to strong.
6. Power switch: Long press ⏻ button for 3 seconds, other control outputs stop, except for light control, and "---" is displayed. (The light control is still effective) Press ⏻ button again for 1 second, starting up to the normal control state.
7. Parameter setup
   - Press ⊗ button and hold for 6 seconds, will enter the corresponding window inner parameter setting, meanwhile PAS flash and display, waiting to enter the password.
   - After enter the correct password, press ⊗ button to change the parameters and E1,E2,E3,....db, PAS will display in sequence.
   - 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 mode.

8. Factory default resumption: Press ⊕ and ⊖ button for 6 seconds at the same time, will flash and display 888,all parameters will resume to factory defaults at this moment, after 6 seconds, it will return to normal operation mode.

9. Buttons locking: A: Automatic lock: when there is no operation within 15 seconds, the buttons will be locked automatically, the buzzer sound for once, press random button for 1 second and then let go to cancel the locking, the buzzer sound for once. B: Manual lock: press ⊙, ❋ and ⊗ button and hold for 6 seconds to lock the parameters if "OFF" is displayed, or to unlock if "ON" is displayed. After it is locked, press any buttons will display "LC" for 6 seconds. (When locked, can not be operated .)

10. Parameter locking: Press ⊖ button and hold for 6 seconds to lock parameters if "OFF" is displayed, or to unlock if "ON" is displayed. Parameters can be displayed only and not be modified if locked, but the adjustment of the set temperature is still active. (Factory default is "ON").

Parameter	Function	Set range	Default	Parameter	Function	Set range	Default
PAS	Password	00～99	00	P2	Fan control during defrost	00=off 01=on 02=Determined by P4,P5	00
E1	Lower set point limit	−45℃～Set temp. −49℉	−25℃ −13℉	P3	Fan starting after defrost	00=time 01=Determined by P4	00
E2	Higher set point limit	Set temp.～ 45℃ 113℉	20℃ 68℉	P4	Fan starting temperature (evap. sensor lower than starting)	−30℃～P5 −22℉	15℃ 59℉
E3	Temp. Hysteresis	01～20℃ 02～36℉	04℃ 07℉	P5	Fan termination temperature (evap. sensor higher than termination)	P4～ 30℃ 86℉	25℃ 77℉
E40	Comp. Start delay time	00～10Min	2Min				
E41	Delay starting time	00～10Min	2Min	P6	Fan delay starting time after defrost	00~30	2 Min
E5	Offset on room temp.	−20～20℃ −36～36℉	00℃ 00℉	C1	Cold room higher temperature alarm	C2～ 45℃ 113℉ ～OFF	40℃ 104℉
E6	Offset on evap. temp.	−20～20℃ −36～36℉	00℃ 00℉	C2	Cold room low temperature alarm	OFF～ −40℃ −40℉ ～C1	−40℃ −40℉
E7	Offset on condenser	−20～20℃ −36～36℉	00℃ 00℉	C3	Condenser high temperature alarm	OFF～ −40℃ 120℃ −40℉ 248℉	OFF
F0	Defrost type	00=Defrost by turning off comp. 01=Heater defrost 02=Hot gas defrost	01	C4	Alarm Hysteresis	01～20℃ 02～36℉	02℃ 04℉
FF0	Hot gas defrost comp. delay starting time	00～20Min	00	C5	When condenser alarm work mode	00=comp. stop running 01=running according to C7,C8	00
FF1	Defrost mode	00=Power on hours 01=Comp. continuously working time	01	C6	Alarm after delay	00～120Min	2Min
F1	Max. defrost duration	01～60Min	20Min	C7	Comp. force termination time	00～120Min	15Min
F2	Defrost interval time	00～24Hr	6Hr				
F30	Defrost starting time	−40℃ −40℉ ～F31	00℃ 32℉	C8	Comp. force running time	00=compressor stop 01～120min=starting time	30Min
F31	Defrost termination time	F30～ 40℃ 104℉	08℃ 46℉	CF	Temperature unit	℃=Celsius ℉=Farenheit	℃
F4	Display during defrost	00=Normal display 01=Last value before defrost 02=Display "dEF"	01	d1	Display type	00=display current cold room actual temp. 01=display no more than "set temp.+E3+d2" 02=fixed display set temp.	00
F5	Dripping time	00～60Min	2Min	d2	Display increment	00～30℃ 00～54℉	05℃ 09℉
P1	Fan control during refrigeration	00=Synchronized with compressor 01=Keep running 02=Determined by P4,P5	00	db	Display resolution	0.1/1	1

Function detail

1. Temperature controller

- After turning on for the delay time E40 (or press ⊘ button to cancel E40 delay), the compressor starts operating when cold-room temperature is higher than the (set temp.+hysteresis),and will be off when cold room temp. is lower than the 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 E41).

2. Defrost control

- When under the condition of FF1, after working a defrost interval(Parameter F2), and evap. sensor temperature is lower than parameter F30, controller will automatically enter the defrost status. Current defrost ends when pass parameter F1 or cold room temperature is higher than F31.
- When defrost interval F2 is set to "00", the automatic defrost by turning off compressor will be cancelled.
- When defrost type is F0=00 defrost by turning off compressor, comp. stop when defrost, defrost relay stop. After defrost and dripping time (Parameter F5), will automatic enter temp. control status.
- When defrost type is F0=01 heating defrost, comp. stop when defrost, defrost relay start. After defrost and dripping time (Parameter F5), will automatic enter temp. control status.
- When defrost type is F0=02 hot gas defrost, when reach hot gas defrost, after FF0 time, enter hot gas defrost. The comp. and defrost relay both start during defrost, the comp. Stop after defrost. After dripping time F5, the defrost relay stop.
- When setting parameter F4=00, the cold room temp. will display normally.
- When setting parameter F4=01, the cold room temp. is locked during defrost, the last value before defrost will be displayed. After defrost, the cold room temp. will display 20 minutes delay (or the cold room temp. < the set temp.) then resume normal display. The defrost LED flash during delay.
- When setting parameter F4=02, dEF will be displayed during defrost. After defrost, will delay 20 minutes display dEF (or cold room temp. < set temp.), then resume normal display. The defrost LED flash during the delay process.

3. Fan control

- When P1=00, the fan synchronized with the compressor, and will determined by P2 during defrost, starting after defrost is determined by P3.
- When P1=01, the fan keep running, and determined by P2 during defrost, starting after defrost is determined by P3.
- When P1=02, the fan comparing control according to defrosting temperature and P4/P5, and will determined by P2 during defrost, starting after defrost is determined by P3.
- After defrost, when P3=00, fan delay P6 start after defrost. When P3=01, the fan control according to defrosting temperature and P4 after defrost.
- When choosing defrosting temperature to control the fan, the fan will start when defrosting temperature is lower than P4.
- When evap. sensor break down, the fan synchronized with the compressor.

4. Alarm control

- After compressor stop for the first time, can trigger the high low temperature alarm function. When the cold room temperature is abnormal(if higher than the high temperature alarm C1 or low temperature alarm C2) and duration more than alarm delay time C6,will enter alarm status and start the alarm. When high temperature alarm, alternate display HI and cold room temperature, corresponding compressor will start.
- When low temperature alarm, alternate display L0 and cold room temperature, the compressor stop. (Press random button to cancel the sound.)
- When cold room temperature is higher than (low temperature alarm value C2+alarm hysteresis C4), the low temperature alarm will end. When cold room temperature is lower than(high temperature alarm value C1-alarm hysteresis C4), the high temperature alarm will end.
- When alarm, the buzzer sound, press random button to cancel.

5. Abnormal work mode:
- When cold-room sensor is short-circuited or high temperature is over limit (over 120℃/248℉), "HH" will be displayed, cold-room temp. sensor is open-circuited or low temperature over limit(lower than −45℃/−49℉), "LL" is displayed. The compressor will enter the force running mode, work according to C7, C8.
- When evap. sensor is short-circuited or high temperature is over limit(over 120℃/248℉), "2H" will be displayed, evap. sensor is open circuited or low temperature over limit (lower than −45℃/−49℉), "2L" is displayed. Temperature factor is not considered when enter and exit defrost, only time factor matters. The fan and compressor synchronized.

6. Circuit Diagram:
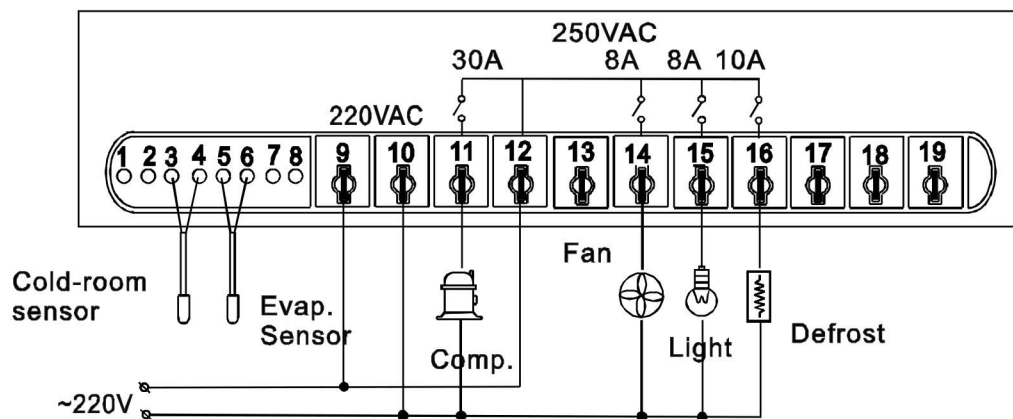
Notes for Installation

The temperature controller cannot be installed in the area with water drops. When installation the sensor shall be placed with the head upward and the wire downward. In case of the long- distance sensor installation from the controller, the sensor cable maybe prolonged up to 100m max. without any re-calibration. 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.

Accessories for the temperature controller

1. Two temperature sensors   2. One installation stand