

D Series Upright Freezers Glass Door Merchandisers



D238BMF
D368BMF
D768BM2F



Metalfrio Solutions

110 Enterprise Parkway

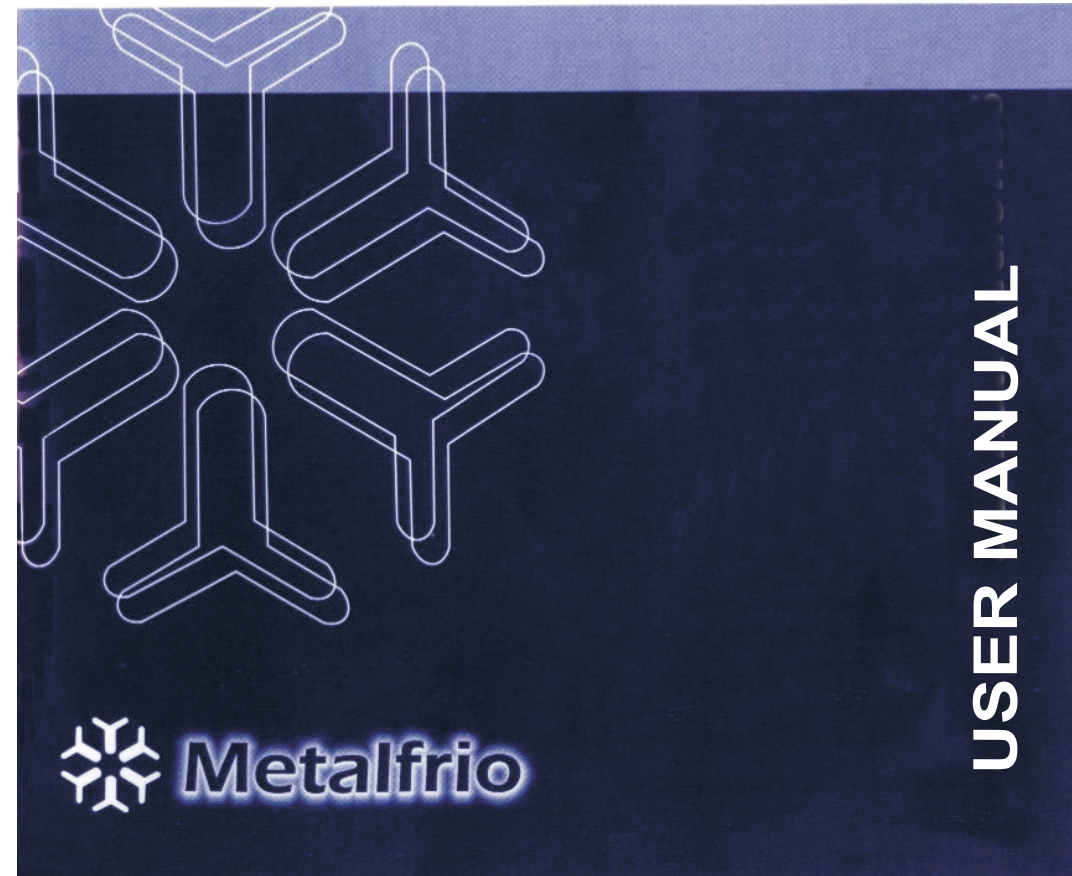
Boerne, TX 78006 USA

(888) 403-0070 / (830) 755-2218 (Telephone)

(888) 339-1904 / (830) 755-4247 (Fax)

www.metalfrio.com

e-mail: sales@metalfrio.com



***PLEASE READ THE MANUAL
THOROUGHLY PRIOR TO
EQUIPMENT SET-UP,
OPERATION AND MAINTENANCE.***

INSTALLATION

- The refrigeration system operates most efficiently when installed in an area with cool, dry air circulation.
- There must be at least 6 inches of clearance on both sides and the back of the cabinet.
- Select a location away from heat and moisture generating equipment such as stoves, ovens, etc.
- Avoid placing unit in direct sunlight.
- Be sure that the floor where you intend to install the unit is level and strong enough to bear the full weight of the unit and its contents.
- To minimize shock and fire hazards, be sure that the unit is properly grounded. For your safety and protection, all units are equipped with a special three-pronged grounding plug on the service cord.

PRECAUTIONS

- To minimize shock and fire hazards be sure not to overload the outlet.
- To minimize electric shock and malfunction do not spray products near the unit.
- To minimize fire hazards do not use flammable spray products near the unit.
- After unplugging the unit, wait at least 6 minutes before re-connecting. Compressor failure could occur if re-connected before a 6 minute waiting period.
- Cautions for cleaning:
 1. Unplug the power cord before cleaning.
 2. Do not unplug/plug in the power cord with wet hands.
 3. Do not use abrasive cleaners, solvents or polishing agents on plastic parts. Doing so might cause cracking or discoloration.
- When unit is not in use, unplug the power cord and wipe down the interior with a dry cloth. You may chose to leave the door open slightly to avoid moisture build-up and odor.

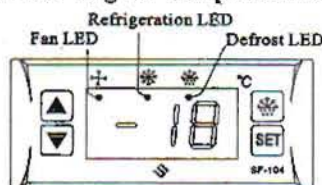
OPERATION AND MAINTENANCE

- When loading the unit be careful not to block the air duct located at the back and the fan on the ceiling of the unit with product. Blocking the airflow may cause a decrease in performance. For best performance maintain at least 4 inches of clearance between product and the air duct.
- Install the shelves packaged with your unit to fit your product height.
- The temperature controller is located at the right front corner of the ceiling. Default temperature setting is on number 4.
- Do not leave door open for very long. For the most efficient operation, close the door immediately after use.

TROUBLESHOOTING GUIDE

SYMPTOMS	SOLUTIONS
Compressor will not start	Check if the power cord has been plugged in. Check for blown fuse or circuit.
Poor performance	Move unit from direct sunlight and avoid installing heating devices nearby. Install the unit in a well ventilated place with a minimum 6" clearance at the back. Check the condenser and clean if there is heavy dust build up. Check to see if product is blocking the air duct. Check the temperature controller to confirm proper setting. Make sure door closes properly. Check to see if refrigerant charge is low.
No interior light	Turn light switch off, then on. Check that bulb is properly seated. Replace bulb if it has blown.
Noisy unit	Confirm unit is on level surface. Check minimum 6" wall clearance. Check for loose parts or mounting.. Make sure tubing is free from contact to avoid tubing rattle.
Condensation on walls and floor	Reduce the relative humidity in the area where the unit is installed. Door gasket is not sealing properly. Clean or replace gasket.

Model: SF-104 Digital Temperature Controller



Features of Function

- Mini-sized and integrated intelligent control and applicable to the compressor of one HP.
- Temperature Display/ Temperature Control/ Manual, automatic defrost by electric heater /Evap. Fan Control/ Value Storing/ Self Testing /Parameter Locking

Specifications

1. Output of the outside sealed transformer: AC12V (one transformer matched with one temp. controller)
2. Temperature sensor: NTC, Double sensors (for cold room temp. & defrost control), 2m (L)
3. Range of temperature displayed: $-45 \sim 150^{\circ}\text{C}$ ($-45 \sim 150^{\circ}\text{F}$) Accuracy: $\pm 1^{\circ}\text{C}$ ($\pm 2^{\circ}\text{F}$)
4. Range of set temperature: $-45 \sim 45^{\circ}\text{C}$ ($-45 \sim 120^{\circ}\text{F}$) Factory default: -10°C ($\pm 14^{\circ}\text{F}$)
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: $-10 \sim 60^{\circ}\text{C}$ ($14 \sim 140^{\circ}\text{F}$)
Relative Humidity: 20%~90% (Non-condensing)
7. Output contact capacity:
 - Compressor: N.O. 20A/250VAC (applicable to 1 HP compressor, if more it needs to connect an AC contactor)
 - Defrost: N.O. 10A/250VAC (applicable to 1KW load, if more it needs to connect an AC contactor)
 - Evap. Fan: N.O. 5A/250VAC

Front Panel Operation

1. Set temperature
 - Press button, the set temperature is displayed
 - Press or button again to modify and store the displayed value. Press button to exit the adjustment and display the cold-room temperature
 - If no more button is pressed within 10 seconds, the cold room temperature will be displayed.
2. Manual start/stop defrost: Press button and hold for 6 seconds to defrost or stop defrost.
3. Display the evap. temperature: Press button and hold 6 for seconds, the evap. temp. is display, after 10 seconds the cold room temp. is resumed to be displayed.
4. Refrigerating LED: During refrigerating, the LED is on; when the cold-room temp. is constant, the LED is off; during the delay, the LED flashes.
5. Defrost LED: during defrosting, the LED is on; when it stops defrosting, the LED is off.
6. Evap. Fan LED: the LED is on during fan operation. The LED is off when the Evap. fan stops operation.
7. Parameters setup
 - Press button for 6 seconds to enter parameter setting, at the same time "PAS" will be displayed and flash
 - Press or to enter a tens digit and press button to confirm; and then press or to enter a single digit and press button to confirm. If it is correct, parameter code E1 will be displayed (when it is set to 00, the password will be cancelled).
 - Press button to select sequentially from E2, E3, E4, E5, E6, F0, F1 ~ C4
 - Press or button, the value of parameter will be displayed and can be modified and stored.
 - If no more button is pressed within 10 seconds, it will return to normal operation mode.
8. The factory default resumption: press button for 1 second and then press button simultaneously for 6 seconds, the LED flashes, all parameters will be resumed to factory defaults. After 10 seconds, it returns to normal operation mode.
9. Parameters Locking
In normal operating, press button and hold for 10 seconds to lock the parameters if "OFF" is displayed or to unlock if "ON" is displayed. Parameters can be displayed only and can not be modified if locked, but the adjustment of the set temp. is still active (factory default is "ON")

Function details

1. Temperature control
After turning on for delay time, the compressor starts operating when cold room temperature \geq (set temp. + Hysteresis), and will be off when cold room temperature \leq set temp.

Parameter	Function	Set range	Default	Parameter	Function	Set range	Default
PAS	Password	00~99		F5	Fan operating function	0=Parallel with comp. 1=Continuous running except defrost 2=Evaporator temperature control	0
E1	Lower setpoint limit	-45℃ ~ Set temp. -45°F ~ Set temp.	-22℃ -8°F	F6	Dripping time	0~10 Min	2 Min
E2	Higher setpoint limit	Set temp. ~ 45℃ 120°F	10℃ 50°F	F7	Fan delay start mode after defrost	0=time 1=Controlled by F9	1
E3	Temp. Hysteresis	1~20℃ 1~36°F	5℃ 9°F	F8	Fan delay start time after defrost	0~10 Min	2
E4	Comp.start delay time	0~10Min	2Min	F9	Fan start temp. (Evap.temp.)	-30~30℃ -22~86°F	-4℃ 25°F
E5	Offset on room temp.	-20~20℃ / °F	0	C1	Temperature unit	Celsius=℃ Fahr.=°F	℃
E6	Offset on evap. Temp.	-20~20℃ / °F	0	C2	High temperature alarm	Set ~ 49℃ ~ OFF value 121°F ~ OFF	40℃ 104°F
F1	Max. Defrost duration	1~60Min	20Min	C3	Low temperature alarm	OFF ~ -44℃ ~ Set value -44°F ~ Set value	OFF
F2	Defrost interval time	0~24Hr	4Hr	C4	Alarm time delay	0~90 Min	30 Min
F3	Defrost termination temp.	0~30℃ 32~86°F	12℃ 54°F				
F4	Display during defrost	0=Normal display 1=Last value before defrost	1				

- 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

- It defrosts and heats only if the temp. of the evap. sensor is less than the defrost termination temperature (Parameter F3).
- After operating for a defrost interval time, it will automatically enter the state of defrost. If the temperature of evap. sensor is lower than the defrost termination temp., the defrost LED will turn on, the heater will work, the compressor and the evaporation fan will stop.
- When the temp. of the evap. sensor exceeds the temp. of defrost termination, or the defrost duration ends, it will exit the defrost states. The heater will stop. After dripping time F6 it will enter the normal state of refrigeration, when cold room temperature > (set temp.+hysteresis), the compressor operates. When the duration of defrost 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 of room temp. display (or cold room temperature < set temperature+4℃) The defrost LED flashes during the delay.

4. Fan control:

- When parameter F5=2, after the first time turning on power, the compressor starts after delay time (parameter E4), the fan follow the compressor to start. After the compressor stops for the first time, the fan start is decided by parameter F9, the fan starts when evaporator temperature drops to fan start temperature.
- During defrosting, the fan stops working. After defrost dripping time, the fan start mode is decided by parameter F7.

5. High/low temperature overrun alarm

- After the first time tuning off the compressor, when cold-room temperature is higher than C2 parameter set value, after alarm delay time (parameter C4) the cold-room temperature will be display and flash, the heater is disconnected the compressor will start. When cold-room temperature is lower than C3 parameter set value, after alarm delay time (parameter C4) the cold-room temperature will be displayed and flash.
- The defrosting heater works according to defrosting mode. At the same time the buzzer will sound, the sound can be cancelled by pressing random key. (When parameter C2=OFF, high temperature alarm function will be cancelled, when parameter C3=OFF, low alarm function will be cancelled).

6. Abnormal work mode:

- When room sensor is short-circuited or overheated (more than 150℃/150°F) "HH" is displayed; when room sensor is open-circuited or temperature is too low (less than -45℃/-45°F) "LL" is displayed. At that time the compressor works automatically by the cycle of 45 minutes on and 15 minutes off.
- When evap. sensor fails or exceeds the displayed range, the defrost termination will be just controlled by the defrost duration. (Parameter F1)

7. Circuit Diagram:

