1、Technical specifications

1.1 power supply：115 or 230 Vac ±10% (50/60 Hz)
1.2 Maximum load current： COMP:16A/240VAC
DEFR:10A/240VAC
FAN: 10A/240VAC
1.3 operation conditions：0℃～55℃ 20%～85% (not condensing)
1.4 storage conditions：-25℃～75℃

2、Specification

Product：78.5*34.5mm*74mm Mounting size：71mm*29mm Probe wire length：2M

3、Technical Parameters

3.1 Temperature controlling range：-49℃～119℃ or -58°F～248°F
3.2 Display resolution：0.1℃ 1℃or 1°F
3.3 Accuracy：±1℃ (-20℃～30℃) ,±2℃ (51℃～70℃) ,others±3℃
or±2°F(-40°F～122°F),±4°F(123°F～158°F),others±6°F
3.4 Probe type：NTC (10KΩ/25℃, B value 3435K)

4、Display panel and LED

LED	state	Description
	on	alarm
	off	no alarm
	on	compressor on or Parameters
	off	compressor off
	blink	request
	on	defrosting or parameters
	off	defrost off
	blink	driping
	on	Fan on
	off	Fan off

5、Operation

5.1 Quick Access MenuMap
By pressing , it is possible to navigate through the function menus.

	Hold down for 5 seconds: turn on/turn off the control functions
SET	Hold down for 2 seconds: setpoint adjustment
∨	Quick touch: current process display
∧	Quick touch: maximum and minimum temperatures display
∨ + ∧	Pressed simultaneously: access to functions selection

5.2 Setting the desired temperature
Press the key for 2 seconds,The message “SP” will appear on the display followed by the normal setpoint set value. Use the or ∧ to ∨ modify the value and confirm by pressing **SET** Immediately, the message “SP-e” appears indicating the setting of the economic setpoint. Again, use the ∧ or ∨ keys to modify the value and confirm by pressing **SET** Finally, the “--- ” indication signals the setup completion. The setpoints can also be adjusted individually in the quick access menu.

5.3 Fast Freezing
In the fast freezing mode the cooling output remains permanently activated, thus accelerating the cooling or freezing process. This operating mode can be activated or deactivated in the quick access menu through the “FASt” option or through an external switch connected to the digital input (F52 or F53). It can also be deactivated automatically by low temperature (F33) or by time (F34). During operation in the fast freezing mode, the compressor on indication flashes quickly and defrost keeps happening. If, when activating the fast freezing mode, the controller identifies that there is a defrost scheduled to start by time in this period, the defrost will be performed immediately before entering the fast freezing mode.
5.4 Economic setpoint (SPE)
The “SP-E” provides the system with greater economy by using more flexible parameters for temperature control (F27-Economic Setpoint and F28 - Control Differential). When active, the “ECO” message is displayed alternating with the temperature and other messages. The operation in economy mode can be activated or deactivated through the commands:

Function	Command	Action
F29	Closed door time to activate	Activates
F30	S3-S1 temperature difference to deactivate	Deactivates
F31	S3-S1 temperature difference to activate	Stays activated
F32	Maximum time in economy mode	Deactivates
F32	Maximum time in economy mode =0(no)	Stays deactivated
F52 / F53	External key (digital input)	Activates / Deactivates
F52 / F53	Open door indication (digital input)	Stays deactivated
-	Action through quick access menu (“ECO”)	Activates / Deactivates
-	Error in ambient temperature reading (S1)	Stays deactivated
-	When switching on the instrument	Deactivates

5.4 Manual Defrost
Manual defrost is activated by the facilitated menu. Press the key (short touch) until the message “dEFr” is displayed. Then press the key **SET** (short touch) to select. The message “on” will be displayed.In order to disable the manual defrost, press the key (short touch) until the message is displayed, Press the key **SET** (short touch) to select. The message ”off” will be displayed.
The manual defrost process also can be activated/deactivated by pressing the key ∧ for 4 seconds.
5.5 Unit Selection
To select the temperature unit in which the instrument will operate enter the [F01] function with access code”231” and press the **SET** key. Then, select the desired unit “℃”or “°F” using the ∧or ∨ keys. To confirm, press **SET** . Whenever the unit is changed, the function settings assume the default value, therefore needing to be reconfigured.

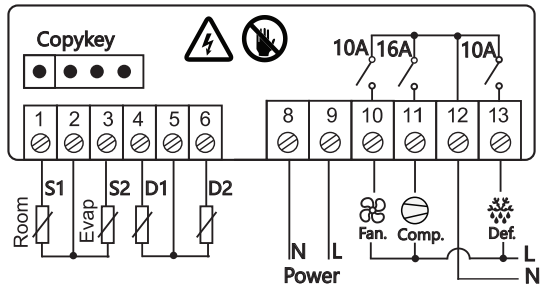
5.6 Minimum and Maximum Temperature Record
The display of the minimum and maximum temperature record can be checked through the quick access menu or by pressing the ∧ key while displaying the temperature. The minimum and maximum temperatures recorded for each sensor are displayed in sequence preceded by identification messages “rEg”, “t-1” for ambient sensor (S1), “t-2” for S2 (when active) and “t-3” for S3 (when active). To delete the minimum and maximum recorded values, hold the ∧ button for 2s when displaying records or use the “CrEg”, option in the quick access menu.

5.7 Adjustmentof the parameters
Access the function F01 by pressing simultaneously the keys ∧ and ∨ or by the facilitated menu.
When F01 is displayed, press the key **SET** (short touch).
Use the keys ∧ or ∨ to enter with the access code “123” and when ready, press **SET** .
Use the keys ∧ or ∨ to access the desired function.
After selecting the function, press the key **SET** (short touch), to view the value set for that function. Use the keys ∧ or ∨ to alter the value and press **SET** to memorize the value set and return to the function menu.
To exit the menu and return to the normal operation (temperature indication), press **SET** (long touch) until “---” is displayed.
NOTE 1: If function blocking is active, pressing the keys ∧ or ∨ ,the controller will display the message “LOC” and parameters will not be allowed to bealtered.
NOTE 2:15 seconds after supplying the access code and/or after setting a paremeter, with no touches in the buttons, the controller returns to the operation mode and the access code will have to be entered again in function F01.

6、Parametes table

Fun	Description	CELSIUS				FAHRENHEIT			
		Min	Max	Unit	Standard	Min	Max	Unit	Standard
F01	Access codes	0	999	-	0	0	999	-	0
F02	Control differential (normal hysteresis)	0.1	20	℃	2	1	36	°F	3
F03	Ambient temperature S1 indication offset	-20	20	℃	0	-36	36	°F	0
F04	Minimum setpoint allowed to the end user	-50	105	℃	-50	-58	221	°F	-58
F05	Maximum setpoint allowed to the end user	-50	105	℃	105	-58	221	°F	221
F06	Delay at start (energization)	0 (NO)	30	min	0 (NO)	0 (NO)	30	min.	0 (NO)
F07	High ambient temperature alarm (S1)	-50	105	℃	105	-58	221	°F	221
F08	Cooling time (interval between defrosts)	1	999	min.	240	1	999	min.	240
F09	Minimum time for compressor on	0 (NO)	999	sec.	0	0 (NO)	999	sec.	0
F10	Minimum time for compressor off	0 (NO)	999	sec.	0	0 (NO)	999	sec.	0
F11	Compressor status with ambient sensor (S1) disconnected	0	2	-	1	0	2	-	1
F12	Defrost at start of instrument	NO	YES	-	NO	NO	YES	-	NO
F13	Temperature at evaporator (S2 / S3) to determine the end of defrost	-50	105	℃	30	-58	221	°F	86
F14	Maximum defrost time	0 (NO)	90	min.	30	0 (NO)	90	min.	30
F15	Fan on during defrost	0 (OFF)	1 (ON)	-	0 (OFF)	0 (OFF)	1 (ON)	-	0 (OFF)
F16	Defrost type (0-Electric / 1-Hot gas)	0	1	-	0	0	1	-	0
F17	Temperature indication (S1) locked during defrost	- 1 (NO)	99	min.	-1 (NO)	-1 (NO)	99	min.	-1 (NO)
F18	Draining time (dripping of defrost water)	0 (NO)	99	min.	1	0 (NO)	99	min.	1
F19	Evaporator temperature (S2 / S3) for fan return after drainage	-50	105	℃	20	-58	221	°F	68
F20	Maximum time for fan return after drainage (fan-delay)	0 (NO)	30	min.	1	0	30	min.	1
F21	Fan operating mode	0	7	-	4	0	7	-	4
F22	Fan stop for high temperature in evaporator	-50	105	℃	30	-58	221	°F	86
F23	Time for gas collection before starting defrost (pre-defrost)	0 (NO)	999	min.	0 (NO)	0 (NO)	999	min.	0 (NO)
F24	Intensity of digital filter applied to sensor 1 (0-deactivated)	0	9	-	0	0	9	-	0
F25	Time to confirm a low evaporator (S2 / S3) temperature to start defrosting (if F39=1)(if F39=1)	0	90	min.	0	0	90	min.	0
F26	Normal setpoint	-50	105	℃	-15	-58	221	°F	5
F27	Economic setpoint (SPE)	-50	105	℃	-10	-58	221	°F	14
F28	Control differential (economic hysteresis)	0.1	20	℃	2	1	36	°F	3
F29	Time for closed door to enter economy mode	0 (NO)	999	min.	0 (NO)	0 (NO)	999	min.	0 (NO)
F30	Temperature difference (S3-S1) below which the economic setpoint is activate	0.1	20	℃	2	1	36	°F	3
F31	Temperature difference (S3-S1) above which the normal setpoint is activated	0.1	20	℃	5	1	36	°F	9
F32	Maximum time in economy mode	0 (NO)	100(OFF)	h.	0 (NO)	0 (NO)	100(OFF)	h.	0 (NO)
F33	Temperature limit for Fast Freezing	-50	105	℃	-25	-58	221	°F	-13
F34	Fast Freezing time	0 (NO)	999	min.	0 (NO)	0 (NO)	999	min.	0 (NO)
F35	Time of fan on	1	99	min.	2	1	99	min.	2
F36	Time of fan off	1	99	min.	8	1	99	min.	8
F37	Compressor on time in case of S1 failure	0	999	min.	0	0	999	min.	0
F38	Compressor off time in case of S1 failure	0	999	min.	0	0	999	min.	0
F39	Condition for starting defrost (0-time / 1-temperature)	0	1	-	0	0	1	-	0
F40	Maximum open door time for instant defrost	0 (NO)	999	min.	0 (NO)	0 (NO)	999	min.	0 (NO)
F41	Temperature at evaporator (S2 / S3) to start defrost	-50	105	℃	-50	-58	221	°F	-58
F42	Open door time to shut down fan	-1 (NO)	999	min.	-1 (NO)	-1 (NO)	999	min.	- 1 (NO)
F43	Open door time to shut down control outputs	0 (NO)	999	min.	0 (NO)	0 (NO)	999	min.	0 (NO)
F44	Maximum temperature at condenser (S3) to shut down control outputs	0 (NO)	105	℃	55	32 (NO)		°F	131
F45	Control differential (hysteresis) for sensor S3 when set as sensor of the condenser	0.1	20	℃	5		221		
F46	Compressor on time without reaching the setpoint to shut down the control outputs	0 (NO)	999	min.	0 (NO)	0 (NO)	999	min.	0 (NO) -
F47	Low ambient temperature alarm (S1)	-50	105	℃	-50	-58	221	°F	58
F48	Alarm inhibition time by temperature	0 (NO)	999	min.	0 (NO)	0 (NO)	999	min.	0 (NO)
F49	Temperature of sensor S3 (condenser) to give an alarm	0	105	℃	45	32	221	°F	113
F50	Time of open door to give an alarm	0 (NO)	999	min.	0 (NO)	0 (NO)	999	min.	0 (NO)
F51	Enabling the buzzer	0 (OFF)	1 (ON)	-	0 (OFF)	0 (OFF)	1(ON)	-	0 (OFF)
F52	Function of digital input1 / sensor S3	0 (OFF)	13	-	0 (OFF)	0 (OFF)	13	-	0 (OFF)
F53	Function of digital input 2	0 (OFF)	10	-	0 (OFF)	0 (OFF)	10	-	0 (OFF)
F54	Evaporator S2 temperature indication offset	-20.1 (OFF)	20	℃	0	-36 (OFF)	36	°F	0
F55	Sensor S3 temperature indication offset	-20	20	℃	0	-36	36	°F	0

7、Wiring Diagram



8、Appendix 1 Character Set: