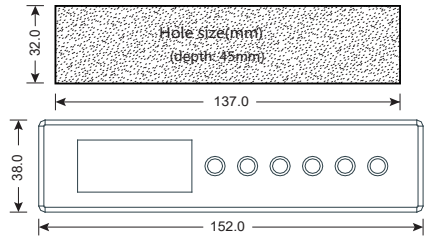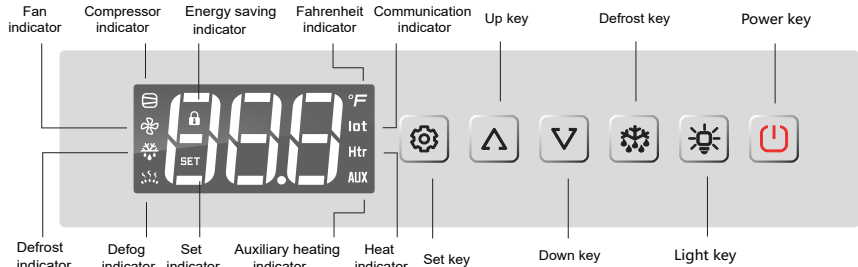Please read the guider carefully before use and keep it properly.

EN-70(Compressor, Defrost, Evap. fan, Light, Defog or Auxiliary heating, Energy saving mode)

1. Dimensions and Panel mounting

Hole size(mm)
(depth 45mm)

137.0

38.0

152.0

32.0

Before installation, please ensure that the working environment of the controller meets the requirements in the technical parameters;

Instrument EN-70 shall be mounted on vertical panel, in a 32x137mm hole,and fixed using the special bracket upplied.

Avoid places subject to strong vibrations, corrosive gases,excessive dirt or humidity.

4. Panel and Operation

Fan indicator
Compressor indicator
Energy saving indicator
Fahrenheit indicator
Communication indicator
Up key
Defrost key
Power key

Defrost indicator
Defog indicator
Set indicator
Auxiliary heating indicator
Heat indicator
Set key
Down key
Light key

4.1 Indicator light description

The compressor indicator lights up when the comp. is working, flashes during the startup delay time.

The evap. fan indicator lights up when the evap. fan is working.

The defrost indicator lights up when defrosting and flashes when dripping.

The defog indicator lights up during defogging.

The energy-saving indicator lights up in the energy-saving mode and flashes in the holiday mode when the key is pressed.

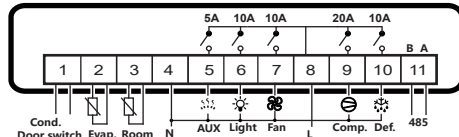The set indicator lights up when setting parameters.

The fahrenheit indicator lights up when the temperature unit is fahrenheit

The communication indicator flashes during communication.

The heat indicator lights up when defrosting and heating, and flashes during startup delay time.

The auxiliary heating indicator lights up when the aux. heating wire is working.

2. Connects

5A 10A 10A   20A 10A
B A

1 2 3 4 5 6 7 8 9 10 11

Cond.
Door switch Evap. Room N   AUX Light Fan L Comp. Def. 485

Please connect according to the actual product.

3. Technical data sheet

Material of shell：   V0 Flame Resistant Polycarbonate
Dimensions：   Length×width×depth：152.0×38.0×45.0mm
Connections：   RV Electrical Cables
Power supply：   220VAC±10%，50/60Hz
Power consumption：   5.0VA max
Display：   3 digit LED, ten status LEDs
Resolution：   0.1℃ or 1℃ or 1℉
Temperature measurement range and accuracy:
                         -50℃～90℃, ±1℃(40℃～50℃), ±2℃(others)
Relay outputs：   Compressor：20A/240VAC normal open, single-phase
                                     2HP compressor can be drived
                         Defrost：   10A/240VAC normal open
                         Evap. Fan： 10A/240VAC normal open
                         Light：   10A/240VAC normal open
                         Defog：   5A/240VAC normal open
Operating temperature：   0℃～55℃
Storage temperature：   -25℃～75℃
Relative humidity: 20%～85% (no condensing)

4.2 Key function

Set key | ⚙
-Pressing this button for 3s to display the value of set point；
-Switch menu and parameter interface.

Up key | ∧
-Scrolls through menu items and increases parameter values.

Down key | ∨
-Scrolls through menu items and decreases parameter values；
-Check the temperature of condenser sensor (If enabled);
-Pressing this button for 3s to start or stop manual defogging.

Defrost key | ❄
-Save the parameters and exit the parameter setting interface；
-Check the temperature of evaporator sensor (If enabled);
-Pressing this button for 3s to start or stop manual defrosting.

Light key | ☀
-Turn on or off light(can still be controlled in the off state).

Power key | ⏻
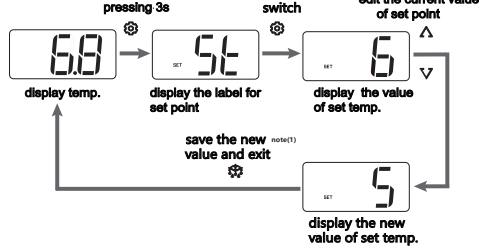-Pressing this key for 3s to switch between on state and off state.

No.	Label	Default	Name	Range
10	d1	1	Enable the evap. probe	0:disabled 1:enable
11	d2	0.0℃	Evap. probe calibration	-10.0℃(-20℉)～10.0℃(20℉)
12	d3	1	Selects the count mode for the defrost	0:compressor running time 1:device running time
13	d4	6	Interval between defrost cycles	0～90hours, 0:auto defrost disabled
14	d5	2	Display mode during defrost	0:display the current temp. of the room probe ；1:display dEF during the whole period of defrosting and dripping; 2:locks recorded value of the room temp. at defrost start until timeout of d9 then display the current temp. of the room probe; 3:locks recorded value of the room temp. at defrost start until the room temp. is lower than the recorded value then display the current temp.of the room probe.
15	d6	25	Max. defrost duration	0～90minutes, 0:defrost disabled
16	d7	25℃	End defrost temperature	0℃(32℉)～50℃(122℉)
17	d8	3	Draining time after defrost	0～60minutes, 0:disabled
18	d9	30	Max. display delay after defrost	0～90minutes
19	d10	0	Hot gas defrost output delay	0～60minutes, 0:disabled
20	d11	1	Defrost type	0:stopping comp. 1:heater 2:hot gas
21	d12	15	Advance working time of aux. heating wire	0～90 minutes
22	d13	-51℃	Forced defrosting temperature	-51℃(-60℉)～10℃(50℉)
23	F1	3	Fan operation mode	0:working with the step of comp. and always on during the period of defrosting and dripping. 1: working with the step of comp. and always off during the period of defrosting and dripping restart when time out of F3 after dripping. 2:always on except the period of defrosting and dripping 3:always on except the period of defrosting and dripping restart when time out of F3 after dripping. 4:It works when the comp. is working, when the comp. is stopped, it works and stops according to the time of F6 and F7, and always off during the period of defrosting and dripping restart when time out of F3 after dripping. 5:always on 6:determined by evap. probe (F4 /F5)
24	F2	5	First fan start delay	0～60minutes
25	F3	5	Fan start delay after dripping	0～60minutes, 0:disabled
26	F4	-40℃	Min. temp. for fan working	-50℃(-58℉)～F5
27	F5	20℃	Max. temp. for fan working	F4～85℃(185℉)
28	F6	3	Fan cycle on time	0～60minutes
29	F7	1	Fan cycle off time	0～60minutes, 0: disabled
30	A1	5	Comp. on time with faulty probe	1～60minutes
31	A2	30	Comp. off time with faulty probe	0～60minutes, 0: disabled
32	A3	1	Buzzer alarm	0:disabled 1:enable
33	A4	-10℃	Lower temperature alarm	-50℃(-58℉)～A5
34	A5	43℃	Higher temperature alarm	A4～85℃(185℉)
35	A6	20	Temperature alarm delay	0～60, delay time = A6x3minutes
36	A7	40	Delay of temp. alarm at start up	0～60, delay time = A7x3minutes
37	A8	0	Aux. output configuration	0:defog 1:alarm 2:aux. heater

No.	Label	Default	Name	Range
38	do1	0	Door switch control output selection	0: disabled ±1: Turn off the fan when the door is open; ±2: Turn on the light when the door is open and turn off the light when the door is closed; ±3: Turn on the light when the door is open and turn off the fan; turn off the light when the door is closed and the fan will return to the state before the door is opened; ±4: As a synchronous defrost signal start defrost; +5:as a door switch signal only; note: - closed valid；+ open valid
39	do2	0	Buzzer response delay when opening the door	0～200, 0: disable delay time = do2 x 3seconds
40	cd1	0	The 3rd probe function	0:door switch 1:condenser probe
41	cd2	55℃	High cond. temp. alarm	30℃(86℉)～cd4-1
42	cd3	5℃	Differential for high cond. temp. alarm recovery	1℃(2℉)～15℃(30℉)
43	cd4	64℃	High cond. temp. protection	cd2+1～90℃(194℉)
44	t1	0	Clock switch	0:disable 1:enable
45	t2	21.0	Energy-saving (closing) mode on time	0.0～23.9; closing time
46	t3	6.0	Energy-saving (opening) mode off time	0.0～23.9; opening time
47	t4	0	Temperature increment in energy-saving mode	0℃(0℉)～10℃(18℉)
48	t5	8.0	Light on time	0.0:lights are not controlled by time 0.1～23.9: the light turns off at t4 and on at t5
49	t6	0	Holiday setting	0: disabled 1: monday 2～7: tuesday,..., sunday 8: friday to saturday 9: saturday to sunday 10: friday to sunday 11: every day, i.e. long holiday
50	t7	22.0	Energy-saving mode on time in holiday days	0.0～23.9
51	t8	0	Auto defogging control mode	0:as with opening time 1:other time
52	t9	6.0	Auto defogging on time	0.0～23.9
53	t10	21.0	Auto defogging off time	0.0～23.9 if t9=t10,it will be cancelled.
54	t11	1	Auto on-off mode	0:as with opening time 1:other time
55	t12	6.0	Auto on time	0.0～23.9
56	t13	6.0	Auto off time	0.0～23.9 if t12=t13,it will be cancelled.
57	u1	1	Unit	0: fahrenheit 1: celsius
58	u2	0	Display delay for every 1℃ increase in cabinet temperature	0～90(unit:10 sec) 0: disabled
59	u3	0	Display resolution	0: decimal 1: integer
60	Adr	0	Machine ID	0～255, 0: communication disabled
61	PAS	55	Password set	0～255，0: cancel the password

4.3 Normal operations

How to change the shutdown temperature and other parameters

Edit the value of set point

pressing 3s → switch → edit the current value of set point

display temp. → display the label for set point → display the value of set temp.

save the new value and exit note(1)

display the new value of set temp.

Edit the value of other parameters (Administrator menu)

select the parameter menu → switch → type the password

display the label for set point → display the label for password → enter password interface

save the new value and exit note(1) → confirm password note(2) → switch

enter the administrator menu → display the label for password → display the entered password
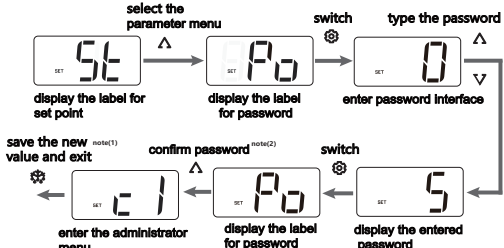
Note(1): there is no key operation for more than 10s in the process of changing the set point or for more than 30s in the process of changing other parameters, the controller will automatically save the changed parameters and exit the parameter change operation.
Note (2): the factory default password is 55, the user can cancel the password or modify the password by setting the parameter PAS. If you forget the password after changing it, please call the supplier to solve it.

How to check the temperature of the evaporation probe

Press and release the ❄ key to display the temperature or fault code of the evaporation probe, and the display will return to normal after 1 second. Note: the evaporation probe is required to be enabled(d1=1).

How to check the temperature of the condenser probe

Press and release the ∨ key to display the temperature or fault code of the condenser probe, and the display will return to normal after 1 second. Note: the condenser probe is required to be enabled(cd1=1).

How to manually start or stop the defrost

Press and hold the ❄ key for 3 seconds to manually start or stop the defrost.

How to turn on or off defogging

Press and hold the ∨ key for 3 seconds to turn on or off defogging.

How to turn the lights on or off

Press the ☼ key to turn the lights on or off. Even in the off state, it still valid.

How to turn on or off the energy saving mode

Press the ∧ key and the ☼ key or the ∨ key and the ☼ key at the same time to display "SoF" or "Son" , which means that the energy-saving mode is off or on.
Press the ∧ key and the ☼ key at the same time for 3 seconds to turn on the energy-saving mode. Press the ∨ key and the ☼ key at the same time for 3 seconds to turn off the energy-saving mode.

How to view the current time

Press the ⚙ key and the ∨ key at the same time to display the week of the current time;
Press the ∨ key and the ❄ key at the same time to display the hour of the current time;
Press the ❄ key and the ☼ key at the same time to display the minute of the current time;
Note: it cannot be viewed when the real-time clock function is turned off.

How to set the current time

Within 10 minutes after startup, press the ∨ key and the ❄ key at the same time for 5 seconds to display "dAy"(the day of week), press the ∧ key or the ∨ key, you can select "dAy", "Hou"(hour), "Min"(minute) and "SEC"(second), press the ⚙ key to switch menus and parameters, and adjust the value through the ∧ key or the ∨ key.
If the ❄ key is pressed at the same time or there is no key operation for 10 seconds, the controller saves the parameters and exits the set state.

How to turn on or off the holiday mode quickly

When the holiday mode is off, press the ⚙ key and the ☼ key at the same time for 3 seconds to turn on it and display "Hon".
When the holiday mode is on, press the ⚙ key and the ☼ key at the same time for 3 seconds to turn off it and display "HoF".

How to turn on or off

In the on state, press the (¹) key for 3 seconds to turn off the controller and display "---"
In the off state, press the (¹) key for 3 seconds to turn on the controller.

5. Alarm signals and other messages

Label	Description	Cause	Problem solving
E1	Room probe failure	The probe is not properly and reliably connected, or the probe of the wrong model is used, or the probe wire is damaged.	Connect the probe reliably or replace it with the correct model.
E2	Evap. probe failure		
E3	Cond. probe failure		
rH	Alarm due to high room temp.	The room temp. is higher than A5 and continuously exceeds the alarm delay time.	The room temp. is lower than A5.
rL	Alarm due to low room temp.	The room temp. is lower than A4 and continuously exceeds the alarm delay time.	The room temp. is higher than A4.
cH	Alarm due to high cond. temp.	The cond. temp. is higher than cd2 and continuously exceeds 30 minutes..	The cond. temp. is lower than (cd2-cd3).
cP	Protection due to high cond. temp.	The cond. temp. is higher than cd4.	The cond. temp. is lower than (cd4-cd3), and the comp. stops for 15 minutes
tr	Clock failure	Not equipped with hardware or the clock doesn't work	Cancel the function by setting t1 to 0 or set the current time.
dA	Door open	/	/
dEF	Defrosting or dripping	/	/
Son	Energy-saving mode	/	/
SoF	Non energy-saving mode	/	/
Hon	Holiday mode	/	/
HoF	Non Holiday mode	/	/

Note (1): if the evap. probe is not connected and d1 is set to 1, it will display E2. At this time, just solve the fault by setting d1 to 0. E3 fault is similard.
Note(2):When the condenser high temperature alarm occurs, it display cH, and the output is not affected. it doesn't display the fault code by Problem solving.
Note(3): when the condenser high temperature protection occurs, it display cP,and turn off the compressor, defrost heatting wire and fan until the protection is removed;.
The fault code disappears by powering off and on.

6. Parameter table

	No.	Label	Default	Name	Range
🌡	1	St	0℃	Set point (to turn off the comp.)	c5～c6
	2	c1	4.0℃	Differential of temp. for the comp.start	0.5℃(1℉)～9.0℃(20℉)
	3	c2	3	Min. time between successive comp. starts	0～60minutes
	4	c3	3	Compressor start delay after power on	0～90minutes
⊝	5	c4	0.0℃	Room probe calibration	-10.0℃(-20℉)～10.0℃(20℉)
	6	c5	0℃	Min. set point	-50℃(-58℉)～St
	7	c6	22℃	Max. set point	St～85℃(185℉)
	8	c7	0	Max. time of the comp. stand by	0～9minutes, 0:disabled
	9	c8	0	Min. on time of the comp.	0～90minutes, 0:disabled