



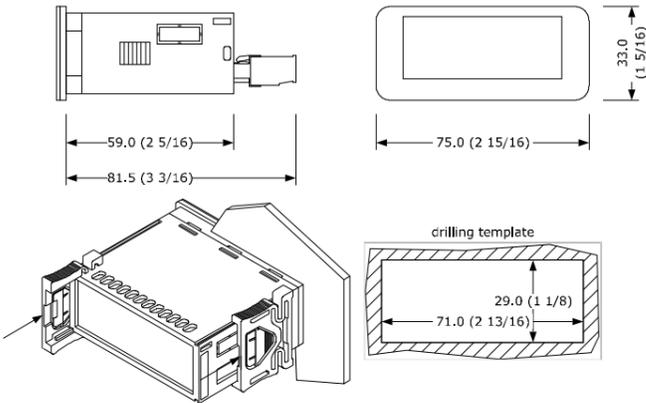
PLEASE READ CAREFULLY
and save this document
CONSIDER THE ENVIRONMENT

E ENGLISH

- Controllers for low temperature units.
- Power supply 115... 230 VAC or 12-24 VAC/DC (according to the model).
- Incorporated clock (according to the model).
- Cabinet probe and evaporator probe (PTC/NTC).
- Door switch input.
- Compressor relay 16 A res. @ 250 VAC.
- Alarm buzzer.
- TTL or RS-485 MODBUS slave port for BMS (according to the model).
- Cooling or heating operation.

1 MEASUREMENTS AND INSTALLATION

Measurements in mm (inches). To be fitted to a panel, snap-in brackets provided.

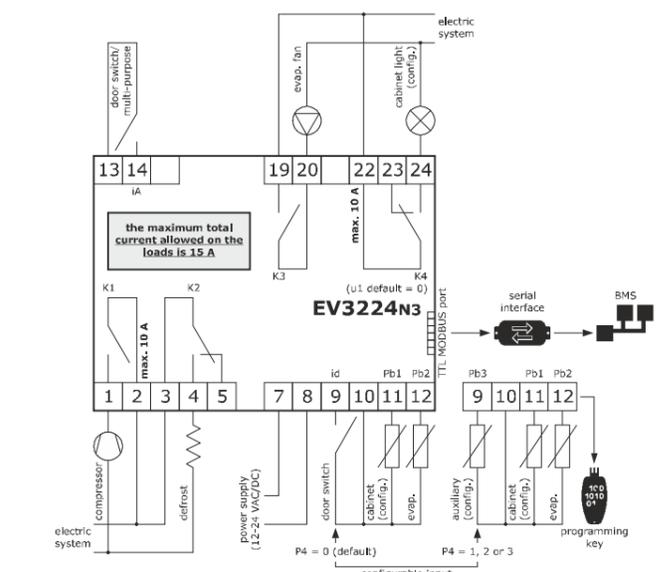
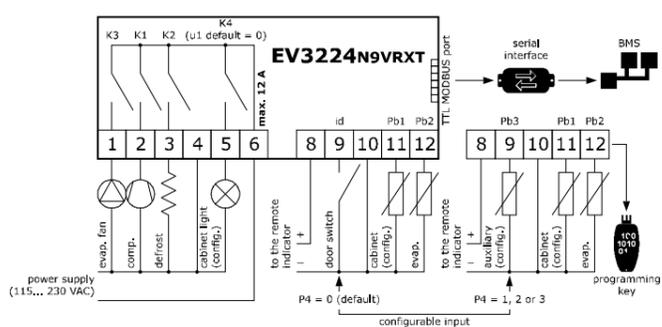
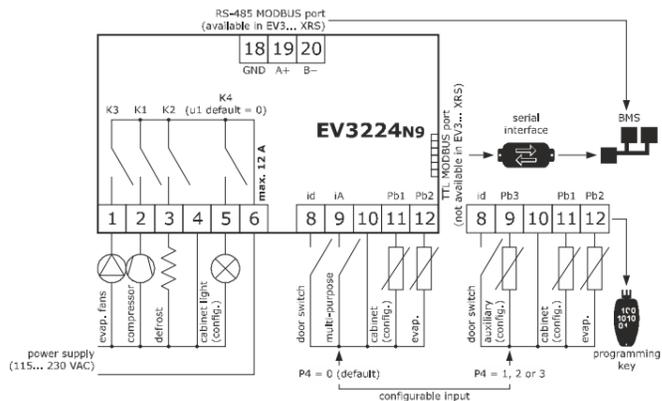


INSTALLATION PRECAUTIONS

- The thickness of the panel must be between 0.8 and 2.0 mm (1/32 and 1/16 in)
- Ensure that the working conditions are within the limits stated in the **TECHNICAL SPECIFICATIONS** section.
- Do not install the device close to heat sources, equipment with a strong magnetic field, in places subject to direct sunlight, rain, damp, excessive dust, mechanical vibrations or shocks.
- In compliance with safety regulations, the device must be installed properly to ensure adequate protection from contact with electrical parts. All protective parts must be fixed in such a way as to need the aid of a tool to remove them.

2 ELECTRICAL CONNECTION

- N.B.**
- Use cables of an adequate section for the current running through them.
 - To reduce any electromagnetic interference connect the power cables as far away as possible from the signal cables.



PRECAUTIONS FOR ELECTRICAL CONNECTION

- If using an electrical or pneumatic screwdriver, adjust the tightening torque.
- If the device has been moved from a cold to a warm place, the humidity may have caused condensation to form inside. Wait about an hour before switching on the power.
- Make sure that the supply voltage, electrical frequency and power are within the set limits. See the section **TECHNICAL SPECIFICATIONS**.
- Disconnect the power supply before doing any type of maintenance.
- Do not use the device as safety device.
- For repairs and for further information, contact the EVCO sales network.

3 FIRST-TIME

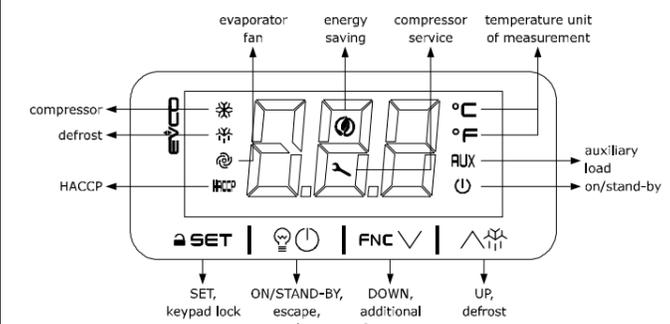
1. Install following the instructions given in the section **MEASUREMENTS AND INSTALLATION**.
2. Power up the device as shown in the section **ELECTRICAL CONNECTION** and an internal test will be run. The test normally takes a few seconds, when it is finished the display will switch off.
3. Configure the device as shown in the section **Setting configuration parameters**. Recommended configuration parameters for first-time use.

PAR.	DEF.	PARAMETER	MIN... MAX.
SP	0.0	setpoint	r1... r2
P0	1	probe type	0 = PTC 1 = NTC
P2	0	temperature unit of measurement	0 = °C 1 = °F
d1	0	defrost type	0 = electric 1 = hot gas 2 = compressor stopped

Then check that the remaining settings are appropriate; see the section **CONFIGURATION PARAMETERS**.

4. Disconnect the device from the mains.
5. Make the electrical connection as shown in the section **ELECTRICAL CONNECTION** without powering up the device.
6. For the connection in an RS-485 network connect the interface EVIF22TSX or EVIF23TSX, to activate real time functions connect the module EVIF23TSX (or use EV3... XRS); see the relevant instruction sheets.
7. Power up the device.

4 USER INTERFACE AND MAIN FUNCTIONS



4.1 Switching the device on/off

1. If POF = 1, touch the ON/STAND-BY key for 4 s.

If the device is switched on, the display will show the P5 value ("cabinet temperature" default); if the display shows an alarm code, see the section **ALARMS**.

LED	ON	OFF	FLASHING
☀	compressor on	compressor off	- compressor protection active - setpoint setting active
☂	defrost or pre-dripping active	-	- defrost delay active - dripping active
🌀	evaporator fan on	evaporator fan off	evaporator fan stop active
🚫	HACCP saved HACCP alarm	-	new HACCP alarm saved
🔧	energy saving active	-	-
🔑	request for compressor service	-	- settings active - access to additional functions active
°C/°F	view temperature	-	overcooling or overheating active
AUX	auxiliary load on	auxiliary load off	- auxiliary load on by digital input - auxiliary load delay active
🔌	device off	device on	device on/off active

If 30 s have elapsed without the keys being pressed, the display will show the "Loc" label and the keypad will lock automatically.

4.2 Unlock keypad

Touch a key for 1 s: the display will show the label "UnL".

4.3 Set the setpoint

Check that the keypad is not locked.

1. Touch the SET key.
2. Touch the UP or DOWN key within 15 s to set the value within the limits r1 and r2 (default "-50... 50°").
3. Touch the SET key (or do not operate for 15 s).

4.4 Activate manual defrost (if r5 = 0, default)

Check that the keypad is not locked and that overcooling is not active.

1. Touch the UP key for 2 s.

If P3 = 1 (default), defrost is activated provided that the evaporator temperature is lower than the d2 threshold.

4.5 Cabinet light on/off (if u1 = 0, default)

1. Touch the ON/STAND-BY key.

- if u1 = 1, the **demisting** switch on for the u6 duration.
- if u1 = 2, r13 = 0 and the keypad is not locked, the **button-operated load** switches on/off.

4.6 Button-operated load on/off (if u1 = 2 and r13 = 1)

1. Touch the UP key.

4.7 Silence buzzer (if A13 = 1)

Touch a key.

If u1 = 3 and u4 = 1, the alarm output switches off.

5 ADDITIONAL FUNCTIONS

5.1 Activate/deactivate overcooling, overheating and manual energy saving

Check that the keypad is not locked.

1. Touch the DOWN key.

FUNCTION	CONDITION	CONSEQUENCE
overcooling	r5 = 0, r8 = 1 and defrost not active	the setpoint becomes "setpoint - r6", for the r7 duration
overheating	r5 and r8 = 1	the setpoint becomes "setpoint + r6", for the r7 duration

energy saving | r5 = 0 and r8 = 2 | the setpoint becomes "setpoint + r4", at maximum for HE2 duration

5.2 View/delete HACCP alarm information

Check that the keypad is not locked.

1. Touch the DOWN key for 4 s.
 2. Touch the UP or DOWN key within 15 s to select a label.
- | LAB. | DESCRIPTION |
|------|--------------------------------|
| LS | view HACCP alarm information |
| rLS | delete HACCP alarm information |
3. Touch the SET key.
 4. Touch the UP or DOWN key to select an alarm code (when label "LS" is selected) or to set "149" (when label "rLS" is selected).

COD.	DESCRIPTION
AL	low temperature alarm
AH	high temperature alarm
Id	door switch alarm
PF	power failure alarm (available in EV3... XRS or if module EVIF23TSX is connected)

5. Touch the SET key.
6. Touch the ON/STAND-BY key (or do not operate for 60 s) to exit the procedure.

Example of alarm information (e.g. a high temperature alarm).

8.0	critical value (cabinet/ calculated product temperature) was 8.0 °C/°F
Sta	(available in EV3... XRS or if module EVIF23TSX is connected)
y15	alarm signalled in 2015
n03	alarm signalled in March
d26	alarm signalled on 26 March 2015
h16	alarm signalled at 16:00
n30	alarm signalled at 16:30
dur	
h01	alarm lasted 1h
n15	alarm lasted 1h 15 min

5.3 View/delete compressor functioning hours and view compressor start-up number

Check that the keypad is not locked.

1. Touch the DOWN key for 4 s.
 2. Touch the UP or DOWN key within 15 s to select a label.
- | LAB. | DESCRIPTION |
|------|--|
| CH | view compressor functioning hours (hundreds) |
| rCH | delete compressor functioning hours |
| nS1 | compressor start-up number (thousands) |
3. Touch the SET key.
 4. Touch the UP or DOWN key to set "149" (when label "rCH" is selected).
 5. Touch the SET key.
 6. Touch the ON/STAND-BY key (or do not operate for 60 s) to exit the procedure.

5.4 View the temperature detected by the probes

Check that the keypad is not locked.

1. Touch the DOWN key for 4 s.
2. Touch the UP or DOWN key within 15 s to select a label.

LAB.	DESCRIPTION
Pb1	cabinet temperature (if P4 = 0, 1 or 2)
Pb2	inlet air temperature (if P4 = 3)
Pb3	evaporator temperature (if P3 = 1 or 2)
Pb4	auxiliary temperature (if P4 = 1, 2 or 3)
Pb4	calculated product temperature (CPT; if P4 = 3)

3. Touch the SET key.
4. Touch the ON/STAND-BY key (or do not operate for 60 s) to exit the procedure.

5.5 View the project number and the firmware revision

Check that the keypad is not locked.

1. Touch the DOWN key for 4 s.
 2. Touch the UP or DOWN key within 15 s to select a label.
- | LAB. | DESCRIPTION |
|------|----------------------------|
| PrJ | view the project number |
| rEU | view the firmware revision |
3. Touch the SET key.
 4. Touch the ON/STAND-BY key (or do not operate for 60 s) to exit the procedure.

6 SETTINGS

6.1 Setting configuration parameters

1. Touch the SET key for 4 s: the display will show the label "PA".
2. Touch the SET key.
3. Touch the UP or DOWN key within 15 s to set the PAS value (default "-19").
4. Touch the SET key (or do not operate for 15 s): the display will show the label "SP".
5. Touch the UP or DOWN key to select a parameter.
6. Touch the SET key.
7. Touch the UP or DOWN key within 15 s to set the value.
8. Touch the SET key (or do not operate for 15 s).
9. Touch the SET key for 4 s (or do not operate for 60 s) to exit the procedure.

6.2 Set the date, time and day of the week (available in EV3... XRS or if module EVIF23TSX is connected)

- N.B.**
Do not disconnect the device from the mains within two minutes since the setting of the time and day of the week.

Check that the keypad is not locked.

1. Touch the DOWN key for 4 s.
2. Touch the UP or DOWN key within 15 s to select the label "rtc".
3. Touch the SET key: the display will show the label "yy" followed by the last two figures of the year.

- Touch the UP or DOWN key within 15 s to set the year.
 - Repeat actions 3. and 4. to set the next labels.
- | LAB. | DESCRIPTION OF THE NUMBERS FOLLOWING THE LABEL |
|------|--|
| n | month (01... 12) |
| d | day (01... 31) |
| h | time (00... 23) |
| n | minute (00... 59) |
- Touch the SET key: the display will show the label for the day of the week.
 - Touch the UP or DOWN key within 15 s to set the day of the week.
- | LAB. | DESCRIPTION |
|--------|--------------------|
| Mon... | lunedì... domenica |
| Sun | |
- Touch the SET key: the device will exit the procedure.
 - Touch the ON/STAND-BY key to exit the procedure beforehand.

7 CONFIGURATION PARAMETERS

N.	PAR.	DEF.	SETPOINT	MIN... MAX.
1	SP	0.0	setpoint	r1... r2
ANALOGUE INPUTS				
2	CA1	0.0	cabinet probe offset	-25... 25 °C/°F if P4 = 3, air in probe offset
3	CA2	0.0	evaporator probe offset	-25... 25 °C/°F
4	CA3	0.0	auxiliary probe offset	-25... 25 °C/°F
5	P0	1	probe type	0 = PTC 1 = NTC
6	P1	1	enable °C decimal point	0 = no 1 = yes
7	P2	0	temperature unit of measurement	0 = °C 1 = °F
8	P3	1	evaporator probe function	0 = disabled 1 = defrost + fan 2 = fan
9	P4	0	configurable input function	0 = digital input 1 = condenser probe 2 = critical temperature probe 3 = air out probe if P4 = 3, regulation temperature = product temperature (CPT)
10	P5	0	value displayed	0 = regulation temperature 1 = setpoint 2 = evaporator temperature 3 = auxiliary temperature 4 = air in temperature
11	P6	0	value displayed by remote display	0 = regulation temperature 1 = setpoint 2 = evaporator temperature 3 = auxiliary temperature 4 = air in temperature
12	P7	5	inlet air weight for calculated product temperature (CPT)	0... 10 % x 10 CPT = {[P7 x (inlet air T)] + [(100 - P7) x (outlet air T)] : 100}
13	P8	5	display refresh time	0... 250 s : 10
REGULATION				
14	r0	2.0	setpoint differential	1... 15 °C/°F
15	r1	-50	minimum setpoint	-99 °C/°F... r2
16	r2	50.0	maximum setpoint	r1... 199 °C/°F
17	r4	0.0	setpoint offset in energy saving	0... 99 °C/°F
18	r5	0	cooling or heating operation	0 = cooling 1 = heating
19	r6	0.0	setpoint offset in overcooling/overheating	0... 99 °C/°F
20	r7	30	overcooling/overheating duration	0... 240 min
21	r8	0	DOWN key additional function	0 = disabled 1 = overcooling/overheating 2 = energy saving
22	r12	0	position of the r0 differential	0 = asymmetric 1 = symmetric
23	r13	0	UP key additional function	0 = none 1 = button-operated load
COMPRESSOR				
24	C0	0	compressor on delay after power-on	0... 240 min
25	C2	3	compressor off minimum time	0... 240 min
26	C3	0	compressor on minimum time	0... 240 s
27	C4	10	compressor off time during cabinet probe alarm	0... 240 min
28	C5	10	compressor on time during cabinet probe alarm	0... 240 min
29	C6	80.0	threshold for high condensation warning	0... 199 °C/°F differential = 2 °C/4 °F
30	C7	90.0	threshold for high condensation alarm	0... 199 °C/°F
31	C8	1	high condensation alarm delay	0... 15 min
32	C10	0	compressor hours for service	0... 999 h x 100 0 = disabled
33	C11	0	second compressor switch-on delay	0... 240 s
34	C13	0	number of start-ups for compressor rotation	0... 10 0 = disabled
DEFROST (if r5 = 0)				
35	d0	8	automatic defrost interval	0... 99 h 0 = only manual if d8 = 3, maximum interval
36	d1	0	defrost type	0 = electric 1 = hot gas 2 = compressor stopped
37	d2	8.0	threshold for defrost end	-99... 99 °C/°F
38	d3	30	defrost duration	0... 99 min se P3 = 1, maximum duration
39	d4	0	enable defrost at power-on	0 = no 1 = yes
40	d5	0	defrost delay after power-on	0... 99 min
41	d6	2	value displayed during defrost	0 = regulation temperature 1 = display locked 2 = dEF label
42	d7	2	dripping time	0... 15 min
43	d8	0	defrost interval counting mode	0 = device on hours 1 = compressor on hours 2 = hours evaporator temperature < d9 3 = adaptive 4 = real time
44	d9	0.0	evaporation threshold for automatic defrost interval counting	-99... 99 °C/°F
45	d11	0	enable defrost timeout alarm	0 = no 1 = yes
46	d15	0	compressor on consecutive time for hot gas defrost	0... 99 min
47	d16	0	pre-dripping time for hot gas defrost	0... 99 min
48	d18	40	adaptive defrost interval	0... 999 min if compressor on + evaporator temperature < d22 0 = only manual
49	d19	3.0	threshold for adaptive defrost (relative to optimal evaporation temperature)	0... 40 °C/°F optimal evaporation temperature - d19

50	d20	180	compressor on consecutive time for defrost	0... 999 min 0 = disabled
51	d21	200	compressor on consecutive time for defrost after power-on and overcooling	0... 500 min if (regulation temperature - setpoint) > 10°C/20 °F 0 = disabled
52	d22	-2.0	evaporation threshold for adaptive defrost interval counting (relative to optimal evaporation temperature)	-10... 10 °C/°F optimal evaporation temperature + d22
ALARMS				
53	AA	0	select value for high/low temperature alarms	0 = regulation temperature 1 = evaporator temperature 2 = auxiliary temperature
54	A1	-10.0	threshold for low temperature alarm	-99... 99 °C/°F
55	A2	1	low temperature alarm type	0 = disabled 1 = relative to setpoint 2 = absolute
56	A4	10.0	threshold for high temperature alarm	-99... 99 °C/°F
57	A5	1	high temperature alarm type	0 = regulation temperature 1 = evaporator temperature 2 = auxiliary temperature
58	A6	12	high temperature alarm delay after power-on	0... 99 min x 10
59	A7	15	high/low temperature alarms delay	0... 240 min
60	A8	15	high temperature alarm delay after defrost	0... 240 min
61	A9	15	high temperature alarm delay after door closing	0... 240 min
62	A10	10	power failure duration for alarm recording	0... 240 min
63	A11	2.0	high/low temperature alarms reset differential	1... 15 °C/°F
64	A12	2	power failure alarm notification type	0 = HACCP LED 1 = HACCP LED + PF label + buzzer 2 = HACCP LED + PF label + buzzer (if duration > A10)
65	A13	0	enable alarm buzzer	0 = no 1 = yes
FANS				
66	F0	3	evaporator fan mode during normal operation	0 = off 1 = on 2 = according to F15 and F16 if compressor off, on if compressor on 3 = thermoregulated (with F1) 4 = thermoregulated (with F1) if compressor on
67	F1	-1.0	threshold for evaporator fan operation	-99... 99 °C/°F differential = 1 °C/2 °F
68	F2	0	evaporator fan mode during defrost and dripping	0 = off 1 = on 2 = according to F0
69	F3	2	evaporator fan stop maximum duration	0... 15 min
70	F4	0	evaporator fan off time during energy saving	0... 240 s x 10
71	F5	10	evaporator fan on time during energy saving	0... 240 s x 10
72	F7	5.0	threshold for evaporator fan on after dripping (relative to setpoint)	-99... 99 °C/°F setpoint + F7
73	F9	0	evaporator fan off delay after compressor off	0... 240 s if F0 = 2
74	F11	15.0	threshold for condenser fan on	0... 99 °C/°F differential = 2 °C/4 °F
75	F12	30	condenser fan off delay after compressor off	0... 240 s if P4 ≠ 1
76	F15	0	evaporator fan off time with compressor off	0... 240 s if F0 = 2
77	F16	1	evaporator fan on time with compressor off	0... 240 s if F0 = 2
DIGITAL INPUTS				
78	i0	5	door switch input function	0 = disabled 1 = compressor + evaporator fan off 2 = evaporator fan off 3 = cabinet light on 4 = compressor + evaporator fan off, cabinet light on 5 = evaporator fan off + cabinet light on 6 = reserved
79	i1	0	door switch input activation	0 = with contact closed 1 = with contact open
80	i2	30	open door alarm delay	-1... 120 min -1 = disabled
81	i3	15	regulation inhibition maximum time with door open	-1... 120 min -1 = until the closing
82	i5	2	door switch/multi-purpose input function (not available in EV3... XT, options 7 and 8 not available in EV3... N9)	0 = disabled 1 = energy saving 2 = iA alarm 3 = button-operated load on 4 = device on/off 5 = Cth alarm 6 = th alarm 7 = compressor + evaporator fan off, cabinet light on 8 = evaporator fan off + cabinet light on
83	i6	0	door switch/multi-purpose input activation (not available in EV3... XT)	0 = with contact closed 1 = with contact open
84	i7	0	multi-purpose input alarm delay (not available in EV3... XT)	-1... 120 min -1 = disabled if i5 = 5 or 6, compressor on delay after alarm reset
85	i10	0	door closed consecutive time for energy saving	0... 999 min after regulation temperature < SP 0 = disabled
86	i13	180	number of door openings for defrost	0... 240 0 = disabled
87	i14	32	door open consecutive time for defrost	0... 240 min 0 = disabled
DIGITAL OUTPUTS				
88	u1	0	auxiliary output configuration	0 = cabinet light 1 = demisting 2 = button-operated load 3 = alarm 4 = door heaters 5 = heater for neutral zone 6 = condenser fan 7 = on/stand-by 8 = second compressor 9 = energy saving
89	u2	0	enable cabinet light and button-operated load in stand-by	0 = no 1 = yes manual

90	u4	0	enable alarm output off silencing the buzzer	0 = no 1 = yes
91	u5	-1.0	threshold for door heaters on	-99... 99 °C/°F differential = 2 °C/4 °F
92	u6	5	demisting on duration	1... 120 min
93	u7	-5.0	neutral zone threshold for heating (relative to setpoint)	-99... 99 °C/°F differential = 2 °C/4 °F setpoint + u7
ENERGY SAVING (if r5 = 0)				
94	HE2	0	energy saving maximum duration	0... 999 min -1 = until the door opening
REAL TIME ENERGY SAVING (if r5 = 0)				
95	H01	0	energy saving time	0... 23 h
96	H02	0	energy saving duration	0... 24 h
97	HEd	7	energy saving day	0 = Monday 1 = Tuesday 2 = Wednesday 3 = Thursday 4 = Friday 5 = Saturday 6 = Sunday 7 = none
REAL TIME DEFROST (if d8 = 4)				
98	Hd1	h-	1st daily defrost time	h- = disabled
99	Hd2	h-	2nd daily defrost time	h- = disabled
100	Hd3	h-	3rd daily defrost time	h- = disabled
101	Hd4	h-	4th daily defrost time	h- = disabled
102	Hd5	h-	5th daily defrost time	h- = disabled
103	Hd6	h-	6th daily defrost time	h- = disabled
SAFETIES				
104	POF	0	enable ON/STAND-BY key	0 = no 1 = yes
105	PAS	-19	password	-99... 999
REAL TIME CLOCK				
106	Hr0	0	enable clock	0 = no 1 = yes
MODBUS				
107	LA	247	MODBUS address	1... 247
108	Lb	2	MODBUS baud rate	0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud parity even

8 ALARMS

COD.	DESCRIPTION	RESET	REMEDIES
Pr1	cabinet probe alarm	automatic	- check P0
Pr2	evaporator probe alarm	automatic	- check probe integrity
Pr3	auxiliary probe alarm	automatic	- check electrical connection
rtc	clock alarm	manual	set date, time and day of the week
AL	low temperature alarm	automatic	check AA, A1 and A2
AH	high temperature alarm	automatic	check AA, A4 and A5
id	open door alarm	automatic	check i0 e i1
pf	power failure alarm	manual	- touch a key - check electrical connection
COH	high condensation warning	automatic	check C6
CSd	high condensation alarm	manual	- switch the device off and on - check C7
IA	multi-purpose input alarm	automatic	check i5 and i6
Cth	compressor thermal switch alarm	automatic	check i5 and i6
th	global thermal switch alarm	manual	- switch the device off and on - check i5 and i6
dFd	defrost timeout alarm	manual	- touch a key - check d2, d3 and d11

9 TECHNICAL SPECIFICATIONS

Purpose of the control device	Function controller	
Construction of the control device	Built-in electronic device	
Container	Black, self-extinguishing	
Category of heat and fire resistance	D	
Measurements		
75.0 x 33.0 x 59.0 mm (2 15/16 x 1 5/16 x 2 5/16 in) with fixed screw terminal blocks;	75.0 x 33.0 x 81.5 mm (2 15/16 x 1 5/16 x 3 3/16 in) with removable screw terminal blocks; 75.0 x 33.0 x 83.0 mm (2 15/16 x 1 5/16 x 3 1/4 in) in EV3... N3 and EV3... XRS	
Mounting methods for the control device		
To be fitted to a panel, snap-in brackets provided		
Degree of protection provided by the covering		
IP65 (front)		
Connection method		
Fixed screw terminal blocks for wires up to 2,5 mm ²	Removable screw terminal blocks for wires up to 2,5 mm ² ; by request	Micro-MaTch connector
Maximum permitted length for connection cables		
Power supply: 10 m (32.8 ft)	Analogue inputs: 10 m (32.8 ft)	
Digital inputs: 10 m (32.8 ft)	Digital outputs: 10 m (32.8 ft)	
Operating temperature		
From 0 to 55 °C (from 32 to 131 °F); from 0 to 50 °C (from 32 to 122 °F) in EV3... N3		
Storage temperature		
From -25 to 70 °C (from -13 to 158 °F)		
Operating humidity		
Relative humidity without condensate from 10 to 90%		
Pollution status of the control device		
2		
Conformity		
RoHS 2011/65/CE	WEEE 2012/19/EU	REACH (EC) Regulation 1907/2006
EMC 2014/30/UE		
LVD 2014/35/UE		
Power supply		
115... 230 VAC (+10% -15%), 50/60 Hz (±3 Hz), max. 3.2 VA insulated in EV3... N9	12-24 VAC/DC (+10% -15%), 50/60 Hz (±3 Hz), max. 4 VA/3 W in EV3... N3, provided by a SELV class 2 source	
Earthing methods for the control device		
None		
Rated impulse-withstand voltage		
2,5 kV (4 kV in EV3... N3).		
Over-voltage category		
II (III in EV3... N3).		
Software class and structure		
A		
Clock		
Incorporated secondary lithium battery (available in EV3... XRS)		
Clock drift		
≤ 60 s/month at 25 °C (77 °F)		
Clock battery autonomy in the absence of a power supply		
> 24 h at 25 °C (77 °F)		
Clock battery charging time		
24 h (the battery is charged by the power supply of the device)		
Analogue inputs		
2 for PTC or NTC probes (cabinet probe and evaporator probe)		
PTC probes	Sensor type	KTY 81-121 (990 Ω @ 25 °C, 77 °F)
	Measurement field	From -50 to 150 °C (from -58 to 302 °F)
NTC probes	Sensor type	B3435 (10 K Ω @ 25 °C, 77 °F)
	Measurement field	From -40 to 105 °C (from -40 to 221 °F)
Resolution		
0.1 °C (1 °F)		
Digital inputs		
1 dry contact (door switch/multi-purpose)		
Dry contact		
Contact type		5 VDC, 1.5 mA
Power supply		None
Protection		None
Other inputs		
Input configurable for analogue input (auxiliary probe) or digital input (door switch/multi-purpose input)		
Digital outputs		
4 electro-mechanical relays (compressor, defrost, evaporator fan and auxiliary relay)		
In EV3... N3 the maximum total current allowed on the loads is 15 A		
Compressor relay (K1)		SPST, 16 A res. @ 250 VAC

Defrost relay (K2)	SPST, 8 A res. @ 250 VAC; SPDT, 8 A res. @ 250 VAC in EV3... N3
Evaporator fan relay (K3)	SPST, 5 A res. @ 250 VAC; SPST, 2 A res. @ 250 VAC (30,000 cycles) in EV3... N3
Auxiliary relay (K4)	SPST, 5 A res. @ 250 VAC; SPDT, 16 A res. @ 250 VAC in EV3... N3
Type 1 or Type 2 Actions	Type 1
Additional features of Type 1 or Type 2 actions	C
Displays	3 digits custom display, with function icons
Alarm buzzer	Incorporated
Communication ports	
1 TTL MODBUS slave port for BMS (not available in EV3... XRS)	1 RS-485 MODBUS slave port for BMS (available in EV3... XRS)

 N.B.
The device must be disposed of according to local regulations governing the collection of electrical and electronic waste.

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