EV3294

Controller for refrigerated cabinets, undercounters and islands, with energy-saving strategies and compatible with EVCO Android APP

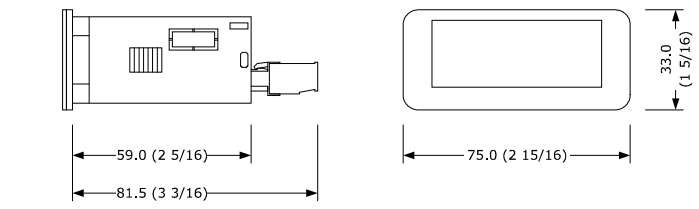
PLEASE READ CAREFULLY and save this document
CONSIDER THE ENVIRONMENT

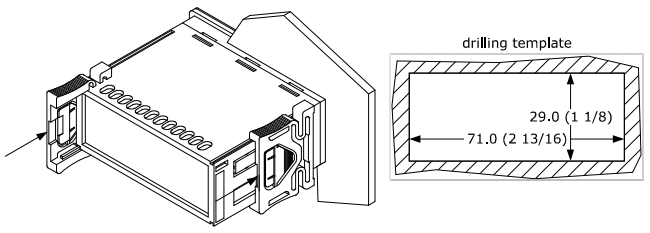
I ENGLISH

- controller for low temperature units
- power supply 115... 230 VAC
- cabinet probe and evaporator probe (PTC/NTC)
- door switch input
- compressor relay 16 A res. @ 250 VAC
- TTL MODBUS slave port for EVCO Android APP or BMS
- cooling or heating operation.

1 MEASUREMENTS AND INSTALLATION

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

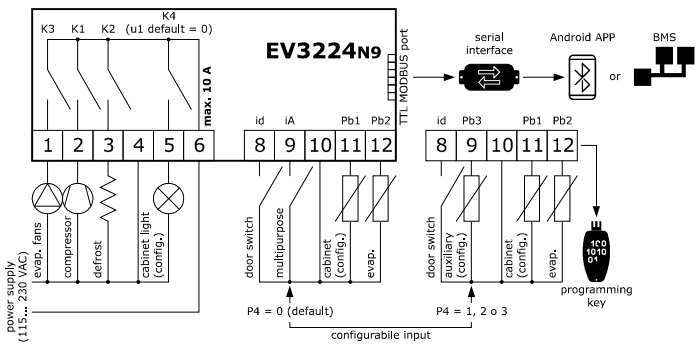




INSTALLATION PRECAUTIONS
- The thickness of the panel must be between 0.8 and 2.0 mm (1/32 and 1/16 in)
- Ensure that the working conditions are within the limits stated in the *TECHNICAL SPECIFICATIONS* section.
- Do not install the device close to heat sources, equipment with a strong magnetic field, 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.

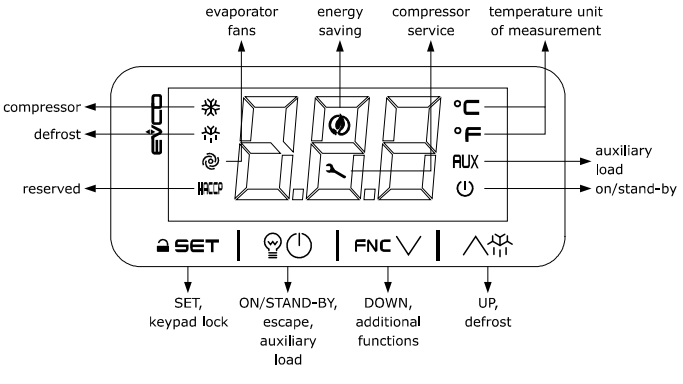
3 FIRST-TIME

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, to use the device with the APP EVconnect connect the interface EVIF25TBX (EVlink); 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 (default), touch the ON/STAND-BY key for 2 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 fans on	evaporator fans off	evaporator fans stop active
HACCP	reserved	reserved	reserved
🍃	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 Loc = 1 (default) and 30s 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.	SET	Touch the SET key.
2.	FNC	Touch the UP or DOWN key within 15s to set the value within the limits r1 and r2 (default "-50... 50")
3.	SET	Touch the SET key (or do not operate for 15s).

4.4 Activate manual defrost

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 heaters** switch on for the u6 duration.
- if u1 = 2 and the keypad is not locked, **auxiliary output** switches on/off.

4.6 Silence buzzer (if present)

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. | FNC | 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 compressor functioning hours and view compressor start-up number

Check that the keypad is not locked.

1.	FNC	Touch the DOWN key for 4 s.
2.	FNC	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.	SET	Touch the SET key.
4.	FNC	Touch the UP or DOWN key to set "**149**" (when label "**rCH**" is selected).
5.	SET	Touch the SET key.
6.		Touch the ON/STAND-BY key (or do not operate for 60 s) to exit the procedure.

5.3 View the temperature detected by the probes

Check that the keypad is not locked.

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

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

3.	SET	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.	SET	Touch the SET key for 4 s: the display will show the label "**PA**".
2.	SET	Touch the SET key.
3.	FNC	Touch the UP or DOWN key within 15 s to set the PAS value (default "**-19**").
4.	SET	Touch the SET key (or do not operate for 15 s): the display will show the label "**SP**".
5.	FNC	Touch the UP or DOWN key to select a parameter.
6.	SET	Touch the SET key.
7.	FNC	Touch the UP or DOWN key within 15s to set the value.
8.	SET	Touch the SET key (or do not operate for 15 s).
9.	SET	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 (only if module EVIF23TSX or interface EVIF25TBX 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
- If the device communicates with the APP EVconnect, the date, time and day of the week will automatically be set by the smartphone or tablet.

Check that the keypad is not locked.

1.	FNC	Touch the DOWN key for 4 s.
2.	FNC	Touch the UP or DOWN key within 15 s to select the label "**rtc**".
3.	SET	Touch the SET key: the display will show the label "**yy**" followed by the last two figures of the year.
4.	FNC	Touch the UP or DOWN key within 15 s to set the year.
5.	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)

6.	SET	Touch the SET key: the display will show the label for the day of the week.
7.		Touch the UP or DOWN key within 15s to set the day of the week.

LAB.	DESCRIPTION
Mon	Monday
tuE	Tuesday
UEd	Wednesday
thu	Thursday
Fri	Friday
Sat	Saturday
Sun	Sunday

8.	SET	Touch the SET key: the device will exit the procedure.
9.		Touch the ON/STAND-BY key to exit the procedure beforehand.

6.3 Restore the factory settings (default) and store customized settings as default

N.B.
- Check that the factory settings are appropriate; see the section *CONFIGURATION PARAMETERS*.
- the storing of customized settings overwrites the default.

1.	SET	Touch the SET key for 4 s: the display will show the label "**PA**".
2.	SET	Touch the SET key.
3.	FNC	Touch the UP or DOWN key within 15 s to set the value.

VAL.	DESCRIPTION
149	value to restore the factory settings (default)
161	value to store customized settings as default

4.	SET	Touch the SET key (or do not operate for 15 s): the display will show the label "**dEF**" (when value "**149**" is set) or the label "**MAP**" (when value "**161**" is set).
5.	SET	Touch the SET key.
6.	FNC	Touch the UP or DOWN key within 15 s to set "**4**".
7.	SET	Touch the SET key (or do not operate for 15 s): the display will show for 4 s "**- - -**" flashing, then the device will exit the procedure.
8.	Interrupt the power supply to the device.	
9.	SET	Touch the SET key 2 s before action 6. to exit the procedure beforehand.

7 CONFIGURATION PARAMETERS

N.	PAR.	DEF.	SETPOINT	MIN... MAX.
1	SP	**0,0**	setpoint	r1... r2; see r0

N.	PAR.	DEF.	ANALOGUE INPUTS	MIN... MAX.
2	CA1	**0,0**	if P4 = 0... 2, cabinet probe offset; if P4 = 3, inlet air probe offset	-25... 25 °C/°F
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 = absent 1 = defrost and fans 2 = fans
9	P4	**0**	configurable input function 0 = digital input (multipurpose input) 1... 3 = analogue input (auxiliary probe)	0 = multipurpose input 1 = condenser probe 2 = critical T probe 3 = outlet air probe if P4 = 3, regulation T = CPT; see P7
10	P5	**0**	value displayed in normal operation	0 = if P4 = 0... 2, cabinet T; if P4 = 3, CPT 1 = SP 2 = evaporator T 3 = auxiliary T; see P4 4 = if P4 = 3, inlet air T
11	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}
12	P8	**5**	display refresh time	0... 250 s : 10

N.	PAR.	DEF.	MAIN REGULATOR	MIN... MAX.
13	r0	**2,0**	setpoint differential	0,1 °C/1 °F... 15 °C/°F; see r12
14	r1	**-50**	minimum setpoint	-99 °C/°F... r2
15	r2	**50,0**	maximum setpoint	r1... 199 °C/°F
16	r4	**0,0**	if r5 = 0, setpoint offset in energy saving	0... 99 °C/°F; see HE2
17	r5	**0**	cooling or heating operation	0 = cooling 1 = heating
18	r6	**0,0**	if r5 = 0, setpoint offset in overcooling; if r5 = 1, setpoint offset in overheating	0... 99 °C/°F; see r7
19	r7	**30**	if r5 = 0, overcooling duration; if r5 = 1 overheating duration	0... 240 min; see r6
20	r8	**0**	DOWN key additional function	0 = none 1 = if r5 = 0, overcooling; if r5 = 1, overheating 2 = energy saving
21	r12	**0**	type of setpoint differential r0	0 = symmetrical 1 = asymmetrical

N.	PAR.	DEF.	COMPRESSOR PROTECTIONS	MIN... MAX.
22	C0	**0**	compressor ON delay after power-on	0... 240 min
23	C2	**3**	compressor OFF minimum time	0... 240 min
24	C3	**0**	compressor ON minimum time	0... 240 s
25	C4	**10**	compressor OFF time in cabinet probe alarm	0... 240 min; see C5
26	C5	**10**	compressor ON time in cabinet probe alarm	0... 240 min; see C4
27	C6	**80,0**	high condensing warning threshold	0... 199 °C/°F differential = 2 °C/4 °F
28	C7	**90,0**	high condensing alarm threshold	0... 199 °C/°F
29	C8	**1**	high condensing alarm delay	0... 15 min
30	C10	**1**	compressor functioning hours for service	0... 999 h x 100 0 = absent
31	C11	**0**	compressor ON delay after other compressor ON	0... 240 min
32	C13	**0**	start-up number to rotate compressors	0... 100 0 = no rotation

N.	PAR.	DEF.	DEFROST (se r5 = 0)	MIN... MAX.
33	d0	**8**	if d8 = 0... 2, defrost interval; if d8 = 3 maximum defrost interval	0... 99 h 0 = only manual
34	d1	**0**	defrost type	0 = electric 1 = hot gas 2 = compressor stopped
35	d2	**8,0**	threshold for defrost end	-99... 99 °C/°F; see d3
36	d3	**30**	se P3 = 0 o 2, defrost duration; se P3 = 1, maximum defrost duration	0... 99 min; see d2
37	d4	**0**	se d8 = 0... 3, enable defrost after power-on	0 = NO 1 = YES
38	d5	**0**	se d4 = 1, defrost dealy after power-on	0... 99 min
39	d6	**2**	if P5 = 0, value displayed in defrost	0 = cabinet T /CPT 1 = at maximum "SP + r0" or cabinet T/CPT at defrost activation 2 = code "**dEF**"
40	d7	**2**	dripping duration	0... 15 min
41	d8	**0**	defrost interval d0 counting mode	0 = device ON 1 = compressor ON 2 = evaporator T < d9 3 = adaptive 4 = real time
42	d9	**0,0**	if d8 = 2, evaporator temperature threshold for defrost interval d0 counting	-99... 99 °C/°F
43	d11	**0**	enable defrost time-out alarm	0 = NO 1 = YES
44	d15	**0**	if d1 = 1, consecutive compressor ON minimum time for defrost consent	0... 99 min
45	d16	**0**	if d1 = 1, pre-dripping duration	0... 99 min
46	d18	**40**	if d8 = 3, defrost interval	0... 999 min; see d0 if compressor ON and evaporator T < d22 0 = only manual
47	d19	**3,0**	if d8 = 3, threshold relative to optimal evaporator temperature for defrost	0... 40 °C/°F "optimal T - d19"
48	d20	**180**	consecutive compressor ON time for defrost	0... 999 min 0 = absent
49	d21	**200**	consecutive compressor ON time after power-on and after overcooling for defrost	0... 500 min if "(cabinet T /CPT - SP) > 10°C/20 °F" 0 = absent
50	d22	**-2,0**	if d8 = 3, threshold relative to optimal evaporator temperature for defrost interval d18 counting	-10... 10 °C/°F "optimal T + d22"

N.	PAR.	DEF.	TEMPERATURE ALARMS	MIN... MAX.
51	AA	**0**	temperature selection for high and low temperature alarm	0 = cabinet T/CPT 1 = evaporator T 2 = auxiliary T; see P4 see A1 and A4
52	A1	**-10,0**	low temperature alarm threshold	-99... 99 °C/°F; see AA, A2 and A11
53	A2	**2**	low temperature alarm type	0 = absent 1 = relat. to SP ("SP - A1") 2 = absolute (A1)
54	A4	**10,0**	high temperature alarm threshold	-99... 99 °C/°F; see AA, A5 and A11
55	A5	**2**	high temperature alarm type	0 = absent 1 = relat. to SP ("SP + A4") 2 = assoluto (A4)
56	A6	**99**	high temperature alarm delay after power-on	0... 99 min x 10
57	A7	**15**	high and low temperature alarms delay	0... 240 min
58	A8	**15**	high temperature alarm delay after defrost end	0... 240 min
59	A9	**15**	high temperature alarm delay after door closing	0... 240 min
60	A10	**10**	power failure duration for power failure alarm storing	0... 240 min
61	A11	**2,0**	A1 and A4 differential	0,1 °C/1 °F... 15 °C/°F

N.	PAR.	DEF.	EVAPORATOR AND CONDENSER FANS	MIN... MAX.
62	F0	**1**	evaporator fans mode in normal operation	0 = OFF 1 = ON 2 = with F15 and F16 if compressor OFF, ON if compressor ON 3 = with F1 4 = OFF if compressor OFF, with F1 if compressor ON
63	F1	**-4,0**	if F0 = 3 or 4 | if r5 = 0, threshold for evaporator fans OFF; if r5 = 1, threshold for evaporator fans ON	-99... 99 °C/°F differential = 1 °C/2 °F
64	F2	**0**	evaporator fans mode in defrost and dripping	0 = OFF 1 = ON 2 = with F0
65	F3	**2**	maximum evaporator fans stop duration	0... 15 min; see F7
66	F4	**0**	evaporator fans OFF time in energy saving	0... 240 s x 10; see F5
67	F5	**10**	evaporator fans ON time in energy saving	0... 240 s x 10; see F4
68	F7	**5,0**	threshold relative to setpoint for evaporator fans stop end	-99... 99 °C/°F; see F3 "SP + F7"
69	F9	**0**	if F0 = 2, evaporator fans OFF delay after compressor OFF	0... 240 s
70	F11	**15,0**	threshold condenser fans ON	0... 99 °C/°F differential = 2 °C/4 °F
71	F12	**30**	if P4 ≠ 1, condenser fans OFF delay after compressor OFF	0... 240 s
72	F15	**0**	if F0 = 2, evaporator fans OFF time with compressor OFF	0... 240 s; see F16
73	F16	**1**	if F0 = 2, evaporator fans ON time with compressor OFF	0... 240 s; see F15

N.	PAR.	DEF.	DIGITAL INPUTS	MIN... MAX.
74	i0	**3**	door switch input function	0 = none 1 = compressor and evaporator fans OFF 2 = evaporator fans OFF 3 = cabinet light ON 4 = compressor and evaporator fans OFF, cabinet light ON 5 = evaporator fans OFF, cabinet light ON
75	i1	**0**	door switch input contact type	0 = normally open 1 = normally closed
76	i2	**30**	door open alarm delay	-1... 120 min -1 = absent
77	i3	**15**	regulation by-pass maximum time with door open	-1... 120 min -1 = until the door closing
78	i5	**2**	multipurpose input function	0 = none 1 = energy saving 2 = multipurpose input alarm 3 = auxiliary output ON 4 = device stand-by 5 = compressor thermal protection alarm 6 = global thermal protection alarm
79	i6	**0**	multipurpose input contact type	0 = normally open 1 = normally closed
80	i7	**0**	if i5 = 2, multipurpose input alarm delay; if i5 = 5 or 6, compressor ON delay after alarm end	-1... 120 min -1 = absent
81	i10	**0**	closed door consecutive time for energy saving	0... 999 min; see HE2 after cabinet T /CPT < SP 0 = absent
82	i13	**180**	number of door openings for defrost	0... 240 0 = absent
83	i14	**32**	open door consecutive time for defrost	0... 240 min 0 = absent

N.	PAR.	DEF.	DIGITAL OUTPUTS	MIN... MAX.
84	u1	**0**	auxiliary relay function	0 = cabinet light 1 = demisting heaters 2 = auxiliary output 3 = alarm output 4 = door heaters 5 = neutral zone heaters 6 = condenser fans 7 = on/stand-by output 8 = compressor 2
85	u2	**0**	enable cabinet light and auxiliary output ON/OFF in stand-by	0 = NO 1 = YES only manual
86	u4	**0**	enable alarm output OFF with buzzer silencing	0 = NO 1 = YES
87	u5	**-1,0**	threshold for door heaters ON	-99... 99 °C/°F differential = 2 °C/4 °F
88	u6	**5**	duration demisting heaters ON	1... 120 min
89	u7	**-5,0**	threshold relative to setpoint for neutral zone heaters ON	-99... 99 °C/°F differential = 2 °C/4 °F "SP + u7"

N.	PAR.	DEF.	ENERGY SAVING	MIN... MAX.
90	HE2	**0**	maximum energy saving duration	0... 999 min; see i10 -1 = until the door opening

N.	PAR.	DEF.	REAL TIME ENERGY SAVING	MIN... MAX.
91	H01	**0**	Monday energy saving time	0... 23 h; see H02
92	H02	**0**	Monday energy saving duration	0... 24 h; see H01
93	H03	**0**	Tuesday energy saving time	0... 23 h; see H04
94	H04	**0**	Tuesday energy saving duration	0... 24 h; see H03
95	H05	**0**	Wednesday energy saving time	0... 23 h; see H06
96	H06	**0**	Wednesday energy saving duration	0... 24 h; see H05
97	H07	**0**	Thursday energy saving time	0... 23 h; see H08
98	H08	**0**	Thursday energy saving duration	0... 24 h; see H07
99	H09	**0**	Friday energy saving time	0... 23 h; see H010
100	H10	**0**	Friday energy saving duration	0... 24 h; see H09
101	H11	**0**	Saturday energy saving time	0... 23 h; see H012
102	H12	**0**	Saturday energy saving duration	0... 24 h; see H11
103	H13	**0**	Sunday energy saving time	0... 23 h; see H014
104	H14	**0**	Sunday energy saving duration	0... 24 h; see H13

N.	PAR.	DEF.	REAL TIME DEFROST (if d8 = 4)	MIN... MAX.
105	Hd1	**h-**	first daily defrost time	h- = absent
106	Hd2	**h-**	second daily defrost time	h- = absent
107	Hd3	**h-**	third daily defrost time	h- = absent
108	Hd4	**h-**	fourth daily defrost time	h- = absent
109	Hd5	**h-**	fifth daily defrost time	h- = absent
110	Hd6	**h-**	sixth daily defrost time	h- = absent

N.	PAR.	DEF.	SAFETIES	MIN... MAX.
111	POF	**1**	enable ON/STAND-BY key	0 = NO 1 = YES
112	PAS	**-19**	configuration parameters settings password	-99... 999
113	PA1	**426**	User password Android APP EVCO	-99... 999
114	PA2	**824**	Maintenance password Android APP EVCO	-99... 999

N.	PAR.	DEF.	REAL TIME CLOCK	MIN... MAX.
115	Hr0	**1**	enable real time clock	0 = NO 1 = YES

N.	PAR.	DEF.	DATA-LOGGING ON EVLINK	MIN... MAX.
116	bLE	**1**	enable EVlink	0 = NO 1 = SÌ
117	rE0	**15**	data-logging interval on EVlink	0... 240 min
118	rE1	**1**	temperature selection for data-logging on EVlink	0 = none 1 = cabinet T 2 = evaporator T 3 = auxiliary T 4 = cabinet and evaporat. T 5 = all

N.	PAR.	DEF.	MODBUS	MIN... MAX.
119	LA	**247**	MODBUS address	1... 247
120	Lb	**2**	MODBUS baud rate (no parity)	0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud

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	real time clock alarm	manual	set date, time and day of the week
AL	low temperature alarm	automatic	check A1
AH	high temperature alarm	automatic	check A4
id	door open alarm	automatic	check i0 e i1
PF	power failure alarm	manual	- touch a key - check electrical connection
COH	high condensing warning	automatic	check C6
CSd	high condensing alarm	manual	- switch the device off and on - check C7
iA	multipurpose input alarm	automatic	check i5 and i6
Cth	compressor thermal protection alarm	automatic	check i5 and i6
th	global thermal protection alarm	manual	- switch the device off and on - check i5 and i6
dFd	defrost time-out 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
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 mm²	Removable screw terminal blocks for wires up to 2,5 mm²; 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)
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
Earthing methods for the control device		None
Rated impulse-withstand voltage		2.5 KV
Over-voltage category		II
Software class and structure		A
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)
	Resolution	0.1 °C (1 °F)
NTC probes	Sensor type	ß3435 (10 KΩ @ 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)
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 (multipurpose input)
Digital outputs		4 electro-mechanical relays (compressor, defrost, evaporator fans and auxiliary relay)
Compressor relay (K1):		SPST, 16 A res. @ 250 VAC
Defrost relay (K2):		SPST, 8 A res. @ 250 VAC
Evaporator fans relay (K3):		SPST, 5 A res. @ 250 VAC
Auxiliary relay (K4):		SPST, 5 A res. @ 250 VAC
The device guarantees double insulation between each digital output connector and the rest of the components of the device.		
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		By request
Communication ports		1 TTL MODBUS slave port for EVCO Android APP or BMS

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

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