EV3254N9VWHXX1

## Controllers for refrigerated units with variable speed compressor, compatible with the EVconnect APP and the EPoCA system

EVCO

EPoCA compatible

PLEASE READ CAREFULLY
and save this document
CONSIDER THE ENVIRONMENT

E   ENGLISH

- Controllers for low temperature units.
- Power supply 115... 230 VAC.
- Cabinet probe and evaporator probe (NTC/Pt 1000).
- Door switch input.
- Compressor relay 16 A res. @ 250 VAC.
- sealed relays compliant with the standard EN 60079-15.
- Alarm buzzer.
- TTL MODBUS slave port for EVconnect app, EPoCA remote monitoring system or for BMS (according to the model).
- on-off/PID control.
- Cooling or heating operation.

1   MEASUREMENTS AND INSTALLATION

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


drilling template
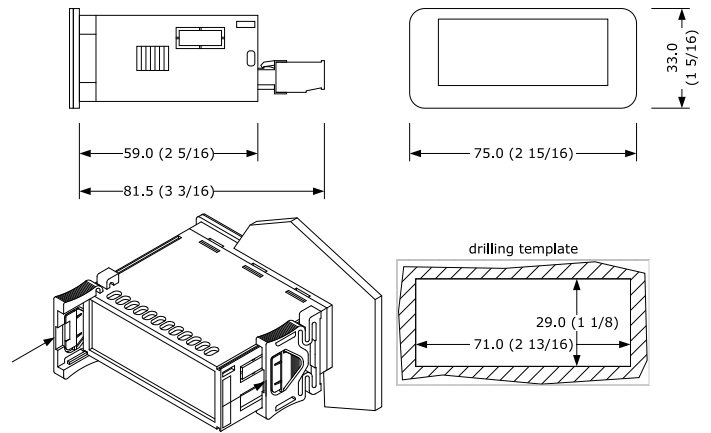
INSTALLATION PRECAUTIONS

- 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.

Option A: electrical connection with cabinet probe, evaporator probe and door switch input (P4 = 0, default) active with contact closed (i1 = 0, default).
Option B: electrical connection with cabinet probe, evaporator probe and condenser probe (P4 = 1).
Option C: electrical connection with cabinet probe, evaporator probe, condenser probe + door switch input (P4 = 2) active with contact closed (i1 = 0, default).
Option D: electrical connection with cabinet probe, evaporator probe, condenser probe + door switch input (P4 = 2) active with contact open (i1 = 1).

A door opening can be interpreted as a condenser probe alarm.
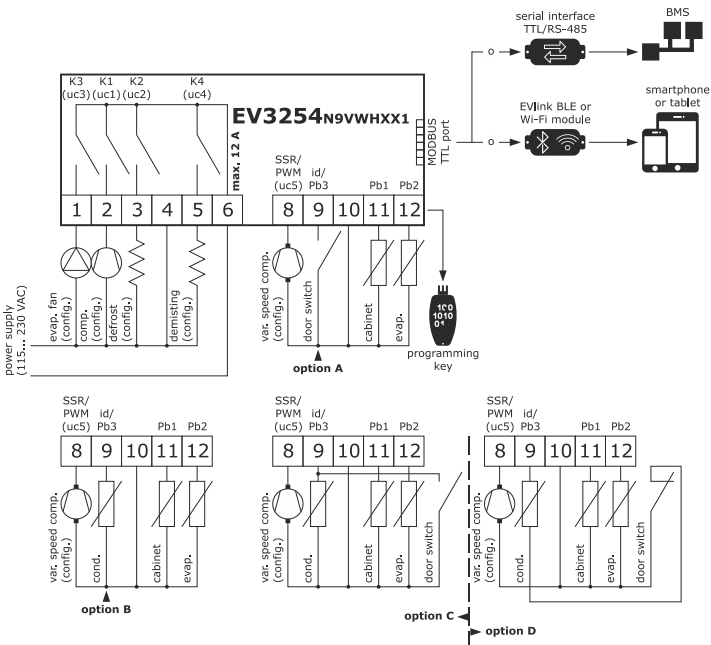
PRECAUTIONS FOR ELECTRICAL CONNECTION

- 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-er.
- 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.
SP1	0.0	setpoint	r1... r2
P0	1	probe type	0 = P t 1000 1 = NTC
P2	0	temperature unit of measurement	0 = °C 1 = °F
d1	0	defrost type	0 = electric 1 = hot gas
			2 = compressor stopped

r15	1	compressor type	0 = Custom
			1 = Embraco VEM
			2 = Embraco VEG
			3 = Embraco VNEK e VNEU
			4 = Secop VNL 50... 150 Hz
			5 = Secop 33... 133 Hz
			6 = Tecumseh 85... 150 Hz
			7 = Embraco VES
			8 = Embraco FMX
			9 = Embraco VESF

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 use the device with the APP EVconnect connect the interface EVIF25TBX. To use the device with the EPoCA remote monitoring system, connect the EVIF25TWX module; see the relevant instruction sheets. **If EVIF22TSX is used, set parameter bLE to 0.**
7. Power up the device.

4   USER INTERFACE AND MAIN FUNCTIONS
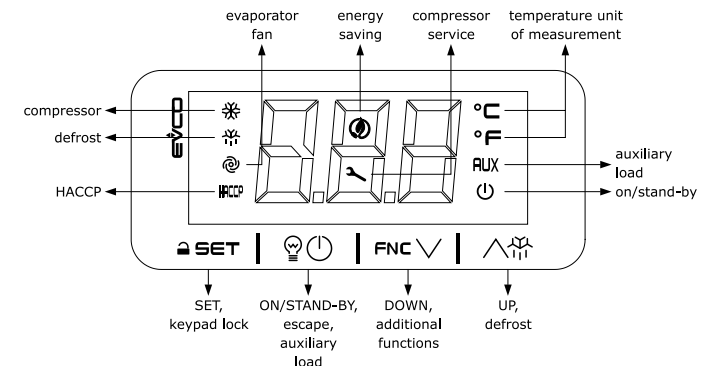
4.1   Switching the device on/off

1.   If POF = 1 (default), touch the ON/STAND-BY key for 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 in EVlink	-	-
🌿	energy saving active	-	-
🔧	request for compressor service	-	- settings active / - access to additional functions active / - operation with EVconnect APP 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 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.	⚿ SET	Touch the SET key.
2.	FNC∨ / ∧❈	Touch the UP or DOWN key within 15 s to set the value within the limits r1 and r2 (default "-40... 50")
3.	⚿ SET	Touch the SET key (or do not operate for 15 s).

If the door is open, the settings has effect on setpoint 2.

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 uc1... uc4 = 3)

1.	⚿⏻	Touch the ON/STAND-BY key.

- if uc1... uc4 = 4, the **demisting** also witches on for the u6 duration
- if uc1... uc4 = 5 and the keypad is not locked, the **button-operated load** also switches on/off.

4.6   Silence buzzer
Touch a key.
If uc1... uc4 = 6 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 comp. 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
Pb2	evaporator temperature (if P3 = 1 or 2)
Pb3	condenser temperature (if P4 = 1 or 2)

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

5.4   Outputs test

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 "- - -".
5.	∧❈	Touch the UP key to select a label.

LAB.	DESCRIPTION
U1	activating relay K1
U2	activating relay K2
U3	activating relay K3
U4	activating relay K4
U5	activating output SSR/PWM at 150 Hz

6.	⚿ SET	Touch the SET key for 4 s (or do not operate for 120 s) to exit the procedure.

6   SETTINGS

6.1   Preliminary notes
Through the setup software system Parameters Manager it is possible to modify the accessibility level of the configuration parameters:
- level 0 (hidden)
- level 1 (not protected by access password)
- level 2 (default, protected by access password that can be changed)
- level 3 (protected by access password that cannot be changed)
For further information please consult the user manual of Parameters Manager.

6.2   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 15 s 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 (available EVIF25TWX module 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 EVconnect app, the date, time and day of the week will be automatically 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.	FNC∨ / ∧❈	Touch the UP or DOWN key within 15 s 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.

7   CONFIGURATION PARAMETERS

	N.	PAR.	DEF.	SETPOINT	MIN... MAX.
🌡	1	SP	0.0	setpoint	r1... r2
	2	SP2	0.0	setpoint 2	r1... r2
	N.	PAR.	DEF.	ANALOGUE INPUTS	MIN... MAX.
🔍	2	CA1	0.0	cabinet 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 = Pt 1000 1 = NTC
	6	P1	1	enable °C decimal point	0 = no 1 = yes

N.	PAR.	DEF.	Description	MIN... MAX.
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 = door switch input / 1 = condenser probe / 2 = condenser probe + door switch input
10	P5	0	value displayed	0 = regulation temperature / 1 = setpoint / 2 = evaporator temperature / 3 = condenser temperature
11	P6	0	enable evaporator fans speed modification	0 = no 1 = yes
12	P8	5	display refresh minimum time of 1/10 °C	0... 250 s : 10

N.	PAR.	DEF.	REGULATION	MIN... MAX.
13	r0	2.0	setpoint differential	0.1... 25 °C/°F
14	r1	-40	minimum setpoint	-99 °C/°F... r2
15	r2	50.0	maximum setpoint	r1... 300 °C/°F
16	r4	0.0	setpoint offset in energy saving	0... 99 °C/°F
17	r5	0	cooling or heating operation	0 = cooling / 1 = heating
18	r6	0.0	setpoint offset in overcooling/overheating	0... 99 °C/°F
19	r7	30	overcooling/overheating duration	0... 240 min
20	r8	0	DOWN key additional function	0 = disabled / 1 = overcooling/overheating / 2 = energy saving
21	r9	0.0	proportional band (relative to setpoint) for PWM compressor at fixed speed	0... 99 °C/°F setpoint + r9
22	r10	0	PWM compressor speed below the r9 band	0... 100 %
23	r11	85	PWM compressor speed in power-on	20... 200 Hz
24	r12	10	PWM compressor at r11 from power-on	0... 999 s
25	r13	0.0	proportional band (relative to setpoint)	0... 99 °C/°F setpoint + r13 / 0 = operation with on-off compressor, SP and r0
26	r14	10	integral action time	0... 99 min
27	r15	3	tipo di compressore	0 = Custom / 1 = Embraco VEM / 2 = Embraco VEG / 3 = Embraco VNEK e VNEU / 4 = Secop VNL 50... 150 Hz / 5 = Secop 33... 133 Hz / 6 = Tecumseh 85... 150 Hz / 7 = Embraco VES / 8 = Embraco FMX / 9 = Embraco VESF
28	r16	0.0	compressor 2 threshold	-99... 99 °C/°F
29	r17	0	PWM compressor frequency in power off	0... 50 Hz
30	r18	50	PWM compressor minimum frequency	20... 100 Hz
31	r19	150	PWM compressor maximum frequency	20... 200 Hz
32	r20	30	RPM per Hertz	0... 50
33	r21	70	evaporator fan speed	0... 100 %
34	r22	40	evaporator fan minimum speed	0... 100 %
35	r23	80	evaporator fan maximum speed	0... 100 %

N.	PAR.	DEF.	COMPRESSOR	MIN... MAX.
36	C0	0	compressor on delay after power-on	0... 240 min
37	C2	0	compressor off minimum time	0... 240 min
38	C3	0	compressor on minimum time	0... 240 s
39	C4	10	compressor off time during cabinet probe alarm	0... 240 min
40	C5	10	compressor on time during cabinet probe alarm	0... 240 min
41	C9	5	consecutive time cabinet temperature in proportional band for compressor at maximum speed	0... 99 h / 0 = disabled / until cabinet temperature < setpoint
42	C10	1	compressor hours for service	0... 999 h x 100 / 0 = disabled

N.	PAR.	DEF.	DEFROST (if r5 = 0)	MIN... MAX.
43	d0	8	automatic defrost interval	0... 99 h / 0 = only manual / if d8 = 3, maximum interval
44	d1	0	defrost type	0 = electric / 1 = hot gas / 2 = compressor stopped
45	d2	2.0	threshold for defrost end	-99... 99 °C/°F
46	d3	30	defrost duration	0... 99 min / se P3 = 1, maximum duration
47	d4	0	enable defrost at power-on	0 = no 1 = yes
48	d5	0	defrost delay after power-on	0... 99 min
49	d6	1	value displayed during defrost	0 = cabinet temperature / 1 = display locked / 2 = dEF label
50	d7	2	dripping time	0... 15 min
51	d8	3	defrost interval counting mode	0 = device on hours / 1 = compressor on hours / 2 = hours evaporator temperature < d9 / 3 = adaptive
52	d9	0.0	evaporation threshold for automatic defrost interval counting	-99... 99 °C/°F
53	d11	0	enable defrost timeout alarm	0 = no 1 = yes
54	d15	0	compressor on consecutive time for hot gas defrost	0... 99 min
55	d16	0	pre-dripping time for hot gas defrost	0... 99 min
56	d18	40	adaptive defrost interval	0... 999 min / if compressor on + evaporator temperature < d22 / 0 = only manual
57	d19	3.0	threshold for adaptive defrost (relative to optimal evaporation temperature)	0... 40 °C/°F / optimal evaporation temperature - d19
58	d20	180	compressor on consecutive time for defrost	0... 999 min
59	d21	200	compressor on consecutive time for defrost after power-on and overcooling	0... 500 min / if (cabinet temperature - setpoint) > 10°C/20 °F / 0 = disabled
60	d22	-2.0	evaporation threshold for adaptive defrost interval counting (relative to optimal evaporation temperature)	-99... 99 °C/°F / optimal evaporation temperature + d22

N.	PAR.	DEF.	ALARMS	MIN... MAX.
61	AA	0	select value for high/low temperature alarms	0 = cabinet temperature / 1 = condenser temperature (always absolute alarm)
62	A1	-10.0	threshold for low temperature	-99... 99 °C/°F / 0 = disabled / if A11 < 0, absolute (A1) / if A11 > 0, relative to setpoint (setpoint – A1)
63	A4	10.0	threshold for high temperature	-99... 99 °C/°F / 0 = disabled / if A11 < 0, absolute (A4) / if A11 > 0, relative to setpoint (setpoint + A4)
64	A6	12	high temperature alarm delay after power-on	0... 99 min x 10
65	A7	15	high/low temperature alarms delay	0... 240 min
66	A8	15	high temperature alarm delay after defrost	0... 240 min
67	A9	15	high temperature alarm delay after door closing	0... 240 min
68	A10	10	power failure duration for alarm recording	0... 240 min
69	A11	-2.0	high/low temperature alarms reset differential	-25... 25 °C/°F

N.	PAR.	DEF.	FANS	MIN... MAX.
70	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
71	F1	-1.0	threshold for evaporator fan operation	-99... 99 °C/°F / differential = 1 °C/2 °F
72	F2	0	evaporator fan mode during defrost and dripping	0 = off 1 = on / 2 = according to F0
73	F3	2	evaporator fan off maximum time	0... 15 min
74	F4	30	evaporator fan off time during energy saving	0... 240 s x 10
75	F5	30	evaporator fan on time during energy saving	0... 240 s x 10
76	F7	5.0	threshold for evaporator fan on after dripping (relative to setpoint)	-99... 99 °C/°F / setpoint + F7
77	F9	0	evaporator fan off delay after compressor off	0... 240 s / if F0 = 2
78	F11	15.0	threshold for condenser fan on	0... 99 °C/°F / differential = 2 °C/4 °F
79	F12	30	condenser fan off delay after compressor off	0... 240 s
80	F13	10	condenser fans speed differential	0.1... 15 °C/°F
81	F15	60	evaporator fan off time with compressor off	0... 240 s / if F0 = 2
82	F16	0	evaporator fan on time with compressor off	0... 240 s / if F0 = 2

N.	PAR.	DEF.	DIGITAL INPUTS	MIN... MAX.
83	i0	2	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
84	i1	0	door switch input activation	0 = with contact closed / 1 = with contact open
85	i2	30	open door alarm delay	-1... 120 min / -1 = disabled
86	i3	15	regulation inhibition maximum time with door open	-1... 120 min / -1 = until the closing
87	i10	0	door closed consecutive time for energy saving	0... 999 min / after cabinet temperature < SP / 0 = disabled
88	i13	180	number of door openings for defrost	0... 240 / 0 = disabled
89	i14	32	door open consecutive time for defrost	0... 240 min / 0 = disabled

N.	PAR.	DEF.	DIGITAL OUTPUTS	MIN... MAX.
90	u1c	0	relay K1 configuration	0 = compressor / 1 = defrost / 2 = evaporator fan / 3 = cabinet light / 4 = demisting / 5 = button-operated load / 6 = alarm / 7 = door heaters / 8 = heater for neutral zone / 9 = condenser fan / 10 = on/stand-by / 11 = compressor 2 / 12 = dripping heater
91	uc2	1	relay K2 configuration	like uc1
92	uc3	2	relay K3 configuration	like uc1
93	uc4	4	relay K4 configuration	like uc1
94	uc5	11	output SSR/PWM configuration SSR if uc5 = 0... 12 PWM if uc5 = 13... 15	0 = compressor / 1 = defrost / 2 = evaporator fan / 3 = cabinet light / 4 = demisting / 5 = button-operated load / 6 = alarm / 7 = door heaters / 8 = heater for neutral zone / 9 = condenser fan / 10 = on/stand-by / 11 = compressor 2 / 12 = dripping heater / 13 = variable speed compressor / 14 = 50... 150 Hz variable speed condenser fans / 15 = 50... 150 Hz variable speed evaporator fans
95	u2	0	enable cabinet light and button-operated load in stand-by	0 = no 1 = yes / manual
96	u4	1	enable alarm output off silencing the buzzer	0 = no 1 = yes
97	u5	-1.0	threshold for door heaters on (u5 – 2 °C/4 °F)	-99... 99 °C/°F / if u11 = 1, threshold for door heaters off / differential = 2 °C/4 °F
98	u6	8	demisting on duration	0... 120 min
99	u7	-5.0	neutral zone threshold for heating (relative to setpoint)	-99... 99 °C/°F / differential = 2 °C/4 °F / setpoint + u7
100	u11	0	select value for door heaters	0 = cabinet temperature / 1 = condenser temperature

N.	PAR.	DEF.	ENERGY SAVING (if r5 = 0)	MIN... MAX.
101	HE2	0	energy saving maximum duration	0... 999 min

N.	PAR.	DEF.	SAFETIES	MIN... MAX.
102	POF	1	enable ON/STAND-BY key	0 = no 1 = yes
103	PAS	-19	password	-99... 999
104	PA1	426	level 1 password	-99... 999
105	PA2	824	level 2 password	-99... 999

N.	PAR.	DEF.	REAL TIME CLOCK	MIN... MAX.
106	Hr0	0	enable clock	0 = no 1 = yes

N.	PAR.	DEF.	DATA-LOGGING EVLINK	MIN... MAX.
107	bLE	1	serial port configuration for connectivity	0 = free / 1 = forced for EVconnect or EPoCA / 2-99 = EPoCA local network address
108	rE0	15	data-logger sampling interval	0... 240 min
109	rE1	1	recorded temperature	0 = none 1 = cabinet / 2 = evaporator / 3 = condensatore / 4 = cabinet and evaporator / 5 = all

N.	PAR.	DEF.	MODBUS	MIN... MAX.
110	LA	247	MODBUS address	1... 247
111	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	condenser 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 and A1
AH	high temperature alarm	automatic	check AA and A4
id	open door alarm	automatic	check i0 e i1
PF	power failure alarm	manual	- touch a key / - check electrical connection
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	
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 inputs: 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 NTC or Pt 1000 probes (cabinet probe and evaporator probe)		
NTC probes	Sensor type	83435 (10 KΩ @ 25 °C, 77 °F)	
	Measurement field	From -40 to 105 °C (from -40 to 221 °F)	
	Resolution	0.1 °C (1 °F)	
Pt 1000 probes	Sensor type	83435 (1 KΩ @ 0 °C, 32 °F)	
	Measurement field	From -50 to 150 °C (from -58 to 302 °F)	
	Resolution	0.1 °C (1 °F)	
Other inputs	Input configurable for analogue input (condenser probe) or digital input (door switch input)		
Dry contact:	Kind of contact:	5 VDC, 1,5 mA	
	Power supply:	none	
	Protection:	none	
Other outputs:	1 SSR/PWM		
PWM sinal:	Power supply:	12 VDC (+16 % -25 %), 20 mA max.	
	Frequency:	0... 150 Hz	
	Protection:	none	
Digital outputs	4 with sealed electro-mechanical relays in compliance with the EN 60079-15 standard		
Relay K1		SPST, 16 A res. @ 250 VAC	
Relay K2		SPST, 8 A res. @ 250 VAC	
Relay K3		SPST, 5 A res. @ 250 VAC	
Relay K4		SPST, 5 A res. @ 250 VAC	
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 EVconnect app, EPoCA remote monitoring system or for BMS	

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