EV3W24 — EPoCA gateway (via Ethernet) in a RS-485 network of EPoCA compatible controllers

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.
- Incorporated clock.
- Cabinet probe and evaporator probe (PTC/NTC).
- Door switch input.
- Compressor relay 16 A res. @ 250 VAC.
- Alarm buzzer.
- RS-485 MODBUS master port for network of 10 EPoCA-compatible controllers.
- plug and play Ethernet port for Internet gateway.
- Cooling or heating operation.

1   MEASUREMENTS AND INSTALLATION

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

33.0 (1 5/16)
74.0 (2 15/16)
75.0 (2 15/16)
drilling template
29.0 (1 1/8)
71.0 (2 13/16)
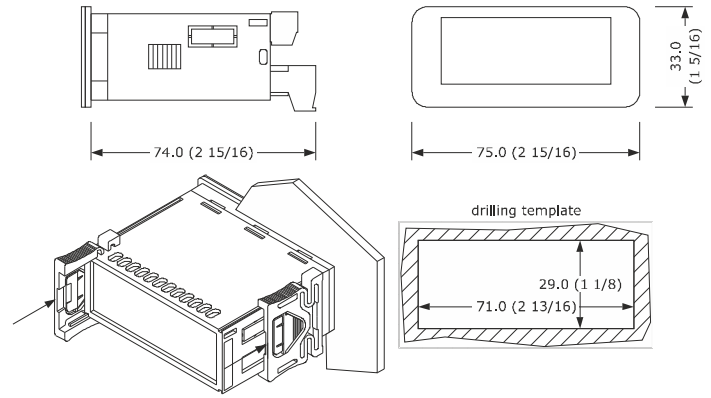
INSTALLATION PRECAUTIONS

- 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
- Connect the RS-485 using a twisted pair.
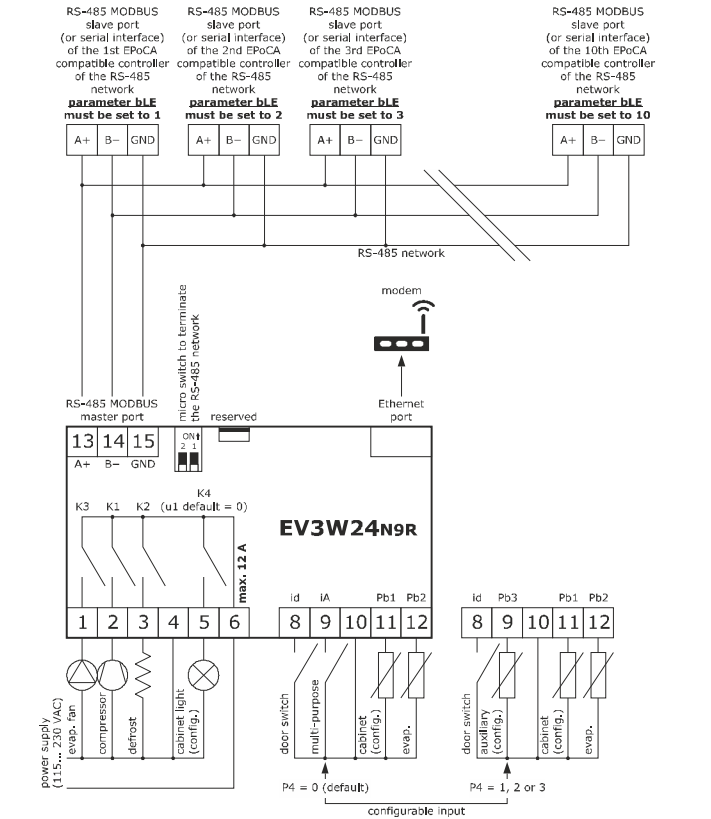
Fit the termination of the first and last controller of the RS-485 network.
The device is always the first controller of the network: to fit the termination, place micro-switch 1 in position ON.

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.
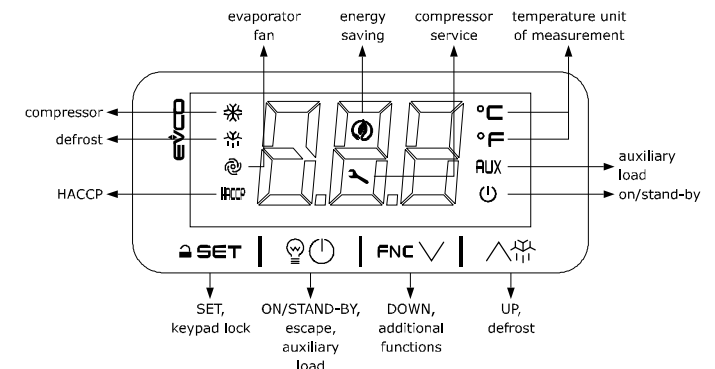- For repairs and for further information, contact the EVCO sales network.

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. Power up the device.

4   USER INTERFACE AND MAIN FUNCTIONS

evaporator fan | energy saving | compressor service | temperature unit of measurement
compressor | defrost | HACCP
auxiliary load | on/stand-by

SET, keypad lock | ON/STAND-BY, escape, auxiliary load | DOWN, additional functions | UP, defrost

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)	defrost or pre-dripping active	-	- defrost delay active - dripping active
fan	evaporator fan on	evaporator fan off	evaporator fan stop active
HACCP	saved HACCP alarm	-	-
energy	energy saving active	-	-
wrench	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
on/off	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 / UP-DOWN	Touch the UP or DOWN key within 15 s to set the value within the limits r1 and r2 (default "-50… 50")
3.	SET	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.	UP	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.	ON/STAND-BY	Touch the ON/STAND-BY key.

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

4.6   Silence buzzer

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 comp. start-up number

Check that the keypad is not locked.

1.	FNC	Touch the DOWN key for 4 s.
2.	FNC / UP-DOWN	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 / UP-DOWN	Touch the UP or DOWN key to set "149" (when label "rCH" is selected).
5.	SET	Touch the SET key.
6.	ON/STAND-BY	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 / UP-DOWN	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.	ON/STAND-BY	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 / UP-DOWN	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 / UP-DOWN	Touch the UP or DOWN key to select a parameter.
6.	SET	Touch the SET key.
7.	FNC / UP-DOWN	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

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 you set the date, time and day of the week of a controller of the RS-485 network (also by the EPoCA remote monitoring system) this setting will automatically be updated in all the controllers of the network

Check that the keypad is not locked.

1.	FNC	Touch the DOWN key for 4 s.
2.	FNC / UP-DOWN	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 / UP-DOWN	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 / UP-DOWN	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.	ON/STAND-BY	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 / UP-DOWN	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 / UP-DOWN	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
N.	**PAR.**	**DEF.**	**ANALOGUE INPUTS**	**MIN… MAX.**
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

Wiring / terminal reference (electrical connection area)

RS-485 MODBUS slave port (or serial interface) of the 1st EPoCA compatible controller of the RS-485 network — **parameter bLE must be set to 1**
A+ B− GND

RS-485 MODBUS slave port (or serial interface) of the 2nd EPoCA compatible controller of the RS-485 network — **parameter bLE must be set to 2**
A+ B− GND

RS-485 MODBUS slave port (or serial interface) of the 3rd EPoCA compatible controller of the RS-485 network — **parameter bLE must be set to 3**
A+ B− GND

RS-485 MODBUS slave port (or serial interface) of the 10th EPoCA compatible controller of the RS-485 network — **parameter bLE must be set to 10**
A+ B− GND

RS-485 network

modem

RS-485 MODBUS master port   reserved   Ethernet port

micro switch to terminate the RS-485 network
ON 1

13 14 15
A+ B− GND

K3 K1 K2 (u1 default = 0)
K4

EV3W24N9R   max. 12 A

1 2 3 4 5 6 | 8 9 10 11 12 | 8 9 10 11 12
id iA Pb1 Pb2 | id Pb3 Pb1 Pb2

power supply (115… 230 VAC) | compressor | defrost | cabinet light (config.) | door switch / multi-purpose | cabinet (config.) | evap.
door switch | auxiliary (config.) | cabinet (config.) | evap.

P4 = 0 (default)   P4 = 1, 2 or 3
configurable input

N.	PAR.	DEF.	DESCRIPTION	MIN... MAX.
11	P7	5	air in weight for calculated product temperature (CPT)	0... 10 % x 10, CPT = {[(P7 x (air in)] + [(100 - P7) x (air out)] : 100}
12	P8	5	display refresh time	0... 250 s : 10
N.	**PAR.**	**DEF.**	**REGULATION**	**MIN... MAX.**
13	r0	2.0	setpoint differential	1... 15 °C/°F
14	r1	-50	minimum setpoint	-99... °C/°F... r2
15	r2	50.0	maximum setpoint	r1... 199 °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	r12	0	position of the r0 differential	0 = asymmetric, 1 = symmetric
N.	**PAR.**	**DEF.**	**COMPRESSOR**	**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 during cabinet probe alarm	0... 240 min
26	C5	10	compressor on time during cabinet probe alarm	0... 240 min
27	C6	80.0	threshold for high condensation warning	0... 199 °C/°F, differential = 2 °C/4 °F
28	C7	90.0	threshold for high condensation alarm	0... 199 °C/°F
29	C8	1	high condensation alarm delay	0... 15 min
30	C10	0	compressor hours for service	0... 999 h x 100, 0 = disabled
31	C11	0	second compressor switch-on delay	0... 240 s
32	C13	0	number of start-ups for compressor rotation	0... 10, 0 = disabled
N.	**PAR.**	**DEF.**	**DEFROST (if r5 = 0)**	**MIN... MAX.**
33	d0	8	automatic defrost interval	0... 99 h, 0 = only manual, if d8 = 3, maximum interval
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
36	d3	30	defrost duration	0... 99 min, se P3 = 1, maximum duration
37	d4	0	enable defrost at power-on	0 = no 1 = yes
38	d5	0	defrost delay after power-on	0... 99 min
39	d6	2	value displayed during defrost	0 = regulation temperature, 1 = display locked, 2 = dEF label
40	d7	2	dripping time	0... 15 min
41	d8	0	defrost interval counting mode	0 = device on hours, 1 = compressor on hours, 2 = hours evaporator temperature < d9, 3 = adaptive, 4 = real time
42	d9	0.0	evaporation threshold for automatic defrost interval counting	-99... 99 °C/°F
43	d11	0	enable defrost timeout alarm	0 = no 1 = yes
44	d15	0	compressor on consecutive time for hot gas defrost	0... 99 min
45	d16	0	pre-dripping time for hot gas defrost	0... 99 min
46	d18	40	adaptive defrost interval	0... 999 min, if compressor on + evaporator temperature < d22, 0 = only manual
47	d19	3.0	threshold for adaptive defrost (relative to optimal evaporation temperature)	0... 40 °C/°F, optimal evaporation temperature - d19
48	d20	180	compressor on consecutive time for defrost	0... 999 min, 0 = disabled
49	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
50	d22	-2.0	evaporation threshold for adaptive defrost interval counting (relative to optimal evaporation temperature)	-10... 10 °C/°F, optimal evaporation temperature + d22
N.	**PAR.**	**DEF.**	**ALARMS**	**MIN... MAX.**
51	AA	0	select value for high/low temperature alarms	0 = regulation temperature, 1 = evaporator temperature, 2 = auxiliary temperature
52	A1	-10.0	threshold for low temperature alarm	-99... 99 °C/°F
53	A2	2	low temperature alarm type	0 = disabled, 1 = relative to setpoint, 2 = absolute
54	A4	10.0	threshold for high temperature alarm	-99... 99 °C/°F
55	A5	2	high temperature alarm type	0 = disabled, 1 = relative to setpoint, 2 = absolute
56	A6	12	high temperature alarm delay after power-on	0... 99 min x 10
57	A7	15	high/low temperature alarms delay	0... 240 min
58	A8	15	high temperature alarm delay after defrost	0... 240 min
59	A9	15	high temperature alarm delay after door closing	0... 240 min
60	A10	10	power failure duration for alarm recording	0... 240 min
61	A11	2.0	low temperature alarms reset differential	1... 15 °C/°F
N.	**PAR.**	**DEF.**	**FANS**	**MIN... MAX.**
62	F0	1	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)
63	F1	-4.0	threshold for evaporator fan operation	-99... 99 °C/°F, differential = 1 °C/2 °F
64	F2	0	evaporator fan mode during defrost and dripping	0 = off 1 = on, 2 = according to F0
65	F3	2	evaporator fan off maximum time	0... 15 min
66	F4	0	evaporator fan off time during energy saving	0... 240 s x 10
67	F5	10	evaporator fan on time during energy saving	0... 240 s x 10
68	F7	5.0	threshold for evaporator fan on after dripping (relative to setpoint)	-99... 99 °C/°F, setpoint + F7
69	F9	0	evaporator fan off delay after compressor off	0... 240 s, if F0 = 2
70	F11	15.0	threshold for condenser fan on	0... 99 °C/°F, differential = 2 °C/4 °F
71	F12	30	condenser fan off delay after compressor off	0... 240 s, if P4 ≠ 1
72	F15	0	evaporator fan off time with compressor off	0... 240 s, if F0 = 2
73	F16	1	evaporator fan on time with compressor off	0... 240 s, if F0 = 2
N.	**PAR.**	**DEF.**	**DIGITAL INPUTS**	**MIN... MAX.**
74	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
75	i1	0	door switch input activation	0 = with contact closed, 1 = with contact open
76	i2	30	open door alarm delay	-1... 120 min, -1 = disabled
77	i3	15	regulation inhibition maximum time with door open	-1... 120 min, -1 = until the closing
78	i5	2	door switch/multi-purpose input function	0 = disabled, 1 = energy saving, 2 = iA alarm, 3 = button-operated load on, 4 = device on/off, 5 = Cth alarm, 6 = th alarm
79	i6	0	door switch/multi-purpose input activation	0 = with contact closed, 1 = with contact open
80	i7	0	multi-purpose input alarm delay	-1... 120 min, -1 = disabled, if i5 = 5 or 6, compressor on delay after alarm reset
81	i10	0	door closed consecutive time for energy saving	0... 999 min, after regulation temperature < SP, 0 = disabled
82	i13	180	number of door openings for defrost	0... 240, 0 = disabled
83	i14	32	door open consecutive time for defrost	0... 240 min, 0 = disabled
N.	**PAR.**	**DEF.**	**DIGITAL OUTPUTS**	**MIN... MAX.**
84	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
85	u2	0	enable cabinet light and button-operated load in stand-by	0 = no 1 = yes
86	u4	0	enable alarm output off silencing the buzzer	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	demisting on duration	1... 120 min
89	u7	-5.0	neutral zone threshold for heating (relative to setpoint)	-99... 99 °C/°F, differential = 2 °C/4 °F, setpoint + u7
N.	**PAR.**	**DEF.**	**ENERGY SAVING (if r5 = 0)**	**MIN... MAX.**
90	HE2	0	energy saving maximum duration	0... 999 min, -1 = until the door opening
N.	**PAR.**	**DEF.**	**REAL TIME ENERGY SAVING (if r5 = 0)**	**MIN... MAX.**
91	H01	0	Monday energy saving time	0... 23 h
92	H02	0	Monday energy saving maximum duration	0... 24 h
93	H03	0	Tuesday energy saving time	0... 23 h
94	H04	0	Tuesday energy saving maximum duration	0... 24 h
95	H05	0	Wednesday energy saving time	0... 23 h
96	H06	0	Wednesday energy saving maximum duration	0... 24 h
97	H07	0	Thursday energy saving time	0... 23 h
98	H08	0	Thursday energy saving maximum duration	0... 24 h
99	H09	0	Friday energy saving time	0... 23 h
100	H10	0	Friday energy saving maximum duration	0... 24 h
101	H11	0	Saturday energy saving time	0... 23 h
102	H12	0	Saturday energy saving maximum duration	0... 24 h
103	H13	0	Sunday energy saving time	0... 23 h
104	H14	0	Sunday energy saving maximum duration	0... 24 h
N.	**PAR.**	**DEF.**	**REAL TIME DEFROST (if d8 = 4)**	**MIN... MAX.**
105	Hd1	h-	1st daily defrost time	h- = disabled
106	Hd2	h-	2nd daily defrost time	h- = disabled
107	Hd3	h-	3rd daily defrost time	h- = disabled
108	Hd4	h-	4th daily defrost time	h- = disabled
109	Hd5	h-	5th daily defrost time	h- = disabled
110	Hd6	h-	6th daily defrost time	h- = disabled
N.	**PAR.**	**DEF.**	**SAFETIES**	**MIN... MAX.**
111	POF	0	enable ON/STAND-BY key	0 = no 1 = yes
112	PAS	-19	password	-99... 999
113	PA1	426	level 1 password	-99... 999
114	PA2	824	level 2 password	-99... 999
N.	**PAR.**	**DEF.**	**REAL TIME CLOCK**	**MIN... MAX.**
115	Hr0	0	enable clock	0 = no 1 = yes
N.	**PAR.**	**DEF.**	**DATA-LOGGING**	**MIN... MAX.**
116	bLE	1	reserved	do not modify
117	rE0	15	data-logger sampling interval	0... 240 min
118	rE1	1	recorded temperature	0 = none 1 = cabinet, 2 = evaporator, 3 = auxiliary, 4 = cabinet and evaporator, 5 = all
N.	**PAR.**	**DEF.**	**MODBUS**	**MIN... MAX.**
119	LA	247	MODBUS address	1... 247
120	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 74.0 mm (2 15/16 x 1 5/16 x 2 15/16 in)
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	
Removable screw terminal blocks for wires up to 1.5 mm² and 2.5 mm²	
Micro-USB connector (reserved)	RJ45 F telephone 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)
RS-485 MODBUS port: 1,000 m (3,280 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
Clock	Incorporated secondary lithium battery
Clock drift	≤ 60 s/month at 25 ℃ (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)
	Resolution	0.1 °C (1 °F)
NTC probes	Sensor type	83435 (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)
Compressor relay (K1)	SPST, 16 A res. @ 250 VAC
Defrost relay (K2)	SPST, 8 A res. @ 250 VAC
Evaporator fan relay (K3)	SPST, 5 A res. @ 250 VAC
Auxiliary 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	
RS-485 MODBUS master port for network of 10 EPoCA-compatible controllers	Plug and play Ethernet port for Internet gateway

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