



### EN ENGLISH

- temperature regulation, temperature regulation + humidity reading/regulation, temperature regulation + pressure reading
- power supply 115... 230 Vac
- 5 analogue inputs: 3 for PTC, NTC or Pt 1000 probes (of which 1 is configurable), 1 for PTC, NTC or Pt 1000 probes or the EVHTP520 humidity and temperature proprietary probe; 1 configurable input for 4...20 mA humidity or pressure transducers
- door switch digital input
- 2 multi-purpose digital inputs
- 6 digital outputs (sealed electro-mechanical relays in compliance with the EN 60079-15 standard), 2 of which are configurable and 2 of which are 30 A res. @ 250 Vac
- alarm buzzer
- magnetothermal switch (models 1 and 2)
- built-in Wi-Fi module for the EPoCA cloud system (models 2 and 3)
- TTL MODBUS slave port for one of the following optional modules (model 1):
  - Wi-Fi EVIF25TWX for the EPoCA cloud system
  - EVIF25TBX Bluetooth module for the EVconnect app
  - EVIF23TSX clock for real-time functions
- RS-485 port for MODBUS RTU serial communication, in model 1 also for Ethernet connectivity using the EV3 Web or the EVD Web gateway for the EPoCA cloud system

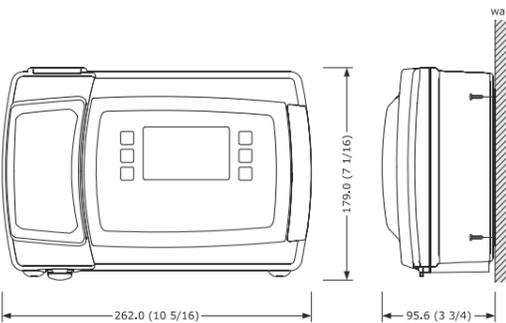
Models available

No.	Purchasing code	Magnetothermal switch	Connectivity
1	EVB1506N9MFX	yes	Ethernet or Wi-Fi or optional BLE
2	EVB1506N9MWX	yes	Built-in Wi-Fi
3	EVB1506N9XWX	no	Built-in Wi-Fi

### 1 MEASUREMENTS AND INSTALLATION

Measurements are expressed in mm (inches). Wall or on-board installation with fixing screws and plugs (not provided)

- CAUTION**
- make sure an o-ring seal (provided) is fitted onto each fixing screw
  - make sure the product used to clean the control panel is not rated as aggressive



### INSTALLATION PRECAUTIONS

- 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.

### 3 FIRST-TIME USE

1. Carry out the installation as shown in the section *MEASUREMENTS AND INSTALLATION*.
2. Power up the device.
3. Configure the device as shown in the section *Setting configuration parameters*.

Recommended configuration parameters for first-time use:

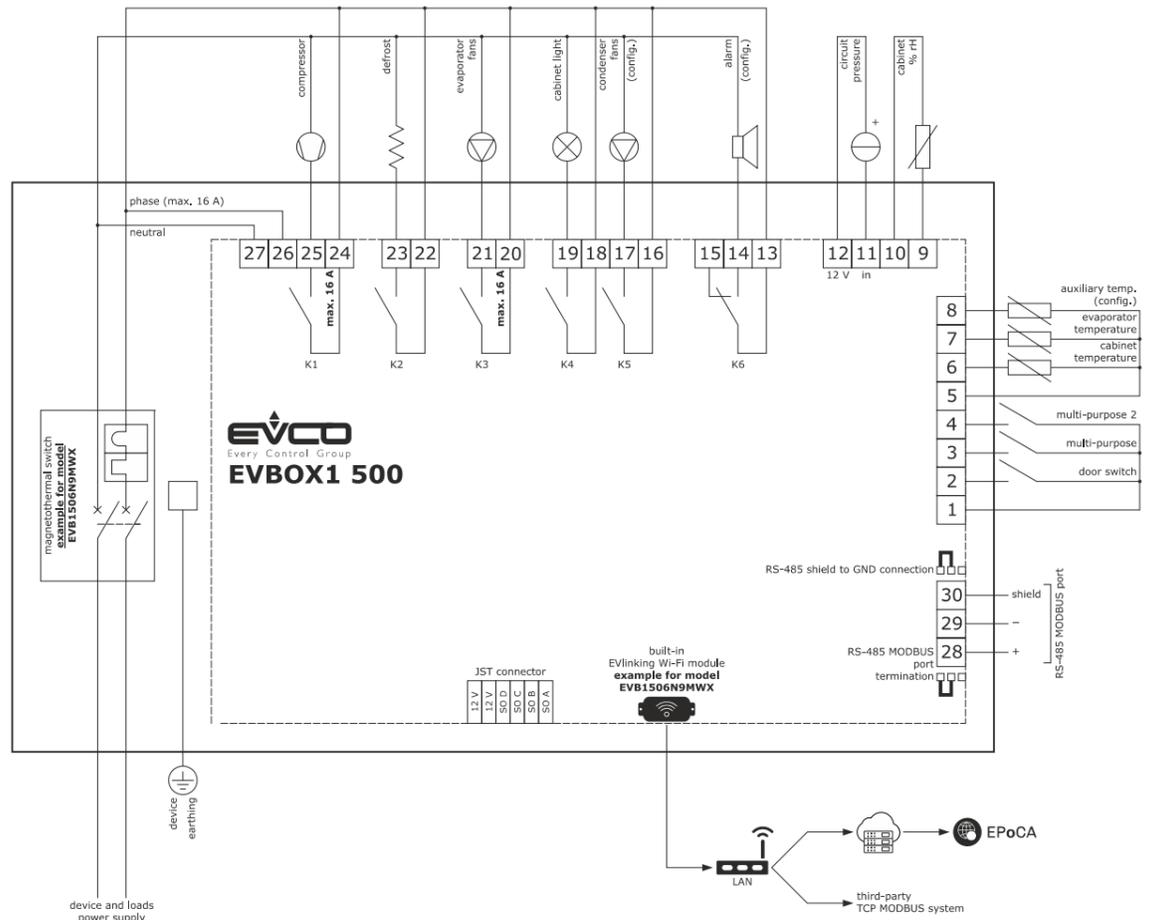
LAB.	DEF.	PARAMETER	MIN... MAX.
d0	8	Automatic defrost interval	0... 99 h 0 = manual only if d8 = 3, maximum interval
d1	0	type of defrost	0 = electric 1 = hot gas 2 = compressor off 3 = thermostat controlled, set by d2
d2	2.0	evaporator temperature threshold to end defrosting (if Pb2=1)	-99.0... 99.0 °C/°F
d3	30	defrost duration if Pb2 = 1, maximum duration	0... 99 min

Next 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. Connect one of the following optional accessories as required (for model 1 only):
  - To activate real-time functions, connect the EVlinking RS-485 EVIF23TSX clock module.
  - To control the device using the EVconnect app, connect the EVlinking BLE EVIF25TBX module to the TTL port (for model 1 only) then synchronise it with the app.
  - To control the device using the EPoCA monitoring system or a third-party MODBUS TCP system:
    - connect the EVlinking Wi-Fi EVIF25TWX module to the TTL port and then to a local Wi-Fi network
    - connect an IoT EV3 Web or EVD Web gateway to the RS-485 port, then connect the gateway to an Ethernet port of a router or to an Ethernet port of an Ethernet hub connected to a local network.
7. Power up the device again.

### 2 ELECTRICAL CONNECTION

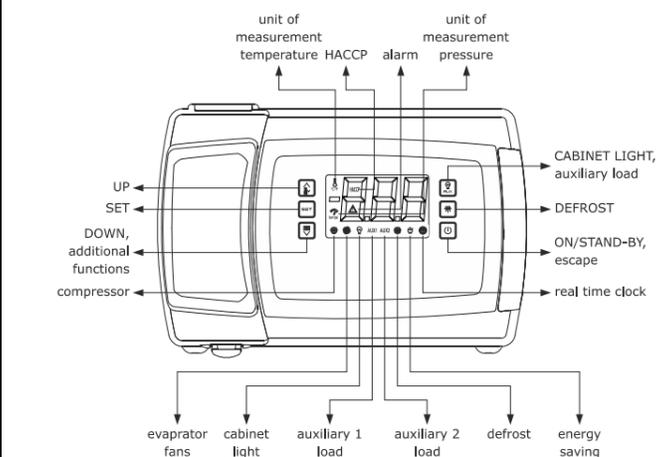
- N.B.**
- use cables of an adequate section for the current running through them
  - to reduce any electromagnetic interference, locate the power cables as far away as possible from the signal cables



### PRECAUTIONS FOR ELECTRICAL CONNECTION

- if using an electrical or pneumatic screwdriver, adjust the tightening torque
- if the device is moved from a cold to a warm place, humidity may cause condensation to form inside. Wait for 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 carrying out any type of maintenance
- do not use the device as a safety device
- for repairs and further information, contact the EVCO sales network
- if the optional EVlinking modules are used for Wi-Fi (EVIF25TWX) or Bluetooth Low Energy (EVIF25TBX) connectivity, the 1256800371 adapter cable must also be ordered

### 4 USER INTERFACE AND FUNCTIONS



LED	ON	OFF	FLASHING
	temperature displayed	-	overcooling active
	pressure displayed	-	-
	compressor on	compressor off	compressor protection active or setpoint being set
	evaporator fans on	evaporator fans off	evaporator fans off active
	cabinet light on	cabinet light off	cabinet light on from digital input
<b>AUX1</b>	load connected with u1 on	load connected with u1 off	compressor 2 protection active (if u1=7), evaporator fans off active (if u1=9), auxiliary load active (if u1=2)
<b>AUX2</b>	load connected with u11 on	load connected with u11 off	compressor 2 protection active (if u11=7), evaporator fans off active (if u11=9), auxiliary load active (if u11=2)
	defrost or pre-drip active	defrost or pre-drip not active	hot gas defrost delay active, dripping or heating of refrigerant active
	energy saving active	energy saving not active	-
	-	-	date, time and day of week setting in progress, in stand-by with programmed switch on/off (flashes normally); access via EPoCA or EVconnect in progress (flashes 1 s on, 9 s off)
<b>HACCP</b>	saved HACCP alarms not yet displayed	no saved HACCP alarms or alarms already displayed	new HACCP alarm saved
	alarm active	alarm not active	compressor maintenance request

#### 4.1 Switching the device on/off

1. Hold down the ON/STAND-BY key for 1 s.  
During normal operation, the display shows the temperature set by parameter P5. If the humidity input is enabled with Pb4=4 or Pb5=1, the display will alternate the humidity reading with the temperature reading every 10", displaying first 'rH' and then the value.



- During defrost, the display shows the temperature set by parameter d6 only if P5=0. If the display shows an alarm code, see the section *ALARMS*.

- N.B.**
- to activate a function or view a value, make sure the device is switched on, the keypad is not locked and that no other procedures are running (see precautions given for each function)
  - when the keypad is locked, functions other than silencing the buzzer, switching the cabinet light on/off, viewing the setpoint and unlocking the keypad are not available. When any other key is pressed, the Loc label will appear and no action can be taken. The Loc label also appears when an attempt is made to make changes to the setpoint with the settings block activated (r3 = 1)
  - if a function or data are requested which are not available, the --- label will appear
  - if d6=2, the dEF label will be displayed during defrost
  - if a switch on/off time (Hon and HoF ≠ ---) has been set, the clock icon will be displayed when the device is in stand-by

#### 4.2 Locking/unlocking the keypad

1. + Hold down both the DOWN and ON/STAND-BY keys for 1 s: the Loc (keypad locked) or UnL (keypad unlocked) label will appear.

#### 4.3 Switching the cabinet light on/off (if u2 = 1)

1. Press the AUX key: the LED will come on/go off.

#### 4.4 Silencing the buzzer (if u9 = 1, default)

- Press any key.  
If u4 = 1 (default), silencing the buzzer will also deactivate the alarm output.

#### 4.5 Viewing values detected by the analogue inputs

1. Hold down the DOWN key for 1 s to view the first available label.
2. Press the UP or DOWN key until the desired label among those given below appears.

LABEL	CORRESPONDING VALUE
<b>Pb1</b>	cabinet temperature; if Pb3 = 4: incoming air temperature
<b>Pb2</b>	evaporator temperature
<b>Pb3</b>	auxiliary temperature
<b>Pb4</b>	auxiliary temperature; if Pb4=4: humidity detected by EVHTP520 probe
<b>Pb5</b>	if Pb5=1: humidity; if Pb5=2: pressure (both from 4... 20 mA transducer)
3. <b>SET</b>	Press the SET key to view the value of the label displayed.
4. <b>SET</b>	Press the SET key (or take no action for 60 s) to go back to the labels.
5.	Press the ON/STAND-BY key to exit the procedure.

#### 4.6 Setting the setpoint (if r3 = 0, default)

1. Press the SET key: the LED will start flashing.
2. Press the UP or DOWN key within 15 s to set the value within the limits r1 and r2 (default -50... 50)
3. Press the SET key (or take no action for 15s): the LED will go off.

#### 4.7 Activating defrost

Make sure overcooling is not activated and that the evaporator temperature is below the d2 threshold.

1. Hold down the DEFROST key for 4 s: the LED will come on.

#### 4.8 Activating/deactivating overcooling

Make sure defrosting, dripping or the evaporator fan stop are not in progress.

1. Hold down the UP key for 4 s: the LED will start flashing. Repeat to deactivate the function.

#### 4.9 Switching the demisting function on (if u1 and/or u11 = 1) and switching the auxiliary load on/off (if u1 and/or u11 = 2)

1. Hold down the AUX key for 2 s: the AUX1 LED (referred to the load associated with u1) and/or the AUX2 LED (referred to the load associated with u11) will come on. The heaters will come on for the time set by parameter u6 and/or the auxiliary load will be activated (and deactivated when the AUX key is held down again).

#### 4.10 Viewing and activating the low or high relative humidity function (if F0 = 5)

1. Hold down both the SET and UP keys for 4 s: the rhL (low relative humidity function) or rhH (high relative humidity function) label will appear. Repeat the operation within 10 s of the label being displayed to select the desired mode.

#### 4.11 Displaying and deleting the compressor operating hours

To view the operating hours:

1. Hold down the DOWN key for 1 s: the display will show the first available label.
2. Press the UP or DOWN key until the desired label is displayed (CH1 for compressor operating hours, CH2 for compressor 2 operating hours).
3. Press the SET key to view the hours of the selected compressor.
4. Press the SET key again to return to the labels.
5. Press the ON/STAND-BY key (or take no action for 60 s) to exit the procedure.

To delete the operating hours (of both the compressors if compressor 2 is present):

1. Hold down the DOWN key for 1 s: the display will show the first available label.
2. Press the UP or DOWN key until the RCH label appears.
3. Press the SET key: the value 0 will be displayed.
4. Press the UP key within 15 s to increase the value up to 149 (access password).
5. Press the SET KEY (or take no action for 15 s): the symbol - - - will flash for 4 s, after which the device will exit the procedure.

#### 4.12 Setting the date, time and day of the week available in models with built-in Wi-Fi (or in model 1 through optional Evlinking modules or EV3/EVD Web gateways)

- N.B.
- do not disconnect the device from the mains in the two minutes after setting the date, time and day of the week
  - if the device communicates with the EVconnect app or the EPoCA remote monitoring system, it is possible to force synchronisation of the date, time and day of the week with those of the smartphone/tablet/PC used.

1. Hold down the DOWN key for 1 s: the display will show the first available label.
2. Press the UP or DOWN key until the rtc label appears.
3. Press the SET key: the LED will start flashing and the display will show the first available label. By pressing the SET key again, others will be displayed in the order given below.

LAB.	DESCRIPTION
y+2 figures	year (00... 99)
n+2 figures	month (01... 12)
d+2 figures	day (01... 31)
h+2 figures	hour (00... 23)
n+2 figures	minutes (00... 59)
Mon	Monday
Tue	Tuesday
Wed	Wednesday
Thu	Thursday
Fri	Friday
Sat	Saturday
Sun	Sunday

4. Press the UP or DOWN key within 15 s of the desired label being displayed to set the value.
5. Press the SET key to confirm any changes and to view the next label; press the SET key after viewing/changing the last label (day of the week) to exit the procedure.
6. Press the ON/STAND-BY key to exit the procedure beforehand.

### 5 SETTINGS

#### 5.1 Setting the configuration parameters

- N.B.
- Check the settings made are appropriate; see the section CONFIGURATION PARAMETERS.

1. Hold down both the UP and DOWN keys for 4 s: the display will show the PA label.
2. Press the SET key: the value 0 will be displayed.
3. Press the DOWN key within 15 s to decrease the value to -19 (access password).
4. Press the SET key (or take no action for 15 s).
5. Hold down both the UP and DOWN keys for 4 s: the display will show the first parameters label (SP).
6. Press the UP or DOWN key to find the label of the parameter to be changed.
7. Press the SET key to access the value of this parameter.
8. Press the UP or DOWN key to increase/decrease the value.
9. Press the SET key (or take no action for 15 s) to confirm the set value.
10. Hold down both the UP and DOWN keys for 4 s to exit the procedure.
11. Or press the ON/STAND-BY key to exit the procedure.

#### 5.2 Restoring factory settings

1. Hold down both the UP and DOWN keys for 4 s: the display will show the PA label.
2. Press the SET key: the value 0 will be displayed.
3. Press the UP key within 15 s to increase the value to 149 (access password).
4. Press the SET key (or take no action for 15 s).
5. Hold down both the UP and DOWN keys for 4 s: the display will show the dEF label.
6. Press the SET key: the value 0 will be displayed.
- 7a. Hold down both the UP and DOWN keys to exit the procedure without restoring the settings.
- 7b. Press the UP key to increase the value to 1 and restore the settings.
8. Press the SET key (or take no action for 15 s): the dEF label will flash for 4 s, after which the device will exit the procedure.
9. Disconnect the device from the power supply.

### 6 CONFIGURATION PARAMETERS

NO.	PAR.	DEF.	SETPOINT	MIN... MAX.
1	SP	3.0	temperature setpoint	r1... r2 °C/°F
2	SrH	50	humidity setpoint	rh2... rh3 %
<b>ANALOGUE INPUTS</b>				
3	CA1	0.0	cabinet probe offset	-25.0... 25.0 °C/°F
4	CA2	0.0	evaporator probe offset	-25.0... 25.0 °C/°F
5	CA3	0.0	sensor 3 offset	-25.0... 25.0 °C/°F
6	CA4	0.0	sensor 4 offset	-25.0... 25.0 °C/°F/% RH
7	CA5	0.0	sensor 5 offset	-25.0... 25.0 %/Bar
8	P0	1	type of temperature probe	0 = PTC 1 = NTC 2 = Pt 1000
9	P1	1	enable decimal point °C	0 = no 1 = yes
10	P2	0	temperature measurement unit	0 = °C 1 = °F
11	Pb2	1	evaporator probe configuration	0 = disabled 1 = defrost regulation + fans 2 = fan regulation
12	Pb3	0	sensor 3 configuration	0 = disabled 1 = condenser temperature 2 = auxiliary temperature 3 = evaporator 2 temperature 4 = outgoing air temperature
13	Pb4	0	sensor 4 configuration	0 = disabled 1 = condenser temperature 2 = auxiliary temperature 3 = evaporator 2 temperature 4 = EVHTP520 humidity probe
14	Pb5	1	sensor 5 configuration	0 = disabled 1 = 4-20 mA humidity transducer 2 = 4-20 mA pressure transducer
15	P5	0	value displayed	0 = cabinet temperature (if Pb3 = 4, product temperature CPT) 1 = setpoint 2 = evaporator temperature 3 = sensor 3 temperature 4 = incoming air temperature
16	P7	50	incoming air effect to calculate product temperature (CPT)	0... 100% CPT = {[(P7 x (incoming air)) + [(100 - P7) x (outgoing air)]: 100}
17	P8	5	display refresh time	0... 250 s: 10
18	P9	0.0	minimum calibration value of input Pb5	-99.9... 99.9 bar/% RH
19	P10	99.9	maximum calibration value of input Pb5	-99.9... 99.9 bar/% RH
<b>TEMPERATURE REGULATION</b>				
20	r0	2.0	setpoint SP differential in cold mode	0.1... 15.0 °C/°F see also r12
21	r1	-50.0	minimum setpoint SP	-99.0 °C/°F... r2
22	r2	50.0	maximum setpoint SP	r1... 99.0 °C/°F
23	r3	0	enable setpoint SP lock	0 = no 1 = yes
24	r4	0.0	setpoint SP offset in energy saving	0.0... 99.0 °C/°F
25	r5	0.0	setpoint offset SP in overcooling	0.0... 99.0 °C/°F
26	r6	30	overcooling duration	0... 240 min
27	r7	-2.0	setpoint SP differential for hot mode (if u1 and/or u11=5 neutral zone)	-99.0... -0.1 °C/°F
28	r12	0	differential position r0	0 = asymmetrical 1 = symmetrical
<b>HUMIDITY REGULATION</b>				
29	rh0	0	enable humidity management	0 = no 1 = read humidity 2 = dehumidification with compressor 3 = dehumidification with compressor + neutral zone heaters (if u1 or u11=5)
30	rh1	5	setpoint SrH differential during dehumidification	1... 25%
31	rh2	20	minimum setpoint SrH	0 %... rh3
32	rh3	100	maximum setpoint SrH	rh2... 100%
33	rh4	5	setpoint SrH differential during humidification	1... 25%
34	rh5	100	humidification percentage in 60 s	0... 100%

**Humidity regulation** is activated by configuring Pb4 = 4 (EVHTP520 humidity probe) or Pb5=2 (4... 20 mA transducer). By setting the differentials rh4 and rh1 relative to the humidity setpoint SrH, a neutral zone for humidification and dehumidification respectively is created. To manage dehumidification, the compressor (rH0=2) or the compressor + heaters (rH0=3) can be activated. Humidification, on the other hand, is activated by setting the relay u1/u11=13; it can be set in 60-second cycles, setting the % with rh5 (e.g. 10%=6" ON and 54" OFF).

**Temperature priority over humidity:** if the temperature drifts from its high neutral zone value of SP+r0 or its low neutral zone value of Sp-r7 during humidity regulation, the controller halts humidity regulation until the temperature reaches the setpoint.

Temperature and humidity regulation are suspended during defrost.

NO.	PAR.	DEF.	PRESSURE	MIN... MAX.
35	h12	0	enable compressor lock due to Lpt and Hpt pressure alarms	0 = no 1 = yes
36	h13	0.5	low pressure Lpt alarm threshold	-0.5... 45.0 barg
37	h14	5	low pressure Lpt alarm delay	0... 250 s
38	h15	0	type of refrigerant	0 = R-22 1 = R-404A 2 = R-507A

NO.	PAR.	DEF.	DEFROST	MIN... MAX.
3				3 = R-744 4 = R-290 5 = R-1270 6 = R-407F 7 = R-717 8 = R-449A 9 = R-448A 10 = R-452A 11 = R-134A 12 = R-32 13 = R-407C 14 = R-410° 15 = R-513A 16 = R-1234YF 17 = R-1234ZE 18 = R-407A 19 = R-454C 20 = R-455A
39	h23	30.0	high pressure Hpt alarm threshold	0.0... 199.0 bar
40	h24	5	high pressure Hpt alarm delay	0... 250 s
<b>COMPRESSOR</b>				
41	C0	0	compressor-on delay from power-on	0... 240 min
42	C1	5	delay between two compressor switch-ons	0... 240 min
43	C2	3	minimum compressor-off time	0... 240 min
44	C3	0	minimum compressor-on time	0... 240 s
45	C4	10	compressor-off time during cabinet probe alarm	0... 240 min
46	C5	10	compressor-on time during cabinet probe alarm Pr1	0... 240 min
47	C6	80.0	condenser overheat COH alarm threshold	0.0... 199.0 °C/°F
48	C7	90.0	compressor locked CSd alarm threshold	0.0... 199.0 °C/°F
49	C8	1	compressor locked CSd alarm delay	0... 15 min
50	C10	0	compressor hours to signal maintenance (flashing LED Δ)	0... 999 h x 10 0 = disabled
51	C11	3	delay between 2 compressor switch-ons	0... 240 s If u1 or u11=7
52	C12	2	compressor hour value for compressor rotation algorithm	0... 10 algorithm = {[C12 x (compressor hours)] + [C13 x (compressor switch-ons)]} if C15=2
53	C13	1	compressor switch-on value for compressor rotation algorithm	0... 10 algorithm = {[C12 x (compressor hours)] + [C13 x (compressor switch-ons)]} if C15=2
54	C14	2	type of pump-down	0 = time-controlled 1 = digital input 2 = evaporator pressure
55	C15	0	constraint between compressor and compressor 2	0 = function of C11 (set delay) 1 = function of r0 (proportional band) 2 = function of C12 and C13 (rotation)

**To manage 2 compressors in steps**, set C15=1 and determine the band with r12 (asymmetrical or symmetrical). The controller divides the interval r0 into 2 steps and for each step controls the compressor as follows:

- delay between compressors C11
- compressor protection delays C1, C2 and C3 applied independently to compressor 1 and compressor 2
- rotation is determined by the incidence of the parameters C12 (hours) / C13 (start-ups)

**To manage 2 compressors or 2 refrigeration units alternately**, set C15=2: the compressor outputs will work one at a time, rotating according to parameters C12-C13.

If i5 or i15 = 7 (compressor 1 thermal switch alarm C1t) and/or = 8 (compressor 2 thermal switch alarm C2t), when a compressor alarm is activated by its digital input, the compressor in alarm mode is replaced by the other one, once protection time has elapsed.

NO.	PAR.	DEF.	DEFROST	MIN... MAX.
56	d0	8	automatic defrost interval	0... 99 h 0 = manual only if d8 = 3, maximum interval
57	d1	0	type of defrost	0 = electric 1 = hot gas 2 = compressor off 3 = thermostat controlled, set by d2 threshold
58	d2	2.0	evaporator temperature threshold to end defrosting (if Pb2=1)	-99.0... 99.0 °C/°F
59	d2b	2.0	evaporator 2 temperature threshold to end defrosting (if Pb2=1 and/or Pb3 = 3)	-99.0... 99.0 °C/°F
60	d3	30	defrost duration	0... 99 min if Pb2 = 1, maximum duration
61	d4	0	enable defrost at power-on	0 = no 1 = yes
62	d5	0	defrost delay from power-on	0... 99 min
63	d6	1	value displayed when defrosting	0 = cabinet temperature (or product temperature CPT) 1 = limited to SP+r0 2 = dEF label
64	d7	2	drip duration	0... 15 min
65	d8	0	type of defrost interval	0 = hours (d0) device on 1 = hours compressor on 2 = hours evaporator temperature < d9 3 = adaptive 4 = timed (if real-time functions are active)
66	d9	0.0	evaporator temperature threshold for defrost interval count (if d8 = 2)	-99.0... 99.0 °C/°F
67	d11	0	enable defrost timeout alarm	0 = no 1 = yes
68	d15	0	compressor-on consecutive time for hot gas defrost (if d1 = 1)	0... 99 min
69	d16	0	pre-drip duration for hot gas defrost with defrost relay active (if d1 = 1)	0... 99 min
70	d18	40	interval for adaptive defrost (if d8=3)	0... 999 min if compressor-on with evaporator T < optimal evaporator T + d22 0 = manual only
71	d19	3.0	threshold relative to optimal evaporator temperature for adaptive defrost (if d8=3)	0.0... 40.0 °C/°F optimal evaporator temperature - d19
72	d20	180	compressor-on consecutive time to force defrost	0... 500 min 0 = disabled
73	d21	200	compressor-on consecutive time to force defrost from power-on and from overcooling	0... 500 min 0 = disabled
74	d22	2.0	threshold relative to optimal evaporator temperature for adaptive	0.0... 10.0 °C/°F optimal evaporator T + d22

NO.	PAR.	DEF.	TEMPERATURE ALARMS	MIN... MAX.
75	A0	0	select value for low temperature alarm	0 = cabinet temperature (or product temperature CPT if Pb3 = 4) 1 = evaporator temperature
76	A1	-10.0	low temperature alarm threshold	-99.0... 99.0 °C/°F
77	A2	1	type of low temperature alarm	0 = disabled 1 = relative to setpoint (i.e. SP + A1) 2 = absolute (i.e. A1)
78	A4	10.0	high temperature alarm threshold	-99.0... 99.0 °C/°F
79	A5	1	type of high temperature alarm	0 = disabled 1 = relative to setpoint (i.e. SP + A4) 2 = absolute (i.e. A4)
80	A6	120	high temperature alarm delay from power-on	0... 240 min
81	A7	15	high/low temperature alarm delay	0... 240 min
82	A8	15	high temperature alarm delay after defrost	0... 240 min
83	A9	15	high temperature alarm delay from door closure	0... 240 min
84	A10	1	duration of power failure for saving alarm	0... 240 min 0 = disabled
85	A11	2.0	high/low temperature alarm threshold differential (A1 and A4)	0.1... 15.0 °C/°F
NO.	PAR.	DEF.	FANS	MIN... MAX.
86	F0	1	evaporator fan mode in normal operation	0 = off 1 = on 2 = on if compressor on 3 = thermostat controlled (with cabinet or product temperature + F1) 4 = thermostat controlled (with cabinet or product temperature + F1) if compressor on 5 = function of F6 (low or high humidity)
87	F1	-1.0	evaporator fan regulation threshold (if Pb2= 1 or 2)	-99.0... 99.0 °C/°F
88	F2	0	evaporator fan mode during defrost and dripping	0 = off 1 = on 2 = function of F0
89	F3	0	maximum time evaporator fans off	0... 15 min
90	F4	60	time evaporator fans off in low humidity	0... 240 s
91	F5	10	time evaporator fans on in low humidity	0... 240 s
92	F6	0	high or low humidity function (if F0 = 5)	0 = for low humidity (with fan time F4 and F5 if compressor is off, on if compressor is on) 1 = for high humidity (fans on)
93	F7	5.0	threshold relative to setpoint (SP) for end of fan stop time	-99.0... 99.0 °C/°F
94	F8	2.0	evaporator fan regulation threshold differential (F1)	0.1... 15.0 °C/°F
95	F9	0	evaporator fans off delay from compressor off	0... 240 s if F0 = 2 or 5
96	F11	15.0	condenser fans on threshold	0.0... 99.0 °C/°F with differential = 2 °C/4 °F
97	F12	30	condenser fans off delay from compressor off	0... 240 s if Pb3 and Pb4 ≠ 1
98	F13	30	time evaporator fans off in energy saving	0... 240 s x 10 if F0 ≠ 5
99	F14	30	time evaporator fans on in energy saving	0... 240 s x 10 if F0 ≠ 5
NO.	PAR.	DEF.	DIGITAL INPUTS	MIN... MAX.
100	i0	3	door switch input function	0 = disabled 1 = compressor + evaporator fans off 2 = evaporator fans off 3 = cabinet light on 4 = compressor + evaporator fans off, cabinet light on 5 = evaporator fans off, cabinet light on
101	i1	0	door switch input activation	0 = with contact closed 1 = with contact open
102	i2	30	door open alarm delay	-1... 120 min -1 = disabled
103	i3	15	maximum compressor and evaporator fan off time with door open	-1... 120 min -1 = until closed
104	i5	7	multi-purpose input 1 function	0 = disabled 1 = energy saving 2 = multi-purpose input alarm (dI2) 3 = high pressure alarm (iSd and HP) 4 = auxiliary load on 5 = switch device on/off 6 = low pressure alarm (LP) 7 = compressor 1 thermal switch alarm (C1t) 8 = compressor 2 thermal switch alarm (C2t) 9 = man in cold room alarm (MIC)
105	i6	0	multi-purpose input 1 activation	0 = with contact closed 1 = with contact open
106	i7	0	alarm delay dI2 (multi-purpose input) if i5 and/or i15 = 2	0... 120 min 0 = disabled
107	i8	0	number of HP alarms required (multi-purpose input activation if i5 and/or i15 = 3) to block regulation after high pressure alarm (iSd)	0... 15 0 = disabled
108	i9	240	consecutive time if there are no HP alarms (multi-purpose input activation if i5 and/or i15 = 3) to reset counter for blocking regulation after high pressure alarm (iSd)	1... 999 min
109	i10	0	door closed consecutive time for energy saving	0... 999 min 0 = disabled
110	i13	180	number of door openings for defrost	0... 240 0 = disabled
111	i14	32	door open consecutive time for defrost	0... 240 min 0 = disabled
112	i15	9	multi-purpose input 2 function	like i5
113	i16	0	multi-purpose input 2 activation	like i6
114	i17	30	low pressure LP alarm delay	0... 240 s
NO.	PAR.	DEF.	DIGITAL OUTPUTS	MIN... MAX.
115	u1	6	k5 relay configuration	0 = reserved 1 = demisting heaters 2 = auxiliary load 3 = alarm 4 = door heaters

116	u2	0	enable cabinet light and auxiliary load (if u1 or u22 = 2) using stand-by key	0 = no 1 = yes
117	u3	0	pump-down delay	0... 240 s
118	u4	1	enable deactivation alarm output with silencing buzzer	0 = no 1 = yes
119	u5	-1.0	door heaters on threshold	-99.0... 99.0 °C/°F
120	u6	5	duration demisting on	1... 120 min
121	u9	1	enable alarm buzzer	0 = no 1 = yes
122	u11	3	k6 relay configuration	as u1
NO.	PAR.	DEF.	CLOCK	MIN... MAX.
123	Hr0	0	enable clock	0 = no 1 = yes
NO.	PAR.	DEF.	ENERGY SAVING	MIN... MAX.
124	HE2	0	maximum duration energy saving	0... 999 min 0 = until door opened
NO.	PAR.	DEF.	ENERGY SAVING WITH RTC	MIN... MAX.
125	H01	0	start time energy saving Monday	0... 23 h 0 = midnight
126	H02	0	maximum duration energy saving Monday	0... 24 h >0 function active
127	H03	0	start time energy saving Tuesday	0... 23 h 0 = midnight
128	H04	0	maximum duration energy saving Tuesday	0... 24 h >0 function active
129	H05	0	start time energy saving Wednesday	0... 23 h 0 = midnight
130	H06	0	maximum duration energy saving Wednesday	0... 24 h >0 function active
131	H07	0	start time energy saving Thursday	0... 23 h 0 = midnight
132	H08	0	maximum duration energy saving Thursday	0... 24 h >0 function active
133	H09	0	start time energy saving Friday	0... 23 h 0 = midnight
134	H10	0	maximum duration energy saving Friday	0... 24 h >0 function active
135	H11	0	start time energy saving Saturday	0... 23 h 0 = midnight
136	H12	0	maximum duration energy saving Saturday	0... 24 h >0 function active
137	H13	0	start time energy saving Sunday	0... 23 h 0 = midnight
138	H14	0	maximum duration energy saving Sunday	0... 24 h >0 function active
NO.	PAR.	DEF.	SWITCH ON/OFF WITH RTC	MIN... MAX.
139	Hon	h--	device switch-on time	0... 23 h h-- = disabled
140	HoF	h--	device switch-off time	0... 23 h h-- = disabled
NO.	PAR.	DEF.	DEFROST WITH RTC	MIN... MAX.
141	Hd1	h--	1 <sup>st</sup> daily defrost time	0... 23 h h-- = disabled
142	Hd2	h--	2 <sup>nd</sup> daily defrost time	like Hd1
143	Hd3	h--	3 <sup>rd</sup> daily defrost time	like Hd1
144	Hd4	h--	4 <sup>th</sup> daily defrost time	like Hd1
145	Hd5	h--	5 <sup>th</sup> daily defrost time	like Hd1
146	Hd6	h--	6 <sup>th</sup> daily defrost time	like Hd1
NO.	PAR.	DEF.	DATA-LOGGING	MIN... MAX.
147	PA1	426	level 1 password to access settings from EVconnect and EPoCA	-99... 999
148	PA2	824	level 2 password to access settings from EVconnect and EPoCA	-99... 999
149	rE0	60	EVlinking Wi-Fi/EV3 Web/EVD Web data logger sampling interval	0... 240 min
150	rE1	4	select temperature for sampling	0 = none 1 = cabinet 2 = evaporator 3 = auxiliary 4 = cabinet and evaporator 5 = all
NO.	PAR.	DEF.	SERIAL COMMUNICATION	MIN... MAX.
151	LA	247	MODBUS address	1... 247
152	Lb	2	MODBUS baud rate the parameter is relevant only if bLE = 0	0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud
153	LP	2	MODBUS parity the parameter is relevant only if bLE = 0	0 = none 1 = odd 2 = even
154	bLE	1	configuration MODBUS serial port	0 = free for real-time functions (in model 1 only through the EVIF23TSX clock) or for MODBUS RTU communication via the RS-485 port 1... 99 = device address for connectivity <b>N.B.:</b> - for the EVconnect app (only in model 1 via the EVlinking BLE module) and the EPoCA system and/or MODBUS TCP communication via Wi-Fi (in model 1 via the EVlinking Wi-Fi EVIF25TWX module), set to 1 - for the EPoCA system and/or for MODBUS TCP communication via Ethernet (only in model 1 via the IoT EV3 Web or EVD Web gateway), follow the procedure to set the address in the relative manuals - communication works with MODBUS baud rate 19,200 and even MODBUS parity, irrespective of the value set with parameters Lb and LP

**7 ERRORS AND ALARMS**

CODE	DESCRIPTION	RESET	TO CORRECT
Pr1	cabinet probe error (if Pb3=4, incoming air probe alarm)	automatic	- check P0 - check sensor integrity
Pr2	evaporator probe error	automatic	- check electrical connection
Pr3	auxiliary temperature probe	automatic	

error			
Pr4	temperature or humidity sensor error Pb4	automatic	
Pr5	humidity or pressure sensor error Pb5	automatic	
rtc	clock error	manual	- set date, time and day of the week
AL	low temperature alarm	automatic	- check A0, A1 and A2
AH	high temperature alarm	automatic	- check A0, A4 and A5
id	door open alarm	automatic	- check i0 and i1
PF	power failure alarm	manual	- press a key - check electrical connection
dI2	multi-purpose 1 and 2 input alarm	automatic	- check i5, i6, i15, i16
C1t	compressor thermal switch alarm	automatic	- check i5, i6, i15, i16
C2t	compressor 2 thermal switch alarm	automatic	- check i5, i6, i15, i16
COH	condenser overheat alarm	automatic	- check C6, C7, C8
CSd	compressor locked alarm	manual	- switch the device off and on - check C6, C7, C8
MIC	man in cold room alarm	automatic	signal only
dFd	defrost timeout alarm	manual	- press a key - check d2, d2b, d3, d3b and d11
Pd	pump-down alarm from digital input timed out	automatic	signal only
iSd	high pressure switch alarm (regulation locked for no. HP events x i8)	manual	- switch the device off and on - check i5, i6, i8, i9, i15, i16
HP	high pressure switch alarm (regulation locked for single event)	automatic	- check i5, i6, i15, i16
LP	low pressure switch alarm	automatic	- check i5, i6, i15, i16
LPT*	low pressure alarm (if Pb5 = 2; with compressor locked if h12=1)	automatic	- check threshold h13
HPT*	high pressure alarm (if Pb5 = 2; with compressor locked if h12=1)	automatic	- check threshold h23 - compressor locked if h12=1

\*When Pb5 = 2, the pressure can be read from the 4... 20 mA signal: in this case the LPT (low pressure) alarm can be triggered if the pressure goes below the threshold h13 after a delay h14. The HPT (high pressure) alarm can be triggered if the pressure goes above the threshold h23 after a delay h24. The value in bar or barg of the minimum and maximum pressure thresholds is obtained by converting the degrees (°C/F). This is done by setting the gas with h15.

**8 TECHNICAL SPECIFICATIONS**

Purpose of the control device:	function controller
Construction of the control device:	built-in electronic device
Housing:	grey, self-extinguishing
Category of heat and fire resistance:	D
Measurements:	262.0 x 179.0 x 95.6 mm (10.314 x 7.047 x 3.763 in; L x H x D).
Mounting method for the control device:	wall or on-board with fixing screws and plugs (not provided)
Degree of protection provided by the casing:	IP65
Connection method:	- fixed screw terminal blocks pitch 6.35 mm (0.25 in) for wires up to 4 mm <sup>2</sup> (0.0062 in <sup>2</sup> ): power supply and digital outputs - fixed screw terminal blocks pitch 5.0 mm (0.196 in) for wires up to 2.5 mm <sup>2</sup> (0.0038 in <sup>2</sup> ): analogue inputs, digital inputs and communications ports Maximum permitted length for connection cables:
power supply: 100 m (328 ft)	power supply 4... 20 mA transducers: 100 m (328 ft)
analogue inputs: 100 m (328 ft)	digital inputs: 100 m (328 ft)
digital outputs: 100 m (328 ft)	communications ports: 1,000 m (3,280 ft); see also the MODBUS specifications and implementation guides available at <a href="http://www.modbus.org/specs.php">http://www.modbus.org/specs.php</a>
Use cables of an adequate section for the current running through them. When the device is used at its maximum operating temperature and at full load, use cables with a maximum operating temperature of ≥ 90 °C (194 °F)	
Operating temperature:	models with a magnetothermal switch: from 0 to 45 °C (from 32 to 113 °F). models without a magnetothermal switch: from 0 to 50 °C (from 32 to 122 °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
Compliance:	
RoHS 2011/65/EC	WEEE 2012/19/EU
REACH (EC) Regulation no. 1907/2006	
EMC compliance	
EN 60730-1	60730-1
Power supply:	115... 230 Vac (+10 % -15 %), 50... 60 Hz (±3 Hz), 35 VA maximum, supplied by a class 2 circuit. The maximum current permitted for the phase is 16 A
Magnetothermal switch	230 Vac, In 16 A, Icn, 4500 A, unipolar + neutral, for wires up to 2.5 mm <sup>2</sup> (0.0387 in <sup>2</sup> ); upon request
Earthing methods for the control device:	with earth terminal
Rated impulse withstand voltage:	4 kV
Overvoltage category:	III
Software class and structure:	A
Analogue inputs:	3 for PTC, NTC or Pt 1000 probes (of which 1 configurable by parameter Pb3); 1 for PTC, NTC, Pt 1000 probes or proprietary humidity and temperature probe EVHTP520, which can be configured by parameter Pb4; 1 for 4...20 mA humidity or pressure transducers, which can be configured by parameter Pb5
PTC probes:	Type of sensor: 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:	Type of sensor: B3435 (10 kΩ @ 25 °C, 77 °F) Measurement field: from -40 to 105 °C (from -40 to 221 °F) Resolution: 0.1 °C (1 °F)
Probes	Type of sensor: 1 kΩ @ 0 °C, 32 °F
Pt 1000:	Measurement field: from -99 to 199 °C (from -146 to 390 °F) Resolution: 0.1 °C (1 °F)
T+RH EVHTP520 probe	Measurement field T: -10... 70°C Measurement field RH: 5... 95 % RH Protection: none
4... 20 mA transducers	Power supply: 8... 28 Vdc (±10%) Measurement field: can be configured against polarity inversion Protection: none
Digital inputs:	3 voltage-free (door switch, multi-purpose 1 and multi-purpose 2)
Voltage-free:	Type of contact: 5 Vdc, 2 mA Power supply: none Protection: none
Digital outputs:	6 with sealed electro-mechanical relays in compliance with the EN 60079-15 standard
K1 relay:	SPST, 30 A res. @ 250 Vac
K2 relay:	SPST, 16 A res. @ 250 Vac
K3 relay:	SPST, 30 A res. @ 250 Vac
K4 relay:	SPST, 16 A res. @ 250 Vac

K5 relay:	SPST, 8 A res. @ 250 Vac
K6 relay:	SPST, 8 A res. @ 250 Vac
The device guarantees reinforced insulation between the digital outputs (electro-mechanical relays) and the SELV (Safety Extra Low Voltage) circuits, as well as between the digital output groups	
Type 1 or Type 2 actions:	type 1
Additional features of Type 1 or Type 2 actions:	C
Displays:	custom display with 3 digits, decimal point and function icons
Alarm buzzer:	built-in
Communications ports:	
1 TTL MODBUS slave port (only in model 1 via the Evlinking modules for the clock, the Evconnect app, the EPoCA system or MODBUS TCP)	1 RS-485 MODBUS slave port
Built-in Wi-Fi sensor (in models 2 and 3 only)	
Wi-Fi output power (EIRP)	11b: 67.5 mW and 11g: 71.1 mW, 11n (HT20) 56.5 mW
Wi-Fi frequency range	.412... 2,472 MHz
Safety protocols	open, WEP, WPA/WPA2 Personal or PSK
Encryption methods	TKIP, CCMP
Unsupported modes	mixed WPA/WPA2 PSK using TKIP + CCMP WPA/WPA2 Enterprise or EAP

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

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