

EC 6-295 P220 S301

ON-OFF digital controller for ventilated refrigerating units

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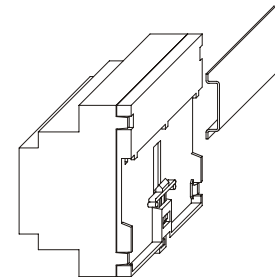
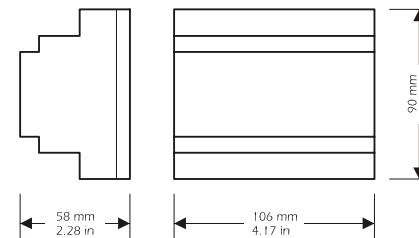
ENGLISH

smart guide

1 PREPARATIONS

1.1 How to install the instrument

On DIN rail (it is not supplied by the builder).



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DIN rail installation (it is not supplied by the builder).

2 OPERATION

2.1 How to turn the instrument ON/OFF

If you have to turn the instrument ON/OFF:

- press for 2 s

During the normal operation the instrument shows the cabinet temperature.

2.2 How to silence the buzzer

If you have to silence the buzzer:

- press

2.3 How to activate the defrost by hand

If you have to activate the defrost by hand:

- press for 4 s

Unless the evaporator temperature is below the defrost end temperature you have set with the parameter d2, the defrost will not be activated.

2.4 How to turn the cabinet light ON/OFF

If you have to turn the cabinet light ON/OFF:

- press

2.5 Compressor thermal protection

The activation of this input forces the compressor OFF by hardware and software.

3 REAL TIME CLOCK

3.1 How to set the clock

Press for 2 s ; the instrument will show **P r 2**

Press or for selecting **r t c**

If you have to modify the value of the hour:

- press and or

If you have to modify the value of the minutes:

- release and press it again during the modification of the hour, then ...

- press or

If you have to quit the procedure:

- press or

as long as the instrument shows the cabinet temperature or do not operate for about 30 s.

4 WORKING SETPOINT

4.1 How to set the working setpoint

If you have to modify the working setpoint value:

- press and or (1) (2)

(1) you can set the working setpoint between the limits you have set with the parameters r1 and r2

(2) unless the parameter r5 has value 0, you can not modify the working setpoint.

5 CONFIGURATION PARAMETERS

5.1 How to set the configuration parameters

Configuration parameters are arranged on two levels.

If you have to gain access the first level:

- press and for 4 s : the instrument will show **PA**

If you have to select a parameter:

- press or

If you have to modify the value of the parameter:

- press and or

If you have to gain access the second level:

- gain access the first level
- press or for selecting **PA**
- press and or for setting “-19”
- press and for 4 s : the instrument will show **P 0**

If you have to quit the procedure:

- press and for 4 s or do not operate for about 60 s.

6 ADDITIONAL FUNCTIONS

6.1 How to gain access the additional functions

If you have to gain access the additional functions:

- press for 2 s : the instrument will show **PR 2**

If you have to quit the procedure:

- press or as long as the instrument shows the cabinet temperature or do not operate for about 30 s.

6.2 Evaporator temperature showing

If you have to show the evaporator temperature:

- gain access the additional functions

- press or for selecting **PR 2**

- press

6.3 Condenser temperature showing

If you have to show the condenser temperature:

- gain access the additional functions

- press or for selecting **PR 3**

- press

6.4 Temperature alarm storage

If you have to show the temperature the instrument has stored during the lower temperature alarm:

- gain access the additional functions

- press or for selecting **AL** (3)

- press

If you have to show the temperature the instrument has stored during the upper temperature alarm:

- gain access the additional functions

- press or for selecting **AH** (4)

- press

If you have to erase the temperature the instrument has stored during the lower or upper temperature alarm:

- gain access the additional functions
- press or for selecting **AL** or **AH**
- press for 4 s : the instrument will show **- - -**

(3) unless the parameter A8 has value 1 or 3, the label AL will not be showed

(4) unless the parameter A8 has value 2 or 3, the label AH will not be showed.

7 SIGNALS

7.1 Signals

LED	MEANING
	Compressor LED if it is lighted, the compressor will be ON if it flashes, a compressor delay will be running (look at the parameters C0, C1, C2, C4, n1 and n4)

- (15) when there is 1 min to the end of the time you have set with the parameter, the cabinet light will be turned OFF just for 1 s; press during the time you have set with the parameter to turn the cabinet light ON and to exclude the function, press again before the end of the time you have set with the parameter to recover the function

(if the remaining time of the parameter is higher than 1 min, the time will be forced at 1 min and the cabinet light will be turned OFF just for 1 s)

- (16) do not set more instruments as master

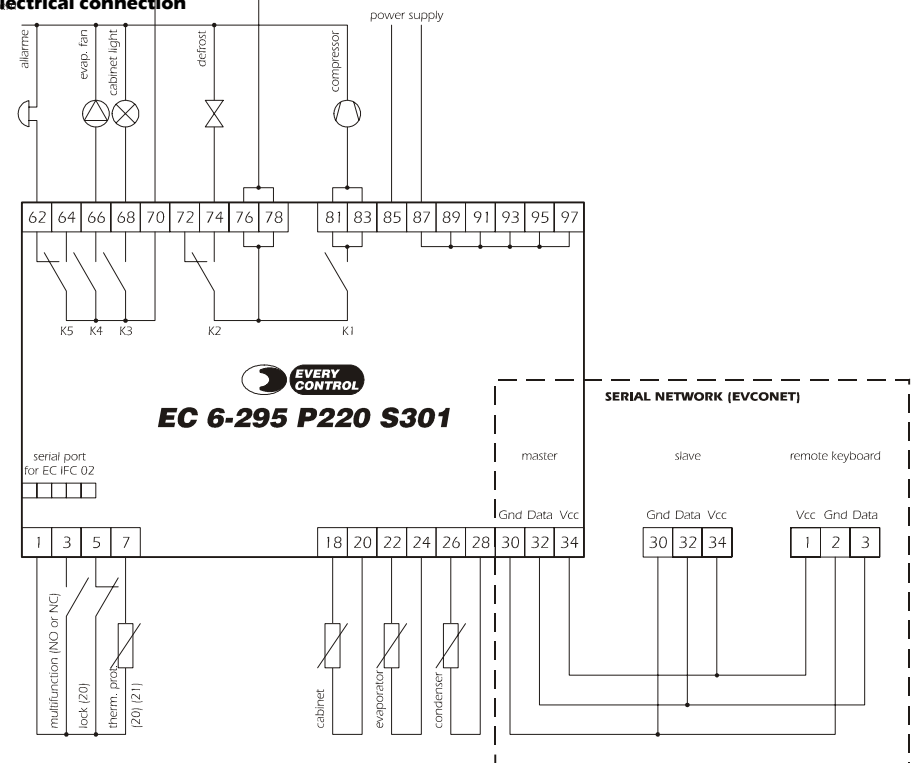
- (17) the time between the master implements a control and the slave implements the same control is "n1 x n4"

- (18) except the control turning ON and OFF; it will immediately be implemented

- (19) if among the remote controls the slave has to implement there is the defrost activation, the parameter d5 will set a time you will have to add to the one you have set with the parameters n1 and n4 (the slave will implement the control even if the conditions will not allow the master of activating the defrost); if the master is in the STAND-BY mode and among the remote controls the slave has to implement there is not the turning ON and OFF, the slave will work with the local settings.

11 ELECTRICAL CONNECTION

11.1 Electrical connection



(20) short-circuit terminals 1 and 5 and/or 1 and 7 if you do not use the lock input and/or the compressor thermal protection

(21) the position of the probe for compressor thermal protection could compromise the insulation between low voltage and high voltage parts.

n4	0	240	s	0	time between the master implements a control and the slave implements the same control (it is important if n0 = 2 and n1 ≠ 0); look at nA as well ⁽¹⁷⁾ ⁽¹⁸⁾
nA	0	15	—	0	remote control the slave has to implement (0 = no controls, 1 and 9 = compressor status, 2 and 10 = defrost activation, 3 and 11 = compressor status and defrost activation, 4 and 12 = turning ON and OFF, 5 and 13 = compressor status and turning ON and OFF, 6 and 14 = defrost activation and turning ON and OFF, 7 and 15 = compressor status, defrost activation and turning ON and OFF, 8 = reserved) ⁽¹⁹⁾

LABEL	MIN.	MAX.	U.M.	DEF.	ENERGY SAVING (the working setpoint becomes r8)
Hr1	0.0	23.5	h.damin ⁽⁶⁾	0.0	Energy Saving cycle activation time
Hr2	0.0	23.5	h.damin ⁽⁶⁾	0.0	Energy Saving cycle length

LABEL	MIN.	MAX.	U.M.	DEF.	REAL TIME DEFROST
Hd1	0.0	23.5	h.damin ⁽⁶⁾	---	first defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾
Hd2	0.0	23.5	h.damin ⁽⁶⁾	---	second defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾
Hd3	0.0	23.5	h.damin ⁽⁶⁾	---	third defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾
Hd4	0.0	23.5	h.damin ⁽⁶⁾	---	fourth defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾
Hd5	0.0	23.5	h.damin ⁽⁶⁾	---	fifth defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾
Hd6	0.0	23.5	h.damin ⁽⁶⁾	---	sixth defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾

⁽⁵⁾ the unit of measure depends on the parameter /8

⁽⁶⁾ damin = 10 minutes

⁽⁷⁾ unless the evaporator temperature is below the defrost end temperature you have set with the parameter d2, the defrost will not be activated

⁽⁸⁾ if the time the compressor is ON is lower than 30 s, the compressor will never be ON; if the cabinet probe failure takes place during a compressor delay, the compressor will be forced OFF for 1 min; the parameter C1 sets the minimum delay between the end of the cabinet probe failure and the following activation of the compressor (if the parameter C1 has value 0, the compressor will be forced off for 2 min)

⁽⁹⁾ if at the moment of the defrost activation the cabinet temperature is below the value "working setpoint + r0", the instrument will not show temperatures above that value; if at the moment of the defrost activation the cabinet temperature is above the value "working setpoint + r0", the instrument will not show the increases of the temperature (if the increase takes place below the value "working setpoint + r0", look at the previous case); the instrument restores the normal operation once the after dripping evaporator fan delay ends and the cabinet temperature falls below the freeze temperature






⁽¹⁰⁾ if at the moment of the defrost activation the compressor is ON since a time lower than the one you have set with the parameter, the compressor will be forced ON for a time such as to finish the time you have set with the parameter

⁽¹¹⁾ if the lower temperature alarm takes place during the count of the delay, this last will be cleared


⁽¹²⁾ if the temperature alarm does not disappear at the end of the times you have set with the parameters A3 and AA, it will further be excluded for the time you have set with the parameter A6; if the temperature alarm takes place during the defrost and does not disappear at the end of the time you have set with the parameter A7, it will further be excluded for the time you have set with the parameter A6; if the temperature alarm takes place during the multifunction input activation, it will be excluded for the time "A5 + A6" since the input activation or for the time you have set with the parameter A6 since the input deactivation


⁽¹³⁾ the evaporator fan stop temperature is "cabinet temperature - F1"; you always have to consider the parameter F1 with positive sign

⁽¹⁴⁾ the instrument will automatically verify the maximum value of the parameter; it always has to be lower than the value you have set with the parameter i4

	Defrost LED if it is lighted, the defrost output will be activated if it flashes: ▪ a defrost delay will be running (look at the parameters C0, C1, C2, C4, n1 and n4) ▪ the dripping will be running (look at the parameter d7) ▪ the freezing fluid heating will be running (look at the parameter dF)
	Evaporator fan LED if it is lighted, the evaporator fan will be ON if it flashes, the after dripping evaporator fan delay will be running (look at the parameter F5)
	Cabinet light LED if it is lighted, the cabinet light will be ON if it flashes, the multifunction input will be active (look at the parameters i0, i1 and i7)
	Lock input/thermal protection LED if it is lighted, there will have been a number of lock input/thermal protection alarms such as to give the lock of the instrument (turn the instrument OFF and turn it ON again, look at the parameters i2, i3, i4 and i5) if it flashes, the lock input/thermal protection will be active (look at the parameters i2, i3, i4 and i5)
	ON STAND-BY LED if it is lighted, the instrument will be in the STAND-BY mode if it flashes, the instrument will be set as slave but it will not be authorized to implement the remote controls coming from the master (look at the parameter n3) if it flashes every two seconds, the instrument will be set as slave and among the remote controls, coming from the master, the slave has to implement, there will be the turning ON and OFF (look at the parameter nA)





nEt

INDICAT.	MEANING
	the instrument will be set as slave and among the remote controls, coming from the master, the slave has to implement, there will be the compressor status (look at the parameter nA). If you have to show the cabinet temperature, press 

	the instrument will be set as slave, among the remote controls, coming every 2 s from the master, the slave has to implement, there will be the compressor status but there will not be the turning ON and OFF, both the master and the slave will be in the STAND-BY mode (look at the parameter nA). If the master is in the STAND-BY mode and the slave is ON, the indication will be showed alternated with the cabinet temperature
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8 ALARMS

8.1 Alarms

CODE	REASONS	REMEDIES	EFFECTS
	there is the corruption of the configuration data of the memory	switch off the power supply of the instrument: unless the alarm disappears, you will have to change the instrument	▪ you can not gain access the setting procedures ▪ all outputs will be forced OFF
	the lock input/thermal protection and the multifunction input are active	▪ deactivate the inputs (look at the parameters i0, i1, i2, i3, i4 and i5) ▪ turn the instrument OFF and turn it ON again	▪ the compressor will be forced OFF ▪ the alarm output will be forced OFF ▪ if the defrost is running, it will immediately end ▪ the defrost will never be activated ▪ you will get the action you have chosen with the parameter i0
	the lock input/thermal protection is active.	▪ deactivate the input (look at the parameters i2, i3, i4 and i5) ▪ turn the instrument OFF and turn it ON again	▪ the compressor will be forced OFF ▪ the alarm output will be forced OFF ▪ if the defrost is running, it will immediately end ▪ the defrost will never be activated
	for 3 s every 4 s (turn the instrum. OFF and turn it ON again)		▪ the defrost will never be activated

E0 cabinet probe alarm	<ul style="list-style-type: none"> the kind of cabinet probe you have connected is not right the cabinet probe plays up the connection instrument-cabinet probe is wrong the cabinet temperature is outside the limits allowed by the working range of the instrument 	<ul style="list-style-type: none"> look at the parameter /0 test the integrity of the probe test the instrument-probe connection test the temperature close to the probe (it has to be between the limits allowed by the working range) 	<ul style="list-style-type: none"> the alarm output will be forced OFF the compressor will work in accordance with the parameters C5 and C6 if the defrost is running, it will immediately end the defrost will never be activated
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E1 evaporator probe alarm	<ul style="list-style-type: none"> the kind of evaporator probe you have connected is not right the evaporator probe plays up the connection instrument-evaporator probe is wrong the evaporator temperature is outside the limits allowed by the working range of the instrument 	<ul style="list-style-type: none"> look at the parameter /0 test the integrity of the probe test the instrument-probe connection test the temperature close to the probe (it has to be between the limits allowed by the working range) 	<ul style="list-style-type: none"> the alarm output will be forced OFF if the parameter dE has value 2, the instrument will work as if the parameter had value 0 if the parameter F7 has value 3 or 4, the evaporator fan will work in accordance with the compressor, except what you have set with the parameters F4 and F5 the defrost will end by time (parameter d3)
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E4 condenser probe alarm	<ul style="list-style-type: none"> the kind of condenser probe you have connected is not right the condenser probe plays up 	<ul style="list-style-type: none"> look at the parameter /0 test the integrity of the probe test the instrument-probe connection 	<ul style="list-style-type: none"> the alarm output will be forced OFF
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E5 condenser temperature alarm	<ul style="list-style-type: none"> the connection instrument-condenser probe is wrong the condenser temperature is outside the limits allowed by the working range of the instrument 	<ul style="list-style-type: none"> test the temperature close to the probe (it has to be between the limits allowed by the working range) 	<ul style="list-style-type: none"> test the temperature close to the probe (it has to be between the limits allowed by the working range)
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E5 condenser temperature alarm	<ul style="list-style-type: none"> the condenser temperature is outside the limit you have set with the parameter AC 	<ul style="list-style-type: none"> test the temperature close to the probe (look at the parameter AC) turn the instrument OFF and turn it ON again 	<ul style="list-style-type: none"> the alarm output will be forced OFF
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Ai n multi-function input alarm	<ul style="list-style-type: none"> the multifunction input is active. Unless the parameter i6 has value 1, the instrument will not show any indication 	<ul style="list-style-type: none"> deactivate the input (look at the parameters i0, i1 and i6) 	<ul style="list-style-type: none"> you will get the action you have chosen with the parameter i0
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AH temperature alarm	<ul style="list-style-type: none"> the cabinet temperature is outside the limit you have set with the parameter A1b 	<ul style="list-style-type: none"> test the temperature close to the probe (look at the parameters A0, A1b and A2b) 	<ul style="list-style-type: none"> the alarm output will be forced OFF
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AH for 3 s every 4 	<ul style="list-style-type: none"> there has been an upper temperature alarm 	<ul style="list-style-type: none"> look at the parameters A0, A1b, A2b, A8 and A9 	<ul style="list-style-type: none"> the alarm output will be forced OFF
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AL temperature alarm	<ul style="list-style-type: none"> the cabinet temperature is outside the limit you have set with the parameter A1A 	<ul style="list-style-type: none"> test the temperature close to the probe (look at the parameters A0, A1A and A2A) 	<ul style="list-style-type: none"> the alarm output will be forced OFF
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AL for 3 s every 4 	<ul style="list-style-type: none"> there has been a lower temperature alarm 	<ul style="list-style-type: none"> look at the parameters A0, A1A, A2A, A8 and A9 	<ul style="list-style-type: none"> the alarm output will be forced OFF
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F7	0	4	—	1	evaporator fan action during the normal operation (0 = it will be forced OFF, 1 = it will be forced ON, 2 = it will work in accordance with the compressor, 3 = it will work in accordance with F1 and F2, 4 = if the compressor is ON, it will work in accordance with F1 and F2, if the compressor is OFF, it will be forced OFF)
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LABEL	MIN.	MAX.	U.M.	DEF.	DIGITAL INPUTS
i0	0	7	—	4	action given by the multifunction input activation (0 = inactive, 1 = once d5 has passed, the defrost will be activated ⁽⁷⁾ , 2 = the cabinet light will be turned ON, 3 = the compressor will be forced ON for A5 and the cabinet light will be turned ON, 4 = the compressor and the evaporator fan will be forced OFF for A5 and the cabinet light will be turned ON, 5 = the evaporator fan will be forced OFF for A5 and the cabinet light will be turned ON, 6 = the working setpoint becomes r8, 7 = the working setpoint becomes r8 and the cabinet light will be turned OFF); look at i7 as well
i1	0	1	—	0	kind of contact of the multifunction input (it is important if i0 ≠ 0; 0 = NO, 1 = NC)
i2	1	2	—	1	action given by the lock input/thermal protection activation (1 = the compressor will be forced OFF, 2 = in accordance with i3, i4 and i5)
i3	0	15	—	0	lock input/thermal protection alarms number such as to give the lock of the instrument (it is important if i2 = 2; 0 = the lock of the instrument will never take place)
i4	i5	240	min	0	time without lock input/thermal protection alarms able to clear the lock input/thermal protection alarms counter (it is important if i2 = 2)
i5	0	15 ⁽¹⁴⁾	min	0	minimum delay between the lock input/thermal protection deactivation and the following compressor activation (it is important if i2 = 2)
i6	0	1	—	1	indication "Ain" flashing on the display during the multifunction input activation (it is important if i0 ≠ 0)
i7	0	240	min	0	delay between the multifunction input deactivation and the cabinet light gets OFF (it is important if i0 = 2, 3, 4 or 5) ⁽¹⁵⁾


LABEL	MIN.	MAX.	U.M.	DEF.	SERIAL NETWORK (EVCOBUS)
L1	1	15	—	1	instrument address
L2	0	7	—	0	instrument group
L4	0	3	—	1	baud rate (0 = 1,200 baud, 1 = 2,400 baud, 2 = 4,800 baud, 3 = 9,600 baud)

LABEL	MIN.	MAX.	U.M.	DEF.	SERIAL NETWORK (EVCONET)
n0	0	2	—	0	operation of the instrument in the network (0 = instrument not enabled to work in the network, 1 = master, 2 = slave) ⁽¹⁶⁾
n1	0	8	—	0	address of the instrument in the network (it is important if n0 ≠ 0; 0 = master address, 1 ... 8 = first ... eighth slave address)
n3	0	1	—	0	authorization to implement the remote controls coming from the master (it is important if n0 = 2 and n1 ≠ 0; 1 = YES)

dP	0	99	min	0	minimum time the compressor must have been ON at the moment of the defrost activation in order that the defrost can be activated (it is important if d1 = 1) ⁽¹⁰⁾
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LABEL	MIN.	MAX.	U.M.	DEF.	ALARMS
A0	0.1	15.0	°C/°F ⁽⁵⁾	2.0	hysteresis (differential, it is relative to A1A and A1b, it is important if A2A and/or A2b ≠ 0)
A1A	-99	99.9	°C/°F ⁽⁵⁾	-10	lower temperature alarm threshold; look at A2A as well
A2A	0	2	—	1	kind of lower temperature alarm (0 = it will never be activated, 1 = lower temperature alarm relative to the working setpoint, 2 = absolute lower temperature alarm)
A1b	-99	99.9	°C/°F ⁽⁵⁾	10.0	upper temperature alarm threshold; look at A2b as well
A2b	0	2	—	1	kind of upper temperature alarm (0 = it will never be activated, 1 = upper temperature alarm relative to the working setpoint, 2 = absolute upper temperature alarm)
A3	0	240	min	120	upper temperature alarm exclusion time since you turn the instrument ON (it is important if A2b ≠ 0) ⁽¹¹⁾
A5	-1	120	min	30	buzzer exclusion time since the multifunction input activation (it is important if i0 ≠ 0; -1 = the buzzer will never be activated)
A6	0	240	min	5	temperature alarm exclusion time (it is important if A2A and/or A2b ≠ 0) ⁽¹³⁾
A7	0	240	min	15	upper temperature alarm exclusion time since the end of the after dripping evaporator fan delay (since the end of F5, it is important if A2b ≠ 0) ⁽¹¹⁾
A8	0	3	—	0	kind of temperature alarm the instrument has to store (it is important if A2A and/or A2b ≠ 0; 0 = it will never be stored, 1 = lower temperature alarm, 2 = upper temperature alarm, 3 = both the lower temperature alarm and the upper one)
A9	1	15	s	1	time between two records of the temperature alarm in succession (it is important if A2A and/or A2b ≠ 0 and A8 ≠ 0)
AA	0	240	min	0	temperature alarms relative to the working setpoint exclusion time since the multifunction input activation/deactivation (it is important if i0 = 6 or 7) and since the activation/end of the Energy Saving cycle
AC	0.0	99.9	°C/°F ⁽⁵⁾	0.0	upper temperature alarm threshold for condenser temperature alarm (condenser temperature)

LABEL	MIN.	MAX.	U.M.	DEF.	EVAPORATOR FAN
F1	-99	99.9	°C/°F ⁽⁵⁾	-1.0	evaporator fan stop temperature (evaporator temperature, it is important if F7 = 3 or 4); look at F6 as well
F2	0.1	15.0	°C/°F ⁽⁵⁾	2.0	hysteresis (differential, it is relative to F1, it is important if F7 = 3 or 4)
F4	0	2	—	0	evaporator fan action during the defrost and dripping (0 = it will be forced OFF, 1 = it will be forced ON, 2 = it will work in accordance with F7)
F5	0	15	min	2	after dripping evaporator fan delay
F6	0	1	—	0	kind of evaporator fan stop temperature (it is important if F7 = 3 or 4; 0 = absolute evaporator fan stop temperature, 1 = evaporator fan stop temperature relative to the cabinet temperature) ⁽¹³⁾

rEtC	there is the corruption of the data of the clock of the instrument alarm	set the clock again	<ul style="list-style-type: none"> if the parameter dE has value 3, the instrument will work as if the parameter had value 0 the Energy Saving cycle will never be activated
nEt	the instrument will be set as slave, among the remote controls, coming from the master, the slave has to implement there will be the compressor status and there will be one of the alarms you saw in the previous cases. If the master is in the STAND-BY mode and the slave is ON, the indication will be showed every 2 s alternated with the alarm code	<ul style="list-style-type: none"> if you have to show the alarm code, press  look at the remedies of that case 	look at the effects of that case
nEt	the value of the parameters n0, n1 and n3 is wrong the connections of the instrument are wrong	<ul style="list-style-type: none"> look at the parameters n0, n1 and n3 test the connections of the instrument 	the instrument will work with the local settings

The instrument shows the indications above alternated with the cabinet temperature, except the indication "E2" (it flashes), "E0" (it is alternated with the indication "...") and "nEt" (slave alarm, it is a fixed indication) and the buzzer utters an intermittent beep.

9 TECHNICAL DATA

9.1 Technical data

Box: self-extinguishing grey.

Size: 106 x 90 x 58 mm (4.17 x 3.54 x 2.28 in, 6 DIN modules).

Installation: on DIN rail (it is not supplied by the builder).

Frontal protection: IP 40.

Connections: screw terminal blocks with pitch 5 mm (0.19 in) for cables up to 2.5 mm² (0.38 sq in, power supply, inputs and outputs), 5 poles single line female connector with pitch 2.5 mm (0.09 in, serial port).

Ambient temperature: from 0 to 55 °C (32 to 131 °F, 10 ... 90% of relative humidity without condensate).

Power supply: 230 Vac, 50/60 Hz, 4 VA.

Clock data maintenance without power supply: 24 hours (the instrument must have been ON for 2 min at least).

Alarm buzzer: included.

Measure inputs: 3 (cabinet, evaporator and condenser probe) for PTC or NTC probes.

Digital inputs: 2 inputs: one multifunction input (NO or NC contact) and one lock input, without voltage (they work with 5 mA).

Working range: from -50 to 99.9 °C (-58 to 212 °F) for PTC probe, from -40 to 99.9 °C (-40 to 212 °F) for NTC probe.

Setpoint range: from -99 to 99.9 °C (-99 to 99 °F).

Resolution: 1 °F with unit of measure in Fahrenheit, 0.1 or 1 °C with unit of measure in Celsius.

Display: one red LED 3-digit display 13.2 mm (0.51 in) high, compressor, evaporator fan, defrost and cabinet light output status indicators, instrument mode indicator.

Outputs: 5 relays: one 16 A @ 250 Vac relay for one 1½ HP @ 230 Vac compressor control (NO contact), one 8 A @ 250 Vac relay for evaporator fan control (NO contact), one 8 A @ 250 Vac relay for defrost system control (change-over contact), one 8 A @ 250 Vac relay for cabinet light control (NO contact) and one 8 A @ 250 Vac relay for alarms control (the relay will be activated during the normal operation and it will be deactivated during an alarm condition, change-over contact).

Kind of defrost: electric and hot gas defrost.

Defrost control: defrost interval, defrost end temperature, defrost maximum length and defrost interval count mode (automatic, by hand and remote).

Serial port: TTL with EVCOBUS communication protocol, adapt for serial interface EC IFC 02.

10 WORKING SETPOINT AND CONFIGURATION PARAMETERS

10.1 Working setpoint

LABEL	MIN.	MAX.	U.M.	DEF.	WORKING SETPOINT
r1	r2		°C/°F ⁽⁵⁾	0.0	working setpoint

10.2 First level parameters

LABEL	MIN.	MAX.	U.M.	DEF.	PASSWORD
PA	-55	99	—	0	password

LABEL	MIN.	MAX.	U.M.	DEF.	MEASURE INPUTS
/1A	-10	10.0	°C/°F ⁽⁵⁾	0.0	cabinet probe calibration
/1b	-10	10.0	°C/°F ⁽⁵⁾	0.0	evaporator probe calibration
/1C	-10	10.0	°C/°F ⁽⁵⁾	0.0	condenser probe calibration

LABEL	MIN.	MAX.	U.M.	DEF.	REGULATOR
r0	0.1	15.0	°C/°F ⁽⁵⁾	2.0	hysteresis (differential, it is relative to the working setpoint)

LABEL	MIN.	MAX.	U.M.	DEF.	SERIAL NETWORK (EVCONET)
n3	0	1	—	0	authorization to implement the remote controls coming from the master (it is important if n0 = 2 and n1 ≠ 0; 1 = YES)

LABEL	MIN.	MAX.	U.M.	DEF.	ENERGY SAVING (the working setpoint becomes r8)
Hr1	0.0	23.5	h.damin ⁽⁶⁾	0.0	Energy Saving cycle activation time
Hr2	0.0	23.5	h.damin ⁽⁶⁾	0.0	Energy Saving cycle length

LABEL	MIN.	MAX.	U.M.	DEF.	REAL TIME DEFROST
Hd1	0.0	23.5	h.damin ⁽⁶⁾	---	first defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾
Hd2	0.0	23.5	h.damin ⁽⁶⁾	---	second defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾
Hd3	0.0	23.5	h.damin ⁽⁶⁾	---	third defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾
Hd4	0.0	23.5	h.damin ⁽⁶⁾	---	fourth defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾
Hd5	0.0	23.5	h.damin ⁽⁶⁾	---	fifth defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾
Hd6	0.0	23.5	h.damin ⁽⁶⁾	---	sixth defrost activation time (it is important if dE = 3; --- = it will never be activated) ⁽⁷⁾

10.3 Second level parameters

LABEL	MIN.	MAX.	U.M.	DEF.	MEASURE INPUTS
/0	1	3	—	1	kind of probe (1 = PTC, 3 = NTC)
/1A	-10	10.0	°C/°F ⁽⁵⁾	0.0	cabinet probe calibration
/1b	-10	10.0	°C/°F ⁽⁵⁾	0.0	evaporator probe calibration
/1C	-10	10.0	°C/°F ⁽⁵⁾	0.0	condenser probe calibration

/5	0	1	—	1	temperature resolution (it is important if /8 = 1; 0 = 1 degree, 1 = 0.1 degrees)
/8	0	1	—	1	temperature unit of measure (0 = Fahrenheit degree, 1 = Celsius degree)

LABEL	MIN.	MAX.	U.M.	DEF.	REGULATOR
r0	0.1	15.0	°C/°F ⁽⁵⁾	2.0	hysteresis (differential, it is relative to the working setpoint)
r1	-99	r2	°C/°F ⁽⁵⁾	-50	minimum value you can assign to the working setpoint
r2	r1	99.9	°C/°F ⁽⁵⁾	50.0	maximum value you can assign to the working setpoint
r5	0	1	—	0	working setpoint modification lock-out (1 = YES)
r8	-99	99.9	°C/°F ⁽⁵⁾	0.0	auxiliary working setpoint (it is the working setpoint during the multifunction input activation if i0 = 6 or 7 and during the Energy Saving cycle)

LABEL	MIN.	MAX.	U.M.	DEF.	COMPRESSOR PROTECTION
C0	0	240	min	0	minimum delay between you turn the instrument ON and the first compressor activation
C1	0	240	min	5	minimum delay between two compressor activation in succession
C2	0	240	min	3	minimum delay between the compressor gets OFF and the following activation
C4	0	1	—	0	fixed delay since the compressor gets ON and OFF (1 = YES, for 3 s)
C5	1	240	min	10	cycle time for the compressor activation during the cabinet probe alarm
C6	0	100	%	50	percentage of C5 the compressor is ON during the cabinet probe failure ⁽⁸⁾

LABEL	MIN.	MAX.	U.M.	DEF.	DEFROST
d0	0	99	h	8	defrost interval (it is important if dE ≠ 3); look at dE as well ⁽⁷⁾ (0 = the defrost will never automatically be activated)
d1	0	1	—	1	kind of defrost (0 = electric defrost, 1 = hot gas defrost)
d2	-99	99.9	°C/°F ⁽⁵⁾	2.0	defrost end temperature (evaporator temperature)
d3	0	99	min	30	defrost maximum length (0 = the defrost will never be activated)
d4	0	1	—	0	defrost activation every time you turn the instrument ON (1 = YES) ⁽⁷⁾
d5	0	99	min	0	delay between you turn the instrument ON and the defrost activation (it is important if d4 = 1)
d6	0	1	—	1	freeze of the temperature showed by the instrument during the defrost (1 = YES) ⁽⁹⁾
d7	0	15	min	2	dripping time
d9	0	1	—	0	compressor protections cleaning at the moment of the defrost activation (it is important if d1 = 1; 1 = YES)
dE	0	3	—	0	defrost interval count mode; look at d0 as well (0 = the instrument counts the working time, 1 = the instrument counts the sum of the times the compressor is ON, 2 = the instrument counts the sum of the times the evaporator temperature is below dF, 3 = real time defrost, the defrost will be activated at the times you have set with the parameters Hd1 ... Hd6)
dF	-99	99.9	°C/°F ⁽⁵⁾	0.0	defrost interval count freeze threshold (evaporator temperature, it is important if dE = 2)