EVXS214 Digital controller for refrigerated cabinets, made up from user interface (integrated into the unit) and a control module

version 1.0

EN ENGLISH

1 IMPORTANT

1.1 Important

Read these instructions carefully before installation and before use and follow all installation recommendations regarding installation and the electric connections. Keep the instructions with the instrument for future consultation.

The instrument must be disposed of in compliance with the local Standards regarding the collection of electrical and electronic appliances.

2 INTRODUCTION

2.1 Introduction

EVXS214 is a digital controller developed for the management of normal or low temperature refrigerated cabinets.

The instrument has:

- clock
- alarm buzzer
- 3 measurement inputs (cabinet probe, evaporator probe and condenser probe) for NTC probes
- 2 digital inputs (door micro switch and multipurpose)
- 4 digital outputs (relays) for compressor management (30 A @ 250 VAC), defrost and evaporator fan management and a fourth utility (cabinet light, demisting heater, auxiliary output, alarm output, door heater, evaporator valve or condenser fan).Defrosting can be electric or using hot gas.
- TTL serial port with MODBUS communication protocol.

The models have "split" execution (user interface + control module).

The user interface is an open frame board and is made up from a 4-digit custom display (with icon function) and 6 keys (set, up, down, defrosting, cabinet light and on/stand-by); back panel installation is envisioned, using M3 studs, for its complete mechanical and aesthetic integration into the cabinet.

The control module is in open frame board; installation is envisioned on a flat surface with spacers.

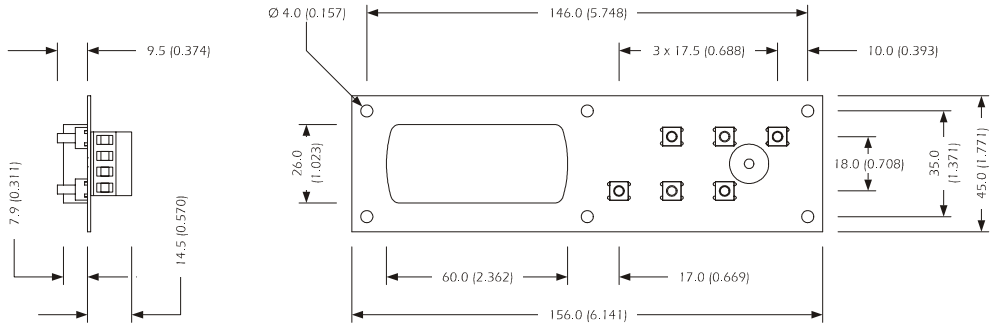
Using the EVKEY programming key (to be ordered separately) configuration parameters can be uploaded and downloaded.

Using a serial interface (to be ordered separately) it is also possible to connect the controller to the Parameters Manager set-up software or to the monitoring and supervision system of RICS plants (via TTL, with MODBUS communication protocol).

3 DIMENSIONS AND INSTALLATION

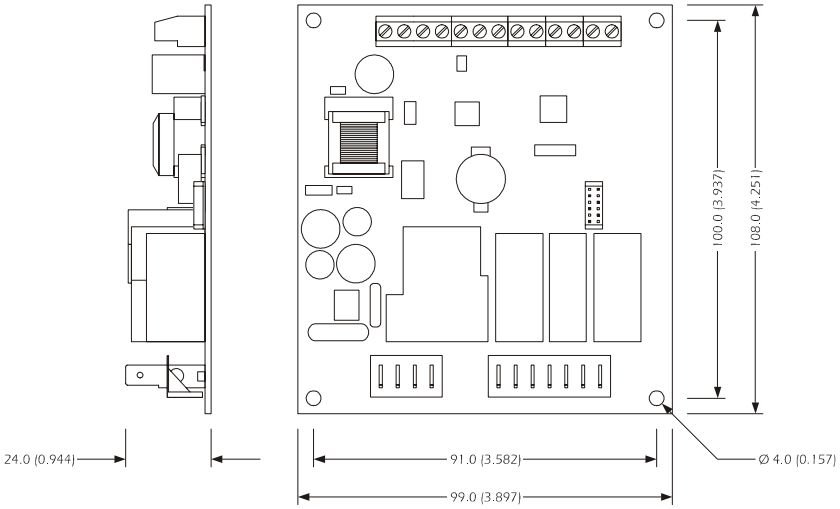
3.1 User interface dimensions

The dimensions are expressed in mm (in); installation is envisioned behind the panel using M3 studs.



3.2 Control module dimensions

The dimensions are expressed in mm (in); installation is envisioned on a flat surface using spacers.



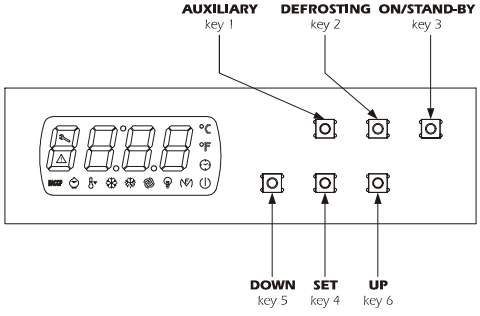
3.3 Recommendations for installation

- make sure that the work conditions (temperature of use, humidity, etc.) lie within the limits indicated in the technical data
- do not install the instrument in proximity of heat sources (heaters, hot air pipes etc.) appliances with strong magnets (large diffusers etc.), places subject to direct sunlight, rain, humidity, excessive dust, mechanical vibrations or shocks
- any metal parts in proximity of the control module must be at a distance such as not to compromise the safety distances
- in compliance with Safety Standards, the protection against any contact with the electric parts must be ensured via correct installation of the instrument. All parts that ensure protection must be fixed in a way such that they cannot be removed without the aid of a tool.

4 USER INTERFACE

4.1 Preliminary considerations

The user interface consists of a custom 4-digit display (with decimal points and function icons) and six keys (SET, UP, DOWN, DEFROST, AUXILIARY and ON/STAND-BY).



The following functioning states exist:

- the "on" status (the instrument is powered and on: the regulators can be on)
- the "stand-by" status (the instrument is powered but is switched off software: the regulators are off, the possibility of switching the cabinet light or auxiliary output on/off in manual mode depends on parameter u2)
- the "off" status (the instrument is not powered).

Successively, the term "switch-on" means that the passage from the stand-by status to the on status; the term "switch-off" means the passage from the on status to the stand-by status.

When the instrument is powered it re-proposes the status in which it found itself at the time when the power supply was disconnected.

4.2 Instrument switch-on/off in manual mode

- make sure that the keyboard is not locked and that no procedure is in progress
- hold the **ON/STAND-BY** key down for 2 s: the on/stand-by LED switches-on/off.

The multipurpose input can also be used to switch the instrument on/off in remote mode.

4.3 The display

If the instrument is on, during normal functioning the display will show the temperature of the cabinet, except during defrosting, when the instrument will display the temperature established with parameter d6.

If the instrument is off, the display will be off.

4.4 Evaporator temperature display

- make sure that the keyboard is not locked and that no procedure is in progress
- hold the **DOWN** key down for 1 s: the display will show the first label available
- press and release the **UP** key or the **DOWN** key to select "**Pb2**"
- press and release the **SET** key.

To exit the procedure:

- press and release the **SET** key or do not operate for 60 s
- press and release the **UP** key or the **DOWN** key until the display shows the cabinet temperature or do not operate for 60 s.

Alternatively:

- press and release the **ON/STAND-BY** key.

If the evaporator probe is absent (parameter P3 = 0), the "**Pb2**" label will not be displayed.

4.5 Condenser temperature display

- make sure that the keyboard is not locked and that no procedure is in progress
- hold the **DOWN** key down for 1 s: the display will show the first label available
- press and release the **UP** key or the **DOWN** key to select "**Pb3**"
- press and release the **SET** key.

To exit the procedure:

- press and release the **SET** key or do not operate for 60 s
- press and release the **UP** key or the **DOWN** key until the display shows the cabinet temperature or do not operate for 60 s.

Alternatively:

- press and release the **ON/STAND-BY** key.

If the condenser probe is absent (parameter P4 = 0), the "**Pb3**" label will not be displayed.

4.6 Activation/deactivation of the Overcooling function

- make sure that the keyboard is not locked, that no procedure is in progress and defrosting is not in progress along with dripping or evaporator fan standstill.
- hold the **UP** key down for 4 s: the Overcooling LED will switch-on.

During the Overcooling function, the work set-point is decreased from the temperature established by parameter r5; the function will last for the time established by parameter r6.

Defrosting is never activated during the Overcooling function; if the defrosting interval expires when the function is in progress, defrosting will be activated on conclusion of the function.

4.7 Activation of defrosting in manual mode

- make sure that the keyboard is not locked, that no procedure is in progress and the Overcooling function is not in progress
- hold the **DEFROST** key down for 4 s.

If the function of the evaporator probe is that of defrosting probe (parameter P3 = 1) and on activation of defrosting the temperature of the evaporator is above that established with parameter d2, defrosting will not be activated.

4.8 Functioning due to low or high relative humidity percentage (only if parameter F0 is set at 5)

During functioning due to low relative humidity percentage, the evaporator fan will be switched-on if the compressor is on and is switched-on cyclically if the compressor is off (parameter F4 establishes the duration of evaporator fan switch-off and parameter F5 that regarding switch-on).

During functioning due to the high relative humidity percentage, the evaporator fan is always on.

4.8.1 Activation of the functioning due to low or high relative humidity percentage (only if parameter F0 is set at 5)

- make sure that the keyboard is not locked and that no procedure is in progress
- press and hold the **SET** and **UP** key for 4 s: the display will show "**rhL**" (functioning due to low relative humidity percentage) or "**rhH**" (functioning due to high relative humidity percentage) for 10 s.

To restore normal display in advance:

- press a key.

It is also possible to activate functioning due to low or high relative humidity percentage using parameter F6.

If parameter F0 is not set at 5, pressing the **SET** and **UP** key will cause the "**- - - -**" indication to be displayed for 1 s.

4.8.2 Learning of the type of functioning in progress (due to low or high relative humidity percentage only if parameter F0 is set at 5)

- make sure no procedure is in progress
- press and release the **SET** key and the **UP** key: the display will show "**rhL**" (functioning due to low relative humidity percentage) or "**rhH**" (functioning due to high relative humidity percentage) for 10 s.

To restore normal display in advance:

- press a key.

If parameter F0 is not set at 5, pressing the **SET** and **UP** key will cause:

- the display of the "**- - - -**" indication for 1 s if the keyboard is not locked
- the display of the "**Loc**" label for 1 s if the keyboard is locked.

4.9 Switch-on/off of the cabinet light in manual mode (only if parameter u1 is set at 0)

- make sure no procedure is in progress
- press and release the **LIGHT** key: the light LED will switch-on/off.

Using the door micro switch input, the cabinet light can also be switched-on/off in remote mode; see also parameter u2.

4.10 Switch-on of the demisting heaters (only if parameter u1 is set at 1)

- make sure that the instrument is on and that no procedure is in progress
- hold the **LIGHT** key down for 2 s: the multipurpose LED will switch-on and the heaters will be switched on, both for the time established with parameter u6.

The demisting heaters cannot be switched off in manual mode (i.e. before the time established with parameter u6 has passed).

4.11 Switch-on/off of the auxiliary output in manual mode (only if parameter u1 is set at 2)

- make sure that the keyboard is not locked and that no procedure is in progress
- press and release the **LIGHT** key.

The multipurpose input can also be used to switch the auxiliary output on/off in remote mode.

If the auxiliary output has been switched on in manual mode, sit can only be switched off in the same way (also, if the auxiliary output has been switched off in remote mode, it can only be switched off in the same way); see also parameter u2.

4.12 Energy Saving

During the Energy Saving function, the work set-point is increased of the temperature established with parameter r4 and the evaporator fan is switched on cyclically, on condition that the parameter F0 is set at 1 or 2 (parameter F13 establishes the duration of fan switch-off and parameter F14 that regarding switch-on).

When the time established with parameter i10 has passed without activation of the door micro switch (after the cabinet temperature has reached the work set-point) the Energy Saving function is activated automatically (until the input is activated again).

4.12.1 Activation/deactivation of the Energy Saving function with effect only on the compressor

The multipurpose input can also be used to switch the Energy Saving function on/off in remote mode.

The Energy Saving function can also be activated in real time at the time established using parameter HE1. In this case, the function will last for the time established with parameter HE2.

4.13 Lock/unlock of the keyboard

To lock the keyboard:

- make sure no procedure is in progress
- press and hold the **DOWN** and **ON/STAND-BY** key for 1 s: the display will show "**Loc**" for 1 s.

If the keyboard is locked, the following is not allowed:

- to switch the instrument on/off in manual mode
- to display the evaporator temperature (with the procedure indicated in paragraph 4.4)
- to display the condenser temperature (with the procedure indicated in paragraph 4.5)
- activated/deactivate the Overcooling function
- activate defrosting in manual mode
- to activate functioning due to high or low relative humidity percentage and to learn the type of functioning
- to switch the auxiliary output on/off in manual mode
- to display the information regarding the HACCP alarms
- to delete the list of HACCP alarms
- to modify the date and time
- to modify the work set-point (with the procedure indicated in paragraph 5.2)
- to display the compressor functioning hours
- to cancel the compressor functioning hours.

These operations cause the "**Loc**" label to be displayed for 1 s.

To unlock the keyboard:

- press and hold the **DOWN** and **ON/STAND-BY** key for 1 s: the display will show "**UnL**" for 1 s.

4.14 Silencing the buzzer

- make sure no procedure is in progress
- press a key (the first time the key is pressed does not cause the associated effect).

If parameter u1 is set at 3 (i.e. the utility managed by the fourth output is the alarm output) and parameter u4 is set at 1, pressing the key will also cause the alarm output to be deactivated.

If parameter u9 is set at 0, the buzzer will not be enabled.

5 SETTINGS

5.1 Setting the day and real time

- make sure that the keyboard is not locked and that no procedure is in progress
- hold the **DOWN** key down for 1 s: the display will show the first label available
- press and release the **UP** key or the **DOWN** key to select "**rtc**"

To modify the year:

- press and release the **SET** key: the display will show "**yy**" followed by the last two numbers of the year and the clock LED will flash
- press and release the **UP** key or the **DOWN** key within 15 s.

To modify the month:

- press and release the **SET** key during modification of the year: the display will show "**nn**" followed by the two numbers of the month
- press and release the **UP** key or the **DOWN** key within 15 s.

To modify the day of the month:

- press and release the **SET** key during modification of the month: the display will show "**dd**" followed by the two numbers of the day
- press and release the **UP** key or the **DOWN** key within 15 s.

To modify the time:

- press and release the **SET** key during modification of the day of the month: the display will show "**hh**" followed by the two numbers of the hour
- press and release the **UP** key or the **DOWN** key within 15 s.

The time is displayed in the 24 h format.

To modify the minutes:

- press and release the **SET** key during modification of the hour the display will show "**nn**" followed by the two numbers of the minutes
- press and release the **UP** key or the **DOWN** key within 15 s.
- press and release the **SET** key or do not operate for 15 s the clock LED will switch-off.

To exit the procedure:

- press and release the **UP** key or the **DOWN** key until the display shows the cabinet temperature or do not operate for 60 s.

Alternatively:

- press and release the **ON/STAND-BY** key.

5.2 Setting the work set-point

- make sure that the keyboard is not locked and that no procedure is in progress
- press and release the **SET** key: the compressor LED will flash
- press and release the **UP** key or the **DOWN** key within 15 s; see also parameters r1, r2 and r3
- press and release the **SET** key or do not operate for 15 s the compressor LED will switch-off, after which the instrument will exit the procedure.

To exit the procedure in advance:

- do not operate for 15 s (any modifications will be saved).

It is also possible to set the work set-point via parameter SP.

5.3 Setting the configuration parameters

To access the procedure:

- make sure no procedure is in progress
- press and hold the **UP** and **DOWN** key for 4 s: the display will show "**PA**"
- press and release the **SET** key
- press and release the **UP** key or the **DOWN** key within 15 s. to set "**-19**"
- press and release the **SET** key or do not operate for 15 s
- press and hold the **UP** and **DOWN** key for 4 s: the display will show "**SP**".

To select a parameter:

- press and release the **UP** key and the **DOWN** key.

To modify a parameter:

- press and release the **SET** key
- press and release the **UP** key or the **DOWN** key within 15 s.
- press and release the **SET** key or do not operate for 15 s.

To exit the procedure:

- press and hold the **UP** key and the **DOWN** key for 4 s or do not operate for 60 s (any modifications will be saved).

Cut off the power supply to the instrument after modification of the parameters.

5.4 Restoring factory settings

To access the procedure:

- make sure no procedure is in progress
- press and hold the **UP** and **DOWN** key for 4 s: the display will show "**PA**"
- press and release the **SET** key
- press and release the **UP** key or the **DOWN** key within 15 s. to set "**149**"
- press and release the **SET** key or do not operate for 15 s
- press and hold the **UP** and **DOWN** key for 4 s: the display will show "**dEF**"
- press and release the **SET** key
- press and release the **UP** key or the **DOWN** key within 15 s. to set "**1**"
- press and release the **SET** key or do not operate for 15 s the display will show flashing "**dEF**" for 4 s, after which the instrument will exit the procedure
- cut the instrument power supply off.

To exit the procedure in advance:

- press and hold the **UP** key and the **DOWN** key for 4 s during the procedure (i.e. before setting "**1**": restore will not be performed).

Check that the factory settings are appropriate (see chapter 12).

6 HACCP FUNCTION

6.1 Preliminary considerations

The instrument can memorise up to 9 HACCP alarms, after which the most recent alarm will overwrite the oldest.

The instrument supplies the following information:

- the critical value
- the date and time of the alarm
- the duration of the alarm (from 1 min to 99 h and 59 min, partial if the alarm is in progress).

CODE	TYPE OF ALARM (CRITICAL VALUE)
AL	minimum temperature alarm (the minimum cabinet temperature during the alarm)
AH	maximum temperature alarm (the maximum cabinet temperature during the alarm)
id	door micro switch input alarm (the maximum temperature of the cabinet during the alarm); see also parameter i4
PF	power supply cut-off alarm (the cabinet temperature on power supply restore); see also parameters A10 and A12

Recommendations:

- **the instrument memorises the minimum temperature alarm and the maximum temperature alarm on condition that the temperature associated to the alarm is that of the cabinet (parameter A0 = 0)**
- **to prevent the power supply cut-off alarms being memorised repeatedly, disconnect the power supply when the instrument is off**
- **if the duration of the power supply cut-off alarm is such to cause the clock error ("rtc" code), the instrument will not supply any information regarding the duration of the alarm**
- **if the instrument is off, no alarm will be memorised.**

When the cause of the alarm disappears, the display restores normal functioning, except for the power supply cut-off alarm ("**PF**" code) that requires restore of normal display in manual mode.

to restore normal display in manual mode:

- press a key.

If parameter u1 is set at 3 (i.e. the utility managed by the fourth output is the alarm output), pressing the key will also cause the alarm output to be deactivated.

The HACCP LED supplies information regarding the status of the HACCP alarms memory; see paragraph 8.1.

6.2 Display of the information regarding the HACCP alarms

To access the procedure:

- make sure that the keyboard is not locked and that no procedure is in progress
- hold the **DOWN** key down for 1 s: the display will show the first label available
- press and release the **UP** key or the **DOWN** key to select "**LS**"
- press and release the **SET** key: the display will show the most recent alarm code (i.e. one of the codes given in the table in paragraph 6.1 followed by "**1**". The higher the number that follows the alarm code the older the alarm).

To select an alarm:

- press and release the **UP** key or the **DOWN** key (for example to select "**AH3**")

To display the information regarding the alarm:

- press and release the **SET** key: the HACCP LED will stop flashing to remain on with a fixed light and the display will successively show the following information (for example):

INFOR.	MEANING
8.0	the critical value is 8.0 °C/8 °F
StA	the display is about to show the date and time when the alarm occurred
y09	the alarm occurred in 2009 (continues ...)
n03	the alarm occurred in March (continues ...)
d26	the alarm occurred on 26th March 2009
h16	the alarm occurred at 16 (continues ...)
n30	the alarm occurred at 16 and 30
dur	the display is about to show the duration of the alarm
h01	the alarm had duration of 1 h (continues ...)
n15	the alarm had duration of 1 h and 15 min
AH3	the alarm selected

The display shows each piece of information for 1 s.

To exit the succession of information:
- press and release the **ON/STAND-BY** key: the display will show the alarm selected (in the example "**AH3**").

To exit the procedure:
- exit the succession of information
- press and release the **UP** key or the **DOWN** key until the display shows the cabinet temperature or do not operate for 60 s.

Alternatively:
- exit the succession of information
- press and release the **ON/STAND-BY** key.

If the instrument has no alarm in the memory, the "**LS**" label will not be displayed.

6.3 Deletion of the list of HACCP alarms

- make sure that the keyboard is not locked and that no procedure is in progress
- hold the **DOWN** key down for 1 s: the display will show the first label available
- press and release the **UP** key or the **DOWN** key to select "**rLS**"
- press and release the **SET** key
- press and release the **UP** key or the **DOWN** key within 15 s. to set "**149**"
- press and release the **SET** key or do not operate for 15 s the display will show flashing "**- - - -**" for 4 s. and the HACCP LED will switch-off, after which the instrument will exit the procedure.

If the instrument has no alarm in the memory, the "**rLS**" label will not be displayed.

7 COUNTING THE COMPRESSOR FUNCTIONING HOURS

7.1 Preliminary considerations

The instrument can memorise up to 9.999 compressor functioning hours, after which the number "**9999**" flashes.

7.2 Display of the compressor functioning hours

- make sure that the keyboard is not locked and that no procedure is in progress
- hold the **DOWN** key down for 1 s: the display will show the first label available
- press and release the **UP** key or the **DOWN** key to select "**CH**"
- press and release the **SET** key.

To exit the procedure:
- press and release the **SET** key or do not operate for 60 s
- press and release the **UP** key or the **DOWN** key until the display shows the cabinet temperature or do not operate for 60 s.

Alternatively:
- press and release the **ON/STAND-BY** key.

7.3 Deletion of the compressor functioning hours

- make sure that the keyboard is not locked and that no procedure is in progress
- hold the **DOWN** key down for 1 s: the display will show the first label available
- press and release the **UP** key or the **DOWN** key to select "**rCH**"
- press and release the **SET** key
- press and release the **UP** key or the **DOWN** key within 15 s. to set "**149**"
- press and release the **SET** key or do not operate for 15 s the display will show flashing "**- - - -**" for 4 s, after which the instrument will exit the procedure.

8 SIGNALS AND INDICATIONS

8.1 Signals

LED	MEANING
❄	compressor LED if on, the compressor will be on if flashing: ▪ the work set-point modification will be in progress (with the procedure indicated in paragraph 5.2) ▪ a compressor protection will be in progress: - parameters C0, C1, C2 - parameter i7

❄	defrosting LED
	if it is on:
	▪ defrosting will be in progress
	▪ pre-dripping will be in progress
	- parameter d16
	if flashing:
	▪ defrosting will be requested but a compressor protection will be in progress:
	- parameters C0, C1 and C2
	▪ dripping will be in progress:
	- parameter d7
	▪ refrigerant fluid heating will be in progress:
	- parameter d15

	evaporator fan LED if on, the evaporator fan will be on if it flashes, the evaporator fan standstill is in progress - parameter F3
	cabinet light LED if on, the cabinet light will have been switched-on in manual mode (only if parameter u1 is set at 0) if flashing, the cabinet light will have been switched on in remote mode: - parameter i0 (only if parameter u1 is set at 0)

	multipurpose LED
	if it is on:
	▪ the demisting heaters will be on (only if parameter u1 is set at 1)
	▪ the auxiliary output will have been switched-on in manual mode (only if parameter u1 is set at 2)
	▪ the door heaters will be on (only if parameter u1 is set at 4)
	▪ the evaporator valve will be activated (only if parameter u1 is set at 5)
	▪ the condenser fan will be on (only if parameter u1 is set at 6)
	if flashing:
	▪ the auxiliary output will have been switched-on in remote mode:
	- parameter i5 (only if parameter u1 is set at 2)
	▪ the condenser fan switch-off delay will be in progress:
	- parameter F12 (only if parameter u1 is set at 6)

	clock LED if it flashes, modification of the day and real time will be in progress
HACCP	HACCP LED id it is on, all of the information regarding the HACCP alarms has not been displayed if it flashes, the instrument will have memorised at least one new HACCP alarm if it is off, all of the information regarding the HACCP alarms will have been displayed or the list of HACCP alarms will have been deleted
	Energy Saving LED if on, the Energy Saving function will be in progress: - parameters r4, F13, F14, i5, i10, HE1 and HE2
	maintenance LED if on, compressor maintenance will be requested: - parameter C10
	Overcooling LED if on, the Overcooling function will be in progress - parameters r5 and r6
⚠	alarm LED if it is on, an alarm or an error is in progress
°C	degree Celsius LED if it is on, the unit of measurement of the temperatures will be the degree Celsius: - parameter P2
°F	degree Fahrenheit LED if it is on, the unit of measurement of the temperatures will be the degree Fahrenheit: - parameter P2
⏻	on/stand-by LED if it is on, the instrument is in the stand-by status

8.2 Indications

CODE	MEANING
rhL	functioning due to low relative humidity percentage is in progress
rhH	functioning due to high relative humidity percentage is in progress
Loc	the keyboard is locked: - see paragraph 4.13 the work set-point is blocked: - parameter r3
- - - -	the functioning requested is not available

9 ALARMS

9.1 Alarms

CODE	MEANING
AL	Minimum temperature alarm (**HACCP alarm**) Solutions: ▪ check the temperature associated to the alarm ▪ see: - see parameters A0, A1 and A2 Main consequences: ▪ if parameter A0 is seta at 0, the instrument memorises the alarm ▪ the alarm output will be activated (only if parameter u1 is set at 3)
AH	Maximum temperature alarm (**HACCP alarm**) Solutions: ▪ verify the temperature of the cabinet ▪ see: - parameters A4 and A5 Main consequences: ▪ the instrument memorises the alarm ▪ the alarm output will be activated (only if parameter u1 is set at 3)
id	Door micro switch input alarm (**HACCP alarm**) Solutions: ▪ check the causes that brought about the activation of the input ▪ see parameters i0, i1 and i4 Main consequences: ▪ the effect established with parameter i0 ▪ if parameter i4 is set at 1, the instrument memorises the alarm, on condition that parameter i2 is not set at -1 ▪ the alarm output will be activated (only if parameter u1 is set at 3)
PF	Power apply cut-off alarm (**HACCP alarm**) Solutions: ▪ check the causes of the power cut ▪ see parameters A10 and A12 ▪ press a key to restore normal display Main consequences: ▪ if the duration of the power supply cut-off is longer than the time established with parameter A10, the instrument will memorise the alarm ▪ the alarm output will be activated (only if parameter u1 is set at 3)
iA	Multipurpose input alarm Solutions: ▪ check the causes that brought about the activation of the input ▪ see parameters i5 and i6 Main consequences: ▪ the effect established with parameter i5 ▪ the alarm output will be activated (only if parameter u1 is set at 3)
iSd	Pressure switch alarm Solutions: ▪ check the causes that brought about the activation of the input ▪ see parameters i5, i6, i7, i8 and i9 ▪ switch the instrument off and back on again or cut the power supply off Main consequences: ▪ the regulators will be switched off ▪ the alarm output will be activated (only if parameter u1 is set at 3)
COH	Overheated condenser alarm Solutions: ▪ verify the temperature of the condenser ▪ see parameter C6 Main consequences: ▪ the alarm output will be activated (only if parameter u1 is set at 3) ▪ if parameter u1 is set at 6, the condenser fan will be on
CSd	Blocked compressor alarm Solutions: ▪ verify the temperature of the condenser ▪ see parameter C7 ▪ switch the instrument off and back on again: when the instrument is switched back on, if the condenser temperature is still above that established with parameter C7, the power supply must be disconnected and the condenser cleaned. Main consequences: ▪ the evaporator compressor and fan will be switched off ▪ the alarm output will be activated (only if parameter u1 is set at 3)
dFd	Defrosting concluded due to maximum duration alarm Solutions: ▪ check the integrity of the evaporator probe ▪ see parameters d2, d3 and d11 ▪ press a key to restore normal display Main consequences: ▪ the instrument continues to function regularly

When the cause of the alarm has disappeared, the instrument will go back to normal functioning, except for the following alarms:
- the power supply cut-off alarm ("**PF**" code), which requires a key to be pressed
- the pressure switch alarm ("**iSd**" code), which requires the instrument to be switched off or the power supply to be cut-off
- the compressor blocked due to condenser temperature alarm ("**CSd**" code), which requires the instrument to be switched off or the power supply to be cut-off
- the defrosting concluded due to maximum duration alarm ("**dFd**" code), which requires a key to be pressed.

10 ERRORS

10.1 Errors

CODE	MEANING
Pr1	Cabinet probe error Solutions: ▪ check that the probe is the NTC type ▪ check the integrity of the probe ▪ check the instrument-probe connection ▪ verify the temperature of the cabinet Main consequences: ▪ the activity of the compressor will depend on parameters C4 and C5 ▪ defrosting will never be activated ▪ the alarm output will be activated (only if parameter u1 is set at 3) ▪ the door heaters will be switched-off (only if parameter u1 is set at 4) ▪ the evaporator valve will be deactivated (only if parameter u1 is set at 5)
Pr2	Evaporator probe error Solutions: ▪ the same as the previous case but relative to the evaporator probe Main consequences: ▪ if parameter P3 is set at 1, defrosting will last for the time established with parameter d3 ▪ if parameter P3 is set at 1 and parameter d8 is set at 2 or 3, the instrument will function as if parameter d8 is set at 0

	▪ if parameter F0 is set at 3 or 4, the instrument will function as if parameter is set at 2 ▪ the alarm output will be activated (only if parameter u1 is set at 3)
Pr3	Condenser probe error Solutions: ▪ the same as the previous case but relative to the condenser probe Main consequences: ▪ the overheated condenser alarm ("**COH**" code) will never be activated ▪ the compressor blocked due to condenser temperature alarm ("**CSd**" code) will never be activated ▪ the alarm output will be activated (only if parameter u1 is set at 3) ▪ if parameter u1 is set at 6, the condenser fan will function in parallel to the compressor
rtc	Clock error Solutions: ▪ set the day and real time again Main consequences: ▪ if parameter d8 is set at 4, the instrument will function as if parameter is set at 0 ▪ the HACCP function will not supply information relative to the date and time the alarm occurred ▪ the Energy Saving function will not be available in real time ▪ the alarm output will be activated (only if parameter u1 is set at 3)
ErC	Error of compatibility user interface-control module Solutions: ▪ check the compatibility user interface-control module (check the data related in the labels) Main consequences: ▪ the control module will keep working correctly
ErL	Error of communication user interface-control module Solutions: ▪ check the connection user interface-control module Main consequences: ▪ the control module will keep working correctly

When the cause of the alarm disappears, the instrument restores normal functioning, except for the clock error ("**rtc**" code) that requires setting of the day and real time.

11 TECHNICAL DATA

11.1 Technical data

User interface container: open frame board.
Control module container: open frame board.
User interface protection rating (front): IP 00.
Control module protection rating: IP 00.
User interface connections: extractable screw terminal block (at the control module).
The user interface connects to the control module via a 4-way cable: the maximum length allowed for the connection cable is 20 m (65.614 ft; the cable is not supplied with the instrument).
Control module connections: 6.3 mm faston (0.248 in, power supply and outputs), screw terminal board (to the user interface and inputs), 6-pole connector (serial port).
Temperature of use: from 0 to 55 °C (from 32 to 131 °F, 10 ... 90% relative humidity without condensate).
User interface power supply: the user interface is powered by the control module.
Control module power supply: 115 ... 230 VCA, 50/60 Hz, 10 VA.
Maintaining the clock data in a power cut: 24 h with battery charged.
Battery charging time: 2 min without interruptions (the battery is charged by the instrument power supply).
Alarm buzzer: incorporated (in the user interface).
Measurement inputs: 3 (cabinet probe, evaporator probe and condenser probe) for NTC probes
Digital inputs: 2 (door micro switch and multipurpose) for normally open/normally closed contact (potential free contact, 5 V 1 mA).
Range of measurement: from -40 to 105 °C (from 40 to 220 °F).
Resolution: 0.1 °C/1 °C/1 °F.
Digital outputs: 4 relays:

- **compressor relay:** 30 A res. @ 250 VCA (NO contact)
- **defrosting relay:** 16 A res. @ 250 VCA (contact in exchange)
- **evaporator fan relay:** 8 A res. @ 250 VCA (NO contact)
- **fourth output relay:** 16 A res. @ 250 VCA (NO contact).

The maximum current allowed on the loads is 20 A.
Serial port: port for communication with the Parameters Manager set-up software system or to the monitoring and supervision system of RICS plants (via TTL, with MODBUS communication protocol) or with the EVKEY programming key.

12 WORK SET-POINT AND CONFIGURATION PARAMETERS

12.1 Work set-point

	MIN.	MAX.	U. M.	DEF.	WORK SET-POINT
	r1	r2	°C/°F (1)	-18.0	work set-point; see also r0

12.2 Configuration parameters

DEF.	MIN.	MAX.	U. M.	PAR.	WORK SET-POINT
SP	r1	r2	°C/°F (1)	-18.0	work set-point; see also r0
DEF.	MIN.	MAX.	U. M.	PAR.	MEASUREMENT INPUTS
CA1	-25.0	25.0	°C/°F (1)	0.0	cabinet probe offset
CA2	-25.0	25.0	°C/°F (1)	0.0	evaporator probe offset
CA3	-25.0	25.0	°C/°F (1)	0.0	condenser probe offset
P1	0	1	----	1	degree Celsius decimal point (for the sizes displayed during normal functioning) 1 = YES
P2	0	1	----	0	temperature unit of measurement (2) 0 = °C 1 = °F
P3	0	2	----	1	evaporator probe function 0 = no probe 1 = defrosting probe and probe for the temperature control system of the evaporator fan 2 = probe for the temperature control system of the evaporator fan
P4	0	1	----	1	enabling of the condenser probe 1 = YES
P8	0	250	ds	5	display delay of the temperature variation detected by the probes
P9	0	2	----	1	type of backlight 0 = off during the on status and active keys with low light intensity 1 = with low light intensity during the on state and active keys with high light intensity 2 = with high light intensity during the on state and all keys with high light intensity
DEF.	MIN.	MAX.	U. M.	PAR.	MAIN REGULATOR
r0	0.1	15.0	°C/°F (1)	2.0	work set-point differential
r1	-99.0	r2	°C/°F (1)	-50.0	minimum work set-point
r2	r1	99.0	°C/°F (1)	50.0	maximum work set-point
r3	0	1	----	0	block of work set-point modification (with the procedure indicated in paragraph 5.2) 1 = YES
r4	0.0	99.0	°C/°F (1)	0.0	temperature increases during Energy Saving function; see also i5, i10, HE1 and HE2
r5	0.0	99.0	°C/°F (1)	0.0	temperature decrease during Overcooling function; see also r6
r6	0	240	min	30	duration of the Overcooling function; see also r5
r7	0.0	99.0	°C/°F (1)	10.0	minimum "cabinet temperature - work set-point" difference (on instrument switch-on) such to cause the exclusion of the consequent evaporator temperature value from those used for the calculation of the relative average (for the activation of defrosting; only if d8 = 3); see also d17 (3)
DEF.	MIN.	MAX.	U. M.	PAR.	COMPRESSOR PROTECTIONS
C0	0	240	min	0	compressor switch-on delay from instrument switch-on (3)
C1	0	240	min	5	minimum time between two consecutive switch-ons of the compressor; also pressure switch-on delay from the conclusion of the cabinet probe error ("**Pr1**"code) (4) (5)
C2	0	240	min	3	minimum duration of compressor switch-off (4)
C3	0	240	s	0	minimum duration of compressor switch-on
C4	0	240	min	10	compressor switch-off duration during cabinet probe error ("**Pr1**" code); see also C5
C5	0	240	min	10	compressor switch-on duration during cabinet probe error ("**Pr1**" code); see also C4
C6	0.0	199.0	°C/°F (1)	80.0	condenser temperature over which the overheated condenser alarm is activated ("**COH**" code) (6)
C7	0.0	199.0	°C/°F (1)	90.0	condenser temperature over which the compressor blocked alarm is activated ("**CSd**" code)
C8	0	15	min	1	compressor blocked alarm delay ("**CSd**" code) (7)
C10	0	9999	h	0	number of compressor functioning hours above which a maintenance request is signalled 0 = no function
DEF.	MIN.	MAX.	U. M.	PAR.	DEFROSTING
d0	0	99	h	8	if d8 = 0, 1 or 2, defrosting interval (8) 0 = defrosting at intervals will never be activated if d8 = 3, maximum defrosting interval
d1	0	2	----	0	type of defrosting 0 = ELECTRIC - during defrosting the compressor will remain off and the defrosting output will be activated; the evaporator fan activity will depend on parameter F2 1 = WITH HOT GAS - during defrosting the compressor will be switched-on and the defrosting output will be activated; the evaporator fan activity will depend on parameter F2 2 = DUE TO COMPRESSOR STOPPING - during defrosting the compressor will remain off and the defrosting output will be deactivated; the evaporator fan activity will depend on parameter F2
d2	-99.0	99.0	°C/°F (1)	2.0	temperature of defrosting end (only if P3 = 1); see also d3
d3	0	99	min	30	if P3 = 0 or 2, duration of defrosting if P3 = 1, maximum duration of defrosting; see also d2 0 = defrosting will never be activated
d4	0	1	----	0	defrosting on instrument switch-on (only if d8 = 0, 1, 2 or 3) (3) 1 = YES
d5	0	99	min	0	if d4 = 0, minimum time between switch-on of the instrument and the activation of defrosting; see also i5 (3) if d4 = 1, defrosting activation delay from instrument switch-on; see also i5 (3)
d6	0	1	----	1	temperature displayed during defrosting 0 = cabinet temperature 1 = if, on activation of defrosting, the cabinet temperature is below "work set-point + r0", at maximum "work set-point + r0"; if, on activation of defrosting, the cabinet temperature is above "work set-point + r0", at maximum the temperature of the cabinet on activation of defrosting (9)
d7	0	15	min	2	during dripping (during dripping the compressor will remain off and the defrosting output will remain deactivated. If d16 = 0, the evaporator fan activity will depend on parameter F2; if d16 ≠ 0, the evaporator fan will remain off)
d8	0	4	----	0	defrosting activation method 0 = AT INTERVALS - defrosting will be activated when the instrument has remained on completely for time d0 1 = AT INTERVALS - defrosting will be activated when the compressor has been left on completely for time d0 2 = AT INTERVALS - defrosting will be activated when the evaporator temperature as remained below temperature d9 completely for time d0 (10) 3 = ADAPTIVE - defrosting will be activated when one of the following conditions occurs; see also d0: (10) - condition 1: the evaporator temperature will be below temperature d22 and the compressor will have remained on totally for time d18 - condition 2: the evaporator temperature will drop below temperature d19 4 = IN REAL TIME - defrosting will be activated at the times set using parameters HD1.... Hd6
d9	-99.0	99.0	°C/°F (1)	0.0	temperature of the evaporator over which the defrosting interval count is suspended (only if d8 = 2)
d11	0	1	----	0	enabling of the defrosting alarm concluded due to maximum duration ("**dFd**" code; only if P3 = 1 and without evaporator probe error ("**Pr2**" code)) 1 = YES
d15	0	99	min	0	minimum duration of the compressor switch-on on activation of defrosting so that this can be activated (only if d1 = 1) (11)
d16	0	99	min	0	duration of pre-dripping (during pre-dripping the compressor will remain off, the defrosting output will be activated and the evaporator fan will remain off)
d17	1	10	----	1	number of evaporator temperature values used to calculate the relative average (for the activation of defrosting; only if d8 = 3); see also r7, i11 and i12
d18	0	3,000	min	40	defrosting interval (only if d8 = 3 and for condition 1) 0 = defrosting due to condition 1 will never be activated
d19	0.0	40.0	°C/°F (1)	3.0	temperature of the evaporator below which defrosting is activated (relative to the average temperatures of the evaporator, i.e. "average of the evaporator temperatures + d19) (only if d8 = 3 and due to condition 2); see also d17

d20	0	500	min	180	minimum consecutive duration of the compressor, such to cause activation of defrosting 0 = defrosting will never be activated due to the effect of compressor switch-on
d21	0	500	min	200	minimum consecutive duration of compressor switch-on from instrument switch-on (on condition that the "cabinet temperature - work set-point" difference is over temperature r7) and from the activation of the Overcooling function, such to cause activation of defrosting 0 = defrosting will never be activated due to the effect of compressor switch-on
d22	0.0	10.0	°C/°F (1)	2.0	temperature of the evaporator above which the defrosting interval count will be suspended (relative to the average temperatures of the evaporator, i.e. "average of the evaporator temperatures + d22") (only if d8 = 3 and due to condition 1); see also d17
d23	0.0	10.0	°C/°F (1)	1.0	increase of the average evaporator temperatures during the Energy Saving function (for activation of defrosting; only if d8 = 3); see also d17
DEF.	MIN.	MAX.	U. M.	PAR.	TEMPERATURE ALARMS
A0	0	1	----	0	temperature associated to the minimum temperature alarm ("**AL**" code) 0 = cabinet temperature 1 = evaporator temperature (12)
A1	-99.0	99.0	°C/°F (1)	-10.0	temperature below which the minimum temperature alarm is activated ("**AL**" code); see also A0, A2 and A11
A2	0	2	----	1	type of minimum temperature alarm ("**AL**" code) 0 = no alarm 1 = relative to the work set-point (i.e. "work set-point - A1"; consider A1 without sign) 2 = absolute (i.e. A1)
A4	-99.0	99.0	°C/°F (1)	10.0	temperature above which the maximum temperature alarm is activated ("**AH**" code); see also A5 and A11
A5	0	2	----	1	type of maximum temperature alarm ("**AH**" code) 0 = no alarm 1 = relative to the work set-point (i.e. "work set-point + A4"; consider A4 without sign) 2 = absolute (i.e. A4)
A6	0	240	min	120	maximum temperature alarm delay ("**AH**" code) from instrument switch-on (3)
A7	0	240	min	15	temperature alarm delay ("**AL**" code and "**AH**" code)
A8	0	240	min	15	maximum temperature alarm delay ("**AH**" code) from conclusion of the evaporator fan standstill (13)
A9	0	240	min	15	maximum temperature alarm delay ("**AH**" code) from deactivation of the door micro switch input (14)
A10	0	240	min	1	duration of a power cut that occurs when the instrument is on such to cause memorisation of the power supply cut-off alarm, when the power supply is restored ("**PF**" code) (15)
A11	0.1	15.0	°C/°F (1)	2.0	differential of parameters A1 and A4
A12	0	2	----	1	type of power supply cut-off alarm signal ("**PF**" code); see also A10 0 = the alarm will not be signalled 1 = the display will show the flashing "**PF**" code and the buzzer will be activated 2 = the display will show the flashing "**PF**" code and the buzzer will be activated (the latter on the condition that the duration of the power supply cut-off is longer than time A10)
DEF.	MIN.	MAX.	U. M.	PAR.	EVAPORATOR FAN
F0	0	5	----	1	evaporator fan activity during normal functioning 0 = off 1 = on; se also F13, F14 and i10 2 = parallel to the compressor; se also F9, F13, F14 and i10 3 = depending on F1 (16) 4 = off if the compressor is off, depending on F1 if the compressor is on; see also F9 (16) 5 = depending on F6; see also F9
F1	-99.0	99.0	°C/°F (1)	-1.0	evaporator temperature over which the evaporator fan is switched off (sonly if F0 = 3 or 4); see also F8
F2	0	2	----	0	activity of the evaporator fan during defrosting and dripping 0 = off 1 = on (it is recommended to set parameter d7 at 0) 2 = depending on F0
F3	0	15	min	2	maximum duration of the evaporator fan standstill; see also F7 (during evaporator fan standstill, the compressor may be on, the defrosting output will remain deactivated and the evaporator fan will remain off)
F4	0	240	s	60	duration of evaporator fan switch-off during functioning due to low relative humidity percentage when the compressor is off; see also F5 (only if F0 = 5)
F5	0	240	s	10	duration of evaporator fan switch-on during functioning due to low relative humidity percentage when the compressor is off; see also F4 (only if F0 = 5)
F6	0	1	----	0	functioning due to low or high relative humidity percentage (only if F0 = 5) (17) 0 = LOW RELATIVE HUMIDITY - the evaporator fan will function in parallel to the compressor; see also F4 and F5 1 = HIGH RELATIVE HUMIDITY - the evaporator fan will always be on
F7	-99.0	99.0	°C/°F (1)	5.0	evaporator temperature below which the evaporator fan standstill is concluded (relative to the work set-point, i.e. "work set-point + F7"); see also F3
F8	0.1	15.0	°C/°F (1)	2.0	parameter F1 differential
F9	0	240	s	0	evaporator fan switch-off delay from switch-off of the compressor (only if F0 = 2, 4 and 5)
F11	0.0	99.0	°C/°F (1)	15.0	condenser temperature over which the condenser fan will be switched-on ("F11 + 2,0 °C/4 °F, only if u1 = 6 and on condition that the compressor is on); see also F12 (18)
F12	0	240	s	30	condenser fan switch-off delay from switch-off of the compressor (only if u1 = 6); see also F11
F13	0	240	min	5	duration of evaporator fan switch-off during the Energy Saving function; see also F14 and i10 (only if F0 = 1 or 2)
F14	0	240	min	5	duration of evaporator fan switch-on during the Energy Saving function; see also F13 and i10 (only if F0 = 1 or 2)
DEF.	MIN.	MAX.	U. M.	PAR.	DIGITAL INPUTS
i0	0	5	----	3	effect caused by the activation of the door micro switch input; see also i4 0 = no effect 1 = the compressor and the evaporator fan will be switched-off (at maximum for time i3 or until when the input is deactivated) (19) 2 = the evaporator fan will be switched-off (at maximum for time i3 or until when the input is deactivated) 3 = the cabinet light will be switched on (only if u1 = 0, until the input is deactivated) 4 = the compressor and the evaporator fan will be switched-off (at maximum for time i3 or until the input is deactivated) and the cabinet light will be switched on (only if u1 = 0, until the input is deactivated) (19) 5 = the evaporator fan will be switched-off (at maximum for time i3 or until the input is deactivated) and the cabinet light will be switched on (only if u1 = 0, until the input is deactivated)
i1	0	1	----	0	type of door micro switch input contact 0 = normally open (active input with closed contact) 1 = normally closed (input open with contact open)
i2	-1	120	min	30	door micro switch input alarm signalling delay ("**id**" code) -1= the alarm will not be signalled
i3	-1	120	min	15	maximum duration of the effect caused by activation of the door micro switch input on the compressor and on the evaporator fan -1= the effect will last until the input is deactivated
i4	0	1	----	0	door micro switch input alarm memorisation ("**id**" code) (20) 1 = YES

i5	0	6	----	2	effect caused by the activation of the multipurpose input 0 = no effect 1 = SYNCHRONISATION OF DEFROSTING - on expiry of time d5 defrosting will be activated 2 = ACTIVATION OF THE ENERGY SAVING FUNCTION - the Energy Saving function will be activated (until the input is deactivated), on condition that the Overcooling function is not in progress; see also r4 3 = ACTIVATION OF THE MUTIPURPOSE INPUT ALARM - when time i7 has expired, the display will show "**iA**" flashing and the buzzer will be activated (up to when the input is deactivated) 4 = ACTIVATION OF THE PRESSURE SWITCH ALARM - the compressor will be off, if u1 = 6 the condenser fan will be on, the display will show the flashing "**iA**" code and the buzzer will be activated (until the input is deactivated): when the input has been activated the number of times established by parameter i8 the regulators will be switched off, if u1 = 6 the condenser fan will be switched on, the display will show the flashing "**iSd**" code and the buzzer will be activated (until the input is deactivated and the instrument is switched off and back on again or the power supply is cut-off); see also i7 and i9 5 = AUXILIARY OUTPUT SWITCH-ON - the auxiliary output will be switched-on (only if u1 = 2, until the input is deactivated) 6 = INSTRUMENT SWITCH-OFF - the instrument will be switched off (until the input is deactivated)
i6	0	1	----	0	type of multipurpose input contact 0 = normally open (active input with closed contact) 1 = normally closed (input open with contact open)
i7	0	120	min	0	if i5 = 3, multipurpose input alarm signal delay ("**iA**" code) if i5 = 4, compressor switch-on delay from the activation of the multipurpose input (21)
i8	0	15	----	0	number of multipurpose input alarms ("**iA**" code) such to cause the pressure switch alarm ("**iSd**" code) (only if i5 = 4) 0 = no alarm
i9	1	999	min	240	time that must pass in absence of multipurpose input alarms ("**iA**" code) so that the alarms contactor is reset (only if i5 = 4)
i10	0	999	min	0	time that must pass without activation of the door micro switch input (after the cabinet temperature has reached the work set-point) so that the Energy Saving function is activated automatically (it affects the evaporator fan only if F0 = 1 or 2) 0 = the function will never be activated automatically
i11	0	240	s	15	minimum duration of door micro switch activation such to cause the exclusion of the consequent evaporator temperature value from those used for the calculation of the relative average (for the activation of defrosting; only if d8 = 3); see also d17
i12	0	240	s	60	minimum total duration of door micro switch activation such to cause the exclusion of the consequent evaporator temperature value from those used for the calculation of the relative average (for the activation of defrosting; only if d8 = 3); see also d17
i13	0	240	----	180	number of door micro switch input activations such to cause the activation of defrosting 0 = defrosting will never be activated due to the effect of door micro switch input activation
i14	0	240	min	32	minimum duration of door micro switch input activations such to cause the activation of defrosting 0 = defrosting will never be activated due to the effect of door micro switch input activation
DEF.	MIN.	MAX.	U. M.	PAR.	DIGITAL OUTPUTS
u1	0	6	----	0	utility managed by the fourth output (22) 0 = CABINET LIGHT - in this case the **LIGHT** key, parameters i0 and u2 will have meaning 1 = DEMISTING HEATERS - in this case the **LIGHT** key and parameter u6 will have meaning 2 = AUXILIARY OUTPUT - in this case the **LIGHT** key, parameters i5 and u2 will have meaning 3 = ALARM OUTPUT - in this case, parameter u4 will have meaning 4 = DOOR HEATERS - in this case, parameter u5 will have meaning 5 = EVAPORATOR VALVE - in this case, parameters u7 and u8 will have meaning 6 = CONDENSER FAN - in this case, parameters P4, F11 and F12 will have meaning
u2	0	1	----	0	enabling of cabinet light or auxiliary output switch-on/off in manual mode when the instrument is off (only if u1 = 0 or 2) (23) 1 = YES
u4	0	1	----	1	enabling deactivation of the alarm output with silencing of the buzzer (only if u1 = 3) 1 = YES
u5	-99.0	99.0	°C/°F (1)	-1.0	cabinet temperature below which the door heaters are switched-on ("u5 - 2.0 °C/4 °F, only if u1 = 4) (6)
u6	1	120	min	5	duration of demisting heaters switch-on (only if u1 = 1)
u7	0.0	99.0	°C/°F (1)	2.0	cabinet temperature below which the evaporator valve is disabled (relative to the work set-point, i.e. "work set-point + u7") (only if u1 = 5) (6)
u8	0	1	----	0	type of evaporator valve contact (only if u1 = 5) 0 = normally open (active valve with closed contact) 1 = normally closed (active valve with open contact)
u9	0	1	----	1	enabling of the buzzer 1 = YES
DEF.	MIN.	MAX.	U. M.	PAR.	ENERGY SAVING IN REAL TIME
HE1	00:00	23:59	h:min	00:00	activation time of the Energy Saving function in real time; see also r4 and HE2
HE2	00:00	23:59	h:min	00:00	duration of the Energy Saving function in real time; see also r4 and HE1 00:00= the Energy Saving function in real time will never be activated
DEF.	MIN.	MAX.	U. M.	PAR.	DEFROSTING IN REAL TIME
Hd1	00:00	23:59	h:min	--:--	activation time of the first defrosting in real time (only if d8 = 4) --:-- = the first defrosting in real time will not be activated
Hd2	00:00	23:59	h:min	--:--	activation time of the second defrosting in real time (only if d8 = 4) --:-- = the second defrosting in real time will not be activated
Hd3	00:00	23:59	h:min	--:--	activation time of the third defrosting in real time (only if d8 = 4) --:-- = the third defrosting in real time will not be activated
Hd4	00:00	23:59	h:min	--:--	activation time of the fourth defrosting in real time (only if d8 = 4) --:-- = the fourth defrosting in real time will not be activated
Hd5	00:00	23:59	h:min	--:--	activation time of the fifth defrosting in real time (only if d8 = 4) --:-- = the fifth defrosting in real time will not be activated
Hd6	00:00	23:59	h:min	--:--	activation time of the sixth defrosting in real time (only if d8 = 4) --:-- = the sixth defrosting in real time will not be activated
DEF.	MIN.	MAX.	U. M.	PAR.	SERIAL NETWORK (MODBUS)
LA	1	247	----	247	instrument address
Lb	0	3	----	2	baud rate 0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud
LP	0	2	----	2	parity 0 = none (no parity) 1 = odd 2 = even
PARAM.	MIN.	MAX.	U.O.M.	DEF.	RESERVED
E9	0	1	----	1	reserved

(1) the unit of measurement depends on parameter P2
(2) appropriately set the parameters relative to the regulators after modification of parameter P2
(3) the parameter only has effect after a power cut that occurs when the instrument is on
(4) the time established with the parameter is counted also when the instrument is off
(5) if parameter C1 is set at 0, the delay from the conclusion of the cabinet probe error will be 2 min
(6) the parameter differential is 2.0 °C/4 °F
(7) on instrument switch-on, the temperature of the condenser is already above that established with parameter C7, parameter C8 will have no effect
(8) the instrument memorises the defrosting interval count every 30 min. The modification of parameter d0 has effect from the conclusion of the previous defrosting interval or from the activation of defrosting in manual mode
(9) the display restores normal functioning when, on conclusion of evaporator fan standstill, the cabinet temperature drops below that which has blocked the display (or if a temperature alarm occurs)

(10) if parameter P3 is set at 0 or 2, the instrument will function as if parameter d8 is set at 0
(11) if, on activation of defrosting, the switch-on duration of the compressor is less than the time established with parameter d15, the compressor will remain on for the fraction of time required to complete it
(12) if parameter P3 is set at 0, the instrument will function as if parameter A0 is set at 0 but will not memorise the alarm
(13) during defrosting, dripping and evaporator fan standstill, the temperature alarms are not present as long as these have occurred after activation of defrosting
(14) during the activation of the door micro switch input, the maximum temperature alarm is absent on the condition that these occur after activation of the input
(15) the alarm is always signalled when the power supply is restored
(16) if parameter P3 is set at 0, the instrument will function as if parameter F0 is set at 2
(17) the parameter is also modified by operating with the procedure given in paragraph 4.8.1
(18) if parameter P4 is set at 0, the condenser fan will function in parallel to the compressor
(19) the compressor is switched-off after 10 s from activation of the input. If the input is activated during defrosting or standstill of the evaporator fan, the activation will not have any effect on the compressor
(20) the instrument memorises the alarm on expiry of the time established with parameter i2. If parameter i2 is set at -1, the instrument does not memorise the alarm
(21) make sure that the time established with parameter i7 is lower than that established with parameter i9
(22) to prevent damage to the utility connected, modify the parameter when the instrument is off
(23) if parameter u2 is set at 0, instrument switch-off will cause the cabinet light or auxiliary output to switch off (on successive switch-on of the instrument, the utility will remain off); if the parameter u2 is set at 1, instrument switch-off will not cause the cabinet light or auxiliary output to switch off (on successive switch-on of the instrument, the utility will remain on).

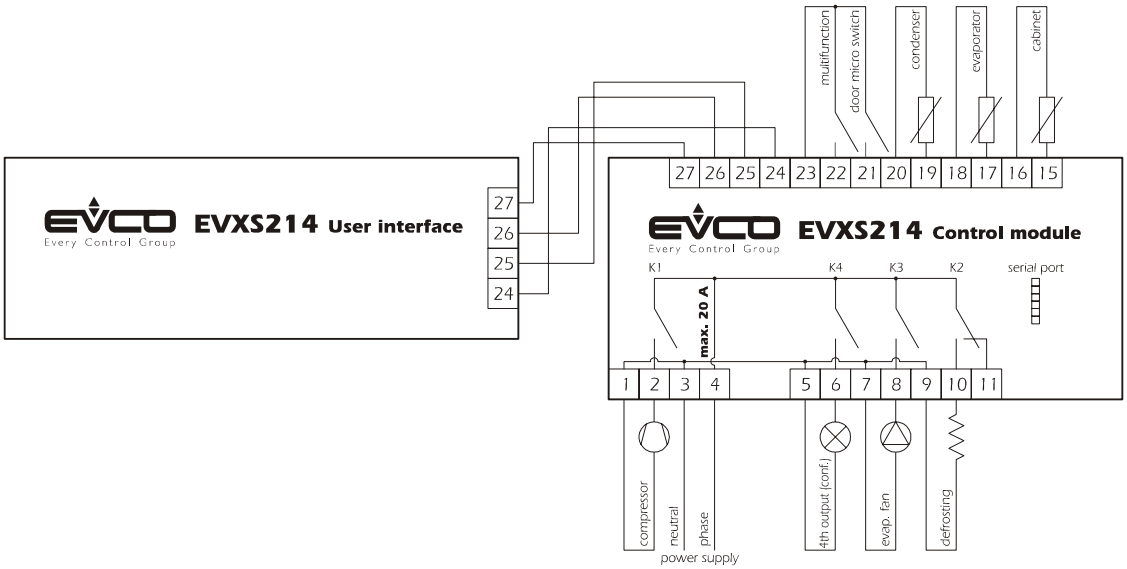
13 ELECTRIC CONNECTION

13.1 Preliminary considerations

With reference to the wiring diagram:

- the utility managed by the fourth output will depend on parameter u1
- the serial is the port for communication with the Parameters Manager set-up software system or to the monitoring and supervision system of RICS plants (through a serial interface, via TTL, with MODBUS communication protocol) or with the EVKEY programming key. The port must not be used simultaneously for three purposes.

13.2 Electric connection



13.3 Recommendations for the electric connection

- do not operate on the terminal boards using electric or pneumatic screwdrivers
- if the instrument has been taken from a old place to a hot one, the humidity could condense inside. Wait about one hour before applying power
- make sure that the power supply voltage, frequency and operational electric power correspond to those of the local power supply
- disconnect the power supply before performing any type of maintenance
- do not use the instrument as a safety device
- for repairs and information regarding the instrument, contact the EVCO sales network.

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