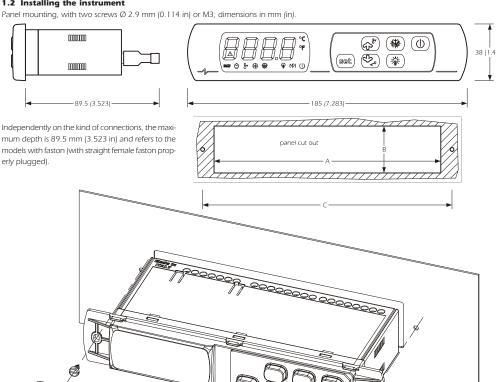
# **EVS223** Digital controller for static refrigerating units, with HACCP and Energy Saving functions

# 1.1 Important

Read these instructions carefully before installing and using the instrument and follow all additional information for installation and electrical connection: keep these instructions close to the instrument for future consultations.

### 1.2 Installing the instrument

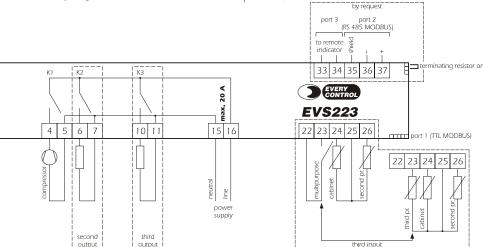


| DIMENS.    | MINIMUM       | TYPICAL       | MAXIMUM<br>150.5 (5.925) |  |  |
|------------|---------------|---------------|--------------------------|--|--|
| A          | 150.0 (5.905) | 150.0 (5.905) |                          |  |  |
| В          | 31.0 (1.220)  | 31.0 (1.220)  | 31.5 (1.240)             |  |  |
| C          | 164.0 (6.456) | 165.0 (6.496) | 166.0 (6.535)            |  |  |
| A 1 17-7 1 |               | 0.00          |                          |  |  |

Additional information for installation

- moderate the clamping torque of the screws, in order not to damage
- working conditions (working temperature, humidity, etc.) must be between the limits indicated in the technical data
- do not install the instrument close to heating sources (resistances, hot air ducts, etc.), devices provided with big magnetos (big speakers, etc.), locations subject to direct sunlight, rain, humidity, dust, mechani-
- according to the safety norms, the protection against electrical parts must be ensured by a correct installation of the instrument; the parts that ensure the protection must be installed so that you can not remove them if not by using a tool.

- 1.3 Wiring diagram With reference to the options in the outlines:
- the operation of the second probe depends on parameter P3
- the operation of the third input depends on parameter P4
- the user managed by the second output depends on parameter u0
- the user managed by the third output depends on parameter u1
- port 1 is the serial port for the communication with the supervision system (through a serial interface) or with the programming key (via TTL, with MODBUS communication protocol); the port must not be used at the same time for the same purposes
- port 2 is the serial port for the communication with the supervision system (via RS 485, with MODBUS communication protocol; by request); port 2 must not be used at the same time to the same purpose
- port 3 is the port for the communication with the remote indicator (by request; the indicator shows the quantity you have set with param-



- do not operate on the terminal blocks with electrical or pneumation screwers
- if the instrument has been moved from a cold location to a warm one, the humidity could condense on the inside: wait about an hour before supplying it
- test the working power supply voltage, working electrical frequency and working electrical power of the instrument; they must correspond
- disconnect the local power supply before servicing the instrument • do not use the instrument as safety device
- for repairs and information on the instrument please contact Evco sales network.

#### 2 USER INTERFACE

with the local power supply

#### 2.1 Turning on/off the instrument by hand

- make sure the keyboard is not locked and no procedure is running ■ press (**((()**) 2 s.
- If the instrument is turned off, the regulators will be turned off; the possibility to turn on/off the cabinet light or the auxiliary output when the instrument is turned off depends on parameter u2

Turning off means turning off the instrument via software (the instrument remains connected with the power supply

Through the multipurpose input it is also possible to turn on/off the instrument at a distance.

# 2.2 The display

If the instrument is turned on, during the normal operation the display will show the quantity you have set with parameter P5:

- $\bullet$  if P5 = 0, the display will show the cabinet temperature
- if P5 = 1, the display will show the working setpoint
- if P5 = 2, the display will show the temperature read by the second
- if P5 = 3, the display will show "cabinet temperature temperature read by the second probe"
- if P5 = 4, the display will show the temperature read by the third probe (only if parameter P4 has value 1 or 2).

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

# 2.3 Showing the cabinet temperature

- make sure the keyboard is not locked and no procedure is running press (2) 2 s: the display will show the first available label
- press 🚱 or 📞 to select "**Pb1**"
- press (80%)

To quit the procedure

- press (80%) or do not operate 15 s
- press or do not operate 60 s.

If during the normal operation the display shows the cabinet tempera-

# ture (parameter P5 = 0), the label "Pb1" will not be shown

- 2.4 Showing the temperature read by the second probe
- make sure the keyboard is not locked and no procedure is running • press (2) 2 s: the display will show the first available label
- press or to select "Pb2"
- press (@@)
- To auit the procedure
- press (996) or do not operate 15 s
- press (♠) or do not operate 60 s.
- If the second probe is not enabled (parameter P3 = 0), the label "**Pb2**"

# 2.5 Showing the temperature read by the third probe (only if parameter P4 has value 1 or 2)

- make sure the keyboard is not locked and no procedure is running press 2 s: the display will show the first available label
- press 🙀 or 📞 to select "**Pb3**"
- To guit the procedure
- press (80%) or do not operate 15 s
- press ( or do not operate 60 s.
- If the function of the third input is not the one of third probe (paramete

P4 = 0 or 3), the label "Pb3" will not be shown.

# 2.6 Activating the defrost by hand

• make sure the keyboard is not locked, no procedure is running and function Overcooling is not running

If the function of the second probe is the one of defrost probe (parameter P3 = 1) and to the defrost activation the evaporator temperature is above the one you have set with parameter d2, the defrost will not be

#### 2.7 Turning on/off the on-off output (only if parameter u0 has value 0)

If the instrument is turned on, the on-off output will be turned on: If the instrument is turned off, the on-off output will be turned off.

#### 2.8 Turning on/off the cabinet light by hand (only if parameter u1 has value 0)

make sure no procedure is running

■ press (※)

Through the multipurpose input it is also possible to turn off the cabinet light at a distance: also look at parameter u2.

#### 2.9 Turning on the demisting resistances by hand (only if parameter u1 has value 1)

- make sure no procedure is running
- press 🙀 2 s: the resistances will be turned on the time you will have set with parameter b1

It is not allowed to turn off the demisting resistances by hand.

#### Turning on/off the auxiliary output by hand (only if parameter u1 has value 2)

make sure the keyboard is not locked and no procedure is running

■ press (※) Through the multipurpose input it is also possible to turn on/off the

auxiliary output at a distance If the auxiliary output has been turned on by hand, it will be allowed to turn it off only in the same way (analogous matter if the auxiliary output

#### 2.11 Activating/deactivating function Overcooling (quick cooling)

 make sure the keyboard is not locked, no procedure is running and the defrost or the dripping are not running

has been turned on at a distance); also look at parameter u2.

■ press (37) 4 s: the working setpoint will be increased of the temperature you will have set with parameter r5 (the time you will have set with parameter r6).

During function Overcooling the defrost is never activated: if the defrost interval expires when the function is running, the defrost will be activated to the end of the function

# 2.12 Locking/unlocking the keyboard

To lock the keyboard:

- make sure no procedure is running
- press ♠ and ♠ 2 s: the display will show "Loc" 1 s.
- If the keyboard is locked, you will not be allowed to:
- turn on/off the instrument by hand
- show the temperature read by the second probe
- show the temperature read by the third probe activate the defrost by hand
- turn on/off the auxiliary output by hand
- activate/deactivate function Overcooling
- show the information on the HACCP alarms
- erase the HACCP alarms list
- modify the working setpoint with the procedure related in paragraph 4.1 (you also can modify the working setpoint through parameter SP).

These operations provoke the visualization of the label "Loc" 1 s.

#### press 🚱 and 📵 2 s: the display will show "**UnL**" 1 s. Silencing the buzzer

- make sure no procedure is running
- press a button (the first pressure of the button does not provoke its usual effect)

#### 3 НАССР

#### 3.1 Preliminary information

The instrument can store up to 2 HACCP alarms and supplies information on:

- the critical value
- the alarm duration (between 1 min and 99 h and 59 min, partial if the alarm is running).

CODE KIND OF ALARM (AND CRITICAL VALUE) lower temperature alarm (the lowest temperature during a

whatever alarm of this type) upper temperature alarm (the highest temperature during a whatever alarm of this type)

# PAY ATTENTION:

- the instrument stores the lower temperature alarm and the upper temperature alarm on condition that the temperature joined to the temperature alarm is the cabinet one (parameters A0 and A3 = 1) or the one read by the third probe, on condition that its function is the one of display probe (parameters A0 and A3 = 1 and parameter P4 = 1)
- the instrument updates the information on the alarm or condition that the critical value of the new alarm is more critical than the one the instrument has stored or on con dition that the information has already been shown
- the alarm duration refers to the one that has provoked the update of the critical value if the instrument is turned off, it will store no alarm. When the cause that has provoked the alarm disappears, the display

# 3.2 Showing the information on the alarms

- make sure the keyboard is not locked and no procedure is running press 💫 2 s: the display will show the first available label
- press 🔊 or 🦃 to select "**LS**"
- press the display will show one of the codes related in the chart of paragraph 3.1
- press 😝 or 🐯 to select a code, for example "AH" To show the information on the alarm:
- press (mit) LED HACCP will stop flashing to remain lit up permanently and the display will show in succession (for example):

|    | EXAMPLE                     | MEANING   |  |
|----|-----------------------------|---|--|
|    | 8                           | the critical value is 8 °C/°F                   |  |
|    | dur                         | the display is about to show the alarm duration |  |
| et | h 1                         | the alarm has lasted 1 h (to be continued)      |  |
|    | n15                         | the alarm has lasted 1 h and 15 min             |  |
| f  | AH                          | the code you had selected                       |  |
|    | Each information lasts 1 s. |   |  |

- To escape from the succession of information:
- press (★) the display will show the code you had selected. To quit the procedure:
- press (★) twice or do not operate 15 s.

#### 3.3 Erasing the alarms list

- make sure the keyboard is not locked and no procedure is running
- press 😥 2 s: the display will show the first available label • press or (5) to select "**rLS**"
- press (and
- press (37) or (52) in 15 s to set "149"
- press (888) or do not operate 15 s: the display will show "----" flashing 4 s and LED HACCP will go out, after which the instrument will guit the procedure.

### 4 SETTINGS

#### 4.1 Setting the working setpoint

- make sure the instrument is turned on, the keyboard is not locked and no procedure is runnina
- press (ask) LED 🚜 will flash
- press or in 15 s; also look at parameters r1, r2 and r3 ■ press (sat) or do not operate 15 s.

#### You also can modify the working setpoint through parameter SP.

4.2 Setting configuration parameters To gain access the procedure:

- make sure no procedure is running
- press 😝 and 🤩 4 s: the display will show "PA"
- press (3) or (5) in 15 s to set "-19"
- or do not operate 15 s
- press ( and ( 4 s: the display will show "SP
- press 🐼 or 🐯
- press ( or ( in 15 s

■ press (80%) or do not operate 15 s. To quit the procedure:

### Switch off/on the power supply of the instrument after the modification of the parameters.

4.3 Restoring the default value of configuration parameters eters

To gain access the procedure make sure no procedure is running

press 🔊 and 🦭 4 s or do not operate 60 s.

- press (3) and (2) 4 s: the display will show "PA ■ press (®
- press ♠ or ♠ in 15 s to set "**743**"
- press (80%) or do not operate 15 s press and 4 s: the display will show "def
- press (acc
- press (3) or (5) in 15 s to set "149" ■ press (808) or do not operate 15 s: the display will show "**dEF**" flash-

ing 4 s, after which the instrument will guit the procedure

### Make sure the default value of the parameters is appropriate, in particular if the probes are PTC probes.

#### 5 SIGNALS 5.1 Signals

- LED MEANING ₩ LFD compressor if it is lit, the compressor will be turned on if it flashes • the modification of the working setpoint will be running
- a comp. prot. will be running (parameters C0, C1 and C2) LED defrost if it is lit, the defrost will be running
- if it flashes: the dripping will be running (parameter d7)
- LED cabinet light if it is lit, the cabinet light will be turned on

# if parameter u1 has value 1 (or the user managed by the third output are the demisting resistances): it is lit, the demisting resistances will be turned on because

of the regulator (parameter b0) if it flashes, the demisting resistances will have been turned

if it is lit, function Overcooling will be running (parameters

if it is lit, function Energy Saving will be running (parameters

#### on by hand (parameter b1) if parameter u1 has value 2 (or the user managed by the third output is the auxiliary output):

f it is lit, the aux. output will have been turned on by hand if it flashes, the auxiliary output will have been turned on at distance (parameter i5)

LED alarm Δ if it is lit. an alarm will be running

LED Overcooling

r5 and r6) 0 LED Energy Saving

4 and i5) HACCP LED HACCE

if it is lit, the instrument will have stored one HACCP alarm at least and you will have already shown all the information on the alarms

if it flashes, the instrument will have stored one HACCP alarm. at least but you will not have shown all the information on

if it is lit, the unit of measure of the temperatures will be Celsius degree (parameter P2) LED Fahrenheit degree if it is lit, the unit of measure of the temperatures will be Fahrenheit degree (parameter P2) Φ LED on/stand-by if it is lit, the instrument will be turned off CODE MEANING

rameter r3); also look at paragraph 2.12

the keyboard and/or the working setpoint are locked (pa

the quantity to show is not available (for example because

°C LED Celsius degree

#### the probe is not enabled) 6 ALARMS 6.1 Alarms

Loc

#### CODE MEANING Lower temperature alarm (HACCP alarm)

- Remedies: check the temperature joined to the alarm
- look at parameters A0. A1 and A2
- if the critical value is lower than the one the instrument has stored, if you have already shown the information on the alarm or if the instrument has stored no alarm, the
  - instrument will store the alarm the alarm output will be turned on (if present)
- Upper temperature alarm (HACCP alarm)
- check the temperature joined to the alarm look at parameters A3, A4 and A5
- if the critical value is higher than the one the instrument
- the alarm or if the instrument has stored no alarm, the instrument will store the alarm

has stored, if you have already shown the information on

- the alarm output will be turned on (if present Multipurpose input alarm (only if parameter P4 has value 3)
  - check the reasons that have provoked the activation of
- the input ■ look at parameters i5 and i6

on (if present)

iSd

СОН

CSd

- Effects: • if parameter i5 has value 4, the alarm output will be turned
- if parameter i5 has value 5, the compressor will be turned off and the alarm output will be turned on (if present)
- Instrument locked alarm (only if parameter P4 has value 3) Remedies:
- check the reasons that have provoked the activation of the multipurpose input
- turn off/on the instrument or switch off/on its power sup
- Iook at parameters i5, i6, i7, i8 and i9
- the regulators will be turned off. • the alarm output will be turned on (if present)
- Overheated condenser alarm (only if parameter P4 has value

■ look at parameter C6

- check the condenser temperature
- the alarm output will be turned on (if present)
- Compressor locked alarm (only if parameter P4 has value 2)
- check the condenser temperature turn off/on the instrument: if the condenser temperature
- will have to disconnect the power supply and clean the
- look at parameter C7 Effects: the compressor will be turned off

is still above the one you have set with parameter C7, you

• the alarm output will be turned on (if present) When the cause that has provoked the alarm disappears, the instrument restores the normal operation, except for the instrument locked alarm (code "iSd") and the compressor locked alarm (code "CSd") that

#### need you turn off/on the instrument or switch off/on its power supply 7 INTERNAL DIAGNOSTICS

# 7.1 Internal diagnostics CODE MEANING

Pr1 Cabinet probe error emedies: look at parameter P0

- check the integrity of the probe
- check the connection instrument-probe
- check the cabinet temperature
- the compressor activity will depend on parameters C4 and
- the alarm output will be turned on lif present.

| Pr2 | Second probe error<br>Remedies:                            |
|-----|--|
|     | Remedies:  |
|     | the same you saw in the previous case but related to       |
|     | second probe   |
|     | Effects:   |
|     | • the defrost will last the time you will have set with pa |
|     | otor d2  |

parameter had value 0

• if parameter d8 has value 2, the instrument will work as if

the alarm output will be turned on (if present) Third probe error (only if parameter P4 has value 1 or 2)

• the same you saw in the previous case but related to the third probe Effects:

• if parameter P4 has value 2, the overheated condenser alarm (code "COH") and the compressor locked alarm (code "CSd") will never be activated • the alarm output will be turned on (if present)

When the cause that has provoked the alarm disappears, the instrument restores the normal operation.

#### 8 TECHNICAL DATA

# 8.1 Technical data

Box: self-extinguishing grey. Frontal protection: IP 65.

Connections: faston 6.3 mm (0.248 in) wide (power supply and outputs), screw terminal block (inputs), 5 poles connector (serial port); extractable terminal blocks or screw terminal blocks (power supply and outputs) by request.

Working temperature: from 0 to 55  $^{\circ}$ C (32 to 131  $^{\circ}$ F, 10 ... 90% of relative humidity without condensate).

Power supply: 230 Vac, 50/60 Hz, 3.5 VA; 115 Vac, 50/60 Hz, 3.5 VA by request.

Alarm buzzer: by request.

Measure inputs: 2 (cabinet probe and second probe configurable for evaporator probe or display probe) for PTC/NTC probes.

Digital inputs: third input configurable for measure input (display probe or condenser probe, for PTC/NTC probes) or digital input (multipurpose, free of voltage, 5 V 1 mA).

Working range: from -50 to 150 °C (-50 to 300 °F) for PTC probe, from -40 to 105  $^{\circ}$ C (-40 to 220  $^{\circ}$ F) for NTC probe.

Resolution: 0.1 °C/1 °C/1 °F.

Relay outputs: 3 relays:

• compressor relay: 8 A @ 250 Vac (NO contact) on-off/alarm relay: 8 A @ 250 Vac (NO contact) • cabinet light/demisting resistances/auxil-

iary output relay: 8 A @ 250 Vac (NO contact).

The maximum current allowed on the loads is 20 A.

**Serial port:** port for the communication with the supervision system (through a serial interface) or with the programming key (via TTL, with MODBUS communication protocoll

Further communication ports (by request): port for the communication with the supervision system (via RS 485, with MODBUS communication protocol), port for the communication with the remote indi-

|          |       | setpoi |                   |       | DNFIGURATION PARAMETERS  |
|----------|-------|--------|-------------------|-------|--|
| 7.1 W    |       |        |                   | ldee  | NY/ODVINIC CETDOINITS  |
|          | MIN.  | MAX.   | U.M.              | DEF.  | WORKING SETPOINTS  |
|          | r1    | r2     | °C/°F (1)         | 0.0   | working setpoint   |
| PARAM    |       | MAX.   | paramete<br> U.M. | DEF.  | WORKING SETPOINTS  |
| SP       | r1    | r2     | °C/°F (1)         | 0.0   |  |
| PARAM    |       | MAX.   |                   | DEF.  | working setpoint   |
| CA1      | -25.0 | 25.0   | U.M.<br>°C/°F (1) | 0.0   | MEASURE INPUTS  cabinet probe offset   |
| CA2      | -25.0 | 25.0   | °C/°F (1)         | 0.0   | second probe offset  |
| CA3      | -25.0 | 25.0   | °C/°F (1)         | 0.0   | third probe offset (only if P4 = 1 or 2)   |
| P0       | 0     | 1      |                   | 1     | kind of probe  |
| 10       |       | Ι΄.    |                   |       | 0 = PTC  |
|          |       |        |                   |       | 1 = NTC  |
| P1       | 0     | 1      |                   | 1     | decimal point Celsius degree (for the quantity to show during the normal operation)  |
|          |       | 1      |                   | ľ     | 1 = YES  |
| <br>P2   | 0     | 1      |                   | 0     | unit of measure temperature (2)  |
| -        |       |        |                   |       | 0 = °C   |
|          |       |        |                   |       | 1 = °F   |
| P3       | 0     | 2      |                   | 1     | second probe function  |
|          |       |        |                   |       | 0 = probe not enabled  |
|          |       |        |                   |       | 1 = defrost probe  |
|          |       |        |                   |       | 2 = display probe  |
| P4       | 0     | 3      |                   | 3     | third input function   |
|          |       |        |                   |       | 0 = input not enabled  |
|          |       |        |                   |       | 1 = measure input (third probe, display probe)   |
|          |       |        |                   |       | 2 = measure input (third probe, condenser probe)   |
|          |       |        |                   |       | 3 = digital input (multipurpose input)   |
| P5       | 0     | 4      |                   | 0     | quantity to show during the normal operation   |
|          |       |        |                   |       | 0 = cabinet temperature  |
|          |       |        |                   |       | 1 = working setpoint   |
|          |       |        |                   |       | 2 = temperature read by the second probe   |
|          |       |        |                   |       | 3 = "cabinet temperature - temperature read by the second probe"   |
|          |       |        |                   |       | 4 = temperature read by the third probe (only if P4 = 1 or 2)  |
| P6       | 0     | 4      |                   | 0     | quantity shown by the remote indicator   |
|          |       |        |                   |       | 0 = cabinet temperature  |
|          |       |        |                   |       | 1 = working setpoint   |
|          |       |        |                   |       | 2 = temperature read by the second probe   |
|          |       |        |                   |       | 3 = "cabinet temperature - temperature read by the second probe"   |
|          |       |        |                   |       | 4 = temperature read by the third probe (only if P4 = 1 or 2)  |
| PARAM    |       | MAX.   | U.M.              | DEF.  | MAIN REGULATOR   |
| r0       | 0.1   | 15.0   | °C/°F (1)         | 2.0   | working setpoint differential  |
| r1       | -99.0 | r2     | °C/°F (1)         | -50.0 | minimum working setpoint   |
| r2       | r1    | 99.0   | °C/°F (1)         | 50.0  | maximum working setpoint   |
| r3       | 0     | 1      |                   | 0     | locking the working setpoint modification (with the procedure related in paragraph 4.1)  |
|          |       |        | 0 - 0             |       | 1 = YES  |
| r4       | 0.0   | 99.0   | °C/°F (1)         | 0.0   | temperature increase during function Energy Saving (only if P4 = 3); also look at i5   |
| r5       | 0.0   | 99.0   | °C/°F (1)         | 0.0   | temperature decrease during function Overcooling; also look at r6  |
| r6       | 0     | 99     | min               | 30    | duration of function Overcooling; also look at r5  |
| PARAM    | _     | MAX.   | U.M.              | DEF.  | COMPRESSOR PROTECTIONS   |
| C0<br>C1 | 0     | 240    | min               | 5     | compressor delay since you turn on the instrument (3)  |
| CI       | 0     | 240    | min               | 5     | minimum time between two activations in succession of the compressor; also compressor delay since  |
| <u></u>  | 0     | 240    |                   | 2     | the end of the cabinet probe error (4) (5)   |
| C2<br>C3 | 0     | 240    | min               | 3     | minimum time the compressor remains turned off (4)   |
| C4       | 0     | 240    | S                 | 10    | minimum time the compressor remains turned on  |
|          | 0     | 240    | min               | 10    | time the compressor remains turned off during the cabinet probe error; also look at C5   |
| C5<br>C6 | 0.0   | 200.0  | min<br>°C/°F (1)  | 80.0  | time the compressor remains turned on during the cabinet probe error; also look at C4  |
| C7       |       | 200.0  |                   | 90.0  | condenser temperature above which the overheated condenser alarm is activated (only if P4 = 2) (6)   |
| C8       | 0.0   | 15     | °C/°F (1)         | 90.0  | condenser temperature above which the compressor locked alarm is activated (only if P4 = 2) compressor locked alarm delay (only if P4 = 2) [7] |
|          |       |        | min               | DEF.  | compressor locked alarm delay (only if P4 = 2) (7)  DEFROST  |
| PARAM    |       | MAX.   | U.M.              |       |  |
| d0       | 0     | 77     | h                 | 8     | defrost interval; also look at d8 (8)  |
|          |       |        |                   |       | 0 = the defrost at intervals will never be activated   |

| 13                           | 0             | 99                  | min                      | 30          | defrost duration if $P3 = 0$ ; defrost maximum duration if $P3 = 1$<br>0 = the defrost will never be activated  |
|------------------------------|---------------|---------------------|--------------------------|-------------|---|
| 14                           | 0             | 1                   |                          | 0           | defrost when you turn on the instrument (3)   |
|                              |               |                     |                          |             | I = YES   |
|                              | 0             | 99                  | min                      | 0           | defrost delay when you turn on the instrument (if d4 = 1); also look at i5 (3) temperature shown during the defrost   |
|                              |               |                     |                          |             | 0 = cabinet temperature 1 = if to the defrost activation the cabinet temperature is below "working setpoint + r0", at most "work-   |
|                              |               |                     |                          |             | ing setpoint + r0"; if to the defrost activation the cabinet temperature is above "working setpoint + r0", at most the cabinet temperature to the defrost activation (9)  |
|                              | 0             | 15                  | min                      | 2           | dripping duration   |
| 18                           | 0             | 2                   |                          | 0           | kind of defrost interval  0 = the defrost will be activated when the instrument will have remained turned on the time d0  1 = the defrost will be activated when the compressor will have remained turned on the time d0  |
|                              |               |                     |                          |             | 2 = the defrost will be activated when the evaporator temperature will have remained below the tem-   |
| 40                           | 00.0          | 00.0                | °C/°F/11                 | 0.0         | perature d9 the time d0 (10)  |
| 19<br>PARAM.                 | -99.0<br>MIN  | 99.0<br>MAX.        | °C/°F (1)<br>U.M.        | 0.0<br>DEF. | evaporator temperature above which the count of the defrost interval is suspended (only if d8 = 2)  ALARMS  |
|                              | 0             | 2                   |                          | 0           | temperature joined to the lower temperature alarm   |
|                              |               |                     |                          |             | 0 = cabinet temperature<br>1 = temperature read by the third probe (only if P4 = 1 or 2) (11)   |
| Λ1                           | 00.0          | 00.0                | 9C/9E (1)                | 10.0        | 2 = temperature read by the second probe (12)   |
|                              | -99.0<br>0    | 99.0                | °C/°F (1)                | -10.0       | temperature below which the lower temperature alarm is activated; also look at A0 and A2 (6) kind of lower temperature alarm  |
| -                            |               | _                   |                          | ľ           | 0 = alarm not enabled   |
|                              |               |                     |                          |             | 1 = relative to the working setpoint (or "working setpoint - A1"; consider A1 without sign)   |
| A3                           | 0             | 1                   |                          | 0           | 2 = absolute (or A1)<br>temperature joined to the upper temperature alarm   |
|                              |               |                     |                          |             | 0 = cabinet temperature   |
|                              | 00.5          | 00.5                | 00.000                   | 10.5        | 1 = temperature read by the third probe (only if P4 = 1 or 2) (11)  |
| A4<br>A5                     | -99.0<br>0    | 99.0                | °C/°F (1)                | 10.0        | temperature above which the upper temperature alarm is activated; also look at A3 and A5 (6) kind of upper temperature alarm  |
| 5                            | 3             | _                   | '                        |             | 0 = alarm not enabled   |
|                              |               |                     |                          |             | 1 = relative to the working setpoint (or "working setpoint + A4"; consider A4 without sign)   |
| A6                           | 0             | 240                 | min                      | 120         | 2 = absolute (or A4)<br>upper temperature alarm delay since you turn on the instrument (only if A3 = 0 or if A3 = 1 and P4 = 1)   |
|                              | 3             | 2 10                |                          | 120         | [3]   |
|                              | 0             | 240                 | min                      | 15          | temperature alarm delay   |
| -                            | 0             | 240                 | min                      | 15          | upper temperature alarm delay since the end of the dripping (only if A3 = 0 or if A3 = 1 and P4 = 1) (13)   |
| PARAM.<br>i5                 | O O           | MAX.                | U.M.                     | DEF.        | effect provoked by the activation of the multipurpose input (only if P4 = 3) (14)   |
|                              |               |                     |                          |             | 3 = CLOSING THE LOCK - the cabinet light will be turned off (only if it will have been turned on by hand) and function Energy Saving will be activated (as long as the input will be deactivated), on condition that function Overcooling is not running; also look at r4  4 = ACTIVATING THE EXTERNAL ALARM - spent the time i7 the display will show the code "IA" flashing and the buzzer will be activated (as long as the input will be deactivated)  5 = ACTIVATING THE MANOSTAT - the compressor will be turned off, the display will show the code "IA" flashing and the buzzer will be activated (as long as the input will be deactivated); also look at i7, i8 and i9  6 = ACTIVATING THE AUXILIARY OUTPUT - the auxiliary output will be turned on (as long as the input will be deactivated)  7 = TURNING OFF THE INSTRUMENT - the instrument will be turned off (as long as the input will be |
| 6                            | 0             | 1                   |                          | 0           | deactivated) kind of contact multipurpose input (only if P4 = 3)  |
|                              | 0             | ľ                   |                          |             | 0 = NO (the input will be active if you close the contact)  |
|                              |               | 120                 |                          |             | 1 = NC (the input will be active if you open the contact)   |
| i7                           | 0             | 120                 | min                      | 0           | if i5 = 4, delay to signal the multipurpose input alarm (only if $P4 = 3$ )<br>if i5 = 5, compressor delay since the deactivation of the multipurpose input (only if $P4 = 3$ ) (15)  |
| i8                           | 0             | 15                  |                          | 0           | number of multipurpose input alarm such as to provoke instrument locked alarm (only if $P4 = 3$ and $I5 = 5$ )  |
| i9                           | 1             | 999                 | min                      | 240         | I= alarm not enabled time without multipurpose input alarm in order that the alarm counter is cleared (only if P4 = 3 and   |
| PARAM.                       | A AIN I       | MAX.                | U.M.                     | DEF.        | i5 = 5) OUTPUTS   |
|                              | 0             | 1                   | U.M.                     | 0<br>0      | User managed by the second output (16)  0 = on-off  |
|                              |               |                     |                          |             | 1 = alarm   |
| u1                           | 0             | 2                   |                          | 0           | user managed by the third output (16) 0 = cabinet light 1 = demiring registrators   |
|                              |               |                     |                          |             | 1 = demisting resistances 2 = auxiliary output  |
| u2                           | 0             | 1                   |                          | 0           | possibility to turn on/off the cabinet light or the auxiliary output by hand when the instrument is turned off (17)   |
| uz                           |               | MAX.                | 1111                     | DEE         | 1 = YES   |
|                              | A AIN I       |                     | U.M.                     | DEF.        | DEMISTING RESISTANCES (only if u1 = 1) cabinet temperature above which the demisting resistances are turned off (only if the resistances have   |
| PARAM.                       |               |                     |                          | -1 O        |   |
| PARAM.                       | MIN.<br>-99.0 | 99.0                | °C/°F (1)                | -1.0        |   |
| PARAM.<br>b0                 | -99.0<br>0    | 99.0                | °C/°F (1)                | 5           | been turned on because of the regulator, not by hand] (6) time the demisting resistances remain turned on (only if the resistances have been turned on by hand)   |
| PARAM.<br>b0<br>b1<br>PARAM. | -99.0<br>0    | 99.0<br>120<br>MAX. | °C/°F (1)<br>min<br>U.M. | 5<br>DEF:   | been turned on because of the regulator, not by hand] (6) time the demisting resistances remain turned on (only if the resistances have been turned on by hand] SERIAL NETWORK (MODBUS)   |
| PARAM.<br>b0<br>b1<br>PARAM. | -99.0<br>0    | 99.0                | °C/°F (1)                | 5           | been turned on because of the regulator, not by hand] (6) time the demisting resistances remain turned on (only if the resistances have been turned on by hand)   |

| Р  | 0  | 2 |  | 2 | parity 0 = none 1 = odd 2 = even |  |  |
|----|--|---|--|---|----------------------------------|--|--|
|    |  |   |  |   | 0 = none                         |  |  |
|    |  |   |  |   | 1 = odd                          |  |  |
|    |  |   |  |   | 2 = even                         |  |  |
| 1) | the unit of measure depends on parameter P2  |   |  |   |                                  |  |  |
| 2) | set the parameters related to the regulators appropriately after the modification of the parameter                                     |   |  |   |                                  |  |  |
| 3) | the parameter also has effect after an interruption of power supply that arises when the instrument is turned on                       |   |  |   |                                  |  |  |
| 1) | the time you have set with the parameter is also counted when the instrument is turned off   |   |  |   |                                  |  |  |
| 5) | if parameter C1 has value 0, the delay since the end of the cabinet probe error will however be 2 min                                  |   |  |   |                                  |  |  |
| 5) | the differential of the parameter is 2 °C/4 °F   |   |  |   |                                  |  |  |
| 7) | if (when you turn on the instrument) the condenser temperature is above the one you have set with parameter C7, parameter C8 will have |   |  |   |                                  |  |  |
|    |  |   |  |   |                                  |  |  |

the instrument stores the count of the defrost interval every 30 min; the modification of parameter d0 has effect since the end of the previous

defrost interval or since the activation of a defrost by hand the display restores the normal operation as soon as the dripping ends and the cabinet temperature falls below the one that has locked the

display (or if a temperature alarm arises) if parameter P3 has value 0, the instrument will work as if parameter d8 had value 0

if parameter P4 has value 0 or 3, the instrument will work as if the parameter had value 0 (but it will not store the alarm)

if parameter P3 has value 0, the instrument will work as if parameter A0 had value 0 (but it will not store the alarm)

during the defrost and the dripping the temperature alarms are not enabled if parameter i5 has value 1, 2, 3, 6 or 7, the effect will not be signalled

make sure the time you have set with parameter i7 is shorter than the one you have set with parameter i9

to avoid damaging the connected user, modify the parameter when the instrument is turned off

if parameter u2 has value 0, when you turn off the instrument the cabinet light or the auxiliary output will also be turned off; next time you turn on the instrument the user will be turned off.