

E ENGLISH

1 IMPORTANT

1.1 Important

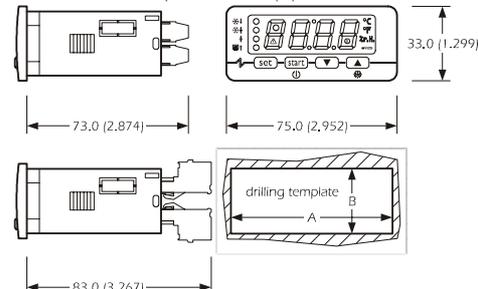
Read these instructions carefully before installation and commissioning and follow the recommendations regarding installation and for electric connection. Keep these instructions with the instrument for future consultation.

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

2 DIMENSIONS AND INSTALLATION

2.1 Dimensions

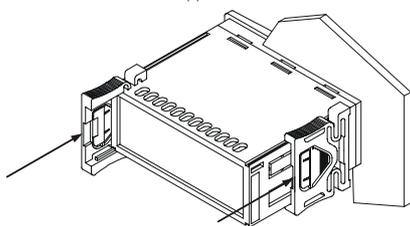
The dimensions are expressed in mm (in).



DIMENS.	MINIMUM	TYPICAL	MAXIMUM
A	71.0 (2.795)	71.0 (2.795)	71.8 (2.826)
B	29.0 (1.141)	29.0 (1.141)	29.8 (1.173)

2.2 Installation

Panel with click brackets supplied.



2.3 Installation recommendations

- the thickness of the panel must not exceed 8.0 mm (0.314 in)
- 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 vicinity of heat sources (resistances, hot air pipes, etc.), appliances with strong magnets (large diffusers, etc.), places subject to direct sunlight, rain, humidity, excessive dust, mechanical vibrations or shocks
- in compliance with Safety Standards, the protection against any contact with electric parts must be assured via correct installation of the instrument; all parts that ensure protection must be fixed in a way that they cannot be removed without using tools.

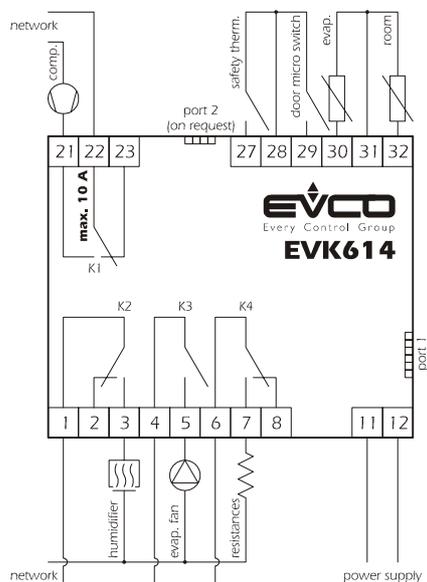
3 ELECTRIC CONNECTION

3.1 Preliminary considerations

With reference to the wiring diagram:

- port 1 is the serial port for communication with the supervision system (through a serial interface, via TTL, with MODBUS communication protocol), with graphic diagram (through a serial interface) or with the programming key; the port must be used just for one purpose
- port 2 (on request) is the port for communication with the remote indicator. The latter shows the temperature of the room.

3.2 Electric connection



3.3 Recommendations for the electric connection

- do not operate on terminal boards using electric or pneumatic screwing devices
- if the instrument has been taken from a cold to a hot place, the humidity could condense inside; wait about 1 hour before applying power
- make sure that the power supply voltage, the frequency and the operational electric power of the instrument correspond with those of the local power supply
- disconnect the power supply before proceeding with 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.

4 FUNCTIONING

4.1 Preliminary considerations

The following functioning cycles exist:

- automatic cycle
- heating manual cycle
- cooling manual cycle.

The automatic cycle is made up of the following phases:

- a retarding provering phase
- a storing phase
- an awakening phase
- a provering phase
- a slowing phase

On conclusion of one phase the instrument passes automatically to the next one.

5 AUTOMATIC CYCLE

5.1 Start/stop of the automatic cycle

To start the cycle:

- make sure that the instrument is in stand-by and that there is no procedure in progress
- press **start**: the display will show the first label available
- press **▲** or **▼** within 15 s to select "Auto"
- press **start** within 15 s: the display will show the following 3 times in succession:
 - the conclusion time of the provering phase (e.g. "02:00")
 - "dd" followed by the two numbers of the day of conclusion of the provering phase (e.g. "dd26")
 - "MM" followed by the two numbers of the month of conclusion of the provering phase (e.g. "MM03")
- press **start** within 9 s: the display will show "Go"
- press **start** within 15 s: the LED  will switch on and the retarding-provering phase will be started.

If the automatic cycles are not enabled (parameter P7 = 0), the "Auto" label will not be displayed.

The end time of the provering phase is displayed in the 24 hour format (hours:minutes). The time proposed is the same as the last automatic cycle started but relative to the next day.

In the example, the provering phase will be concluded at 02:00 on 26 March. The display will show all information for 1 s.

If parameter P9 is set at 0, the display will only show the conclusion time of the provering phase.

To stop the cycle:

- press **start** for 4 s.

5.2 Modifying the end time and date of the provering phase

- make sure that the day and real time are set correctly, that the instrument is in stand-by and that no procedure is in progress.
- press **start**: the display will show the first label available
- press **▲** or **▼** within 15 s to select "Auto"
- press **start** within 15 s: the display will show the end time and date of the provering phase in succession
- press **set** within 9 s: the display will show "hh" followed by the two numbers regarding the hour
- press **▲** or **▼** within 15 s; parameter P8 is also seen
- press **set** within 15 s: the display will show "nn" followed by the two numbers regarding the minutes
- press **▲** or **▼** within 15 s; parameter P8 is also seen
- press **set** within 15 s: the display will show "dd" followed by the two numbers regarding the day
- press **▲** or **▼** within 15 s; parameter P8 is also seen
- if the two numbers of the day exceed the real ones, the end date of the provering phase will refer to the real month (e.g., if it is 26 March and the two numbers of the day are set at 27, the end date of the provering phase will be 27 March)
- if the two numbers of the day are lower than the real ones, the end date of the provering phase will refer to the following month (e.g., if it is 26 March and the two numbers of the day are set at 25, the end date of the provering phase will be 25 April)
- press **set** within 15 s: the display will show the end time and date of the provering phase in succession again.

To go back to previous levels:

- press **start** during modification of the values.

To exit the procedure:

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

5.3.1 Modifying the settings of the retarding-provering phase

To set the duration of the retarding-provering phase:

- make sure that the instrument is in stand-by and that there is no procedure in progress
- press **start**: the display will show the first label available
- press **▲** or **▼** within 15 s to select "Auto"
- press **start** within 15 s: the display will show the end time and date of the provering phase in succession
- press **▲** or **▼** within 9 s to select "PHA1" (it is the label of the retarding-provering phase): the LED  will switch on
- press **set** within 15 s: the display will show "hh" followed by the two numbers regarding the hours
- press **▲** or **▼** within 15 s; parameter P8 is also seen
- press **set** within 15 s: the display will show "nn" followed by the two numbers regarding the minutes
- press **▲** or **▼** within 15 s; parameter P8 is also seen.

It is also possible to set the duration of the retarding-provering phase via the dur0 parameter.

To set the work set-point during the retarding-provering phase:

- press **set** during the modification of the duration of the retarding-provering phase (i.e. during modification of the minutes): the display will show "Set" for 1 s after which the value is shown
- press **▲** or **▼** within 15 s; parameters P8, rC1 and rC2 are also seen.

It is also possible to set the retarding-provering phase work set-point via the Set0 parameter.

To set the percentage of relative humidity during the retarding-provering phase (only if parameter rU4 is set at 1):

- press **set** during the modification of the work set-point during the retarding-provering phase: the display will show "Ur" for 1 s after which the value is shown
- press **▲** or **▼** within 15 s; parameters P8, rU3, rU5 and rU6 are also seen.
- press **set** within 15 s: the display will show "PHA2" (it is the label of the storing phase), the LED  will switch off and the LED  will switch on.

It is also possible to set the percentage of relative humidity during the retarding-provering phase via the Ur0 parameter.

To go back to previous levels:

- press **start** during modification of the values.

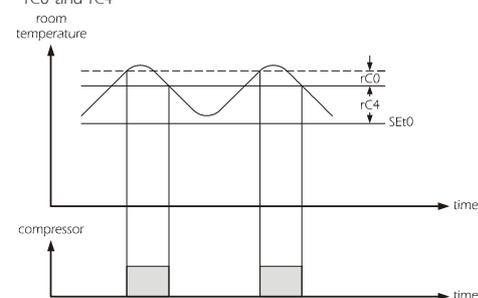
To exit the procedure:

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

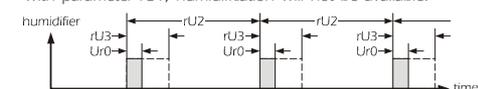
5.3.2 The retarding provering phase

During the retarding provering phase:

- the activity of the compressor depends mainly on parameters Set0, rC0 and rC4



- the resistances remain off
- the evaporator fan activity depends mainly on parameter F0
- the activity of the humidifier mainly depends on parameters Ur0, rU2 and rU3 (the rU3 parameter establishes the duration of humidifier switch-on, in the course of time rU2, such to cause 100% relative humidity). If the temperature of the room falls below that established with parameter rU1, humidification will not be available.



- defrosting can be activated
- the LED  is on.

The retarding-provering phase has duration of the time established via parameter dur0. When this time has expired the instrument passes automatically to the storing phase.

5.4.1 Modifying the settings of the storing phase

To set the work set-point during the storing phase:

- make sure that the instrument is in stand-by and that there is no procedure in progress
- press **start**: the display will show the first label available
- press **▲** or **▼** within 15 s to select "Auto"
- press **start** within 15 s: the display will show the end time and date of the provering phase in succession

- press **▲** or **▼** within 9 s to select **"PHAZ"** (it is the label of the storing phase): the LED **☄** will switch on.

Alternatively:

- press **set** during the modification of the percentage of relative humidity during the retarding-provering phase.

Successively:

- press **set** within 15 s: the display will show **"SEt"** for 1 s after which the value is shown
- press **▲** or **▼** within 15 s; parameters P8, rC1 and rC2 are also seen.

It is also possible to set the storing phase work set-point via the SET1 parameter.

To set the percentage of relative humidity during the storing phase (only if parameter rU4 is set at 1):

- press **set** during the modification of the work set-point during the storing phase: the display will show **"Ur"** for 1 s after which the value is shown
- press **▲** or **▼** within 15 s; parameters P8, rU3, rU5 and rU6 are also seen.
- press **set** within 15 s: the display will show **"PHA3"** (it is the label of the awakening phase), the LED **☄** will switch off and the LED **☄** will switch on.

It is also possible to set the percentage of relative humidity during the storing phase via the Ur1 parameter.

To go back to previous levels:

- press **start** during modification of the values.

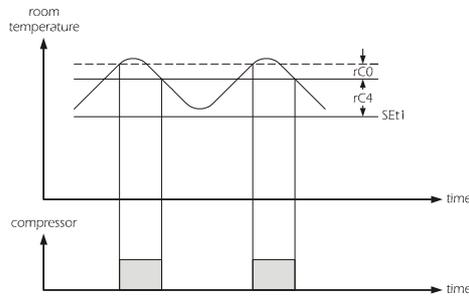
To exit the procedure:

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

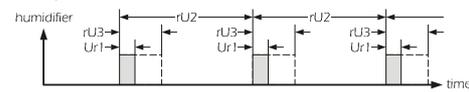
5.4.2 The storing phase

During the storing phase:

- the activity of the compressor depends mainly on parameters SEt1, rC0 and rC4



- the resistances remain off
- the evaporator fan activity depends mainly on parameter F1
- the activity of the humidifier mainly depends on parameters Ur1, rU2 and rU3 (the rU3 parameter establishes the duration of humidifier switch-on, in the course of time rU2, such to cause 100% relative humidity). If the temperature of the room falls below that established with parameter rU1, humidification will not be available



- defrosting can be activated
- the LED **☄** is on.

The duration of the storing phase adapts itself automatically to that of the retarding-provering phase, to that of the awakening phase, to that of the provering phase and the end time and date of the provering phase. At the end of the storing phase, the instrument passes automatically to the awakening phase.

5.5.1 Modifying the settings of the awakening phase

To set the duration of the awakening phase:

- make sure that the instrument is in stand-by and that there is no procedure in progress
- press **start**: the display will show the first label available
- press **▲** or **▼** within 15 s to select **"Auto"**
- press **start** within 15 s: the display will show the end time and date of the provering phase in succession
- press **▲** or **▼** within 9 s to select **"PHA3"** (it is the label of the awakening phase): the LED **☄** will switch on.

Alternatively:

- press **set** during the modification of the percentage of relative humidity during the storing phase

Successively:

- press **set** within 15 s: the display will show **"hh"** followed by the two numbers regarding the hours
- press **▲** or **▼** within 15 s; parameter P8 is also seen
- press **set** within 15 s: the display will show **"nn"** followed by the two numbers regarding the minutes
- press **▲** or **▼** within 15 s; parameter P8 is also seen.

It is also possible to set the duration of the awakening phase via the dur2 parameter.

To set the work set-point during the awakening phase:

- press **set** during the modification of the duration of the awakening phase (i.e. during modification of the minutes): the display will show **"SEt"** for 1 s after which the value is shown
- press **▲** or **▼** within 15 s; parameters P8, rH1 and rH2 are also seen.

It is also possible to set the awakening phase work set-point via the SET2 parameter.

To set the percentage of relative humidity during the awakening phase:

- press **set** during the modification of the work set-point during the awakening phase: the display will show **"Ur"** for 1 s after which the value is shown
- press **▲** or **▼** within 15 s; parameters P8, rU3, rU5 and rU6 are also seen.
- press **set** within 15 s: the display will show **"PHA4"** (it is the label of the provering phase), the LED **☄** will switch off and the LED **☄** will switch on.

It is also possible to set the percentage of relative humidity during the awakening phase via the Ur2 parameter.

To go back to previous levels:

- press **start** during modification of the values.

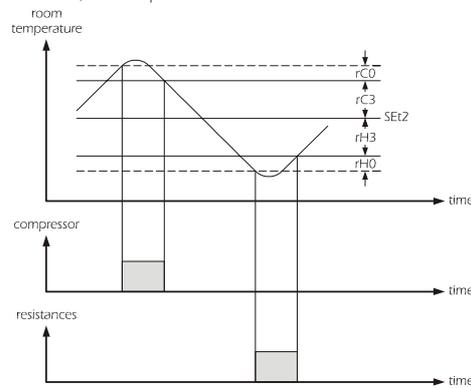
To exit the procedure:

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

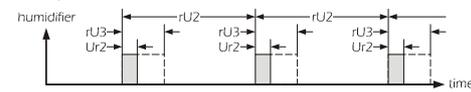
5.5.2 The awakening phase

During the awakening phase:

- compressor activity mainly depends on the SET2, rC0 and rC3 parameters and that of the resistances from the SET2, rH0 and rH3 parameters; see also parameter rH1



- the evaporator fan activity depends mainly on parameter F2
- the activity of the humidifier mainly depends on parameters Ur2, rU2 and rU3 (the rU3 parameter establishes the duration of humidifier switch-on, in the course of time rU2, such to cause 100% relative humidity). If the temperature of the room falls below that established with parameter rU1, humidification will not be available.



- defrosting is never activated
- the LED **☄** is on.

The awakening phase has duration of the time established via parameter dur2. When this time has expired, the instrument passes automatically to the provering phase.

5.6.1 Modifying the settings of the provering phase

To set the duration of the provering phase:

- make sure that the instrument is in stand-by and that there is no procedure in progress
- press **start**: the display will show the first label available
- press **▲** or **▼** within 15 s to select **"Auto"**
- press **start** within 15 s: the display will show the end time and date of the provering phase in succession
- press **▲** or **▼** within 9 s to select **"PHA4"** (it is the label of the provering phase): the LED **☄** will switch on.

Alternatively:

- press **set** during the modification of the percentage of relative humidity during the awakening phase.

Successively:

- press **set** within 15 s: the display will show **"hh"** followed by the two numbers regarding the hours
- press **▲** or **▼** within 15 s; parameter P8 is also seen
- press **set** within 15 s: the display will show **"nn"** followed by the two numbers regarding the minutes
- press **▲** or **▼** within 15 s; parameter P8 is also seen.

It is also possible to set the duration of the provering phase via the dur3 parameter.

To set the work set-point during the provering phase:

- press **set** during the modification of the duration of the provering phase (i.e. during modification of the minutes): the display will show **"SEt"** for 1 s after which the value is shown
- press **▲** or **▼** within 15 s; parameters P8, rH1 and rH2 are also seen.

It is also possible to set the provering phase work set-point via the SET3 parameter.

To set the percentage of relative humidity during the provering phase:

- press **set** during the modification of the work set-point during the provering phase: the display will show **"Ur"** for 1 s after which the value is shown
- press **▲** or **▼** within 15 s; parameters P8, rU3, rU5 and rU6 are also seen.
- press **set** within 15 s: the display will show **"PHA5"** (it is the label of the slowing phase), the LED **☄** will switch off and the LED **☄**, **☄**, **☄** and **☄** will switch on.

It is also possible to set the percentage of relative humidity during the provering phase via the Ur3 parameter.

To go back to previous levels:

- press **start** during modification of the values.

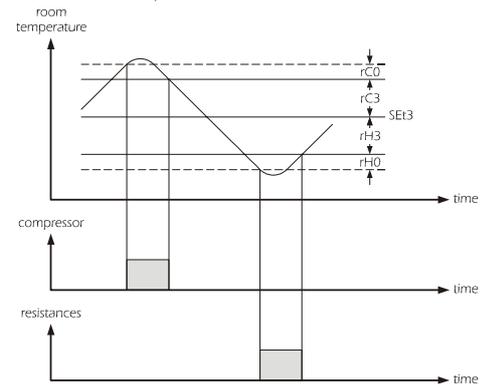
To exit the procedure:

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

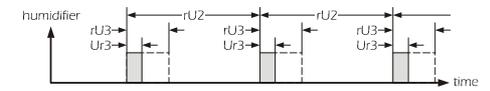
5.6.2 The provering phase

During the provering phase:

- compressor activity mainly depends on the SET3, rC0 and rC3 parameters and that of the resistances from the SET3, rH0 and rH3 parameters; see also parameter rH2



- the evaporator fan activity depends mainly on parameter F3
- the activity of the humidifier mainly depends on parameters Ur3, rU2 and rU3 (the rU3 parameter establishes the duration of humidifier switch-on, in the course of time rU2, such to cause 100% relative humidity). If the temperature of the room falls below that established with parameter rU1, humidification will not be available



- defrosting is never activated
- the LED **☄** is on.

The provering phase has duration of the time established via parameter dur3. When this time has expired, the instrument passes automatically to the slowing phase.

5.7.1 Modifying the settings of the slowing phase

To set the work set-point during the slowing phase:

- make sure that the instrument is in stand-by and that there is no procedure in progress
- press **start**: the display will show the first label available
- press **▲** or **▼** within 15 s to select **"Auto"**
- press **start** within 15 s: the display will show the end time and date of the slowing phase in succession
- press **▲** or **▼** within 9 s to select **"PHA5"** (it is the label of the slowing phase): the LEDs **☄**, **☄**, **☄** and **☄** will switch on.

Alternatively:

- press **set** during the modification of the percentage of relative humidity during the slowing phase.

Successively:

- press **set** within 15 s: the display will show **"SEt"** for 1 s after which the value is shown
- press **▲** or **▼** within 15 s; parameters P8, rH1 and rH2 are also seen.

It is also possible to set the slowing phase work set-point via the SET4 parameter.

To set the percentage of relative humidity during the slowing phase:

- press **set** during the modification of the work set-point during the slowing phase: the display will show **"Ur"** for 1 s after which the value is shown
- press **▲** or **▼** within 15 s; parameters P8, rU3, rU5 and rU6 are also seen.
- press **set** within 15 s: the display will show the end time and date of the slowing phase in succession again and the LEDs **☄**, **☄**, **☄** and **☄** will switch off.

It is also possible to set the percentage of relative humidity during the slowing phase via the Ur4 parameter.

To go back to previous levels:

- press **start** during modification of the values.

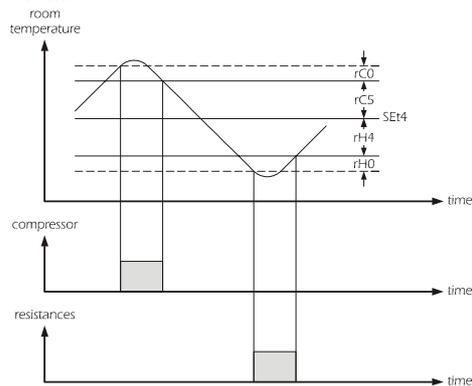
To exit the procedure:

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

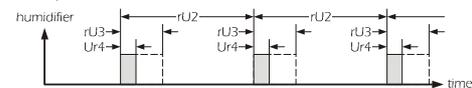
5.7.2 The slowing phase

During the slowing phase:

- compressor activity mainly depends on the SET4, rC0 and rC5 parameters and that of the resistances from the SET4, rH0 and rH4 parameters



- the evaporator fan activity depends mainly on parameter F4
- the activity of the humidifier mainly depends on parameters Ur4, rU2 and rU3 (the rU3 parameter establishes the duration of humidifier switch-on, in the course of time rU2, such to cause 100% relative humidity). If the temperature of the room falls below that established with parameter rU1, humidification will not be available



- defrosting is never activated
- the LEDs and are on.

The slowing phase lasts until the cycle is interrupted by pressing the **start** for 4 s.

6 HEATING MANUAL CYCLE

6.1 Start/stop of the heating manual cycle

To start the cycle:

- make sure that the instrument is in stand-by and that there is no procedure in progress
- press **start**: the display will show the first label available
- press or within 15 s to select "Hot"
- press **start** within 15 s: the display will show "Go"
- press **start** within 15 s: the LED will switch on and the cycle will be started.

To stop the cycle:

- press **start** for 4 s.

6.2.1 Modifying the settings of the heating manual cycle

To set the duration of the heating manual cycle:

- make sure that the instrument is in stand-by and that there is no procedure in progress
- press **start**: the display will show the first label available
- press or within 15 s to select "Hot"
- press **set** within 15 s: the display will show "hh" followed by the two numbers regarding the hours and the LED will switch on
- press or within 15 s
- press **set** within 15 s: the display will show "nn" followed by the two numbers regarding the minutes
- press or within 15 s.

To set the work set-point during the heating manual cycle:

- press **set** during the modification of the duration of the heating manual cycle (i.e. during modification of the minutes): the display will show "SEt" for 1 s after which the value is shown
- press or within 15 s; parameters rH1 and rH2 are also seen.

It is also possible to set the heating manual cycle work set-point via the SET5 parameter.

To set the percentage relative humidity during the heating manual cycle:

- press **set** during the modification of the work set-point during the heating manual cycle: the display will show "Ur" for 1 s after which the value is shown
- press or within 15 s; parameters rU3, rU5 and rU6 are also seen.
- press **set** within 15 s: the display will show "Hot" again.

It is also possible to set the percentage of relative humidity during the heating manual cycle via the Ur5 parameter.

To go back to previous levels:

- press **start** during modification of the values.

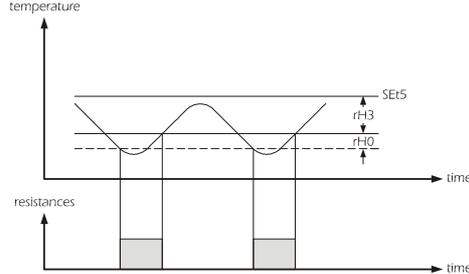
To exit the procedure:

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

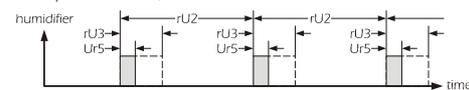
6.2.2 The heating manual cycle

During the heating manual cycle:

- the activity of the resistances depends mainly on parameters SET5, rH0 and rH3



- the compressor stays off
- the evaporator fan activity depends mainly on parameter F3
- the activity of the humidifier mainly depends on parameters Ur5, rU2 and rU3 (the rU3 parameter establishes the duration of humidifier switch-on, in the course of time rU2, such to cause 100% relative humidity). If the temperature of the room falls below that established with parameter rU1, humidification will not be available.



- defrosting is never activated
- the LED is on.

The heating manual cycle lasts until it is interrupted by pressing the

start for 4 s. When the duration of the heating manual cycle has ended, the buzzer is activated for the time established with parameter dur5.

7 COOLING MANUAL CYCLE

7.1 Start/stop of the cooling manual cycle

To start the cycle:

- make sure that the instrument is in stand-by and that there is no procedure in progress
- press **start**: the display will show the first label available
- press or within 15 s to select "Cold"
- press **start** within 15 s: the display will show "Go"
- press **start** within 15 s: the LED will switch on and the cycle will be started.

To stop the cycle:

- press **start** for 4 s.

7.2.1 Modifying the settings of the cooling manual cycle

To set the work set-point during the cooling manual cycle:

- make sure that the instrument is in stand-by and that there is no procedure in progress
- press **start**: the display will show the first label available
- press or within 15 s to select "Cold"
- press **set** within 15 s: the display will show "SEt" for 1 s after which the value is shown
- press or within 15 s; parameters rC1 and rC2 are also seen.
- press **set** within 15 s: the display will show "Cold" again.

It is also possible to set the heating manual cycle work set-point via the SET6 parameter.

To go back to previous levels:

- press **start** during modification of the values.

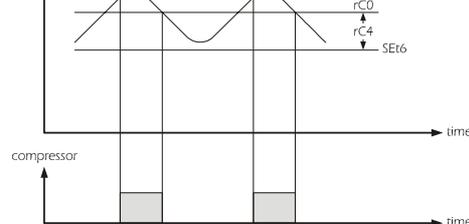
To exit the procedure:

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

7.2.2 The cooling manual cycle

During the cooling manual cycle:

- the activity of the compressor depends mainly on parameters SET6, rC0 and rC4



- the resistances remain off
- the evaporator fan activity depends mainly on parameter F0
- the humidifier remains off
- defrosting can be activated
- the LED is on.

The cooling manual cycle lasts until it is interrupted by pressing the **start** for 4 s.

8 USER INTERFACE

8.1 Preliminary considerations

The following functioning states exist:

- the "on" status (the instrument is powered and a functioning cycle is in progress; the regulators can be switched on)
- the "stand-by" status (the instrument is powered but no functioning cycle is in progress: the regulators are off)
- the "off" status (the instrument is not powered).

Successively, the term "switch-on" means 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.

If the power supply is shut-off during the stand-by status, the same status will be proposed again when the power supply is restored.

If the power supply is shut-off during the on status, instrument functioning will depend on parameter P6 when the power supply is restored.

8.2 The display

If the instrument is on, during normal functioning the display will show the size established via parameter P4:

- if P4 = 0, the display will show the temperature of the room if a functioning cycle is in progress and will be off if the instrument is in stand-by
- if P4 = 1, the display will show the end time of the proving phase if a functioning cycle is in progress and will be off if the instrument is in stand-by
- if P4 = 2, the display will show the temperature of the room (for 3 s) alternating with the end time of the proving phase (for 1 s) if a functioning cycle is in progress and will be off if the instrument is in stand-by
- if P4 = 3, the display will show the temperature of the room if a functioning cycle is in progress and the real time if the instrument is in stand-by
- if P4 = 4, the display will show the end time of the proving phase if a functioning cycle is in progress and the real time if the instrument is in stand-by
- if P4 = 5, the display will show the temperature of the room (for 3 s) alternating with the end time of the proving phase (for 1 s) if a functioning cycle is in progress and the real time if the instrument is in stand-by.

8.3 Displaying the room temperature

- make sure that no procedure is in progress
- press for 1 s: the display will show the first label available
- press or to select "Pb1"
- press **set**

To exit the procedure:

- press **set** or do not operate for 60 s
- press or until the display shows the size established via parameter P4 or do not operate for 60 s.

Alternatively:

- press **start**

8.4 Displaying the evaporator temperature

- make sure that no procedure is in progress
- press for 1 s: the display will show the first label available
- press or to select "Pb2"
- press **set**

To exit the procedure:

- press **set** or do not operate for 60 s
- press or until the display shows the size established via parameter P4 or do not operate for 60 s.

Alternatively:

- press **start**

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

8.5 Displaying the end time and date of the proving phase

- make sure that an automatic cycle is in progress and no procedure is in progress
- press for 1 s: the display will show the first label available
- press or to select "End"
- press **set**: the display will show the following in succession:
 - the conclusion time of the proving phase (e.g. "02:00")
 - "dd" followed by the two numbers of the day of conclusion of the proving phase (e.g. "dd26")
 - "MM" followed by the two numbers of the end month of the proving phase (e.g. "MM03")

To exit the procedure:

- press **set** or do not operate for 60 s
- press or until the display shows the size established via parameter P4 or do not operate for 60 s.

Alternatively:

- press **start**

If a heating or cooling manual cycle is in progress, the "End" label will not be displayed.

The end time of the proving phase is displayed in the 24 hour format (hours: minutes).

In the example, the proving phase will be concluded at 02:00 on 26 March. The display will show all information for 1 s. If parameter P9 is set at 0, the display will only show the conclusion time of the proving phase.

8.6 Displaying the real time

- make sure that no procedure is in progress
- press for 1 s: the display will show the first label available
- press or to select "tIME"
- press to exit the procedure:
- press or do not operate for 60 s
- press or until the display shows the size established via parameter P4 or do not operate for 60 s.

Alternatively:

- press to exit the procedure:
- The real time is displayed in 24 hour format (hour:minutes).

If the automatic cycles are not enabled (parameter P7 = 0), the "tIME" label will not be displayed.

8.7 Displaying the output states

To display the state of the compressor:

- make sure that a functioning cycle is in progress and no procedure is in progress
- press : the display will show the first label available
- if the display shows "C-1", the compressor is on
- if the display shows "C-0", the compressor is off
- if the display shows "C-P", a compressor protection is in progress (parameters C0, C1, C2 and C3).

To display the state of the evaporator fan:

- make sure that a functioning cycle is in progress and no procedure is in progress
 - press twice: the display will show the first label available.
- Alternatively:
- press during the display of the compressor status
 - if the display shows "F-1", the evaporator fan is on
 - if the display shows "F-0", the evaporator fan is off.

To display the state of the resistances:

- make sure that a functioning cycle is in progress and no procedure is in progress
 - press 3 times: the display will show the first label available.
- Alternatively:
- press during the display of the evaporator fan status
 - if the display shows "r-1", the resistances are on
 - if the display shows "r-0", the resistances are off.

To display the state of the humidifier:

- make sure that a functioning cycle is in progress and no procedure is in progress
 - press 4 times: the display will show the first label available.
- Alternatively:
- press during the display of the status of the resistances
 - if the display shows "i-1", the humidifier is on
 - if the display shows "i-0", the humidifier is off.

To exit the procedure:

- press until the display shows the size established via parameter P4 or do not operate for 15 s.

8.8 Defrosting activation in manual mode

- make sure that a retarding-provering phase, a storing phase or a cooling manual cycle is in progress and no procedure is in progress
 - press for 4 s: the defrosting LED will switch on.
- If the evaporator probe is enabled (parameter P3 = 1) and on activation of the defrosting, the temperature of the evaporator is over that established via parameter d2, defrosting will not be activated.

8.9 Silencing the buzzer

- make sure that no procedure is in progress
- press a key.

9 SETTINGS

9.1 Setting the day and real time

- make sure that the instrument is in stand-by and that there is no procedure in progress
 - press for 1 s: the display will show the first label available
 - press or to select "rtc".
- To modify the year:
- press : the display will show "yy" followed by the two numbers regarding the year
 - press or within 15 s.
- To modify the month:
- press during modification of the year: the display will show "nn" followed by the two numbers regarding the month
 - press or within 15 s.
- To modify the day of the month:
- press during modification of the month: the display will show "dd" followed by the two numbers regarding the day
 - press or within 15 s.
- To modify the hour:
- press during modification of the day of the month: the display will show "hh" followed by the two numbers regarding the hour
 - press or within 15 s.
- To modify the minutes:
- press during modification of the hour: the display will show "nn" followed by the two numbers regarding the minutes
 - press or within 15 s
 - press : the instrument will exit the procedure.
- To exit the procedure ahead of time:
- do not operate for 60 s.
- Alternatively:
- press twice.
- The time is displayed in 24 hour format.

If the automatic cycles are not enabled (parameter P7 = 0), the "rtc" label will not be displayed.

9.2 Setting the configuration parameters

To access the procedure:

- make sure that no procedure is in progress
- press and for 4 s: the display will show "PA"
- press
- press or within 15 s to set "-19"
- press or do not operate for 15 s
- press and for 4 s: the display will show "SP".

To select a parameter:

- press or

To modify a parameter:

- press
- press or within 15 s
- press or do not operate for 15 s.

To exit the procedure:

- press and for 4 s or do not operate for 60 s (any modifications will be saved).

Shut-off the instrument power supply after the modification of the parameters.

9.3 Restoring factory settings

To access the procedure:

- make sure that no procedure is in progress
 - press and for 4 s: the display will show "PA"
 - press
 - press or within 15 s to set "149"
 - press or do not operate for 15 s
 - press and for 4 s: the display will show "DEF"
 - press
 - press or within 15 s to set "1"
 - press or do not operate for 15 s: the display will show "dEF" flashing for 4 s, after which the instrument will exit the procedure
 - shut-off the instrument power supply.
- To exit the procedure ahead of time:
- press and for 4 s during the procedure (i.e. before setting "1": restore will not be performed).

Make sure that the factory settings are appropriate (see chapter 14).

10 SIGNALS AND INDICATIONS

10.1 Signals

LED	MEANING
	Retarding-provering phase/cooling manual cycle LED if it is on: <ul style="list-style-type: none"> • the retarding-provering phase is in progress • the cooling manual cycle is in progress • the modification of the settings of the retarding-provering phase is in progress (with the procedure indicated in paragraph 5.3.1) • the modification of the settings of the cooling manual cycle is in progress (with the procedure indicated in paragraph 7.2.1)
	Storing phase LED if it is on: <ul style="list-style-type: none"> • the storing phase is in progress • the modification of the settings of the storing phase is in progress (with the procedure indicated in paragraph 5.4.1)
	Awakening phase LED if it is on: <ul style="list-style-type: none"> • the awakening phase is in progress • the modification of the settings of the awakening phase is in progress (with the procedure indicated in paragraph 5.5.1)
	Provering phase/heating manual cycle LED if it is on: <ul style="list-style-type: none"> • the provering phase is in progress • heating manual cycle is in progress • the modification of the settings of the provering phase is in progress (with the procedure indicated in paragraph 5.6.1) • the modification of the settings of the heating manual cycle is in progress (with the procedure indicated in paragraph 6.2.1)
	Slowing phase LED if they are all on: <ul style="list-style-type: none"> • the slowing phase is in progress • the modification of the settings of the slowing phase is in progress (with the procedure indicated in paragraph 5.7.1)
	Defrosting LED if on, defrosting is in progress
	Alarm LED if on, an alarm or error is in progress
°C	Degree Celsius LED if on, the unit of measurement is the degree Celsius: <ul style="list-style-type: none"> - parameter P2
°F	Degree Fahrenheit LED if on, the unit of measurement is the degree Fahrenheit: <ul style="list-style-type: none"> - parameter P2
% r.H.	Percentage of relative humidity LED if on, the measurement of the size displayed will be the percentage of relative humidity
	On/stand-by LED if on, the instrument will be in stand-by

11 ALARMS

11.1 Alarms

CODE	MEANING
AH	Maximum temperature alarm Solutions: <ul style="list-style-type: none"> • check the temperature of the evaporator • see: <ul style="list-style-type: none"> - parameters A0 and A1 Main consequences: <ul style="list-style-type: none"> • the instrument will continue to function regularly
id	Door micro switch input alarm Solutions: <ul style="list-style-type: none"> • check the causes for the activation of the input • see parameters i0 and i1 Main consequences: <ul style="list-style-type: none"> • the effect established with parameter i1
iA	Safety thermostat input alarm Solutions: <ul style="list-style-type: none"> • check the causes for the activation of the input • see parameter i2 Main consequences: <ul style="list-style-type: none"> • the functioning cycle will be interrupted • all charges will be switched off
PF	Power supply shut-off alarm Solutions: <ul style="list-style-type: none"> • check the causes for the shut-off of the power supply • see parameters P5 and P6 Main consequences: <ul style="list-style-type: none"> • the effect established with parameter P5

When the cause of the alarm disappears, the instrument restores normal functioning, except for the following alarms:

- the safety thermostat input alarm (code "iA") that requires a key to be pressed
- the power supply shut-off alarm (code "PF") that requires a key to be pressed.

12 ERRORS

12.1 Errors

CODE	MEANING
Pr1	Room probe error Solutions: <ul style="list-style-type: none"> • see parameter P0 • check the integrity of the probe • check the instrument-probe connection • check the temperature of the room Main consequences: <ul style="list-style-type: none"> • the functioning cycle will be interrupted • all charges will be switched off
Pr2	Evaporator probe error Solutions: <ul style="list-style-type: none"> • the same as the previous case but relative to the evaporator probe Main consequences: <ul style="list-style-type: none"> • defrosting will have duration of the time established with parameter d3
Err	End time and/or date error of the provering phase Solutions: <ul style="list-style-type: none"> • set the end time and date of the provering phase again Main consequences: <ul style="list-style-type: none"> • the functioning cycle will not be started
rtc	Clock error Solutions: <ul style="list-style-type: none"> • set the day and real time again Main consequences: <ul style="list-style-type: none"> • the functioning cycle will be interrupted • all charges will be switched off

When the cause of the error disappears, the instrument restores normal functioning, except for the following errors:

- the room probe error (code "Pr1") that requires a key to be pressed
- the clock error (code "rtc") that requires a key to be pressed and the date and time to be set.

The display shows the end time and/or date error of the provering phase (code "Err") for 15 s after which the instrument passes to the stand-by status. Pressing a key during the error causes the access to the procedure for the modification of this variable.

13 TECHNICAL DATA

13.1 Technical data

Container: grey self-extinguishing.

Frontal protection rating: IP 65.

Connections: terminal board with screws (power supply, inputs and outputs), 6-pole connector (serial port) 4-pole connector (at the remote indicator on request); sprung extractable terminal board (power supply, inputs and outputs) on request.

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

Power supply: 12 VAC/DC (or 12-24 VAC/DC), 50/60 Hz, 3.5 VA (approx) or 115 ... 230 VAC, 50/60 Hz, 5 VA (approx).

Keeping the clock data in the case of a power cut: 24 h with charged battery.

Battery charging time: 2 min without interruptions (the battery is charged by the instrument power supply).

Alarm buzzer: built-in.

Measure inputs: 2 (room probe and evaporator probe) for PTC/NTC probes.

Digital inputs: 2 (door micro switches and safety thermostat) for normally open/normally closed contact (potential-free contact, 5 V 1 mA).

Field of measurement: from -50.0 to 150.0 °C (from -50 to 300 °F) for PTC probe, from -40.0 to 105.0 °C (from -40 to 220 °F) for NTC probe.

Resolution: 0.1 °C/1 °C/1 °F.

Digital outputs: 4 relays:

- **compressor relay:** 16 A res. @ 250 VAC (change-over contact)

- **humidifier relay:** 8 A res. @ 250 VAC (change-over contact)

- **evaporator fan relay:** 8 A res. @ 250 VAC (NO contact)

- **resistances relay:** 8 A res. @ 250 VAC (change-over contact).

The maximum current accepted on charges is 10 A.

Serial port: port for communication with the supervision system (through a serial interface, via TTL, with MODBUS communication protocol), with the graphic diagram (through a serial interface) or with the programming key.

Other communication ports (on request): serial port for the communication with the remote indicator.

14 CONFIGURATION PARAMETERS

14.1 Configuration parameters

PARAM	MIN.	MAX.	U. M.	DEF.	WORK SET-POINT
SEt0	rC1	rC2	°C/°F (1)	-2.0	work set-point during the retarding-provering phase; also see rC4
SEt1	rC1	rC2	°C/°F (1)	4.0	work set-point during the storing phase; also see rC4
SEt2	rH1	rH2	°C/°F (1)	16.0	work set-point during the awakening phase; also see rC3 and rH3
SEt3	rH1	rH2	°C/°F (1)	26.0	work set-point during the provering phase; also see rC3 and rH3
SEt4	rH1	rH2	°C/°F (1)	15.0	work set-point during the slowing phase; also see rC5 and rH4
SEt5	rH1	rH2	°C/°F (1)	26.0	work set-point during the heating manual cycle, see also rH3
SEt6	rC1	rC2	°C/°F (1)	-2.0	work set-point during the cooling manual cycle; see also rC4
PARAM	MIN.	MAX.	U. M.	DEF.	PERCENTAGE OF RELATIVE HUMIDITY
Ur0	rU5	rU6	%	0	percentage of relative humidity during the retarding-provering phase (intended as percentage of time rU3); see also rU1
Ur1	rU5	rU6	%	0	percentage of relative humidity during the storing phase (intended as percentage of time rU3); see also rU1
Ur2	rU5	rU6	%	70	percentage of relative humidity during the awakening phase (intended as percentage of time rU3); see also rU1
Ur3	rU5	rU6	%	75	percentage of relative humidity during the provering phase (intended as percentage of time rU3); see also rU1
Ur4	rU5	rU6	%	75	percentage of relative humidity during the slowing phase (intended as percentage of time rU3); see also rU1
Ur5	rU5	rU6	%	0	percentage of relative humidity during the heating manual cycle (intended as percentage of time rU3); see also rU1
PARAM	MIN.	MAX.	U. M.	DEF.	DURATION OF THE PHASES
dur0	00:00	23:59	h:min	04:00	duration of the retarding-provering phase
dur2	00:00	23:59	h:min	02:00	duration of the awakening phase
dur3	00:00	23:59	h:min	02:00	duration of the provering phase
dur5	00:00	23:59	h:min	00:00	duration of the activation of the buzzer and the end of the duration of the heating manual cycle
PARAM	MIN.	MAX.	U. M.	DEF.	MEASURE INPUTS
CA1	-25.0	25.0	°C/°F (1)	0.0	room probe offset
CA2	-25.0	25.0	°C/°F (1)	0.0	evaporator probe offset
P0	0	1	----	1	type of probe 0 = PTC 1 = NTC
P1	0	1	----	1	degree Celsius decimal point (for the size displayed during normal functioning) 1 = YES
P2	0	1	----	0	temperature unit of measurement (2) 0 = °C 1 = °F
P3	0	1	----	1	enabling the evaporator probe 1 = YES
P4	0	5	----	2	size displayed during normal functioning 0 = room temperature if a functioning cycle is in progress display off if the instrument is in stand-by 1 = end time of the provering phase if an automatic cycle is in progress display off if the instrument is in stand-by (3) 2 = room temperature (for 3 s) alternately with the end time of the provering phase (for 1 s) if an automatic cycle is in progress display off if the instrument is in stand-by (3) 3 = room temperature if a functioning cycle is in progress real time if the instrument is in stand-by 4 = end time of the provering phase if an automatic cycle is in progress real time if the instrument is in stand-by (4) 5 = room temperature (for 3 s) alternately with the end time of the provering phase (for 1 s) if an automatic cycle is in progress real time if the instrument is in stand-by (4)
P5	1	30	min	15	duration of a power cut (that occurs during a functioning cycle) after which the cycle is interrupted (only if P6=2)
P6	0	2	----	1	functioning of the instrument when the power supply is restored after shut-off that occurs during a functioning cycle 0 = the cycle will be interrupted 1 = the cycle will be restored 2 = depending on P5
P7	0	1	----	1	enabling of the automatic cycle 1 = YES
P8	0	1	----	0	blocking the modification of the automatic cycle settings (operate with the procedures indicated in chapter 5). 1 = YES
P9	0	1	----	1	enabling of the display of the end time and date of the provering phase in succession (instead of just the end time of the provering phase) during the modification of the automatic cycle settings (operate with the procedures indicated in chapter 5) 1 = YES
PARAM	MIN.	MAX.	U. M.	DEF.	COOLING REGULATOR
rC0	0.1	15.0	°C/°F (1)	3.0	differential of the rC3, rC4 and rC5 parameters
rC1	-99.0	rC2	°C/°F (1)	-3.0	minimum value of the SEt0, SEt1 and SEt6 parameters
rC2	rC1	99.0	°C/°F (1)	15.0	maximum value of the SEt0, SEt1 and SEt6 parameters
rC3	0.0	10.0	°C/°F (1)	3.0	value of the neutral zone for cooling functioning during the awakening phase and during the provering phase (relative to the work set-point, i.e. "SEt2 and SEt3 + rC3"); see also rC0
rC4	0.0	10.0	°C/°F (1)	1.0	value of the neutral zone for cooling functioning during the retarding provering phase, during the storage phase and during the cooling manual cycle (relative to the work set-point i.e. "SEt0, SEt1 or SEt6 + rC4"); see also rC0
rC5	0.0	10.0	°C/°F (1)	1.0	value of the neutral zone for cooling functioning during the slowing phase (relative to the work set-point, i.e. "SEt4 + rC5"); see also rC0
PARAM	MIN.	MAX.	U. M.	DEF.	HEATING REGULATOR
rH0	0.1	15.0	°C/°F (1)	3.0	differential of the rH3 and rH4 parameters
rH1	0.0	rH2	°C/°F (1)	0.0	minimum value of the SEt2, SEt3, SEt4 and SEt5 parameters
rH2	rH1	99.0	°C/°F (1)	35.0	maximum value of the SEt2, SEt3, SEt4 and SEt5 parameters
rH3	0.0	10.0	°C/°F (1)	1.0	value of the neutral zone for heating functioning during the awakening phase and during the provering phase and during the heating manual cycle (relative to the work set-point, i.e. "SEt2, SEt3 and SEt5 + rH3"); see also rH0
rH4	0.0	10.0	°C/°F (1)	3.0	value of the neutral zone for heating functioning during the slowing phase (relative to the work set-point, i.e. "SEt4 + rH4"); see also rH0
rn1	1	3	----	1	number of steps by which the "room temperature on activation of the awakening phase - SEt2" difference is divided, depending on the time dur2, for the calculation of the work set-point during the same phase (5)
rn2	1	3	----	1	number of steps by which the "room temperature on activation of the provering phase - SEt3" difference is divided, depending on the time dur3, for the calculation of the work set-point during the same phase (6)
PARAM	MIN.	MAX.	U. M.	DEF.	HUMIDIFIER
rU1	0.0	90.0	°C/°F (1)	10.0	temperature of the room below which humidification is not available (7)
rU2	30	600	s	60	cycle time for humidifier switch-on; see also rU3
rU3	0	rU2	s	30	duration of humidifier switch-on (during time rU2) such to cause 100% relative humidity
rU4	0	1	----	0	enabling of setting the percentage relative humidity during the modification of the settings of the retarding-provering phase and during modification of the storing phase settings (with the procedures indicated in paragraphs 5.3.1 and 5.4.1) 1 = YES
rU5	0	rU6	%	0	minimum value of the Ur0, Ur1, Ur2, Ur3, Ur4 and Ur5 parameters
rU6	rU5	100	%	100	maximum value of the Ur0, Ur1, Ur2, Ur3, Ur4 and Ur5 parameters

PARAM.	MIN.	MAX.	U. M.	DEF.	COMPRESSOR PROTECTIONS
C0	0	240	min	2	compressor switch-on delay from instrument switch-on (8)
C1	0	240	min	2	minimum time between the two consecutive compressor switch-ons (9)
C2	0	240	min	2	minimum duration of compressor switch-off (9)
C3	0	240	s	0	minimum duration of compressor switch-on
PARAM.	MIN.	MAX.	U. M.	DEF.	DEFROSTING (10)
d0	0	99	h	6	defrosting interval (11) 0 = defrosting will never be activated at intervals
d2	-99.0	99.0	°C/°F (1)	2.0	defrosting end temperature (only if P3 = 1); see also d3
d3	0	120	min	30	if P3 = 0, defrosting duration if P3 = 1, maximum defrosting duration; see also d2 0 = defrosting will never be activated
PARAM.	MIN.	MAX.	U. M.	DEF.	TEMPERATURE ALARMS
A0	0.0	99.0	°C/°F (1)	55.0	evaporator temperature above which the maximum temperature alarm is activated (code "AH"); see also A1 (12)
A1	0	1	----	1	enabling of the maximum temperature alarm (code "AH"); see also A0 1 = YES
PARAM.	MIN.	MAX.	U. M.	DEF.	EVAPORATOR FAN
F0	0	1	----	0	evaporator fan activity during the retarding-provering phase and during the cooling manual cycle 0 = parallel to the compressor 1 = on
F1	0	1	----	0	evaporator fan activity during the storing phase 0 = parallel to the compressor 1 = on
F2	0	1	----	1	evaporator fan activity during the awakening phase 0 = parallel to the compressor 1 = on
F3	0	1	----	1	evaporator fan activity during the provering phase and during the heating manual cycle 0 = parallel to the compressor 1 = on
F4	0	1	----	1	evaporator fan activity during the slowing phase 0 = parallel to the compressor 1 = on
F5	0	1	----	0	evaporator fan activity during defrosting 0 = off 1 = on
PARAM.	MIN.	MAX.	U. M.	DEF.	DIGITAL INPUTS
i0	0	1	----	0	door micro switch input contact type 0 = normally open (input active with closed contact) 1 = normally closed (input active with open contact)
i1	0	2	----	2	effect caused by the activation of the door micro switch input 0 = no effect 1 = the resistances and the evaporator fan are off. The display shows the code "id" flashing and the buzzer will be activated (until the input is deactivated) 2 = all charges will be switched off. The display shows the code "id" flashing and the buzzer will be activated (until the input is deactivated)
i2	0	1	----	0	type of contact of the safety thermostat input 0 = normally open (input active with closed contact) 1 = normally closed (input active with open contact)
PARAM.	MIN.	MAX.	U. M.	DEF.	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.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 the modification of parameter P2**
- (3) if the parameter P4 is set at 1 or 2 and a heating or cooling manual cycle is in progress, the instrument will function as if the parameter P4 is set at 0
- (4) if the parameter P4 is set at 4 or 5 and a heating or cooling manual cycle is in progress, the instrument will function as if the parameter P4 is set at 3
- (5) for example: if on activation of the awakening phase, the room temperature is 4.0 °C, the SET2 parameter is set at 16.0, the dur2 parameter is set at 02:00 h:min and the m1 parameter is set at 2, for the first 60 min of the awakening phase the work set-point will be 10.0 °C and for the remaining 60 min it will be 16.0 °C
- (6) for example: if on activation of the provering phase, the room temperature is 16.0 °C, the SET3 parameter is set at 26.0, the dur2 parameter is set at 02:00 h:min and the m2 parameter is set at 2, for the first 60 min of the awakening phase the work set-point will be 21.0 °C and for the remaining 60 min it will be 26.0 °C
- (7) humidification is not available during the cooling manual cycle
- (8) the parameter has effect also after the interruption of the power supply, which takes place when a functioning cycle is in progress
- (9) the time established via the parameter is counted also when the instrument is in the stand-by status
- (10) defrosting is only activated during the retarding-provering phase, during the storing phase and during the cooling manual cycle. If at the end of a storing phase defrosting is in progress, this will be interrupted on start-up of the awakening phase (during the phases and functioning cycles in which the defrosting is not activated, the count of the defrosting interval remains frozen)
- (11) the instrument memorises the count of the defrosting every 30 mins. The modification of parameter d0 has effect from the end of the previous defrosting interval or from the activation of defrosting in manual mode.
- (12) the differential of the A0 parameter is 2.0 °C/4 °F.