EVF818

Split execution controller for temperature-controlled blast chillers (with capacitive touch-key user interface, which can be integrated into the unit)

ENGLISH

INSTALLER MANUAL ver. 1.0

CODE 144F818E104

Important

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Read this document thoroughly before installation and before use of the device and follow all recommendations; keep this document with the device for future consultation.

The following symbols support reading of the document:

- indicates a suggestion
- ⚠ indicates a warning.

The device must be disposed of in compliance with local Standards regarding the collection of electric and electronic equipment.

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1 INTRODUCTION

1.1 Introduction

EVF818 is a digital controller studied to manage temperature-controlled blast chillers, which can be mechanically and aesthetically integrated into the unit.

The controller is fitted with:

- clock
- signal buzzer and alarm
- 6 analogue inputs (cabinet probe, “multipoint” needle probe with up to three sensors, evaporator probe and condenser probe) for PTC/NTC probes
- 4 digital inputs (door micro switch, high pressure, low pressure and compressor circuit breaker protection)
- 1 PWM analogue output for management of the evaporator fan
- 8 digital outputs (electromechanical relays), 1 x 30 A res. @ 250 VAC for compressor management, 1 x 16 A res. @ 250 VAC for management of needle probe heating, 6 x 8 A res. @ 250 VAC for management of defrosting, evaporator fan, condenser fan, door heating elements, of a seventh utility that can be set for the cabinet light or UV light and an eighth utility that can be configured for pump down valve or alarm output.
- TTL type serial port
- RS-48 serial port with MODBUS communication protocol.

The device can manage both temperature-controlled and time-controlled and hard and soft blast chilling and storage cycles and deep freezing and storage cycles, with intensity management via the use of a PWM analogue output and phase cut speed regulator for EVDFAN1 single phase fans.

Every operating cycle can be preceded by pre-cooling. The temperature-controlled cycles are also preceded by a test for checking the correct connection of the needle probe, with "multipoint" probes management (up to three sensors).

The device is available in “split” execution (user interface + control module).

The user interface is behind a Plexiglas sheet and is made up from a custom 3 + 4 + 1 digit display (with function icons) and 10 capacitive touch-keys; installation is envisioned on rear of panel with studs.

The control module is without cover and installation is envisioned on flat surface with spacers.

The "programs" function can be used to memorise some settings in a program and start an operating cycle with the settings it has memorised.

Via the "HACCP" function, up to 9 events can be memorised for each of the 3 HACCP alarms (temperature-controlled blast chilling or deep freezing not concluded within the maximum duration alarm, maximum temperature during storage alarm and power cut during storage alarm); the critical value, date and time at which the alarm occurred and the duration can be memorised for each HACCP alarm.

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

It is also finally possible to connect the controller to the Parameters Manager set-up software system, to the monitoring and surveillance system of the RICS plants, to the data recording device and to download the recorded data (via USB) EVUSBREC01 or to the print module PM 100A X9S001.

The following are indicated among the many other features:

- IP65 protection rating of the user interface
- management of three types of backlight
- memorisation of the defrosting interval
- management of temperature alarms
- compressor operating hours count, "keyboard block" function.

1.2 Summary table of the main features and the models available

The following table illustrates the main features of the device and the models available.
" / " indicates the feature can be set via a configuration parameter.

User interface (without cover)	**EVF818**
340.0 x 84.0 mm (13.385 x 8.400 cm; L x H)	•
custom 3 + 4 + 1 digit display (with function icon)	•
number of keys (capacitive touch-key type)	10
Control module (without cover)	**EVF818**
166.0 x 116.0 mm (6.535 x 11.598 cm; L x H)	•
Connections	**EVF818**
faston + fixed screw terminal board + removable screw terminal board	•
Power supply	**EVF818**
115... 230 VAC	•
Analogue inputs	**EVF818**
cabinet probe	PTC/NTC
needle probe 1	PTC/NTC
needle probe 2	PTC/NTC
needle probe 3	PTC/NTC
evaporator probe	PTC/NTC
condenser probe	PTC/NTC
Digital inputs (for NO/NC contact)	**EVF818**
door micro switch	•
high pressure	•
low pressure	•

compressor circuit breaker protection	•
Analogue outputs (PWM)	**EVF818**
evaporator fan	(1)
Digital outputs (electromechanical relays; A res. @ 250 VAC)	**EVF818**
compressor	30 A
defrosting	8 A
evaporator fan	(1)
condenser fan	8 A
door heating elements	8 A
needle probe heating	16 A
cabinet light/UV light	8 A
pump down valve/alarm	8 A
Communication port	**EVF818**
TTL type serial port	•
RS-48 serial port with MODBUS communication protocol	•
Other features	**EVF818**
IP65 protection rating of the user interface	IP65
clock	•
signal buzzer and alarm	•
management of three types of backlight	•
management of blast chilling and storage/deep freezing and storage cycles	•
management of temperature/time controlled operation cycles	•
hard/soft operating cycles management	•

management of the test regarding correct insertion of the needle probe	•
memorisation of the defrosting interval	•
management of temperature alarms	•
compressor operating hours count	•
"programs" function	•
"HACCP" function	•
"keyboard lock" function	•
configuration parameters access password	•
restoring the factory settings	•
Codes	**EVF818**
codes	EVF818P9

Notes:

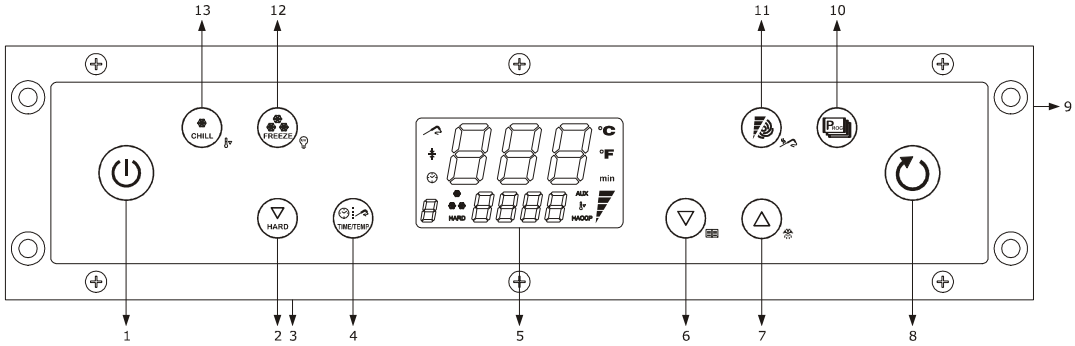
(1) The evaporator fan control signal can be analogue or digital.

For further information, see chapter 15 "TECHNICAL DATA"; for other models contact the EVCO sales network.

2 DESCRIPTION

2.1 Description of the user interface

The following drawing illustrates the aspect of the EVF818 user interface.



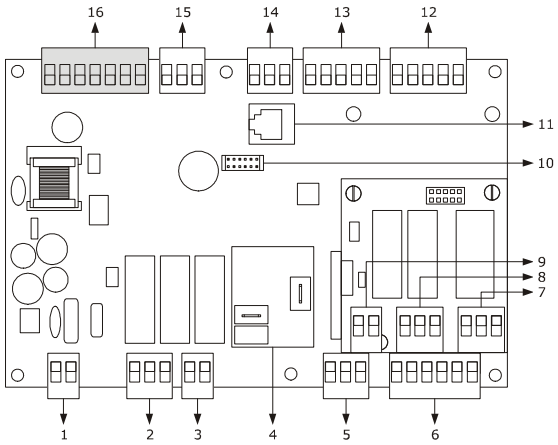
The following table illustrates the meaning of EVF818 user interface parts.

Part	Meaning
1	on/off key, herein called also "ON/STAND-BY key"
2	hard blast chilling or soft deep freezing key, hereon called HARD/SOFT" key
3	communication port with the control module (signal)
4	temperature-controlled cycle/time-controlled cycle key, hereon also called "TIME/TEMPERATURE key"
5	display
6	decrease key, hereon called "DOWN key"
7	increase key, hereon called "UP key"
8	cycle start/cycle cut-off key, hereon called "START/STOP key"
9	communication port with the control module (power supply)
10	programs memorisation/execution key, hereon also called “PROGRAMS key”
11	blast chilling/deep freezing intensity key, hereon also called "BLAST CHILLING INTENSITY key"
12	deep freezing key
13	blast chilling key

For further information, see the next chapters.

2.2 Description of the control module

The following drawing illustrates the aspect of the EVF818 control module.



The following table illustrates the meaning of EVF818 control module parts.

Part	Meaning
1	power supply
2	digital outputs K3 and K4
3	digital output K2
4	digital output K1
5	digital output K5
6	digital inputs
7	digital output K6
8	digital outputs K7 and K8
9	reserved
10	TTL type serial port
11	reserved
12	digital inputs (cabinet probe, evaporator probe and condenser probe)
13	digital inputs (needle probe 1, needle probe 2 and needle probe 3)
14	reserved

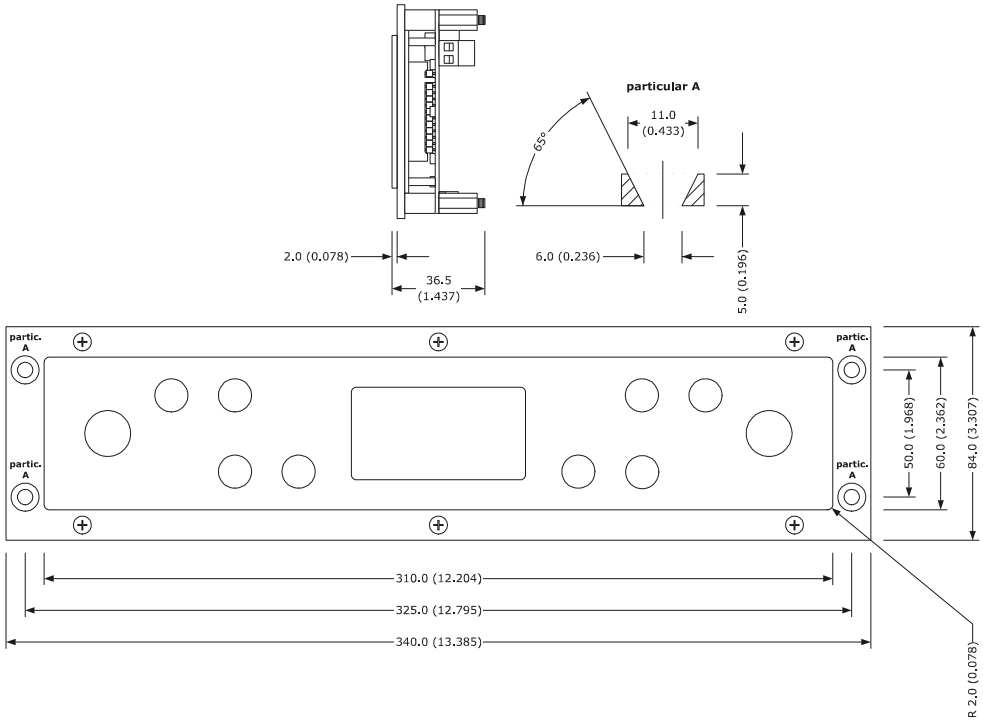
15	PWM analogue output
16	RS-485 serial port with MODBUS communication protocol and communication port with user interface (signal and power supply)

For further information, see the next chapters.

3 DIMENSIONS AND INSTALLATION

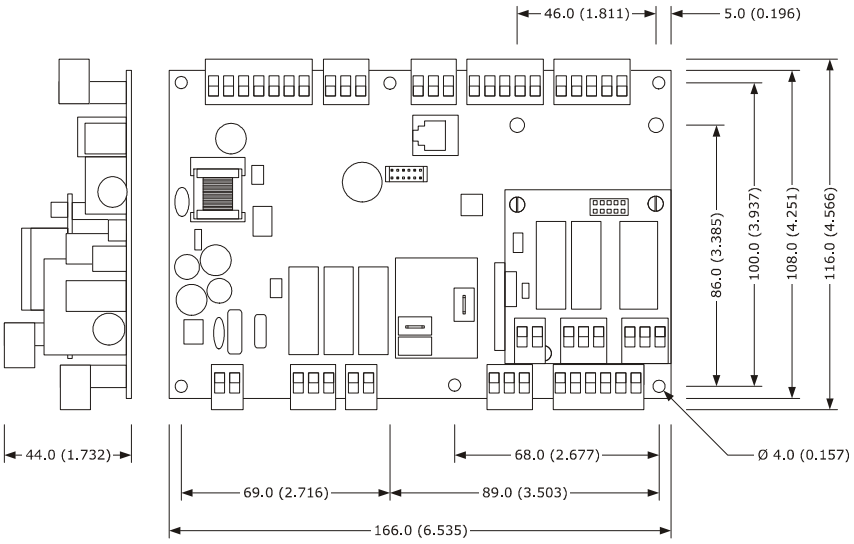
3.1 User interface dimensions

The following drawing illustrates the EVF818 user interface dimensions; these are expressed in mm (in).



3.2 Control module dimensions

The following drawing illustrates the EVF818 control module dimensions; these are expressed in mm (in).



3.3 User interface installation

Back panel via studs

3.4 Control module installation

On flat surface, with spacers.

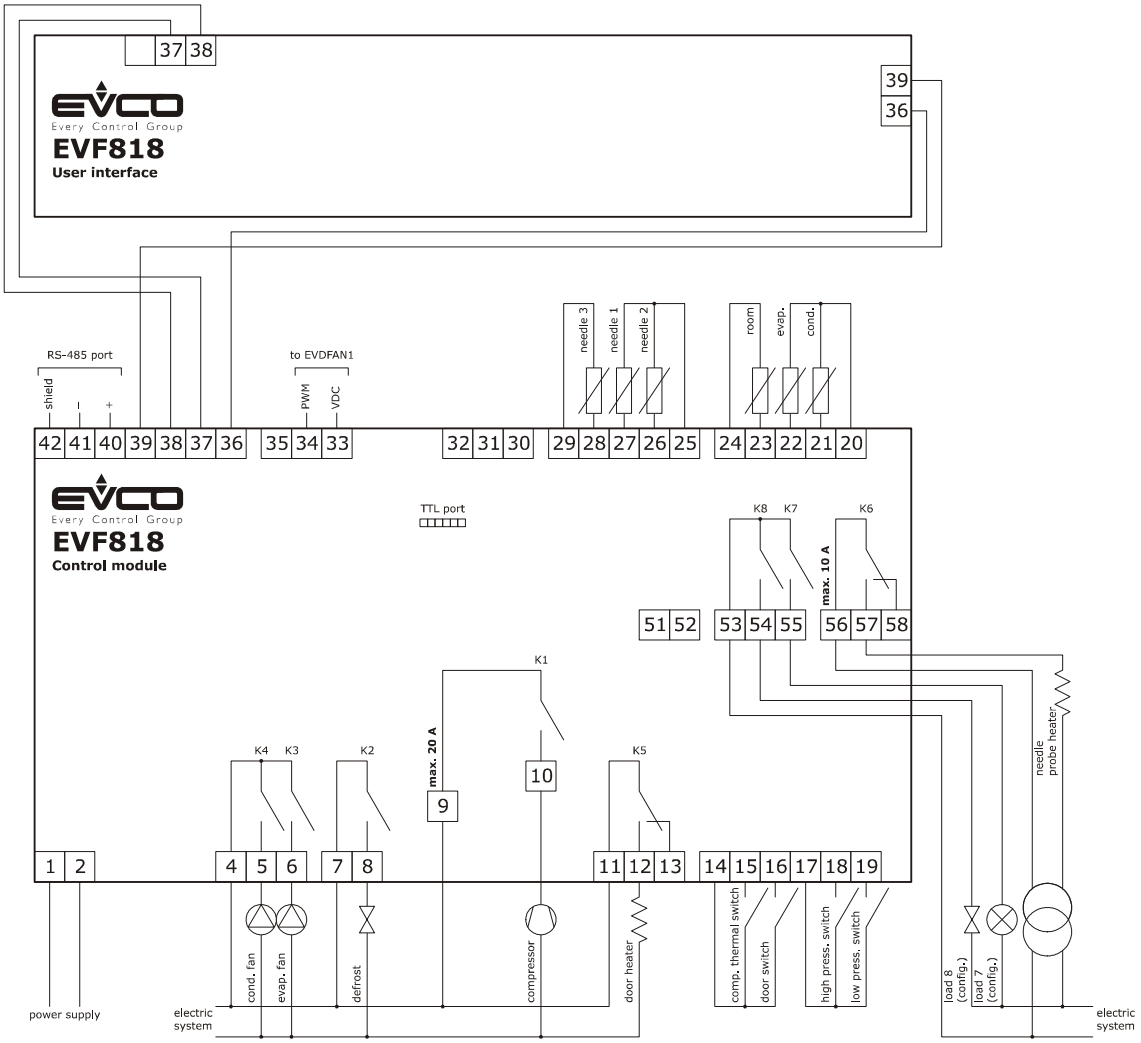
3.5 Installation warnings

- make sure that the device work conditions (temperature of use, humidity, etc.) lie within the limits indicated; see chapter 15 "TECHNICAL DATA"
- do not install the device near to any heat sources (heating elements, hot air ducts etc.), equipment containing powerful magnets (large diffusers, etc.), areas affected by direct sunlight, rain, humidity, excessive dust, mechanical vibrations or shocks.
- any metal parts in proximity of the control module must be at a distance such that they do not compromise the safety distances.
- in compliance with Safety Standards, the device must be installed correctly and in a way to protect against any contact with electric parts; all parts that ensure protection must be fixed in a way that they cannot be removed without the use of tools.

4 ELECTRIC CONNECTION

4.1 Electric connection

The following drawing illustrates the EVF818 electric connection.



The utility managed by the K7 output, depends on parameter u11, as follows:

- cabinet light (u11 = 0, pre-defined setting)
- UV light (u11 = 1).

For the settings relative to the parameters, see chapter 10 “CONFIGURATION”.

The utility managed by the K8 output, depends on parameter u1, as follows:

- pump down valve (u1 = 0, per-defined setting)
- alarm (u1 = 1).

For the settings relative to the parameters, see chapter 10 “CONFIGURATION”.

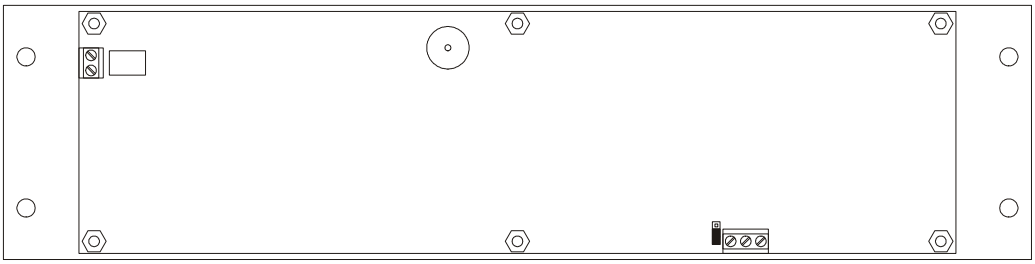
⚠ The TTL port is the port used for connection of the controller to the EVKEY programming key.

⚠ The RS-485 port is for the connection of the controller to the following additional products:
- Parameters Manager set-up software system
- RICS plants monitoring and surveillance systems
- device for recording data and to download recorded data (via USB) EVUSBREC01
- print module PM 100A X9S001.

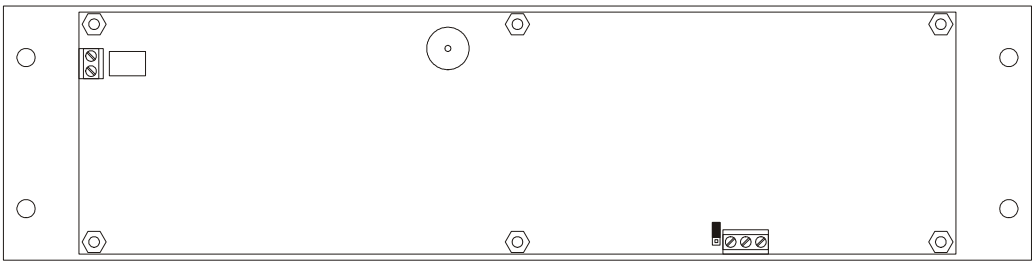
The port must not be used simultaneously with more than one of these products.

4.1.1 Connection of the terminating resistors

The terminating resistor must be connected in order to reduce the reflections on the signal transmitted along the cables that connect the user interface to the control model.
To connect the terminating resistors, position the jumper as illustrated in the following drawing.



To disconnect the terminating resistors, position the jumper as illustrated in the following drawing.



4.2 Warnings for the electric connection

- do not use electric or pneumatic screwdrivers on the device terminal board
- if the device has been taken from a cold to hot place, humidity could condense inside; wait about 1 hour before powering it
- make sure that the power supply voltage, the frequency and the operational electric power of the device, correspond with those of the local power supply; see chapter 15 "TECHNICAL DATA"
- disconnect the device power supply before proceeding with any type of maintenance
- do not use this device as a safety device
- for repairs and information regarding the device, contact the EVCO sales network.

5 USER INTERFACE

5.1 Foreword

The following operating status exist:

- the “off” status (the device is not powered)
- the “stand-by” status (the device is powered and is off)
- the “on” status (the device is powered, is on and is in stand-by for the start-up of an operating cycle)
- the “run” status (the device is powered, is on and an operating cycle is in progress).

Hereon, the term "device switch-on" means the passage from the "stand-by" status to the "on" status. the term "switch-off" means passage from the "on" status to the "stand-by" status.

If a power cut occurs during the "stand-by" status or during the "on" status, the device will re-propose the same status when the power supply is restored.

If a power cut occurs during the "run" status, the device will operate as follows when this is restored:

- if a temperature-controlled blast chilling or deep freezing operation was in progress, these will be started again from the beginning
- if a time-controlled blast chilling or deep freezing operation was in progress, these will be started again from the moment the power supply was cut-off
- if storage was in progress, this will be re-proposed.

5.2 Switching the device on/off

Operate as follows:

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Hold the ON/STAND-BY key down for 2 s: the ⏻ LED will switch on/off.

5.3 The display

All displays are off during the "off" status and during the "stand-by" status.

During the "on" state:

- the 1 digit display is off.
- the 3 digit display:
  - will display the blast chilling end temperature if a temperature-controlled blast chilling cycle has been selected or the deep freezing end temperature if a temperature-controlled deep freezing cycle has been selected.
  - will display the blast chilling duration if a temperature-controlled blast chilling cycle has been selected or the deep freezing duration if a temperature-controlled deep freezing cycle has been selected.
- the 4 digit display:
  - will display the work set-point during blast chilling if temperature-controlled blast chilling has been selected or the work set-point during deep freezing if temperature-controlled deep-freezing has been selected.
  - will be off if time-controlled blast chilling or time-controlled deep freezing has been selected.

During the "run" state:

- the 1 digit display shows the program number if there is one in progress.
- the 3 digit display:
  - will show the temperature detected by the needle probe if a temperature-controlled blast chilling or deep freezing cycle is in progress
  - will display the residual blast chilling time if time-controlled blast chilling is in progress or the residual deep freezing time if time-controlled deep freezing is in progress

- the 4 digit display:
  - will show the temperature of the cabinet.

5.4 Cabinet temperature display

Operate as follows:

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Hold the DOWN key down for 2 s: the 3 digit display will show the first label available.
3. Press and release the UP or DOWN key to select "**Pb1**".
4. Press and release the BLAST CHILLING key: the 4 digit display will show the cabinet temperature.

Operate as follows to exit the procedure:

5. Press and release the BLAST CHILLING key or do not operate for 60 s: the 4 digit display will switch off.
6. Press and release the UP or DOWN key until the display shows the magnitude indicated in paragraph 5.3 "The display" or do not operate for 60 s.

5.5 Evaporator temperature display

Operate as follows:

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Hold the DOWN key down for 2 s: the 3 digit display will show the first label available.
3. Press and release the UP or DOWN key to select "**Pb2**".
4. Press and release the BLAST CHILLING key: the 4 digit display will show the evaporator temperature.

Operate as follows to exit the procedure:

5. Press and release the BLAST CHILLING key or do not operate for 60 s: the 4 digit display will switch off.
6. Press and release the UP or DOWN key until the display shows the magnitude indicated in paragraph 5.3 "The display" or do not operate for 60 s.

If the evaporator probe is not enabled, i.e. if parameter P4 is set at 0, the "**Pb2**" label will not be displayed.

5.6 Condenser temperature display

Operate as follows:

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Hold the DOWN key down for 2 s: the 3 digit display will show the first label available.
3. Press and release the UP or DOWN key to select "**Pb3**".
4. Press and release the BLAST CHILLING key: the 4 digit display will show the condenser temperature.

Operate as follows to exit the procedure:

5. Press and release the BLAST CHILLING key or do not operate for 60 s: the 4 digit display will switch off.
6. Press and release the UP or DOWN key until the display shows the magnitude indicated in paragraph 5.3 "The display" or do not operate for 60 s.

If the condenser probe is not enabled, i.e. if parameter P5 is set at 0, the "**Pb3**" label will not be displayed.

5.7 Display of the temperature detected by needle probe 1, needle probe 2 and needle probe 3

Operate as follows:

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Hold the DOWN key down for 2 s: the 3 digit display will show the first label available.
3. Press and release the UP or DOWN key to select "**Pb4**" (needle probe 1), "**Pb5**" (needle probe 2) or "**Pb6**" (needle probe 3).
4. Press and release the BLAST CHILLING key: the 4 digit display will show the temperature detected by the respective needle probe.

Operate as follows to exit the procedure:

5. Press and release the BLAST CHILLING key or do not operate for 60 s: the 4 digit display will switch off.
6. Press and release the UP or DOWN key until the display shows the magnitude indicated in paragraph 5.3 "The display" or do not operate for 60 s.

If the needle probe 1 is not enabled, i.e. if parameter P3 is set at 0, the "**Pb4**" label will not be displayed.

If the needle probe 2 is not enabled, i.e. if parameter P3 is set at 0 or 1, the "**Pb5**" label will not be displayed.

If the needle probe 3 is not enabled, i.e. if parameter P3 is set at 0 1 or 2, the "**Pb6**" label will not be displayed.

5.8 Defrosting activation in manual mode

Operate as follows:

1. Make sure the device is in the "on" status and that pre-cooling or storage cycle is in progress.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Hold the UP key down for 4 s: the 3 digit display will show "**dEF**".

If the evaporator probe is enabled, i.e. the parameter P4 is set at 1 and on activation of defrosting the evaporator temperature is above that established with parameter d2, defrosting will not be activated.

5.9 Switch-on/off of the cabinet light in manual mode

Operate as follows:

1. Make sure that parameter u11 is set at 0.
2. Make sure no procedures are in progress
3. Press and release the DEEP FREEZING key for 2 sec.: the **AUX** LED will switch on/off.

5.10 Locking/unlocking the keyboard

Operate as follows to lock the keyboard:

1. Make sure no procedures are in progress
2. Hold the DOWN key and the ON/STAND-BY key down for 2 s: the 3 digit display will show "**Loc**" for 2 seconds.

The following operations will not be allowed if the keyboard is locked:

- switching the device on/off
- cabinet temperature display (with the procedure given in paragraph 5.4)
- evaporator temperature display
- condenser temperature display
- display of the temperature detected by needle probe 1, needle probe 2 and needle probe 3
- defrosting activation in manual mode
- operating cycle start-up/cut-off
- switching on UV light for sterilisation cycle
- heating the needle probe

- display of information relative to the HACCP alarms
- memorisation of a program
- execution of a program
- deleting the information relative to the HACCP alarms
- display of compressor operating hours
- deleting the compressor operating hours
- setting the real date and time.

Operate as follows to unlock the keyboard:

1. Make sure no procedures are in progress
2. Hold the DOWN key and the ON/STAND-BY key down for 2 s: the 3 digit display will show "**UnL**" for 2 seconds.

5.11 Silencing the buzzer

Operate as follows:

1. Make sure no procedures are in progress
2. Press and release the key.

6 OPERATION

6.1 Foreword

The device can manage the following operating cycles:

- temperature-controlled blast chilling and storage
- temperature-controlled hard blast chilling and storage
- time-controlled blast chilling and storage
- time-controlled hard blast chilling and storage
- continuous blast chilling
- temperature-controlled deep freezing and storage
- temperature-controlled soft deep freezing and storage
- time-controlled deep freezing and storage
- time-controlled soft deep freezing and storage
- continuous deep freezing

For further information, see the next paragraphs

Every operating cycle can be preceded by pre-cooling; see paragraph 6.13 "Pre-cooling start-up".

The temperature-controlled cycles are preceded by a test to verify the correct insertion of the needle probe; see paragraph 6.14 " Test for verification of the correct insertion of the needle probe".

If the needle probe is not enabled, i.e. if parameter P3 is set at 0, the temperature-controlled cycles will be started with time-control.

The following functions can also be used:

- switching on sterilisation cycle UV light
- heating the needle probe.

For further information, see the next paragraphs

6.1.1 Foreword regarding needle probe

The device can manage "multipoint" needle probes (with up to three sensors).

Parameter P3 establishes the number of needle probe sensors as indicated:

- if parameter P3 is set at 0, the needle probe will not be enabled
- if parameter P3 is set at 1, there will be one sensor (needle probe 1)
- if parameter P3 is set at 2, there will be 2 sensors (needle probe 1 and needle probe 2)
- if parameter P3 is set at 3, there will be 3 sensors (needle probe 1 and needle probe 2 and needle probe 3).

If parameter P3 is set at values different to 0, the temperature-controlled cycles will be preceded by a test to verify the correct insertion of the needle probe; see paragraph 6.14 " Test for verification of the correct insertion of the needle probe".

On conclusion of the test, the device will operate as indicated:

- the sensor that has detected the lowest temperature is then used as the reference temperature for heating the needle probe.
- the sensor that has detected the highest temperature is then used as the reference for the temperature-controlled cycles
- the sensors for which the test is not completed successfully are not used successively.

6.2 Temperature-controlled blast chilling and storage

The temperature-controlled blast chilling and storage cycle is divided into the following two phases:

- blast chilling
- storage.

On conclusion of a phase, the device passes automatically to the next.

Operate as indicated to start the cycle:

1. Make sure the device is in the "on" status.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Press and release the BLAST CHILLING key: the ❄ LED and the LED will flash.

4.1 If parameter r19 is set at 0, the 4 digit display will show the work set-point during blast chilling; this value can also be set via parameter r7.

4.2 If parameter r19 is set at 1, the 3 digit display will show the blast chilling end temperature; this value can also be set via parameter r3.

4.3 Press and release the UP or DOWN key within 60 s to modify the parameter value:

5. Press and release the START/STOP key: the ❄ LED and the LED will remain permanently on and the test to verify the correct insertion of the needle probe will be started; see paragraph 6.14 " Test for verification of the correct insertion of the needle probe".

   5.1 If the test is completed successfully, the cycle will be started.
   The maximum blast chilling duration count is started on condition that the temperature detected by the needle probe is below that established with parameter r15.

   5.2 If the test is not completed successfully, the cycle will be started with timed-control; see paragraph 6.4 "Time-controlled blast chilling and storage".

Operate as indicated to stop the cycle:

6. Hold the START/STOP key down for 2 s.

During blast chilling, the 3 digit display will show the temperature detected by the needle probe and the 4 digit display shows the cabinet cell.

The successive parameters establish the following values:

- parameter r3 establishes the blast chilling end temperature
- parameter r5 establishes the maximum blast chilling duration
- parameter r7 establishes the work set-point during blast chilling.

To display the cabinet work set-point during blast chilling, press and release the BLAST CHILLING, DEEP FREEZING or the HARD/SOFT key; to restore the normal display, press and release the same key again or do not operate for 60 s.

If the temperature detected by the needle probe reaches the blast chilling end temperature within the maximum blast chilling duration, it means that blast chilling has been completed successfully, the device will automatically pass to storage and the buzzer will be activated for the period of time established with parameter AA.

Press and release a key to silence the buzzer.

During storage, the 3 digit display shows the time taken to complete blast chilling successfully, the 4 digit display shows the cabinet temperature and the ❄ LED is on.

Parameter r10 establishes the work set-point during storage.

If the temperature detected by the needle probe does not reach the blast chilling end temperature within the maximum blast chilling duration, blast chilling will not be completed successfully but will continue, the LED will flash and the buzzer will be activated.

Press and release a key to restore normal display and to silence the buzzer.

When the temperature detected by the needle probe reaches the blast chilling end temperature, the device automatically passes to storage in the same way as illustrated previously.

6.3 Temperature-controlled hard blast chilling and storage

The temperature-controlled hard blast chilling and storage cycle is divided into the following three phases:

- blast chilling hard phase
- blast chilling

- storage.

On conclusion of a phase, the device passes automatically to the next.

Operate as indicated to start the cycle:

1. Make sure the device is in the "on" status.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Press and release the BLAST CHILLING key: the ❄ LED and the LED will flash.
4. Press and release the HARD/SOFT key: the **HARD** LED will flash.

5.1 If parameter r19 is set at 0, the 3 digit display will show the work set-point during blast chilling; this value can also be set via parameter r7.

5.2 If parameter r19 is set at 1, the 4 digit display will show the blast chilling end temperature; this value can also be set via parameter r3.

5.3 Press and release the UP or DOWN key within 60 s to modify the parameter value:

6. Press and release the START/STOP key: the ❄ LED, the LED and the **HARD** LED will remain permanently on and the test to verify the correct insertion of the needle probe will be started; see paragraph 6.14 " Test for verification of the correct insertion of the needle probe".

   6.1 If the test is completed successfully, the cycle will be started.
   The maximum blast chilling duration count is started on condition that the temperature detected by the needle probe is below that established with parameter r15.

   6.2 If the test is not completed successfully, the cycle will be started with timed-control; see paragraph 6.5 "Time-controlled hard blast chilling and storage".

Operate as indicated to stop the cycle:

7. Hold the START/STOP key down for 2 s.

During the hard blast chilling phase, the 3 digit display will show the temperature detected by the needle probe and the 4 digit display shows the cabinet cell.

The successive parameters establish the following values:

- parameter r5 establishes the maximum blast chilling duration
- parameter r9 establishes the work set-point during the blast chilling hard phase
- parameter r13 establishes blast chilling hard phase end temperature.

When the temperature detected by the needle probe reaches the hard blast chilling phase end temperature, the device automatically passes to blast chilling mode.

During blast chilling, the 3 digit display will show the temperature detected by the needle probe and the 4 digit display shows the cabinet cell.

The successive parameters establish the following values:

- parameter r3 establishes the blast chilling end temperature
- parameter r5 establishes the maximum blast chilling duration
- parameter r7 establishes the work set-point during blast chilling.

To display the cabinet work set-point during blast chilling, press and release the BLAST CHILLING, DEEP FREEZING or the HARD/SOFT key; to restore the normal display, press and release the same key again or do not operate for 60 s.

If the temperature detected by the needle probe reaches the blast chilling end temperature within the maximum blast chilling duration, it means that blast chilling has been completed successfully, the device will automatically pass to storage and the buzzer will be activated for the period of time established with parameter AA.

Press and release a key to silence the buzzer.

During storage, the 3 digit display shows the time taken to complete blast chilling successfully, the 4 digit display shows the cabinet temperature and the ⸸ LED is on.

Parameter r10 establishes the work set-point during storage.

If the temperature detected by the needle probe does not reach the blast chilling end temperature within the maximum blast chilling duration, blast chilling will not be completed successfully but will continue, the LED will flash and the buzzer will be activated.

Press and release a key to restore normal display and to silence the buzzer.
When the temperature detected by the needle probe reaches the blast chilling end temperature, the device automatically passes to storage in the same way as illustrated previously.

6.4 Time-controlled blast chilling and storage

The time-controlled blast chilling and storage cycle is divided into the following two phases:
- blast chilling
- storage.

On conclusion of a phase, the device passes automatically to the next.
Operate as indicated to start the cycle:
1. Make sure the device is in the "on" status.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Press and release the BLAST CHILLING key: the ❄ LED and the LED will flash.
4. Press and release the TIME/TEMPERATURE key: the LED flashes and the LED will switch off.

5.1 If parameter r19 is set at 0, the 4 digit display will show the work set-point during blast chilling; this value can also be set via parameter r7.

5.2 If parameter r19 is set at 1, the 3 digit display will show the blast chilling duration; this value can also be set via parameter r1.

5.3 Press and release the UP or DOWN key within 60 s to modify the parameter value:

6. Press and release the START/STOP key: the ❄ LED and the LED will remain permanently on and the cycle will be started.

Operate as indicated to stop the cycle:
7. Hold the START/STOP key down for 2 s.

During blast chilling, the 3 digit display shows the residual time of the blast chilling duration and the 4 digit display shows the cabinet temperature.
To modify the residual time, operate as indicated:
8. Press and release the UP or DOWN key again to modify the time value: the display will flash.
9. Do not operate for 4 s: the display will stop flashing and remain on permanently.

The successive parameters establish the following values:
- parameter r1 establishes blast chilling duration
- parameter r7 establishes the work set-point during blast chilling.

To display the cabinet work set-point during blast chilling, press and release the BLAST CHILLING, DEEP FREEZING or the HARD/SOFT key; to restore the normal display, press and release the same key again or do not operate for 60 s.
On expiry of the blast chilling duration, the device automatically passes to storage mode and the buzzer is activated for the time period established with parameter AA.
Press and release a key to silence the buzzer.
During storage, the 3 digit display shows blast chilling duration, the 4 digit display shows the cabinet temperature and the ❄ LED is on.
Parameter r10 establishes the work set-point during storage.

6.5 Time-controlled hard blast chilling and storage

The time-controlled hard blast chilling and storage cycle is divided into the following three phases:
- blast chilling hard phase
- blast chilling
- storage.

On conclusion of a phase, the device passes automatically to the next.

Operate as indicated to start the cycle:

1. Make sure the device is in the "on" status.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Press and release the BLAST CHILLING key: the ❄ LED and the LED will flash.
4. Press and release the HARD/SOFT key: the **HARD** LED will flash.
5. Press and release the TIME/TEMPERATURE key: the LED flashes and the LED will switch off.

6.1 If parameter r19 is set at 0, the 4 digit display will show the work set-point during blast chilling; this value can also be set via parameter r7.

6.2 If parameter r19 is set at 1, the 3 digit display will show the blast chilling duration; this value can also be set via parameter r1.

6.3 Press and release the UP or DOWN key within 60 s to modify the parameter value:

7. Press and release the START/STOP key: the ❄ LED, the LED and the **HARD** LED will remain permanently on and the cycle will be started.

Operate as indicated to stop the cycle:

8. Hold the START/STOP key down for 2 s.

During the hard blast chilling phase, the 3 digit display shows the residual time of the blast chilling duration and the 4 digit display shows the cabinet temperature.

To modify the residual time, operate as indicated:

9. Press and release the UP or DOWN key again to modify the time value: the display will flash.
10. Do not operate for 4 s: the display will stop flashing and remain on permanently.

The successive parameters establish the following values:

- parameter r9 establishes the work set-point during the blast chilling hard phase
- parameter r14 establishes blast chilling hard phase duration.

On expiry of the hard blast chilling phase duration, the device automatically passes to blast chilling.

During blast chilling, the 3 digit display shows the residual time of the blast chilling duration and the 4 digit display shows the cabinet temperature.

The successive parameters establish the following values:

- parameter r1 establishes blast chilling duration
- parameter r7 establishes the work set-point during blast chilling.

To display the cabinet work set-point during blast chilling, press and release the BLAST CHILLING, DEEP FREEZING or the HARD/SOFT key; to restore the normal display, press and release the same key again or do not operate for 60 s.

On expiry of the blast chilling duration, the device automatically passes to storage mode and the buzzer is activated for the time period established with parameter AA.

Press and release a key to silence the buzzer.

During storage, the 3 digit display shows blast chilling duration, the 4 digit display shows the cabinet temperature and the ǂ LED is on.

Parameter r10 establishes the work set-point during storage.

6.6 Continuous blast chilling

Operate as indicated to start the cycle:

1. Make sure the device is in the "on" status.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Press and release the BLAST CHILLING key: the ❄ LED and the LED will flash.
4. Press and release the TIME/TEMPERATURE key: the LED flashes and the LED will switch off.
5. Press and release the TIME/TEMPERATURE key again: the 3 digit display will show "**inF**".

6.1 The 4 digit display will show the work set-point during blast chilling; this value can also be set via parameter r7.

6.2 Press and release the UP or DOWN key within 60 s to modify the parameter value:

7. Press and release the START/STOP key: the ❄ LED and the ⏲ LED will remain permanently on and the cycle will be started.

Operate as indicated to stop the cycle:

8. Hold the START/STOP key down for 2 s.

During blast chilling, the 3 digit display shows "**inF**" and the 4 digit display shows the cabinet cell.

Parameter r7 establishes the work set-point during blast chilling.

To display the cabinet work set-point during blast chilling, press and release the BLAST CHILLING, DEEP FREEZING or the HARD/SOFT key; to restore the normal display, press and release the same key again or do not operate for 60 s.

6.7 Temperature-controlled deep freezing and storage

The temperature-controlled deep freezing and storage cycle is divided into the following two phases:

- deep freezing
- storage.

On conclusion of a phase, the device passes automatically to the next.

Operate as indicated to start the cycle:

1. Make sure the device is in the "on" status.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Press and release the DEEP FREEZING key: the ❄ LED, the ❄❄ LED, the LED and the **HARD** LED will flash.

4.1 If parameter r19 is set at 0, the 4 digit display will show the work set-point during deep freezing; this value can also be set via parameter r8.

4.2 If parameter r19 is set at 1, the 3 digit display will show the deep freezing end temperature; this value can also be set via parameter r4.

4.3 Press and release the UP or DOWN key within 60 s to modify the parameter value:

5. Press and release the START/STOP key: the ❄ LED, the ❄❄ LED, the LED and the **HARD** LED will remain permanently on and the test to verify the correct insertion of the needle probe will be started; see paragraph 6.14 " Test for verification of the correct insertion of the needle probe".

   5.1 If the test is completed successfully, the cycle will be started.
   The maximum deep freezing duration count is started on condition that the temperature detected by the needle probe is below that established with parameter r15.

   5.2 If the test is not completed successfully, the cycle will be started with timed-control; see paragraph 6.9 "Time-controlled deep freezing and storage".

Operate as indicated to stop the cycle:

6. Hold the START/STOP key down for 2 s.

During deep freezing, the 3 digit display will show the temperature detected by the needle probe and the 4 digit display shows the cabinet cell.

The successive parameters establish the following values:

- parameter r4 establishes the deep freezing end temperature
- parameter r6 establishes the maximum deep freezing duration
- parameter r8 establishes the work set-point during deep freezing.

To display the cabinet work set-point during deep freezing, press and release the BLAST CHILLING, DEEP FREEZING or the HARD/SOFT key; to restore the normal display, press and release the same key again or do not operate for 60 s.

If the temperature detected by the needle probe reaches the deep freezing end temperature within the maximum deep freezing duration, it means that deep freezing has been completed successfully, the device will automatically pass to storage and the buzzer will be activated for the period of time established with parameter AA.

Press and release a key to silence the buzzer.

During storage, the 3 digit display shows the time taken to complete deep freezing successfully, the 4 digit display shows the cabinet temperature and the ❄ LED is on.
Parameter r11 establishes the work set-point during storage.
If the temperature detected by the needle probe does not reach the deep freezing end temperature within the maximum deep freezing duration, deep freezing will not be completed successfully but will continue, the LED will flash and the buzzer will be activated.
Press and release a key to restore normal display and to silence the buzzer.
When the temperature detected by the needle probe reaches the deep freezing end temperature, the device automatically passes to storage in the same way as illustrated previously.

6.8 Temperature-controlled soft deep freezing and storage

The temperature-controlled soft deep freezing and storage cycle is divided into the following three phases:
- deep freezing soft phase
- deep freezing
- storage.

On conclusion of a phase, the device passes automatically to the next.
Operate as indicated to start the cycle:
1. Make sure the device is in the "on" status.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Press and release the DEEP FREEZING key: the ❄ LED, the ❄❄ LED, the LED and the **HARD** LED will flash.
4. Press and release the HARD/SOFT key: the **HARD** LED will switch off.

5.1 If parameter r19 is set at 0, the 4 digit display will show the work set-point during deep freezing; this value can also be set via parameter r8.

5.2 If parameter r19 is set at 1, the 3 digit display will show the deep freezing end temperature; this value can also be set via parameter r4.

5.3 Press and release the UP or DOWN key within 60 s to modify the parameter value:

6. Press and release the START/STOP key: the ❄ LED, the ❄❄ LED and the LED will remain permanently on and the test to verify the correct insertion of the needle probe will be started; see paragraph 6.14 " Test for verification of the correct insertion of the needle probe".

   6.1 If the test is completed successfully, the cycle will be started.
   The maximum deep freezing duration count is started on condition that the temperature detected by the needle probe is below that established with parameter r15.

   6.2 If the test is not completed successfully, the cycle will be started with timed-control; see paragraph 6.10 "Time-controlled soft deep freezing and storage".

Operate as indicated to stop the cycle:
7. Hold the START/STOP key down for 2 s.

During soft deep freezing phase, the 3 digit display will show the temperature detected by the needle probe and the 4 digit display shows the cabinet cell.
The successive parameters establish the following values:
- parameter r3 establishes deep freezing soft phase end temperature
- parameter r6 establishes the maximum deep freezing duration
- parameter r7 establishes the work set-point during the deep freezing soft phase

When the temperature detected by the needle probe reaches the end temperature of the soft phase, the device automatically passes to deep freezing.
During deep freezing, the 3 digit display will show the temperature detected by the needle probe and the 4 digit display shows the cabinet cell.

The successive parameters establish the following values:

- parameter r4 establishes the deep freezing end temperature
- parameter r6 establishes the maximum deep freezing duration
- parameter r8 establishes the work set-point during deep freezing.

To display the cabinet work set-point during deep freezing, press and release the BLAST CHILLING, DEEP FREEZING or the HARD/SOFT key; to restore the normal display, press and release the same key again or do not operate for 60 s.

If the temperature detected by the needle probe reaches the deep freezing end temperature within the maximum deep freezing duration, it means that deep freezing has been completed successfully, the device will automatically pass to storage and the buzzer will be activated for the period of time established with parameter AA.

Press and release a key to silence the buzzer.

During storage, the 3 digit display shows the time taken to complete deep freezing successfully, the 4 digit display shows the cabinet temperature and the ❄ LED is on.

Parameter r11 establishes the work set-point during storage.

If the temperature detected by the needle probe does not reach the deep freezing end temperature within the maximum deep freezing duration, deep freezing will not be completed successfully but will continue, the LED will flash and the buzzer will be activated.

Press and release a key to restore normal display and to silence the buzzer.

When the temperature detected by the needle probe reaches the deep freezing end temperature, the device automatically passes to storage in the same way as illustrated previously.

6.9 Time-controlled deep freezing and storage

The time-controlled deep freezing and storage cycle is divided into the following two phases:

- deep freezing
- storage.

On conclusion of a phase, the device passes automatically to the next.

Operate as indicated to start the cycle:

1. Make sure the device is in the "on" status.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Press and release the DEEP FREEZING key: the ❄ LED, the ❄❄ LED, the LED and the **HARD** LED will flash.
4. Press and release the TIME/TEMPERATURE key: the LED flashes and the LED will switch off.

5.1 If parameter r19 is set at 0, the 4 digit display will show the work set-point during deep freezing; this value can also be set via parameter r8.

5.2 If parameter r19 is set at 1, the 3 digit display will show the deep freezing duration; this value can also be set via parameter r2.

5.3 Press and release the UP or DOWN key within 60 s to modify the parameter value:

6. Press and release the START/STOP key: the ❄ LED, the ❄❄LED, the LED and the **HARD** LED will remain permanently on and the cycle will be started.

Operate as indicated to stop the cycle:

7. Hold the START/STOP key down for 2 s.

During deep freezing, the 3 digit display shows the residual time of the deep freezing duration and the 4 digit display shows the cabinet temperature.

To modify the residual time, operate as indicated:

8. Press and release the UP or DOWN key again to modify the time value: the display will flash.
9. Do not operate for 4 s: the display will stop flashing and remain on permanently.

The successive parameters establish the following values:

- parameter r2 establishes deep freezing duration
- parameter r8 establishes the work set-point during deep freezing.

To display the cabinet work set-point during deep freezing, press and release the BLAST CHILLING, DEEP FREEZING or the HARD/SOFT key; to restore the normal display, press and release the same key again or do not operate for 60 s.
On expiry of the deep freezing duration, the device automatically passes to storage mode and the buzzer is activated for the time period established with parameter AA.
Press and release a key to silence the buzzer.
During storage, the 3 digit display shows deep freezing duration, the 4 digit display shows the cabinet temperature and the ❄ LED is on.
Parameter r11 establishes the work set-point during storage.

6.10 Time-controlled soft deep freezing and storage

The time-controlled soft deep freezing and storage cycle is divided into the following three phases:

- soft deep freezing phase
- deep freezing
- storage.

On conclusion of a phase, the device passes automatically to the next.
Operate as indicated to start the cycle:

1. Make sure the device is in the "on" status.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Press and release the DEEP FREEZING key: the ❄ LED, the ❄❄ LED, the LED and the **HARD** LED will flash.
4. Press and release the HARD/SOFT key: the **HARD** LED will switch off.
5. Press and release the TIME/TEMPERATURE key: the LED flashes and the LED will switch off.

6.1 If parameter r19 is set at 0, the 4 digit display will show the work set-point during deep freezing; this value can also be set via parameter r8.

6.2 If parameter r19 is set at 1, the 3 digit display will show the deep freezing duration; this value can also be set via parameter r2.

6.3 Press and release the UP or DOWN key within 60 s to modify the parameter value:

7. Press and release the START/STOP key: the ❄ LED, the ❄❄LED and the LED will remain permanently on and the cycle will be started.

Operate as indicated to stop the cycle:

8. Hold the START/STOP key down for 2 s.

During the soft deep freezing phase, the 3 digit display shows the residual time of the deep freezing duration and the 4 digit display shows the cabinet temperature.
To modify the residual time, operate as indicated:

9. Press and release the UP or DOWN key again to modify the time value: the display will flash.
10. Do not operate for 4 s: the display will stop flashing and remain on permanently.

The successive parameters establish the following values:

- parameter r7 establishes the work set-point during the deep freezing soft phase.
- parameter r14 establishes deep freezing soft phase duration.

On expiry of the soft deep freezing phase duration, the device automatically passes to deep freezing.
During deep freezing, the 3 digit display shows the residual time of the deep freezing duration and the 4 digit display shows the cabinet temperature.
The successive parameters establish the following values:

- parameter r2 establishes deep freezing duration
- parameter r8 establishes the work set-point during deep freezing.

To display the cabinet work set-point during deep freezing, press and release the BLAST CHILLING, DEEP FREEZING or the HARD/SOFT key; to restore the normal display, press and release the same key again or do not operate for 60 s.
On expiry of the deep freezing duration, the device automatically passes to storage mode and the buzzer is activated for the time period established with parameter AA.
Press and release a key to silence the buzzer.
During storage, the 3 digit display shows deep freezing duration, the 4 digit display shows the cabinet temperature and the ❄ LED is on.
Parameter r11 establishes the work set-point during storage.

6.11 Continuous deep freezing

Operate as indicated to start the cycle:

1. Make sure the device is in the "on" status.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Press and release the DEEP FREEZING key: the ❄ LED, the ❄❄ LED, the LED and the **HARD** LED will flash.
4. Press and release the TIME/TEMPERATURE key: the LED flashes and the LED will switch off.
5. Press and release the TIME/TEMPERATURE key again: the 3 digit display will show "**inF**".

6.1 The 4 digit display will show the work set-point during deep freezing; this value can also be set via parameter r8.

6.2 Press and release the UP or DOWN key within 60 s to modify the parameter value:

7. Press and release the START/STOP key: the ❄ LED, the ❄❄LED, the LED and the **HARD** LED will remain permanently on and the cycle will be started.

Operate as indicated to stop the cycle:

8. Hold the START/STOP key down for 2 s.

During deep freezing, the 3 digit display shows "**inF**" and the 4 digit display shows the cabinet cell.
Parameter r8 establishes the work set-point during deep freezing.
To display the cabinet work set-point during deep freezing, press and release the BLAST CHILLING, DEEP FREEZING or the HARD/SOFT key; to restore the normal display, press and release the same key again or do not operate for 60 s.

6.12 Blast chilling/deep freezing intensity

The device can manage the phase cut speed regulator for EVDFAN1 single phase fans (to be ordered separately); see paragraph 14.4 "phase cut speed regulator for EVDFAN1 single phase fans".
The regulator can be used to manage evaporator fan activities with a single analogue control, i.e. via the PWM analogue output of the device and the regulator phase cut output (the digital output K3 is however activated).
Parameter F0 must be set at 3.
Parameters F18... F22 establish speed 1... 5 of the evaporator speed (intended as a percentage of the maximum speed), parameter F23 establishes the speed at which the evaporator fan is switched on during post blast chilling storage and parameter F24 establishes the speed at which the evaporator fan is switched on during post deep freezing storage (the latter intended as one of the speeds 1... 5).

The following table illustrates the speeds at which the evaporator fan is switched on during the operating cycles.
A different speed can be selected using the procedure given in 6.12.1 (intended as one of the speeds 1.. 5) in temporary mode (i.e. if a power cut occurs, on restore of the same the speeds illustrated in the following table will be shown), except if the selection is made before starting a blast chilling and storage cycle or before starting a hard blast chilling and storage cycle or before starting a soft deep freezing and storage cycle (in this case the speeds are memorised instead).

	Blast chilling and storage	**Hard blast chilling and storage**	**Deep freezing and storage**	**Soft deep freezing and storage**
Blast chilling hard phase	-	speed 5	-	-
Blast chilling	speed 1... 5 (can be memorised with the procedure given in paragraph 6.12.1 if selected before starting the operating cycle)	speed 1... 5 (can be memorised with the procedure given in paragraph 6.12.1 if selected before starting the operating cycle)	-	-
Deep freezing soft phase	-	-	-	speed 1... 5 (can be memorised with the procedure given in paragraph 6.12.1 if selected before starting the operating cycle)
Deep freezing	-	-	speed 5	speed 5
Storage	speed established with parameter F23	speed established with parameter F23	speed established with parameter F24	speed established with parameter F24

6.12.1 Selecting the evaporator fan speed

Operate as follows:

1. Press and release the BLAST CHILLING INTENSITY key: the LED bars will supply information relative to fan speed (for example, one bar corresponds to speed 1, two bars on correspond to speed 2, three bars on correspond to speed 3, etc.).

Pressing and releasing the BLAST CHILLING INTENSITY key causes the speed to be selected in pre-defined mode, as indicated:

- speed 5 - speed 4 - speed 3 - speed 2 - speed 1 - speed 2 - speed 3 - speed 4 - speed 5.

The fan is switched on at the selected speed after 5 s from release of the BLAST CHILLING INTENSITY key.

6.13 Pre-cooling start-up

Every operating cycle can be preceded by pre-cooling.

Operate as indicated to start pre-cooling:

1. Make sure the device is in the "on" status.
2. Make sure no procedures are in progress
3. Hold the BLAST CHILLING key down for 2 s: the LED will flash.

Operate as indicated to cut-off pre-cooling:

4. Hold the BLAST CHILLING key for 2 s or start an operating cycle.

Parameter r120 establishes the work set-point during pre-cooling.

When the cabinet temperature reaches that established with parameter r12, pre-cooling continues, the LED remains on permanently and the buzzer is activated for 2 s.

6.14 Management of the test regarding correct insertion of the needle probe

If the needle probe is enabled, i.e. the parameter P3 is set at values different to 0, the temperature-controlled cycles are preceded by a test on two phases for the verification of the correct insertion of the needle probe.

The second phase is only performed if the first is not completed successfully.

The first phase is completed successfully if the "temperature detected by the needle probe - cabinet temperature" difference is greater than the value established with parameter r17 in at least 3 controls out of 5 (the controls are performed at 10 s intervals, consider the difference without sign).

The second phase is completed successfully if the "temperature detected by the needle probe - cabinet temperature" difference is 1°C/1°F higher with respect to the previous control in at least 6 controls out of 8 (the controls are performed at time intervals corresponding to 1/8 of the time established with parameter r18; consider the difference without sign).

If the test is completed successfully, the cycle will be started; if the test is not completed successfully, the LED will flash and the buzzer will be activated for 5 s every 60 s.

To start the temperature-controlled cycle, press the BLAST CHILLING key or the DEEP FREEZING key. After 1 min from the signal that the test has not been completed successfully without having operated, the cycle is started with time control.

If parameter r17 is set at 0, the test will not be carried out (neither first nor second phase).

6.15 Switching on UV light for sterilisation cycle

Operate as follows:

1. Make sure that parameter u11 is set at 2.
2. Make sure the device is in the "on" status and that the door is closed, i.e. the door micro switch is not active.
3. Make sure that the keyboard is not locked and that no procedure is in progress.
4. Hold the DEEP FREEZING key down for 2 s: the **AUX** LED will switch on.

The UV light is switched on for the time period established by parameter u6; opening the door i.e. the activation of the door micro switch cause the light to switch off.

If the UV light is on, it will not be allowed to select or start any operating cycle.

6.16 Needle probe heating

Operate as follows:

1. Make sure the device is in the "on" status or storage is in progress and that the door is open, i.e. the door micro switch is active.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Hold the BLAST CHILLING INTENSITY key down for 2 s: the LED flashes and the **AUX** LED will switch on.

Output K6 is activated at maximum for the time established with parameter u8 or until the temperature detected by the needle probe reaches that established with parameter u7; closing the door, i.e. the deactivation of the door micro switch input causes heating to be cut-off.
The buzzer is activated for 2 s on conclusion of heating.

6.17 Data print-out

The device can manage the PM 100A X9S001 module (to be ordered separately); see paragraph 14.5 "Print module PM 100A X9S001".
Using the module, it is possible to print information relative to the cabinet temperature, the temperature detected by the needle probe, at the alarms and at the errors (the latter two on condition that the alarm and/or the error is in progress on expiry of the print interval.
Parameter L0 must be set at 1.
Parameter L1 establishes the print interval during blast chilling and during deep freezing and parameter L2 establishes the print interval during storage.
The module prints the data as indicated:

```
**********************
         EVCO
**********************

       11/11/2011

       CHILL TEMP
START     14:31
             T        Tc
14:36     14 °C     39 °C
14:41      9 °C     25 °C
14:46      2 °C     12 °C
14:51     -1 °C      7 °C
14:56      0 °C      4 °C
 ==>      14:58
15:13      1 °C
15:28      3 °C
15:43      2 °C
STOP      15:32
```

Key:

T cabinet temperature
Tc temperature detected by the needle probe
==> passage to storage.

7 "PROGRAMS" FUNCTION

7.1 Foreword

The programs function can be used to memorise some settings in a program and start an operating cycle with the settings it has memorised.
Up to 9 programs can be memorised.

7.2 Memorisation of a program

Operate as follows:

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Hold the PROGRAMS key down for 2 seconds before starting and operating cycle or during reservation: the 1 digit display will show the number of the first program available (if the display shows "**F**", it means that all programs are already used; in this case, an existing program must be overwritten).

2.1 If the PROGRAMS key is pressed and released before starting an operation cycle, the device will memorise the following settings:

- type of operating cycle selected
- blast chilling/deep freezing intensity selected
- if the key is pressed before starting-up a temperature-controlled cycle:
  - the work set-point during blast chilling if parameter r19 is set at 0, the blast chilling end temperature
    if parameter r19 is set at 1.
- if the key is pressed before starting-up a time-controlled cycle:
  - the work set-point during blast chilling if parameter r19 is set at 0, the blast chilling duration
    if parameter r19 is set at 1.

2.2 If the PROGRAMS key is pressed and released during storage, the device memorises the following settings:

- type of operating cycle in progress
- the duration of blast chilling or deep freezing, i.e. the time taken to successfully complete blast chilling or deep freezing.
- blast chilling/deep freezing intensity selected before starting an operating cycle.
- the work set-point selected before starting up an operating cycle.

The execution of a program memorised by pressing and releasing the PROGRAMS key during storage causes the start of a time-controlled cycle.

3. Press and release the UP or DOWN key to select the program number.
4. Press and release the PROGRAMS key: the 1 digit display will switch off.

Operate as follows to abandon the procedure indicated:

5. Do not operate for 60 s (press and release the PROGRAMS key if all programs are already used).

7.3 Execution of a program

Operate as follows:

1. Make sure the device is in the "on" status.
2. Make sure that the keyboard is not locked and that no procedure is in progress.
3. Press and release the PROGRAMS key: the 1 digit display will show the number of the first program available and the dedicated LEDs will flash (if the display remains off, it means that there is no program available).
4. Press and release the UP or DOWN key to select the program number.

5. Press and release the START/STOP key: the dedicated LEDs will remain on permanently and the operating cycle will be started with the settings memorised in the program.

8 "HACCP" FUNCTION

8.1 Foreword

Using the "HACCP" function, it is possible to memorise up to 9 events for each of the 3 HACCP alarms, after which the most recent event overwrites the oldest.

The following table illustrates the information relative to the HACCP alarms, which the device can memorise.

Alarm	Code	Critical value	Date and time of occurrence	Duration
temperature-controlled blast chilling or deep freezing not concluded within maximum duration alarm	**tiM**	the maximum temperature detected by the needle probe after temperature-controlled blast chilling of deep freezing not concluded within maximum duration	yes	from 1 min to 99 h and 59 min, partial if the alarm is in progress
maximum temperature during storage alarm	**AH**	maximum cabinet temperature during the alarm	yes	from 1 min to 99 h and 59 min, partial if the alarm is in progress
power-cut during storage alarm	**PF**	the cabinet temperature at restore f power supply	yes	from 1 min to 99 h and 59 min

To prevent repeated memorisation of power cut alarms ("**PF**" code), make sure that the device is in the "stand-by" or "on" status before disconnecting the power supply.

If the duration of the power cut alarm ("**PF**" code) is such to cause a clock error ("**rtc**" code), the device does not memorise the date or time the alarm occurred or its duration.

The **HACCP** LED supplies information relative to the memory status of the HACCP alarms of the device; see paragraph 11.1 "Signals".

8.2 Display of information relative to the HACCP alarms

Operate as follows:

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Hold the DOWN key down for 2 s: the 3 digit display will show the first label available.
3. Press and release the UP or DOWN key to select "**LS**".
4. Press and release the BLAST CHILLING key: the 4 digit display will show the most recent alarm code, i.e. one of the codes stated in the table in paragraph 8.1 "Foreword", followed by the number "**1**" (the higher the number that follows the alarm code, the older the alarm).

To display the information relative to a HACCP alarm, operate as follows:

5. Press and release the UP or DOWN key to select an alarm code, for example "**AH3**".
6. Press and release the BLAST CHILLING key: the **HACCP** LED will stop flashing and remain on permanently and the display will show, for example, the following information in succession:

Inf.	Meaning
8	the critical value is 8 °C /8 °F
StA	the display is about to show the date and time the alarm occurred
y11	the alarm occurred in 2011 (continue...)
n03	the alarm occurred in the month of March (continue...)
d26	the alarm occurred on 26 March 2011
h16	the alarm occurred at 16:00 (continue...)
n30	the alarm occurred at 16:30
dur	the display is about to show the duration of the alarm
h01	the alarm had duration of 1 h (continue ...)
n15	the alarm had duration of 1 h and 15 minutes
AH3	the alarm code selected

the displays each piece of information for 2 s.

Operate as follows to abandon the succession of information:

7. Press and release the START/STOP key: the display will show the alarm code selected again.

Operate as follows to exit the procedure:

8. Abandon the succession of information.
9. Press and release the UP or DOWN key until the display shows the magnitude indicated in paragraph 5.3 "The display" or do not operate for 60 s.

8.3 Deleting the information relative to the HACCP alarms

Operate as follows:

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Hold the DOWN key down for 2 s: the 3 digit display will show the first label available.
3. Press and release the UP or DOWN key to select "**rLS**".
4. Press and release the BLAST CHILLING key: the 4 digit display will show "**0**".
5. Press and release the UP or DOWN key within 60 s to set "**149**".
6. Press and release the BLAST CHILLING key or do not operate for 60 s: the 4 digit display will show "**- - - -**" flashing for 4 s and the **HACCP** LED will switch off, after which the device will automatically exit the procedure and the display will show the magnitude indicated in paragraph 5.3 "The display".

If the device has not memorised any information relative to the HACCP alarms, the "**rLS**" label will not be displayed.

9 COMPRESSOR OPERATING HOURS COUNT

9.1 Display of compressor operating hours

Operate as follows:

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Hold the DOWN key down for 2 s: the 3 digit display will show the first label available.
3. Press and release the UP or DOWN key to select "**CH**".
4. Press and release the BLAST CHILLING key: the 4 digit display will show the compressor operating hours.

Operate as follows to exit the procedure:

5. Press and release the BLAST CHILLING key or do not operate for 60 s: the 4 digit display will switch off.
6. Press and release the UP or DOWN key until the display shows the magnitude indicated in paragraph 5.3 "The display" or do not operate for 60 s.

9.2 Deleting the compressor operating hours

Operate as follows:

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Hold the DOWN key down for 2 s: the 3 digit display will show the first label available.
3. Press and release the UP or DOWN key to select "**rCH**".
4. Press and release the BLAST CHILLING key: the 4 digit display will show "**0**".
5. Press and release the UP or DOWN key within 60 s to set "**149**".
6. Press and release the BLAST CHILLING key or do not operate for 60 s: the 4 digit display will show "**- - - -**" flashing for 4 s and the **HACCP** LED will switch off, after which the device will automatically exit the procedure and the display will show the magnitude indicated in paragraph 5.3 "The display".

10 CONFIGURATION

10.1 Setting the real date and time

Operate as follows:

1. Make sure that the keyboard is not locked and that no procedure is in progress.
2. Hold the DOWN key down for 2 s: the 3 digit display will show the first label available.
3. Press and release the UP or DOWN key to select "**rtc**".

Operate as follows to set the year:

4. Press and release the BLAST CHILLING key: the 4 digit display will show "**yy**" followed by the last two numbers of the year and the ⏲ LED will flash.
5. Press and release the UP or DOWN key within 60 s to modify the value:

Operate as follows to set the month:

6. Press and release the BLAST CHILLING key when setting the year: the 4 digit display will show "**nn**" followed by the two numbers of the month.
7. Press and release the UP or DOWN key within 60 s to modify the value:

Operate as follows to set the day of the month:

8. Press and release the BLAST CHILLING key when setting the month: the 4 digit display will show "**dd**" followed by the two numbers of the month.
9. Press and release the UP or DOWN key within 60 s to modify the value:

Operate as follows to set the hour:

10. Press and release the BLAST CHILLING key when setting the day of the month: the 4 digit display will show "**hh**" followed by the two numbers of the hour.
11. Press and release the UP or DOWN key within 60 s to modify the value:

The hour is displayed in the 24 h format.

Operate as follows to set the minutes:

12. Press and release the BLAST CHILLING key when setting the hour: the 4 digit display will show "**nn**" followed by the two numbers of the minutes.
13. Press and release the UP or DOWN key within 60 s to modify the value:
14. Press and release the BLAST CHILLING key or do not operate for 60 s: the 4 digit display will show "**rtc**" again and the ⏲ LED will switch off.

Operate as follows to exit the procedure:

15. Press and release the UP or DOWN key until the display shows the magnitude indicated in paragraph 5.3 "The display" or do not operate for 60 s.

10.2 Setting the configuration parameters

Operate as follows:

1. Make sure no procedures are in progress
2. Hold the UP and DOWN key for 4 s: the 3 digit display will show "**PA**".
3. Press and release the BLAST CHILLING key: the 4 digit display will show "**0**".
4. Press and release the UP or DOWN key within 60 s to set "**-19**".
5. Press and release the BLAST CHILLING key or do not operate for 60 s: the 3 digit display will show "**PA**" again.
6. Hold the UP and DOWN key for 4 s: the 3 digit display will show "**SP**".

Operate as follows to set a parameter:

7. Press and release the UP or DOWN key to select a parameter label.
8. Press and release the BLAST CHILLING key: the 4 digit display will show the value of the parameter.
9. Press and release the UP or DOWN key within 60 s to modify the parameter value:

10. Press and release the BLAST CHILLING key or do not operate for 60 s: the 4 digit display will switch off.

Operate as follows to exit the procedure:

11. Hold the UP and DOWN key for 4 s or do not operate for 60 s The display will show the magnitude indicated in paragraph 5.3 "The display".

Cut the device power supply off after setting the configuration parameters.

10.3 Restoring the factory settings

Operate as follows:

1. Make sure no procedures are in progress
2. Hold the UP and DOWN key for 4 s: the 3 digit display will show "**PA**".
3. Press and release the BLAST CHILLING key: the 4 digit display will show "**0**".
4. Press and release the UP or DOWN key within 60 s to set "**149**".
5. Press and release the BLAST CHILLING key or do not operate for 60 s: the 3 digit display will show "**PA**" again.
6. Hold the UP and DOWN key for 4 s: the 3 digit display will show "**dEF**".
7. Press and release the BLAST CHILLING key: the 4 digit display will show "**0**".
8. Press and release the UP or DOWN key within 60 s to set "**1**".
9. Press and release the BLAST CHILLING key or do not operate for 60 s: the 3 digit display will show "**dEF**" flashing for 4 s, after which the device will automatically exit the procedure and the display will show the magnitude indicated in paragraph 5.3 "The display".
10. Cut the device power supply off.

Operate as follows to abandon the procedure:

11. Hold the UP and DOWN key for 4 s before point 8: The display will show the magnitude indicated in paragraph 5.3 "The display".

Ensure that the factory settings are appropriate; see paragraph 10.4 "List of configuration parameters".

10.4 List of configuration parameters

The following table illustrates the meaning of the configuration parameters.

The management of some inputs and outputs is subject to the value set with some parameters, as follows:

- management of the needle probe is only available if parameter P3 is set at values different to 0
- management of the evaporator probe is only available if the parameter P4 is set at 1
- management of the condenser probe is only available if the parameter P5 is set at 1
- management of the cabinet light is only available if the parameter u11 is set at 0
- management of the UV light is only available if parameter u11 is set at 1.
- management of the pump down valve is only available if parameter u1 is set at 0
- management of the alarm output is only available if parameter u1 is set at 1.

The evaporator fan control signal can be analogue (parameter F0 set at 3) or digital (parameter F0 set at values different to 3).

Par.	Min.	Max.	Unit	Default	Analogue inputs
CA1	-25	25	°C/°F (1)	0	cabinet probe offset
CA2	-25	25	°C/°F (1)	0	needle probe offset 1

CA3	-25	25	°C/°F (1)	0	evaporator probe offset
CA4	-25	25	°C/°F (1)	0	condenser probe offset
CA5	-25	25	°C/°F (1)	0	needle probe offset 2
CA6	-25	25	°C/°F (1)	0	needle probe offset 3
P0	0	1	- - - -	0	probe type 0 = PTC 1 = NTC
P2	0	1	- - - -	0	temperature unit of measurement (2) 0 = °C 1 = °F
P3	0	3	- - - -	1	number of needle probe sensors 0 = needle probe not available 1 = 1 (needle probe 1) 2 = 2 (needle probe 1 and needle probe 2) 3 = 3 (needle probe 1, needle probe 2 and needle probe 3)
P4	0	1	- - - -	1	enabling the evaporator probe 1 = yes
P5	0	1	- - - -	1	enabling the condenser probe 1 = yes
P8	0	250	ds	5	delay displaying temperature variation detected by the probes
P9	0	2	- - - -	2	type of backlight 0 = off during "on" status and during the "run" status and with ON/STAND-BY key low light intensity during the "stand-by" status 1 = with low light intensity during the "on" status and during the "run" status and with ON/STAND-BY key low light intensity during the "stand-by" status 2 = with high light intensity during the "on" status and during the "run" status and with ON/STAND-BY key high light intensity during the "stand-by" status
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Main regulator**
r0	1	15	°C/°F (1)	2	parameters differential r7, r8, r9, r10, r11 and r12
r1	1	500	min	90	duration of time-controlled blast chilling

r2	1	500	min	240	duration of time-controlled deep freezing
r3	-99	99	°C/°F (1)	3	temperature-controlled blast chilling end time temperature; also end temperature of the temperature-controlled soft deep freezing phase (temperature detected by the needle probe); see also parameter r5
r4	-99	99	°C/°F (1)	-18	temperature-controlled deep freezing end temperature (temperature detected by the needle probe); see also parameter r6
r5	1	500	min	90	maximum duration of temperature-controlled blast chilling; see parameter r3 also
r6	1	500	min	240	maximum duration of temperature-controlled deep freezing; see parameter r4 also
r7	-99	99	°C/°F (1)	0	work set-point during blast chilling; also work set-point during the soft deep freezing phase (cabinet temperature); see also parameter r0
r8	-99	99	°C/°F (1)	-40	work set-point during deep freezing (cabinet temperature); see also parameter r0
r9	-99	99	°C/°F (1)	-20	work set-point during hard blast chilling phase (cabinet temperature); see also parameter r0
r10	-99	99	°C/°F (1)	2	work set-point during post blast chilling storage (cabinet temperature); see also parameter r0
r11	-99	99	°C/°F (1)	-20	work set-point during post deep freezing storage (cabinet temperature); see also parameter r0
r12	-99	99	°C/°F (1)	5	work set-point during pre-cooling (cabinet temperature); see also parameter r0
r13	-99	99	°C/°F (1)	15	end temperature of the temperature-controlled hard blast chilling phase (temperature detected by the needle probe)
r14	10	100	%	60	duration of the time-controlled hard blast chilling phase (intended as a percentage of the value established with parameter r1); also duration of the time-controlled soft deep freezing phase (intended as a percentage of the value established with parameter r2)

r15	-99	199	°C/°F (1)	65	temperature below which the count of the maximum temperature-controlled blast chilling and maximum temperature-controlled deep freezing is started (temperature detected by the needle probe)
r16	0	2	- - - -	1	type of operating cycle that can be selected 0 = blast chilling and storage 1 = blast chilling and storage or deep freezing and storage 2 = deep freezing and storage
r17	0	99	°C/°F (1)	5	"temperature detected by the needle probe - cabinet temperature" minimum difference such to consider the first phase of the test to verify correct insertion of the needle probe completed successfully (consider the difference without sign) 0 = the test will not be performed (neither first or second phase)
r18	1	99	s	60	duration of the second phase of the test for verification of correct insertion of the needle probe
r19	0	1	- - - -	0	quick modification value during the "On" status before starting the operating cycle 0 = work set-point during blast chilling or during deep freezing 1 = blast chilling or deep freezing end temperature before starting a temperature-controlled cycle, duration of blast chilling or deep freezing before starting a time-controlled cycle (except before starting a continuous blast chilling cycle or continuous deep freezing cycle).
r20	0	1	- - - -	1	memorisation of the quick modification value during the "On" status before starting the operating cycle 0 = no (on start-up of the successive same cycle, the values established with parameters r7 and r3 or those establishes with r4 and r8 will be re-proposed) 1 = yes (on start-up of the successive same cycle the rapidly modified values will be re-proposed before starting the previous same cycle)
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Compressor protections**
C0	0	240	min	0	minimum time between restoring the power supply after a power cut, occurring during an operating cycle and compressor switch-on

C1	0	240	min	5	minimum time between two consecutive compressor switch-ons (3)
C2	0	240	min	3	minimum time between compressor switch-off and successive switch-on (3)
C3	0	240	s	0	compressor switch-on minimum duration
C4	0	240	min	10	duration of compressor switch-off during the cabinet probe error ("**Pr1**" code) that occurs during storage; see also parameters C5 and C9
C5	0	240	min	10	duration of compressor switch-on during the cabinet probe error ("**Pr1**" code) that occurs during post blast chilling storage; see also parameter C4
C6	0	199	°C/°F (1)	80	condenser temperature above which the blocked overheated condenser alarm is activated ("COH" code)
C7	0	199	°C/°F (1)	90	condenser temperature above which the blocked compressor alarm is activated ("CSd" code)
C8	0	15	min	1	blocked compressor alarm delay ("**CSd**" code) (5)
C9	0	240	min	30	duration of compressor switch-on during the cabinet probe error ("**Pr1**" code) that occurs during post deep freezing storage; see also parameter C4
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Defrosting (6)**
d0	0	99	h	8	defrosting interval (7) 0 = defrosting will never be activated at intervals

d1	0	3	- - - -	1	type of defrosting 0 = electrical (the compressor will be switched off during defrosting, the defrosting output will be activated and the evaporator fan will be switched off) 1 = hot gas (the compressor will be switched on during defrosting, the defrosting output will be activated and the evaporator fan will be switched off) 2 = air (the compressor will be switched off during defrosting and the defrosting output will be activated; the evaporator fan will be switched on, independently from the conditions of the door, i.e. independently from the door micro switch input status) 3 = air with door open (the compressor will be switched off during defrosting and the defrosting output will be activated; the evaporator fan will be switched on, on condition that the door is open, i.e. that is on condition that the door micro switch is active and that the parameter i0 is set at values different to 0)
d2	-99	99	°C/°F (1)	2	defrosting end temperature (evaporator temperature); see also parameter d3
d3	0	99	min	30	if parameter P4 is set at 0, duration of defrosting if parameter P4 is set at 1, maximum duration of defrosting; see also parameter d2 0 = defrosting will never be activated
d4	0	1	- - - -	0	defrosting on start-up of blast chilling and deep freezing 1 = yes
d5	0	99	min	30	defrosting delay on start-up of storing 0 = defrosting will be started on expiry of the time established with parameter d0
d7	0	15	min	2	dripping duration (the compressor and the evaporator fan remain off during dripping and the defrosting output will be deactivated)
d15	0	99	min	0	minimum duration of compressor switch-on on activation of defrosting so these can be activated (only if parameter d1 is set at 1) (8)

d16	0	99	min	0	duration of pre-dripping (only if parameter d1 is set at 1; the compressor and evaporator fan will be off during pre-dripping and the defrosting output will remain activated)
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Temperature alarms (9) (10)**
A1	0	99	°C/°F (1)	10	cabinet temperature below which the minimum temperature alarm is activated (relative to the work set-point, i.e. "r10 - A1" during post blast chilling storage and "r11 - A1" during post deep freezing storage; ("**AL**" code); see also parameter A11 (4)
A2	0	1	- - - -	1	enabling of minimum temperature alarm ("**AL**" code) 1 = yes
A4	0	99	°C/°F (1)	10	cabinet temperature above which the maximum temperature alarm is activated (relative to the work set-point, i.e. "r10 +A4" during post blast chilling storage and "r11 +A4" during post deep freezing storage; ("**AH**" code); see also parameter A11 (4)
A5	0	1	- - - -	1	enabling of maximum temperature alarm ("**AH**" code) 1 = yes
A7	0	240	min	15	temperature alarm delay("**AL**" code and "**AH**" code)
A8	0	240	min	15	maximum temperature alarm delay ("**AH**" code) from the conclusion of evaporator fan stop and storage start-up
A10	0	240	min	5	duration of a power cut such to cause the power cut alarm to be memorised ("**PF**" code)when the power is supplied 0 = the alarm will not be signalled
AA	0	240	s	5	duration of buzzer activation on conclusion of blast chilling and deep freezing
A11	1	15	°C/°F (1)	2	parameters A1 and A4 differential

A13	0	1	- - - -	1	memorisation of the temperature-controlled blast chilling or temperature-controlled deep freezing non concluded within maximum duration alarm ("**tiM**" code) 1 = yes
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Evaporator and condenser fan**
F0	0	3	- - - -	1	evaporator fan activity during pre-cooling, blast chilling and deep freezing (if the parameter is set at 3, there will be effect also during storage) 0 = off, with digital control signal, i.e. via digital output K3 1 = on, with digital control signal, i.e. via the K3 digital output; see also parameters F16 and F17 2 = parallel to the compressor, with digital control signal, i.e. via the K3 digital output; see also parameters F9 and F17 3 = with analogue control signal, i.e. via the PWM analogue output and the speed regulator phase cut output for EVDFAN1 single phase fans (to order separately); see also parameters F18, F19, F20, F21, F22, F23 and F24
F1	-99	99	°C/°F (1)	-1	evaporator temperature above which the evaporator fan is off during storage (only if parameter F0 and/or parameter F2 is set at 3); see also parameter F8 (11)
F2	0	3	- - - -	3	evaporator fan activity during storage (only if parameter F0 is set at values different to 3) 0 = off 1 = on 2 = parallel to the compressor; see also parameter F9 3 = on; see also parameter F1
F3	0	15	min	2	duration of evaporator fan standstill (the compressor can be on during evaporator fan standstill, the defrosting output will remain deactivated and the evaporator fan will remain off)
F8	1	15	°C/°F (1)	2	F1, F16 and F17 parameters differential

F9	0	240	s	0	evaporator fan switch-off delay from compressor switch off (only if parameter F0 and/or parameter F2 are set at 2)
F11	0	99	°C/°F (1)	15	condenser temperature above which the condenser fan is switched on (intended as "F11 + differential and on condition that the compressor is on); see also parameter F12 (4) (12)
F12	0	240	s	30	condenser fan switch-off delay from compressor switch-off
F15	0	240	s	15	evaporator fan delay from door closure, i.e. from the deactivation of the door micro switch input
F16	-99	99	°C/°F (1)	20	evaporator temperature above which the evaporator fan is off during pre-cooling, blast chilling and deep freezing (only if parameter F0 is set at 1); see also parameter F8 (11)
F17	-99	199	°C/°F (1)	90	cabinet temperature above which the evaporator fan is off during pre-cooling, blast chilling and deep freezing (only if parameter F0 is set at 1 or 2); see also parameter F8
F18	0	100	%	20	evaporator fan speed 1 (intended as a percentage of the maximum speed; sonly if parameter F0 is set at 3); see paragraph 6.12 "Blast chilling/deep freezing intensity"
F19	0	100	%	40	evaporator fan speed 2 (intended as a percentage of the maximum speed; sonly if parameter F0 is set at 3); see paragraph 6.12 "Blast chilling/deep freezing intensity"
F20	0	100	%	60	evaporator fan speed 3 (intended as a percentage of the maximum speed; sonly if parameter F0 is set at 3); see paragraph 6.12 "Blast chilling/deep freezing intensity"
F21	0	100	%	80	evaporator fan speed 4 (intended as a percentage of the maximum speed; sonly if parameter F0 is set at 3); see paragraph 6.12 "Blast chilling/deep freezing intensity"

F22	0	100	%	100	evaporator fan speed 5 (intended as a percentage of the maximum speed; sonly if parameter F0 is set at 3); see paragraph 6.12 "Blast chilling/deep freezing intensity"
F23	1	5	- - - -	5	speed at which the evaporator fan is switched on during post blast chilling 1 = speed established with parameter F18 (speed 1) 2 = speed established with parameter F19 (speed 2) 3 = speed established with parameter F20 (speed 3) 4 = speed established with parameter F21 (speed 1) 5 = speed established with parameter F22 (speed 5)
F24	1	5	- - - -	5	speed at which the evaporator fan is switched on during post deep freezing 1 = speed established with parameter F18 (speed 1) 2 = speed established with parameter F19 (speed 2) 3 = speed established with parameter F20 (speed 3) 4 = speed established with parameter F21 (speed 1) 5 = speed established with parameter F22 (speed 5)
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Digital inputs**
i0	0	2	- - - -	2	effect caused by opening the door, i.e. by activation of the door micro switch (13) 0 = no effect 1 = the compressor and the evaporator fan will be off and the cabinet light will be on. On expiry of the time established with parameter i2, the 3 digit display will show the flashing "**id**" code and the buzzer will be activated (until the door is closed); see also parameter F15 (14) 2 = the evaporator fan will be off and the cabinet light will be on. On expiry of the time established with parameter i2, the 3 digit display will show the flashing "**id**" code and the buzzer will be activated (until the door is closed); see also parameter F15
i1	0	1	- - - -	0	type of door micro switch input contact 0 = normally open (input active with closed contact) 1 = normally closed (input active with open contact)

i2	-1	120	min	5	door open alarm signalling delay ("**id**" code); on expiry of the time established with the parameter, the compressor will be off -1 = the alarm will not be signalled
i5	0	1	- - - -	1	effect caused by the activation of the high pressure input 0 = no effect 1 = the compressor and the evaporator fan will be off and the condenser fan will be on. On expiry of the time established with parameter i7, the 3 digit display will show the flashing "**HP**" code and the buzzer will be activated (until the input is deactivated)
i6	0	1	- - - -	0	type of high pressure input 1 0 = normally open (input active with closed contact) 1 = normally closed (input active with open contact)
i7	-1	240	s	5	high pressure alarm signalling delay ("**HP**" code) -1 = the alarm will not be signalled
i8	0	1	- - - -	0	type of low pressure input 1 0 = normally open (input active with closed contact) 1 = normally closed (input active with open contact)
i9	-1	240	s	5	low pressure alarm signalling delay ("**LP**" code) -1 = the alarm will not be signalled
i10	0	1	- - - -	0	type of compressor circuit breaker protection input contact 0 = normally open (input active with closed contact) 1 = normally closed (input active with open contact)
i11	-1	240	s	5	compressor circuit breaker protection alarm signal delay ("**CtH**" code) -1 = the alarm will not be signalled
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Digital outputs**

u1	0	1	- - - -	0	utility managed by the output K8 (15) 0 = pump down valve (in this case, parameter u12 will have meaning) 1 = alarm output
u2	0	1	- - - -	0	enabling of cabinet light switch-on/off in manual mode during "stand-by" status (16) 1 = yes
u5	-99	99	°C/°F (1)	20	cabinet temperature over which the door heating elements are off (4)
u6	1	240	min	5	switching on UV light for sterilisation cycle duration
u7	-99	199	°C/°F (1)	40	needle probe heating end temperature (temperature detected by the needle probe); see also parameter u8
u8	1	240	min	2	maximum duration of needle probe heating; see also parameter u7
u11	0	1	- - - -	0	utility managed by the output K7 (15) 0 = cabinet light (in this case, the DEEP FREEZING key and parameters i0 and u2 will assume significance) 1 = UV light (in this case, the DEEP FREEZING key and parameter u6 will assume significance)
u12	0	999	s	10	compressor switch off delay from pump down valve deactivation (pump down in switch-off) (17)
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Serial communication (RS-48 serial port with MODBUS communication protocol)**
L0	0	1	- - - -	0	operating mode 0 = slave (in this case, it will be possible to connect Parameters Manager set-up software system, to the monitoring and surveillance system of the RICS plants or to the data recording device, to download the recorded data to the port (via USB) EVUSBREC01). 1 = master (in this case, it will be possible to connect the print module PM 100A X9S001 to the port)
L1	1	240	min	5	print interval during blast chilling or during deep freezing
L2	1	240	min	15	print interval during storage

LA	1	247	- - - -	247	device 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

Notes:

(1) the unit of measurement depends on parameter P2

(2) appropriately set the parameters relative to the regulators after modification of parameter P2

(3) the time established with the parameter is counted also during the "on" status and during the "stand-by" status

(4) The parameter differential is 2 °C/4 °F

(5) on device switch-on (or cycle start), if the condenser temperature is already over that established with parameter C7, parameter C8 will have no effect

(6) defrosting is only enabled during pre-cooling, on start-up of blast feeding and at the start-up of deep freezing (in these last two cases on condition that parameter d4 is set at 1) and during storage

(7) the device memorises the defrosting interval count every 30 minutes; the modification of parameter d0 has effect from the conclusion of the previous defrosting interval (or the activation of defrosting in manual mode)

(8) if on activation of defrosting, the previous compressor switched on at from a time shorter than that established with parameter d15, the compressor will remain on longer for the fraction of time necessary to complete this time period

(9) the temperature alarms are only enabled during storage

(10) during defrosting. pre-dripping, dripping and evaporator fan standstill, the temperature alarms are not enabled, on condition that they occurred after activation of defrosting. When the door is open, i.e. if the door micro switch input is active and the parameter i0 is set at values different to 0, the maximum temperature alarm is not enabled, on condition that occurred after the door was opened

(11) if parameter P4 is set at 0, during pre-cooling, blast chilling and deep freezing the evaporator fan will be on and during storing the device will operate as if parameter F2 it were set at 2

(12) if parameter P5 is set at 0, the condenser fan will function parallel to the compressor

(13) the door open is enabled only using the "run" state

(14) if the door is opened during defrosting or evaporator fan standstill, opening has no effect on the compressor

(15) modify the parameter during the "stand-by" status to prevent damage to the utility

(16) if parameter u2 is set at 0, device switch-off will cause the cabinet light to switch off and on successive switch on the cabinet light will remain off. If parameter u2 is set at 1, device switch-off will not cause the cabinet light to switch off and on successive switch-on the cabinet light stays on

(17) the pump down valve is activated when the compressor is switched-on.

11 SIGNALS AND INDICATIONS

11.1 Signals

The following table illustrates the meaning of the signalling LEDS.

LED	Meaning
❄	Blast chilling LED. If it is on: - blast chilling will be in progress (or has been performed). If flashing: - a blast chilling and storage cycle will have been selected.
❄❄	Deep freezing LED. If it is on: - a soft deep freezing cycle will be in progress (or has been performed). If flashing: - a soft deep freezing and storage cycle will have been selected.
HARD	hard blast chilling/deep freezing LED If it is on: - hard blast chilling or deep freezing will be in progress (or has been performed). If flashing: - a hard blast chilling and storage cycle or a deep freezing and storage cycle will have been selected.
	temperature-controlled blast chilling/temperature-controlled deep freezing LED. If it is on: - a temperature-controlled blast chilling and storage cycle or a temperature-controlled deep freezing and storage cycle will have been performed. - temperature-controlled blast chilling or deep freezing will be in progress. If flashing: - a temperature-controlled blast chilling and storage cycle or a temperature-controlled deep freezing and storage cycle will have been selected. - the verification test for the correct insertion of the needle probe will not have been completed successfully - needle probe heating will be in progress.
	Time-controlled blast chilling/time-controlled deep freezing LED. If it is on: - a time-controlled blast chilling and storage cycle or a time-controlled deep freezing and storage cycle will have been performed. - time-controlled blast chilling or deep freezing will be in progress. If flashing: - a time-controlled blast chilling and storage cycle or a time-controlled deep freezing and storage cycle will have been selected. - setting the real date and time will be in progress.

⏚	Storage LED. If it is on: - storage will be in progress. If flashing: - work set-point modification will be in progress (cabinet temperature).
	Blast chilling/deep freezing intensity LED bars (only if parameter F0 is set at 3). They supply information relative to evaporator fan speed (for example, one bar on corresponds to speed 1, two bars on correspond to speed 2, three bars on correspond to speed 3, etc.).
	Pre-cooling LED. If it is on: - pre-cooling will be in progress and the cabinet temperature will have reached that established using parameter r12. If flashing: - pre-cooling will be in progress and the cabinet temperature will not have reached that established using parameter r12.
AUX	Auxiliary LED. If it is on: - the cabinet light will be on - needle probe heating will be in progress - the UV light will be on.
HACCP	HACCP LED. If it is on: - all information regarding HACCP alarms will not have been displayed. If flashing: - the device will have memorised at least one new HACCP alarm.
°C	Degree Celsius LED. If it is on: - the temperature unit of measurement will be the degree Celsius.
°F	Degree Fahrenheit LED. If it is on: - the temperature unit of measurement will be the degree Fahrenheit.
min	minutes LED. If it is on: - the time unit of measurement will be the minute.

If the ON/STAND-BY key is on, it means that the device will be in the "stand-by" state.

11.2 Indications

The following table illustrates the meaning of the indication codes.

Code	Meaning
dEF	Defrosting will be in progress.
Loc	The keyboard is locked, see paragraph 5.10 "Lock/unlock the keyboard".
UnL	The keyboard has been locked, see paragraph 5.10 "Lock/unlock the keyboard".

12 ALARMS

12.1 Alarms

The following table illustrates the meaning of the alarm codes.

Code	Meaning
tiM	Temperature-controlled blast chilling or deep freezing not concluded within maximum duration alarm (HACCP alarm). Solutions: - check the value of parameters r5 and r6 and AA. Main consequences: - the device will memorise the alarm - the alarm output will be activated.
AL	Minimum temperature alarm. Solutions: - check the temperature of the cabinet - check the value of parameters A1 and A2. Main consequences: - the alarm output will be activated.
AH	Maximum temperature alarm (HACCP alarm). Solutions: - check the temperature of the cabinet - check the value of parameters A4 and A5. Main consequences: - the device will memorise the alarm - the alarm output will be activated.
id	Door open alarm Solutions: - check the door conditions - check the value of parameters i0 and i1. Main consequences: - the effect established with parameter i0 - the alarm output will be activated.
HP	High pressure alarm. Solutions: - check the conditions of the high pressure input - check the value of parameters i5 and i6. Main consequences: - the effect established with parameter i5 - the alarm output will be activated.

LP	Low pressure alarm. Solutions: - check the conditions of the low pressure input - check the value of the parameter i8. Main consequences: - the compressor and the evaporator fan will be off - the alarm output will be activated.
CtH	Compressor circuit breaker protection alarm. Solutions: - check the conditions of the compressor circuit breaker protection input - check the value of the parameter i10. Main consequences: - the compressor will be switched off - the alarm output will be activated.
PF	Power supply cut-off alarm during storage (HACCP). Solutions: - check the device-power supply connection - check the value of the parameter A10. Main consequences: - the device will memorise the alarm - the alarm output will be activated.
COH	Condenser overheated alarm. Solutions: - check the temperature of the condenser - check the value of the parameter C6. Main consequences: - the condenser fan will be switched on - the alarm output will be activated.
CSd	Compressor blocked alarm. Solutions: - check the temperature of the condenser - check the value of the parameter C7 - disconnect the device power supply and clean the condenser. Main consequences: - if the error occurs during the “stand-by” status, no operating cycles can be selected or started - if the error occurs during an operating cycle, the cycle will be interrupted - the alarm output will be activated.

ESt	Configuration parameters download not completed successfully alarm. Solutions: - press and release a key to restore normal display - download the configuration parameters again. Main consequences: - the alarm output will be activated.
CEr	Configuration parameters firmware contained in EVKEY not coinciding with that of the device. Solutions: - cut the device power supply off - check that the configuration parameters firmware contain in EVKEY coincides with that of the device - download the configuration parameters again. Main consequences: - the alarm output will be activated.
Erd	Configuration parameters upload not completed successfully alarm. Solutions: - to restore the factory settings - upload the configuration parameters again. Main consequences: - the digital outputs will be switched off.

13 ERRORS

13.1 Errors

The following table illustrates the meaning of the error codes.

Code	Meaning
Pr1	Cabinet probe error. Solutions: - check the value of the parameter P0 - check the integrity of the probe - check the device-probe connection - check the temperature of the cabinet. Main consequences: - if the error occurs during the "stand-by" status, no operating cycles can be selected or started - if the error occurs during blast chilling or deep freezing, the cycle will be interrupted - if the error occurs during storage, compressor activity will depend on parameters C4 and C5 or C9 - defrosting will never be activated - the minimum temperature alarm ("**AL**" code) will never be activated - the maximum temperature alarm ("**AH**" code) will never be activated - the door heating elements will never be switched on - the alarm output will be activated.
Pr2	Evaporator probe error. Solutions: - the same as the cabinet probe error ("**Pr1**" code) but relative to the evaporator probe. Main consequences: - if parameter P4 is set at 1, defrosting will last for the period of time established with parameter d3 - if parameter F0 is set at 1, parameter F16 will have no effect - if parameter F2 is set at 1, the device will operate as if it were set at 2. - the alarm output will be activated.

Pr3	Condenser probe error. Solutions: - the same as the cabinet probe error ("**Pr1**" code) but relative to the condenser probe. Main consequences: - the condenser fan will operate parallel to the compressor - the overheated condenser alarm ("**COH**" code) will never be activated - the compressor blocked alarm ("**CSd**" code) will never be activated - the alarm output will be activated.
Pr4	Needle probe error 1. Solutions: - the same as the cabinet probe error ("**Pr1**" code) but relative to the needle probe 1. ain consequences if parameter P3 is set at 1: - if the error occurs during the "stand-by" status, temperature-controlled operating cycles will be started by time-control - if the error occurs during temperature-controlled blast chilling, this will have duration of the time set by parameter r1 - if the error occurs during temperature-controlled deep freezing, this will have duration of the time set by parameter r2 - if the error occurs during needle probe heating, this operation will be interrupted. - the alarm output will be activated. ain consequences if parameter P3 is set at 2 or at 3: - the device will not use needle probe 1.
Pr5	Needle probe error 2. Solutions: - the same as the cabinet probe error ("**Pr1**" code) but relative to the needle probe 2. Main consequences: - the device will not use needle probe 2.
Pr6	Needle probe error 3. Solutions: - the same as the cabinet probe error ("**Pr1**" code) but relative to the needle probe 3. Main consequences: - the device will not use needle probe 3.

rtc	Clock error. Solutions: - set the real date and time again. Main consequences: - the device does not memorise the date or time at which the HACCP alarm occurred or its duration - the alarm output will be activated.
ErC	User interface-control module compatibility. Solutions: - check that the user interface and the control module are compatible. Main consequences: - the control module will continue to operate normally.
ErL	User interface-control module communication error. Solutions: - check user interface-control module control module. Main consequences: - the control module will continue to operate normally.

14 ACCESSORIES

14.1 EVKEY programming key

14.1.1 Introduction

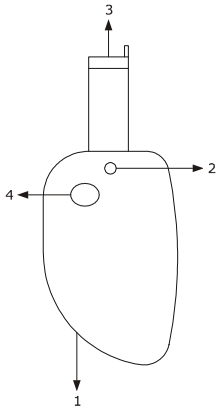
EVKEY is a programming key.

The key can be used to upload and download the controller configuration parameters.

The key can be used on condition that the controller is powered.

14.1.2 Description

The following drawing illustrates the aspect of the EVKEY.

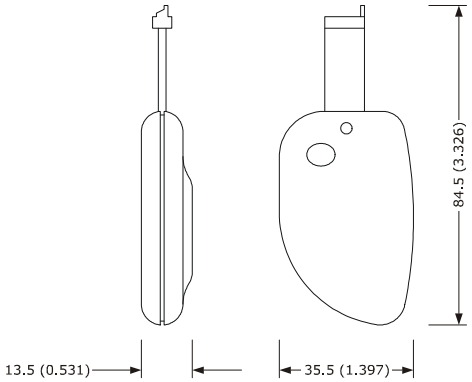


The following table illustrates the meaning of the EVKEY parts.

Part	Meaning
1	reserved
2	Signal LED
3	Micromatch connector
4	programming key

14.1.3 Dimensions

The following drawing illustrates the EVKEY dimensions; these are expressed in mm (in).



14.1.4 Uploading the configuration parameters

Operate as follows:

1. Cut the device power supply off.
2. Insert the EVKEY Micromatch connector into the device TTL serial port.
3. Connect the device power supply. the 3 digit display will show "**Cln**" and the EVKEY signal LED will emit a green light.
4. Hold the BLAST CHILLING key down for 4 s: the 3 digit display will show flashing "**St**".
5. Hold the BLAST CHILLING key down for 4 s: download will start, the 3 digit display will show "**St**" permanently and the EVKEY signalling LED will emit a red light.
   The download operation requires several seconds. If the operation is not completed successfully within this time period, i.e. if the EVKEY signalling LED does not stop emitting red light and emitting green light, the operation must be repeated.
6. When downloading has been concluded, the 3 digit display restores normal viewing and the EVKEY signalling LED emits green light again.
7. Disconnect the EVKEY Micromatch connector from the device serial port.

Operate as follows to abandon the procedure:

8. Do not operate for 60 s.
9. Disconnect the EVKEY Micromatch connector from the device serial port.

For further information, consult the documentation relative to EVKEY.

14.1.5 Downloading the configuration parameters

Operate as follows:

1. Make sure that the configuration parameters firmware contained in EVKEY coincides with that of the device.
2. Cut the device power supply off.
3. Insert the EVKEY Micromatch connector into the device TTL serial port.
4. Connect the device power supply. the 3 digit display will show "**Cln**" and the EVKEY signal LED will emit a green light.
5. Hold the EVKEY programming key down for 2 s: upload will start and the EVKEY signalling LED will emit a red light.
   The upload operation requires several seconds. If the operation is not completed successfully within this time period, i.e. if the EVKEY signalling LED does not stop emitting red light and emitting green light, the operation must be repeated.

6. The 3 digit display shows "**PrG**" on conclusion of the upload and the EVKEY signalling LED will emit a green light again.
7. Press and release a key to restore normal display.
8. Disconnect the EVKEY Micromatch connector from the device serial port.

Operate as follows to abandon the procedure:

9. Do not operate for 60 s.
10. Disconnect the EVKEY Micromatch connector from the device serial port.

For further information, consult the documentation relative to EVKEY.

14.2 Data recording device EVUSBREC01

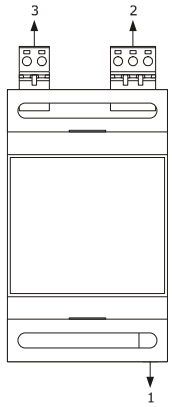
14.2.1 Introduction

EVUSBREC01 is a data recording device.

Using the device, it is possible to record controller data and their download (via USB, into a text document).

14.2.2 Description

The following drawing illustrates the aspect of the EVUSBREC01.

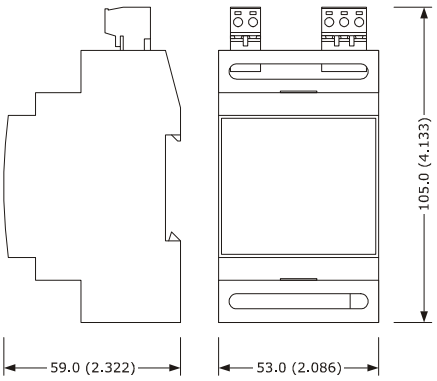


The following table illustrates the meaning of the EVUSBREC01 parts.

Part	Meaning
1	USB type serial port
2	RS-485 type serial port
2	power supply

14.2.3 Dimensions

The following drawing illustrates the EVUSBREC01 dimensions; these are expressed in mm (in).



14.2.4 Connection to the device

Operate as follows:

1. Make sure that parameter L0 is set at 0.
2. Cut the device power supply off.
3. Cut the EVUSBREC01 power supply off.
4. Connect the device RD-485 serial port to the EVUSBREC01 RS-485 type serial port.
5. Connect the device power supply.
6. Connect the EVUSBREC01 power supply.

For further information, consult the documentation relative to EVUSBREC01.

14.3 Optoisolated RS-485/RS-232 serial interface EVIF21RS7I

14.3.1 Introduction

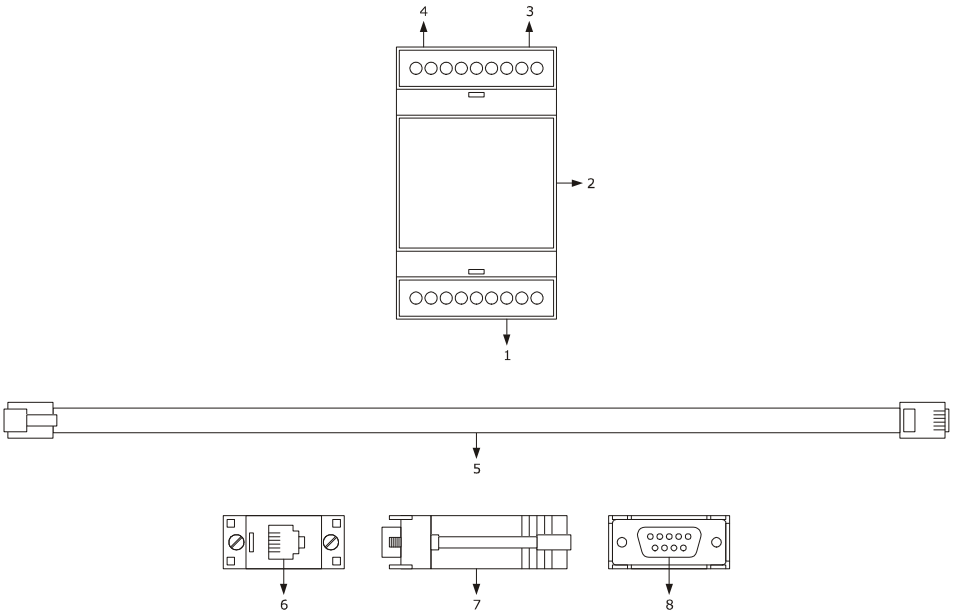
EVIF21RS7I is an optoisolated RS-485/RS-232 serial interface.

The interface can be used to connect the controller to the Parameters Manager set-up software system.

The Personal Computer must have a free COM port; to connect the driver via a USB port, the adapter must also be used from COM to USB 0810500011.

14.3.2 Description

The following drawing illustrates the aspect of the EVIF21RS7I.

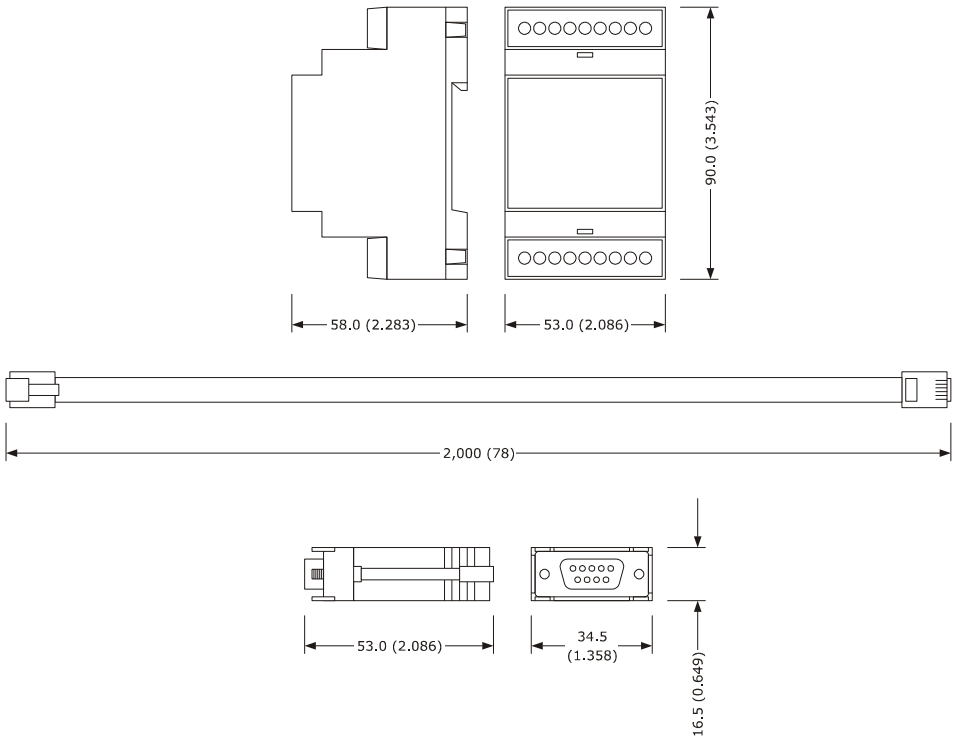


The following table illustrates the meaning of the EVIF21RS7I parts.

Part	Meaning
1	RS-485 type serial port
2	EVIF21RS7I
3	power supply
4	RS-232 type serial port
5	1256800042 telephone cable
6	RJ connector
7	1256800079 adapter
8	DB connector

14.3.3 Dimensions

The following drawing illustrates the EVIF21RS7I dimensions; these are expressed in mm (in).



14.3.4 Connection to the device

Operate as follows:

1. Make sure that parameter L0 is set at 0.
2. Cut the device power supply off.
3. Connect the device RD-485 serial port to the EVIF21RS7I RS-485 type serial port.
4. Insert one end of the telephone cable 1256800042 into the EVIF21RS7I RS-232 serial port.
5. Insert the other end of the telephone cable 1256800042 into the 1256800079 adapter RJ connector.
6. Connect the 1256800079 adapter DB connector to a Personal Computer COM, in which Parameters Manager is installed.
7. Connect the device power supply.

For further information, consult the documentation relative to Parameters Manager.

14.4 Phase cut speed regulator for single phase fans EVDFAN1

14.4.1 Introduction

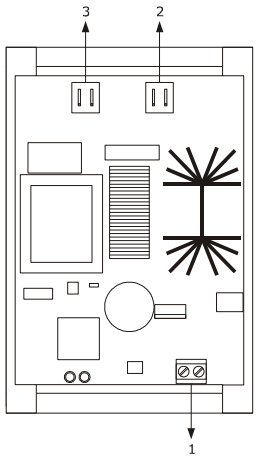
EVDFAN1 is a phase cut speed regulator for single phase fans.

The regulator control signal is the PWM type, the same supplied by the controller analogue output.

The maximum current allowed on the fan is 5 A.

14.4.2 Description

The following drawing illustrates the aspect of the EVDFAN1.

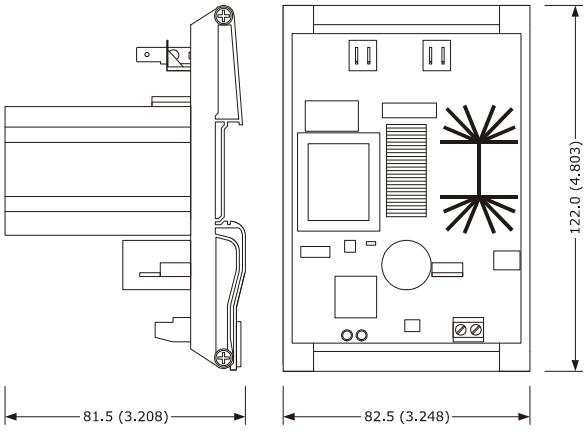


The following table illustrates the meaning of EVDFAN1 parts.

Part	Meaning
1	control signal input
2	power supply
3	phase cut output

14.4.3 Dimensions

The following drawing illustrates the EVDFAN1 dimensions; these are expressed in mm (in).



14.4.4 Connection to the device

Operate as follows:

1. Make sure that parameter F0 is set at 3.
2. Cut the device power supply off.
3. Cut the EVDFAN1 power supply off.
4. Connect the device PWM analogue output to the EVDFAN1 control signal input.

5. Connect the evaporator fan to the EVDFAN1 phase cut output.
6. Connect the device power supply.
7. Connect the EVDFAN1 power supply.

   In order to use EVDFAN1, the phase that powers the controller must be the same that powers EVDFAN1.

For further information, consult the documentation relative to EVDFAN1.

14.5 Print module PM 100A X9S001

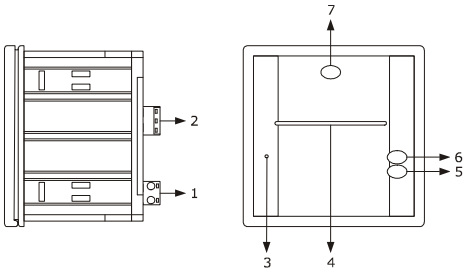
14.5.1 Introduction

PM 100A X9S001 is a print module.

Using the module, it is possible to print information relative to the temperatures detected by the probes, at the alarms and at the errors.

14.5.2 Description

The following drawing illustrates the aspect of the PM 100A X9S001.

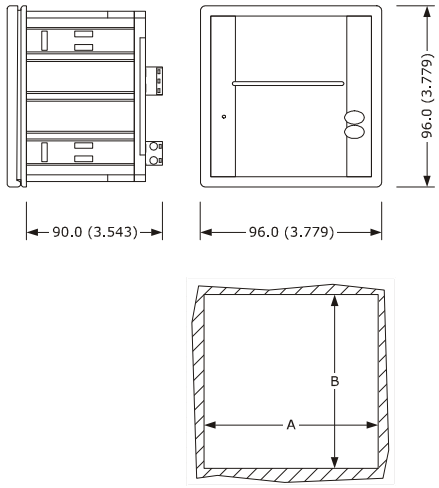


The following table illustrates the meaning of the PM 100A X9S001 parts.

Part	Meaning
1	power supply
2	RS-485 type serial port
3	On/stand-by LED
4	slot for paper advancement
5	slot for manual paper advancement
6	On/stand-by key
7	key for opening front panel

14.5.3 Dimensions

The following drawing illustrates the PM 100A X9S001 dimensions; these are expressed in mm (in).



Part	Minimum	Typical	Maximum
A	92,0 (3,622)	92,0 (3,622)	92,8 (3,653)
B	92,0 (3,622)	92,0 (3,622)	92,8 (3,653)

14.5.4 Connection to the device

Operate as follows:

1. Make sure that parameter L0 is set at 1.
2. Cut the device power supply off.
3. Disconnect the PM 100A X9S001 power supply.
4. Connect the device RD-485 serial port to the PM 100A X9S001 RS-485 type serial port.
5. Connect the device power supply.
6. Connect the PM 100A X9S001 power supply.

For further information, consult the documentation relative to PM 100A X9S001.

15 TECHNICAL DATA

15.1 Technical data

Purpose of the device:	blast chiller controller.	
Execution:	user interface	control module
	board without cover behind a Plexiglas sheet.	board without cover.
Dimensions:	user interface	control module
	340.0 x 84.0 x 36.5 mm (13.385 x 3.307 x 3.650 cm; L x H x P).	166.0 x 116.0 x 44.0 mm (6.535 x 4.566 x 4.399 cm; L x H x P).
Installation:	user interface	control module
	back panel via studs.	on flat surface, with spacers.
Protection rating:	user interface	control module
	IP65.	IP00.
Connections:	user interface	control module
	fixed screw terminal boards (control module).	removable screw terminal boards (user interface, power supply, inputs, outputs, except the output for compressor management and RS-485 serial port), faston measuring 6.3 mm (0.248 in, compressor management output), 6-pole connector (TTL serial port).
	The maximum length of the user interface - control module connection is 20 m (65.614 ft).	
Temperature of use:	from 0 to 55 °C (from 32 to 131 °F).	
Storage temperature:	from -25 to 60 °C (from -13 to 140 F).	
Humidity for use:	from 10% to 90% relative humidity without condensate.	

Pollution situation:	2.	
Power supply:	user interface	control module
	supplied from the control module.	115... 230 VAC (±15%), 50/ 60Hz (±3 Hz), 10 VA max.
Overvoltage category:	III.	
Clock:	incorporated (with condenser).	
	Battery autonomy in the event of a power-cut: 24 h with battery fully charged.	
	Battery charging time: 2 min (the battery is charged by the device power supply).	
Signal buzzer and alarm:	incorporated.	
Analogue inputs:	6 inputs (cabinet probe, "multipoint" needle probe with up to three sensors, evaporator probe and condenser probe) can be set via configuration parameter for PTC/NTC probes.	
	PTC type analogue inputs (990 Ω @ 25°C, 77°F) Type of sensor: Field of measurement: Resolution: Protection:	 KTY 81-121. from -50 to 150 °C (from -58 to 302°F). 1 °C (1 °F). none.
	NTC type analogue inputs (10K Ω @ 25°C, 77°F) Type of sensor: Field of measurement: Resolution: Protection:	 ß3435. from -40 to 105 °C (from -40 to 220°F). 1 °C (1 °F). none.
Digital inputs:	4 inputs (door micro switch, high pressure, low pressure and compressor circuit breaker protection), which can be set via configuration parameter due to normally open contact/normally closed contact (potential-free contact, 5 VDC, 2 mA)	
	Digital inputs Power supply: Protection:	 none. none.
Displays:	custom 3 + 4 + 1 digit display, with function icon.	
Analogue outputs:	1 PWM output for management of the evaporator fan.	

Digital outputs:	8 outputs (electromechanical relays): - 1 x 30 A res. output @ 250 VAC SPST type (K1) for compressor management - 6 x 8 A res. outputs @ 250 VAC of which five SPST type for managing defrosting (K2), the evaporator fan (K3), the condenser fan (K4), cabinet light or UV light (K7), the pump down valve or alarm output (K8) and one SPDT type for management of the door heating elements (K5) - 1 x 16 A res. output @ 250 VAC SPDT type (K6) for heating management of the needle probe.
Type of actions and complementary features:	1C.
Communication port:	2 ports: - 1 TTL type serial port - 1 RS-48 serial port with MODBUS communication protocol.

Notes

EVF818

Controller in split execution for temperature-controlled blast chillers (with capacitive touch-key user interface, which can be integrated into the unit)

Installer manual ver. 1.0

PT - 50 / 11

Code 144F818E104

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