

***Control for Blast chiller/Deep freezer***  
**EVCO**

CODE	DESCRIPTION					
	<i>Id Firmware</i>	<i>Interface</i>	<i>N° Probes</i>	<i>N° Relays</i>	<i>Inputs</i>	<i>Print Terminal Connection</i>
EVC80S10P7XXX00	prj295AA	HORIZONTAL	3	2	2	ABSENT
EVC80S10P7XXX02	prj295AA	HORIZONTAL	3	2	2	PRESENT
EVC80S11P7XXX00	prj295AC	VERTICAL	3	2	2	ABSENT
EVC80S11P7XXX02	prj295AC	VERTICAL	3	2	2	PRESENT
EVC80S10P7XXX01	prj295AB	HORIZONTAL	4	4	2	ABSENT
EVC80S11P7XXX01	prj295AD	VERTICAL	4	4	2	ABSENT
EVC80S10P7XXX03	prj295AE	HORIZONTAL	4	4	2	ABSENT
EVC80S10P7XXX04	prj295AF	HORIZONTAL	4	4	2	ABSENT

VERSION	DATE	DESCRIPTION	FIRMWARE ID	AUTHOR
Preliminary	17/05/06	First draught	prj295AA01,prj295AB01,prj295AC01, prj295AD01	M.P. Boscolo/ A. DePol
1.0	15/06/06		prj295AA02,prj295AB02,prj295AC02, prj295AD02	A. DePol
1.1	06/03/07		prj295AA02,prj295AB02,prj295AC02, prj295AD02, prj295AE03	A. DePol
1.2	29/05/07		prj295AA02,prj295AB02,prj295AC02, prj295AD02, prj295AE03, prj295AF04	A. DePol
1.3	28/06/07		prj295AA05,prj295AB05,prj295AC05, prj295AD05, prj295AE05, prj295AF05	A. DePol

**Description of modifications of the preliminary version to Ver. 1.2:**

1. Delay between two successive On modes of the Compressor parameter PC1 default 3 minutes.
2. Description of firmware identification
3. Defrosting/compressor output activation delay added Pd9.
4. FW Prj295AE03, manages door resistance and condenser fan, via two K3 and K4 relays added.
5. FW Prj295AF04, deriving from the Prj295AB02 with new default values of the Parameters map added.

**Description of modifications from Ver.1.2 to Ver.1.3:**

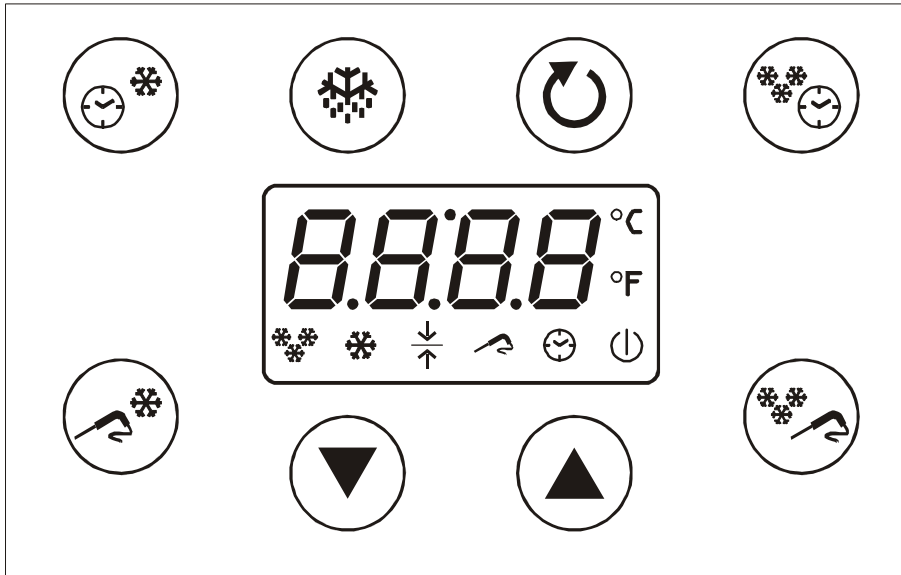
6. Hard blast chilling cycles added.

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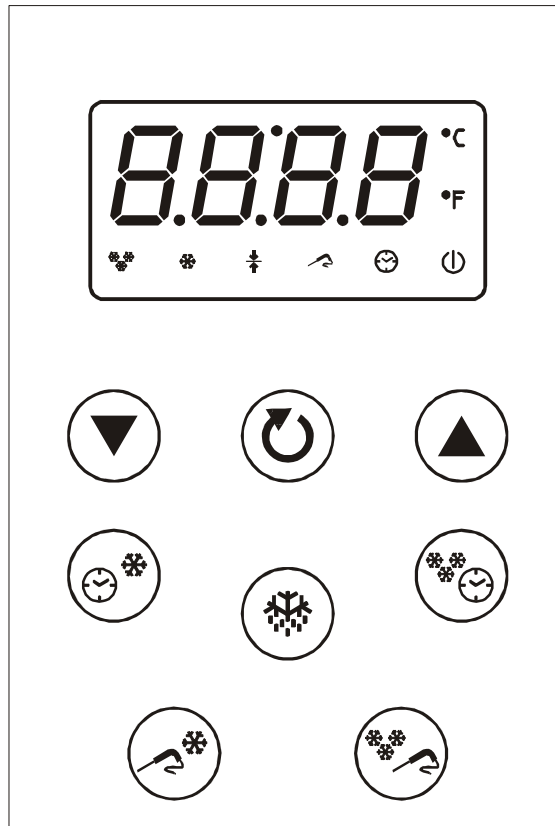
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# 1. USER INTERFACE









For codes EVC80S10P7XXX00 – EVC80S10P7XXX01 – EVC80S10P7XXX02 – EVC80S10P7XXX03-  
EVC80S10P7XXX04



For codes EVC80S11P7XXX00 – EVC80S11P7XXX01 – EVC80S11P7XXX02



## 1.1. Keys

SYMBOL	NAME
	ABBA-TEMPO KEY (BLAST CHILLING-TIME) key
	DEFROST key
	STANDBY key
	SURG-TEMPO (DEEP FREEZING-TIME) key
	ABBA-TEMPERATURA (BLAST CHILLING-TEMPERATURE) key
	DECREASE key
	INCREASE key
	SURG-TEMPERATURA (DEEP FREEZING-TEMPERATURE) key

### **STANDBY KEY**

With board in Off mode:

- a single press allows to put the board in standby

With board in standby and cycle selected:

- a single press allows to start the cycle

With board in cycle execution mode:

- a single press allows to block execution of the cycle

**NOTE:** In any state the board is found, continuous pressing for three seconds allows to put the board in Off mode.

### **BLAST CHILLING-TIME KEY**

With board in standby mode:

- a single press allows to select a timed SOFT/HARD blast chilling cycle

### **DEEP FREEZING-TIME KEY**

With board in standby mode:

- a single press allows to select a timed deep freezing cycle

### **BLAST CHILLING-TEMPERATURE KEY**

With board in standby mode:

- a single press allows to select a temperature SOFT/HARD blast chilling cycle

**DEEP FREEZING-TEMPERATURE KEY**

With board in standby mode:

- a single press allows to select a temperature deep freezing cycle

**DEFROST KEY**

With board in standby mode:

- a single press allows to start a defrosting cycle

**DECREASE KEY**

Allows to decrease a value

**INCREASE KEY**







Allows to increase a value

NOTE: The INCREASE and DECREASE keys can be replaced by an encoder.

**1.2. Display**

Viewing is entrusted to a display, which contains four digits that can be switched-on in red or green and also eight icons. For simplicity, successively the four digits will be identified as "display" and the icons will be identified independently.

**1.2.1. Icons**

<i>SYMBOL</i>	<i>DESCRIPTION</i>
	DEEP FREEZING icon
	BLAST CHILLING icon
	PRESERVATION icon
	TEMPERATURE icon
	TIME icon
	OFF icon
°F	FAHRENHEIT icon
°C	CELSIUS icon

**DEEP FREEZING ICON**

It flashes during a deep freezing cycle and is on during successive preservation.

**BLAST CHILLING ICON**

It flashes during a blast chilling cycle and is on during successive preservation.

**PRESERVATION ICON**

It is on or flashing during a preservation cycle.

**TEMPERATURE ICON**

It is on during a temperature cycle.

**TIME ICON**

It is on during a time cycle.

**OFF ICON**

It is on when the board is off, off in all other states.

**FAHRENHEIT ICON**

It is on in red or green, depending on the colour of the display, if a temperature is displayed and if the unit of measurement is the degree Fahrenheit.

**CELSIUS ICON**

It is on in red or green, depending on the colour of the display, if a temperature is displayed and if the unit of measurement is the degree Celsius.

**1.2.2. Display**

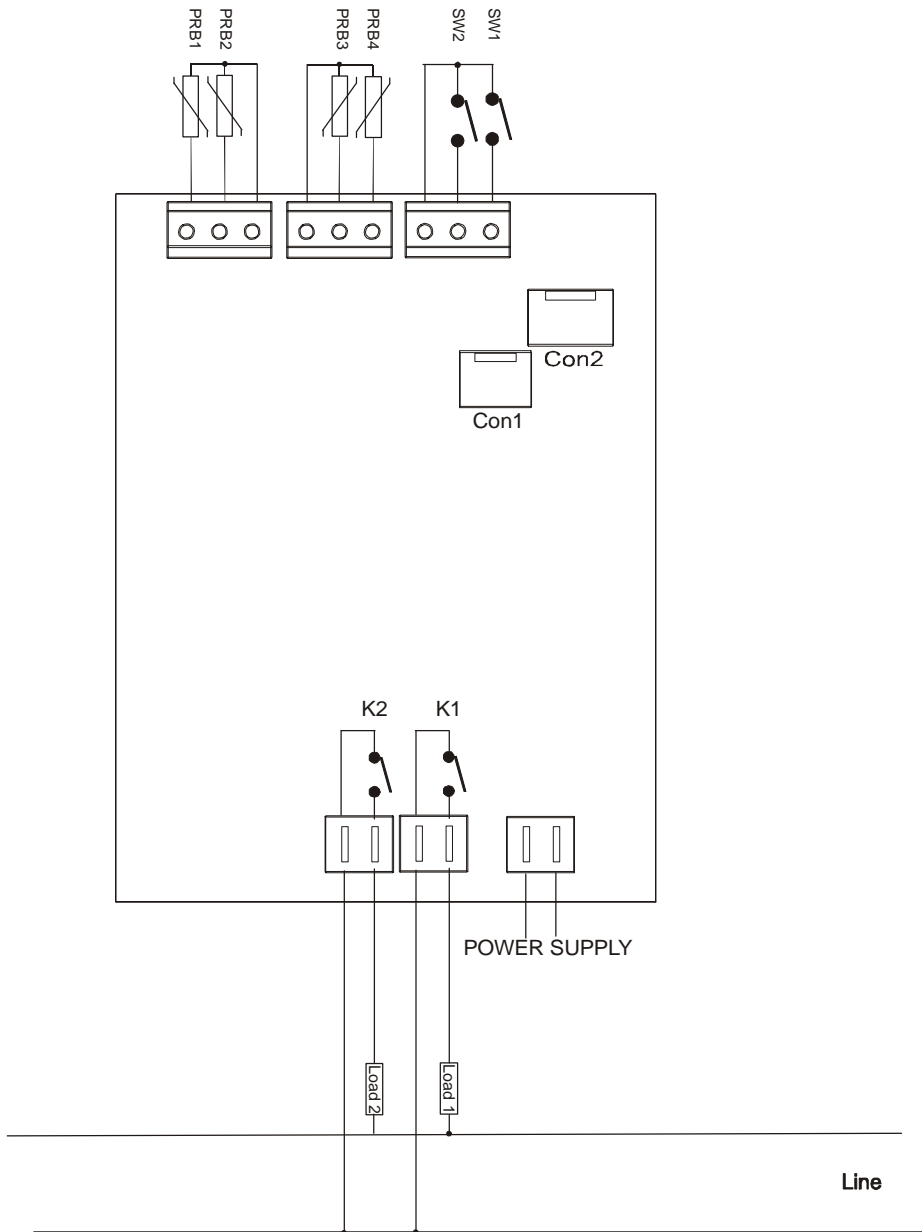
The four digits on the display can be on in red or green.

See the following paragraphs for the detail of the displays.

NOTE: The labels are displayed compatibly with the features of the display itself.

## 2. CONNECTIONS LAYOUT

For codes EVC80S10P7XXX00 – EVC80S11P7XXX00



**Power supply (Tab. 1)**

NAME	DESCRIPTION	TYPE
POWER SUPPLY	POWER SUPPLY	230VAC +10/-15% 50/60Hz

**Outputs (Tab. 2)**

NAME	DESCRIPTION	TYPE
K1 (Load1)	COMPRESSOR	12A AC1 SPST 30A AC1 SPST <i>only</i> EVC80S10P7XXX03
K2 (Load2)	EVAPORATOR FANS	12A AC1 SPST

Con1	OPTIONAL CONNECTOR FOR BUZZER	---
Con2	OPTIONAL CONNECTOR FOR ENCODER	---

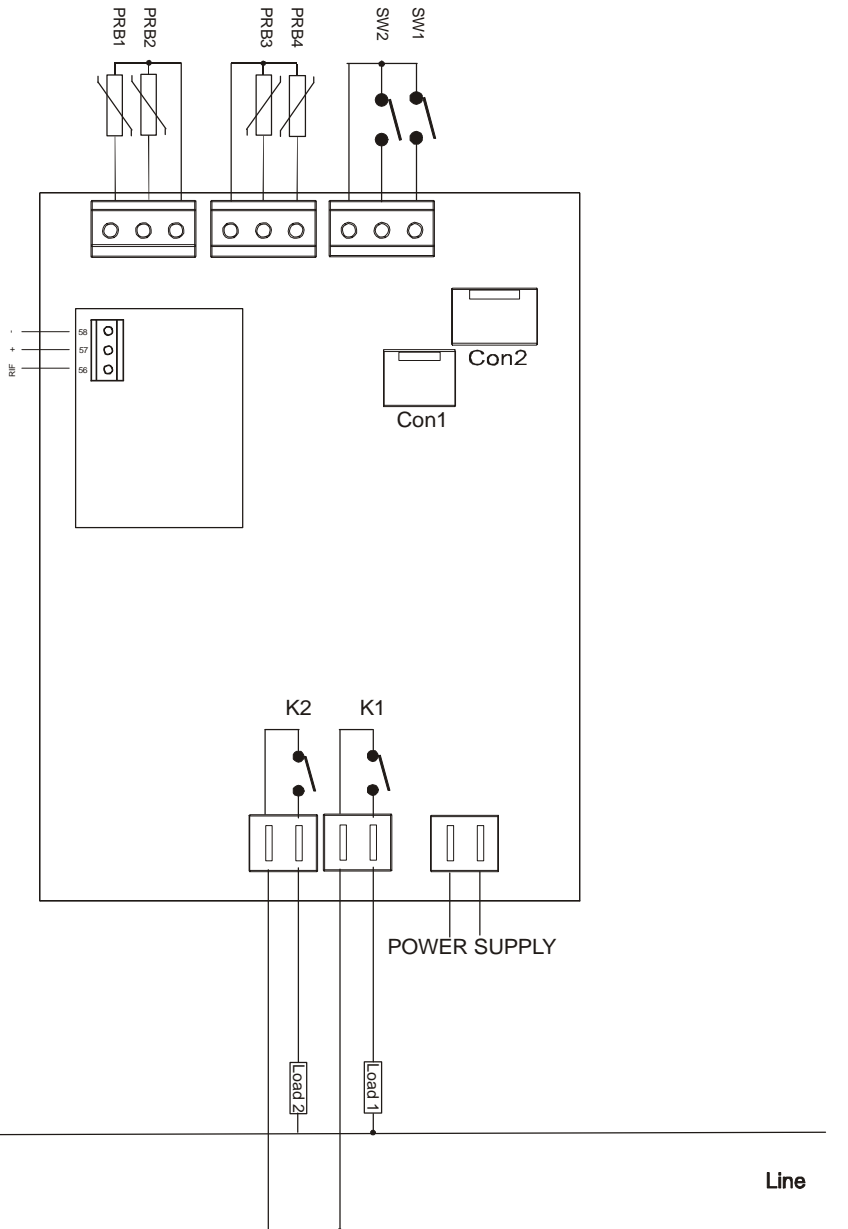
### Digital Inputs (Tab. 3)

<i>NAME</i>	<i>DESCRIPTION</i>	<i>TYPE</i>
SW1	HIGH PRESSURE INPUT	Potential-free Contact
SW2	DOOR MICRO SWITCH INPUT	Potential-free Contact

### Analogue Inputs (Tab. 4)

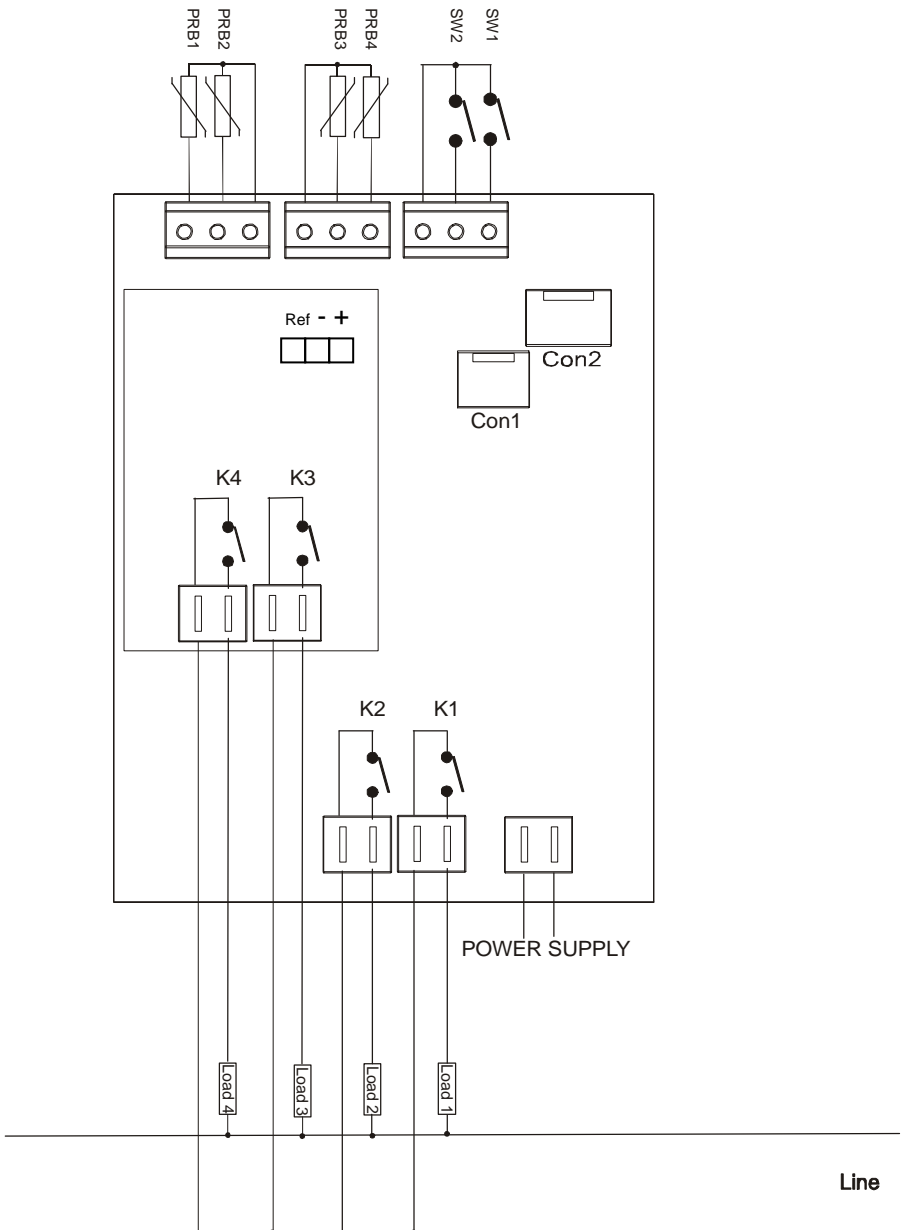
<i>NAME</i>	<i>DESCRIPTION</i>	<i>TYPE</i>	<i>RANGE</i>
PRB1	NEEDLE PROBE	PTC	-55°C – 100°C
PRB2	CELL PROBE	PTC	-55°C – 100°C
PRB4	EVAPORATOR PROBE	PTC	-55°C – 100°C

**For codes EVC80S10P7XXX02 – EVC80S11P7XXX02**



For the connections, refer to Tab.1, Tab.2, Tab.3 and Tab.4. For the connection to the print terminal, use the clamps identified as REF,+ and – that correspond to the RS485 output.

**For codes EVC80S10P7XXX01 – EVC80S11P7XXX01 – EVC80S10P7XXX03- EVC80S10P7XXX04**



For the connections, refer to Tab.1, Tab.2, Tab.3. For the meaning of K3 and K4 and PRB3 refer to the following tables. For the MODBUS communication connection, use the clamps identified as REF,+ and – that correspond to the RS485 output.

### Analogue Inputs

NAME	DESCRIPTION	TYPE	RANGE
PRB1	NEEDLE PROBE	PTC	-55°C – 100°C
PRB2	CELL PROBE	PTC	-55°C – 100°C
PRB3	CONDENSER PROBE	PTC	-55°C – 100°C
PRB4	EVAPORATOR PROBE	PTC	-55°C – 100°C

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**Outputs**

*For codes EVC80S10P7XXX01 – EVC80S11P7XXX01 – EVC80S10P7XXX04*

<i>NAME</i>	<i>DESCRIPTION</i>	<i>TYPE</i>
K3 (Load3)	DEFROSTING	8A AC1 SPST
K4 (Load4)	CONDENSER FANS/DOOR RESISTANCE	8A AC1 SPST

*For codes EVC80S10P7XXX03*

<i>NAME</i>	<i>DESCRIPTION</i>	<i>TYPE</i>
K3 (Load3)	DOOR RESISTANCE	8A AC1 SPST
K4 (Load4)	CONDENSER FANS	8A AC1 SPST

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## 3. GENERAL DESCRIPTION

The board supplies a control for the Blast chillers/Deep freezers guaranteeing Blast chilling/Deep freezing cycles with product core temperature control and simple timed cycles. Every Blast chilling/Deep freezing cycle is followed by a preservation cycle. A manual and/or automatic defrosting cycle is available. If the configuration selected allows, it is possible to connect a print terminal on-line for the temperature values and alarms.

## 4. POWER SUPPLY

When the board is powered, a two-second lamp-test follows. On completion it goes back to the state it was found in before power was removed. The states allowed are OFF, STANDBY and CYCLE EXECUTION.

## 5. OFF

In Off mode, the display and the icons are off with exception of the OFF icon, which indicates that the board is live. All outputs are disabled.

The following keys are enabled in OFF mode:

- the STANDBY key to put the board in Standby
- the DEFROST and STANDBY keys, with continuous pressing for three seconds, to enable access to parameters programming (paragraph 25),
- the BLAST CHILLING-TEMPERATURE key, with continuous pressing for three seconds, to enable access to firmware identification (paragraph 34),
- the BLAST CHILLING-TIME key, with continuous pressing for three seconds, to enable access to the setting procedure for the report print-off initialisation string (paragraph 31).
- the DEFROST key, with continuous pressing for three seconds, to enable access to temperature display (paragraph 32),
- the BLAST CHILLING-TIME and DEEP FREEZING-TIME keys, with continuous pressing for three seconds, to enable access to clock setting (paragraph 33).

## 6. STANDBY

In Standby the display shows the temperature of the cell probe in red. The OFF icon switches off.

The following keys are enabled in standby mode:

- the BLAST CHILLING-TEMPERATURE key to select a timed SOFT/HARD blast chilling cycle
- the DEEP FREEZING-TEMPERATURE key to select a temperature deep freezing cycle
- the BLAST CHILLING-TIME key for selecting timed SOFT/HARD blast chilling
- the DEEP FREEZING-TIME key to select a timed deep freezing cycle
- the DEFROST key to start a defrosting cycle with ventilation
- the STANDBY key to start the execution of the cycle selected

## 7. SELECTION OF A TEMPERATURE SOFT BLAST CHILLING CYCLE

With board in standby, press the BLAST CHILLING-TEMPERATURE key, **SOFT** appears, the TEMPERATURE icon and the BLAST CHILLING icon flash. **After 3 seconds** the display shows the temperature set point in red for the cell probe during blast chilling, given by the parameter Pr1. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the BLAST CHILLING-TEMPERATURE key confirms the value set and displays the product temperature set point given by the parameter Pr6, the BLAST CHILLING icon remains on with fixed light, while the TEMPERATURE icon continues to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the set point value. Pressing the BLAST CHILLING-TEMPERATURE key confirms the value and displays the cell temperature set point during preservation given by the parameter Pr2, the BLAST CHILLING icon remains on with fixed light, while the PRESERVATION icon and the TEMPERATURE icons continue to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the BLAST CHILLING-TEMPERATURE key confirms the new value.

The new set points set are not saved, they only remain active until a different cycle is selected. The STANDBY key can be pressed at any time to start the execution of the cycle.

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## **8. SELECTION OF A TEMPERATURE HARD BLAST CHILLING CYCLE**

With board in standby, press the BLAST CHILLING-TEMPERATURE key, SOFT will appear and on pressing the BLAST CHILLING-TEMPERATURE key again, HARD appears, the TEMPERATURE icon, the BLAST FEEDING icon and the DEEP FREEZING icons flash. After 3 seconds, the display shows the temperature set point in red for the cell probe during the HARD phase, given by the Pr5 parameter. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the BLAST CHILLING-TEMPERATURE key confirms the value set and displays the product temperature set point given by the parameter Pr8, the BLAST CHILLING and DEEP FREEZING icon remains on with fixed light, while the TEMPERATURE icon continues to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the set point value. Pressing the BLAST CHILLING-TEMPERATURE key confirms the value and displays the cell temperature set point during preservation given by the parameter Pr2, the BLAST CHILLING icon and DEEP FREEZING icon remain on with fixed light, while the PRESERVATION icon and the TEMPERATURE icons continue to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the BLAST CHILLING-TEMPERATURE key confirms the new value.

The new set points set are not saved, they only remain active until a different cycle is selected. The STANDBY key can be pressed at any time to start the execution of the cycle.

## **9. SELECTION OF A TEMPERATURE DEEP FREEZING CYCLE**

With board in standby, press the BLAST CHILLING-TEMPERATURE key, the TEMPERATURE icon and the DEEP FREEZING icon flash. After 3 seconds, the display shows the temperature set point in red for the cell probe during deep freezing, given by the parameter P3. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the DEEP FREEZING-TEMPERATURE key confirms the value set and displays the product temperature set point given by the parameter Pr7. The DEEP FREEZING icon remains on with fixed light, while the TEMPERATURE icon continues to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the set point value. Pressing the DEEP FREEZING-TEMPERATURE key confirms the value and displays the cell temperature set point during preservation given by the parameter Pr4. the DEEP FREEZING icon remains on with fixed light, while the PRESERVATION icon and the TEMPERATURE icons continue to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the DEEP FREEZING-TEMPERATURE key confirms the new value.

The new set points set are not saved, they only remain active until a different cycle is selected. The STANDBY key can be pressed at any time to start the execution of the cycle.

## **10. SELECTION OF A TIMED SOFT BLAST CHILLING CYCLE**

With board in standby, press the BLAST CHILLING-TIME key, SOFT appears, the TIME icon and the BLAST CHILLING icon flash. After 3 seconds the display shows the temperature set point in red for the cell probe during blast chilling, given by the parameter Pr1. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the BLAST CHILLING-TIME key confirms the value set and displays the duration of the cycle given by the parameter Pt0. The BLAST CHILLING icon remains on with fixed light, while the TIME icon continues to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the duration of the cycle. Pressing the BLAST CHILLING-TIME key confirms the value and displays the cell temperature set point during preservation given by the parameter Pr2. The BLAST CHILLING icon remains on with fixed light, while the PRESERVATION icon and the TIME icons continue to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the BLAST CHILLING-TIME key confirms the new value.

The new set points set are not saved, they only remain active until a different cycle is selected. The STANDBY key can be pressed at any time to start the execution of the cycle.

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## **11. SELECTION OF A TIMED HARD BLAST CHILLING CYCLE**

With board in standby, press the BLAST CHILLING-TIME key, SOFT will appear and on pressing the BLAST CHILLING-TEMPERATURE key again, HARD appears. The TIME icon, the BLAST CHILLING icon and the DEEP FREEZING icons flash. After 3 seconds, the display shows the temperature set point in red for the cell probe during blast chilling, given by the parameter Pr5 . Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the BLAST CHILLING-TIME key confirms the value set and displays the duration of the HARD phase given by the parameter Pt2. The BLAST CHILLING and DEEP FREEZING icons remain on with fixed light, while the TIME icon continues to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the duration of the cycle. Pressing the BLAST CHILLING-TIME key confirms the value and displays the cell temperature set point during preservation given by the parameter Pr2. The BLAST CHILLING icon and DEEP FREEZING icon remain on with fixed light, while the PRESERVATION icon and the TIME icons continue to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the BLAST CHILLING-TIME key confirms the new value.

The new set points set are not saved, they only remain active until a different cycle is selected. The STANDBY key can be pressed at any time to start the execution of the cycle.

## **12. SELECTION OF A TIMED DEEP FREEZING CYCLE**

With board in standby, press the DEEP FREEZING-TIME key. The TIME icon and the DEEP FREEZING icon flash. The display shows the temperature set point in red for the cell probe during blast chilling, given by the parameter Pr3. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the DEEP FREEZING-TIME key confirms the value set and displays the duration of the cycle given by the parameter Pt1. The DEEP FREEZING icon remains on with fixed light, while the TIME icon continues to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the duration of the cycle. Pressing the DEEP FREEZING-TIME key confirms the value and displays the cell temperature set point during preservation given by the parameter Pr4, the DEEP FREEZING icon remains on with fixed light, while the PRESERVATION icon and the TIME icons continue to flash. Using the INCREASE and DECREASE keys (or using the ENCODER) it is possible to modify the value. Pressing the DEEP FREEZING-TIME key confirms the new value.

The new set points set are not saved, they only remain active until a different cycle is selected. The STANDBY key can be pressed at any time to start the execution of the cycle.

## **13. EXECUTION OF A TEMPERATURE CYCLE**

After having selected a cycle, whether it is blast chilling or deep freezing, pressing the STANDBY key allows to start the execution. The BLAST CHILLING or DEEP FREEZING icon flashes. The TEMPERATURE icon is on with fixed light, while the PRESERVATION and TIME icons are off.

The display shows the temperature of the product probe in red. During the blast chilling/deep freezing phase, it is always possible to display the temperature of the cell probe. By pressing the BLAST CHILLING-TEMPERATURE and the DEEP FREEZING-TEMPERATURE key, the cell probe temperature is displayed in green for 5 seconds. By pressing the BLAST CHILLING-TIME and the DEEP FREEZING-TIME keys, the duration of blast chilling/deep freezing is displayed for 5 seconds. The time is displayed in minutes or hours and minutes, on the basis of the selection with the parameter P8.

The blast chilling/deep freezing cycle ends when the temperature of the core probe reaches the set point. Preservation begins at this point. The BLAST CHILLING or DEEP FREEZING icon switches on with a fixed light, while the PRESERVATION icon flashes and the buzzer, if present, sounds intermittently for the time defined by the parameter P7. Pressing any key silences the buzzer and the PRESERVATION icon switches on with a fixed light. The display shows the temperature of the cell probe in red. The maximum time allowed for the product probe to reach the set point is fixed by the parameters Pt0, for blast chilling and Pt1 for deep freezing. If these times are exceeded, when passing to preservation mode, the display shows the cell probe temperature in red, while the TIME icon flashes to indicate the time has been exceeded.

Pressing the BLAST CHILLING-TIME key or the DEEP FREEZING-TIME key allows to display the total time used during the blast chilling/deep freezing phase.

The STANDBY key can be pressed all times to block the execution of the cycle. The cycle remains selected, the next press of the STANDBY key starts the execution of the cycle, which re-starts from the beginning. To unselect the cycle, just select a different cycle or press any of the BLAST CHILLING-TEMPERATURE, DEEP FREEZING-TEMPERATURE, BLAST CHILLING-TIME and DEEP FREEZING-TIME keys for three seconds. In this case everything is unselected.

For details regarding the management of compressor and ventilation, see paragraphs 18 and 19.

## 14. EXECUTION OF A TEMPERATURE HARD BLAST CHILLING CYCLE

After having selected a hard blast chilling cycle, pressing the STANDBY key allows to start the execution. The BLAST CHILLING icon and the DEEP FREEZING icon flash. The TEMPERATURE icon is on fixed, while the PRESERVATION and TIME icons are off.

The display shows the temperature of the product probe in red.

During the blast chilling phase, it is always possible to display the temperature of the cell probe. By pressing the BLAST CHILLING-TEMPERATURE key, the cell probe temperature is displayed in green for 5 seconds. By pressing the BLAST CHILLING-TIME key the duration of blast chilling is displayed for 5 seconds. The time is displayed in minutes or hours and minutes, on the basis of the selection with the parameter P8.

A hard cycle is made up from two phases. The first point envisions a very low regulation set point for the cell probe, given by the parameter Pr5, in a way to maximise blast chilling of the temperature. The next phase envisions a set point for the cell probe given by the parameter Pr1. The first phase ends when the product probe reaches the set point given by the parameter Pr8, while the second phase ends when the product probe reaches the set point given by parameter Pr6.

When the first phase ends, the DEEP FREEZING icon switches-on with a fixed light, while the BLAST CHILLING icon continues to flash. When the second phase has terminated, the cycle is considered concluded and the preservation phase starts. The DEEP FREEZING icon and the BLAST CHILLING icon switch on with a fixed light, while the PRESERVATION icon flashes and the buzzer, if present, sounds intermittently for the time defined by the parameter P7.

Pressing any key silences the buzzer and the PRESERVATION icon switches on with a fixed light. The display shows the temperature of the cell probe in red.

During the preservation phase, the regulation set point for the cell probe is given by the parameter Pr2.

The maximum time allowed to complete the two phases is given by the parameter Pt0. If this time is exceeded, when passing to preservation mode, the display shows the cell probe temperature in red, while the TIME icon flashes to indicate the time has been exceeded.

Pressing the BLAST CHILLING-Time key allows to display the total time used during the blast chilling phase. The STANDBY key can be pressed all times to block the execution of the cycle. The cycle remains selected, the next press of the STANDBY key starts the execution of the cycle, which re-starts from the beginning. To unselect the cycle, just select a different cycle or press any of the BLAST CHILLING-TEMPERATURE, DEEP FREEZING-TEMPERATURE, BLAST CHILLING-TIME and DEEP FREEZING-TIME keys for three seconds. In this case everything is unselected.

For details regarding the management of compressor and ventilation, see paragraphs 18 and 19.

## 15. CONTROL NEEDLE INSERTION

When a temperature cycle is selected and executed, a control is made on the trends of the product temperature probe and cell probe to evaluate the effective insertion of the product probe.

The control is performed in two phases, the first with a control on the difference between the temperature of the cells probe and the temperature of the product probe. The second phase, evaluates how the product probe temperature drops.

- **First Phase**

Five comparisons are made between the temperatures of the cell and needle. If at least three comparisons respect the following relationship, the needle can be considered inserted.

$$|T_{\text{needle}} - T_{\text{cell}}| > \text{Pr11}$$

The duration of this phase is about 50 seconds, as each sampling is performed at a frequency of 10 seconds.

- **Second Phase**

If the comparisons made in the first phase do not give a result, the second phase is performed, which verifies that the temperature variation between outside and inside of the product increases. The relation is the following:

$$|\Delta_{\text{Current}} - \Delta_{\text{Prev}}| > 1^{\circ}\text{C}$$

---

where

$$\Delta_{\text{Current}} = | T_{\text{current needle}} - T_{\text{current cell}} |$$

$$\Delta_{\text{Prev}} = | T_{\text{prev needle}} - T_{\text{prev cell}} |$$

The duration of this test is fixed via parameter Pr12. Eight measurements are taken with a frequency equal to one eighth of Pr12. The needle is considered inserted when, in at least six cases, the previous relationship is respected.

The needle insertion control can be disabled by putting the parameter Pr10 at zero.

If the needle results inserted after the execution of the test, the cycle continue normally. Whenever the test result should be negative, the display shows the "AL 4" label in red alternately with the current display. The TEMPERATURE icon flashes and the buzzer, if present, makes an intermittent noise with one beep of five seconds every 15. The user can decide whether to continue with the temperature cycle by pressing the BLAST CHILLING-TEMPERATURE or DEEP FREEZING-TEMPERATURE key. In this case the "AL 4" label disappears and the TEMPERATURE icon stops flashing. The user can decide to continue with a timed cycle by pressing the BLAST CHILLING-TIME or DEEP FREEZING-TIME key. In this case the "AL 4" label disappears, the TEMPERATURE icon switches-off and the TIME icon switches-on. The duration of this cycle is that given by the parameter Pt0 for a SOFT/HARD blast chilling cycle or by the Pt1 parameter for a deep freezing cycle.

If after one minute from the signal not inserted signal, the user has not made any choice, the passage is made to a timed cycle automatically.

If the needle is considered not inserted during hard blast chilling, the cycle is divided into two phases, whose duration is no longer given by the trend of the product probe. The first phase has duration fixed by the parameter Pt2, while the second phase has duration given by the difference between Pt0 and Pt2.

## 16. EXECUTION OF A TIMED CYCLE

After having selected a cycle, whether it is blast chilling or deep freezing, pressing the STANDBY key allows to start the execution. The BLAST CHILLING or DEEP FREEZING icons flash. The TIME icon is on with fixed light, while the PRESERVATION and TEMPERATURE icons are off.

The display shows the temperature of the cell probe in red. During the blast chilling/deep freezing phase, it is always possible to display the temperature of the product probe. By pressing the BLAST CHILLING-TEMPERATURE and the DEEP FREEZING-TEMPERATURE key, the product probe temperature is displayed in green for 5 seconds. By pressing the BLAST CHILLING-TIME and the DEEP FREEZING-TIME keys, the duration of blast chilling/deep freezing is displayed for 5 seconds. The time is displayed in minutes or hours and minutes, on the basis of the selection with the parameter P8.

The blast chilling/deep freezing cycle ends when the time set as duration of the blast chilling/deep freezing phase has passed. Preservation begins at this point. The BLAST CHILLING or DEEP FREEZING icon switches on with a fixed light, while the PRESERVATION icon flashes and the buzzer, if present, rings intermittently for the time defined by the parameter P7. Pressing any key silences the buzzer and the PRESERVATION icon switches on with a fixed light. The display shows the temperature of the cell probe in red. Pressing the BLAST CHILLING-TIME key or the DEEP FREEZING-TIME key allows to display the total time used during the blast chilling/deep freezing phase.

The STANDBY key can be pressed all times to block the execution of the cycle. The cycle remains selected.

The STANDBY key can be pressed all times to block the execution of the cycle. The cycle remains selected, the next press of the STANDBY key starts the execution of the cycle, which re-starts from the beginning. To unselect the cycle, just select a different cycle or press any of the BLAST CHILLING-TEMPERATURE, DEEP FREEZING-TEMPERATURE, BLAST CHILLING-TIME and DEEP FREEZING-TIME keys for three seconds. In this case everything is unselected.

For details regarding the management of compressor and ventilation, see the 18 and 19 paragraphs.

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## **17. EXECUTION OF A TIMED HARD BLAST CHILLING CYCLE**

After having selected the hard blast chilling cycle, pressing the STANDBY key allows to start the execution. The BLAST CHILLING and DEEP FREEZING icons flash. The TIME icon is on fixed, while the PRESERVATION and TEMPERATURE icons are off.

The display shows the temperature of the cell probe in red. During the blast chilling phase, it is always possible to display the temperature of the product probe. By pressing the BLAST CHILLING-TEMPERATURE key, the product probe temperature is displayed in green for 5 seconds. By pressing the BLAST CHILLING-TIME key the duration of blast chilling is displayed for 5 seconds. The time is displayed in minutes or hours and minutes, on the basis of the selection with the parameter P8.

A hard cycle is made up from two phases. The first point envisions a very low regulation set point for the cell probe, given by the parameter Pr5, in a way to maximise blast chilling of the temperature. The next phase envisions a set point for the cell probe given by the parameter Pr1. The first phase ends when the time set as duration of the hard blast chilling phase has passed Pt2, while the second phase ends when the remaining Pt0 time less Pt2 has passed.

Preservation begins at this point. The DEEP FREEZING icon and the BLAST CHILLING icon switch on with a fixed light, while the PRESERVATION icon flashes and the buzzer, if present, rings intermittently for the time defined by the parameter P7.

Pressing any key silences the buzzer and the PRESERVATION icon switches on with a fixed light. The display shows the temperature of the cell probe in red.

During the preservation phase, the regulation set point for the cell probe is given by the parameter Pr2.

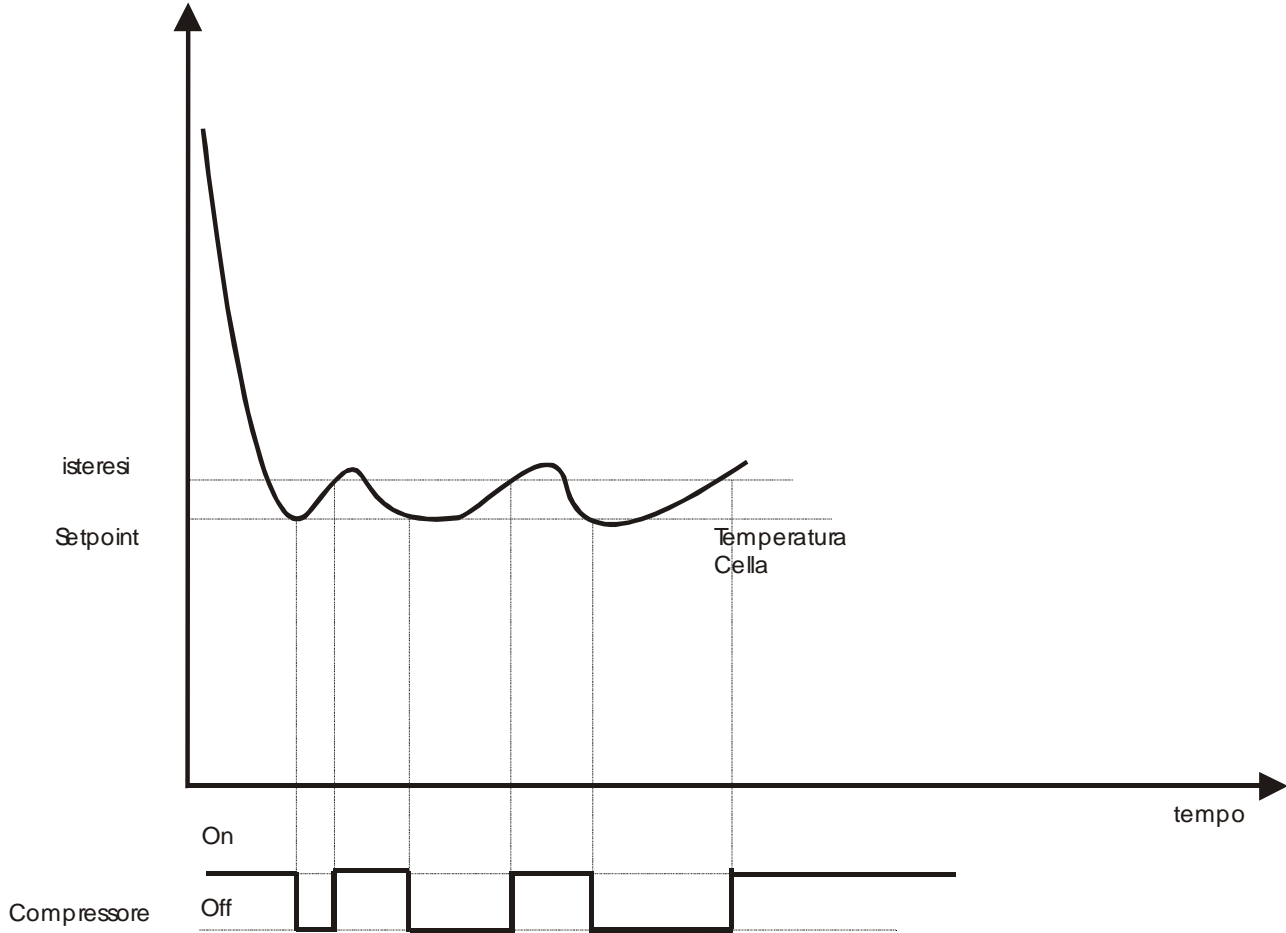
The maximum time allowed to complete the two phases is given by the parameter Pt0. If this time is exceeded, when passing to preservation mode, the display shows the cell probe temperature in red, while the TIME icon flashes to indicate the time has been exceeded.

Pressing the BLAST CHILLING-Time key allows to display the total time used during the blast chilling phase. The STANDBY key can be pressed all times to block the execution of the cycle. The cycle remains selected, the next press of the STANDBY key starts the execution of the cycle, which re-starts from the beginning. To unselect the cycle, just select a different cycle or press any of the BLAST CHILLING-TEMPERATURE, DEEP FREEZING-TEMPERATURE, BLAST CHILLING-TIME and DEEP FREEZING-TIME keys for three seconds. In this case everything is unselected.

For details regarding the management of compressor and ventilation, see paragraphs 18 and 19.

## 18. COMPRESSOR MANAGEMENT

Compressor management is ON-OFF. Thermostatting is carried out on the basis of the temperature of the cell probe with respect to the set point set for blast chilling, deep freezing and preservation. The activation/deactivation state of the compressor is given in the following graphics.

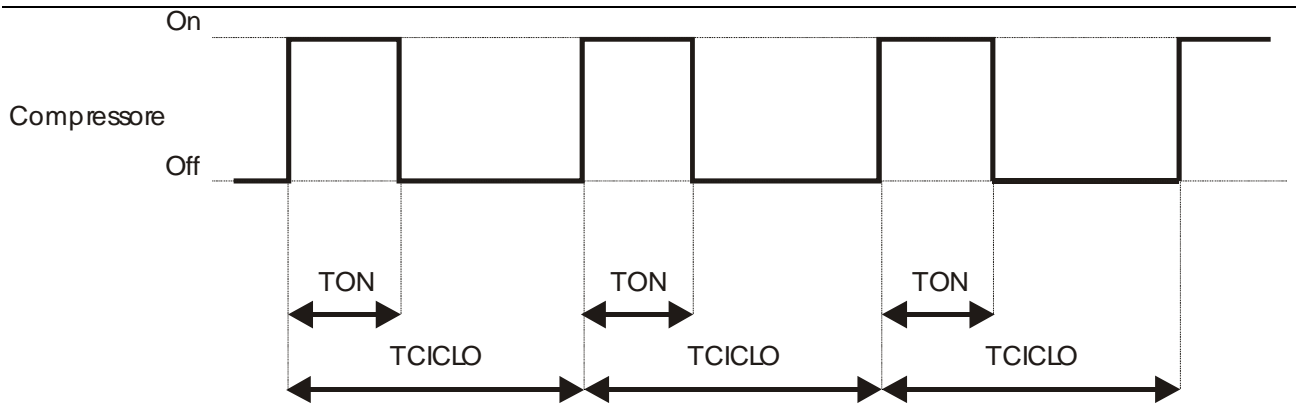


where:

- Set point is the value of the cell set point set
- Hysteresis is the value of the parameter Pr0 .

Compressor switch-on is subject to the safety times set with the PC0, PC1 and PC2 parameters. The parameter PC0 defines a minimum delay time for compressor switch-on from board power on. The parameter PC1 defines the minimum time that must pass between one activation and the next and the parameter PC2 defines the minimum time that must pass between one deactivation and the next reactivation of the compressor.

Whenever the cell probe is in alarm mode during blast chilling/deep freezing phase, the cycle is interrupted (see paragraph 30). If the cell probe alarm occurs during preservation the cycle continues but compressor management is performed at On and Off cycles defined by parameters PC3, PC4 and PC5 according to the following graphics.



where:

- T ON corresponds to the value of parameter PC4 for preservation successive to blast chilling or the parameter PC5 for preservation successive to deep freezing.
- T CICLO corresponds to the value of the parameter PC3.

Note: The T ON and T OFF times must be over the parameters PC1 and PC2 protection times.

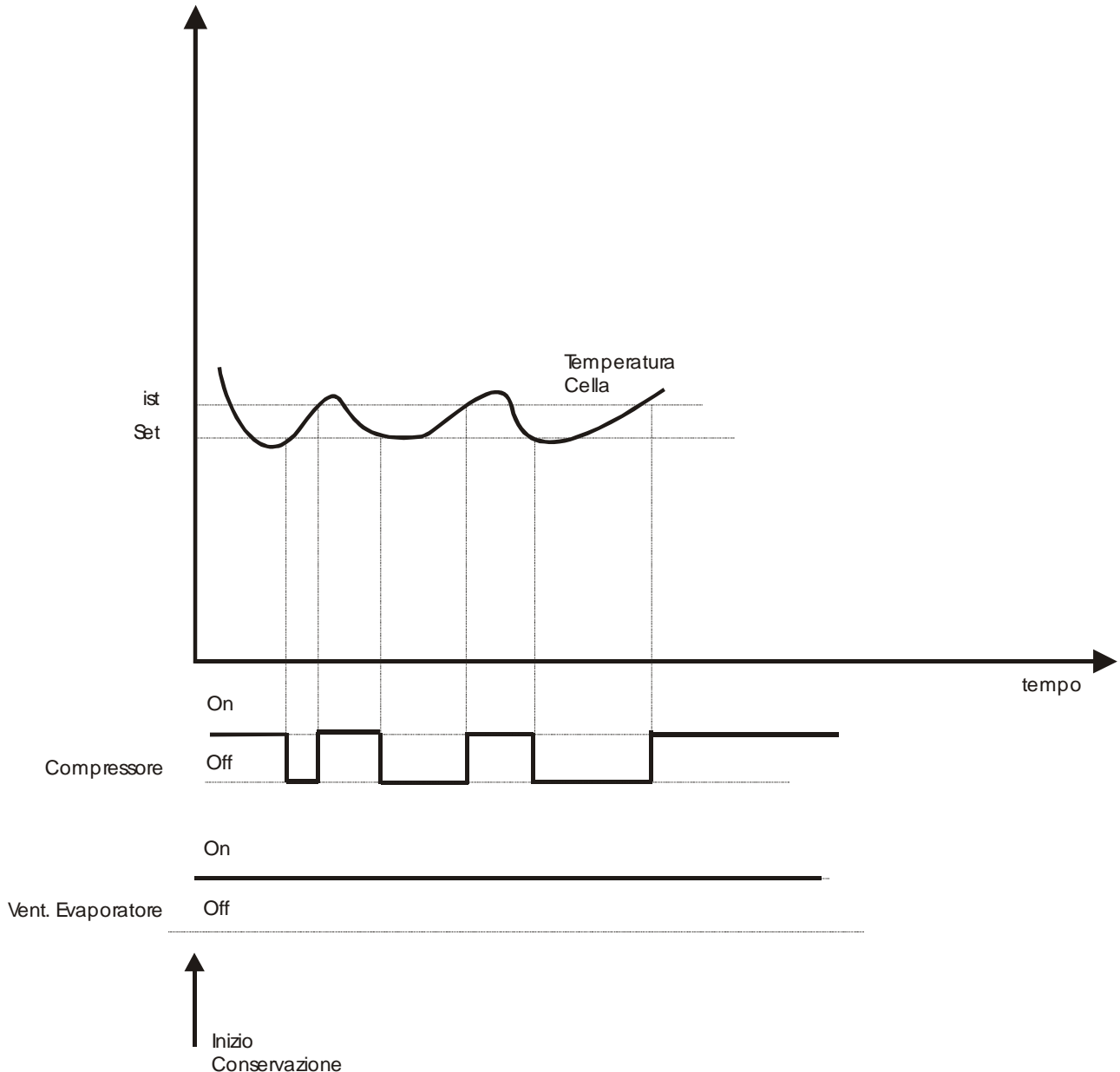
## 19. EVAPORATOR FANS MANAGEMENT

Management of the evaporator fans differs if blast chilling/deep freezing/hard blast chilling or preservation is in execution.

In blast chilling, deep freezing and hard, the fans are active, independently from the state of the compressor, if the temperature of the cell probe is lower than the parameter PF1. During preservation, management is linked to the value of the P3, PF0, PF2 and PF3 parameter.

The management is the following:

- ***P3 = 0 (evaporator probe not present) and PF0 = 0 (fans released from compressor state)***

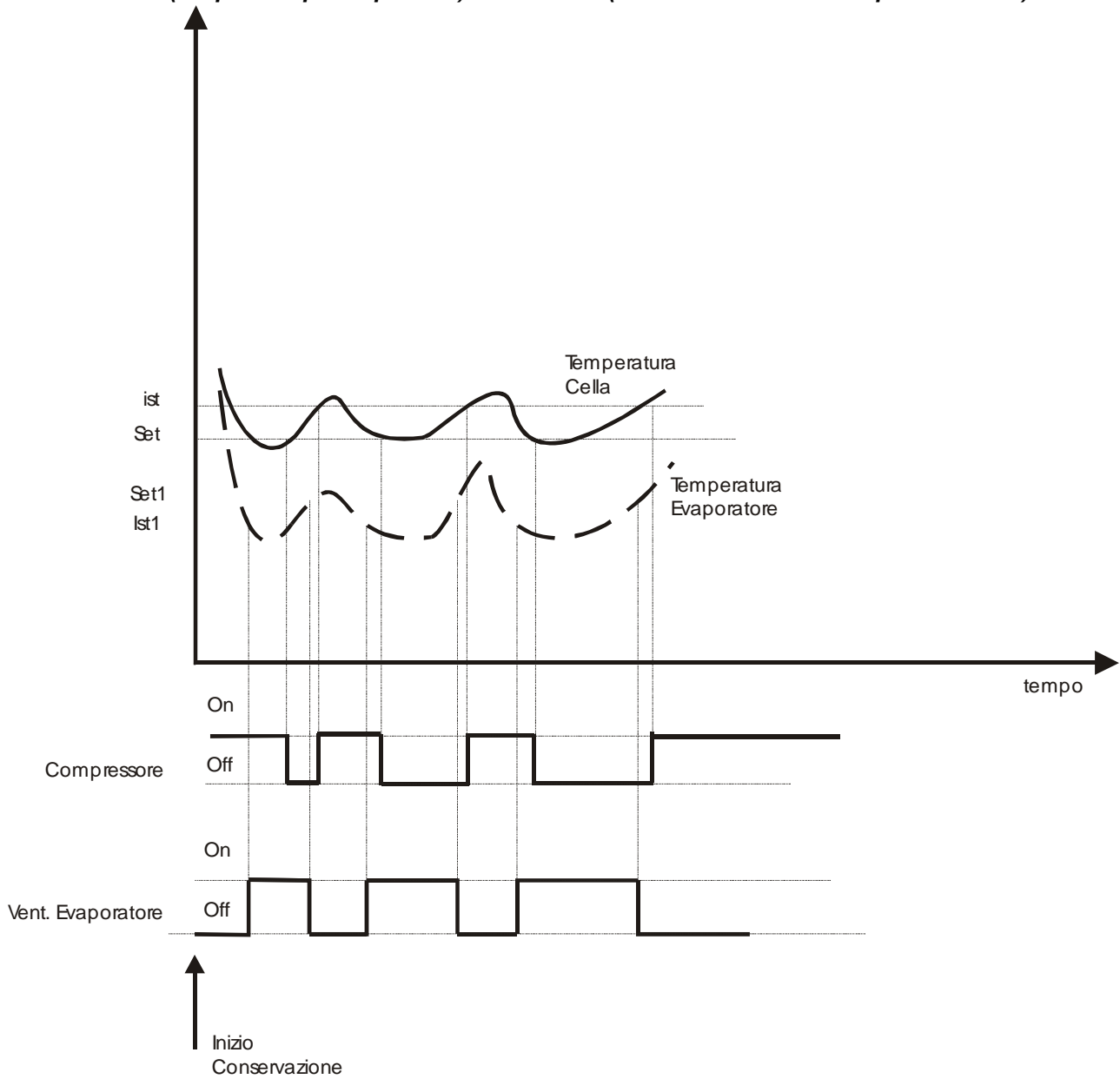


where:

- Set corresponds to the cell set point set for preservation
- ist is the value of the parameter Pr0 .

The fans are not restricted by the state of the compressor and as the evaporator probe is not present, they are always active during all preservation.

- $P3 = 1$  (evaporator probe present) and  $PF0 = 0$  (fans released from compressor state)

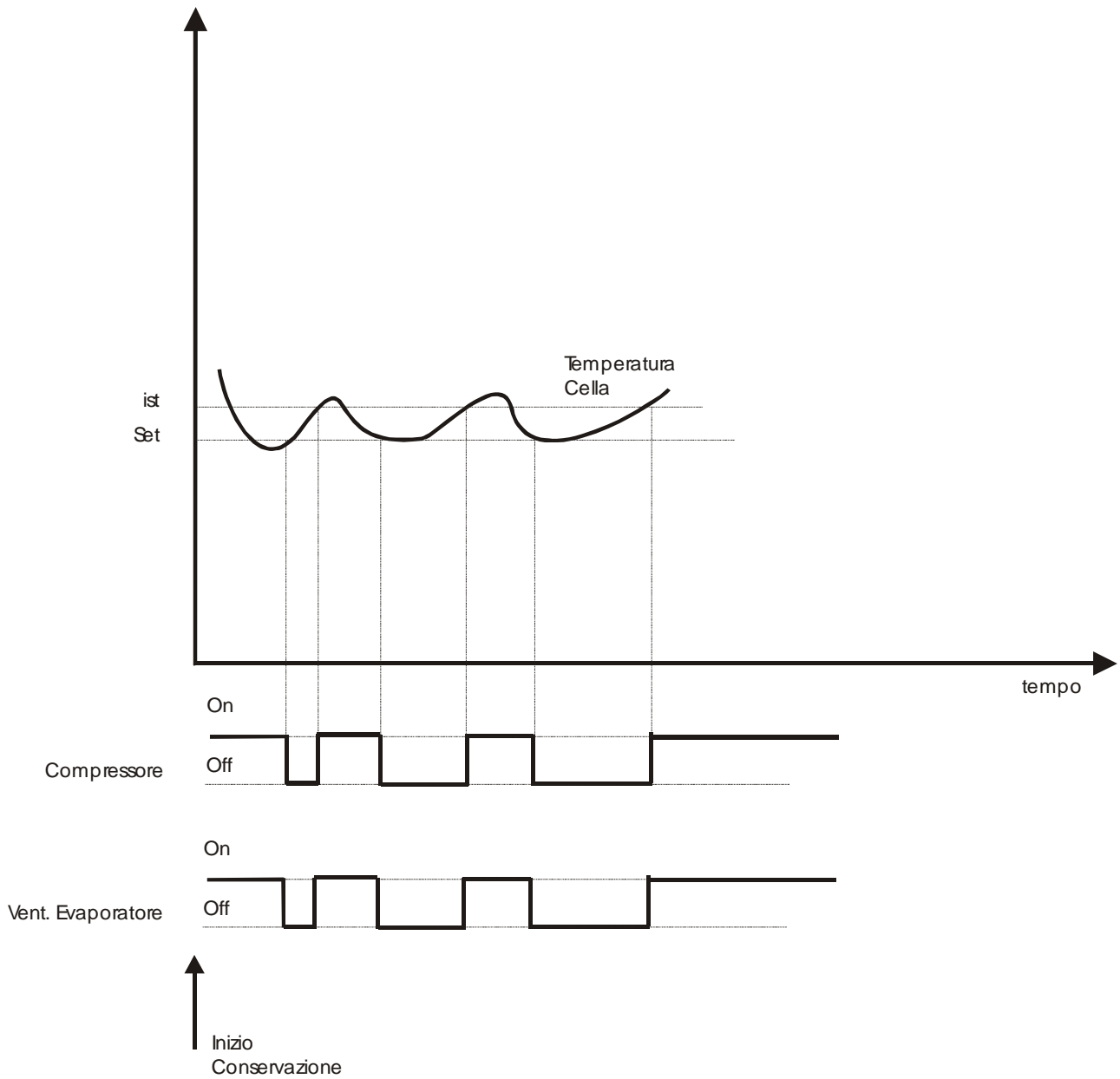


where:

- Set is the cell set point set for preservation
- ist is the value of the parameter Pr0 .
- Set1 is the value of the parameter PF2.
- ist1 is the value of the parameter PF3.

The fans are managed in ON/OFF mode on the basis of the value of the of the evaporator probe with respect to the PF2 and PF3 parameters.

- $P3 = 0$  (evaporator probe not present) and  $PF0 = 1$  (fans off if compressor off)

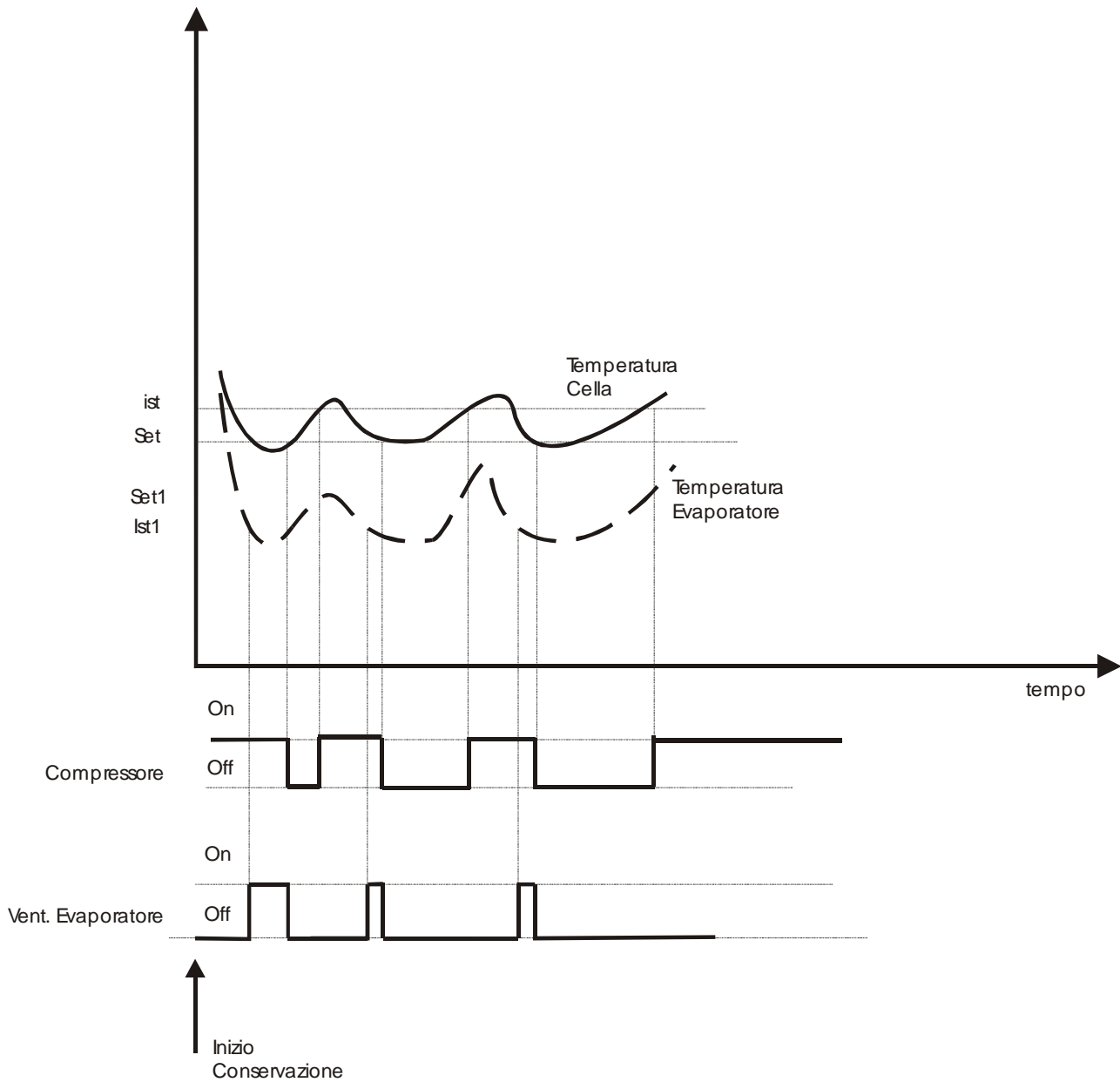


where:

- *Set* is the cell set point set for preservation
- *ist* is the value of the parameter  $Pr0$ .

As the evaporator probe is not present, the fans are managed in parallel with the compressor.

- $P3 = 1$  (evaporator probe not present) and  $PF0 = 1$  (fans off if compressor off)



where:

- Set is the cell set point set for preservation
- ist is the value of the parameter Pr0 .
- Set1 is the value of the parameter PF2.
- ist1 is the value of the parameter PF3.

As the fans are linked to the state of the compressor and the temperature of the evaporator probe, if requested by the value of the probe, they can be activated only if the compressor is active.

## 20. CONDENSER FANS MANAGEMENT

**For codes EVC80S10P7XXX01 - EVC80S11P7XXX01 - EVC80S10P7XXX03 - EVC80S10P7XXX04**

The parameter P11 positioned at zero allows to use the K4 output for management of the condenser fans. The condenser fans are always active in parallel with the compressor for blast chilling/deep freezing, preservation and defrosting cycles.

Deactivation, instead, is delayed on the basis of the parameter PF6, with respect to deactivation of the compressor.

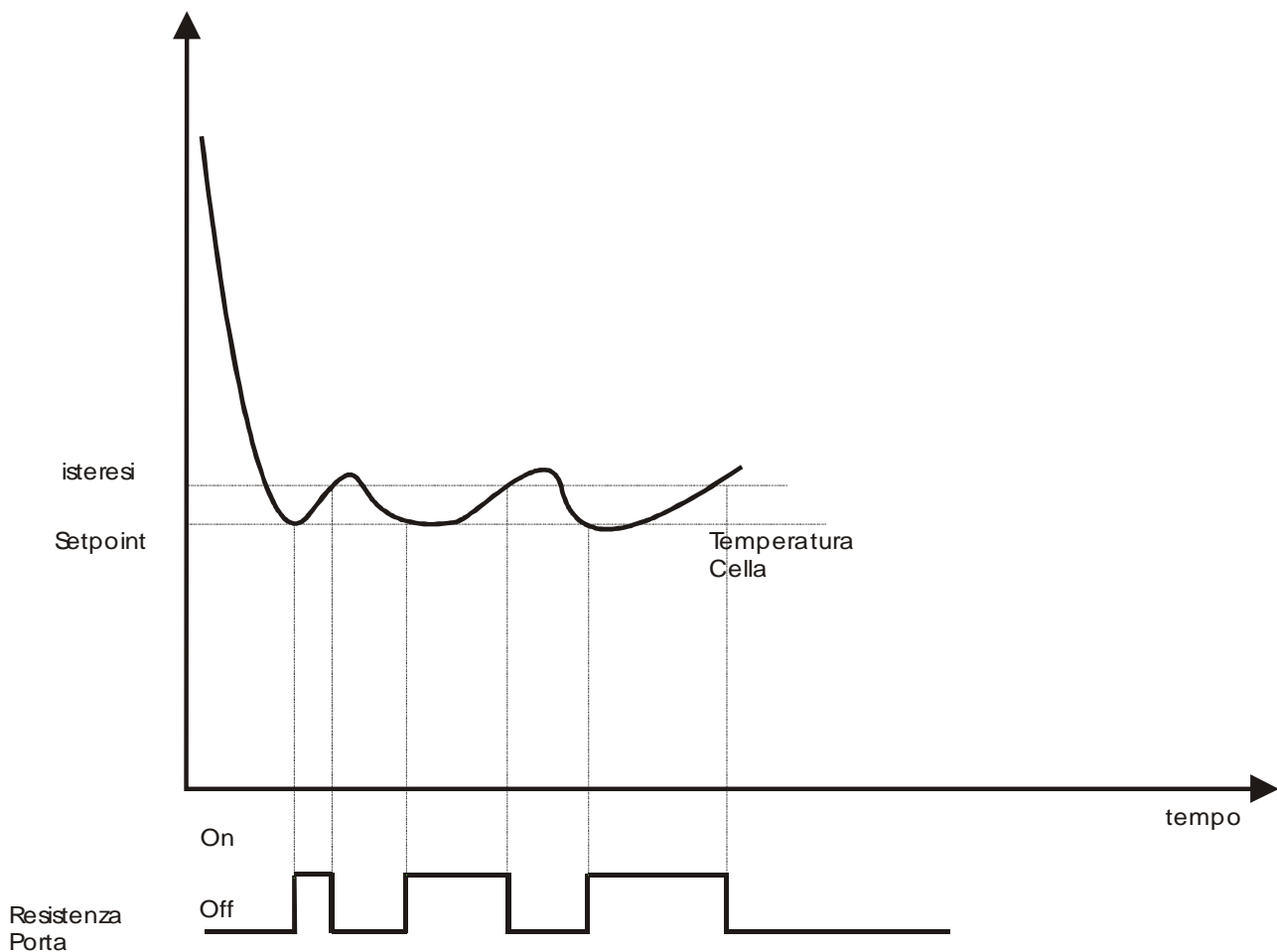
Whenever the condensation high temperature alarm is active they are or remain activated for the entire duration of the alarm.

**Note: For code EVC80S10P7XXX03 the K4 output is always condenser fans.**

## 21. DOOR RESISTANCE MANAGEMENT

**For codes EVC80S10P7XXX01 - EVC80S11P7XXX01 - EVC80S10P7XXX03 - EVC80S10P7XXX04**

The parameter P11 positioned at one allows to use the K4 output for management of the door resistance. This output is activated when the cell probe is lower than the value of the Pr13 parameter and is deactivated when the cell probe exceeds the value of the Pr13 parameter plus the hysteresis (Pr14), according to the following graphics.



where:

- Set point corresponds to Pr13
- Hysteresis corresponds to Pr14

**Note: Whenever the cell probe is in alarm, the resistance will be active.**

**For code EVC80S10P7XXX03 the K3 output is always door resistance.**

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## 22. VENTILATION DEFROSTING

**For codes EVC80S10P7XXX00 – EVC80S10P7XXX02 – EVC80S11P7XXX00 – EVC80S11P7XXX02 – EVC80S10P7XXX03**

Defrosting can be manual or automatic.

Manual defrosting starts by pressing the DEFROST key, when the board is in standby. Manual defrosting ends by pressing the DEFROST key, due to the timeout given by the parameter Pd3 or if the evaporator probe is present (P3=1), when this reaches the value of the Pd2 parameter.

Automatic defrosting starts during the preservation phase. The first automatic defrosting takes place after a delay from the start of preservation, given by the parameter Pd5 and is repeated at intervals defined by the parameter Pd0. Automatic defrosting ends if the evaporator probe is over the value of the parameter Pd2 or due to timeout given by the parameter Pd3.

During manual or automatic defrosting, the display shows the "DEF" label in red.

During manual or automatic defrosting, only the evaporator fans are active.

By setting the parameter Pd4 it is possible to enable the execution of automatic defrosting at the start of a blast chilling/deep freezing cycle. Also in this case, defrosting starts only if the temperature of the evaporator probe is less than the parameter Pd2.

Keep the door open for better performance.

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## 23. DEFROSTING

*For codes EVC80S10P7XXX01 – EVC80S11P7XXX01 – EVC80S10P7XXX04*

Defrosting can be manual or automatic.

Manual defrosting starts by pressing the DEFROST key, when the board is in standby. Manual defrosting ends by pressing the DEFROST key, due to the timeout given by the parameter Pd3 or if the evaporator probe is present (P3=1), when this reaches the value of the Pd2 parameter.

Automatic defrosting starts during the preservation phase. The first automatic defrosting takes place after a delay from the start of preservation, given by the parameter Pd5 and is repeated at time intervals defined by the parameter Pd0. Automatic defrosting ends if the evaporator probe is over the value of the parameter Pd2 or due to timeout given by the parameter Pd3.

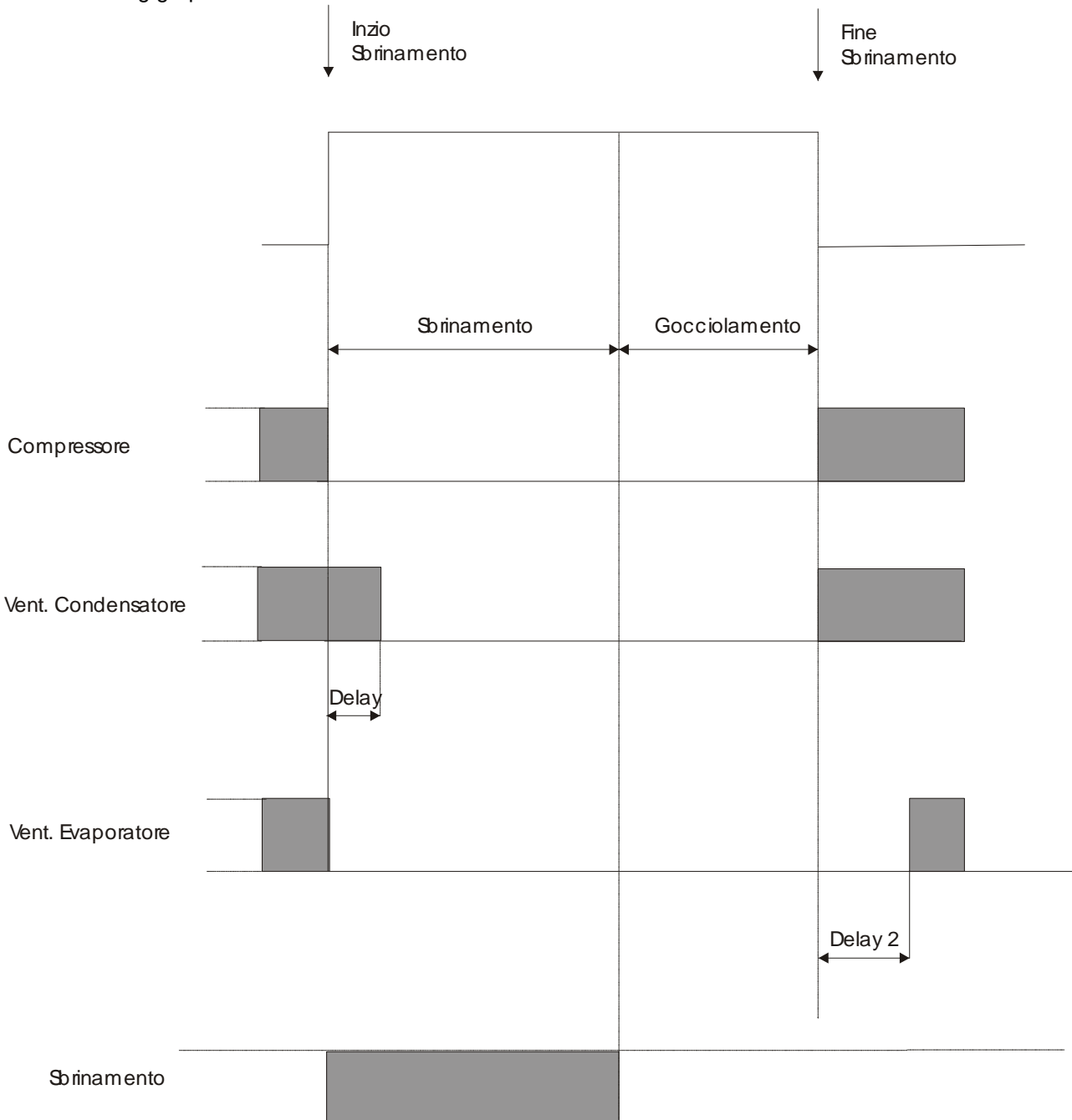
During manual or automatic defrosting, the display shows the "DEF" label in red, which flashes during dripping.

By setting the parameter Pd4 it is possible to enable the execution of automatic defrosting at the start of a blast chilling/deep freezing cycle. Also in this case, defrosting starts only if the temperature of the evaporator probe is less than the parameter Pd2.

Manual or automatic defrosting can be with ventilation, resistance or hot gas. The type of defrosting is selected using the parameter Pd1.

### 23.1. Resistance Defrosting

If Pd1 = 0 if resistance defrosting is selected. When defrosting is active, the outputs are managed according to the following graphics.



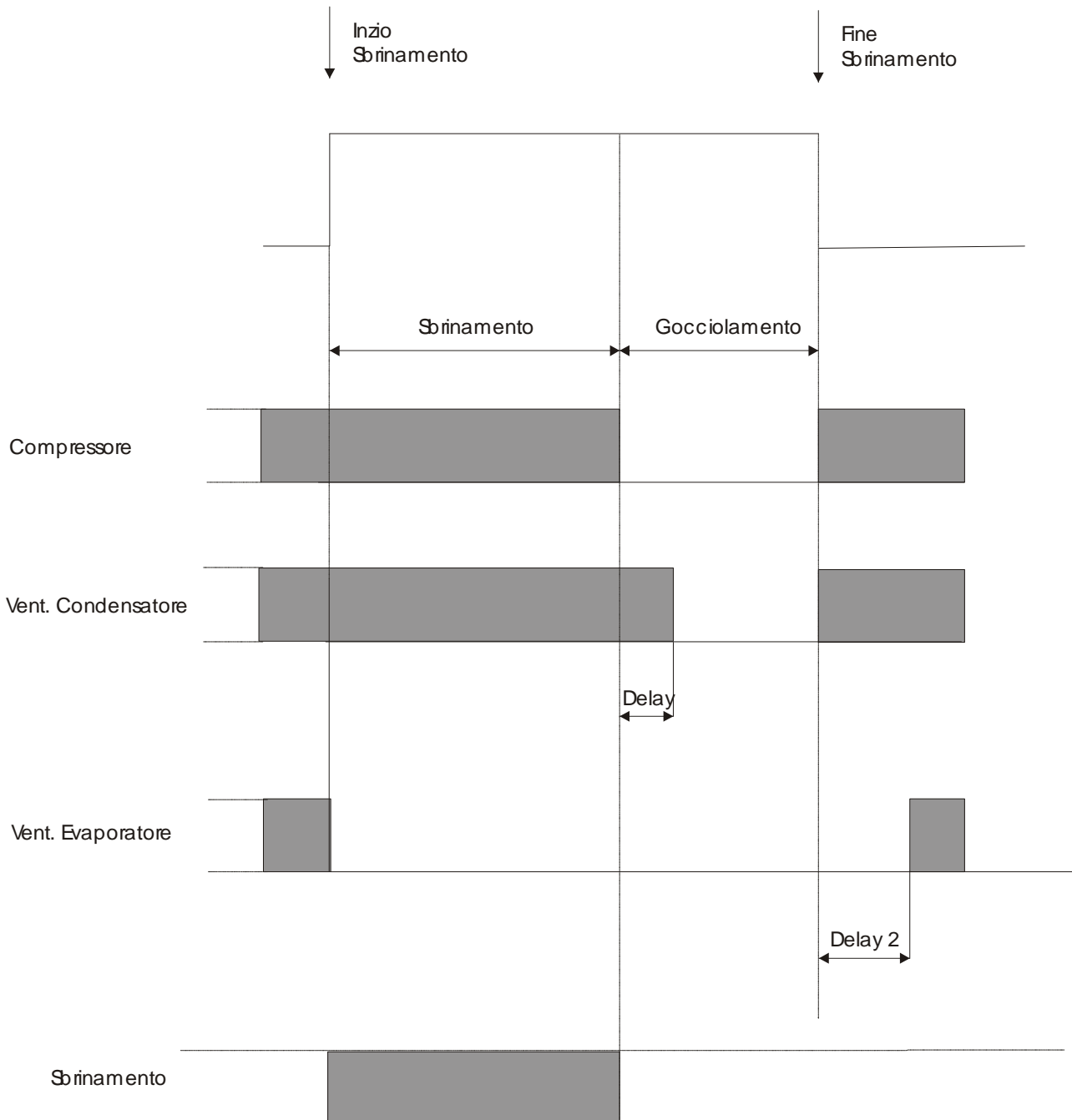
where:

- Delay is the condenser fans deactivation delay given by the parameter PF6
- Delay2 is the evaporator fans activation delay after dripping, given by the parameter PF5.

During defrosting, the evaporator fans can remain active if the parameter PF4 is at one.

### 23.2. Hot Gas Defrosting

If Pd1 = 1 if hot gas defrosting is selected. When defrosting is active, the outputs are managed according to the following graphics.



where:

- Delay is the condenser fans deactivation delay given by the parameter PF6
- Delay2 is the evaporator fans activation delay after dripping, given by the parameter PF5.

During defrosting, the evaporator fans can remain active if the parameter PF4 is at one.

#### Using the Pd9 defrosting/compressor output activation delay parameter

- Pd9 = 0. As in the previous graphics, the compressor remains active and the defrosting output is activated without delay.
- Pd9 = 0. As in the previous graphics, the compressor remains active and the defrosting output is activated after a delay equal to the absolute value Pd9.

- 
- $Pd9 > 0$ . The compressor is switched-off and defrosting output is active. After a delay equal to  $Pd9$  from the activation of the defrosting output, the compressor is activated .

### **23.3. Ventilation Defrosting**

If  $Pd1 = 2$  if ventilation defrosting is selected. All of the outputs are deactivated in this type of defrosting, while only the evaporator fans are active. Keep the door open for better performance. [There is no dripping.](#)

## 24. PRINT TERMINAL MANAGEMENT

### For codes EVC80S10P7XXX02 – EVC80S11P7XXX02

For the codes indicated above it is possible to connect a printing terminal, which communicates with the board via the RS485 port. The communication protocol envisions baudrate equal to 9600, a stop bit and no parity bit.

The data sent to the print terminal are the values of the cell and product probe during the blast chilling/deep freezing phase and during the preservation phase.

The sampling intervals are given by the parameter PS0 for blast chilling/deep freezing and PS1 for preservation. If the parameter PS0 is positioned at zero, during blast chilling/deep freezing, only the initial and final value of the probes is sampled.

An example of a report print-off is given successively.

*****		
26/04/06		
16:41		
ABBATTIMENTO		
INIZIO		
00:00	Cella	20°C
	Cuore	60°C
00:15	Cella	18°C
	Cuore	59°C
00:20	Porta Aperta	
00:23	Porta Chiusa	
.....		
FINE		
01:20	Cella	-8°C
	Cuore	3°C
CONSERVAZIONE		
INIZIO		
01:20	Cella	-8°C
	Cuore	3°C
.....		
01:25	AL4 On	
.....		
02:16	Sbrinamento On	

The asterisks present in the heading can be replaced with a string of 10 characters, which can be set via a procedure described in the 31 paragraph.

It is also possible to select the language in which the strings are printed. Italian, English and French are present. The choice is made in the parameters setting phase using the parameterPS2.

If a probe is in alarm, "Err" is printed instead of the value of the temperature.

## 25. CONFIGURATION PARAMETERS

To enter the parameters programming, put the board in Off mode and press the DEFROST and STANDBY keys at the same time for 3 seconds. The display shows the “PASS” label in red, the user level parameters are already visible (just scroll them using the INCREASE and DECREASE keys or with ENCODER). For access to the assistance level parameters, press the DEEP FREEZING-TEMPERATURE key, the display will show 0 in green. Use the INCREASE and DECREASE keys (or with ENCODER) to modify the value and insert the correct password value (for this application the correct value is -19). Press the DEEP FREEZING-TEMPERATURE key to confirm. If the value is correct, the display shows the label of the first parameter available in red.

To modify the value of a parameter, press the DEEP FREEZING-TEMPERATURE key. The display will show the current value of the parameter in green. This value can be modified with the INCREASE and DECREASE keys (or with ENCODER). Press the DEEP FREEZING-TEMPERATURE key to confirm the value and pass to the display of the list of parameters.

Exit this phase by pressing the STANDBY key or due to timeout of 20 seconds.

### 25.1. List of Parameters 1

For codes EVC80S10P7XXX00 – EVC80S10P7XXX02 – EVC80S11P7XXX00 – EVC80S11P7XXX02

LABEL AND DESCRIPTION	MIN	MAX	DEFAULT	U.M.	Level
<b>General Configuration</b>					
P0 Choice of a unit of measurement for temperature 0 = Fahrenheit 1 = Celsius	0	1	1	--	User
P1 Cell probe offset	-10	10	0	°C	After-sales assistance
P2 Core probe offset	-10	10	0	°C	After-sales assistance
P3 Enabling of evaporator probe	0	1	0	--	After-sales assistance
P4 Evaporator probe offset (valid if P3 = 1)	-10	10	0	°C	After-sales assistance
P7 Duration of buzzer at the end of blast chilling/Deep freezing 0 = no acoustic signal at the end of Blast chilling/Deep freezing	0	99	10	sec	After-sales assistance
P8 Time display mode 0 = minutes 1 = hours and minutes	0	1	0	--	After-sales assistance
<b>Regulation Set point</b>					
Pr0 Regulation hysteresis	+1	15	2	°C	After-sales assistance
Pr1 Blast chilling cell set point	-20	30	-3	°C	User
Pr2 Cell set point in Positive Preservation	-20	30	+3	°C	User
Pr3 Deep freezing cell set point	-50	20	-40	°C	User
Pr4 Cell set point in Negative Preservation	-50	20	-25	°C	User
Pr5 Cell set point for Hard phase	-50	20	-40	°C	User
Pr6 Product temperature for end of Blast chilling	-20	30	+3	°C	User
Pr7 Product temperature for end of Deep freezing	-30	20	-18	°C	User
Pr8 Product temperature for end of Hard phase	-20	30	10	°C	User
Pr9 Product temperature set point for time count start	-10	99	+65	°C	User
Pr10 Enabling of needle insertion control	0	1	1	--	After-sales assistance
Pr11 Core and Cell Temperature Delta for first needle insertion control phase	0	99	5	°C	After-sales assistance
Pr12 Duration of second needle test phase	1	99	90	Sec	After-sales assistance

<b>Cycle Times</b>					
Pt0 Temperature blast chilling cycle max. duration	1	200	90	min	User
Pt1 Temperature deep freezing cycle max. duration	1	400	240	min	User
Pt2 Hard phase duration (the value must be <= Pt0) 0 = Hard cycle disabled	0	200	0	min	Assistance
<b>Compressor Management</b>					
PC0 Compressor activation delay from power on	0	99	0	min	After-sales assistance
PC1 Delay between two successive On modes of the Compressor	0	99	3	min	After-sales assistance
PC2 Delay between an Off and On of the compressor	0	99	2	min	After-sales assistance
PC3 Compressor On/Off cycle if cell probe in alarm during the Positive and Negative Preservation	0	99	10	min	After-sales assistance
PC4 Compressor time if cell probe in alarm during Positive Preservation	0	99	3	min	After-sales assistance
PC5 Compressor time if cell probe in alarm during Negative Preservation	0	99	8	min	After-sales assistance
<b>Ventilation Management</b>					
PF0 Fan state if compressor off 0 = fans released from compressor state 1 = fans at standstill if compressor off	0	1	0	--	After-sales assistance
PF1 Cell temperature threshold for fans block	-50	99	70	°C	After-sales assistance
PF2 Evaporator set point for management of fans in Blast chilling/Deep freezing mode (active only if P3 = 1)	-50	99	-1	°C	After-sales assistance
PF3 Hysteresis for management in Blast chilling/Deep freezing mode (active only if P3 = 1)	1	15	2	°C	After-sales assistance
<b>Defrosting</b>					
Pd0 Interval between two defrosting cycles 0 = automatic defrosting disabled	0	99	8	hours/min	After-sales assistance
Pd2 Evaporator temperature threshold for defrosting end (active only if P3 = 1)	-10	99	2	°C	After-sales assistance
Pd3 Maximum defrosting duration	1	99	10	min/sec	After-sales assistance
Pd4 Enabling of defrosting at cycle start 0 = disabled 1 = enabled	0	1	0	--	After-sales assistance
Pd5 Defrosting enabling delay from Preservation start	0	99	40	min/sec	After-sales assistance
Pd8 Choice of times 0 = hours and minutes 1 = minutes and seconds	0	1	0	--	After-sales assistance
<b>Digital Inputs</b>					
Pi0 Door input polarity 0 => open contact = door closed 1 => closed contact = door closed	0	1	0	--	After-sales assistance
Pi1 Warning signal delay for open door	0	400	60	sec	After-sales assistance
Pi2 Door open alarm signal delay after warning signal	0	400	60	sec	After-sales assistance
Pi3 Compressor switch-off delay from door opening	0	400	120	sec	After-sales assistance
Pi4 Effect of door opening on ventilation 0 = no effect 1 = ventilation block	0	1	0	--	After-sales assistance
Pi5 High Pressure Input Polarity 0 => open contact = High Pressure not active 1 => closed contact = High Pressure not active	0	1	0	--	After-sales assistance

Pi6 High Pressure Alarm Delay	0	999	5	sec	After-sales assistance
<b>Print Management</b>					
PS0 Sampling time during Blast Chilling/Deep Freezing 0 = print only start and end	0	120	15	min	After-sales assistance
PS1 Sampling time during Preservation	1	120	15	min	After-sales assistance
PS2 Language 0 = Italian 1 = English 2 = French	0	2	0	--	After-sales assistance

**NOTES:**

- The parameters relative to the report print-off are only valid for codes EVC80K10P7XXX01 and EVC80K11P7XXX01.
- Whenever the parameter P0 is positioned at 0, all default values, minimum and maximum of the parameters will be converted into the corresponding value in degrees Fahrenheit.

**NOTE FOR FW IMPLEMENTATION:**

If it is not possible to implement the parameters relative to the serial by the delivery date, leave the values fixed at default.

## 25.2. List of Parameters 2

**For codes EVC80S10P7XXX01 – EVC80S11P7XXX01 – EVC80S10P7XXX03**

LABEL AND DESCRIPTION	MIN	MAX	DEFAULT	U.M.	NEW LABEL
<b>General Configuration</b>					
P0 Choice of a unit of measurement for temperature 0 = Fahrenheit 1 = Celsius	0	1	1	--	User
P1 Cell probe offset	-10	10	0	°C	After-sales assistance
P2 Core probe offset	-10	10	0	°C	After-sales assistance
P3 Enabling of evaporator probe	0	1	0	--	After-sales assistance
P4 Evaporator probe offset (valid if P3 = 1)	-10	10	0	°C	After-sales assistance
P5 Enabling of condenser probe	0	1	0	°C	After-sales assistance
P6 Condenser probe offset (if P5 = 1)	-10	10	0	°C	After-sales assistance
P7 Duration of buzzer at the end of blast chilling/Deep freezing 0 = no acoustic signal at the end of Blast chilling/Deep freezing	0	99	10	sec	After-sales assistance
P8 Time display mode 0 = minutes 1 = hours and minutes	0	1	0	--	After-sales assistance
P9 Condenser temperature threshold for Condensation High Temperature alarm	0	99	70	°C	After-sales assistance
P10 Condensation High Temperature alarm output hysteresis	0	30	10	°C	After-sales assistance
P11 K4 Output Management 0 = condenser fans 1 = door resistance (only EVC80S10P7XXX01 – EVC80S11P7XXX01)	0	1	0	--	After-sales assistance
<b>Regulation Set point</b>					

Pr0 Regulation hysteresis	+1	15	2	°C	After-sales assistance
Pr1 Blast chilling cell set point	-20	30	-3	°C	User
Pr2 Cell set point in Positive Preservation	-20	30	+3	°C	User
Pr3 Deep freezing cell set point	-50	20	-40	°C	User
Pr4 Cell set point in Negative Preservation	-50	20	-25	°C	User
Pr5 Cell set point for Hard phase	-50	20	-40	°C	User
Pr6 Product temperature for end of Blast chilling	-20	30	+3	°C	User
Pr7 Product temperature for end of Deep freezing	-30	20	-18	°C	User
Pr8 Product temperature for end of Hard phase	-20	30	10	°C	User
Pr9 Product temperature set point for time count start	-10	99	+65	°C	User
Pr10 Enabling of needle insertion control	0	1	1	--	After-sales assistance
Pr11 Core and Cell Temperature Delta for first needle insertion control phase	0	99	5	°C	After-sales assistance
Pr12 Duration of second needle test phase	1	99	90	Sec	After-sales assistance
Pr13 Cell temperature threshold for door resistance activation	-20	30	0	°C	After-sales assistance
Pr14 Hysteresis for door resistance management	1	10	2	°C	After-sales assistance
<b>Cycle Times</b>					
Pt0 Temperature blast chilling cycle max. duration	1	200	90	min	User
Pt1 Temperature deep freezing cycle max. duration	1	400	240	min	User
Pt2 Hard phase duration (the value must be <= Pt0) 0 = Hard cycle disabled	0	200	0	min	User
<b>Compressor Management</b>					
PC0 Compressor activation delay from power on	0	99	0	min	After-sales assistance
PC1 Delay between two successive On modes of the Compressor	0	99	3	min	After-sales assistance
PC2 Delay between an Off and On of the compressor	0	99	2	min	After-sales assistance
PC3 Compressor On/Off cycle if cell probe in alarm during the Positive and Negative Preservation	0	99	10	min	After-sales assistance
PC4 Compressor time if cell probe in alarm during Positive Preservation	0	99	3	min	After-sales assistance
PC5 Compressor time if cell probe in alarm during Negative Preservation	0	99	8	min	After-sales assistance
<b>Evaporator Fans Management</b>					
PF0 Fan state if compressor off 0 = fans released from compressor state 1 = fans at standstill if compressor off	0	1	0	--	After-sales assistance
PF1 Cell temperature threshold for fans block	-50	99	70	°C	After-sales assistance
PF2 Evaporator set point for management of fans in Blast chilling/Deep freezing mode (active only if P3 = 1)	-50	99	-1	°C	After-sales assistance
PF3 Hysteresis for management in Blast chilling/Deep freezing mode (active only if P3 = 1)	1	15	2	°C	After-sales assistance
PF4 Fans state during defrosting	0	1	0	--	After-sales assistance
PF5 Ventilation block duration after dripping phase	0	15	3	Min/sec	After-sales assistance
PF6 Condenser fans deactivation delay from compressor switch-off	0	300	0	Sec	After-sales assistance
<b>Defrosting</b>					
Pd0 Interval between two defrosting cycles 0 = automatic defrosting disabled	0	99	8	hours/min	After-sales assistance

Pd1 Type of defrosting (only EVC80S10P7XXX01 – EVC80S11P7XXX01)	0	2	2	--	After-sales assistance
Pd2 Evaporator temperature threshold for defrosting end (active only if P3 = 1)	-10	99	2	°C	After-sales assistance
Pd3 Maximum defrosting duration	1	99	10	min/sec	After-sales assistance
Pd4 Enabling of defrosting at cycle start 0 = disabled 1 = enabled	0	1	0	--	After-sales assistance
Pd5 Defrosting enabling delay from Preservation start	0	99	40	min/sec	After-sales assistance
Pd6 Duration of dripping phase	0	99	2	Min/sec	After-sales assistance
Pd7 Compressor delays control at defrosting start 0 = delays ignored 1 = delays respected	0	1	1	--	After-sales assistance
Pd8 Choice of times 0 = hours and minutes 1 = minutes and seconds	0	1	0	--	After-sales assistance
Pd9 Defrosting/compressor output activation delay	-400	400	0	sec	After-sales assistance
<b>Digital Inputs</b>					
Pi0 Door input polarity 0 => open contact = door closed 1 => closed contact = door closed	0	1	0	--	After-sales assistance
Pi1 Warning signal delay for open door	0	400	60	sec	After-sales assistance
Pi2 Door open alarm signal delay after warning signal	0	400	60	sec	After-sales assistance
Pi3 Compressor switch-off delay from door opening	0	400	120	sec	After-sales assistance
Pi4 Effect of door opening on ventilation 0 = no effect 1 = ventilation block	0	1	0	--	After-sales assistance
Pi5 High Pressure Input Polarity 0 => open contact = High Pressure not active 1 => closed contact = High Pressure not active	0	1	0	--	After-sales assistance
Pi6 High Pressure Alarm Delay	0	999	5	sec	After-sales assistance
<b>Serial Communication</b>					
PL0 BaudRate 0 = 2400 1 = 4800 2 = 9600	0	2	2	--	After-sales assistance
PL1 Parity 0 = no parity 1 = odd parity 2 = even parity	0	2	2	--	After-sales assistance
PL2 Board address	1	247	1	--	After-sales assistance

**NOTES:**

- Whenever the parameter P0 is positioned at 0, all default values, minimum and maximum of the parameters will be converted into the corresponding value in degrees Fahrenheit.

## 25.3. List of Parameters 3

For codes EVC80S10P7XXX04

LABEL AND DESCRIPTION	MIN	MAX	DEFAULT	U.M.	NEW LABEL
<b>General Configuration</b>					
P0 Choice of a unit of measurement for temperature 0 = Fahrenheit 1 = Celsius	0	1	1	--	User
P1 Cell probe offset	-10	10	0	°C	After-sales assistance
P2 Core probe offset	-10	10	0	°C	After-sales assistance
P3 Enabling of evaporator probe	0	1	0	--	After-sales assistance
P4 Evaporator probe offset (valid if P3 = 1)	-10	10	0	°C	After-sales assistance
P5 Enabling of condenser probe	0	1	0	°C	After-sales assistance
P6 Condenser probe offset (if P5 = 1)	-10	10	0	°C	After-sales assistance
P7 Duration of buzzer at the end of blast chilling/Deep freezing 0 = no acoustic signal at the end of Blast chilling/Deep freezing	0	99	10	sec	After-sales assistance
P8 Time display mode 0 = minutes 1 = hours and minutes	0	1	0	--	After-sales assistance
P9 Condenser temperature threshold for Condensation High Temperature alarm	0	99	60	°C	After-sales assistance
P10 Condensation High Temperature alarm output hysteresis	0	30	10	°C	After-sales assistance
P11K4 Output Management 0 = condenser fans 1 = door resistance	0	1	1	--	After-sales assistance
<b>Regulation Set point</b>					
Pr0 Regulation hysteresis	+1	15	2	°C	After-sales assistance
Pr1 Blast chilling cell set point	-20	30	-5	°C	User
Pr2 Cell set point in Positive Preservation	-20	30	+2	°C	User
Pr3 Deep freezing cell set point	-50	20	-25	°C	User
Pr4 Cell set point in Negative Preservation	-50	20	-22	°C	User
Pr5 Cell set point for Hard phase	-50	20	-40	°C	User
Pr6 Product temperature for end of Blast chilling	-20	30	+3	°C	User
Pr7 Product temperature for end of Deep freezing	-30	20	-18	°C	User
Pr8 Product temperature for end of Hard phase	-20	30	10	°C	User
Pr9 Product temperature set point for time count start	-10	99	+70	°C	User
Pr10 Enabling of needle insertion control	0	1	1	--	After-sales assistance
Pr11 Core and Cell Temperature Delta for first needle insertion control phase	0	99	7	°C	After-sales assistance
Pr12 Duration of second needle test phase	1	99	56	Sec	After-sales assistance
Pr13 Cell temperature threshold for door resistance activation	-20	30	-5	°C	After-sales assistance
Pr14 Hysteresis for door resistance management	1	10	2	°C	After-sales assistance
<b>Cycle Times</b>					
Pt0 Temperature blast chilling cycle max. duration	1	200	90	min	User

Pt1 Temperature deep freezing cycle max. duration	1	400	240	min	User
Pt2 Hard phase duration (the value must be <= Pt0) 0 = Hard cycle disabled	0	200	0	min	User
<b>Compressor Management</b>					
PC0 Compressor activation delay from power on	0	99	0	min	After-sales assistance
PC1 Delay between two successive On modes of the Compressor	0	99	3	min	After-sales assistance
PC2 Delay between an Off and On of the compressor	0	99	2	min	After-sales assistance
PC3 Compressor On/Off cycle if cell probe in alarm during the Positive and Negative Preservation	0	99	10	min	After-sales assistance
PC4 Compressor time if cell probe in alarm during Positive Preservation	0	99	3	min	After-sales assistance
PC5 Compressor time if cell probe in alarm during Negative Preservation	0	99	8	min	After-sales assistance
<b>Evaporator Fans Management</b>					
PF0 Fan state if compressor off 0 = fans released from compressor state 1 = fans at standstill if compressor off	0	1	1	--	After-sales assistance
PF1 Cell temperature threshold for fans block	-50	99	70	°C	After-sales assistance
PF2 Evaporator set point for management of fans in Blast chilling/Deep freezing mode (active only if P3 = 1)	-50	99	20	°C	After-sales assistance
PF3 Hysteresis for management in Blast chilling/Deep freezing mode (active only if P3 = 1)	1	15	2	°C	After-sales assistance
PF4 Fans state during defrosting	0	1	0	--	After-sales assistance
PF5 Ventilation block duration after dripping phase	0	15	3	Min/sec	After-sales assistance
PF6 Condenser fans deactivation delay from compressor switch-off	0	300	30	Sec	After-sales assistance
<b>Defrosting</b>					
Pd0 Interval between two defrosting cycles 0 = automatic defrosting disabled	0	99	0	hours/min	After-sales assistance
Pd1 Type of defrosting	0	2	2	--	After-sales assistance
Pd2 Evaporator temperature threshold for defrosting end (active only if P3 = 1)	-10	99	8	°C	After-sales assistance
Pd3 Maximum defrosting duration	1	99	15	min/sec	After-sales assistance
Pd4 Enabling of defrosting at cycle start 0 = disabled 1 = enabled	0	1	0	--	After-sales assistance
Pd5 Defrosting enabling delay from Preservation start	0	99	40	min/sec	After-sales assistance
Pd6 Duration of dripping phase	0	99	2	Min/sec	After-sales assistance
Pd7 Compressor delays control at defrosting start 0 = delays ignored 1 = delays respected	0	1	0	--	After-sales assistance
Pd8 Choice of times 0 = hours and minutes 1 = minutes and seconds	0	1	1	--	After-sales assistance
Pd9 Defrosting/compressor output activation delay	-400	400	0	sec	After-sales assistance
<b>Digital Inputs</b>					
Pi0 Door input polarity 0 => open contact = door closed 1 => closed contact = door closed	0	1	0	--	After-sales assistance

Pi1 Warning signal delay for open door	0	400	0	sec	After-sales assistance
Pi2 Door open alarm signal delay after warning signal	0	400	30	sec	After-sales assistance
Pi3 Compressor switch-off delay from door opening	0	400	120	sec	After-sales assistance
Pi4 Effect of door opening on ventilation 0 = no effect 1 = ventilation block	0	1	0	--	After-sales assistance
Pi5 High Pressure Input Polarity 0 => open contact = High Pressure not active 1 => closed contact = High Pressure not active	0	1	0	--	After-sales assistance
Pi6 High Pressure Alarm Delay	0	999	5	sec	After-sales assistance
<b>Serial Communication</b>					
PL0 BaudRate 0 = 2400 1 = 4800 2 = 9600	0	2	2	--	After-sales assistance
PL1 Parity 0 = no parity 1 = odd parity 2 = even parity	0	2	2	--	After-sales assistance
PL2 Board address	1	247	1	--	After-sales assistance

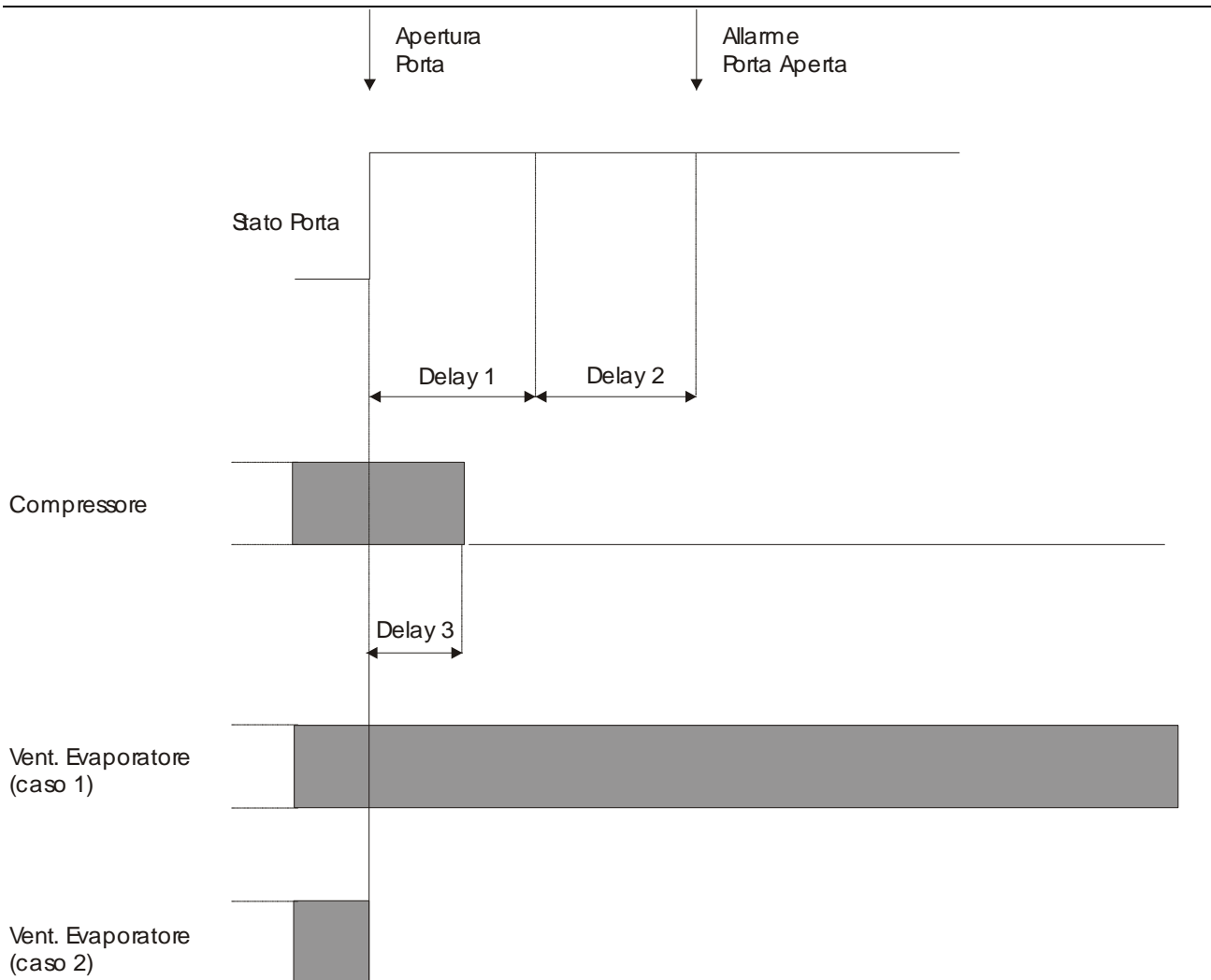
**NOTES:**

- Whenever the parameter P0 is positioned at 0, all default values, minimum and maximum of the parameters will be converted into the corresponding value in degrees Fahrenheit.

## 26. DOOR OPENING

Opening of the door is not signalled immediately, but with a delay given by parameters Pi1 and Pi2. After the time set with the parameter Pi1, the display shows the flashing "door" label in red with current display. After the time set with parameter Pi2, the open door alarm signal is given and the display shows the "AL 1" label in red. If the buzzer is present, a beep of five seconds, repeated every 15 seconds, is given as an indication.

The effect of opening the door on the compressor and evaporator fans is given in the following graphics.



where:

- Delay 1 corresponds to parameter Pi1.
- Delay 2 corresponds to parameter Pi2.
- Delay 3 corresponds to parameter Pi3.
- Case 1 corresponds to parameter Pi4 = 0.
- Case 2 corresponds to parameter Pi4 = 1.

NOTE: If fans functioning is linked to the compressor, the fans will however be off when the compressor is switched off independently from the value of the parameter Pi4.

Door opening during ventilation defrosting is not signalled.

## **27. HIGH PRESSURE ALARM**

The activation of the high pressure input is signalled after a time set by the parameter Pi6. The display shows the "AL 2" label in red and the buzzer, if present, emits one beep of five seconds every 15 seconds. Any cycle in progress is blocked and the board goes back to standby. Put the board in Off mode to rearm. The input polarity can be configured via the parameter Pi5.

## **28. CONDENSATION HIGH TEMPERATURE ALARM**

**For codes EVC80S10P7XXX01 – EVC80S11P7XXX01 – EVC80S10P7XXX03 – EVC80S10P7XXX04**

The activation of the condensation high temperature input is activated when the temperature of the condenser probe exceeds the value set with the parameter P9. The condenser fans are activated in the presence of this alarm. The display shows the "AL 3" label in red, alternately with the current display. Any cycle in progress is interrupted and the buzzer (if present) sounds intermittently with a beep of 5 seconds

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every 15. The alarm returns automatically when the temperature of the condenser probe drops below the value of the parameter P9 less P10.

## **29. BUZZER MANAGEMENT (IF PRESENT)**

An external buzzer can be connected to the connector identified as Con1 for acoustic signals.

The buzzer is activated at the end of a blast chilling/deep freezing cycle with intermittent sound with duration defined by the parameter P7 and in presence of an alarm with a beep of five seconds repeated every 15 seconds.

The buzzer can be silenced by pressing any key.

NOTE: If no buzzer is connected, in the presence of any alarm, the first key pressed does not generate any effect as it would be to silence the buzzer.

## 30. ALARMS

<b>CODE</b>	<b>CAUSE</b>	<b>EFFECT</b>	<b>RESET</b>
<b>Er 1</b>	Cell Probe Fault	In standby it prevents the start-up of blast chilling/deep freezing. In blast chilling/deep freezing it causes the cycle to block and the board goes back to standby. In preservation, the cycle is not blocked and the compressor is activated cyclically (paragraph18)	Check connection and functioning of the cell probe
<b>Er 2</b>	Product Probe Fault	In standby it prevents the start-up of blast chilling/deep freezing. In temperature blast chilling/deep freezing mode causes the passage to a timed cycle. In preservation mode it has no effect.	Check connection and functioning of the product probe
<b>Er 3</b>	Evaporator Probe Fault (only if evaporator probe enabled)	In blast chilling/deep freezing and in preservation it does not cause any effect. Any defrosting ends due to time-out.	Check connection and functioning of the evaporator probe
<b>Er 4</b>	Condenser Probe Fault (only if condenser probe enabled) Present in codes EVC80S10P7XXX01, EVC80S11P7XXX01, EVC80S10P7XXX03, EVC80S10P7XXX04	Only signalling on display	Check connection and functioning of the condenser probe
<b>AL 1</b>	Open Door Alarm	In standby and in defrosting it does not cause any effect. For the effects on compressor and ventilation, see paragraph 26.	Close the door
<b>AL 2</b>	High Pressure Alarm	In standby mode it has no effect. In blast chilling/deep freezing and in preservation it causes the cycle to block and the board goes back to standby.	Eliminate the cause of alarm, switch the board off and back on again.
<b>AL 3</b>	Condensation High Temperature Alarm (only if condenser probe enabled) Present in codes EVC80S10P7XXX01, EVC80S11P7XXX01, EVC80S10P7XXX03, EVC80S10P7XXX04	Interrupts the cycle in progress, deactivates all outputs except the condenser fans.	Wait for condenser temperature to lower
<b>AL 4</b>	Needle not Inserted	See paragraph 15	See paragraph 15

Every alarm is accompanied by the buzzer (if present). The noise is one beep of five seconds repeated every 15 seconds.

The label that indicates the alarm in progress is displayed in red on the display and alternately with respect the current display.

## 31. CUSTOMISATION OF REPORT PRINT-OFFS

*For codes EVC80S10P7XXX02 – EVC80S11P7XXX02*

It is possible to customise the initial string of the report print-off. The asterisks are printed by default. For customisation, a specific procedure is required to insert the ASCII codes of the symbols desired. To activate the procedure, press the BLAST CHILLING-TIME key for three seconds.

The display shows the “C 1” label in red. Press the BLAST CHILLING-TIME key, the display shows the ASCII code in green of the first character that can be selected. Using the INCREASE and DECREASE keys it is possible to select the ASCII code of the desired character. Press the BLAST CHILLING-TIME key to confirm the new character and the display shows the “ C 2” label. Proceed in the same way to select all 10 characters. Once the procedure has been concluded, press the STANDBY key to go back to Off mode.

Below find the correspondence between the ASCII codes and the characters available.

CODE	CHARACTER
32	spazio
33	!
34	"
35	#
36	\$
37	%
38	&
39	'
40	(
41	)
42	*
43	+
44	,
45	-
46	.
47	/
48	0
49	1
50	2
51	3
52	4
53	5
54	6
55	7
56	8
57	9
58	:
59	;
60	<
61	=
62	>
63	?
64	@
65	A

CODE	CHARACTER
66	B
67	C
68	D
69	E
70	F
71	G
72	H
73	I
74	J
75	K
76	L
77	M
78	N
79	O
80	P
81	Q
82	R
83	S
84	T
85	U
86	V
87	W
88	X
89	Y
90	Z
91	[
92	\
93	]
94	^
95	
96	Φ
97	a
98	b

CODE	CHARACTER
99	c
100	d
101	e
102	f
103	g
104	h
105	i
106	j
107	k
108	l
109	m
110	n
111	o
112	p
113	q
114	r
115	s
116	t
117	u
118	v
119	w
120	x
121	y
122	z
123	°
124	±
125	□
126	□
127	≠
128	Ç
129	ù
130	é
131	â
132	ä
133	à
134	â
135	ç
136	ê
137	ë
138	è
139	ï
140	î
141	ì
142	Ä
143	Å
144	É
145	æ

CODE	CHARACTER
146	Æ
147	ô
148	ö
149	ò
150	û
151	ù
152	ÿ
153	Ö
154	Ü
155	ø
156	£
157	¥
158	Pt
159	f
160	á
161	í
162	ó
163	ú
164	ñ
165	Ñ
166	a
167	o
168	¿
169	-
170	¬
171	½
172	¼
173	¡
174	«
175	»
176	⋮
177	⋮
178	⋮
179	
180	┆
181	≡
182	≡
183	π
184	ε
185	≡
186	≡
187	⌋
188	⌋
189	⌋
190	⌋
191	⌋
192	L

CODE	CHARACTER
193	⊥
194	⊤
195	⊢
196	□
197	⊕
198	⊖
199	⊗
200	⊘
201	⊙
202	⊚
203	⊛
204	⊜
205	⊝
206	⊞
207	⊟
208	⊠
209	⊡
210	⊢
211	⊣
212	⊤
213	⊥
214	⊦
215	⊧
216	⊨
217	⊩
218	⊪
219	■
220	■
221	■
222	■
223	■
224	α

CODE	CHARACTER
225	β
226	Γ
227	Π
228	Σ
229	σ
230	μ
231	τ
232	Φ
233	θ
234	Ω
235	δ
236	∞
237	∅
238	ε
239	∩
240	≡
241	±
242	≥
243	≤
244	∫
245	∫
246	÷
247	≈
248	°
249	•
250	·
251	√
252	n
253	z
254	¬
255	↑

## 32. PROBE DISPLAY

With the board in Off mode, press the DEFROST key for three seconds. The display shows the temperature of the cell probe in red and the BLAST CHILLING probe flashes. Press the DEFROST key. The display shows the temperature of the product probe in red and the TEMPERATURE probe flashes. Press the DEFROST key. The display shows the temperature of the evaporator probe in red, if enabled via the parameter P3 and the DEEP FREEZING probe flashes. [If the evaporator probe is not enabled, pass to the display of the condenser probe.](#) Press the DEFROST key. The display shows the temperature of the condenser probe in red, if enabled via the parameter P5 and the PRESERVATION probe flashes. [If the condenser probe is not enabled, pass to the display of the cell probe.](#)

Pressing the STANDBY key or a timeout of 10 seconds, takes the board to Off mode.

## 33. SETTING THE CLOCK

**For codes EVC80S10P7XXX02 – EVC80S11P7XXX02**

If the expansion board is present, it is possible to set the date and time. The procedure is the following. With board in Off mode, press the BLAST CHILLING-TIME DEEP FREEZING-TIME keys for three seconds. The display shows the “dAy” label in red. Press the BLAST CHILLING-TIME key. The display shows the day in green. Use the INCREASE and DECREASE keys to set the correct day. Press the BLAST CHILLING-TIME key to confirm and pass to setting the month. The display shows the “Mon” label. Proceed as described previously.

The succession of the labels is the following.

“dAy” to set the day

“Mon” to set the month

“Yr” to set the year

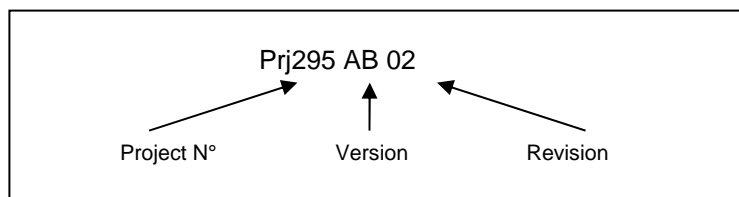
“Hr” to set the hour

“Min” to set the minutes

Press the STANDBY key to go back to Off.

## 34. FIRMWARE IDENTIFICATION

The Firmware identification is composed of 3 fields, Project N°, Version (that are unmistakably associated to the product code) and the Revision (that keeps track of modifications).



With the board in Off mode, press the BLAST CHILLING-TEMPERATURE key for three seconds. The display shows the project code in green. The next press of the BLAST CHILLING-TEMPERATURE key allows the display, in green, in the first two digits from the left, of the version code (0 means AA, 1 means AB, 2 means AC, 3 means AD and 4 means AE) and the revision code in the remaining digits. The two values are separated by the point of the second digit.

Pressing the STANDBY key or waiting for a timeout of 5 seconds, takes the board to Off mode.

## **35. APPENDIX**

### ***35.1. Indications for specific reading***

The specifications concern 7 codes with functionality slightly different under some aspects.

All paragraphs that do not state code indications, describe common functions to all configurations. However, for the parts specific for every code, the indication of the codes to which the function described refers is given at the top of the paragraph.