

## ON-OFF DIGITAL CONTROLLER FOR QUICK-COOLER/FREEZER MANAGEMENT

# EC 8-818

### GENERAL CHARACTERISTICS



- \* Frontal size: 72 x 144 mm (2.83 x 5.66 ").
- \* Power supply: 220 Vac (other on request).
- \* Six easy selectable cycles of functioning: quick-cooling, cold-storing, quick-cooling and cold-storing, quick-freezing, very cold-storing, quick-freezing and very cold-storing.
- \* Adapt to manage quick-cooling/freezing for temperature or time.
- \* Alarm buzzer included.
- \* One 3-digit 12.5 mm (0.49 ") high red LED display showing the temperature read by the needle/cabinet probe.
- \* One 3-digit 12.5 mm (0.49 ") high red LED display showing the remaining time at the end of a cycle/phase of quick-cooling/freezing.
- \* Adapt to manage electrical, hot gas and air defrost (automatic).
- \* Three measure inputs (cabinet, evaporator and needle probe) for PTC probe.
- \* One configurable door-switch digital input.
- \* Six relay outputs of which one 16 (2) A @ 250 Vac relay for one 1½ HP @ 250 Vac compressor (NO) management, four 6 (2) A @ 250 Vac relays for one ½ HP @ 250 Vac compressor (NO), two evaporator fans (NO), defrost system (resistances or bypass valve, change-over) management and one 5 (2) A @ 250 Vac relay for UV light control (change-over) management.

**EC 8-818** is an ON-OFF digital controller studied for quick-cooler/freezer management through the compressor, evaporator fans, defrost (for time-temperature) and UV light output control.

The instrument basically permits the control, according with the established parameters, automatic cycles of quick cooling/freezing of (pre-cooked or at environmental temperature) food temperature, using the compressor at its best, in order to preserve the product quality.

The controller has principally six different cycles of functioning configurable **according with the norms** and selectable through the keys located on the frontal panel:

**quick-cooling (for temperature or time)**, during which the instrument regulates the quick-cooling of food temperature, verifying that it happens within the maximum established time

**cold-storing**, during which the instrument works as a normal thermostat (with evaporator fans and defrost management) and regulating the cabinet temperature at the established value

**quick-cooling (for temperature or time) and cold-storing**, during which the instrument at first executes the phase of quick-cooling and at its end automatically moves to the phase of cold-storing

**quick-freezing (for temperature or time)**, similar to the cycle of quick-cooling

**very cold-storing**, similar to the cycle of cold-storing

**quick-freezing (for temperature or time) and very cold-storing**, during which the instrument at first executes the phase of quick-freezing and at its end automatically moves to the phase of very cold-storing.

In order to assure a correct execution of a cycle/phase of quick-cooling/freezing for temperature of pre-cooked (hot) food temperature it is necessary that the needle probe is properly positioned inside the product: so, the instrument, at the beginning of the cycle, executes a test to verify the proper insertion of the needle probe; the overcoming of this test permits the execution of the cycle/phase, contrary some alarm signals gets activated.

A proper key located on the frontal panel, permits to exclude this function permitting the execution of a cycle/phase of quick-cooling/freezing for temperature of at environmental temperature food temperature.

The six outputs permit the direct management of loads, in small power refrigeration systems, without using auxiliary relays.

The second compressor is on only during the quick-cooling/freezing phase and it repeats the activity of the first compressor with a activation delay time of 10 seconds; the second evaporator fan repeats the first evaporator fan activity and it is on only during a quick-cooling/freezing phase.

The device is provided of **two temperature alarms** (that can be disabled): the intervention of this kind of alarm activates the alarm buzzer with intermittent beep and the contemporary showing on the display of a proper temperature value but alternated to an alarm code.

Others alarm conditions (not proper kind of probe, defective probe, wrong connection, temperature outside the limits permitted by the used probe, etc. ), activate the alarm buzzer with intermittent beep and the contemporary showing on the display of univocal alarm codes that permit a sudden intervention against the causes of failure.

## FUNCTIONING:

Pressure on key **T 10** determines the start (status "ON", LED **L 8** lighted) or the stop (status "STAND-BY", LED **L 8** turned off) of the instrument: at any new restart the last programming will reappear; in case of lack of power-supply, when the voltage recover the last programming will reappear but an eventual count of a time will start from the beginning.

Pressure on key **T 7** during the status "STOP" selects the modality of quick-cooling/freezing of food temperature (for temperature, with LED **L 5** lighted and LED **L 6** turned off or for time, with LED **L 5** turned off and LED **L 6** lighted).

During the status "STOP" it is possible to select the desired cycle of functioning.

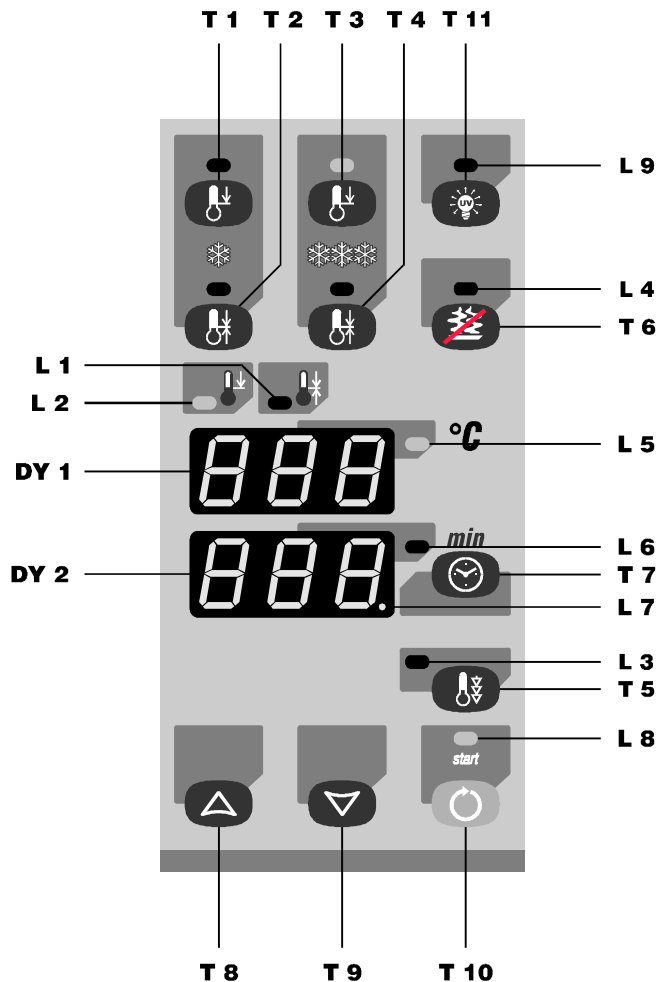


Fig. 1 - Interfaccia utente

### **Cycle number 1a: Quick-cooling for temperature of pre-cooked or at environmental temperature food temperature:**

Push the key **T 1** to select this cycle and the key **T 10** to start it: the LED **L 2** turning on.

If the conditions permit it (the temperature read by the evaporator probe must be below the set established with the parameter "d2" and the parameter "d4" must be set to 1), the instrument automatically executes a defrost cycle to permit a best performance of refrigerating system: the indicators **DY 1** and **DY 2** respectively display the indications "dEF" and the time established with the parameter "c1", the LED **L 3** and **L 7** turning on (during this cycle the defrost will never be activated again).

In order to assure a correct execution of a cycle of quick-cooling of pre-cooked (hot) food temperature it is necessary that the needle probe is properly positioned inside the product: so, the instrument (after pressure on key **T 10**), executes a test to verify the proper insertion of the needle probe (during the test the LED **L 4** flashes); the test has a happy success if, when the time established with the parameter "cE" ends, the temperature read by the needle probe is higher the set established with the parameter "c7".

In order to assure a correct execution of a cycle of quick-cooling of at ambient temperature food temperature the test must be deactivated (during the status "STOP") pushing the key **T 6**: the LED **L 4** turning on.

If the test has a happy success and if the conditions permit it (the eventual defrost cycle must be finished and the temperature read by the needle probe must be lower to the set established with the parameter "c8"), the instrument starts the cycle: the indicators **DY 1** e **DY 2** respectively display the temperature read by the needle probe and the decrease of the time established with the parameter "c1", the LED **L 7** flashes to indicate

that a count of a time is on run, the outputs concerning get activated.

*If the test has not an happy success, the cycle and the eventual defrost immediately end, the buzzer is activated with intermittent beep till when it is stopped (pressure on an any key during an alarm condition permit to stop the buzzer), the indicators **DY 1** and **DY 2** respectively display the indications "0-" flashing and "---", the compressor, evaporator fans and defrost outputs get deactivated: push the key **T 10** to set the instrument for a new cycle.*

The kind of temperature regulation is ON-OFF: the temperature that regulates the compressor activity is the temperature read by the cabinet probe, the set can be established with the parameter "**cb**", the hysteresis can be established with the parameter "**c0**"; the evaporator fans output is forced to the status on.

When the time established with the parameter "**c1**" ends, if the temperature read by the needle probe is lower the set established with the parameter "**c2**" the cycle has an happy success, the buzzer is activated with intermittent beep for the time established with the parameter "**c9**", the indicators **DY 1** and **DY 2** respectively display the indications "End" flashing and "---", the LED **L 2** and **L 7** turning off, the compressor, evaporator fans and defrost outputs get deactivated: push the key **T 10** to set the instrument for a new cycle; pushing the key **T 7** the indicator **DY 2** displays the time in minutes occurred to reach the set established with the parameter "**c2**".

*When the time established with the parameter "**c1**" ends, if the temperature read by the needle probe is not lower the set established with the parameter "**c2**" the cycle does not end, the buzzer is activated till when it is stopped (pressure on an any key during an alarm condition permit to stop the buzzer), the indicators **DY 1** and **DY 2** respectively display the temperature read by the needle probe and the indication "0" flashing, the concerning outputs remain activated: pushing the key **T 7** the indicator **DY 2** displays the time in minutes passed from the end of the time established with the parameter **c1**".*

*When the temperature read by the needle probe reaches the set established with the parameter "**c2**" the cycle ends, the indicators **DY 1** and **DY 2** respectively and alternately display the indication "End" and "---", the LED **L 2** and **L 7** turning off, the compressor, evaporator fans and defrost outputs get deactivated: push the key **T 10** to set the instrument for a new cycle.*

### **Cycle number 1b: Quick-cooling for time of pre-cooked or at environmental temperature food temperature:**

Push the keys **T 1** and **T 7** to select this cycle: the LED **L 6** turning on, the LED **L 5** turning off.

The indicator **DY 2** displays the maximum length of the quick-cooling for time: to modify its value push the key **T 8** or **T 9**.

Push the key **T 10** to start the cycle: the LED **L 2** turning on.

If the conditions permit it (the temperature read by the evaporator probe must be below the set established with the parameter "**d2**" and the parameter "**d4**" must be set to 1), the instrument automatically executes a defrost cycle to permit a best performance of refrigerating system: the indicators **DY 1** and **DY 2** respectively display the indications "dEF" and the maximum length of the quick-cooling for time, the LED **L 3** and **L 7** turning on (during this cycle the defrost will never be activated again).

When the eventual defrost ends the instrument starts the cycle: the indicators **DY 1** e **DY 2** respectively display the temperature read by the cabinet probe and the decrease of the length of the quick-cooling for time, the LED **L 7** flashes to indicate that a count of a time is on run, the outputs concerning get activated.

The kind of temperature regulation is ON-OFF: the temperature that regulates the compressor activity is the temperature read by the cabinet probe, the set can be established with the parameter "**cb**", the hysteresis can be established with the parameter "**c0**"; the evaporator fans output is forced to the status on.

Pushing the key **T 7** during this cycle the indicator **DY 2** displays the time in minutes passed from the start of the cycle.

When the length of the quick-cooling for time ends the cycle has an happy success, the buzzer is activated with intermittent beep for the time established with the parameter "**c9**", the indicators **DY 1** and **DY 2** respectively display the indications "End" flashing and "0", the LED **L 2** and **L 7** turning off, the compressor, evaporator fans and defrost outputs get deactivated: push the key **T 10** to set the instrument for a new cycle.

### **Cycle number 2: Cold-storing:**

Push the key **T 2** to select this cycle and the key **T 10** to start it: the LED **L 1** turning on.

The indicators **DY 1** and **DY 2** respectively display the temperature read by the cabinet probe and the indication "---".

The instrument works as a normal thermostat with evaporator fans and defrost management.

The kind of temperature regulation is ON-OFF: the temperature that regulates the compressor activity is the temperature read by the cabinet probe, the set can be established with the parameter "**c3**", the hysteresis can be established with the parameter "**c0**"; if the parameter "**F0**" has value 0, the temperature that regulates the evaporator fans activity is the temperature read by the evaporator probe, the set can be established with the parameter "**F1**", the hysteresis can be established with the parameter "**F2**".

### **Cycle number 3a: Quick-cooling for temperature of pre-cooked or at environmental temperature food temperature and cold-storing:**

Push the keys **T 1** and **T 2** to select this cycle and the key **T 10** to start it: the LED **L 2** turning on.

When the phase of quick-cooling ends (it is related in Cycle number 1a) the instrument moves to the phase of cold-storing (it is related in Cycle number 2).

### **Cycle number 3b: Quick-cooling for time of pre-cooked or at environmental temperature food temperature and cold-storing:**

Push the keys **T 1**, **T 2** and **T 7** to select this cycle: the LED **L 6** turning on, the LED **L 5** turning off.

The indicator **DY 2** displays the maximum length of the quick-cooling for time: to modify its value push the key **T 8** or **T 9**.

Push the key **T 10** to start the cycle: the LED **L 2** turning on.

When the phase of quick-cooling ends (it is related in Cycle number 1b) the instrument moves to the phase of cold-storing (it is related in Cycle number 2).

### **Cycle number 4a: Quick-freezing for temperature of pre-cooked or at environmental temperature food temperature:**

Push the key **T 3** to select this cycle and the key **T 10** to start it: the LED **L 2** turning on.

If the conditions permit it (the temperature read by the evaporator probe must be below the set established with the parameter "d2" and the parameter "d4" must be set to 1), the instrument automatically executes a defrost cycle to permit a best performance of refrigerating system: the indicators **DY 1** and **DY 2** respectively display the indications "dEF" and the time established with the parameter "c4", the LED **L 3** and **L 7** turning on (during this cycle the defrost will never be activated again).

In order to assure a correct execution of a cycle of quick-freezing of pre-cooked (hot) food temperature it is necessary that the needle probe is properly positioned inside the product: so, the instrument (after pressure on key **T 10**), executes a test to verify the proper insertion of the needle probe (during the test the LED **L 4** flashes); the test has an happy success if, when the time established with the parameter "cE" ends, the temperature read by the needle probe is higher the set established with the parameter "c7".

In order to assure a correct execution of a cycle of quick-freezing of at ambient temperature food temperature the test must be deactivated (during the status "STOP") pushing the key **T 6**: the LED **L 4** turning on.

If the test has an happy success and if the conditions permit it (the eventual defrost cycle must be finished and the temperature read by the needle probe must be lower to the set established with the parameter "c8"), the instrument starts the cycle: the indicators **DY 1** e **DY 2** respectively display the temperature read by the needle probe and the decrease of the time established with the parameter "c4", the LED **L 7** flashes to indicate that a count of a time is on run, the outputs concerning get activated.

*If the test has not an happy success, the cycle and the eventual defrost immediately end, the buzzer is activated with intermittent beep till when it is stopped (pressure on an any key during an alarm condition permit to stop the buzzer), the indicators **DY 1** and **DY 2** respectively display the indications "0-" flashing and "---", the compressor, evaporator fans and defrost outputs get deactivated: push the key **T 10** to set the instrument for a new cycle.*

The kind of temperature regulation is ON-OFF: the temperature that regulates the compressor activity is the temperature read by the cabinet probe, the set can be established with the parameter "cc", the hysteresis can be established with the parameter "c0"; the evaporator fans output is forced to the status on.

When the time established with the parameter "c4" ends, if the temperature read by the needle probe is lower the set established with the parameter "c5" the cycle has an happy success, the buzzer is activated with intermittent beep for the time established with the parameter "c9", the indicators **DY 1** and **DY 2** respectively display the indications "End" flashing and "---", the LED **L 2** and **L 7** turning off, the compressor, evaporator fans and defrost outputs get deactivated: push the key **T 10** to set the instrument for a new cycle; pushing the key **T 7** the indicator **DY 2** displays the time in minutes occurred to reach the set established with the parameter "c2".

*When the time established with the parameter "c4" ends, if the temperature read by the needle probe is not lower the set established with the parameter "c5" the cycle does not end, the buzzer is activated till when it is stopped (pressure on an any key during an alarm condition permit to stop the buzzer), the indicators **DY 1** and **DY 2** respectively display the temperature read by the needle probe and the indication "0" flashing, the concerning outputs remain activated: pushing the key **T 7** the indicator **DY 2** displays the time in minutes passed from the end of the time established with the parameter "c4".*

*When the temperature read by the needle probe reaches the set established with the parameter "c5" the cycle ends, the indicators **DY 1** and **DY 2** respectively and alternately display the indication "End" and "---", the LED **L 2** and **L 7** turning off, the compressor, evaporator fans and defrost outputs get deactivated: push the key **T 10** to set the instrument for a new cycle.*

### ***Cycle number 4b: Quick-freezing for time of pre-cooked or at environmental temperature food temperature:***

Push the keys **T 3** and **T 7** to select this cycle: the LED **L 6** turning on, the LED **L 5** turning off.

The indicator **DY 2** displays the maximum length of the quick-freezing for time: to modify its value push the key **T 8** or **T 9**.

Push the key **T 10** to start the cycle: the LED **L 2** turning on.

If the conditions permit it (the temperature read by the evaporator probe must be below the set established with the parameter "d2" and the parameter "d4" must be set to 1), the instrument automatically executes a defrost cycle to permit a best performance of refrigerating system: the indicators **DY 1** and **DY 2** respectively display the indications "dEF" and the maximum length of the quick-freezing for time, the LED **L 3** and **L 7** turning on (during this cycle the defrost will never be activated again).

When the eventual defrost ends the instrument starts the cycle: the indicators **DY 1** e **DY 2** respectively display the temperature read by the cabinet probe and the decrease of the length of the quick-freezing for time, the LED **L 7** flashes to indicate that a count of a time is on run, the outputs concerning get activated.

The kind of temperature regulation is ON-OFF: the temperature that regulates the compressor activity is the temperature read by the cabinet probe, the set can be established with the parameter "cc", the hysteresis can be established with the parameter "c0"; the evaporator fans output is forced to the status on.

Pushing the key **T 7** during this cycle the indicator **DY 2** displays the time in minutes passed from the start of the cycle.

When the length of the quick-freezing for time ends the cycle has an happy success, the buzzer is activated with intermittent beep for the time established with the parameter "c9", the indicators **DY 1** and **DY 2** respectively display the indications "End" flashing and "0", the LED **L 2** and **L 7** turning off, the compressor, evaporator fans and defrost outputs get deactivated: push the key **T 10** to set the instrument for a new cycle.

### ***Cycle number 5: Very cold-storing:***

Push the key **T 4** to select this cycle and the key **T 10** to start it: the LED **L 1** turning on.

The indicators **DY 1** and **DY 2** respectively display the temperature read by the cabinet probe and the indication "---".

The instrument works as a normal thermostat with evaporator fans and defrost management.

The kind of temperature regulation is ON-OFF: the temperature that regulates the compressor activity is the temperature read by the cabinet probe, the set can be established with the parameter "c6", the hysteresis can be established with the parameter "c0"; if the parameter "F0" has value 0, the temperature that regulates the evaporator fans activity is the temperature read by the evaporator probe, the set can be established with the parameter "F1", the hysteresis can be established with the parameter "F2".

### ***Cycle number 6a: Quick-freezing for temperature of pre-cooked or at environmental temperature food temperature and very cold-storing:***

Push the keys **T 3** and **T 4** to select this cycle and the key **T 10** to start it: the LED **L 2** turning on.

When the phase of quick-freezing ends (it is related in Cycle number 4a) the instrument moves to the phase of very cold-storing (it is related in Cycle number 5).

### ***Cycle number 6b: Quick-freezing for time of pre-cooked or at environmental temperature food temperature and very cold-storing:***

Push the keys **T 3**, **T 4** and **T 7** to select this cycle: the LED **L 6** turning on, the LED **L 5** turning off.

The indicator **DY 2** displays the maximum length of the quick-freezing for time: to modify its value push the key **T 8** or **T 9**.

Push the key **T 10** to start the cycle: the LED **L 2** turning on.

When the phase of quick-freezing ends (it is related in Cycle number 4b) the instrument moves to the phase of very cold-storing (it is related in Cycle number 5).

### ***Door-switch input :***

The instrument is provided of a door-switch input which activation does not end a cycle on run but determines the action established with the parameters "u1" and "u5" and it is indicated from the showing on the indicator **DY 1** of the indication "]-[" alternated to the indication that the indicator displayed when the door-switch input on alarm happened and (during the status "START") from the alarm buzzer activation with intermittent beep: a door-switch input on alarm does not permit the start of an any cycle of functioning.

### ***Hard-Soft quick-cooling:***

This temperature quick-cooling modality is only available during a cycle/phase of quick-cooling.

During the quick-cooling, this operation is divided in two parts: a Hard phase (in this phase the compressor work with a very low setpoint to

permit to maximize the temperature quick-cooling speed) and a Soft phase (in this phase the compressor work with a setpoint higher than the previous setpoint).

To select the Hard-Soft quick-cooling push the key **T 5** when the instrument is in STAND-BY status: the LED **L 3** turning on.

If a cycle/phase of quick-cooling for temperature is selected, during the Hard phase the working-setpoint of the compressor can be established with the parameter "**cF**" (the Hard-phase automatically ends when the temperature read by the needle probe reaches the setpoint established with the parameter "**cd**"), during the Soft-phase the compressor works in the same way of the cycle 1a.

If a cycle/phase of quick-cooling for time is selected, during the Hard-phase the working-setpoint of the compressor can be established with the parameter "**cF**" (the Hard-phase automatically ends when the time established with the parameter "**t1**" is passed), during the Soft-phase the compressor works in the same way of the cycle 1b.

To unselect the Hard-Soft quick-cooling push the key **T 1**, **T 2**, **T 3** or **T 4** during the STAND-BY status: the LED **L 3** turning off.

### ***Hard phase lenght (for a quick-cooling for time):***

To set the Hard phase lenght (when a quick-cooling for time is selected), keep pushed for four seconds at least the key **T 5** (when four seconds are transurred the LED **L 3** flashes) and change the value with the keys **T 8** and **T 9**.

After the modify do not operate with the keys for four seconds at least (the instrument automatically turns out from the setting of the Hard phase lenght).

### ***UV Light:***

Pushing the key **T 11** the instrument activates the UV light output and turning on the LED **L 9** for the time established with the parameter "**u5**", except if is pushed the key **T 11** (if the parameter "**u5**" had value 0 the UV light is activated and deactivated with the pushing of the key **T 11**).

During the activation of the door-switch digital input the activation of the UV light is denied.

The activation of the door-switch digital input during the counting of the time established with the parameter "**u5**" freezing the counting and restart itself when the door-switch digital input is deactivated.

## SIGNALS

<i>Signals</i>	<i>Indications</i>
the LED <b>L 1</b> is lighted	a cycle/phase of cold-storing is on run
the LED <b>L 2</b> is lighted	a cycle/phase of quick-cooling/freezing is on run
the LED <b>L 3</b> is lighted	a Hard-Soft quick-cooling was selected
the LED <b>L 5</b> is lighted	the modality of quick-cooling/freezing for temperature was selected
the LED <b>L 6</b> is lighted	the modality of quick-cooling/freezing for time was selected
the LED <b>L 7</b> is lighted	the instrument is ready to execute the count of a time but the conditions do not permit it (a defrost cycle is on run or the temperature read by the needle probe is not lower the set established with the parameter " <b>c8</b> ")
the LED <b>L 8</b> is lighted	the instrument is on
the LED <b>L 7</b> flashes	a count of a time is on run
on the indicator <b>DY 1</b> appears the indication " <b>dEF</b> "	a defrost cycle is on run
on the indicator <b>DY 1</b> flashes the indication " <b>dEF</b> "	a delay count at the defrost cycle activation is on run (parameters " <b>C0</b> ", " <b>C1</b> ", " <b>C2</b> ", and " <b>d1</b> ")

## ALARMS (1/3)

<i>Alarms</i>	<i>Causes</i>	<i>Remedies</i>	<i>Effects</i>
on the indicator <b>DY 1</b> flashes the indication " <b>E0</b> " and the buzzer is activated with intermittent beep ( <b>cabinet probe failure</b> )	the kind of cabinet probe is not proper, the cabinet probe is defective, the connection instrument-cabinet probe is not proper, the temperature read by the cabinet probe is outside the limits permitted by the cabinet probe in use	check if the cabinet probe is a PTC probe, check the integrity of the cabinet probe, check the correctness of the connection instrument-cabinet probe, check if the temperature near the cabinet probe is inside the limits permitted by the cabinet probe in use	if the alarm happens during the status " <b>STOP</b> " it does not permit the start of a cycle of quick-cooling/freezing; if the alarm happens during a cycle of quick-cooling/freezing it immediately ends the cycle; if the alarm happens during a cycle of cold-storing the compressor output is activated with the modality established with the parameters " <b>C5</b> " and " <b>C6</b> " (or " <b>C7</b> ")
on the indicator <b>DY 1</b> flashes the indication " <b>E1</b> " alternated to a temperature value and the buzzer is activated with intermittent beep ( <b>evaporator probe failure</b> )	the same saw in the preceding case but referred to the evaporator probe	the same saw in the preceding case but referred to the evaporator probe	the defrost ends for maximum length (parameter " <b>d3</b> ")

## ALARMS (2/3)

<i>Alarms</i>	<i>Causes</i>	<i>Remedies</i>	<i>Effects</i>
on the indicator <b>DY 1</b> flashes the indication "E2" and the buzzer is activated with intermittent beep ( <b>corrupted memory data alarm</b> )	there is a failure of memorised configuration data	try to switch the power supply off and then switch it on: if the alarm persists also to the instrument restart it is necessary to change the instrument	if the alarm happens during the status " <b>STOP</b> " it does not permit the start of any cycle of functioning; if the alarm happens during the status " <b>START</b> " it immediately ends the cycle, all the outputs are deactivated
on the indicator <b>DY 1</b> flashes the indication "E3" alternated to a temperature value and the buzzer is activated with intermittent beep ( <b>needle probe failure</b> )	the same saw for the cabinet probe failure but referred to the evaporator probe	the same saw for the cabinet probe failure but referred to the evaporator probe	if the alarm happens during the status " <b>STOP</b> " it does not permit the start of a cycle of quick-cooling/freezing for temperature
on the indicator <b>DY 1</b> flashes the indication "e-" alternated to a temperature value and the buzzer is activated with intermittent beep ( <b>needle probe test failure</b> )	the test to verify the proper position of the needle probe is failed (parameters "c7" and "CE")	push the key <b>T 6</b> to confirm manually the proper insertion of the needle probe	the cycle/phase of quick-cooling/freezing for temperature ends at the end of the time established with the parameter "c1" or "c4"
on the indicator <b>DY 1</b> flashes the indication "End" and the buzzer is activated with intermittent beep for some seconds ( <b>cycle of quick-cooling/freezing for temperature successfully</b> )	a cycle of quick-cooling/freezing for temperature has successfully finished	push the key <b>T 10</b> to set the instrument for a new cycle	the compressor, evaporator fans and defrost outputs are deactivated
on the indicator <b>DY 1</b> flashes the indication "End", on the indicator <b>DY 2</b> appears the indication "0" and the buzzer is activated with intermittent beep for some seconds ( <b>cycle of quick-cooling/freezing for time successfully</b> )	a cycle of quick-cooling/freezing for temperature has successfully finished	push the key <b>T 10</b> to set the instrument for a new cycle	the compressor, evaporator fans and defrost outputs are deactivated
on the indicator <b>DY 1</b> appears a temperature value, on the indicator <b>DY 2</b> flashes the indication "0" and the buzzer is activated with intermittent beep ( <b>cycle/phase of quick-cooling/freezing out of maximum length</b> )	the temperature read by the needle probe has not reached the set established with the parameter "c2" (or "c5") inside the maximum length established with the parameter "c1" (or "c4")	push the key <b>T 10</b> to set the instrument for a new cycle	the concerning outputs remain activated



### ALARMS (3/3)

<i>Alarms</i>	<i>Causes</i>	<i>Remedies</i>	<i>Effects</i>
on the indicator <b>DY 1</b> appears the indication "End", on the indicator <b>DY 2</b> flashes the indication "---" and the buzzer is activated with intermittent beep ( <b>cycle of quick-cooling/freezing failed and out of maximum length</b> )	the temperature read by the needle probe has reached the set established with the parameter "c2" (or "c5") out of the maximum length established with the parameter "c1" (or "c4")	push the key <b>T 10</b> to set the instrument for a new cycle	the compressor, evaporator fans and defrost outputs are deactivated
on the indicator <b>DY 1</b> appears a temperature value, on the indicator <b>DY 2</b> flashes the indication "---" and the buzzer is activated with intermittent beep ( <b>phase of quick-cooling/freezing failed and out of maximum length and phase of cold-storing on run</b> )	the temperature read by the needle probe has reached the set established with the parameter "c2" (or "c5") out of the maximum length established with the parameter "c1" (or "c4") and the instrument moved to the phase of cold-storing	push the key <b>T 10</b> to set the instrument for a new cycle	the concerning outputs remain activated
on the indicator <b>DY 1</b> flashes the indication "]-[" alternated to a temperature value ( <b>door-switch input on alarm</b> )	the door-switch input is on	deactivate the door-switch input	the action established with the parameter "u5"
on the indicator <b>DY 1</b> flashes the indication "]-[" alternated to a temperature value and the buzzer is activated with intermittent beep ( <b>door-switch input on alarm</b> )	the door-switch input is on	deactivate the door-switch input	the action established with the parameters "u1" and "u5"
on the indicator <b>DY 1</b> flashes the indication "]-[" alternated to the indication "dEF" ( <b>door-switch input on alarm</b> )	the door-switch input is on during a defrost cycle managed at air (parameter "d1")	when the defrost cycle ends deactivate the door-switch input	the action established with the parameter "u5"
on the indicator <b>DY 1</b> flashes the indication "]-[" alternated to the indication "dEF" and the buzzer is activated with intermittent beep ( <b>door-switch input on alarm</b> )	the door-switch input is on during a defrost cycle managed at resistances or at hot gas (parameter "d1")	deactivate the door-switch input	the action established with the parameters "u1" and "u5"
on the indicator <b>DY 1</b> flashes the indication "AL" alternated to a temperature value and the buzzer is activated with intermittent beep ( <b>temperature alarm</b> )	the temperature read by the cabinet probe is outside the set established with the parameter "A1" (or "A3") or "A2" (or "A4")	check if the temperature read by the cabinet probe is re-entering the set established with the parameter "A1" (or "A3") or "A2" (or "A4")	inactive

## PROCEDURE OF CONFIGURATION PARAMETERS PROGRAMMING

The configuration parameters programming can be done during the status "STOP" only, if there is not a **corrupted memory data alarm**. There are two Levels of configuration (Level 2 is protected by password):

### Level 1

Keep pushed **T 8** and **T 9** at the same time for 4 seconds at least: on the indicator **DY 1** appear the parameter "PA".

Push **T 8** or **T 9** to select the parameter to modify at Level 1.

Keep pushed **T 10** and **T 8** or **T 9** to modify the selected parameter: after the modify release the key **T 10** as last.

### Level 2

From Level 1 push **T 8** or **T 9** to select the parameter "PA".

Keep pushed **T 10** and **T 8** or **T 9** to set "-19": after the modify release the key **T 10** as last.

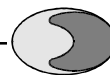
Keep pushed **T 8** and **T 9** at the same time for 4 seconds at least: on the indicator **DY 1** appear the first parameter of Level 2.

Push **T 8** or **T 9** to select the parameter to modify at Level 2.

Keep pushed **T 10** and **T 8** or **T 9** to modify the selected parameter: after the modify release the key **T 10** as last.

### How to leave the PROCEDURE

Keep pushed **T 8** and **T 9** at the same time for 4 seconds at least or wait 50 seconds without operate on the keyboard (time-out exit) or stop and restart the instrument after about 1 second from the last modify.



## CONFIGURATION PARAMETERS (1/2)

NOTE	CODE	PARAMETER	DESCRIPTION	MIN.	MAX.	U.M.	STAND.
(1)	PA	password		-55	99	---	---
	/	<b>MEASURE INPUTS</b>					
(1)	/1	calibration (ref. to the cabinet probe)		-10	+10	°C	0
	c	<b>QUICK-COOLING/FREEZING AND COLD-STORING ON-OFF REGULATOR</b>					
(1)	c0	hysteresis (differential, ref. to the cabinet probe)		+1	+15	°C	+2
(1)	c1	maximum length of the quick-cooling for temperature		1	400	min.	90
(1)	c2	quick-cooling for temperature cut off set (ref. to the needle probe)		-55	+99	°C	+10
(1)	c3	cold-storing set (ref. to the cabinet probe)		-55	+99	°C	+3
(1)	c4	maximum length of the quick-freezing for temperature		1	400	min.	270
(1)	c5	quick-freezing for temperature cut off set (ref. to the needle probe)		-55	+99	°C	-18
(1)	c6	very cold-storing set (ref. to the cabinet probe)		-55	+99	°C	-25
	c7	needle probe properly positioned test set (ref. to the needle probe)		0	+99	°C	+30
(1)	c8	quick-cooling/freezing for temperature enabling set (ref. to the needle probe)		-55	+99	°C	+65
	c9	alarm buzzer activation length when a quick-cooling/freezing ends		0	99	sec.	3
(1)(2)	cA	needle probe reading		---	---	°C	---
(1)	cb	quick-cooling working set (ref. to the cabinet probe)		-55	+99	°C	-10
(1)	cc	quick-freezing working set (ref. to the cabinet probe)		-55	+99	°C	-55
(1)	cd	Hard phase interruption set (ref. to the needle probe)		-55	+99	°C	+15
	cE	needle probe properly positioned test maximum length		1	99	sec.	35
(1)	cF	Hard phase working set (ref. to the needle probe)		-55	+99	°C	-15
	C	<b>COMPRESSOR OUTPUT PROTECTIONS</b>					
	C0	disabling time at the output activation from the instrument start		0	99	min.	0
	C1	disabling time at the output activation from the preceding activation		0	99	min.	0
	C2	disabling time at the output activation from the preceding deactivation		0	99	min.	0
	C5	cycle time for the output activation in case of cabinet probe failure		0	99	min.	10
	C6	output activation length during the cold-storing in case of cabinet probe failure		0	99	min.	3
	C7	output activation length during the very cold-storing in case of cabinet probe failure		0	99	min.	8
	d	<b>DEFROST REGULATOR</b>					
(3)	d0	defrost interval		0	99	hours/min.	8
(4)	d1	kind of defrost		0	2	---	1
	d2	defrost cut off set (ref. to the evaporator probe)		-55	+99	°C	+2
	d3	maximum defrost length		1	99	min./sec.	30
	d4	defrost at the beginning of the quick-cooling/freezing 0=NO; 1=YES		0	1	---	0
	d7	dripping length		0	99	min./sec.	2
(5)	d9	forced defrost (delays override)		0	1	---	0
(1)(2)	dA	evaporator probe reading		---	---	°C	---
(6)	db	times base for the parameters d0, d3, d7 and F5		0	1	---	0
	F	<b>EVAPORATOR FANS REGULATOR</b>					
(7)	F0	output activity		0	1	---	0
	F1	output deactivation set (ref. to the evaporator probe)		-55	+99	°C	-1
	F2	hysteresis (differential, ref. to the evaporator probe)		+1	+15	°C	+1
	F3	output deactivated if the compressor is deactivated 0=NO; 1=YES		0	1	---	1
	F4	output deactivated during the defrost 0=NO; 1=YES		0	1	---	1
	F5	disabling time at the output activation from the end of the dripping		0	99	min./sec.	3
	u	<b>DIGITAL INPUTS</b>					
(8)	u1	door-switch deactivate evaporator fans output 0=NO; 1=YES		0	1	---	1
(8)	u2	door-switch input polarity 0=NO; 1=NC		0	1	---	0
	u5	UV light output activation during		0	99	min.	3
	A	<b>TEMPERATURE ALARM REGULATOR</b>					
	A0	hysteresis (differential, ref. to the cabinet probe)		+1	+15	°C	+2

## CONFIGURATION PARAMETERS (2/2)

NOTE	CODE	PARAMETER	DESCRIPTION	MIN.	MAX.	U.M.	STAND.
(9)	A1		lower temperature alarm set relative to the cold-storing set (ref. to the cabinet probe)	-99	0	°C	0
(9)	A2		upper temperature alarm set relative to the cold-storing set (ref. to the cabinet probe)	0	+99	°C	0
(9)	A3		lower temperature alarm set relative to the very cold-storing set (ref. to the cabinet probe)	-99	0	°C	0
(9)	A4		upper temperature alarm set relative to the very cold-storing set (ref. to the cabinet probe)	0	+99	°C	0
	A5		disabling time of the alarm temperature from the beginning of the cold-storing	0	255	min.	30
	A6		disabling time of the alarm temperature	0	255	min.	0
	<b>L</b>	<b>RESERVED</b>					
	L1		reserved	---	---	---	---
	L2		reserved	---	---	---	---
	L3		reserved	---	---	---	---
	L4		reserved	---	---	---	---

## QUICK-COOLING/FREEZING FOR TIME

NOTE	CODE	PARAMETER	DESCRIPTION	MIN.	MAX.	U.M.	STAND.
			quick-cooling/freezing for time length	0	999	min.	90

### NOTES

- (1) = configuration parameters present on Level 1.
- (2) = reading parameter (it can not be changed).
- (3) = it establishes the time between the start of an automatic defrost and the start of the following automatic one and, during a cycle/phase of cold-storing, the time between the start of the cycle/phase of cold-storing and the start of the first automatic defrost; if the parameter has value 0 the automatic defrost will never be activated, excepting the parameter d4.
- (4) = it establishes the kind of defrost that the instrument must manage, as indicated:  
 0=resistances (during the defrost compressor output deactivated and defrost output activated),  
 1=hot gas (during the defrost compressor and defrost outputs activated),  
 2=air (during the defrost evaporator fans and defrost outputs activated).
- (5) = it establishes if to subjugate the compressor output to the disabling time established with the parameters C0, C1 and C2 or to clear this times when a defrost is requested, as indicated:  
 0=the disabling time are observed,  
 1=the disabling time are cleared.
- (6) = it establishes the measure unit for the parameters d0, d3, d7 and F5, as indicated:  
 0=the measure unit for the parameter d0 is hours, the measure unit for the parameters d3, d7 and F5 is minutes,  
 1=the measure unit for the parameter d0 is minutes, the measure unit for the parameters d3, d7 and F5 is seconds.
- (7) = it establishes the output activity, as indicated:  
 0=the output activity depends from the temperature read by the evaporator probe and from the parameters F1 and F2, excepting the parameters d7, F3, F4 and F5,  
 1=the output is continuously activated, excepting the parameters d7, F3, F4 and F5.
- (8) = set to 0 this parameter if the digital inputs are not used.
- (9) = if the parameter has value 0 the temperature alarm is disabled.

## INSTALLATION

For a proper installation take note of the attached indications.

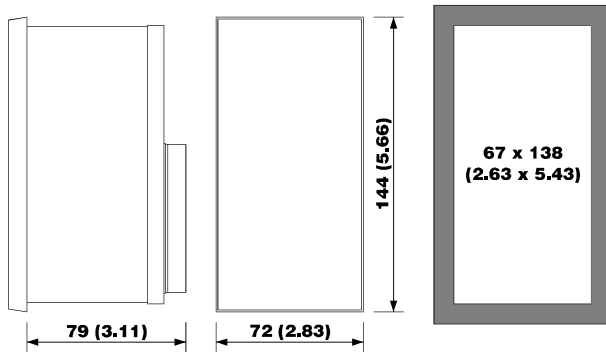
Be sure that the conditions of use (environment temperature, humidity, power supply voltage, etc ...) are inside the indicated limits.

Do not overload the relay outputs over the indicated limits.

It is necessary to give the outputs the suitable protection against the short circuits and overloads.

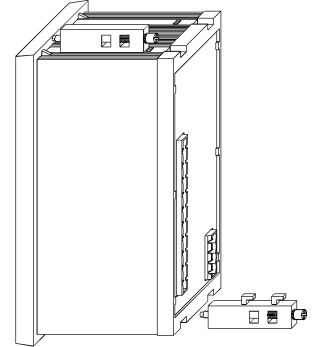
### Size and piercing template

All measures are in mm and inches.



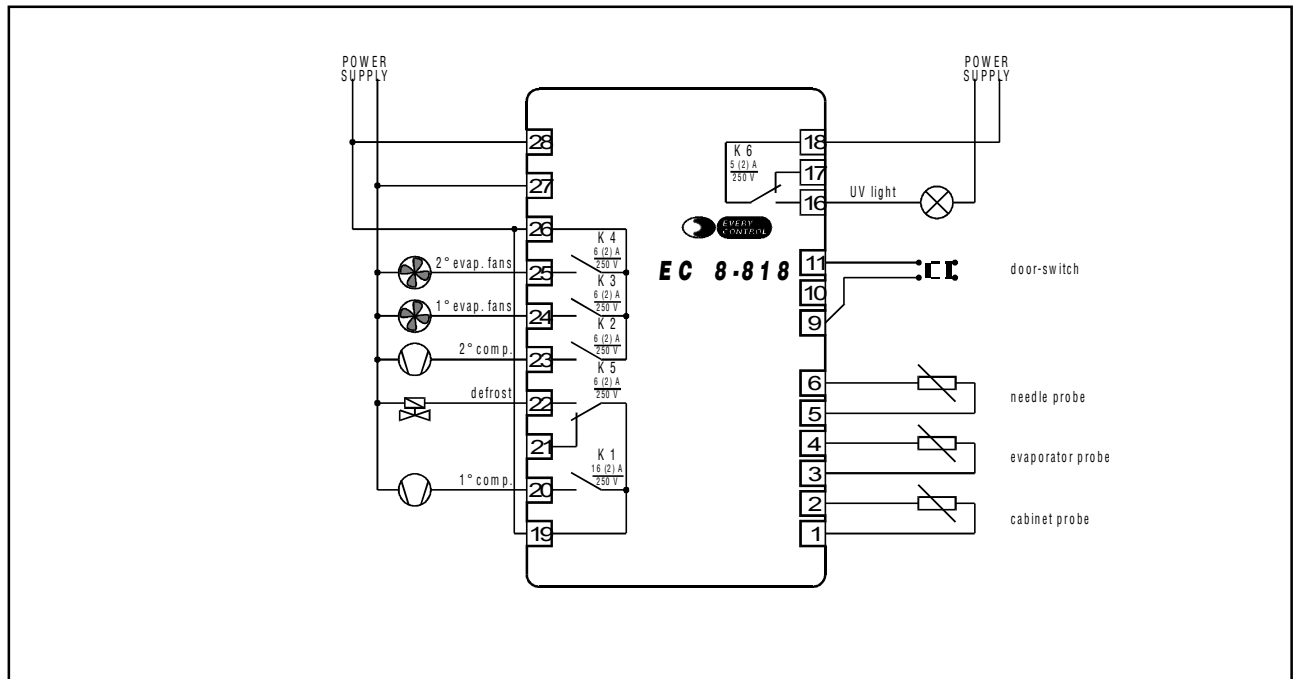
### Fixing

Panel mounting through screw brackets; the panel thickness must be between 1 and 5 mm.



### Electrical connections

Example of typical application



## ELECTROMECHANICAL CHARACTERISTICS

<b>Case:</b>	plastic black (PPO), self-extinguishing ABS according with UL 94 V-0.
<b>Size:</b>	72 x 144 x 79 mm (2.83 x 5.66 x 3.11 ").
<b>Installation:</b>	panel mounting, panel cutout 67 x 138 mm (2.63 x 5.43 "), with equipped screw brackets.
<b>Frontal protection index:</b>	IP 54.
<b>Connections:</b>	extractable screw terminal blocks with pitch 5 mm (0.19 ", inputs) and pitch 7.5 mm (0.29 ", power supply and outputs) for cables up to 2.5 mm <sup>2</sup> .
<b>Environment temperature:</b>	from 0 to +60 °C (10 ... 90 % of relative humidity).
<b>Power supply:</b>	220 Vac, 50/60 Hz, 4 VA (115 Vac or 24 Vac or 12-24 Vac/dc or 12 Vac/dc on request).
<b>Insulation class:</b>	II (only the models powered in ac).
<b>Alarm buzzer:</b>	included.
<b>Measure inputs:</b>	3 (cabinet, evaporator and needle probe) for PTC probe.
<b>Digital inputs:</b>	1 (5 V, 1 mA), door-switch.
<b>Working range:</b>	from -50 to +150 °C.
<b>Setting range:</b>	from -55 to +99 °C.
<b>Timer setting range:</b>	from 1 to 400 minutes for the quick-cooling/freezing for temperature and from 0 to 999 minutes for the quick-cooling/freezing for time.
<b>Resolution:</b>	1 °C.
<b>Display:</b>	two 3-digit display 12,5 mm (0.49 ") high red LED display with automatic sign, programming status indicators.
<b>Outputs:</b>	6 relays of which one 16 (2) @ 250 Vac relay for one 1½ HP @ 250 Vac compressor management (NO), four 6 (2) A @ 250 Vac relays for one ½ HP @ 250 Vac compressor management, two evaporator fans (NO), defrost system (change-over) management and on 5 (2) A @ 250 Vac for UV light control (change-over).
<b>Kind of defrost managed:</b>	electrical, hot gas and air (automatic).
<b>Defrost management:</b>	interval, cut off temperature and maximum length.