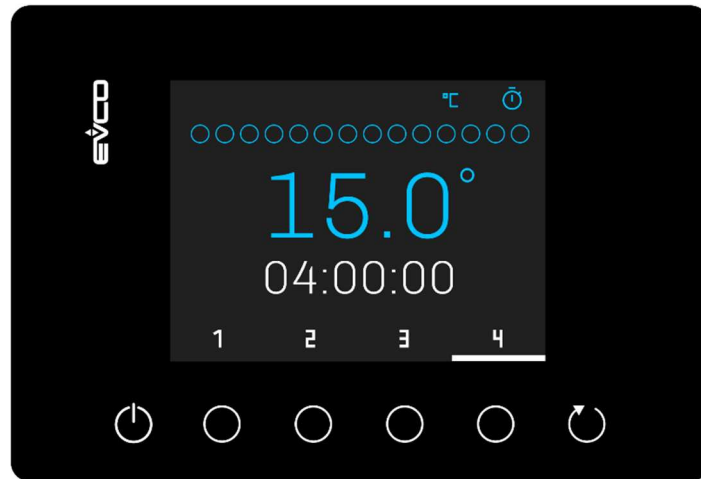




EVJ 700 Thawing

Controllers for thawing cabinets



ENGLISH

INSTALLER MANUAL ver. 1.0

CODE 144J795E104



Important

Read this document carefully before installation and before using the device and take all the prescribed precautions. Keep this document with the device for future consultation.
Only use the device in the ways described in this document. Do not use the device as a safety device.



Disposal

The device must be disposed of according to local regulations governing the collection of electrical and electronic equipment.

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1 INTRODUCTION

1.1 Product description

EVJ 700 Thawing is a controller for thawing cabinets. It has five relays which can be configured to meet users' needs and are also available in the sealed version, so can be used with refrigerant gases with reduced environmental impact (such as R290).

The thawing cycles can be time- or temperature-controlled (using a needle probe) and automatically go to the holding phase. Each of the two operating modes has four pre-set programmes which are accessed from the display, allowing users to customise thawing and preservation setpoints for the loads quickly and easily, preventing the development of bacteria and ensuring only the highest quality and safety standards.

The display can be configured to show the current values or the setpoints set for cabinet temperature, needle probe temperature (for temperature-controlled cycles) and countdown (for time-controlled cycles). A status bar indicates if a thawing cycle is running and a buzzer sounds to signal the end of the cycle. Alarms are also signalled with visual messages and sounds.

The controller has a built-in user interface with a 2.8 inch colour graphic display, 6 capacitive keys and an IP65 front with a continuous surface. It can be fitted to the panel in the conventional way, built into the front, or concealed under the panel (if made of glass or methacrylate), ensuring high cleaning and hygiene standards.

Users can interact remotely with their equipment using the **EPoCA®** cloud platform with Wi-Fi or Ethernet connectivity (which also enables alternative or parallel control through MODBUS TCP). Onsite, they can interact from a mobile device with the **EVconnect®** app which uses Bluetooth Low Energy connectivity. For more details, compare all the connectivity options in the Technical Data table and consult the Management and Monitoring Products/Systems and the Connectivity Products/Devices sections of our website.

1.2 Models available and hardware features

The table below shows the technical features of the model available and the purchasing code.

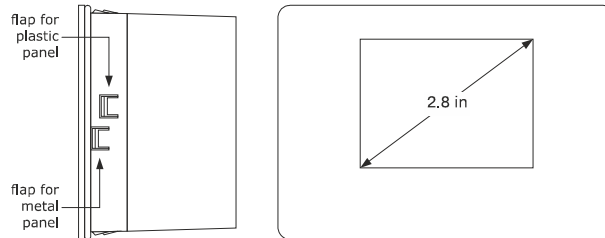
	EVJ795N9VX3	EVJ795N9VXC
Power supply		
115...230 Vac	•	•
Analogue inputs (configurable)		
Pb1: default cabinet probe (PTC/NTC)	•	•
Pb2: default needle probe (PTC/NTC)	•	•
Multi-purpose analogue/digital inputs (configurable)		
Pb3: default evaporator probe (PTC/NTC) or id2: default disabled	•	•
Digital inputs		
id1: door switch	•	•
Digital outputs (configurable)		
k1: default compressor	30 A	30 A (HC)
k2: default thawing heaters	8 A	8 A (HC)
k3: default defrost heaters	8 A	8 A (HC)
k4: default evaporator fan	5 A	5 A (HC)
k5: default auxiliary output	5 A	5 A (HC)
Communications ports		
TTL MODBUS	•	•
Connectivity		
RS-485 MODBUS RTU (optional through the EVlinking RS-485 module)	•	•
Bluetooth Low Energy for EVconnect app (optional through the EVlinking BLE module)	•	•
Wi-Fi EPoCA/MODBUS TCP (optional through the EVlinking Wi-Fi module powered by controller)	•	•
Ethernet EPoCA/MODBUS TCP (optional through EV3 Web gateway)	•	•
Other features		
Alarm buzzer	•	•

2 INSTALLATION

2.1 Format features

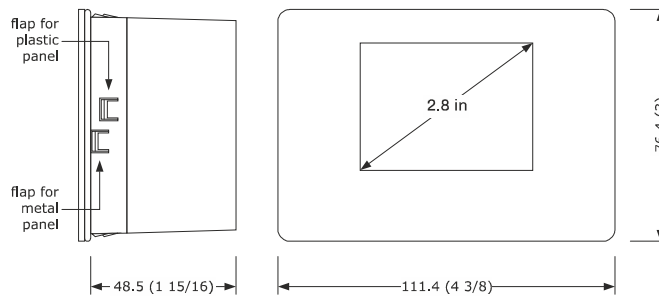
The controller is available in a compact version with a plastic housing and holding flaps.

The user interface has a 2.8 inch colour graphic display, 6 capacitive keys and an IP65 front.

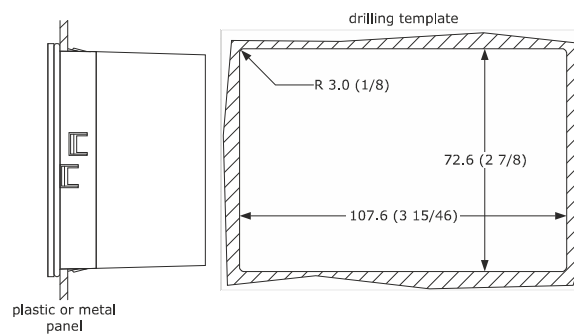


2.2 Measurements and installation

Measurements



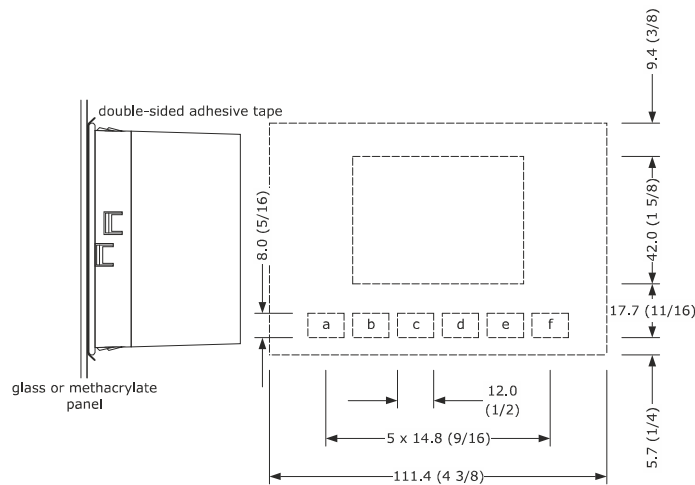
Panel, from the front



CAUTION:

The metal panel must be between 0.8 and 1.5 mm (1/32 and 1/16 in) thick, while the plastic panel must be between 0.8 and 3.4 mm (1/32 and 1/8 in).

Under glass or methacrylate panel



CAUTION:

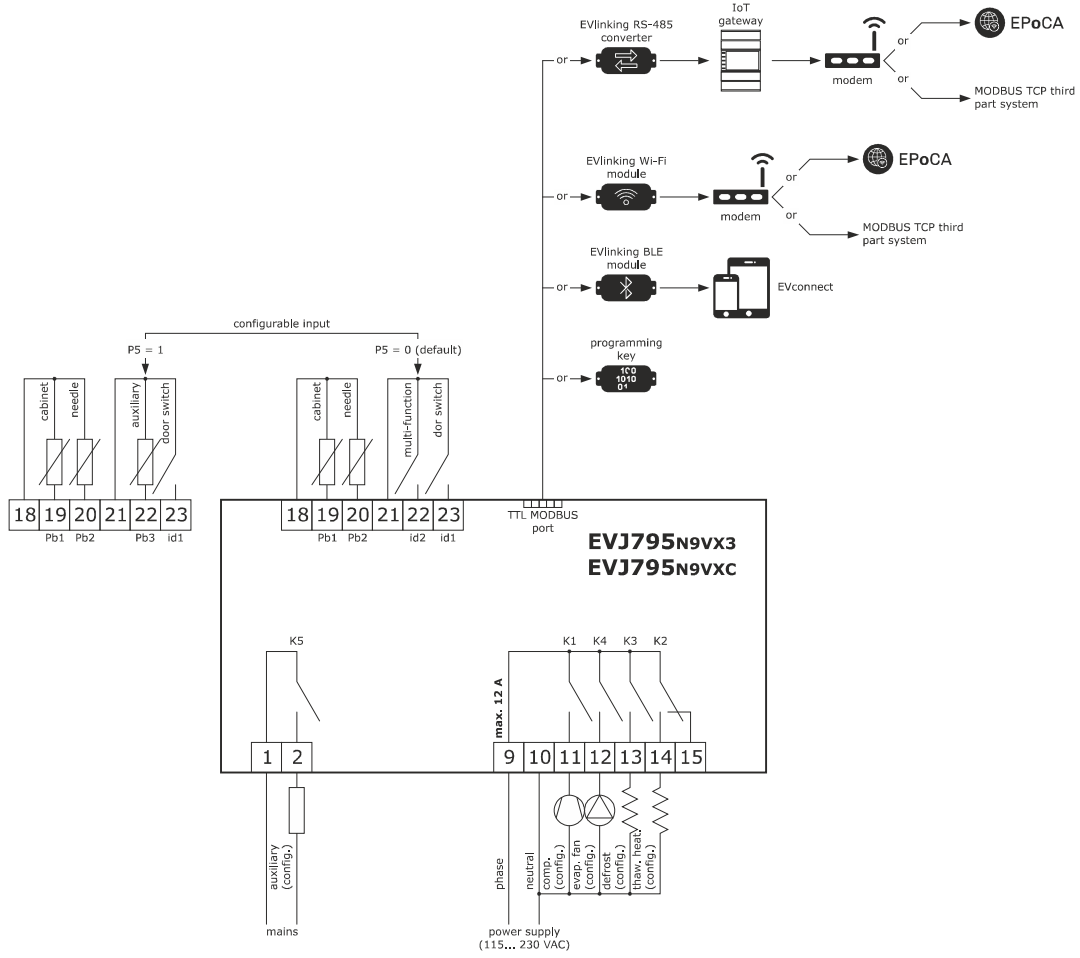
- the glass panel must have a maximum thickness of 4.0 mm (3/16 in), while the methacrylate panel must be no thicker than 2.0 mm (1/16 in)
- the panel and the material used to carry out screen printing must not contain conductive substances
- keep the device and the panel at a temperature of between 15 and 38 °C (59 and 100 °F) for about an hour before carrying out the installation
- before installation, carefully clean the panel surface that will be in contact with the double-sided adhesive tape, making sure that the product used for cleaning is suitable for the panel material (we recommend using isopropyl alcohol, in the case of surfaces greased with a hydrocarbon solvent). Continue cleaning with a cloth until it is clean and dry after use
- during installation, apply uniform and constant pressure for about 30 seconds on the panel surface in contact with the double-sided adhesive tape. Then leave the device and the panel in a horizontal position for about 48 hours at a temperature of between 15 and 38 °C (59 and 100 °F).



Installation precautions

- ensure that the working conditions for the device (operating temperature, humidity, etc.) are within the set limits. See section 10 "TECHNICAL SPECIFICATIONS"
- do not install the device close to heat sources (heaters, hot air ducts, etc.), equipment with a strong magnetic field (large diffusers, etc.), in places subject to direct sunlight, rain, damp, excessive dust, mechanical vibrations or shocks.
- any metal items close to the control module must be at a sufficient distance so as not to compromise the safety distance; any cabling must be placed at least 2 cm away
- in compliance with safety regulations, the device must be installed properly to ensure adequate protection from contact with electrical parts. All protective parts must be fixed in such a way as to need the aid of a tool to remove them.

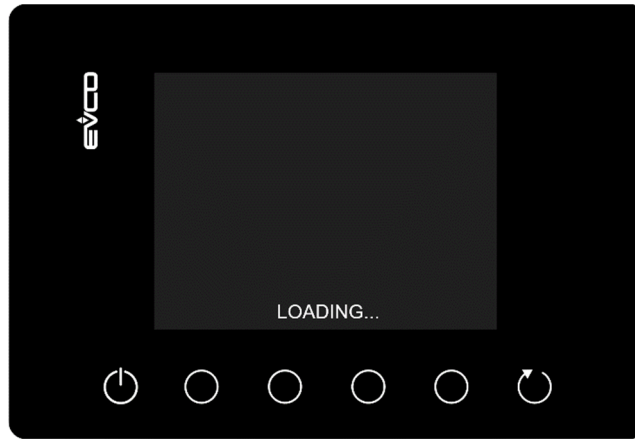
2.3 Electrical connection



3 OPERATING THE DEVICE

3.1 Initial switch-on

Connect the device to the power supply: a neutral system loading screen will be presented:



Once loading is complete, the device will go back to the mode it was in before being powered down, namely:

- to the Home screen with no power outage message;
- the cycle in progress with the POWER OUTAGE message indicating that there has been a loss of power.

3.2 Power outage

If there is a power outage with no function in progress, when power is restored the device will return to the mode set before the failure occurred.

If the power supply fails while a function is active, when power is restored the device will behave as follows:

- if a thawing cycle was running, it will resume from where it was interrupted;
- if a preservation cycle was running, the cycle will continue with the same settings.


3.3 Silencing the buzzer

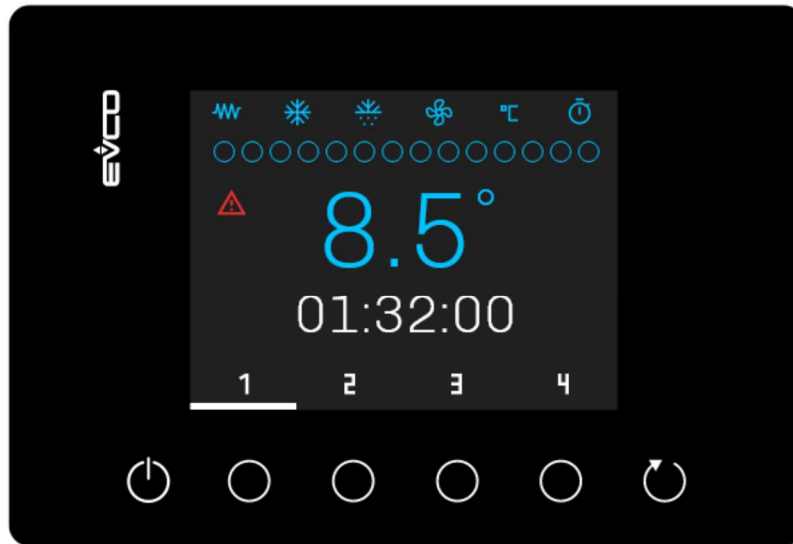
The buzzer can be programmed to signal an alarm and the end of a thawing cycle (if $Pbu = 2$) or to signal an alarm only (if $Pbu = 1$). The buzzer can be silenced by pressing any function key; if not silenced manually, the buzzer will sound until the activation interval set by parameter E4 (for end of cycle) and A13 (for alarm) has elapsed.




If $Pbu = 0$, the buzzer will never be activated, irrespective of the settings of E4 and A13. Even if $Pbu \neq 0$, the buzzer will not sound if the respective activation intervals (E4 and A13) are set to 0.

4 DISPLAY


















4.1 Keys

There are six capacitive touch keys at the bottom of the user interface; each key activates different functions depending on the navigation level or the function currently running. The functions of each of the four central keys  are indicated by the icon displayed above it (see the next section "Function icons").











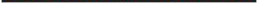


KEY	FUNCTION
	On/Off key - Go from stand-by to On and vice versa - Go back to the previous menu in all pages (settings, cycles, menus)
	Run key - Confirm a selection - Start up a cycle after selecting it - Holding down the key when the device is in stand-by opens the settings "menu" page
	Function key - Activates the function indicated by the icon above it (a description of the function icons is given in the next section)

4.2 Function icons

ICON	DESCRIPTION
	Select the time-controlled thawing cycle
	Select the temperature-controlled thawing cycle (needle probe)
	Select cycle options (loads), each one with personalised cabinet temperature configurations (as well as duration in time-controlled cycles and needle temperature in temperature-controlled cycles)
	Set the initial cabinet temperature
	Set the final cabinet temperature
	Set the preservation temperature
	Set duration (for time-controlled cycles)
	Set the final temperature setpoint of the needle probe (for temperature-controlled cycles)
	Increase values (quick pre-start-up settings, parameters, passwords, date/time) Scroll through the options on the "menu" page
	Decrease values (quick pre-start-up settings, parameters, passwords, date/time) Scroll through the options on the "menu" page
	Confirm the set value (quick pre-start-up settings, parameters, passwords, date/time) In the "parameters" option on the "menu" page, touch the key once to change the parameter
	Confirm the option selected on the "menu" page
	Activate/deactivate an auxiliary output
	View information about the cycle in progress
	Force the arrest of the cycle in progress
	View the type of alarm in progress (if placed above a key)
	Remove the alarm in progress signal

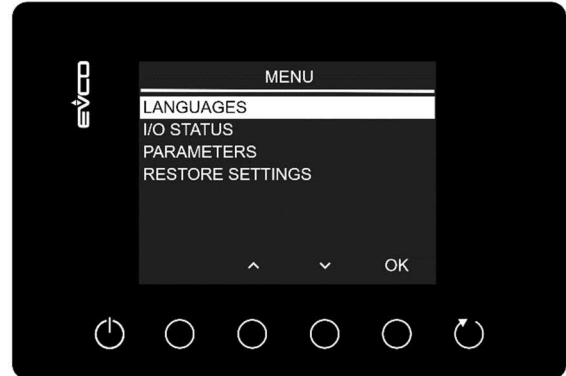
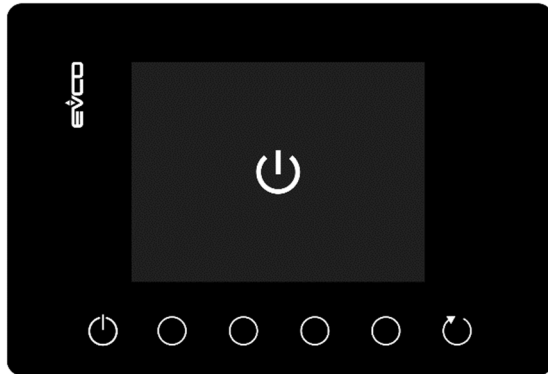
4.3 Status icons

ICON	DESCRIPTION
	Heaters on (only if a cycle is running)
	Compressor on (only if a cycle is running)
	Defrost in progress
	Fans on (only if a cycle is running)
	Temperature unit of measurement
	Time-controlled cycle mode
	Temperature-controlled cycle mode
	Alarm in progress
	Cycle progress bar off: no cycle running
	Cycle progress bar flashing: cycle running
	Cycle progress bar stays on: cycle completed

5 SETTINGS

5.1 Initial information

The list of settings is accessed by pressing the  key on the stand-by screen for 3 seconds.

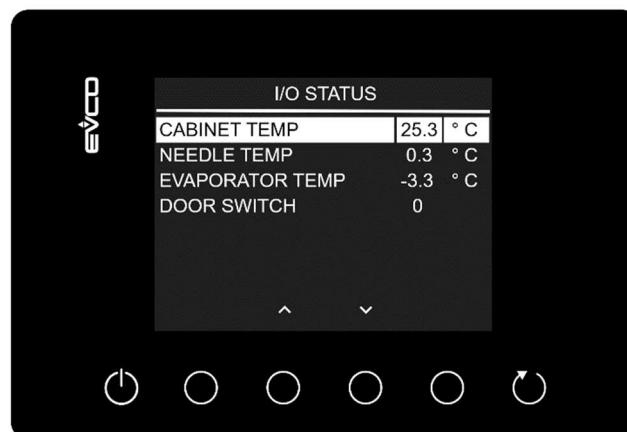



5.2 Languages

The choice of languages consists of Italian, English, French, German, Spanish, Portuguese, Simplified Chinese, Traditional Chinese and Russian.




5.3 I/O status

The input and output status menu is shown below.





To go back to the previous screen from this menu, press the  key.

5.4 Parameters

To view the parameters, first enter the password -19 (which can be changed using parameter PAS) from the menu using the  key. To change the value of a parameter, select the parameter and press  to edit it; confirm any changes by pressing the  key again.






For a complete list of parameters with their respective labels, descriptions and values (default, minimum and maximum), see section 8 "CONFIGURATION PARAMETERS".

5.5 Restore parameters

Access the MENU using the  key, select RESTORE PARAMETERS and press . Enter the password 149 and press  to confirm.

5.6 Real time clock

The REAL TIME CLOCK option on the menu is displayed only if the device is connected to accessories modules with a clock through the TTL port.

When the  key is pressed, the 2 digits indicating the year start to flash. The value can be set by using the   keys and then confirmed by pressing the  key. Continue using this procedure to complete the changes. Once the date and time have been set, you will be returned to the previous menu after 50 seconds of inactivity or by pressing the  key.

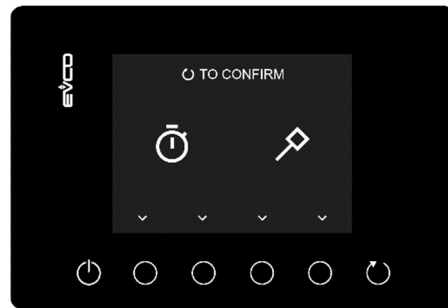
6 FUNCTIONS

6.1 Initial information

The device is able to manage the following cycles:



- time-controlled thawing and preservation
- temperature-controlled thawing (with needle probe) and preservation

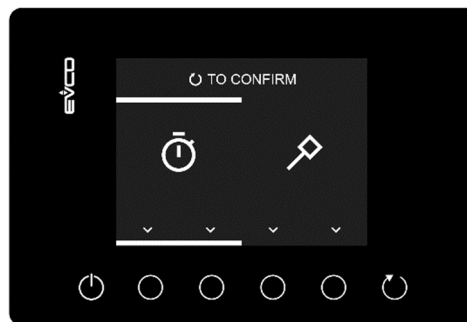
To select the mode, go to the Home page by pressing the On/Off key from the stand-by page.



6.2 Time-controlled thawing and preservation

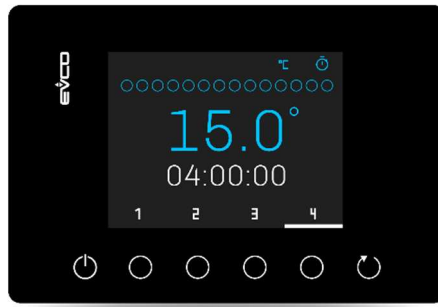
6.2.1 Selection and start-up of time-controlled cycles


Select the time-controlled cycle on the Home page by pressing either of the two  keys on the left next to the  icon.

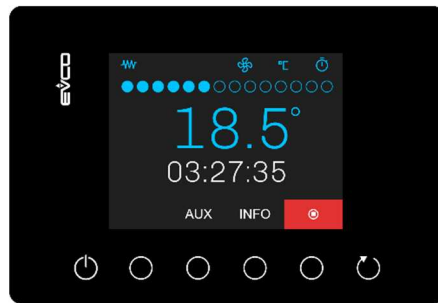


A page will appear with:

- status icons at the top for the temperature unit of measurement and type of thawing and a status bar which is not lit up (no cycle running);
- four numbers at the bottom which indicate the thawing options available (each one with different temperature and time configurations);
- the final cabinet setpoint and duration of the selected cycle in the centre.



To select a cycle, press the key relating to it and to start up the cycle, press the Run  key. The following screen will appear:



While the cycle is running, the screen displays the cabinet temperature (if E6 = 0) or the final cabinet setpoint (if E6 = 1) and the countdown to the end of the cycle. The status bar will flash until the end of the countdown, then it will stay on and the device will automatically go into preservation mode.

Depending on the configuration of parameter E4, the end of the thawing cycle may be signalled by the buzzer (E4 ≠ 0), which is silenced by pressing any one of the six function keys, or when the set interval elapses (E4 = 1÷240 seconds). If E4 = -1, the buzzer will sound continuously until it is silenced by pressing a key.

The cycle in progress may be stopped any time before the countdown ends by pressing the  key.

6.2.2 Time-controlled cycle management

In time-controlled thawing mode, the three values loaded by the controller for each option are defined as follows:

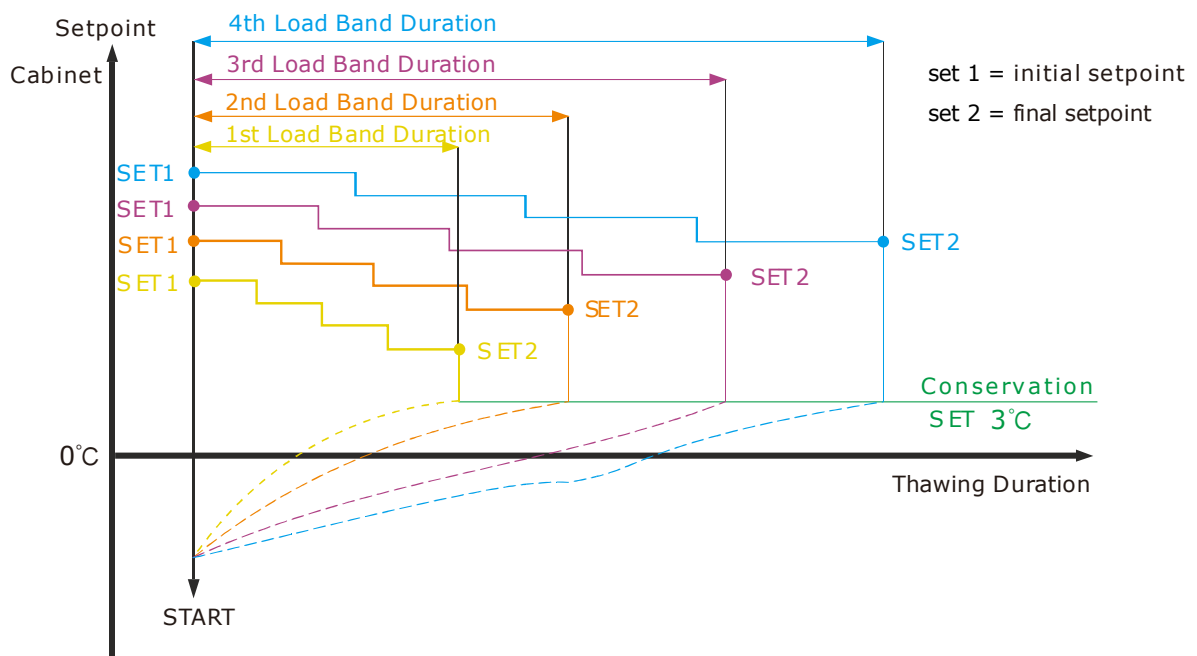
Time-controlled cycle options	Initial cabinet setpoint	Final cabinet setpoint	Cycle duration
Option 1	r0	r8	r20
Option 2	r1	r9	r21
Option 3	r2	r10	r22
Option 4	r3	r11	r23

These three parameters will be used to define the working cabinet setpoints and the duration of the thawing cycle which is divided equally into four phases following on from each other as shown:

- phase 1 working setpoint = initial setpoint
- phase 2 working setpoint = phase 1 setpoint - $[(\text{initial setpoint} - \text{final setpoint}) / 4]$
- phase 3 working setpoint = phase 2 setpoint - $[(\text{initial setpoint} - \text{final setpoint}) / 4]$
- phase 4 working setpoint = phase 3 setpoint - $[(\text{initial setpoint} - \text{final setpoint}) / 4]$

The cycle terminates when the set duration ends and each phase terminates when the relative setpoint is reached or the duration ends.

At the end of the time-controlled thawing cycle, the device goes into preservation mode with the setpoint set by parameter r26 and for infinite duration.





Five parameters are used to manage the ventilation (F13, F14, F15, F16 respectively for the four phases and F17 for preservation). The parameters define fan operation as either continuous or in parallel with the compressor/thawing heater.

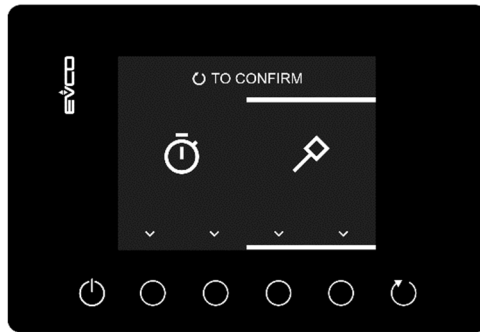
Defrost cycles cannot be carried out during thawing, whereas automatic defrost (at intervals set by parameter) is possible during the post-defrost preservation phase.

If the door is opened, the machine will operate according to the value of parameter i0.

6.3 Temperature-controlled thawing and preservation

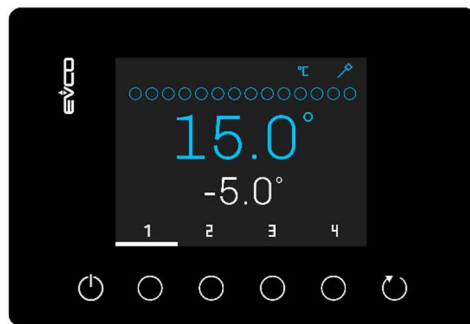
6.3.1 Selection and start-up of temperature-controlled cycles


Select the temperature-controlled cycle (with needle probe) on the Home page by pressing either of the two  keys on the right next to the  icon.

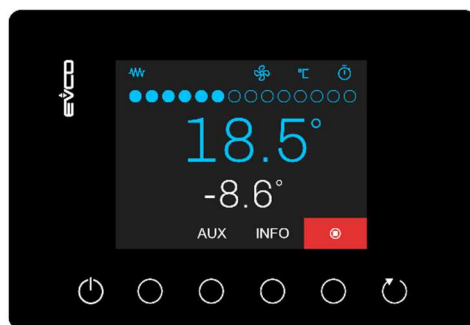


A page will appear with:

- status icons at the top for the temperature unit of measurement and type of thawing selected and a status bar which is not lit up (no cycle running);
- four numbers at the bottom which indicate the thawing options available (each one with different cabinet temperature and needle temperature configurations);
- the final cabinet setpoint and final needle probe setpoint of the selected cycle in the centre.




To select a cycle, press the key corresponding to it and to start up the cycle, press the Run  key. The following screen will appear:



While the cycle is running, the screen displays the cabinet temperature and the needle probe temperature (if E6 = 0) or the final cabinet and needle probe setpoints (if E6 = 1). The status bar will continue flashing until the final needle probe setpoint is reached, then it will stay on and the device will automatically go into preservation mode.

Depending on the configuration of parameter E4, the end of the thawing cycle may be signalled by the buzzer (E4 ≠ 0), which is silenced by pressing any one of the six function keys, or when the set interval elapses (E4 = 1 ÷ 240 seconds).

If E4 = -1, the buzzer will sound continuously until it is silenced by pressing a key.

The cycle in progress may be stopped any time by pressing the  key.

6.3.2 Temperature-controlled cycle management

In temperature-controlled thawing mode, the four values loaded by the controller for each option are defined as follows:

Temperature-controlled cycle options	Initial cabinet setpoint	Final cabinet setpoint	Initial needle probe temperature	Final needle probe temperature
Option 1	r4	r12	Current value	r16
Option 1	r5	r13	Current value	r17
Option 1	r6	r14	Current value	r18
Option 1	r7	r15	Current value	r19

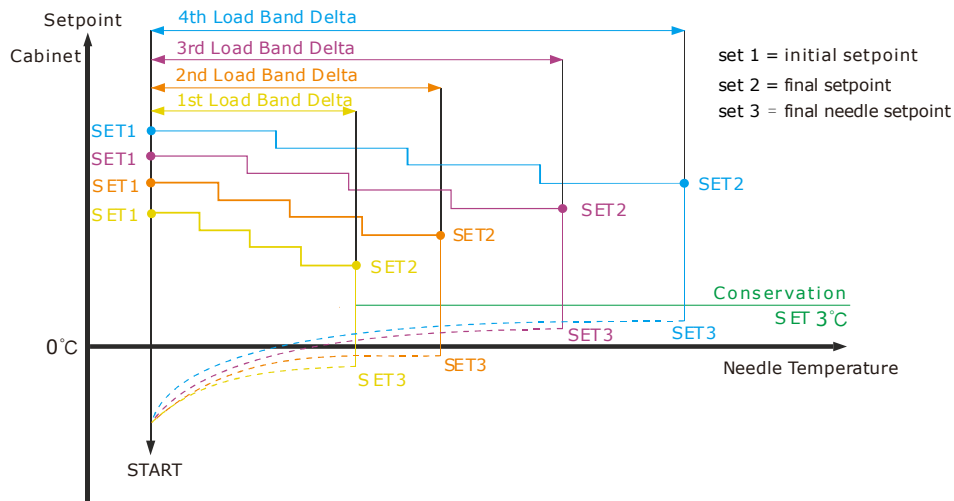
These values are used to regulate the temperature of the cabinet and needle probe. The duration of the thawing cycle will be divided equally into four phases following on from each other as shown:

Initial needle probe temperature (value detected by the controller when cycle starts up)	-22°C
Final needle probe setpoint (set by parameter or quick pre-start-up settings):	2°C
Initial cabinet setpoint (set by parameter or quick pre-start-up settings):	26°C
Final cabinet setpoint (set by parameter or quick pre-start-up settings):	10°C

- The controller detects the initial temperature of the needle probe and calculates as follows:
 $(\text{INITIAL NEEDLE PROBE TEMPERATURE} - \text{FINAL NEEDLE PROBE TEMPERATURE}) / 4$
 $-22 - 2 = -24/4 = 6^\circ\text{C}$
- The controller verifies the difference between the initial and final cabinet temperature and calculates as follows:
 $(\text{INITIAL CABINET TEMPERATURE} - \text{FINAL CABINET TEMPERATURE}) / 4$
 $26 - 10 = 16/4 = 4^\circ\text{C}$

This means that, when the temperature detected by the needle probe rises 6 °C, the cabinet setpoint will fall 4 °C and the controller will move on to the next phase. This continues until the fourth phase which ends the cycle when the final needle probe setpoint is reached.

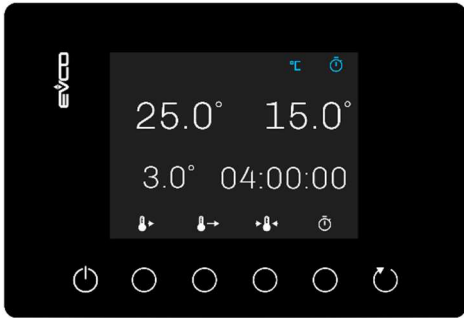
At the end of the temperature-controlled thawing cycle, the device goes into preservation mode with the setpoint set by parameter r26 and for infinite duration.



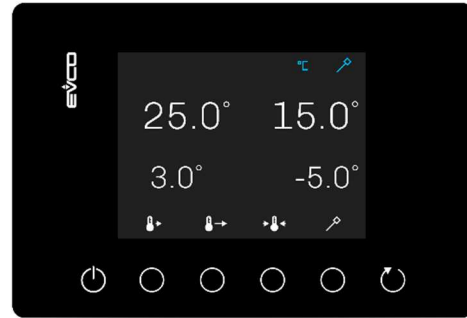
6.4 Quick setting of thawing and preservation values

Before running a cycle, irrespective of whether it is time- or temperature-controlled, its values may be changed quickly by pressing the key used to select it a second time. The function to quickly change the setpoints must have been enabled beforehand by parameter E0.

Time-controlled cycle



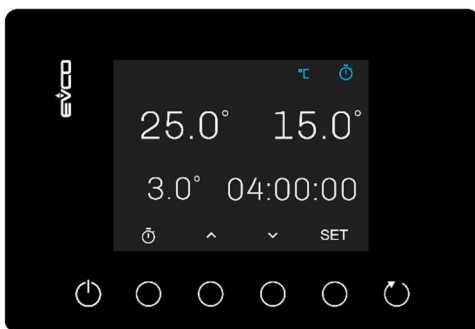
Temperature-controlled cycle



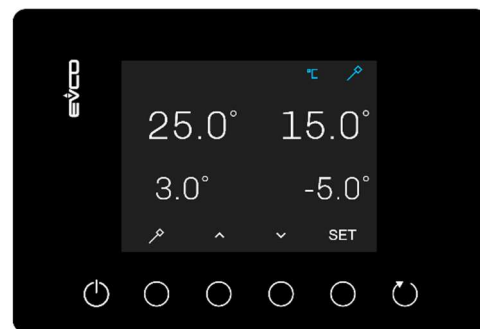
For time-controlled thawing cycles, the following can be changed by selecting the respective key, starting from the left: initial cabinet temperature setpoint, final cabinet temperature setpoint, cabinet temperature setpoint during preservation and cycle duration. For temperature-controlled cycles, the quick settings are the same except for the last key which changes the final setpoint of the needle probe.



When the key relating to the value to be changed is pressed, the value begins to flash.

Time setting



Needle probe temperature setting



To change the value, press either the up  or down  arrow and confirm with the **SET** key.

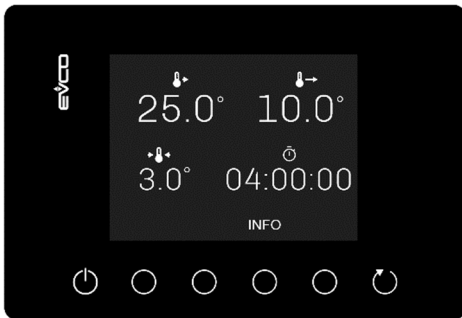
Depending on the setting of parameter r34, changes may be saved for future start-ups.

6.5 Viewing information on the cycle in progress

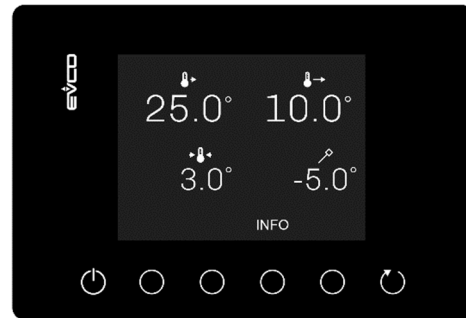
While a cycle is in progress, the **INFO** key can be pressed to view information about it.

The setpoints are displayed when the **INFO** key is pressed once.

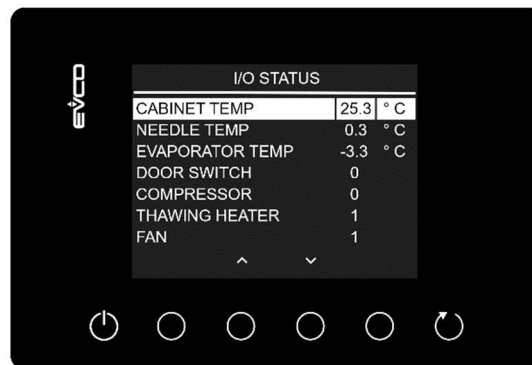
Time-controlled cycle




Temperature-controlled cycle



When the **INFO** is pressed again, the "I/O STATUS" screen of the settings page opens, showing the status of the inputs and outputs.



The controller returns to the cycle in progress due to timeout or by pressing the  key.

7 MANAGING THE LOADS

7.1 Alarm

The load is managed only if one of the five digital outputs (uc1, uc2, uc3, uc4 or uc5) is configured as an alarm (value 1).

This activates when an alarm is set off and deactivates when the alarm stops.

7.2 Compressor

Compressor management (with the digital output set to 2) varies according to the cycle activated, as specified below.

Defrost

During defrost, compressor status depends on the value of parameter d1. If d1 equals 0, 2 or 3, the compressor is switched off.

If d1 equals 1, the compressor will remain switched on for the entire duration of the defrost cycle and if it is switched off when the defrost cycle is selected, it will be switched on for the period set by parameter d15 before defrost starts.

When defrost is finished the compressor remains off for the period set by parameter d7.

Thawing

The compressor comes on if the cabinet temperature is equal to or higher than $SP + r27 + r29$, where SP is the working setpoint based on parameter r26, r27 is the neutral zone relative threshold and r29 is the cabinet setpoint differential for activating the compressor. The compressor switches off if the cabinet temperature is equal to or lower than $SP + r27$.

Preservation

The compressor comes on if the cabinet temperature is equal to or higher than $SP + r29$, where SP is the working setpoint based on parameter r26 and r29 is the cabinet setpoint differential for activating the compressor. The compressor switches off if the cabinet temperature is equal to or lower than SP.

7.3 Thawing heaters

The load is managed only if one of the five digital outputs (uc1, uc2, uc3, uc4 or uc5) is configured as the thawing heater (value 3).

The heaters are activated during thawing to bring the temperature in the cabinet to the setpoint value in accordance with the cabinet temperature formula $\leq SP - r27 - r28$, where SP is the working setpoint during thawing, r27 is the neutral zone relative threshold and r28 is the cabinet setpoint differential for activating the heater. The heaters are deactivated when the cabinet temperature $\geq SP - r19$.

Activation takes place with on/off cycles established by parameters r25 (heater on time for thawing) and r24 (heater cycle time for thawing).

If E3 = 1, the output configured as "Thawing heaters" will also be used for defrosting, inhibiting the "Defrost" output if configured.

7.4 On/stand-by

If one of the five digital outputs (uc1, uc2, uc3, uc4 or uc5) is configured as "On/Stand-by" (value 4), the relay works as follows:

- OFF when the device is in stand-by mode
- ON in all other situations

The polarity of the "On/Stand-by" relay is set by parameter "ucP".

7.5 Cabinet light

If one of the five digital outputs (uc1, uc2, uc3, uc4 or uc5) is configured as "Cabinet light" (value 5), the light goes on when the door is opened and goes off when it is closed.

7.6 Evaporator fans

Five parameters (F13, F14, F15, F16, F17) are used to manage the fans (with digital output set to 6) and define the way they behave in each of the four thawing phases and the final preservation cycle. The fans can operate either in continuous mode or in parallel with the compressor/thawing heaters.

During defrost, the evaporator fans depend on parameter F2.


7.7 Defrost heaters

The load is managed only if one of the five digital outputs (uc1, uc2, uc3, uc4 or uc5) is configured as "Defrost" (value 7).

The defrost heaters are activated automatically at intervals set by parameter d0 only during preservation and never when defrost is in progress.

During defrost, outputs are managed according to the type of defrost set by parameter d1.

7.8 Auxiliary relay

If one of the five digital outputs (uc1, uc2, uc3, uc4 or uc5) is configured as "AUX" (value 8), the  icon is displayed above the second function key from the left. The icon is blue when the relay is active and becomes white when it is deactivated. Relay status is changed by pressing the related key.

7.9 Managing loads with active digital inputs

Load management can vary according to the configuration of parameter i0 (door open effect) and i5 (multi-purpose digital input effect). For more details, see the table of parameters.

The configuration of parameter i0 has an effect on the compressor, thawing heaters, evaporator fans and cabinet light; the configuration of parameter i5 has an effect on the compressor, thawing heaters, evaporator fans, cabinet light, defrost heaters, On/Stand-by and the auxiliary relay.

8 CONFIGURATION PARAMETERS

The parameters are set by default in °C and the relative values and limits are shown in the table in this unit of measurement (the device displays decimals for values in °C only).

In order for the controller to display the values in °F, set P2 to 1 and after the change, disconnect the power from the device and then reconnect it. Any previously stored programmes will return to the default value each time P2 is reset.

CAUTION

- Because some functions are managed according to the value set for some parameters, ensure these are set correctly and consistently.
- It is not possible to set any value beyond the minimum and maximum limits indicated in the table.
- After changing the parameters, it is advisable to disconnect the power from the device and then reconnect it.

The following table gives the meaning of the configuration parameters.

PAR.	DEFAULT	MIN.	MAX.	M.U.	ANALOGUE INPUTS
CA1	0	-25.0	25.0	°C	cabinet probe offset
CA2	0	-25.0	25.0	°C	needle probe offset
CA3	0	-25.0	25.0	°C	third probe offset
P0	0	0	1	----	type of probe 0 = PTC 1 = NTC
P2	0	0	1	----	temperature measurement unit 0 = °C 1 = °F
P3	0	0	3	----	configuration Pb1 input 0 = cabinet probe 1 = needle probe 2 = evaporator probe 3 = disabled
P4	0	0	3	----	configuration Pb2 input (same as Pb1 input, see parameter P3)
P5	0	0	1	----	type of Pb3 input 0 = digital input (see parameter i5) 1 = analogue input (PTC/NTC probe)
P6	0	0	3	----	configuration Pb3 input (same as Pb1 input, see parameter P3)
P8	5	0	250	1/10 s	Temperature display delay

PAR.	DEFAULT	MIN.	MAX.	M.U.	MAIN REGULATOR
r0	25.0	-50.0	99.0	°C	initial cabinet temperature setpoint for time-controlled thawing option 1
r1	30.0	-50.0	99.0	°C	initial cabinet temperature setpoint for time-controlled thawing option 2
r2	35.0	-50.0	99.0	°C	initial cabinet temperature setpoint for time-controlled thawing option 3
r3	35.0	-50.0	99.0	°C	initial cabinet temperature setpoint for time-controlled thawing option 4
r4	25.0	-50.0	99.0	°C	initial cabinet temperature setpoint for needle probe thawing option 1
r5	35.0	-50.0	99.0	°C	initial cabinet temperature setpoint for needle probe thawing option 2
r6	35.0	-50.0	99.0	°C	initial cabinet temperature setpoint for needle probe thawing option 3
r7	35.0	-50.0	99.0	°C	initial cabinet temperature setpoint for needle probe thawing option 4
r8	10.0	-50.0	99.0	°C	final cabinet temperature setpoint for time-controlled thawing option 1
r9	12.0	-50.0	99.0	°C	final cabinet temperature setpoint for time-controlled thawing option 2
r10	15.0	-50.0	99.0	°C	final cabinet temperature setpoint for time-controlled thawing option 3
r11	15.0	-50.0	99.0	°C	final cabinet temperature setpoint for time-controlled thawing option 4
r12	10.0	-50.0	99.0	°C	final cabinet temperature setpoint for needle probe thawing option 1
r13	12.0	-50.0	99.0	°C	final cabinet temperature setpoint for needle probe thawing option 2
r14	15.0	-50.0	99.0	°C	final cabinet temperature setpoint for needle probe thawing option 3
r15	15.0	-50.0	99.0	°C	final cabinet temperature setpoint for needle probe thawing option 4
r16	-5.0	-50.0	99.0	°C	final needle probe temperature setpoint for temperature-controlled thawing option 1
r17	-2.0	-50.0	99.0	°C	final needle probe temperature setpoint for temperature-controlled thawing option 2
r18	1.0	-50.0	99.0	°C	final needle probe temperature setpoint for temperature-controlled thawing option 3
r19	2.0	-50.0	99.0	°C	final needle probe temperature setpoint for temperature-controlled thawing option 4
r20	240	1	1440	min	cycle duration for time-controlled thawing option 1
r21	480	1	1440	min	cycle duration for time-controlled thawing option 2

r22	720	1	1440	min	cycle duration for time-controlled thawing option 3
r23	960	1	1440	min	cycle duration for time-controlled thawing option 4
r24	45	1	600	s	thawing heaters cycle time
r25	4	1	600	s	thawing heaters activation time
r26	3.0	-50.0	99.0	°C	cabinet temperature setpoint for post-thawing preservation
r27	1.0	0.0	10.0	°C	neutral zone
r28	2.0	0.1	25.0	°C	hysteresis for thawing heaters
r29	2.0	0.1	25.0	°C	hysteresis for compressor
r30	0.0	-99.0	r31	°C	minimum preservation setpoint
r31	50.0	r30	99.0	°C	maximum preservation setpoint
r32	0.0	-99.0	r33	°C	minimum thawing setpoint
r33	50.0	r32	99.0	°C	maximum thawing setpoint
r34	0	-0	1	- - - -	save quick pre-start-up changes for future start-ups 0 = no 1 = yes
PAR.	DEFAULT	MIN.	MAX.	M.U.	COMPRESSOR PROTECTION
C0	0	0	240	min	minimum time between restoration of power supply after a power outage occurring during an operating cycle and compressor switch-on
C2	3	0	240	min	minimum time between compressor switch-off and subsequent switch-on
C3	30	0	240	s	minimum compressor-on time
C4	10	0	240	min	compressor-off time during cabinet probe or needle probe error
C5	10	0	240	min	compressor-on time during cabinet probe or needle probe error
PAR.	DEFAULT	MIN.	MAX.	M.U.	DEFROST
d0	8	0	99	h	defrost interval during preservation 0 = defrosting during preservation is never activated
d1	2	0	2	- - - -	type of defrost 0 = electrical (during defrosting the compressor is switched off, the defrost output is activated and the evaporator fan switched off) 1 = hot gas (during defrosting the compressor is switched on, the defrost output is activated and the evaporator fan is switched off) 2 = air (during defrosting the compressor is switched off and the defrost output is activated. The evaporator fan is switched on, regardless of the door status, or regardless of the status of the door switch input)
d2	8.0	-99.0	99.0	°C	evaporator temperature to end defrost

d3	30	0	99	min	maximum duration of defrost
d6	0	0	2	----	Cabinet temperature displayed during defrost 0 = current value 1 = value at beginning of defrost 2 = DEF label
d7	0	0	15	min	drip time after a defrost, in which the compressor and the evaporator fan are switched off and the defrost output is deactivated
d11	0	0	1	----	Enable " DEFROST TIMEOUT " alarm 0 = no 1 = yes
d15	0	0	99	min	minimum consecutive compressor-on duration for starting hot gas defrost, if d1 is set to 1
PAR.	DEFAULT	MIN.	MAX.	M.U.	TEMPERATURE ALARMS
A1	0.0	-99.0	99.0	°C	threshold for activation of " LOW TEMPERATURE " alarm; see also parameter A11
A2	2	0	2	----	type of " LOW TEMPERATURE alarm"; 0 = disabled 1 = relative to setpoint 2 = absolute
A4	50.0	-99.0	99.0	°C	threshold for activation of " HIGH TEMPERATURE " alarm; see also parameter A11
A5	2	0	2	----	type of " HIGH TEMPERATURE alarm" 0 = disabled 1 = relative to setpoint 2 = absolute
A6	120	0	240	min	high and low temperature alarm activation delay from device switch-on
A7	15	0	240	min	high and low temperature alarm activation delay from temperature reading
A8	15	0	240	min	high and low temperature alarm activation delay from end of defrost
A9	15	0	240	min	high and low temperature alarm activation delay from door closed
A10	15	0	240	min	minimum time power outage due to activation of " POWER OUTAGE " alarm
A11	1.0	0.1	15.0	°C	parameters A1 and A4 differential
A13	60	0	240	s	duration of buzzer activation for alarm signal 0 = buzzer disabled

PAR.	DEFAULT	MIN.	MAX.	M.U.	EVAPORATOR FANS
F2	0	0	1	----	fan operating mode during defrost 0 = off 1 = on
F3	0	0	15	min	fan activation delay after defrost
F7	99.0	-99.0	99.0	°C	high evaporator temperature threshold for fans off
F8	2.0	0.1	15.0	°C	parameter F7 differential
F9	5	0	240	min	fan activation delay from compressor/thawing heater switch-off
F13	0	0	1	----	fan operating mode in thawing phase 1 0 = in parallel with compressor/heaters 1 = always on
F14	0	0	1	----	fan operating mode in thawing phase 2 0 = in parallel with compressor/heaters 1 = always on
F15	0	0	1	----	fan operating mode in thawing phase 3 0 = in parallel with compressor/heaters 1 = always on
F16	0	0	1	----	fan operating mode in thawing phase 4 0 = in parallel with compressor/heaters 1 = always on
F17	0	0	1	----	fan operating mode during preservation 0 = in parallel with compressor/heaters 1 = always on
PAR.	DEFAULT	MIN.	MAX.	M.U.	DIGITAL INPUTS
i0	1	0	5	----	effect of the door opening or when the digital input d1 is activated 0 = no effect and no signal 1 = the compressor, evaporator fans and thawing heaters are switched off 2 = the evaporator fans and thawing heaters are switched off 3 = the light comes on 4 = the compressor, evaporator fans and thawing heaters are switched off and the light comes on 5 = the evaporator fans and thawing heaters are switched off and the light comes on
i1	0	0	1	----	polarity of digital input id1 (door switch) 0 = normally open (input active with contact closed) 1 = normally closed (input active with contact open)
i2	15	-1	120	min	door open alarm signal delay (if i0 ≠ 0) -1 = alarm not signalled



i3	15	-1	120	min	maximum duration of effect of the door opening
i5	0	0	3	-----	effect caused by activation of multi-purpose digital input id2 (only if P5 = 0) 0 = no effect and no signal 1 = "ALARM 1" visual signal and buzzer sounds 2 = "ALARM 2" visual signal, buzzer sounds and loads are switched off 3 = goes into stand-by
I6	0	0	1	-----	polarity of digital input id1 (multi-purpose) 0 = normally open (input active with contact closed) 1 = normally closed (input active with contact open)
i7	0	0	120	min	multi-purpose alarm signalling delay (if i5 ≠ 0)
PAR.	DEFAULT	MIN.	MAX.	M.U.	DIGITAL OUTPUTS
uc1	2	0	8	-----	load managed by output K1 0=none 1=alarm 2=compressor 3=thawing heater 4 = Stand-By/On 5=cabinet light 6=evaporator fans 7=defrost 8=AUX
uc2	3	0	8	-----	load managed by output K2 same configuration as uc1
uc3	7	0	8	-----	load managed by output K3 same configuration as uc1
uc4	6	0	8	-----	load managed by output K4 same configuration as uc1
uc5	8	0	8	-----	load managed by output K5 same configuration as uc1
uc6				-----	reserved
ucP	0	0	1	-----	polarity of Stand-by/On digital output 0 = Stand-by status with output deactivated, On status with output active 1 = Stand-by status with output active, On status with output deactivated
PAR.	DEFAULT	MIN.	MAX.	M.U.	MODBUS
LA	247	1	247	-----	device address

Lb	3	0	3	----	baud rate 0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud
LP	2	0	2	----	parity 0 = none 1 = odd 2 = even
PAR.	DEFAULT	MIN.	MAX.	M.U.	CONNECTIVITY
Hr0	1	0	1	----	enable clock 0=no 1=yes
PA1	426	-99	999	----	EVconnect/EPoCA level 1 password
PA2	824	-99	999	----	EVconnect/EPoCA level 2 password
rE0	15	0	240	min	data recording interval on accessories modules
rE1	0	0	5	----	selection of values sampled by accessories modules 0 = none 1 = cabinet probe 2 = needle probe 3 = evaporator probe 4 = cabinet and needle probe 5 = all probes
bLE	1	0	99	----	serial port configuration for connectivity 0 = free 1 = forced for EVconnect or EPoCA 2÷99 = EPoCA local network address (in this case the baud rate is automatically configured to 19,200 baud irrespective of the Lb value) N.B.: if connectivity comes from EVlinking Wi-Fi or BLE, the only value that can be set is 1
PAR.	DEFAULT	MIN.	MAX.	M.U.	MISCELLANEOUS
E0	4	0	4	----	enable setpoint changes before cycle start-up 0 = no 1 = only for option 4 2 = only for options 3 and 4 3 = only for options 2, 3 and 4 4 = for all options
E1	0	0	1	----	enable viewing of needle probe in time-controlled cycles 0 = no 1 = yes

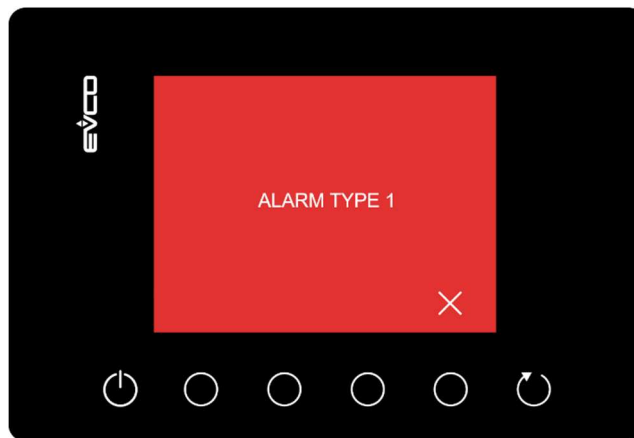
E2	0	0	1	----	enable AUX output key 0 = no (the AUX icon is not displayed) 1 = yes (the AUX icon is displayed only if ucx = 8)
E3	1	0	1	----	activate defrost with thawing heaters output 0 = no 1 = yes
E4	5	-1	240	s	duration of buzzer activation when going from thawing to preservation -1 = until key pressed 0 = buzzer disabled
E5	0	0	1	----	type of cycles possible 0 = time + temperature 1 = time only
E6	0	0	1	----	temperature displayed during cycle in progress 0 = value detected by probe 1 = = setpoint
PSr	1	0	1	----	deactivate alarm output with alarm silenced by still in progress 0 = no 1 = yes
Pbu	2	0	2	----	activate buzzer 0 = never 1 = for alarms only 2 = for end of cycle and alarms
SEn	70	60	120	----	capacitive keypad sensitivity N.B.: the lower the set value, the greater the sensitivity of the keypad
PAS	-19	-99	999	----	password to access parameter settings

9 ALARMS

9.1 Alarms

Alarms are displayed only when the device is on or a cycle is in progress; the screen is red and the type of alarm is indicated. When the  key is pressed, the alarm signal is removed and the  icon appears. The icon is not interactive if a cycle is not running but if it is pressed when a cycle is in progress, information about the type of alarm will be given.

Whether the buzzer is activated or not depends on the configuration of parameters Pb1 and A13. For more details, see section 3.3 "Buzzer activation" and consult the table of parameters.



The table below lists the various alarms.

Code	Meaning
RTC	<p>Clock error (only if the device is connected to accessories modules with a clock)</p> <p>To correct:</p> <ul style="list-style-type: none"> - re-set the date and time <p>Main results:</p> <ul style="list-style-type: none"> -- the alarm output will be activated
CABINET PROBE	<p>Cabinet probe error</p> <p>To correct:</p> <ul style="list-style-type: none"> - check the value of parameter P0 - check the integrity of the probe - check the device-probe connection - check the cabinet temperature <p>Main results:</p> <ul style="list-style-type: none"> - if the error occurs during preservation, the compressor will operate according to parameters C4 and C5 - if the error occurs during a thawing cycle, the cycle will move on to preservation - the minimum temperature alarm will never be activated - the maximum temperature alarm will never be activated - the alarm output will be activated

<p>EVAPORATOR PROBE</p>	<p>Evaporator probe error</p> <p>To correct:</p> <ul style="list-style-type: none"> - the same as for the cabinet probe error but with reference to the evaporator probe <p>Main results:</p> <ul style="list-style-type: none"> - if the probe is configured, defrost will last for the time set by parameter d3 - the alarm output will be activated
<p>NEEDLE PROBE</p>	<p>Needle probe error</p> <p>To correct:</p> <ul style="list-style-type: none"> - the same as for the cabinet probe error but with reference to the needle probe <p>Main consequences if parameter P3 is set to 1:</p> <ul style="list-style-type: none"> - if the error occurs during a thawing cycle, the cycle will move on to preservation - the alarm output will be activated
<p>DOOR OPEN</p>	<p>Door open alarm</p> <p>To correct:</p> <ul style="list-style-type: none"> - check the condition of the door <p>Main results:</p> <ul style="list-style-type: none"> - the results depend on the setting of parameter i0
<p>HIGH TEMPERATURE</p>	<p>Maximum temperature alarm</p> <p>To correct:</p> <ul style="list-style-type: none"> - check the cabinet temperature - check the value of parameters A4 and A5 <p>Main results:</p> <ul style="list-style-type: none"> - the alarm output will be activated
<p>LOW TEMPERATURE</p>	<p>Minimum temperature alarm</p> <p>To correct:</p> <ul style="list-style-type: none"> - check the cabinet temperature - check the value of parameters A1 and A2 <p>Main results:</p> <ul style="list-style-type: none"> - the alarm output will be activated
<p>POWER FAILURE</p>	<p>Power failure alarm</p> <p>To correct:</p> <ul style="list-style-type: none"> - check the device-power supply connection <p>Main results:</p> <ul style="list-style-type: none"> - any cycle in progress will resume when power is restored - the alarm output will be activated
<p>DEFROST TIMEOUT</p>	<p>Maximum duration of defrost alarm (if enabled with d11 = 1)</p> <p>Main results:</p> <ul style="list-style-type: none"> - the alarm output will be activated

ALARM 1

Alarm 1:

To correct:

- check digital input id2

Main results:

- the alarm output will be activated

ALARM 2

Alarm 2:

To correct:

- check digital input id2

Main results:

- all outputs will be deactivated except for the alarm output which will be activated

10 ACCESSORIES

10.1 Programming key

EVJKEY

Makes possible configuration upload and download.



10.2 TTL/RS-485 signal conversion module

EVIF24TSX

Enables connection to a RS-485 network.



10.3 TTL/RS-485 signal conversion + clock module

EVIF23TSX

Makes it possible to activate real-time functions and to connect to a RS-485 network.



10.4 EVlinking BLE module

EVIF25TBX

Through the TTL communications port, it provides the controller with Bluetooth connectivity which enables wireless management from smartphones and tablets using the EVconnect app.



10.5 EVlinking Wi-Fi TTL module

EVIF25SWX

Through the TTL communications port, it provides the controller with Wi-Fi connectivity which enables remote management and monitoring from the Internet using the EPoCA cloud system.



10.6 EV3 Web IoT Gateway

EV3W01

IoT gateway with Ethernet connectivity and data logging functions to remotely monitor and control an RS-485 MODBUS RTU network with up to 10 EVCO controllers with EPoCA® technology using the EPoCA® cloud platform.



11 TECHNICAL SPECIFICATIONS

11.1 Technical data

Purpose of the control device	Operating control device	
Construction of the control device	Built-in electronic device	
Housing	Black, self-extinguishing	
Category of heat and fire resistance	D	
Measurements	111.4 x 76.4 x 48.0 mm (4 3/8 x 3 x 1 15/16 in)	
Mounting methods for the control device	Front installation model:	to be fitted to a plastic or metal panel, with elastic holding flaps
	Model for installing behind glass or methacrylate:	with double-sided tape
Degree of protection provided by the casing	IP65 (front), provided that the device is installed on a metal panel 0.8 mm (1/32 in) thick	
Connection method	<ul style="list-style-type: none"> - Fixed screw terminal blocks for wires up to 2.5 mm² (plug-in screw terminal blocks for wires up to 2.5 mm² on request) - Pico-Blade connector 	
	Maximum permitted length for connection cables: <ul style="list-style-type: none"> - power supply: 10 m (32.8 ft) - analogue inputs: 10 m (32.8 ft) - digital inputs: 10 m (32.8 ft) - digital outputs: 10 m (32.8 ft) 	
Operating temperature	from -5 to 55 °C (from 23 to 131 °F)	
Storage temperature	from -25 to 70 °C (from -13 to 158 °F)	
Operating humidity	Relative humidity without condensate from 10 to 90%	
Pollution status of the control device	2	
Compliance	<ul style="list-style-type: none"> - RoHS 2011/65/EC - WEEE 2012/19/EU - REACH (EC) Regulation no. 1907/2006 - EMC 2014/30/EU - LVD 2014/35/EU 	
Power supply	230 Vac (+10 % -15 %), 50/60 Hz (±3 Hz), max. 6 VA	
Earthing methods for the control device	None	

Rated impulse-withstand voltage	2.5 KV
Over-voltage category	II
Software class and structure	A
Analogue inputs	2 for PTC or NTC probes (can be configured)
	<i>PTC probes</i> Type of sensor: KTY 81-121 (990 Ω @ 25 °C, 77 °F) Measurement field: from -50 to 150 °C (from -58 to 302 °F) Resolution: 1 °C (1 °F)
	<i>NTC probes</i> Type of sensor: β 3435 (10 K Ω @ 25 °C, 77 °F) Measurement field: from -40 to 105 °C (from -40 to 221 °F) Resolution: 1 °C (1 °F)
Analogue-digital inputs	1 input can be configured for analogue input (NTC/PTC temperature probe) or digital input (multi-purpose input)
Digital inputs	1 voltage-free (door switch) Type of contact: 5 Vdc, 1.5 mA Power supply: none
Digital outputs	5 with electro-mechanical relay or in the sealed version (can be configured) Compressor relay: SPST, 30 A res. @ 250 Vac Defrost relay: SPDT, 8 A res. @ 250 Vac Evaporator fan relay: SPST, 8 A res. @ 250 Vac Auxiliary relay 1: SPST, 5 A res. @ 250 Vac Auxiliary relay 2: SPST, 5 A res. @ 250 Vac
	The device guarantees reinforced insulation between each digital output connector and the rest of the components of the device
Type 1 or Type 2 actions	Type 1
Additional features of Type 1 or Type 2 actions	C
Displays	2.8 inch TFT graphic display, 16 colours, 320 x 240 pixel resolution
Alarm buzzer	built-in
Communications ports	1 TTL slave port for IoT gateway, EVJKEY programming key, EVlinking Wi-Fi (for connectivity with the EPoCA system), EVlinking BLE (to use the EVconnect app) or TTL/RS-485 EVIF22TSX serial interface.

EVJ 700 Thawing

Controller for thawing cabinets

Installer manual ver. 1.0

PB - 49/22

Code 144J795I104

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