EVFTFT618

Split execution controller for management of retarder-proofer cabinets/cells with capacitive type user interface and TFT graphic display

ENGLISH

INSTALLER MANUAL ver. 2.4

CODE 144FTFT618E244

Important

Important

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

The following symbols support reading of the document:

💡 indicates a suggestion

⚠ indicates a warning.

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

Index

1 INTRODUCTION

1.1 Introduction

EVFTFT618 is a digital controller studied to manage retarder proofer cabinets/cells, which can be mechanically and aesthetically integrated into the unit.

The controller is fitted with:

- clock, signal buzzer and alarm
- 4 analogue inputs of which 3 for PTC/NTC probes and 1 for 4-20mA
- 4 digital inputs (door micro switch, compressor circuit breaker, high pressure and low pressure protection)
- 1 PWM analogue output for management of the evaporator fan
- 8 digital outputs (electromechanical relays), 1 x 16 A res. @ 250 VAC for compressor management, 1 x 16 A res. @ 250 VAC for heating element management and 6 x 8 A res. @ 250 VAC for management of the cabinet light, humidifier, dehumidifier/condenser fan, defrosting, steam generator and pump-down valve/evaporator fan.
- RS-48 serial port with MODBUS communication protocol
- USB port on board.

The controller supplies a complete control for retarder-proofer cabinets or cells for confectionery and bread-making, through the automatic management of the complete mixture retarder-proofer cycle.

The machine can have 3 different states, defined unmistakeably in the following way through the entire document:
STAND-BY status: the machine is off but powered, it is not possible to perform any selection/cycle start command
ON status: the machine is on but in stand-by for operating cycle selection
RUN status: the machine is on with a cycle in progress

1.2 Summary table of the main features and the models available

The following table illustrates the main features of the device.

" / " indicates the feature can be set via a configuration parameter.

User interface (without cover)	
200.0 x 135.0 mm (7.874 x 13.498 cm; L x H)	•
320 x 240 pixel (3.5 inch) colour TFT graphics display	•
number of keys (capacitive touch-key type)	11
Control module (without cover)	
166.0 x 116.0 mm (6.535 x 11.598 cm; L x H)	•
Connections	
removable screw terminal board	•
Power supply	
115-230 VAC	•
Analogue inputs	
cabinet probe	PTC/NTC
evaporator probe	PTC/NTC
condenser probe	PTC/NTC
humidity transducer	4-20mA
Digital inputs (for NO/NC contact)	
door micro switch	•
high pressure	•
low pressure	•
compressor circuit breaker protection	•
Analogue outputs (PWM)	
evaporator fan	(1)

Digital outputs (electromechanical relays; A res. @ 250 VAC)	
compressor	16 A
cabinet light	8 A
humidifier	8 A
dehumidifier/condenser fan	8 A
defrosting	8 A
heating elements	16 A
steam generator	8 A
pump down valve/evaporator fan	8 A
Communication port	
RS-48 serial port with MODBUS communication protocol	•
USB type serial port	•
Other features	
IP65 protection rating of the user interface	IP65
clock	•
signal buzzer and alarm	•
management of temperature alarms	•
"programs" function	•
configuration parameters access password	•
restoring the factory settings	•

Notes:

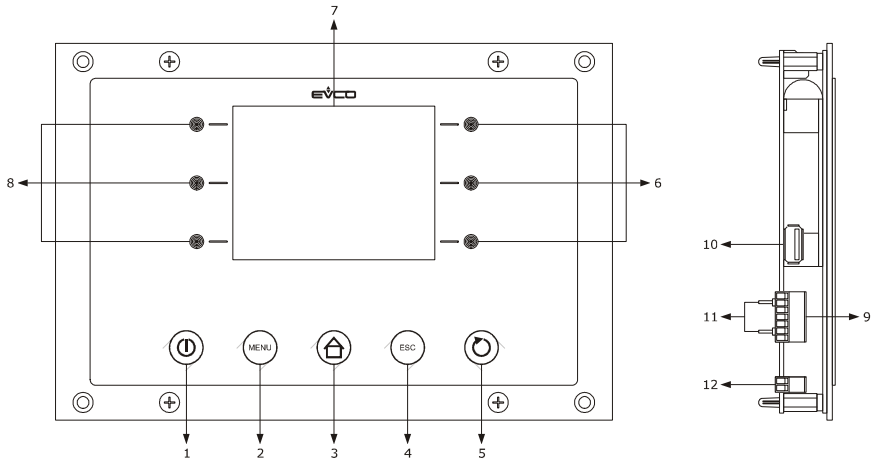
(1) The evaporator fan control signal can be analogue or digital.

For further information, see chapter 0 15 TECHNICAL DATA; for other models contact the EVCO sales network.

2 DESCRIPTION

2.1 Description of the user interface

The following drawing illustrates the aspect of the EVFTFT618 user interface.



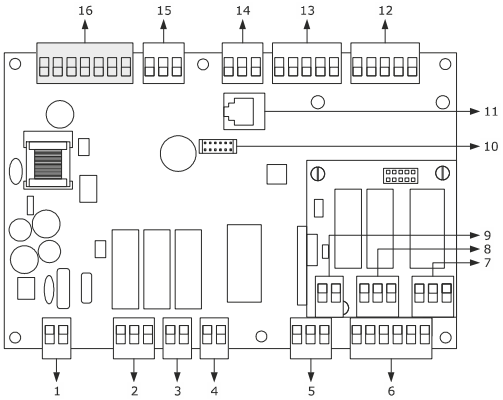
The following table illustrates the meaning of EVFTFT618 user interface parts.

Part	Part
1	on/off key, herein called also "ON/STAND-BY key"
2	options key, hereon call "MENU key"
3	pre-selection key, hereon call "HOME key"
4	annul key, hereon call "ESCAPE key"
5	cycle start/cycle cut-off key, hereon called "START/STOP key"
6	interactive keys
7	display
8	interactive keys
9	RS-485 serial port with MODBUS communication protocol and communication port with control module (signal and power supply)
10	USB type serial port
11	jumper for the insertion of the terminating resistor of the user interface-control module communication port and of the RS-485 serial port
12	earth

For further information, see the next chapters.

2.2 Description of the control module

The following drawing illustrates the aspect of the EVFTFT818 control module.



The following table illustrates the meaning of EVFTFT618 control module parts.

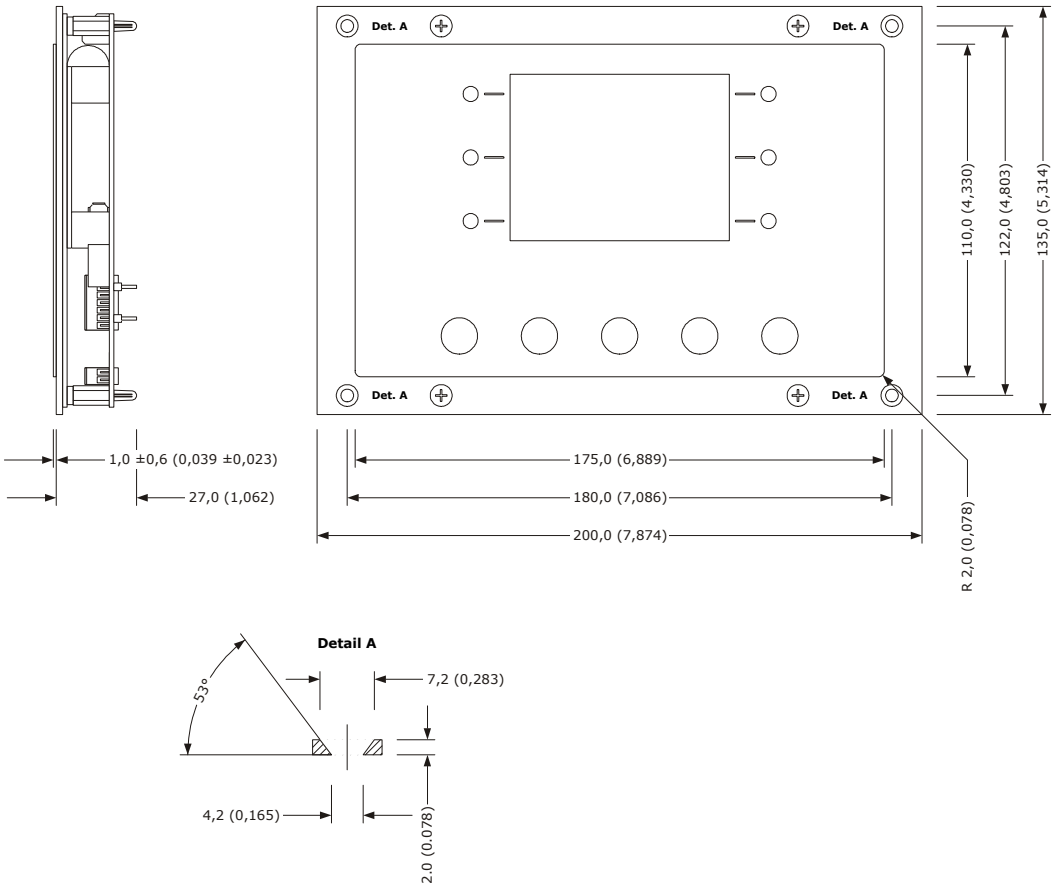
Part	Part
1	power supply
2	digital outputs K3 and K4
3	digital output K2
4	digital output K1
5	digital output K5
6	digital inputs
7	digital output K6
8	digital outputs K7 and K8
9	reserved
10	reserved
11	reserved
12	Not used
13	analogue inputs (cabinet probe, evaporator probe and condenser probe)
14	Humidity probe
15	PWM analogue output
16	communication port with the user interface (signal and power supply)

For further information, see the next chapters.

3 DIMENSIONS AND INSTALLATION

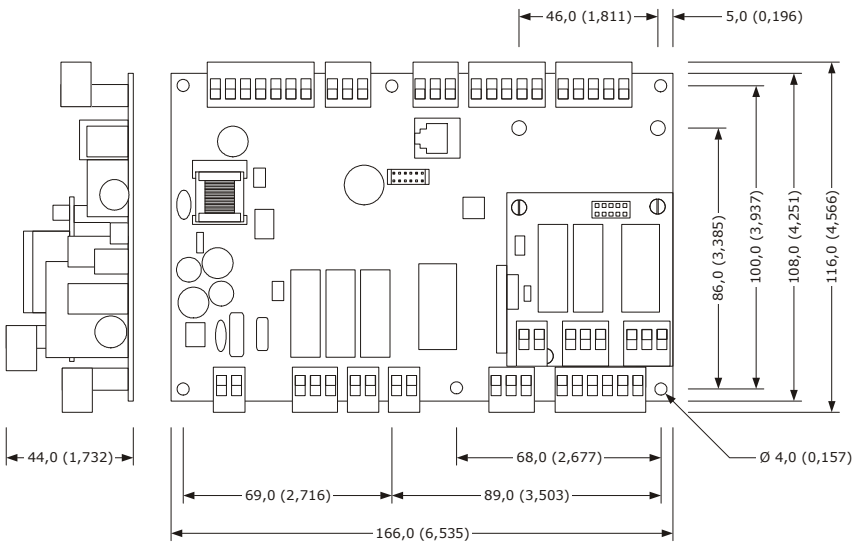
3.1 User interface dimensions

The following drawing illustrates the EVFTFT618 user interface dimensions; these are expressed in mm (in).



3.2 Control module dimensions

The following drawing illustrates the EVFTFT618 control module dimensions; these are expressed in mm (in).



3.3 User interface installation

Back panel via studs

3.4 Control module installation

On flat surface, with spacers.

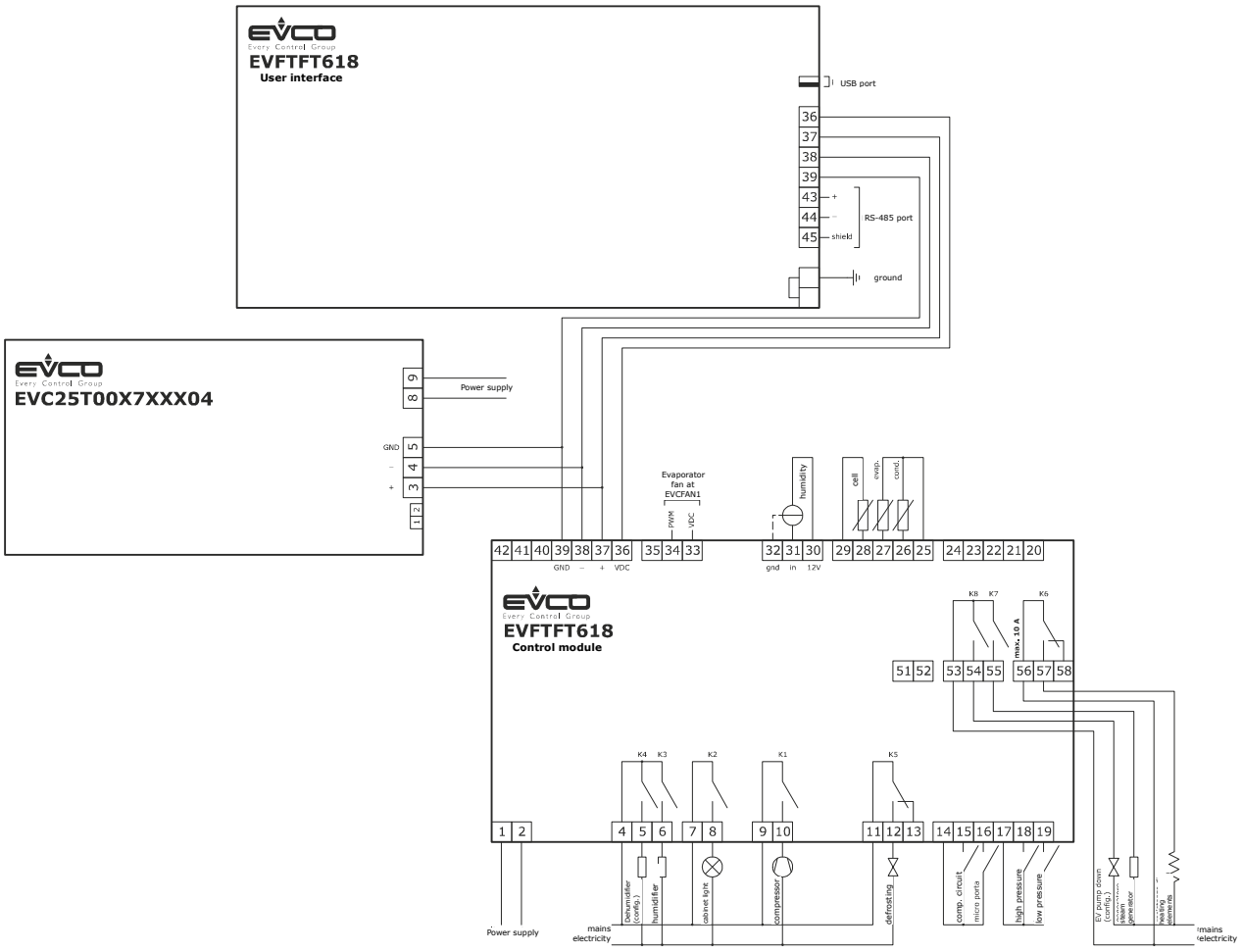
3.5 Installation warnings

- make sure that the device work conditions (temperature of use, humidity, etc.) lie within the limits indicated; see chapter 0 15 TECHNICAL DATA
- do not install the device near to any heat sources (heating elements, hot air ducts etc.), equipment containing powerful magnets (large diffusers, etc.), areas affected by direct sunlight, rain, humidity, excessive dust, mechanical vibrations or shocks.
- any metal parts in proximity of the control module must be at a distance such that they do not compromise the safety distances; any wiring must be positioned at least 2 cm
- in compliance with Safety Standards, the device must be installed correctly and in a way to protect against any contact with electric parts; all parts that ensure protection must be fixed in a way that they cannot be removed without the use of tools.

4 ELECTRIC CONNECTION

4.1 Electric connection

The following drawing illustrates the EVFTFT618 electric connection.



The utility managed by the K4 output, depends on parameter u3, as follows:

- dehumidifier (u3 = 0)
- condenser fan (parameter u3 = 1).

For the settings relative to the parameters, see chapter 0.

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

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

For the settings relative to the parameters, see chapter 0.

⚠ The RS-485 port is for the connection of the controller to the following additional products:

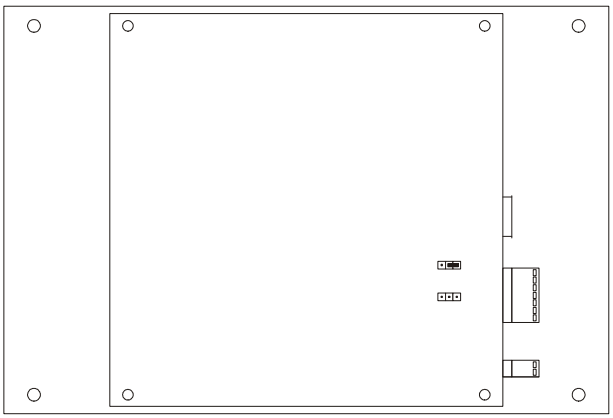
- Parameters Manager set-up software system
- RICS plants monitoring and surveillance systems
- device for recording data and to download recorded data (via USB).

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

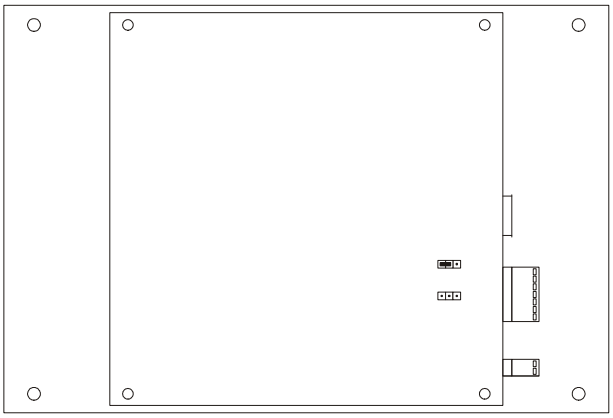
4.1.1 Connection of the terminating resistors of the communication port

The terminating resistor must be connected in order to reduce the reflections on the signal transmitted along the cables that connect the user interface to the control model.

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

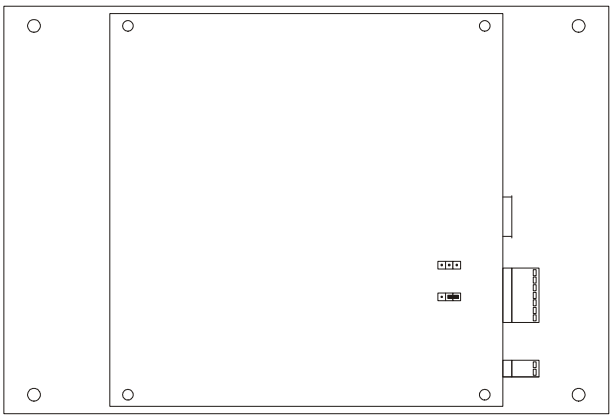


To disconnect the terminating resistors, position the jumper as illustrated in the following drawing.

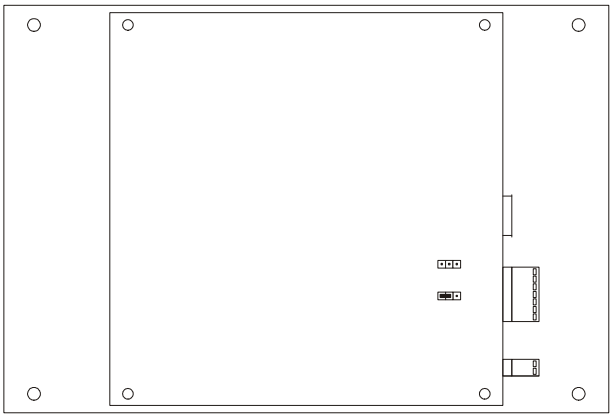


4.1.2 Connection of the RS-485 serial port terminating resistor

The terminating resistor must be connected in order to reduce the reflections on the signal transmitted along the cables that connect the RS-485 serial port to other EVCO products.
To connect the terminating resistors, position the jumper as illustrated in the following drawing.



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



4.2 Warnings for the electric connection

- do not use electric or pneumatic screwdrivers on the device terminal board
- if the device has been taken from a cold to hot place, humidity could condense inside; wait about 1 hour before powering it
- make sure that the power supply voltage, the frequency and the operational electric power of the device, correspond with those of the local power supply; see chapter 0
- disconnect the device power supply before proceeding with any type of maintenance
- do not use this device as a safety device
- for repairs and information regarding the device, contact the EVCO sales network.

5 USER INTERFACE

5.1 Preliminary notes

The following operating status exist:

- the “stand-by” status (the device is powered and is off)
- the “on” status (the device is powered, is on and is in stand-by for the start-up of an operating cycle)
- the “run” status (the device is powered, is on and an operating cycle is in progress).

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

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

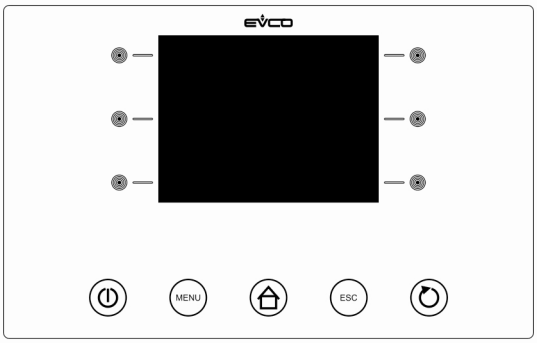
If a power cut occurs during the "run" status, the device will operate as follows when this is restored:

operation after cut-off of the power supply depends on parameter "P6"; if set at 0 the cycle will be interrupted, if set at 1 the cycle will be re-started and if set at 2 the cycle will only be re-started if the the power cut-off supply was less than the time set by parameter "P5".

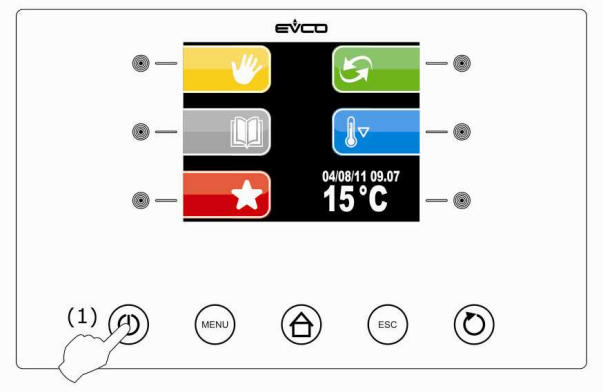
5.2 Device commissioning

Operate as follows:

1. Connect the device power supply. if parameter E9 is set at 1, the device will display the EVCO splash screen for 10 seconds, otherwise it will display a black screen for 10 seconds, after which it will go to the STANDBY status.



2. Press and release the ON/STAND-BY (1) key.



⚠ If the duration of power supply cut-off was such to cause the clock error, the board will display the clock setting screen directly. The controller does not control the coherence of the data entered, it is the user's job to control the data are entered correctly.

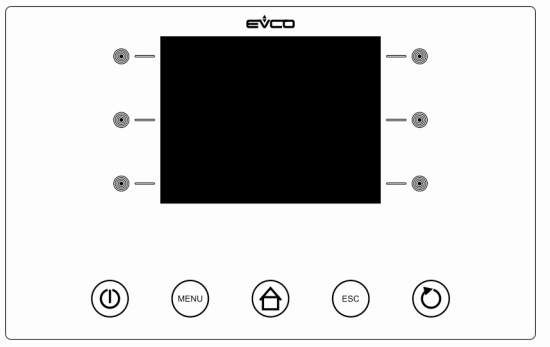
5.3 Switching the Device On/Off

Operate as follows:

1. Press and release the ON/STAND-BY key.

5.4 The display

The display will be off during the STANDBY status. The LEDs relative to the active keys are on.

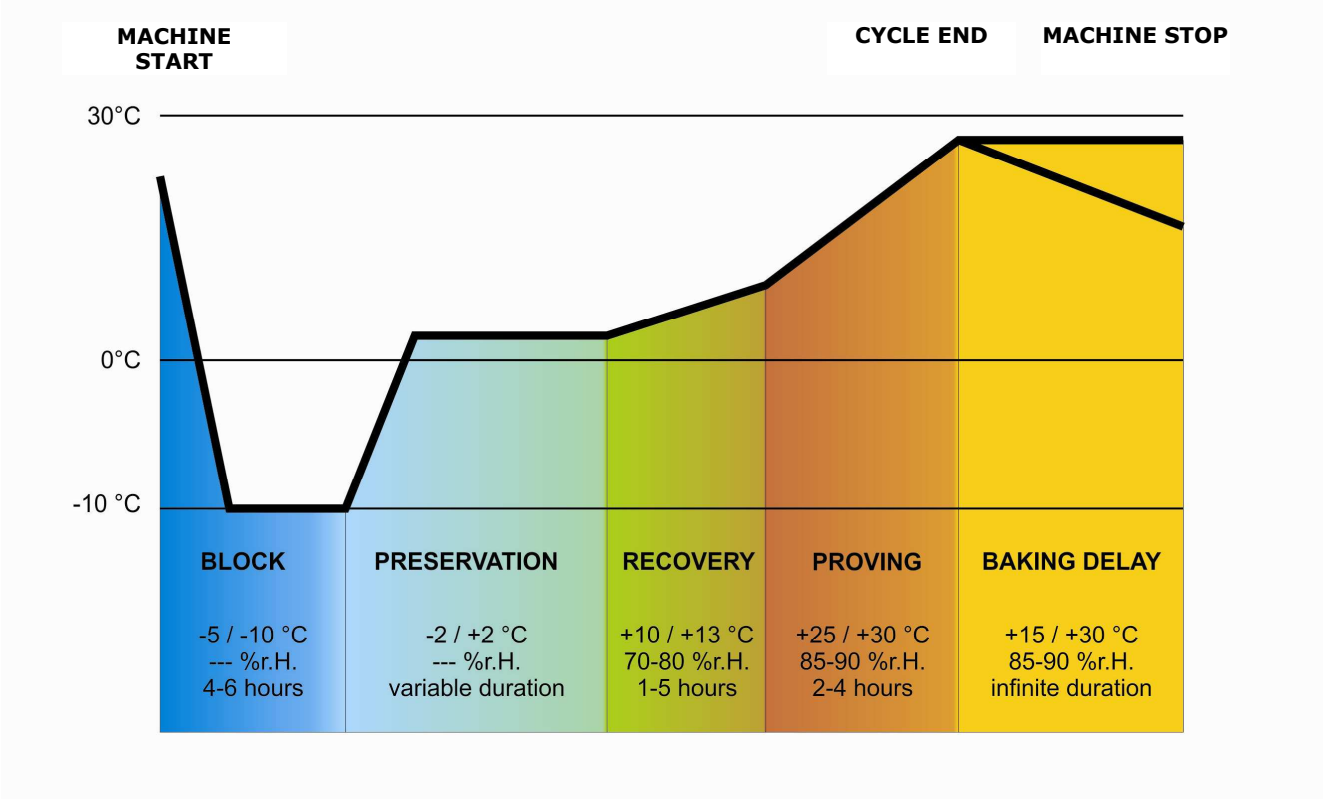


During the ON status, the device will display the date, real time, cabinet temperature and the possible functions that can be selected.

6. OPERATION

6.1 Preliminary notes

The controller supplies a complete control for retarder-proofer cabinets or cells for confectionery and bread-making, through the automatic management of the complete mixture retarder-proofer cycle.



An automatic retarder-proffer cycle is composed of 5 different phases with different temperatures, relative humidity, fan speed and duration, which are performed one after the other and precisely:

1. *BLOCK phase*

The block phase is the first phase of the automatic cycle.

Temperature regulation is active and is neutral area, the temperature set-point, the humidity set-point (the control if envisioned), the speed of the fans and the duration in hours and minutes of the phase are established by the final user.

Adjustment of the relative humidity depends on parameter rU4. If set at zero, humidity control is not envisioned in this phase.

2. *STORAGE phase*

The storage phase is the second phase of the automatic cycle.

Temperature regulation is active and is neutral area, the temperature set-point, the humidity set-point (the control if envisioned), the speed of the fans and are established by the final user.

Adjustment of the relative humidity depends on parameter rU4. If set at zero, humidity control is not envisioned in this phase.

The duration of this phase is calculated automatically by the controller on the basis of the duration of the lock, recovery, proving phases and the day and time of proving end time desired for the mixture.

3. *RECOVERY phase*

The recovery phase is the third phase of the automatic cycle.

The temperature regulation is active and is NEUTRAL AREA, the work set-point is established by the final user. The passage from the storage set-point (previous phase) to the recovery set-point can be gradual with increase percentages established in the parameters programming phase.

The relative humidity regulation is active and is NEUTRAL AREA, the work set-point is established by the final user.

The duration in hours and minutes of the phase and the evaporator fan speed are established by the final user.

4. *PROVING phase*

The proving phase is the fourth phase of the automatic cycle.
The temperature regulation is active and is NEUTRAL AREA, the work set-point is established by the final user. The passage from the recovery set-point (previous phase) to the proving set-point can be gradual with increase percentages established in the parameters programming phase.
The relative humidity regulation is active and is NEUTRAL AREA, the work set-point is established by the final user.
The duration in hours and minutes of the phase and the evaporator fan speed are established by the final user.

5. *BAKING DELAY phase*

The baking delay phase is the fifth phase of the automatic cycle.
The baking delay phase is always disabled but can be enabled both in the cycle setting phase and also with cycle in progress by the final user.
The temperature regulation is active and is NEUTRAL AREA, the work set-point is established by the final user.
The relative humidity regulation is active and is NEUTRAL AREA, the work set-point is established by the final user, as is the evaporator fan speed.
The duration of the phase is theoretically infinite, i.e. it ends when the cycle is interrupted by pressing the stop key (a pop-up menu will ask the confirm; press the Escape button to clear the pop-up menù).

There are also 2 manual work cycles available; one MANUAL REFRIGERATION cycle (equivalent to a storage but with infinite duration) and a MANUAL HEATING cycle (equivalent to a proving cycle with infinite duration and without regulation steps).

To make these regulations possible, the controller will therefore manage the utilities set-up for cooling (compressor, evaporator fan, defrosting, pump-down electrovalve), for heating (heating elements or operating in heat pump mode), humidification (steam generator, humidifier) end dehumidification (dehumidification via extraction fan or via activation of the cooling plant); the regulations of each individual utility will be described in the following chapters.

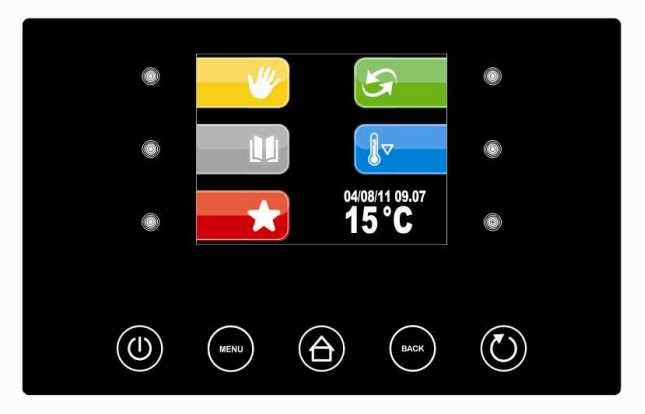
In addition to management of the automatic and manual cycles, the controller envisions the possibility to manage other functions, such as:

- Pre-cooling management
- "Delayed baking" connection/disconnection management
- Cabinet light management
- Management of 10 user programs
- Management of 10 Favourite Programs
- Connection to RICS
- Host USB port management on machine for: download/upload PROGRAMS, download/upload PARAMETERS and download HACCP data.

6.1.1 Pre-selection page

The Pre-selection page represents the "start point" foe navigating the user interface.

The functions enabled and the dates data, time and temperature in cabinet are present in the pre-selection page.



All final user selections will start from the pre-selection page.

The 5 “interactive” keys will allow to select:

-  MANUAL: i.e. selection, setting and running a manual cooling or heating cycle.
-  PROGRAMS: i.e. the selection and/or modification of automatic retarder-proffer cycles saved in the memory
-  FAVOURITES: i.e. the quick recall of the last 10 performed.
-  AUTOMATIC: i.e. the selection, setting and execution of a complete automatic retarder-proofer cycle.
-  PRE-COOLING: i.e. the execution of a cabinet pre-cooling cycle

The 2 active “navigation” keys will allow to select:

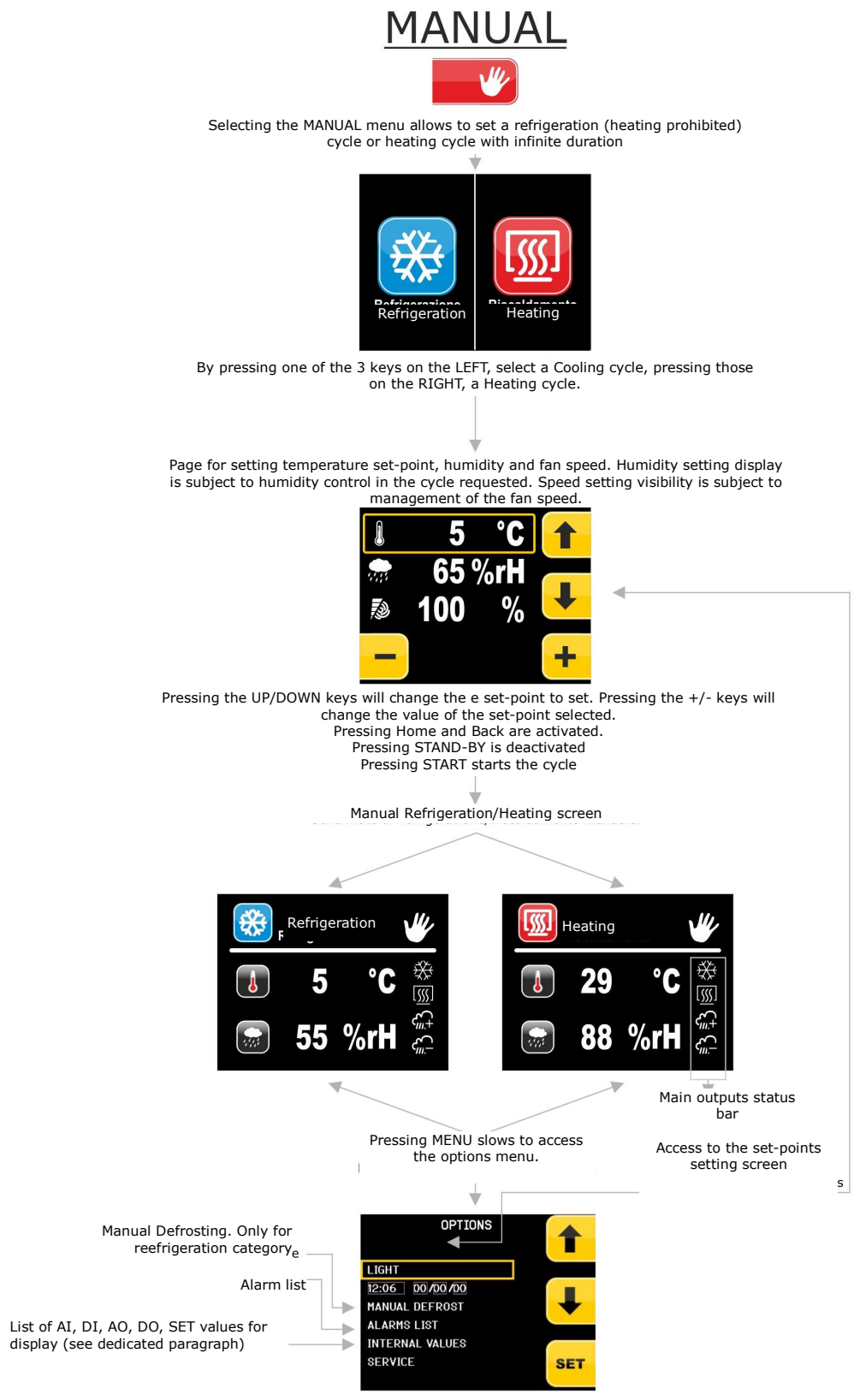
- ON/STANDBY to take the machine back to STANDBY status
- MENU to access the pre-selection page options screen

6.1.2 Setting and execution of a manual cycle

Below the complete navigation system of the MANUAL menu is illustrated.

From this menu it is possible to select and perform a complete manual COOLING or HEATING cycle.

To reach the MANUAL menu from the pre-selection page, press the key at the side of the MANUAL icon:



Press the START/STOP key to start the cycle. Press the START/STOP key to interrupt the cycle (a pop-up menu will ask the confirm; press the Escape button to clear the pop-up menù).

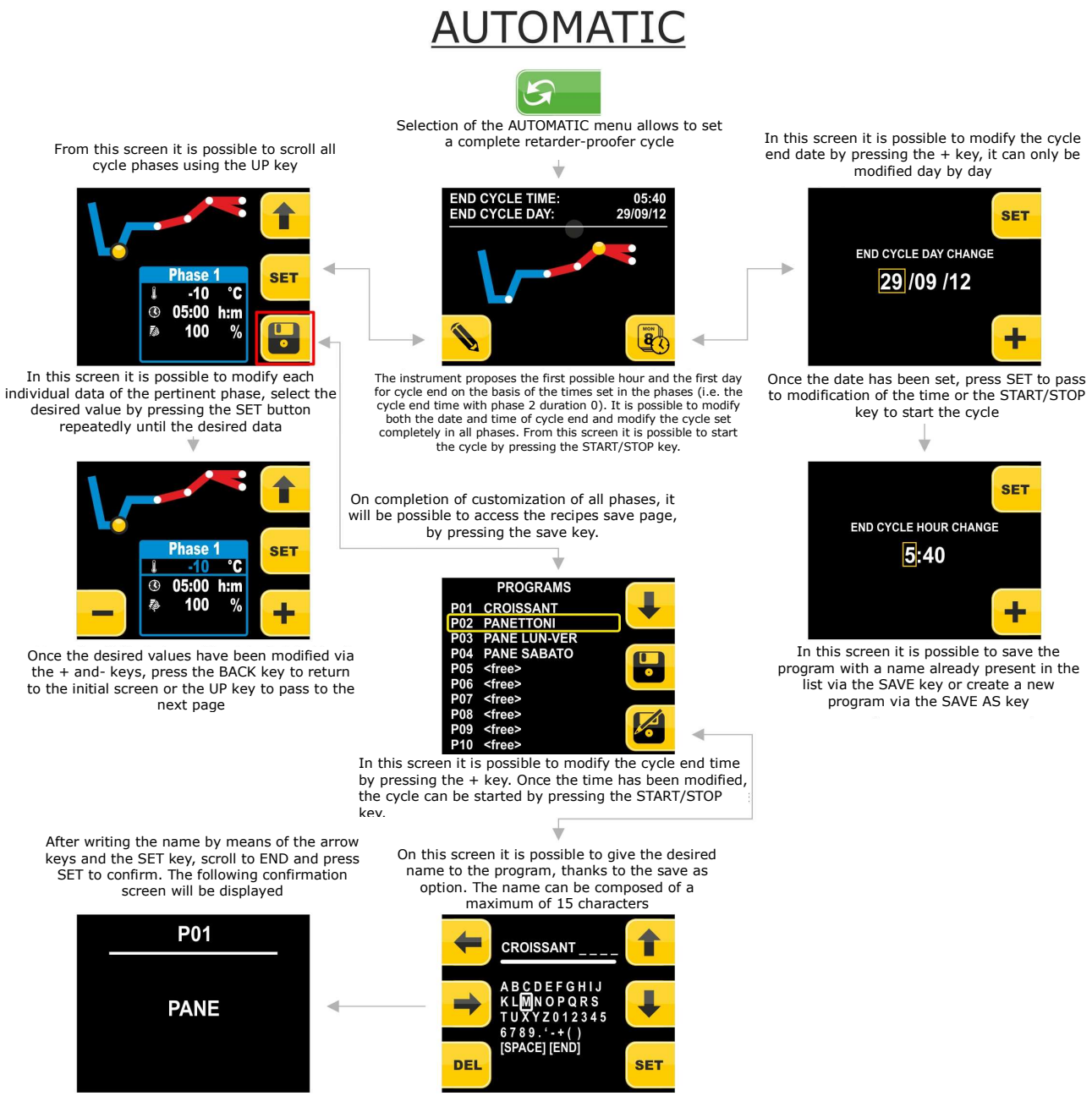
6.1.3 Setting an automatic cycle

Below the complete navigation system of the AUTOMATIC menu is illustrated.

It is the real "heart" of the product as all retarder-proofer cycles will be set from this menu and the PROGRAMS and FAVOURITES menus will be passed on once the saved cycles have been selected.

From this menu it will also be possible to save the cycle set before its execution (from the 10 programs available).

To reach the AUTOMATIC menu from the pre-selection page, press the key at the side of the AUTOMATIC icon. The following scheme shows the menu flow if parameter E15 is set to 0:



The following scheme shows the menu flow if parameter E15 is set to 1:

AUTOMATIC

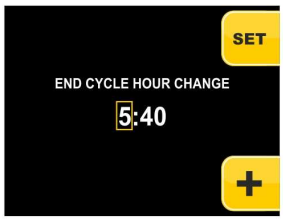
Selection of the AUTOMATIC menu allows to set a complete retarder-proofer cycle

The cycle end can be postponed of 24 hours (by pressing the key once), of 48 hours (by pressing the key twice) or of 72 hours (by pressing the key three times)

The instrument proposes the first possible hour and the first day for cycle end on the basis of the times set in the phases (i.e. the cycle end time with phase 2 duration 0). It is possible to modify both the date and time of cycle end and modify the cycle set completely in all phases. From this screen it is possible to start the cycle by pressing the START/STOP key.

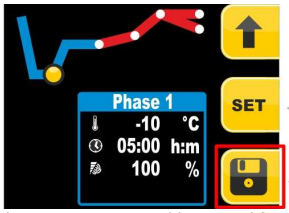
In this screen it is possible to modify the cycle end date by pressing the + key, it can only be modified day by day

Once the date has been set, press SET to pass to modification of the time or the START/STOP key to start the cycle

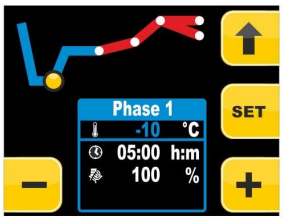


In this screen it is possible to save the program with a name already present in the list via the SAVE key or create a new program via the SAVE AS key

From this screen it is possible to scroll all cycle phases using the UP key

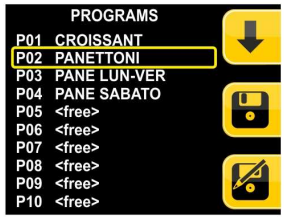


In this screen it is possible to modify each individual data of the pertinent phase, select the desired value by pressing the SET button repeatedly until the desired data



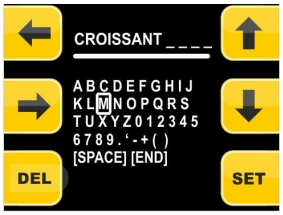
Once the desired values have been modified via the + and- keys, press the BACK key to return to the initial screen or the UP key to pass to the next page

On completion of customization of all phases, it will be possible to access the recipes save page, by pressing the save key.

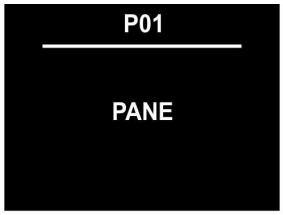


In this screen it is possible to modify the cycle end time by pressing the + key. Once the time has been modified, the cycle can be started by pressing the START/STOP key.

On this screen it is possible to give the desired name to the program, thanks to the save as option. The name can be composed of a maximum of 15 characters



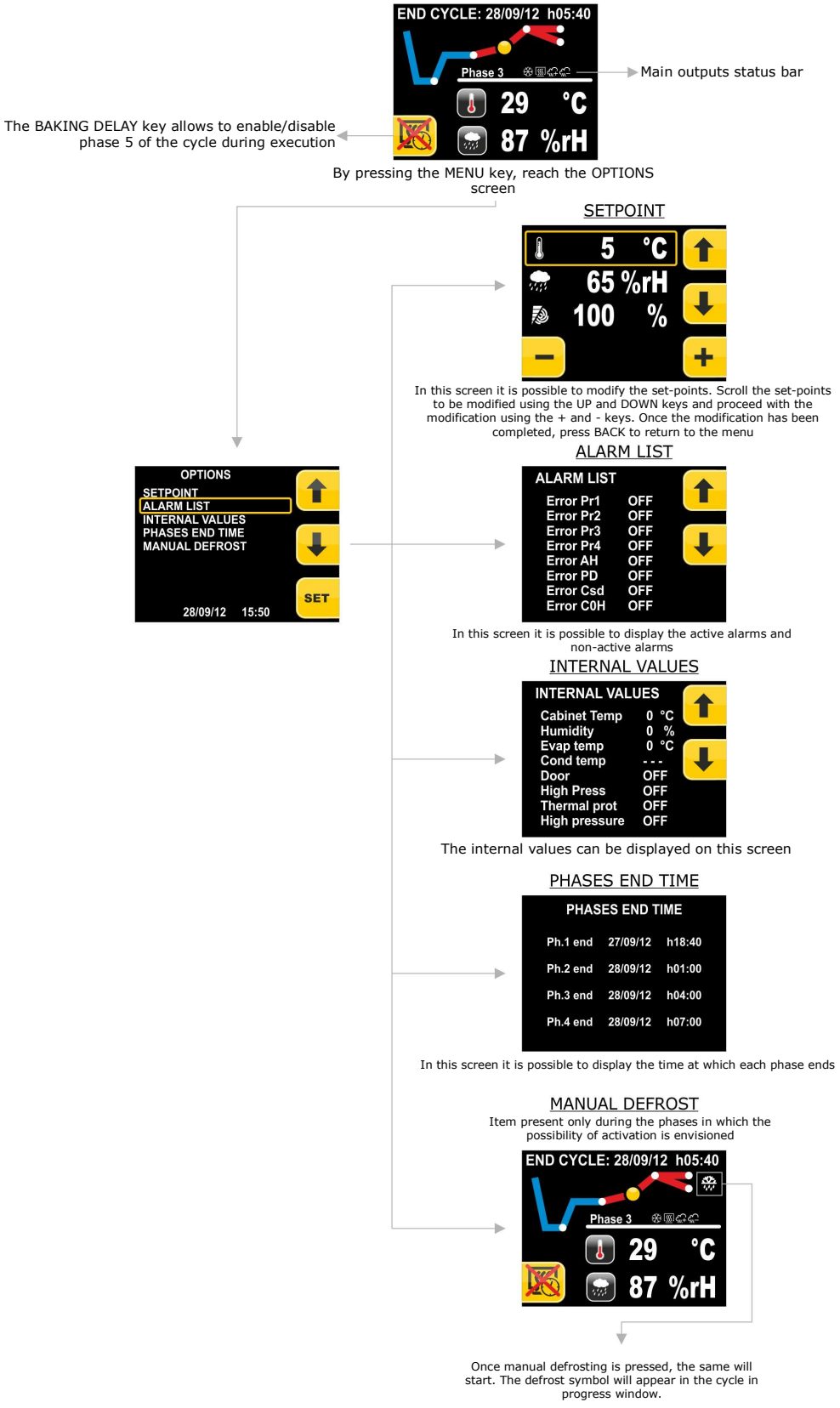
After writing the name by means of the arrow keys and the SET key, scroll to END and press SET to confirm. The following confirmation screen will be displayed



6.1.4 Execution of an automatic cycle

Below find the illustration of the complete navigation system during the execution of an automatic cycle.

Once the automatic cycle is started, the following screen is displayed:



Press the START/STOP key to start the cycle. Press the START/STOP key to interrupt the cycle (a pop-up menu will ask the confirm; press the Escape button to clear the pop-up menù).

6.1.5 The PROGRAMS menu

Below the complete navigation system of the PROGRAMS menu is illustrated.

This menu allows to select the program to be performed and/or modified. Once selected, press the SET key. In this way the choice is confirmed and passes to the AUTOMATIC menu.

To reach the PROGRAMS menu from the pre-selection page, press the key at the side of the PROGRAMS icon:

Selection of the PROGRAMS menu allows to select a retarder-proofer cycle from the 10 programs available

Use the UP and DOWN keys to scroll the programs available. Once the desired program has been highlighted, press the SET key to confirm. The program selected will be re-proposed will all settings in the first automatic cycle selection screen, i.e. with the selection of end cycle time and date.

From this point, the cycle start-up and setup management will be the same as those of automatic cycle setting.

If the program selected is not present, pressing the SET key will have no effect.

6.1.5.1 Modify Date and Time of Automatic Cycle End

The program end day can be moved up to 20 days after. The MINUS key only appears of the day is modified, otherwise it is not visible as the date that is proposed is the first possible with the settings present.

6.1.6 The FAVOURITES menu

Below the complete navigation system of the FAVOURITES menu is illustrated.

This menu has the purpose of quickly recalling the "favourites" cycles, i.e. the last 10 cycles performed by the machine.

To reach the FAVOURITES menu from the pre-selection page, press the key at the side of the FAVOURITES key:

Selection of the FAVOURITES menu allows the quick selection of one of the last 9 cycle performed, whether they be programs, automatic cycles or manual cycles

Use the UP and DOWN keys to scroll the programs available. Once the desired program has been highlighted, press the SET key to confirm. The program selected will be re-proposed will all settings in the first automatic cycle selection screen, i.e. with the selection of end cycle time and date.

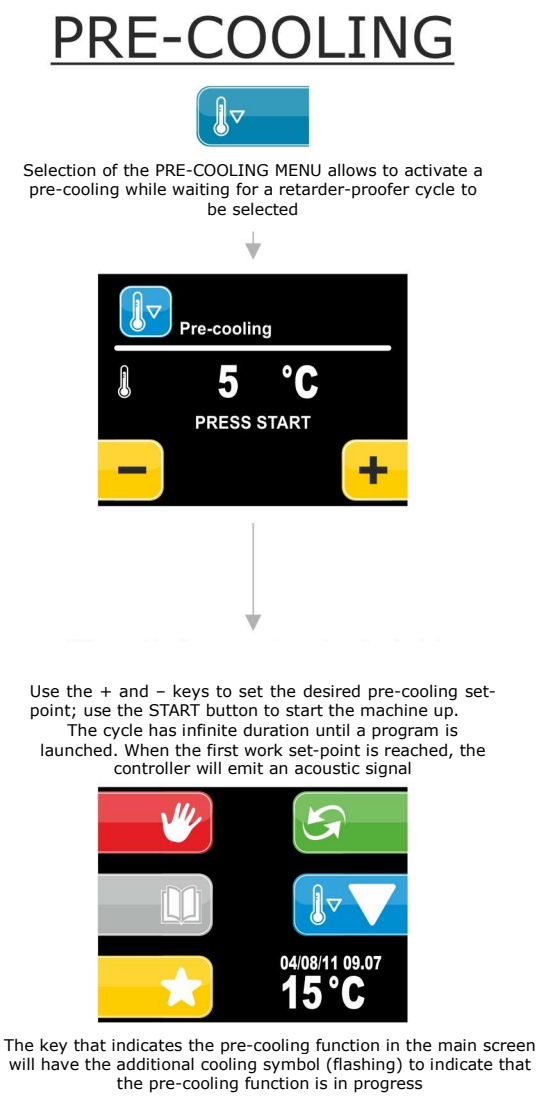
From this point, the cycle start-up and setup management will be the same as those of automatic cycle setting

The selection of a program with hyphens is not allowed. Pressing the set key has no effect.

6.1.7 The PRE-COOLING menu

Below the complete navigation system of the PRE-COOLING menu is illustrated.
This menu allows to activate pre-cooling of the cabinet while waiting to select a retarder-proofer cycle.

To reach the PRE-COOLING menu from the pre-selection page, press the key at the side of the PRE-COOLING icon:

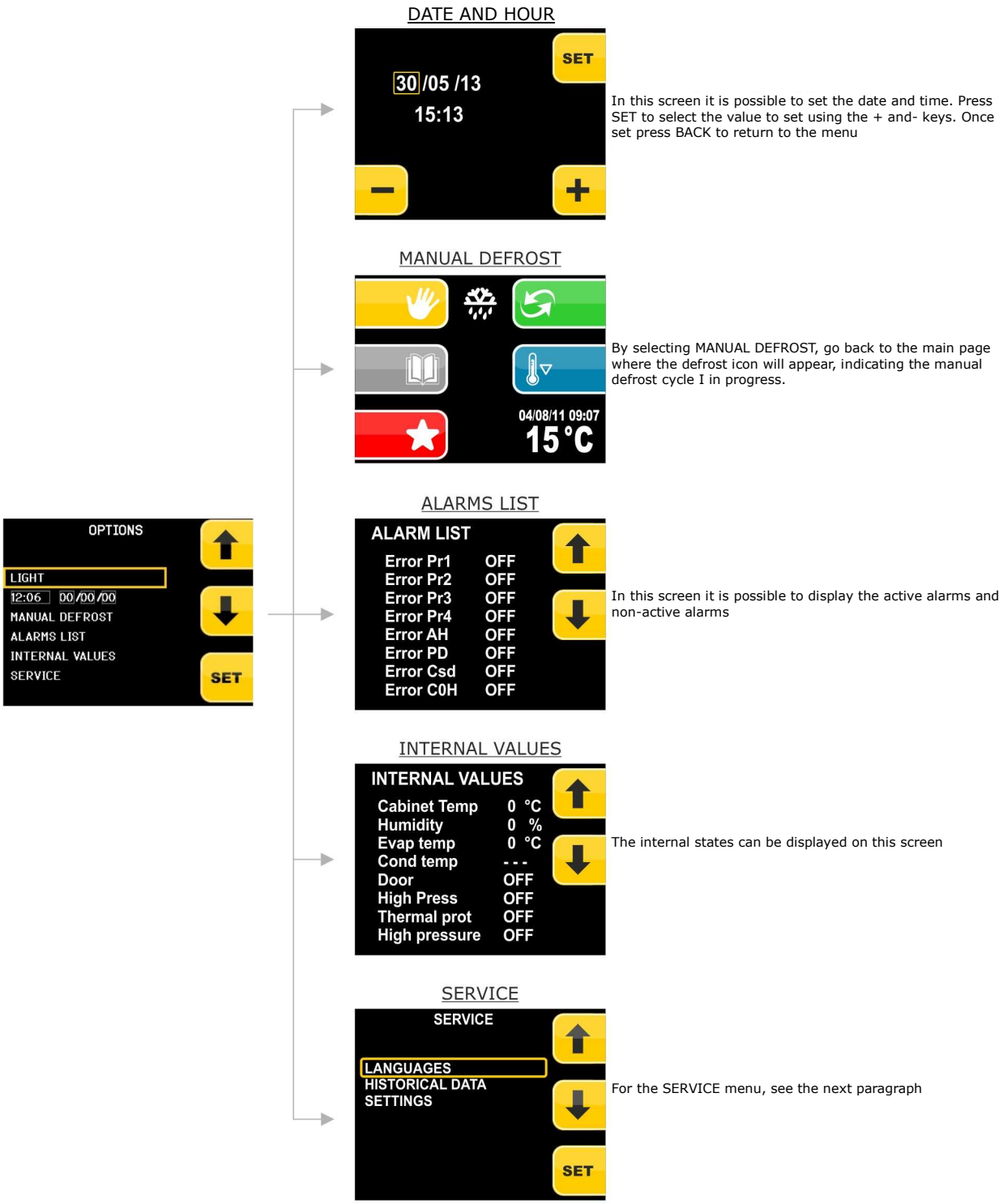


Note: a cycle can be launched at any time during pre-cooling.

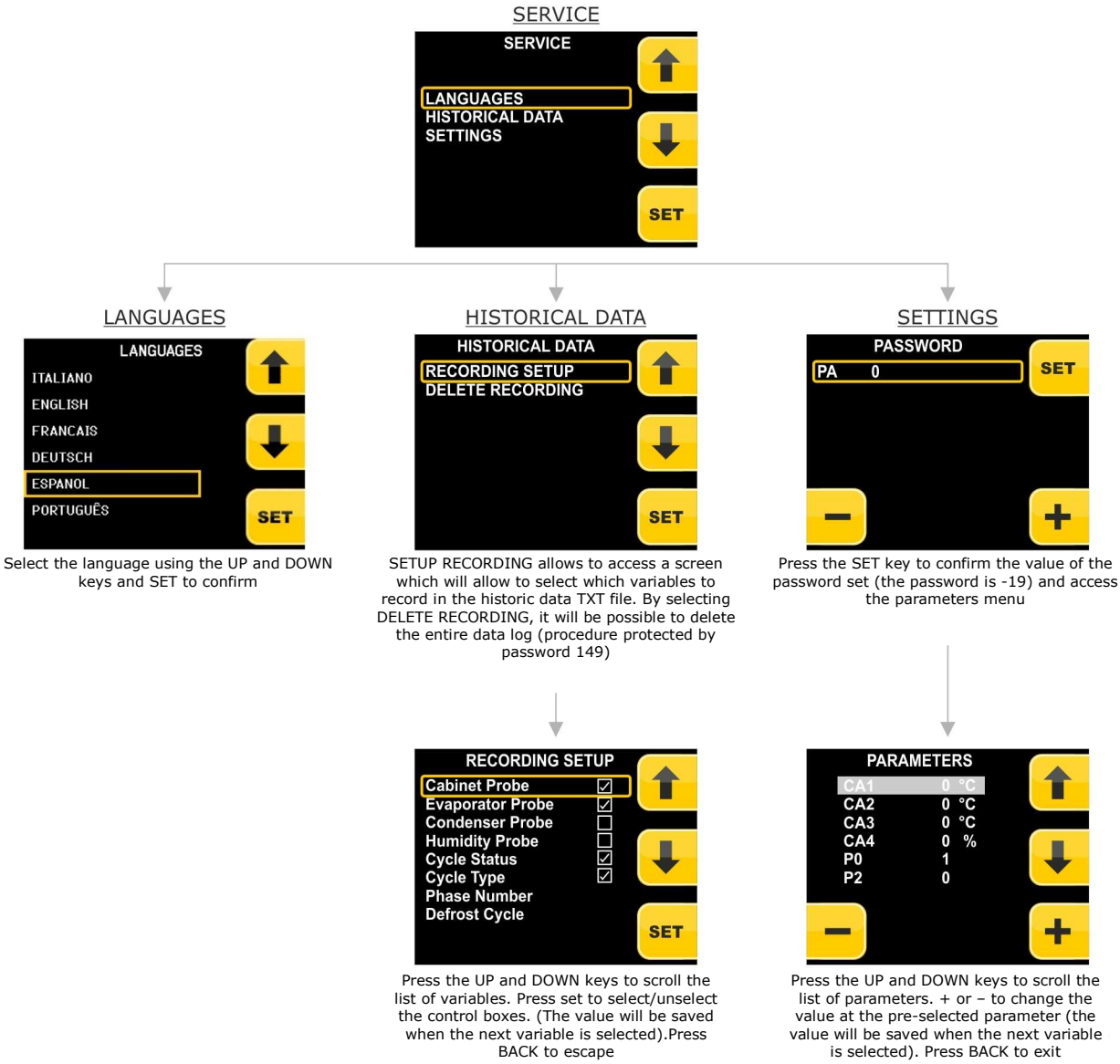
6.1.8 The PRE-SELECTION PAGE OPTIONS menu

Below the complete navigation system of the FAVOURITES menu is illustrated.

To reach the PRE-SELECTION PAGE OPTIONS menu from the pre-selection page, press the MENU key.



6.1.8.1 The SERVICE menu



Note: if the language is modified, all programs memorised (favourites) will be deleted and those customised (default) will be taken back to the pre-established values.

7 Detail Meaning Icons Status Regulators

During the execution of a cycle (both manual and automatic) the states of the main utilities are displayed through the icons.

White light on indicates the compressor is active
Yellow light on indicates the request for compressor activation but safety times not yet expired
Off means compressor is not active

On indicates heating active
Off indicates heating not on

On indicates humidification active
Off indicates humidification not on

On indicates dehumidification active
Off indicates dehumidification not on

7.1 Silencing the buzzer

Press and release any key when the buzzer is ringing. If the buzzer rings to end an automatic cycle or for pre-cooling temperature reached, as well as by pressing the key, the button also deactivates after the seconds defined by parameter E12.

8 Keyboard lock

The keyboard lock can be managed in manual and automatic mode, the method of use must be set with parameter E8.

8.1 Manual keyboard lock

In this case, to lock and unlock the keyboard it is necessary to press the HOME key (a closed padlock will be shown 3 s).

8.2 Automatic keyboard lock

In this case, the keyboard will lock after 1 minute of inactivity during the cycle. The HOME key must be pressed to unlock it (an open padlock will be shown 3 s).

9 Regulations

9.1 Pre-cooling

The pre-cooling cycle has the purpose of taking the cabinet to a determined temperature before selecting and performing a retarder-proofer cycle.

During the pre-cooling cycle, the compressor, condenser fans, the pump-down electrovalve (if enabled) and the evaporator fan work to reach the temperature established.

Once the pre-cooling temperature has been reached, the buzzer rings intermittently to indicate that the machine is ready to perform a cycle. The buzzer is silenced by pressing any key or after the time defined by parameter E11.

The pre-cooling cycle continues until the START/STOP key is pressed or until an automatic or manual cycle is started by the user.

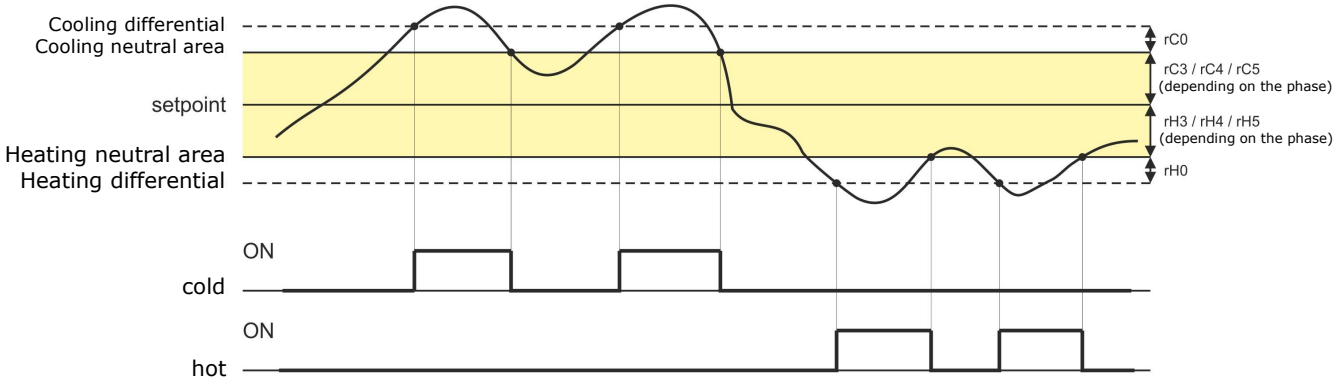
9.2 Temperature regulation

The temperature regulation for all machine phases is with neutral area.

Meaning with a work set-point and a neutral area within which activations of loads set-up for heating or cooling do not take place.

When the temperature goes above the neutral area value of the cooling differential value, the utilities set-up for cooling will be activated until the temperature returns within the neutral area value.

In the same way, when the temperature goes below the neutral area value of the heating differential value, the utilities set-up for heating will be activated until the temperature returns within the neutral area value.



9.2.1 Generating cold

The generation of the cold refers to the cooling circuit installed on the machine.

During a cooling request, the compressor output will be activated along with the pump-down electro valve (if enabled).

The evaporator fan will go in continuous mode or parallel to the compressor on the basis of that established for each parameters configuration phase and at the speed established for the phase in progress.

9.2.2 Generating heat

Generation of the heat refers to a heating element.

During a heating request, the heating element outputs will be activated, with possibility of management of a switch-on and switch-off duty cycle, defined by parameters rH6 and rH7 in a way to limit the heating power if very powerful resistors are used, in order to prevent overheating in the cabinet.

The evaporator fan will go continuously or in parallel to the resistors output, at the speed established for the phase in progress.

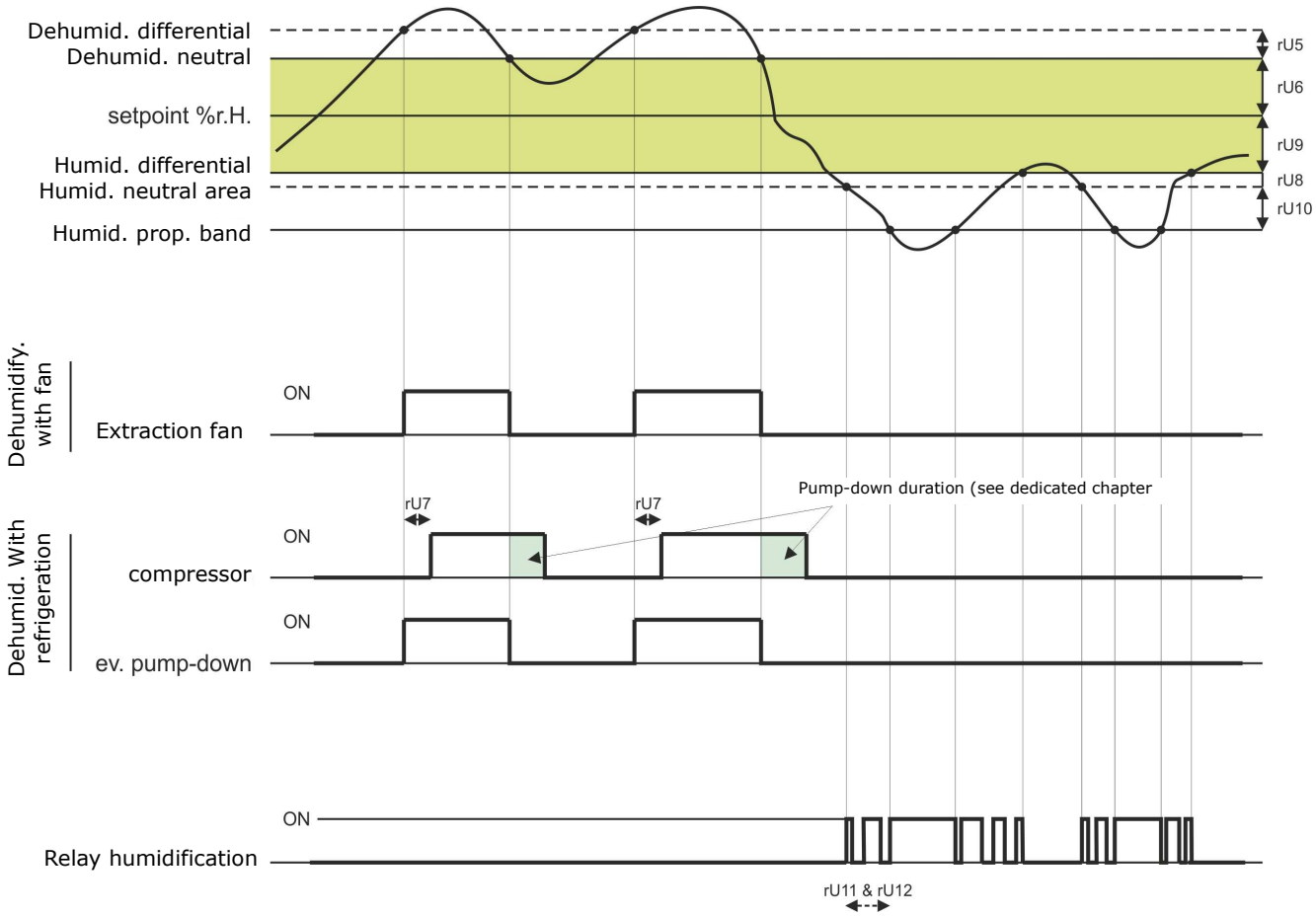
9.3 Regulation of humidity

The regulation of the humidity in the cabinet for all phases where it is envisioned and with humidity transducer enabled, is neutral area.

Meaning with a work set-point and a neutral area within which activations of loads set-up for humidification or dehumidification do not take place.

When the humidity goes above the neutral area value of the dehumidification differential value, the utilities set-up for dehumidification will be activated until the humidity returns within the neutral area value.

In the same way, when the humidity goes below the neutral area value of the humidification differential value, the utilities set-up for humidification will be activated proportionally until the humidity returns within the neutral area value. (For management without humidity transducer, see chapter 0).



9.3.1 Humidification management

Generation of humidity refers to two different utilities, a humidity generator output and a humidifier output.
The humidity generator output is activated during the phases in which management of humidification is envisioned; it is used for machines with external boiler, in order to generate the steam to be introduced successively into the cabinet whenever requested by the regulator.
The humidifier output activates when the humidity value inside the cabinet drops below the neutral area value given by the parameter rU9 of the humidification differential value given by the parameter rU8. The percentage activation of the humidifier output will be proportional to the value of the humidity with respect to the humidification proportional band defined by the parameter rU10. The humidification activation/deactivation cycle time is given by parameter ru11 and regulated on the basis of times defined by parameter rU12.

9.3.2 Dehumidification management

Dehumidification can be managed in two different ways, via an extraction/dehumidifier fan (u3=1) or via the activation of the cooling plant (u3=1).
In the case of management via extractor fan/dehumidifier, the output will activate when the humidity has exceeded the dehumidification neutral area, given by parameter rU6 of the value of the differential value given by the parameter rU5 and deactivates when the humidity has returned within the dehumidification neutral area value.
The compressor will behave in the same way whenever the management of the pump-down electrovalve is enabled (parameter u1 =1).

If pump-down electrovalve management is enabled (parameter u1=0), there will first be a dehumidification attempt via activation of the electrovalve for a period of time equal to parameter rU7, to try and make use of the high pressure generated during pump-down in compressor switch-off, on the expiry of which, the compressor output will be activated, if dehumidification is still requested.
Once the humidity returns within the dehumidification neutral area value, the pump-down electrovalve will be deactivated. After which, the compressor will deactivate via the pump-down algorithm.

10 Loads management

10.1 Management of the compressor

Compressor activation is subject to the delay time between the two switch-ons (parameter C1), the delay between switch-off and successive activation (parameter C2), the activation delay from board power on (parameter C0) and the minimum switch-on time (parameter C3).
The compressor can also be active during hot gas defrosting (parameter d1 = 1). In this case, for the defrosting to start, the compressor must be active for at least the time established with parameter d15.
The compressor can also be used for dehumidification; for more details see paragraph 0.

Compressor switch-off is managed differently when management of the pump-down electrovalve management is envisioned. For greater details see the staff 0.

10.2 Pump-down management

If output K8 is configured as pump-down electrovalve (parameter u1= 0), the controller will manage the interaction between compressor output and electrovalve output as follows:
With timed pump-down (parameter u1 = 0 and i6 = 0 or 1):
On activation of the compressor in parallel, the pump-down electrovalve will also be activated.
Compressor deactivation will be advanced by the deactivation of the pump-down electrovalve; after time u2 the compressor outlet will also be deactivated.

With pump-down managed from LP digital input (parameter u1 = 0 and i6 = 2):

On activation of the compressor in parallel, the pump-down electrovalve will also be activated.

Compressor deactivation will be advanced by the deactivation of the pump-down electrovalve; the compressor will be switched off successively via the intervention of the LP digital input.

Whenever the LP digital input does not intervene within maximum time U2, the compressor will be deactivated and the PD alarm activated; an alarm turns off the high-pressure compressor regardless of the management of the pump-down.

If the pump-down is managed by the LP digital input, at every compressor output and electrovalve switch-on, a LP digital input rearm time will be loaded (parameter i9). When the compressor is off, the status of the LP digital input will not be considered.

10.3 Management of the evaporator fan

The evaporator fan is managed via the PWM analogue output and the phase cut module EVDFAN1 or via the digital output K8 in On/Off mode if the parameter u1 = 1.

The evaporator fan can be configured for every phase of the cycle to operate continuously or in parallel to the adjustment output, i.e. in parallel with the compressor, heating element, humidification and dehumidification. The definition of the behaviour is given by the parameters from F0 to F4.

It will also be possible to establish a delay time for deactivation of the fan with respect to the adjustment output through parameter F13 and a duty-cycle with a cycle time and an On time given by parameters F14 and F 15 during deactivation of the main utility. If parameters F14 and F15 are at zero, there will be no activation.

In the event of evaporator fan management via PWM analogue output, it will also be possible to establish the speed of the fan itself for every phase.

O fan switch-on the controller manages a speed (F21) and a peak time (F22) of the same. On conclusion of the ramp-up phase, the fan will modulate according to the speed set for the phase in progress, compensated via parameters F23 and F24, which respectively establish the minimum and maximum speed of the fan itself.

The fan is OFF during defrosting cycle. At the end of a defrosting cycle the evaporator fan will remain at a standstill for the dripping time given by parameter d7 and for the successive evaporator fans standstill time given by parameter F12.

Evaporator fan calibration procedure managed via TDF module:

To adapt the TDF adjustment to all types of single-phase 230 Vac motors, it is recommended to perform manually calibrate the evaporator fan.

1. Set F23 at 0% and F24 at 100%
2. Carry out a manual cycle and varying the fan speed, check the minimum percentage below which the fan switches off and the maximum percentage above which the fan goes to maximum.
3. Set these values respectively for F23 and F24.

10.4 Defrosting management

Defrosting is active during the automatic LOCK and STORAGE phases and during the MANUAL COOLING phase and can be automatic (at time intervals) or manual. Manual defrosting can be activated from the PRE-SELECTION, MANUAL CYCLE RUN OPTIONS and AUTOMATIC CYCLE RUN OPTIONS menu.

Depending on the value of parameter d1, the machine will perform electric or hot gas defrosting cycles.

Defrosting will end on reaching the defrosting end temperature given by the parameter d2, if the evaporator probe is enabled (parameter P3=1) or for maximum duration given by parameter d3. If the evaporator probe is enabled but broken, defrosting ends due to maximum duration.

At the end of defrosting, the controller will perform a dripping time (d7) during which, all adjustment outputs will be switched off. After dripping time, the cooling plant will start to operate again but the activation of the evaporator fan will be delayed further by the time given by the parameter F12.

In the event of hot gas defrosting, the compressor must be activated for at least time d15 for the compressor to start.

10.5 Management of the heating elements

During a heating request, the heating elements output will be activated, making the management of a switch-on/off duty-cycle also possible, defined by parameters rH6 and rH7.

10.5.1 Cabinet step heating management

The desired set-point can be reached in the recovery and proving phases gradually, defining the number of steps to reach the set-point and the percentage increase of the set-point for every step fixed.

For the recovery phase, the number of steps is defined by parameter rr0, while the percentage increases of the set-point are given by parameters from rr1 to rr10.

For the proving phase, the number of steps is defined by parameter rL0, while the percentage increases of the set-point are given by parameters from rrL1 to rL10.

Attention, it is the user's task to check the coherence of the number of steps set and the correct number of set-point increase percentages. Example, if rr0 is equal to 4, only the parameters from rr1 to rr4 must be set.

10.6 Management of the steam generator

The steam generator output is active during all phases in which cabinet humidification management is envisioned.

10.7 Humidification management

The humidity in the cabinet can be managed with or without the use of humidity transducer, depending on the value of the parameter rU0.

10.7.1 Management of humidity without transducer (rU0 = 1)

In this case, the humidifier output will remain active for a variable duty-cycle according to the humidity set-point set for the phase in progress.
The duration of the activations and deactivations of the output is given by parameters rU2 (humidification cycle time) and the maximum humidification time to obtain 100% humidity inside the cabinet (rU3).
The activation times will therefore be a percentage of the parameter rU3, on the basis of the set-point set, which will repeat every cycle time set with rU2.

10.7.2 Management of humidity with transducer (rU0 = 0)

The humidifier output activates when the humidity value inside the cabinet drops below the neutral area value (rU9) of the humidification differential value (rU8). The activation percentage of the humidifier output will be proportional to the value of the humidity with respect to the humidification proportional band value (rU10), on the basis of the humidification cycle time (rU11) and a times base for said time (rU12).

10.8 Dehumidification management

Dehumidification management is only active when the humidity management takes place via the use of the humidity transducer (rU0 = 0).
The dehumidification can be managed in two different ways: via an extractor fan (parameter u3 = 0, utility associated to output K4) or via the activation of the cooling plant (compressor and pump-down electrovalve if present).

10.8.1 Management via extractor fan/dehumidifier

In the case of management via extractor fan/dehumidifier, the output will activate when the humidity has exceeded the dehumidification neutral area, (rU6) of the value of the differential value (rU5) and deactivates when the humidity has returned within the dehumidification neutral area value.

10.8.2 Management via cooling plant activation

The compressor will behave in the same way whenever the management of the pump-down electrovalve is enabled.
If, instead, pump-down electrovalve management is enabled, there will first be a dehumidification attempt via activation of the electrovalve (rU7, to try and make use of the high pressure generated during pump-down in compressor switch-off mode), on the expiry of which, the compressor output will be activated.
Once the humidity returns within the dehumidification neutral area value, the pump-down electrovalve will be deactivated. After which, the compressor will deactivate via the pump-down algorithm.

10.9 Management of the condenser fan

If parameter u3 has value 1, output K4 will assume condenser fan control function.
If the condenser probe is active (parameter P4 = 1), the condenser fan will activate when the condenser temperature is over the value of parameter F16 of the differential value (F16 + 2.0 °C / 4 °F), independently from the status of the compressor, while it will always be on with the compressor on.
The condenser fan will switch-off when the condenser temperature drops below the value of parameter F16.
With condenser probe disabled (parameter P4 = 0) the condenser fan will be activated in parallel to the compressor, while deactivation will be delayed by the time established with parameter F17.
The condenser fan is always on during an overheated condenser alarm (label COH) or compressor blocked (label CSd) alarm.
The fans are handled during the hot gas defrost.

10.10 Cabinet light management

Cabinet light switch-on is enabled/disabled by opening/closing the door.
Light on with door open, light off with door closed.

11 Alarms

When an alarm occurs, a pop-up window opens a indicating the code of the alarm present. The buzzer sounds intermittently until any key is pressed that silences the buzzer and makes the pop-up window disappear. The alarm presence is indicated with the  icon.

The following table gives the alarms that may occur.

Code	Part
AH	Evaporator maximum temperature alarm Solutions: - check the temperature of the evaporator. - check the value of parameters A1 and A2. Main consequences: - signals only - all loads will be deactivated
id	Door open alarm Solutions: - check the door conditions - check the value of parameters i0, i1 and i2. Main consequences: - the effect established with parameter i0
HP	High pressure alarm. Solutions: - check the conditions of the high pressure input - check the value of parameters i3, i4 and i5. Main consequences: - the effect established with parameter i3 - all loads will be deactivated
LP	Low pressure alarm. Solutions: - check the conditions of the low pressure input - check the value of parameter i6, i7, i8 and i9. Main consequences: - all loads will be deactivated
CtH	Compressor circuit breaker protection alarm. Solutions: - check the conditions of the compressor circuit breaker protection input - check the value of the parameter i10 and i11. Main consequences: - all loads will be deactivated

PF	Power supply cut-off during execution of a cycle alarm Solutions: - check the device-power supply connection
COH	Condenser overheated alarm. Solutions: - check the temperature of the condenser - check the value of the parameter C6. Main consequences: - the condenser fan will be switched on
CSd	Compressor blocked alarm. Solutions: - check the temperature of the condenser - check the value of parameters C7 and C8 - disconnect the device power supply and clean the condenser. Main consequences: - if the error occurs during an operating cycle, the cycle will be interrupted
PD	Pump-down alarm Solutions: - check the maximum pump-down time established with parameter u2 - the alarm will be rearmed on the successive activation of the compressor or by pressing the buzzer silencing key Main consequences: - compressor switch-off
Pr1	Cabinet probe error. Solutions: - check the value of the parameter P0 - check the integrity of the probe - check the device-probe connection - check the temperature of the cabinet. Main consequences: - if the error occurs during the "stand-by" status, no operating cycles can be started - if the error occurs during a cycle, the cycle will be interrupted
Pr2	Evaporator probe error. Solutions: - the same as the cabinet probe error ("**Pr1**" code) but relative to the evaporator probe. Main consequences: - if parameter P3 is set at 1, the defrosting period will last for the amount of time set with parameter 3 - all the other loads will be deactivated
Pr3	Condenser probe error. Solutions: - the same as the cabinet probe error ("**Pr1**" code) but relative to the condenser probe. Main consequences: - the condenser fan will operate parallel to the compressor - the overheated condenser alarm ("**COH**" code) will never be activated

	- the compressor blocked alarm ("**CSd**" code) will never be activated
Pr4	Humidity transducer error. Solutions: - check the integrity of the transducer - check the device-transducer connection - check the humidity relative to the cabinet. Main consequences if parameter rU0 is set at 0: - if the error occurs during "stand-by", cycles that envision humidity management cannot be launched - if the error occurs during the execution of a cycle that envisions humidity control, the cycle will be interrupted.
rtc	Clock error. Solutions: - set the real date and time again. Main consequences: - the device will not be able to start automatic cycles - any automatic cycles in progress will be blocked.
ErC	User interface-control module compatibility. Solutions: - check that the user interface and the control module are compatible. Main consequences: - interruption of cycle in progress.
ErL	User interface-control module communication error. Solutions: - check user interface-control module control module. Main consequences: - interruption of cycle in progress

12 Management of the Host USB port on the board

The EVFTFT618 model mounts a USB port on the board able to perform the following functions:

- Allows the download of the data relative to the cycles performed onto USB (historic)
- Allows to download the programs saved in the controller onto USB pen
- Allows to download the parameters saved in the controller onto USB pen
- Allows to upload the programs saved in the USB pen into the controller
- Allows to upload the parameters saved in the USB pen into the controller

On connection of a pen to the USB port on the machine, with board in stand-by, a window will appear that will allow to access the menu described in the following flow-chart.

FINESTRE POP-UP CONNESSIONE USB

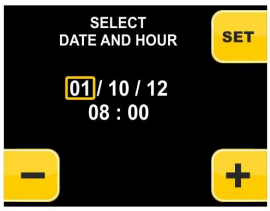
La connes The connection of a USB pen in the USB input cause the USB menu to appear, USB d from where it will be possible to select del n and display the operation to be selez performed

HISTORICAL DOWNLOAD

Se By selecting the HISTORICAL DOWNLOAD menu

PARAMETERS DOWNLOAD
PROGRAMS DOWNLOAD
PARAMETERS UPLOAD
PROGAMS UPLOAD

Se By selecting one of these options the execution screen will be shown



Prer Press SET to pass from one field to un c another and press START to begin the STAR download

Una vo The following screen will appear once compa the download/upload once finished

In cas In the case of download the following screen is obtained

Una The following screen will appear once com the download/upload once finished

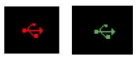
Ri Remove the USB pen

n cas In the case of upload the following screen is obtained

Verrà r Machine reset will be requested

Alla On removal of the USB pen all scor windows relative to USB tutte le f management will disappear automatically

Per la s Just for the HISTORICAL DOWNLOAD operation che può which can have very long duration, it is possible premere to press ESC during the download and go back pagina di to the pre-selection page to start new Fiano a cycles/procedures. A red USB icon will appear on USB ross the display for the time the download is in del down progress, while at the end of the download, the la possibi USB icon will turn green to indicate that the pen can be removed



13 Parameters

Par.	Min.	Max.	Unit	Default	Analogue inputs
CA1	-25	25	°C	0	offset cell probe
CA2	-25	25	°C	0	offset evaporator probe
CA3	-25	25	°C	0	offset condenser probe
CA4	-25	25	%r.H.	0	humidity probe offset
P0	0	1	- - - -	1	probe type 0 = PTC 1 = NTC
P2	0	1	- - - -	0	temperature unit of measurement 0 = °C 1 = °F
P3	0	1	- - - -	1	enabling the evaporator probe 0 = disabled 1 = enabled
P4	0	1	- - - -	0	enabling the condenser probe 0 = disabled 1 = enabled
P5	0	60	Min	15	duration of a power supply cut-off during a higher cycle at which a cycle is interrupted (see also P6)
P6	0	2	- - - -	1	behaviour of the instrument on power supply restore 0 = the cycle will be interrupted 1 = the cycle will be re-started 2 = the cycle will be restarted if the duration of interruption has been less than parameter P5
P7	0	P8	%r.H.	0	humidity transducer low calibration limit (corresponding to 4mA)
P8	P7	100	%r.H.	100	humidity transducer high calibration limit (corresponding to a 20mA)
P9	0	250	ds	5	delay displaying temperature variation detected by the probes
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Cooling regulator**
rC0	1	15	°C	2	differential of the parameters rC3, rC4, rC5
rC1	-99	rC2	°C	-20	minimum set-point that can be set for the lock, storage and manual cooling phases
rC2	rC2	99	°C	20	maximum set-point that can be set for the lock, storage and manual cooling phases
rC3	0	10	°C	1	cooling neutral area value for the block, storage and manual cooling phases
rC4	0	10	°C	1	cooling neutral area value for the recovery, proving and manual heating phases

rC5	0	10	°C	1	cooling neutral area value for the baking delay phase
rC6	-99	99	°C	2	pre-cooling set-point
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Heating regulator**
rH0	1	15	°C	2	rH3, rH4, rH5 parameters differential
rH1	-99	rH2	°C	0	minimum set-point that can be set for the recovery, proving, making delay and manual heating phases
rH2	rH2	99	°C	40	maximum set-point that can be set for the recovery, proving, making delay and manual heating phases
rH3	0	10	°C	1	heating neutral area value for the block, storage and manual cooling phases
rH4	0	10	°C	1	heating neutral area value for the recovery, proving and manual heating phases
rH5	0	10	°C	1	heating neutral area value for the baking delay phase
rH6	1	600	sec	60	cycle time for switch-on of the heating elements in the event of a heating request (see also rh7)
rH7	1	600	sec	45	heating elements switch-on time within the cycle time rH6
rr0	1	10	- - - -	4	number of regulation steps in the recovery phase
rr1	1	rr2	%	25	increase percentage 1st recovery step (with respect to 100% total)
rr2	rr1	rr3	%	50	increase percentage 2nd recovery step (with respect to 100% total)
rr3	rr2	rr4	%	75	increase percentage 3rd recovery step (with respect to 100% total)
rr4	rr3	100	%	100	increase percentage 4th recovery step (with respect to 100%)
rr5	rr4	rr6	%	- - - -	increase percentage 5th recovery step (with respect to 100%)
rr6	rr5	rr7	%	- - - -	increase percentage 6th recovery step (with respect to 100%)
rr7	rr6	rr8	%	- - - -	increase percentage 7th recovery step (with respect to 100%)
rr8	rr7	rr9	%	- - - -	increase percentage 8th recovery step (with respect to 100%)
rr9	rr8	rr10	%	- - - -	increase percentage 9th recovery step (with respect to 100%)
rr10	rr9	100	%	- - - -	increase percentage 10th recovery step (with respect to 100%)
rL0	1	10	- - - -	4	number of resistor regulation steps in the proving phase
rL1	1	rL2	%	25	increase percentage 1st proving step (with respect to 100%)

rL2	rL1	rL3	%	50	increase percentage 2nd proving step (with respect to 100%)
rL3	rL2	rL4	%	75	increase percentage 3rd proving step (with respect to 100%)
rL4	rL3	100	%	100	increase percentage 4th proving step (with respect to 100%)
rL5	rL4	rL6	%	- - - -	increase percentage 5th proving step (with respect to 100%)
rL6	rL5	rL7	%	- - - -	increase percentage 6th proving step (with respect to 100%)
rL7	rL6	rL8	%	- - - -	increase percentage 7th proving step (with respect to 100%)
rL8	rL7	rL9	%	- - - -	increase percentage 8th proving step (with respect to 100%)
rL9	rL8	rL10	%	- - - -	increase percentage 9th proving step (with respect to 100%)
rL10	rL9	100	%	- - - -	increase percentage 1oth proving step (with respect to 100%)
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Humidity regulator**
rU0	0	1	- - - -	0	humidity management mode: 0 = with humidity probe 1 = at time cycles on the basis of the percentage set
rU1	-99	99	°C	0	Minimum temperature in the cabinet below which the humidification/dehumidification control is prevented
rU2	1	600	sec	60	cycle time for switch-on of the humidifier (only for rU0 = 1, see also uU3)
rU3	1	600	sec	30	humidifier switch-on time within the cycle time uU2 to generate 100% humidity in the cabinet (only for rU0 = 1, see also rU2)
rU4	0	1	- - - -	0	enabling of humidification/dehumidification control during the block, storage and manual cooling phases
rU5	1	100	%r.H.	5	dehumidification differential
rU6	0	100	%r.H.	2	value of dehumidification neutral area
rU7	0	255	sec	10	dehumidification attempt duration with pump-down electrovalve
rU8	1	100	%r.H.	5	humidification differential
rU9	0	100	%r.H.	2	value of humidification neutral area
rU10	0	50	%r.H.	10	value of humidification proportional band
rU11	0	255	s	30	cycle time for humidification proportional regulation
rU12	0	1	- - - -	0	base times for humidification proportional adjustment cycle time:

					0 = seconds 1 = minutes
rU13	0	100	%	80	maximum humidity setpoint
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Compressor protection**
C0	0	240	min	0	compressor switch-on delay from instrument switch-on
C1	0	240	min	2	minimum time between two compressor switch-ons (3)
C2	0	240	min	0	compressor switch off minimum duration
C3	0	240	s	0	minimum duration of compressor switch on time
C4	0	240	min	0	compressor forced switch-on duration and start of recovery, proving and baking delay phases
C6	0	199	°C	70	condenser temperature above which the blocked overheated condenser alarm is activated ("**COH**" code)
C7	0	199	°C	80	condenser temperature above which the blocked compressor alarm is activated ("**CSd**" code)
C8	0	15	min	1	blocked compressor alarm delay ("**CSd**"code)
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Defrosting**
d0	0	99	h	6	defrosting interval 0 = defrosting will never be activated at intervals
d1	0	1	- - - -	0	type of defrosting 0 = electrical (the compressor will be switched off during defrosting, the defrosting output will be activated and the evaporator fan will be switched off) 1 = hot gas (the compressor will be switched on during defrosting, the defrosting output will be activated and the evaporator fan will be switched off)
d2	-99	99	°C	8	defrosting end temperature (evaporator temperature); see also parameter d3
d3	0	99	min	30	if parameter P3 is set at 0, duration of defrosting if parameter P3 is set at 1, maximum duration of defrosting; see also parameter d2 0 = defrosting will never be activated
d5	0	99	min	30	defrosting delay from start-up of storing/manual refrigeration 0 = defrosting will be started on expiry of the time established with parameter d0
d7	0	15	min	2	dripping duration (the compressor and the evaporator fan remain off during dripping and the defrosting output will be deactivated)
d15	0	99	min	0	minimum duration of compressor switch-on on activation of defrosting so these can be activated (only if parameter d1 is set at 1)

Par.	Min.	Max.	Unit	Default	Temperature alarms
A1	0	99	°C	70	evaporator temperature above which evaporator high temperature alarm is activated (code "**AH**"); see also parameter A2
A2	0	1	- - - -	1	enabling of evaporator high temperature alarm ("**AH**" code) 1 = yes
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Evaporator and condenser fan**
F0	0	1	- - - -	0	evaporator fan activity during block phase 0 = operation in parallel with compressor 1 = continuous operation
F1	0	1	- - - -	0	evaporator fan activity during storage. cooling, pre-cooling phase 0 = operation in parallel with compressor 1 = continuous operation
F2	0	1	- - - -	0	evaporator fan activity during recovery phase 0 = operation in parallel with main utilities 1 = continuous operation
F3	0	1	- - - -	0	evaporator fan activity during proving, heating phase 0 = operation in parallel with main utilities 1 = continuous operation
F4	0	1	- - - -	0	evaporator fan activity during baking delay phase 0 = operation in parallel with main utilities 1 = continuous operation
F10	0	100	%	100	fan speed in pre-cooling phase
F11	0	100	%	100	fan speed in dehumidification phase
F12	0	15	m	2	fan stop after dripping phase
F13	0	250	s	0	delayed switch-off of the evaporator fan from main utilities off
F14	1	600	sec	0	evaporator fan cycle time, if set at 0, the cyclical switch-on of the fan will be deactivated.
F15	1	600	sec	0	evaporator fan switch-on time within the cycle time F14
F16	0	99	°C	20	temperature of the condenser above which the condenser fan is on also with compressor off
F17	0	240	s	5	condenser fan switch off delay on compressor switch off (valid only with condenser probe disabled)
F18	0	240	s	15	evaporator fan switch-on delay from door closure, i.e. from the deactivation of the door micro switch input
F19	0	100	%	20	minimum evaporator fan speed settable
F20	0	100	%	100	maximum evaporator fan speed settable
F21	0	100	%	75	evaporator fan top speed

F22	1	10	s	5	top speed at evaporator fan switch-on
F23	0	100	%	35	evaporator fan min speed calibration value
F24	0	100	%	65	evaporator fan max speed calibration value
F25	-50	99	°C	1	evaporator temperature above which the ventilation in cabinet is stopped
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Digital inputs**
i0	0	2	- - - -	2	effect caused by opening the door, i.e. by activation of the door micro switch 0 = no effect 1 = the compressor, the evaporator fan and the heater will be switched off and the cabinet will be switched on 2 = the evaporator fan and the heater will be switched off and the cabinet light will be switched on
i1	0	1	- - - -	1	type of door micro switch input contact 0 = normally open (input active with closed contact) 1 = normally closed (input active with open contact)
i2	-1	120	min	5	door open alarm signalling delay ("**id**" code) -1 = the alarm will not be signalled
i3	0	1	- - - -	1	effect caused by the activation of the high pressure input 0 = no effect 1 = the compressor and the evaporator fan will be switched off and the condenser fan will be switched on
i4	0	1	- - - -	0	type of high pressure input 1 0 = normally open (input active with closed contact) 1 = normally closed (input active with open contact)
i5	-1	240	s	5	high pressure alarm signalling delay ("**HP**" code) -1 = the alarm will not be signalled
i6	0	2	- - - -	2	effect caused by the activation of the low pressure input 0 = no effect t1 = alarm the compressor and the evaporator fan will be off 2 = pump-down management and alarm. In the compressor switch-off phase, the intervention of the digital input will switch the compressor output off to end the pump-down phase . During the cooling plant activation phases, the intervention of the digital input will switch the compressor and the evaporator fan off
i7	0	1	- - - -	0	type of low pressure input 1 0 = normally open (input active with closed contact) 1 = normally closed (input active with open contact)
i8	-1	240	s	10	low pressure alarm signalling delay ("**LP**" code) -1 = the alarm will not be signalled

i9	0	240	s	40	low pressure switch rearm time on compressor switch on (only if i6 =2)
i10	0	1	- - - -	1	type of circuit breaker protection input contact 0 = normally open (input active with closed contact) 1 = normally closed (input active with open contact)
i11	-1	240	s	5	input circuit breaker protection alarm signal delay ("CtH"code) -1 = the alarm will not be signalled
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Digital outputs**
u1	0	1	- - - -	0	utility managed by the output K8 0 = pump down valve (in this case, parameter u2 will have meaning) 1 = evaporator fan (in this case, the output will respond to the status of the PWM output dedicated to the evaporator fan in ON/OFF mode)
u2	0	240	s	90	if i6 = 0 or 1: compressor deactivation delay from pump-down valve switch-off (pump-down in switch-off only for u1 = 0) If i6 = 2: Pump-down maximum duration in compressor switch-off mode without activation if the low pressure input such to cause the compressor to switch-off and signal the pump-down alarm. 0 = the alarm is not signalled
u3	0	1	- - - -	0	utility managed by the output K4 0 = dehumidifier/extractor fan (in this case, parameters rU5 and rU6 will have meaning) 1 = condenser fan (in this case, the F16 and F17 parameters will assume significance) **N.B.** with u3 = 1 dehumidification will be automatically managed via the activation of the cooling plant
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Serial communication (RS-48 serial port with MODBUS communication protocol)**
L1	1	240	min	5	internal data sampling time
LA	1	247	- - - -	247	device address
Lb	0	3	- - - -	2	baud rate 0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud
LP	0	2	- - - -	2	parity 0 = none (no parity) 1 = odd 2 = even
Par.	**Min.**	**Max.**	**Unit**	**Default**	**Other**

E8	0	2	- - - -	2	keyboard lock 0 = disabled 1= manual 2 = automatic after 1 minute of inactivity during a cycle
E9	0	1	- - - -	1	display of the EVCO splash screen on power supply restore 0 = black screen 1 = EVCO splash
E10	0	1	- - - -	1	orientation of the display 0 = device positioned high with respect to unit 1 = device positioned low with respect to unit
E11	0	120	s	10	buzzer duration during the pre-cooling phase and cycle end
E12	0	1	- - - -	0	reserved
E14	0	1		1	Deactivation of the block phase in the automatic programs 0 = the first block phase is not performed 1 = the first block phase is performed
E15	0	1		0	Enabling the 24h-48h-72h setting

14 Accessories

14.1 Phase cut speed regulator for single phase fans EVDFAN1

14.1.1 Introduction

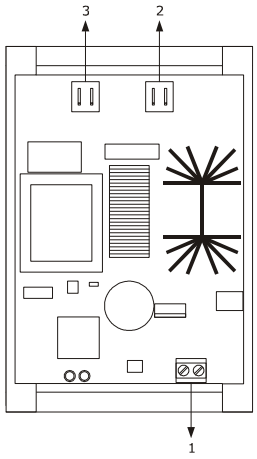
EVDFAN1 is a phase cut speed regulator for single phase fans.

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

The maximum current allowed on the fan is 5 A.

14.1.2 Description

The following drawing illustrates the aspect of the EVDFAN1.

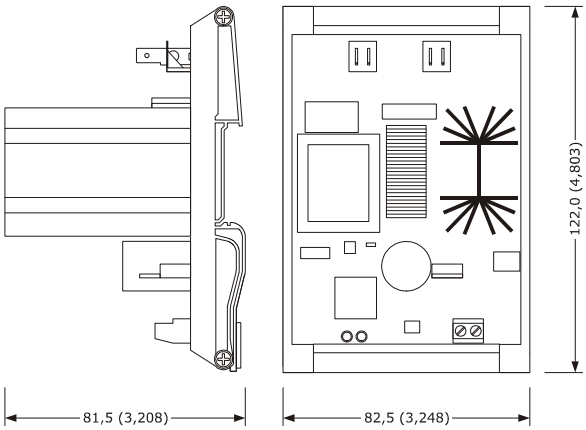


The following table illustrates the meaning of EVDFAN1 parts.

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

14.1.3 Dimensions

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



14.1.4 Connection to the device

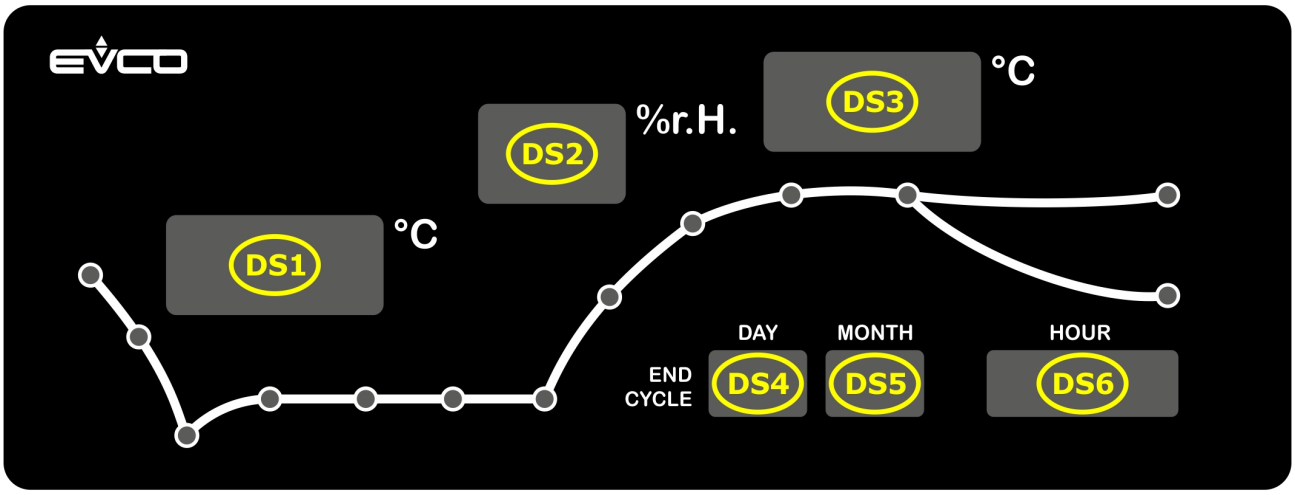
Operate as follows:

2. Cut the device power supply off.
3. Cut the EVDFAN1 power supply off.
4. Connect the device PWM analogue output to the EVDFAN1 control signal input.
5. Connect the evaporator fan to the EVDFAN1 phase cut output.
6. Connect the device power supply.
7. Connect the EVDFAN1 power supply.
8. It is recommended to perform the evaporator fan manual calibration procedure described in paragraph 10.3.
   In order to use EVDFAN1, the phase that powers the controller must be the same that powers EVDFAN1.

For further information, consult the documentation relative to EVDFAN1.

14.2 Synoptic Panel EVC25T00X7XXX04

This board reproduces the status of EVFTFT618. It is an optional board. Lack of the same does not generate any alarm signal.



On system power on, the synoptic performs a lamp test with duration of 10 seconds.

At the end, it shows the OFF label on display DS1 if EVFTFT618 is in standby, or it shows the cabinet temperature and the current time on display DS6.

During setting of the set-point of a manual cooling cycle, the temperature set-point is displayed on DS1 and the humidity set-point on display DS2 (if humidity control is envisioned, otherwise the display remains off). The other displays are off.

During the execution of the manual cooling cycle it shows the cabinet temperature on display DS1, the relative humidity value or the humidity set-point on DS2 or the display remains off (depending on parameters rU0 and rU4), the current time is on display DS6. The other displays are off.

During setting of the set-point of a manual heating cycle, the temperature set-point is displayed on DS1 and the humidity set-point on display DS2 (depending on parameter rU0). The other displays are off.

During the execution of the manual heating cycle it shows the cabinet temperature on display DS3, the relative humidity value or the humidity set-point on DS2 (depending on parameter rU0), the current time is on display DS6.

During setting of an automatic program, the following is displayed:

For the block phase, the cabinet temperature set-point is on display DS1, the humidity set-point on DS2 (if humidity control is envisioned) and the duration is on display DS6

For the storage phase, the cabinet temperature set-point is on display DS1, the humidity set-point on DS2 (if humidity control is envisioned)

For the recovery and proving phase, the cabinet temperature set-point on the display DS3, the humidity set-point on DS2 and duration on DS6

For the baking delay phase, the cabinet temperature set-point is on display DS3, the humidity set-point on DS2.

During execution of an automatic program, the following is displayed:

For the block phase, the cabinet temperature on the display DS1, the humidity set-point or the relative humidity on DS2 (depending on parameters rU0 and rU4), the program end day on display DS4, the program end month on DS5 and the program end time on DS6;

For the storage phase, the cabinet temperature on the display DS1, the humidity set-point or the relative humidity on DS2 (depending on parameters rU0 and rU4), the program end day on display DS4, the program end month on DS5 and the program end time on DS6;

For the recovery and proving phase, the cabinet temperature on the display DS3, the humidity set-point or the relative humidity on DS2 (depending on parameter rU0), the program end day on display DS4, the program end month on DS5 and the program end time on DS6;

For the baking delay phase, the End label on DS1, the cabinet temperature on display DS3, the humidity set-point or the relative humidity on DS2 (depending on parameter rU0), the current time is on DS6.

If defrosting is activated (manual or automatic), the display DS1 shows the DEF label for the entire duration of defrosting.

If an alarm occurs, the display DS1 shows the ALL label until any key is pressed.

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

14.3.1 Introduction

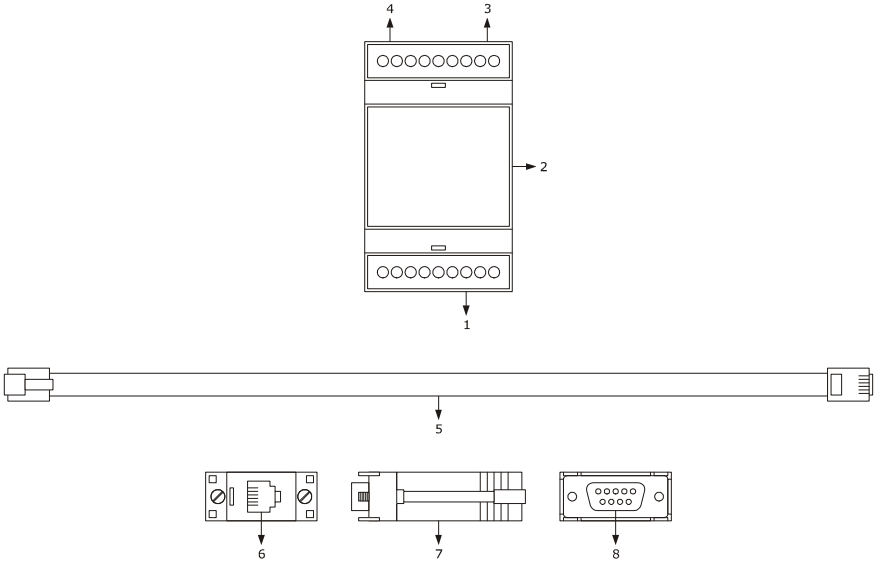
EVIF21RS7I is an optoisolated RS-485/RS-232 serial interface.

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

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

14.3.2 Description

The following drawing illustrates the aspect of the EVIF21RS7I.

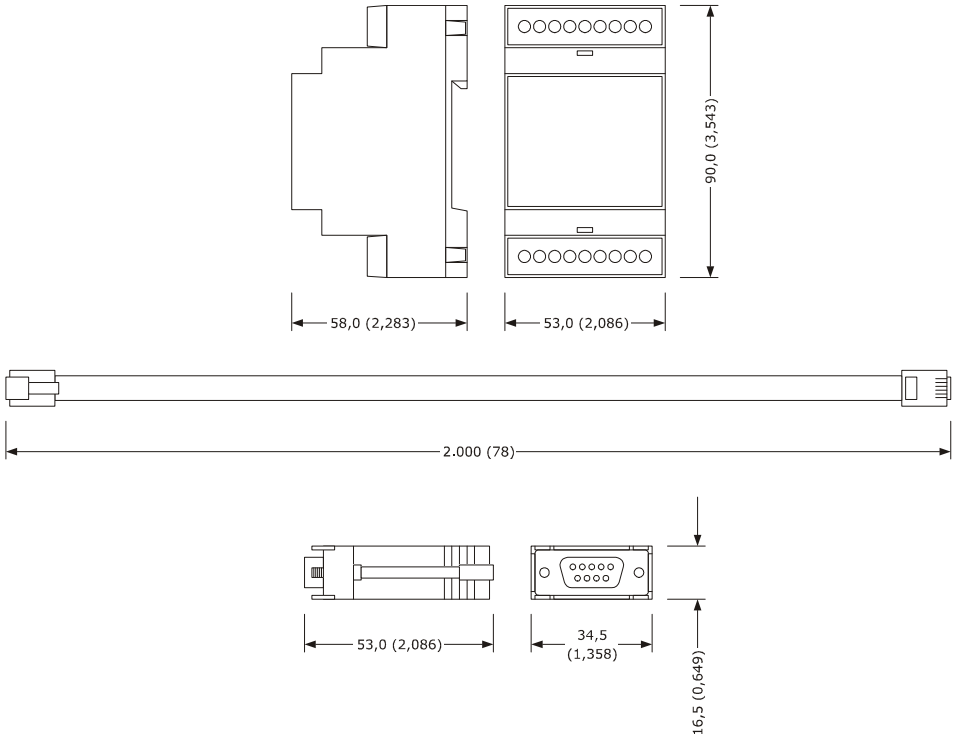


The following table illustrates the meaning of the EVIF21RS7I parts.

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

14.3.3 Dimensions

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



14.3.4 Connection to the device

Operate as follows:

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

14.4 Non-isolated RS-485/USB serial interface EVIF20SUXI

14.4.1 Introduction

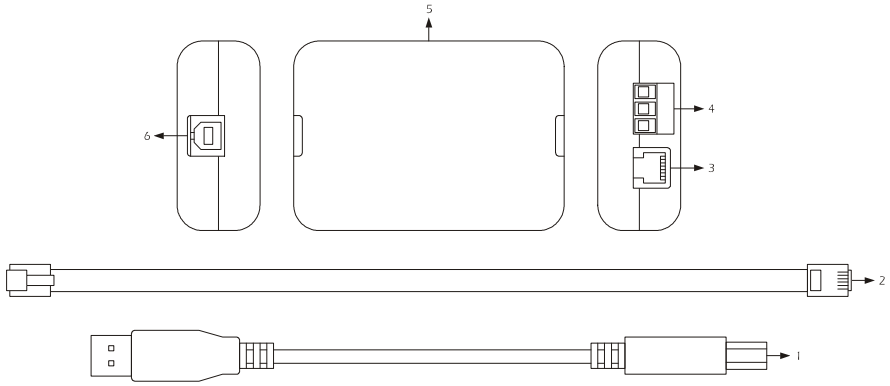
EVIF20SUXI is a non-isolated RS-485/USB serial interface.

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

The Personal Computer must have a free USB port.

14.4.2 Description

The following drawing illustrates the aspect of the EVIF20SUXI.

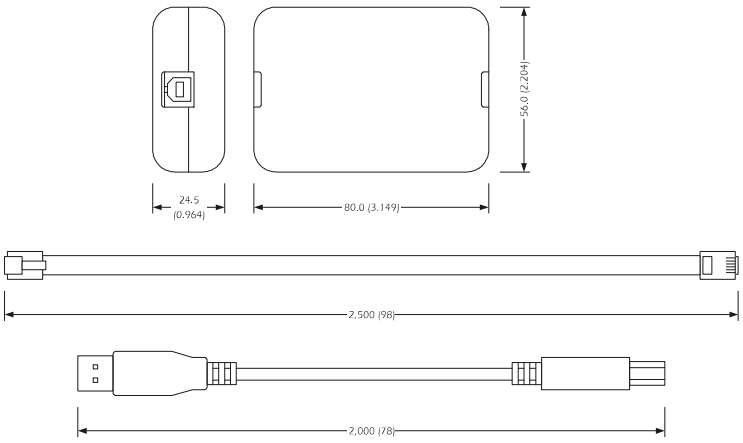


The following table illustrates the meaning of the EVIF21RS7I parts.

Part	Part
1	USB cable (length of 2 m)
2	RS-485 cable with length of 2.5 m
3	RS-485 port on telephone connector
4	RS-485 port on screw terminal
5	RS-485/USB non-isolated interface
6	USB port

14.4.3 Dimensions

The following drawing illustrates the EVIF20SUXI dimensions; these are expressed in mm (in).



14.4.4 Connection to the device

Operate as follows:

1. Cut the device power supply off.
2. Connect the device RD-485 serial port to the EVIF20SUXI RS-485 type serial port.
3. Insert one end of the USB cable into the EVIF20SUXI USB port.
4. Connect the other end of the USB cable to the USB connector of the Personal Computer.

15 TECHNICAL DATA

15.1 Technical data

Purpose of the device:	retarder proofer controller	
Execution:	user interface	control module
	board without cover behind a Plexiglas sheet.	board without cover.
Dimensions:	user interface	control module
	200.0 x 135.0 x 28.0 ±0.6 mm (7.874 x 5.314 x 1.102 ±0.023 in; L x H x D).	166.0 x 116.0 x 44.0 mm (6.535 x 4.566 x 1.732 in; L x H x D).
Installation:	user interface	control module
	back panel via studs.	on flat surface, with spacers.

Protection rating:	user interface	control module
	IP65.	IP00.
Connections:	user interface	control module
	removable screw terminal board (control module and RS-485 serial port).	terminal board with extractable screws (user interface, power supply, inputs, outputs).
	The maximum length of the user interface- control module connection is 10 m (32.808 ft).	
Operating temperature:	from 0 to 55 °C (from 32 to 131 °F).	
Storage temperature:	from -10 to 70 °C (from 14 to 158 °F).	
Humidity for use:	from 10% to 90% relative humidity without condensate.	

Pollution situation:	normal.	
Power:	user interface	control module
	supplied from the control module.	115/230 VAC (±15%), 50 / 60 Hz (±3 Hz), 10 VA max.
Overvoltage category:	integrated control.	
Clock:	incorporated (with condenser).	
	Battery autonomy in the event of a power-cut: 24 h with battery fully charged.	
	Battery charging time: 2 min (the battery is charged by the device power supply).	
Signal buzzer and alarm:	incorporated.	

Analogue inputs:	3 inputs (cabinet probe, evaporator probe, condenser probe), can be set via configuration parameter for PTC/NTC probes 1 digital input (humidity sensor).
	PTC type analogue inputs (990 Ω @ 25°C, 77°F) Type of sensor: KTY 81-121. Measurement field: from -50 to 150□ (from -58 to 302°F). Resolution: 1 °C (1 °F). Protection: none.
	NTC type analogue inputs (10K Ω @ 25°C, 77°F) Type of sensor: ß3435. Measurement field: from -40 to 105□ (from -40 to 220 □). Resolution: 1 °C (1 °F). Protection: none.
	4-20 mA analogue input
Digital inputs:	4 inputs (door micro switch, high pressure, low pressure and compressor circuit breaker protection), which can be set via configuration parameter due to normally open contact/normally closed contact (potential-free contact, 5 VDC, 2 mA)
	Digital inputs Power: none. Protection: none.
Displays:	320 x 240 pixel (3.5 inch) colour TFT graphics display
Analogue outputs:	1 PWM output for management of the evaporator fan.

Digital outputs:	8 outputs (electromechanical relays): N° 1:16 A res. @ 250 VAC or compressor management. N° 1: 16 A res. @ 250 VAC for management of the heating elements. N° 6: 8 A res. @ 250 VAC for management of the cabinet light, humidifier, dehumidifier/condenser fan, defrosting, steam generator and pump-down valve/evaporator fan.
Type of actions and complementary features:	1C.
Communication port:	2 ports: - 1 RS-48 serial port with MODBUS communication protocol. - 1 USB type serial port

EVFTFT618
Installer manual ver. 2.4
GA - 24 / 16
Code 144FTFT618E244

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