EW PLUS

Electronic controllers for refrigeration units

REFRIGERATION SYSTEMS

Versatile high-performance controllers with new energy saving algorithms for plug-in refrigerated cabinets.

USER MANUAL

CONTENTS

The **NEW** EWPlus EO family of devices consists of electronic microprocessor controllers developed for the management of plug-in refrigerated cabinets. It stands out for its performance and flexibility, thanks to energy saving algorithms and compressor management.

MAIN FEATURES

The following table lists the main features of models in the EWPlus EO family.

Feature	MODEL		
	EWPlus 961 EO	**EWPlus 971 EO**	**EWPlus 974 EO**
4-key keypad	✓	✓	✓
Setpoint edit lock to prevent tampering	✓	✓	✓
Password controlled access to configuration parameters	✓	✓	✓
Display range	NTC: -50.0°C ... +110°C		
Configurable decimal point	✓	✓	✓
Configurable °C/°F display	✓	✓	✓
LEDs present on display	❄ ❄ ✕ AUX ((•)) °C °F		
Defrost: end defrost by timeout	✓(*)	✓	✓
end defrost by temperature	×	✓	✓
Number of analogue inputs for NTC probes	1	2	2
Analogue inputs Pb3 / Digital input D.I.1	1	1	1
Digital input D.I.2	1	1	1
Display probe 3	✓	✓	✓
Relay outputs (*)	❄	❄ AUX	❄ ✕ AUX
Relay ratings	2Hp	2Hp + 8A	2Hp + 8A + 5A
TTL for connection to Copy Card	✓	✓	✓
Buzzer	×	Optional (*)	✓
Quick fitting to panel using brackets	✓	✓	✓

(*) refer to the label on the device

⚠ **IMPORTANT**: each feature must always be verified with the model available.

MODELS

The 3 models in the EWPlus EO family differ in terms of the number of inputs and outputs and, more particularly:

- **EWPlus 961 EO**: 1 analogue input, 1 digital/analogue input, 1 digital input and 1 relay output (2 Hp)
- **EWPlus 971 EO**: 2 analogue inputs, 1 digital/analogue input, 1 digital input and 2 relay outputs (2 Hp+8A)
- **EWPlus 974 EO**: 2 analogue inputs, 1 digital/analogue input, 1 digital input and 3 relay outputs (2 Hp+8A+5A)

DESCRIPTION

These are new-generation devices with one or two activation points developed for the management of plug-in refrigerated cabinets. They have one, two or three relay outputs, one or two sensors for temperature regulation and/or defrost, a multifunctional Digital/Temperature input and a digital input.

Outputs A, B and C can be used to control:

- compressor
- defrosting elements
- evaporator fans
- alarm
- AUX output
- standby
- reversal of condenser fans direction
- activation of check valve

The Digital inputs (D.I.1 and D.I.2) can be used for:

- defrost activation
- reduced setpoint
- AUX management
- door switch
- external alarm
- standby (ON/OFF)
- pressure switch
- deep cooling
- Energy Saving
- door switch + Energy Saving

TECHNICAL SPECIFICATIONS (EN 60730-2-9)

Classification:	operating (not safety) device for incorporation
Mounting:	panel mounting with 71x29 mm (+0.2/-0.1 mm) drilling template
Type of action:	1.B
Pollution class:	2
Material class:	IIIa
Overvoltage category:	II
Nominal pulse voltage:	2500V
Temperature:	Use: -5 … +55 °C - Storage: -30 … +85 °C
Power supply:	230V~ (±10%) 50/60 Hz
Power consumption:	4.5W max
Digital outputs (relay):	refer to the label on the device
Fire resistance category:	D
Software class:	A

NOTE: check the power supply rating on the device's label; contact our Sales Office for power and relay ratings.

FURTHER INFORMATION

INPUT CHARACTERISTICS

Display range:	**NTC**: -50.0°C ... +110°C (on 3-digit display with +/- sign)
Accuracy:	Better than 0.5% of full-scale +1 digit
Resolution:	0.1 °C
Buzzer:	YES (depends on model)
Analogue Inputs:	**1 NTC** (EWPlus 961 EO) or **2 NTC** (EWPlus 971/974 EO)
Digital Inputs:	**2** voltage-free digital inputs (**D.I.1** and **D.I.2**)

NOTES: - D.I.1 can also be configured as a probe input (H11=0 and H43=y)
- D.I.2, if activated, should be connected to terminals 1-2 of the TTL connector (H12 ≠ 0)

OUTPUT CHARACTERISTICS

Digital Outputs:	EWPlus 961 EO:	1 Compressor relay:	UL60730 (A)	12(8) A max 250V~
			UL60730 (A)	2Hp (12FLA - 72LRA) max 240V~
	EWPlus 971 EO:	1 Compressor relay:	UL60730 (A)	12(8) A max 250V~
			UL60730 (A)	2Hp (12FLA - 72LRA) max 240V~
		1 AUX relay:	N.O. 8(4)A - N.C. 6(3)A max 250V~	
	EWPlus 974 EO:	1 Compressor relay:	UL60730 (A)	12(8) A max 250V~
			UL60730 (A)	2Hp (12FLA - 72LRA) max 240V~
		1 Fan relay:	N.O. 8(4)A - N.C. 6(3)A max 250V~	
		1 AUX relay:	5(2)A max 250V~	

MECHANICAL CHARACTERISTICS

Housing:	PC+ABS UL94 V-0 resin casing, polycarbonate window, thermoplastic resin keys
Dimensions:	front 74x32 mm, depth 59 mm (without terminals)
Terminals:	screw-on/removable for cables with cross-section of 2.5mm^2
Connectors:	TTL for connection to Copy Card + **D.I.2**
Humidity:	Usage / Storage: 10...90% RH (non-condensing)

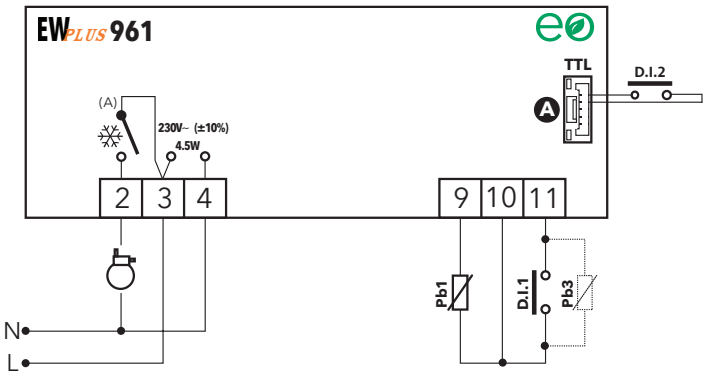
REGULATIONS

Electromagnetic compatibility:	The device complies with Directive 2004/108/EC
Safety:	The device complies with Directive 2006/95/EC
Food Safety:	The device complies with standard EN 13485 as follows: - suitable for storage - climate range A - measurement class 1 in the range from -35°C to 25°C (*) (*** exclusively using Eliwell NTC probes**)

NOTE: The technical specifications stated in this document regarding measurement (range, accuracy, resolution, etc.) refer strictly to the instrument and not to any accessories provided, such as the probes.
This means, for example, that the error introduced by the probe must be added to the error of the instrument.

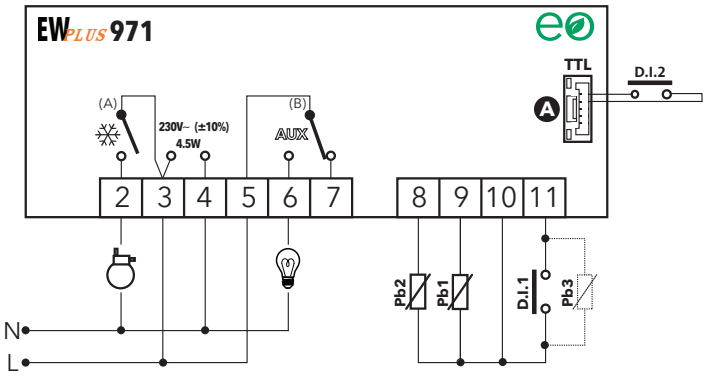
CONNECTIONS

EWPLUS 961 EO CONNECTIONS



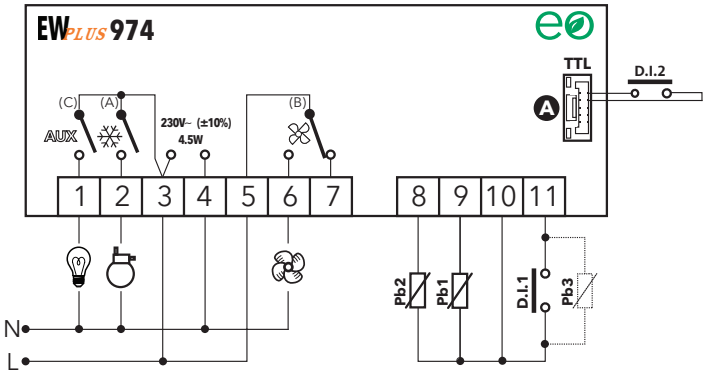
TERMINALS	
❄	**2-3**: Compressor relay
3-4	230Va power supply input
N-L	230Va power supply
9-10	Probe Pb1
11-10	Digital Input 1 (H11 ≠ 0 and H43 = n) or Probe Pb3 (H11 = 0 and H43 = y)
TTL	TTL Input or Digital Input 2 (H12 ≠ 0)

EWPLUS 971 EO CONNECTIONS



TERMINALS	
❄	**1-2**: Compressor relay
3-4	230Va power supply input
N-L	230Va power supply
AUX	**5-6**: N.O. AUX relay
	5-7: N.C. AUX relay
8-10	Probe Pb2
9-10	Probe Pb1
11-10	Digital Input 1 (H11 ≠ 0 and H43 = n) or Probe Pb3 (H11 = 0 and H43 = y)
TTL	TTL Input or Digital Input 2 (H12 ≠ 0)

EWPLUS 974 EO CONNECTIONS



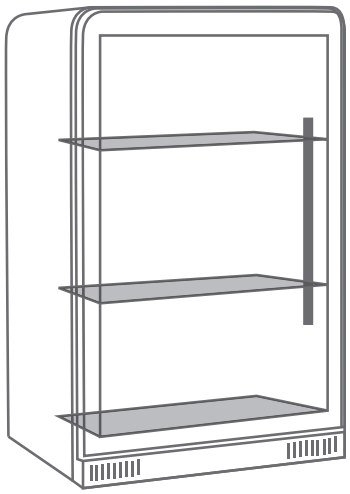
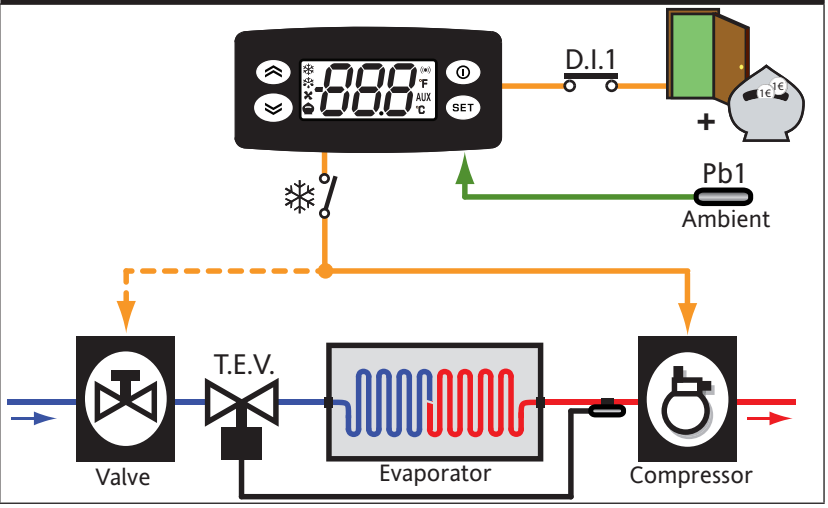
TERMINALS	
AUX	**1-3**: AUX relay
❄	**2-3**: Compressor relay
3-4	230Va power supply input
N-L	230Va power supply
✣	**5-6**: N.O. Fans relay
	5-7: N.C. Fans relay
8-10	Probe Pb2
9-10	Probe Pb1
11-10	Digital Input 1 (H11 ≠ 0 and H43 = n) or Probe Pb3 (H11 = 0 and H43 = y)
TTL	TTL Input or Digital Input 2 (H12 ≠ 0)

EWPLUS 961 EO MODEL

APPLICATION 1

The application is for "**GLASS DOOR BOTTLE COOLERS**" and the set configuration is as follows:

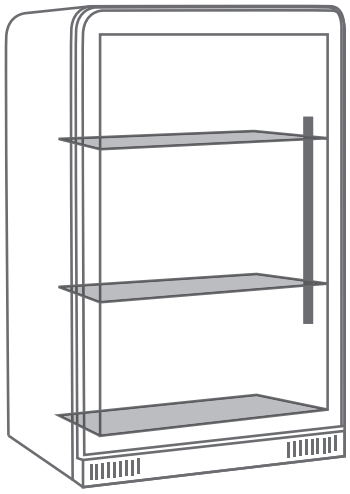
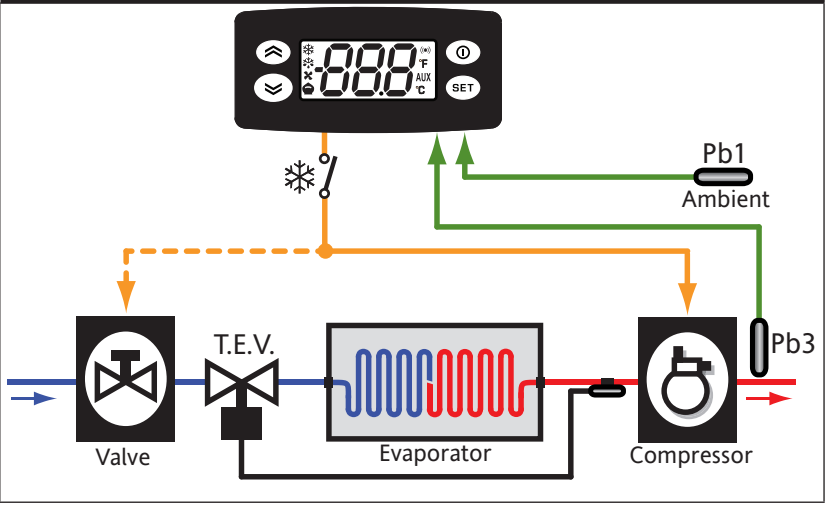
- Defrost end: *set by time (start delay (dOH) = **0 minutes**, maximum duration (dEt) = **30 minutes**)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as a **relative value**)*
- Analogue Inputs: *1 **NTC** input (environmental probe Pb1)*
- Digital Input: *1 input set as "**Door Switch + Energy Saving**" (H11 = 10)*
- Digital Outputs: *1 compressor relay:* *UL60730 (A)* *2Hp (12FLA - 72LRA) max 240V~ or*
  UL60730-1 (A) *12(8)A max 250V~*
- Key configuration: *UP key* = *manual defrost*
  DOWN key = *not set*
  ESC key = *standby*

APPLICATION	CONNECTION DIAGRAM
	

APPLICATION 2

The application is for "**GLASS DOOR BOTTLE COOLERS**" and the set configuration is as follows:

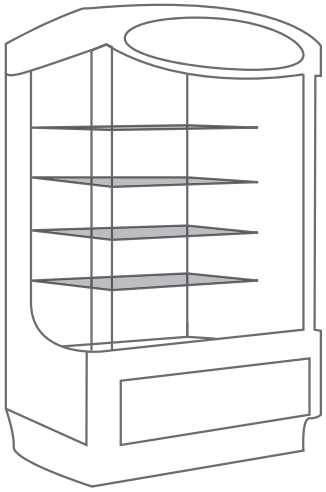
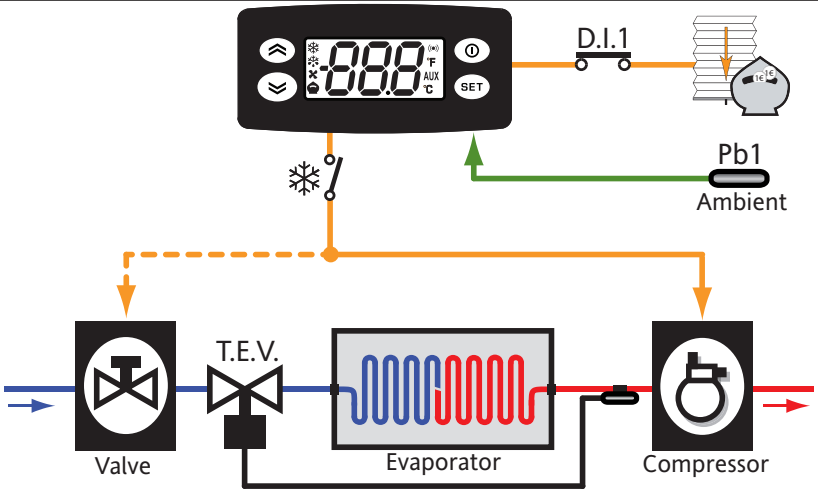
- Defrost end: *set by time (start delay (dOH) = **0 minutes**, maximum duration (dEt) = **30 minutes**)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as a **relative value**)*
  Compressor overheating alarm on Pb3
- Analogue Inputs: *1 **NTC** input (environmental probe Pb1)*
- Digital Input: *1 **NTC** input (set as analogue which connects to Pb3 - H11=0 and H43=y)*
- Digital Outputs: *1 compressor relay:* *UL60730 (A)* *2Hp (12FLA - 72LRA) max 240V~ or*
  UL60730-1 (A) *12(8)A max 250V~*
- Key configuration: *UP key* = *manual defrost*
  DOWN key = *not set*
  ESC key = *-= standby*

APPLICATION	CONNECTION DIAGRAM
	

APPLICATION 3

The application is for "**OPEN FRONT BOTTLE COOLERS**" and the set configuration is as follows:

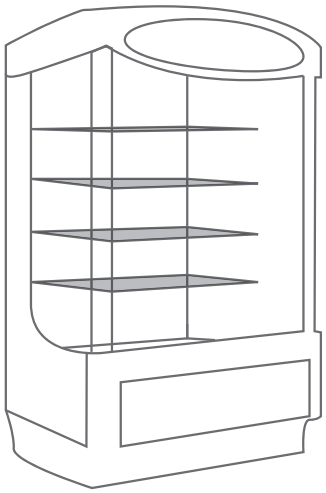
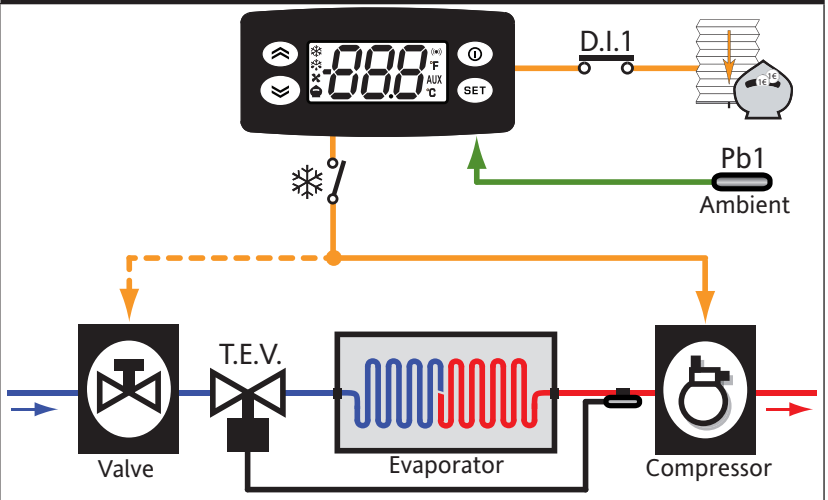
- Defrost end: *set by time (start delay (dOH) = **0 minutes**, maximum duration (dEt) = **30 minutes**)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as a **relative value**)*
- Analogue Inputs: *1 **NTC** input (environmental probe Pb1)*
- Digital Input: *1 input set as "**Energy Saving**" (H11 = 9)*
- Digital Outputs: *1 compressor relay:* *UL60730 (A)* *2Hp (12FLA - 72LRA) max 240V~ or*
  UL60730-1 (A) *12(8)A max 250V~*
- Key configuration: *UP key* = *manual defrost*
  DOWN key = *not set*
  ESC key = *standby*

APPLICATION	CONNECTION DIAGRAM
	

APPLICATION 4

The application is for "**OPEN FRONT BOTTLE COOLERS**" and the set configuration is as follows:

- Defrost end: *set by time (start delay (dOH) = **0 minutes**, maximum duration (dEt) = **30 minutes**)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as a **relative value**)*
- Analogue Inputs: *1 **NTC** input (environmental probe Pb1)*
- Digital Input: *1 input set as "**Energy Saving**" (H11 = 9)*
- Digital Outputs: *1 compressor relay:* *UL60730 (A)* *2Hp (12FLA - 72LRA) max 240V~ or*
  UL60730-1 (A) *12(8)A max 250V~*
- Key configuration: *UP key* = *manual defrost*
  DOWN key = *not set*
  ESC key = *standby*

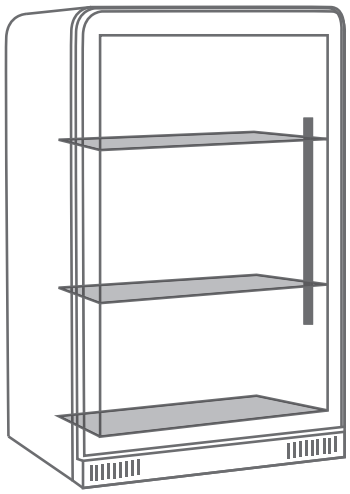
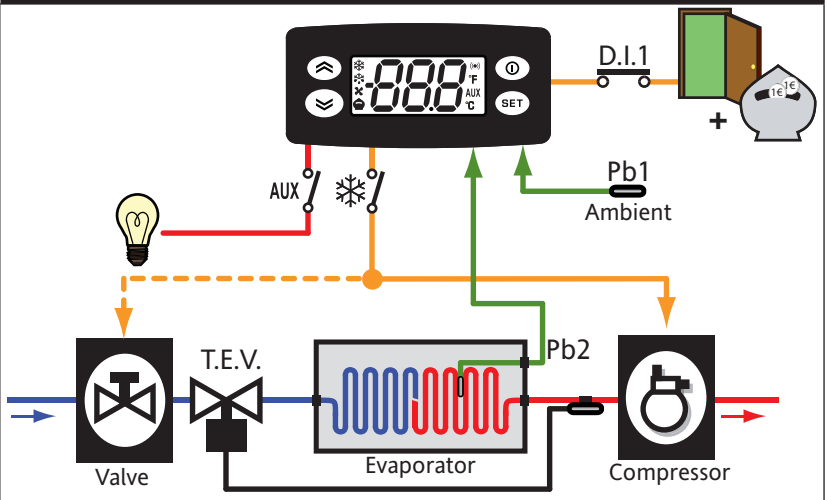
APPLICATION	CONNECTION DIAGRAM
	

EWPLUS 971 EO MODEL

APPLICATION 1

The application is for "**GLASS DOOR BOTTLE COOLERS**" and the set configuration is as follows:

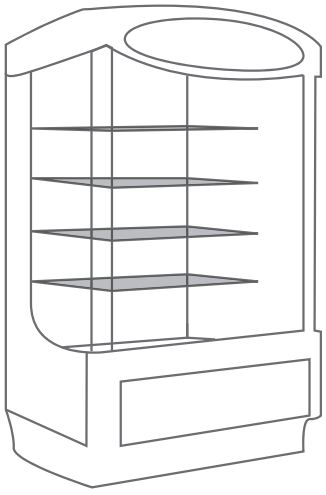
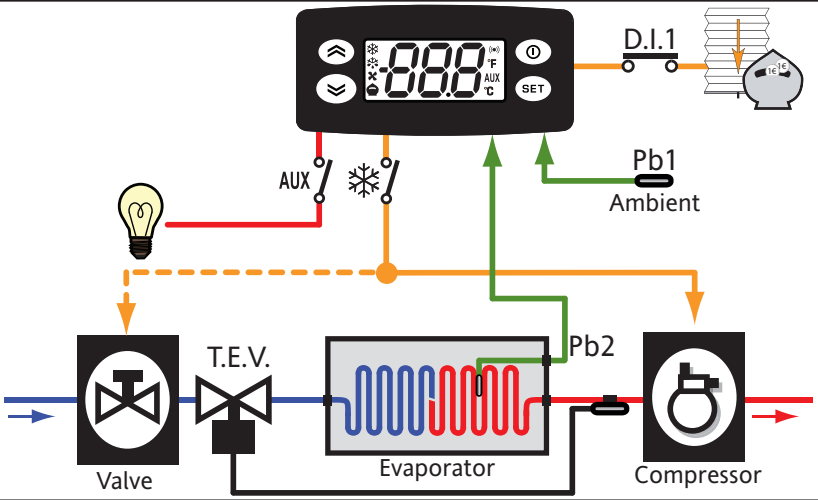
- Defrost end: *set by temperature (dSt = 8.0°C)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as a **relative value**)*
- Analogue Inputs: *2 **NTC** inputs (environmental probe Pb1 + evaporator probe Pb2)*
- Digital Input: *1 input set as "**Door Switch + Energy Saving**" (H11 = 10)*
- Digital Outputs: *1 AUX/light relay: N.O. 8(4)A - N.C. 6(3)A max 250V~*
  1 compressor relay: UL60730 (A) 2Hp (12FLA - 72LRA) max 240V~ or
  UL60730-1 (A) 12(8)A max 250V~
- Key configuration: *UP key = manual defrost*
  DOWN key = light/AUX activation
  ESC key = standby

APPLICATION	CONNECTION DIAGRAM
	

APPLICATION 2

The application is for "**OPEN FRONT BOTTLE COOLERS**" and the set configuration is as follows:

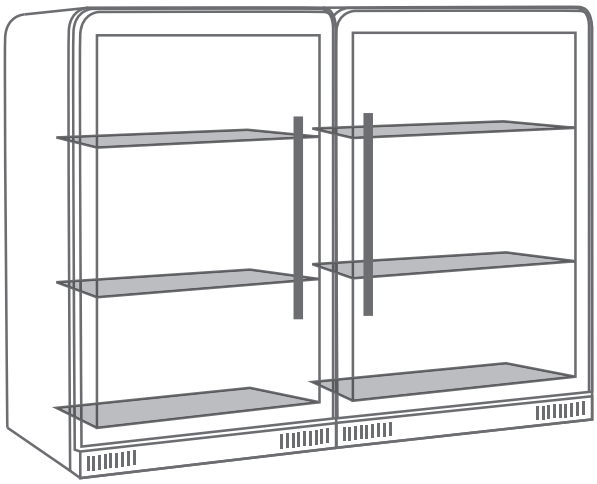
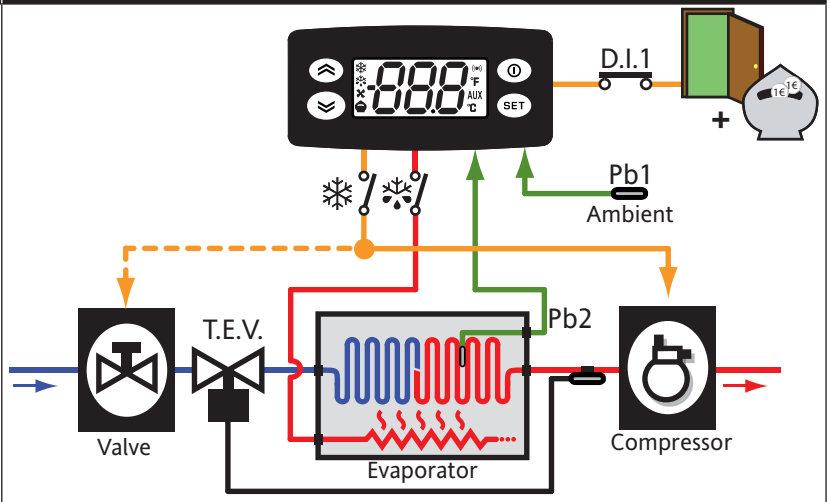
- Defrost end: *set by temperature (dSt = 3.0°C)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as an **absolute value**)*
- Analogue Inputs: *2 **NTC** inputs (environmental probe Pb1 + evaporator probe Pb2)*
- Digital Input: *1 input set as "**Energy Saving**" (H11 = 9)*
- Digital Outputs: *1 AUX/light relay: N.O. 8(4)A - N.C. 6(3)A max 250V~*
  1 compressor relay: UL60730 (A) 2Hp (12FLA - 72LRA) max 240V~ or
  UL60730-1 (A) 12(8)A max 250V~
- Key configuration: *UP key = manual defrost*
  DOWN key = light/AUX activation
  ESC key = standby

APPLICATION	CONNECTION DIAGRAM
	

APPLICATION 3

The application is for "**GLASS DOOR MERCHANDISERS**" and the set configuration is as follows:

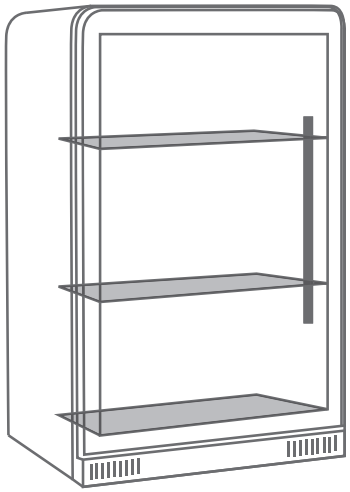
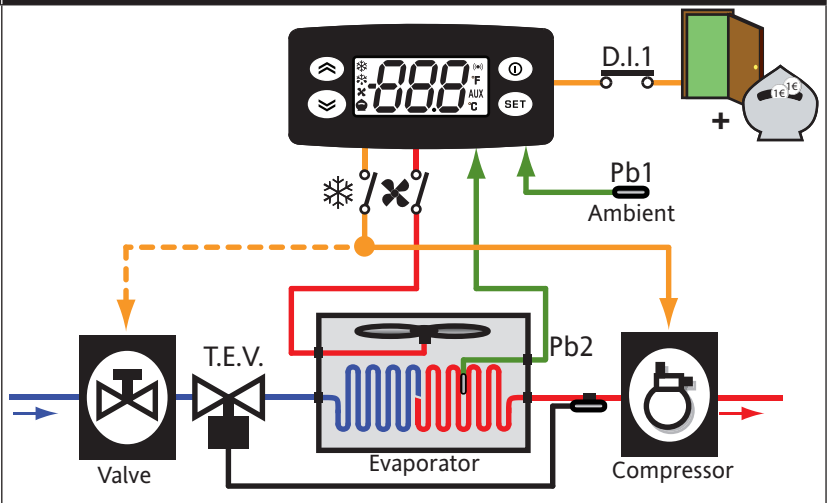
- Defrost end: *set by temperature (dSt = 8.0°C)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as a **relative value**)*
- Analogue Inputs: *2 **NTC** inputs (environmental probe Pb1 + evaporator probe Pb2)*
- Digital Input: *1 input set as "**Door Switch + Energy Saving**" (H11 = 10)*
- Digital Outputs: *1 defrost relay: N.O. 8(4)A - N.C. 6(3)A max 250V~*
  1 compressor relay: UL60730 (A) 2Hp (12FLA - 72LRA) max 240V~ or
  UL60730-1 (A) 12(8)A max 250V~
- Key configuration: *UP key = manual defrost*
  DOWN key = not set
  ESC key = standby

APPLICATION	CONNECTION DIAGRAM
	

APPLICATION 4

The application is for "**GLASS DOOR BOTTLE COOLERS**" and the set configuration is as follows:

- Defrost end: *set by temperature (dSt = 8.0°C)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as a **relative value**)*
- Analogue Inputs: *2 **NTC** inputs (environmental probe Pb1 + evaporator probe Pb2)*
- Digital Input: *1 input set as "**Door Switch + Energy Saving**" (H11 = 10)*
- Digital Outputs: *1 fan relay: N.O. 8(4)A - N.C. 6(3)A max 250V~*
  1 compressor relay: UL60730 (A) 2Hp (12FLA - 72LRA) max 240V~ or
  UL60730-1 (A) 12(8)A max 250V~
- Key configuration: *UP key = manual defrost*
  DOWN key = not set
  ESC key = standby

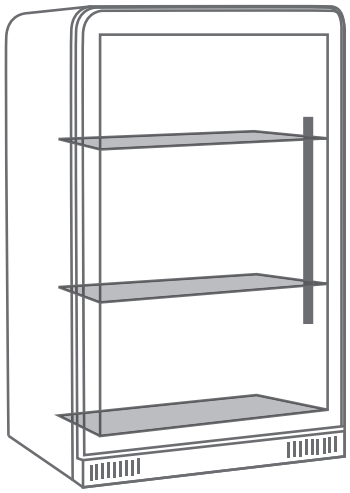
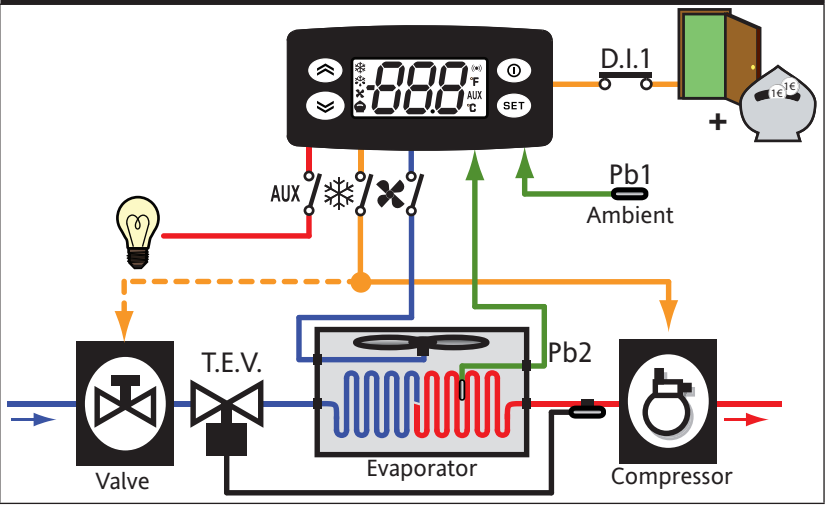
APPLICATION	CONNECTION DIAGRAM
	

EWPLUS 974 EO MODEL

APPLICATION 1

The application is for "**GLASS DOOR BOTTLE COOLERS**" and the set configuration is as follows:

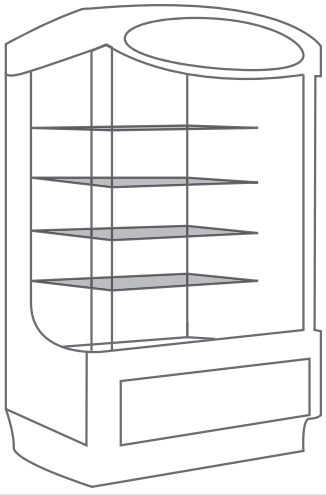
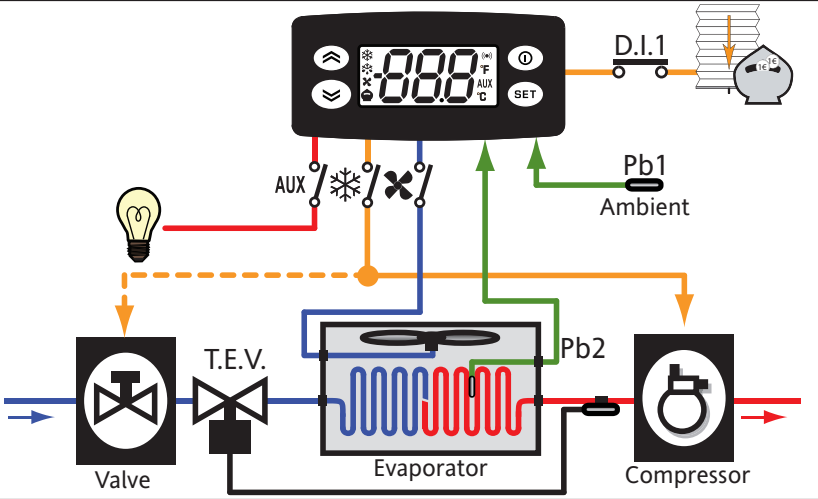
- Defrost end: *set by temperature (dSt = 8.0°C)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as a **relative value**)*
- Analogue Inputs: *2 **NTC** inputs (environmental probe Pb1 + evaporator probe Pb2)*
- Digital Input: *1 input set as "**Door Switch + Energy Saving**" (H11 = 10)*
- Digital Outputs:
  - *1 fan relay: N.O. 8(4)A - N.C. 6(3)A max 250V~*
  - *1 compressor relay: UL60730 (A) 2Hp (12FLA - 72LRA) max 240V~ or UL60730 (A) 12(12)A max 250V~*
  - *1 AUX/light relay: 5(2)A max 250V~*
- Key configuration:
  - *UP key = manual defrost*
  - *DOWN key = light/AUX activation*
  - *ESC key = standby*

APPLICATION	CONNECTION DIAGRAM
	

APPLICATION 2

The application is for "**OPEN FRONT BOTTLE COOLERS**" and the set configuration is as follows:

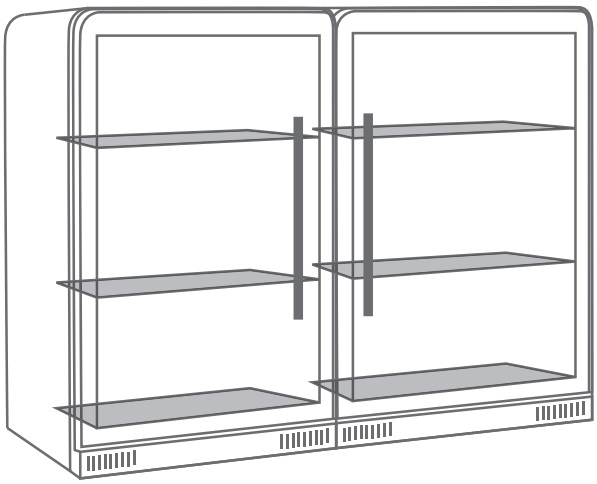
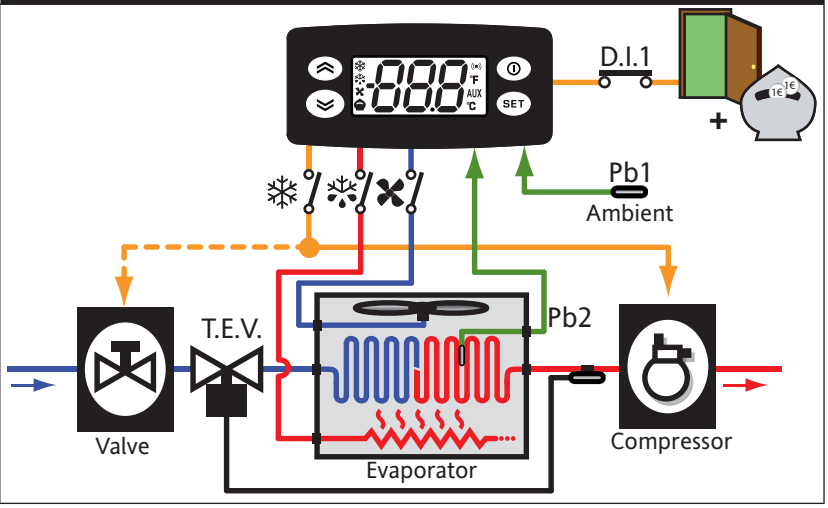
- Defrost end: *set by temperature (dSt = 3.0°C)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as an **absolute value**)*
- Analogue Inputs: *2 **NTC** inputs (environmental probe Pb1 + evaporator probe Pb2)*
- Digital Input: *1 input set as "**Energy Saving**" (H11 = 9)*
- Digital Outputs:
  - *1 fan relay: N.O. 8(4)A - N.C. 6(3)A max 250V~*
  - *1 compressor relay: UL60730 (A) 2Hp (12FLA - 72LRA) max 240V~ or UL60730 (A) 12(12)A max 250V~*
  - *1 AUX/light relay: 5(2)A max 250V~*
- Key configuration:
  - *UP key = manual defrost*
  - *DOWN key = light/AUX activation*
  - *ESC key = standby*

APPLICATION	CONNECTION DIAGRAM
	

APPLICATION 3

The application is for "**GLASS DOOR MERCHANDISERS**" and the set configuration is as follows:

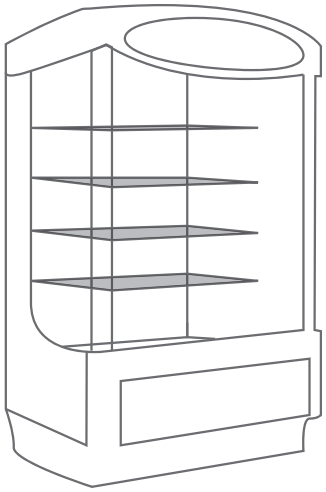
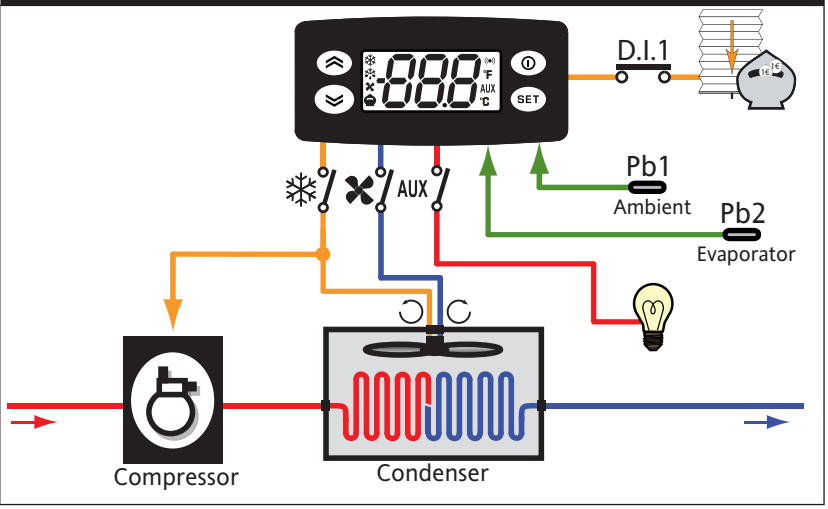
- Defrost end: *set by temperature (dSt = 8.0°C)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as a **relative value**)*
- Analogue Inputs: *2 **NTC** inputs (environmental probe Pb1 + evaporator probe Pb2)*
- Digital Input: *1 input set as "**Door Switch + Energy Saving**" (H11 = 10)*
- Digital Outputs:
  - *1 defrost relay: N.O. 8(4)A - N.C. 6(3)A max 250V~*
  - *1 compressor relay: UL60730 (A) 2Hp (12FLA - 72LRA) max 240V~ or UL60730 (A) 12(12)A max 250V~*
  - *1 fan relay: 5(2)A max 250V~*
- Key configuration:
  - *UP key = manual defrost*
  - *DOWN key = not set*
  - *ESC key = standby*

APPLICATION	CONNECTION DIAGRAM
	

APPLICATION 4

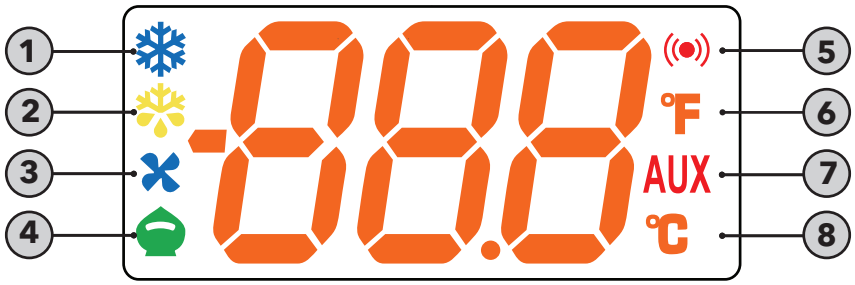
The application is for "**OPEN FRONT BOTTLE COOLERS**" and the set configuration is as follows:

- Defrost end: *set by temperature (dSt = 7.0°C)*
- ACTIVE alarms: *max/min temperature alarm on Pb1 (HAL and LAL as a **relative value**)*
- Analogue Inputs: *2 **NTC** inputs (environmental probe Pb1 + evaporator probe Pb2)*
- Digital Input: *1 input set as "**Energy Saving**" (H11 = 9)*
- Digital Outputs:
  - *1 relay for reversing condenser fans: N.O. 8(4)A - N.C. 6(3)A max 250V~*
  - *1 compressor relay: UL60730 (A) 2Hp (12FLA - 72LRA) max 240V~ or UL60730 (A) 12(12)A max 250V~*
  - *1 AUX/light relay: 5(2)A max 250V~*
- Key configuration:
  - *UP key = manual defrost*
  - *DOWN key = light/AUX activation*
  - *ESC key = standby*

APPLICATION	CONNECTION DIAGRAM
	

LED

All instruments in the EWPlus EO family are equipped with the following display:



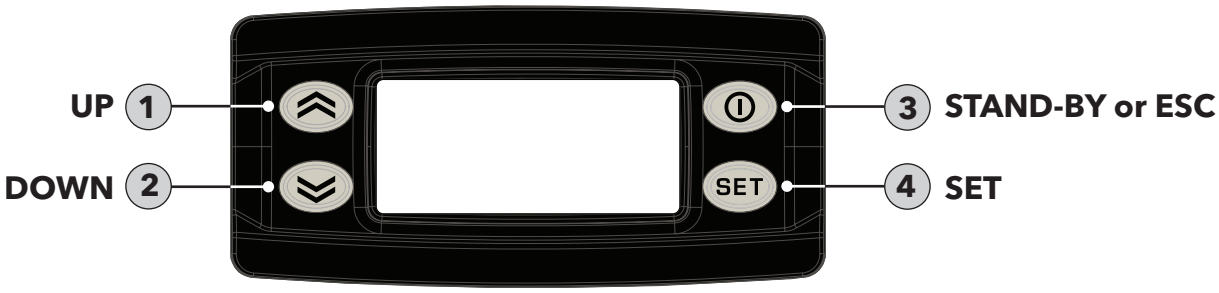
Meaning of LEDs:

No	Icon	LED	Operation	Meaning
1	❄	**Compressor**	Permanently on	compressor active
			Blinking	delay, protection or start-up blocked
			OFF	otherwise
2		**Defrost**	Permanently on	defrost active
			Blinking	activated manually or from Digital Input
			OFF	otherwise
3		**Fans**	Permanently on	fans active
			OFF	otherwise
4		**Reduced SET / Economy**	Permanently on	Energy Saving ON
			Blinking	reduced setpoint active
			Rapid blinking	access to level2 parameters
			OFF	otherwise
5		**Alarm**	Permanently on	alarm present
			Blinking	alarm acknowledged
			OFF	otherwise
6	°F	**°F readout**	Permanently on	°F setting (dro =1)
			OFF	otherwise
7	AUX	**AUX**	Permanently on	Aux output active (according to model)
			Blinking	deep cooling cycle active
			OFF	otherwise
8	°C	**°C readout**	Permanently on	°C setting (dro = 0)
			OFF	otherwise

NOTE: When the instrument is powered on it performs a lamp test, during which time the display and LEDs will flash for several seconds to check that they all function correctly.

KEYS

All devices in the EWPlus family are equipped with 4 keys as shown in the picture:



Each key has a different function depending on whether it is:

- pressed and released
- pressed for at least 5 seconds
- pressed and held at start-up
- pressed in combination with another key

The following table summarises the function of each key:

No	Key	Action		
		Press and release	**Press for at least 5 secs**	**Start-up**
1		- Scrolls through menu items - Increases values	- Activates the **Manual Defrost** function (when outside the menus)	---
2		- Scrolls through menu items - Decreases values	- Function can be configured by the user (when outside the menus) (see parameter H32)	---
3		- Returns to the previous menu level - Confirms parameter value	- Activates the Standby function (when outside the menus)	---
4		- Displays any alarms (if active) - Opens Machine Status menu	- Opens Programming menu (User and Installer Parameters) - Confirms commands	when pressed during start-up it enables the user to select the application to be loaded.

PRELIMINARY CONFIGURATIONS

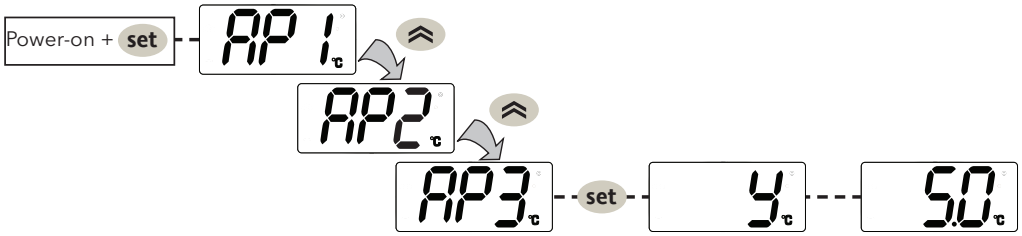
After making the electrical connections, simply power up the device to start operation.
At first start-up, Eliwell recommends that you:

1) select the preset Application that most closely matches your own.
2) configure the main parameters, indicated in the USER menu, as per your requirements.
3) make sure there are no active alarms (" ((●)) " icon off and labels E1, E2 and E3 not displayed).
   NOTE: E2 is only present on EWPlus 971/974 EO.

SELECTING APPLICATIONS

The procedure for loading one of the default applications is:

- at start-up of the device, keep the set key pressed: the label "AP1" will appear;
- browse the various applications (AP1-AP2-AP3-AP4) using the ⩓ and ⩔ keys;
- select the desired application using the set key ("AP3" in the example) or cancel the procedure by pressing the ⏻ key; alternatively wait for the timeout;
- if the operation is successful, the display will show "y", if not it will show "n";
- after a few seconds the instrument will return to the main display.



RESET PROCEDURE

EWPlus EO instruments can be **RESET** and the default factory settings restored in a simple and user-friendly way.
This is done by simply reloading one of the basic applications (see "Loading default applications").

You may need to **RESET** the instrument in circumstances in which the normal operation of the instrument is compromised or if you decide to restore the instrument to its default configuration (e.g. Application 1 values).

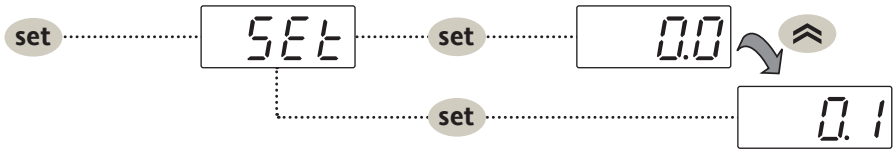
⚠ **IMPORTANT!**: This operation resets the instrument to its initial state, returning all the parameters to their default values. This means that all changes made to operating parameters will be lost.

MAIN PARAMETERS

See USER menu table parameters for the various models.

SETPOINT: SETTING AND EDIT LOCK

To display the Setpoint value, press the set key and enter the "Machine Status" menu, then press the set key again when the “SEt” label is displayed.
The Setpoint value appears on the display. To change the Setpoint value, press the ⌃ and ⌄ keys within 15 seconds.
Press set to confirm the modification.



It is possible to disable the keypad on this device.
The keypad can be locked by programming the “LOC” parameter.
With the keypad locked you can still access the “Machine Status” menu by pressing set to display the Setpoint, but you cannot edit it.
To disable the keypad lock, repeat the locking procedure.

DISPLAY PROBES VALUE

To display the value read from probes connected to the device, press the set key and enter the "Machine Status" menu, then press the set key again when one of the probe-related labels “Pb1, Pb2 or Pb3” is displayed.
The value measured by the associated probe will appear on the display.

NOTES:
1) Pb2 is only present on EWPlus 971/974 EO models.
2) The displayed value is read-only and cannot be modified.

KEY-ACTIVATED FUNCTIONS

All models have the **UP** key set to activate the "Manual Defrost" function.
The DOWN and ESC keys can also be set to activate a specific user-defined function.
The parameters for configuring the two keys are:

- **H32** = DOWN key configuration
- **H33** = ESC key configuration

The values that can be set apply to both keys and the functions that can be activated are:

Temperature value H32/H33	Functions that can be activated by model		
	EWPlus 961 EO	EWPlus 971 EO	EWPlus 974 EO
0	disabled	disabled	disabled
1	defrost	defrost	defrost
2	**not used**	aux	aux
3	reduced set	reduced set	reduced set
4	standby	standby	standby
5	deep cooling cycle	deep cooling cycle	deep cooling cycle
6	energy saving	energy saving	energy saving

This section describes the various functions of the devices.

⚠ **IMPORTANT**: the functions may not be available in certain models.

SETTINGS

PROBE SETTING AND CALIBRATION

Depending on the model, the devices are equipped with:

- 1 or 2 analogue inputs Pb1 and Pb2;
- 1 multifunctional analogue/digital input that can be configured as:
  - Digital input (H11 ≠ 0 and H43 = n) or
  - Analogue probe Pb3 (H11 = 0 and H43 = y).

ONLY NTC type probes can be used.

After installation, the values read by the probes can be corrected/calibrated using the following parameters:

- **CA1**: probe 1 offset. Positive or negative value to be added to the value read by Pb1 (Range: **-12.0 ... +12.0**)
- **CA2**: probe 2 offset. Positive or negative value to be added to the value read by Pb2 (Range: **-12.0 ... +12.0**)
- **CA3**: probe 3 offset. Positive or negative value to be added to the value read by Pb3 (Range: **-12.0 ... +12.0**)

⚠ **IMPORTANT**: parameter CA2 is not available in model EWPlus 961 EO since this device is not equipped with probe Pb2.

DISPLAY SETTINGS

Folder "**diS**" contains the parameters used to set the temperature readout, decimal point usage, unit of measurement and display during defrost.

- **ndt**: enables/disables decimal point display (with resolution of one-tenth of a degree; e.g.: 10.0°C)
  Display with decimal point is only possible within the range of values from -99.9°C to +99.9°C
  - ndt = y ➔ displays read values with decimal point
  - ndt = n ➔ displays read values without decimal point

  NOTE: enabling/disabling the decimal point only affects the on-screen display of values. The controller will continue to perform calculations with the decimal point.

- **ddL**: sets the type of display during and up to the end of defrost
  - ddL = 0 ➔ displays the value of Pb1
  - ddL = 1 ➔ continues to display the value read by Pb1 at the start of defrosting
  - ddL = 2 ➔ displays fixed label "**dEF**"

- **dro**: sets temperature display to °C or °F.
  - dro = 0 ➔ display in °C
  - dro = 1 ➔ display in °F

  ⚠ **IMPORTANT**: switching between °C and °F DOES NOT modify the values of temperature parameters (e.g. set=10°C becomes 10°F).
  This means that the maximum and minimum limits of the parameters as an absolute value are the same for both units of measurement and the ranges are therefore different from each other.

- **ddd**: determines whether to display the value of the Setpoint, probe Pb1, probe Pb2 or the value of multifunctional (analogue or digital) input Pb3. All other display and adjustment modes are the same.
  - ddL = 0 ➔ displays the Setpoint value
  - ddd = 1 ➔ displays the values read by Pb1
  - ddd = 2 ➔ displays the values read by Pb2
  - ddd = 3 ➔ displays the values read by Pb3

  ⚠ **IMPORTANT**: model EWPlus 961 EO is not equipped with probe Pb2 therefore the value ddd= 2 is not used and must not be set.

FUNCTIONS

UPLOAD, DOWNLOAD, FORMATTING

Description

The Unicard/Copy Card must be connected to the TTL serial port and allows the rapid programming of instrument parameters.

DOWNLOAD From Reset Only operating mode: at power-on, if the Unicard/Copy Card is inserted in the device, the controller automatically downloads data.

After connecting the Unicard/Copy Card with the device switched off and at the end of the lamp test, one of the following labels will be displayed:

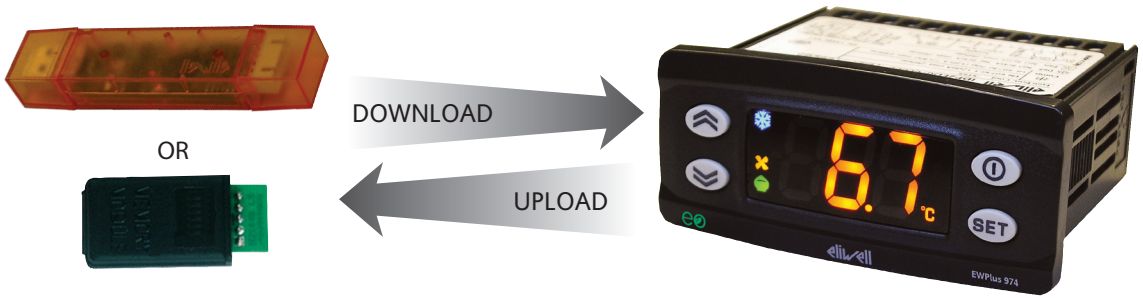
- **dLY** if the operation was successful
- **dLn** if the operation was not successful

After about 5 seconds, the display will display the probe or setpoint value, depending on the default settings.

IMPORTANT: once download has been completed successfully, the controller will start to work with the new map loaded.

Operating mode: access "Installer" parameters by entering the password "**PA2**" if enabled (PA2≠0), scroll through the folders using ⌃⌃ and ⌄⌄ until folder "**FPr**" appears. Select it using **set**, scroll through the parameters using ⌃⌃ and ⌄⌄ and finally select one of the functions by pressing **set**:

- **UL** (Upload): This function uploads the programming parameters from the instrument to the card. If the operation is successful, the display will show "**y**", otherwise it will show "**n**".
- **Fr** (Format): This command is used to format the copy card (which is necessary when using the card for the first time). Important: the **Fr** parameter deletes all data present and this operation cannot be reversed.
- **Download**: Connect the Unicard/Copy Card with the instrument switched off. At power-on, data will automatically start downloading from the Unicard/Copy Card to the instrument. At the end of the lamp test, the display will show "**dLy**" if the operation was successful and "**dLn**" if not.



User parameters

The parameters that control this function are:

Label	Description	Model
UL	Transfer programming parameters from instrument to Copy Card	All
Fr	Format Copy Card. Erases all data contained in the Copy Card.	All

COPY CARD

The Copy Card can be used to download/upload a parameter map from/to a controller.
Depending on whether the parameter map is being uploaded or downloaded, the controller must be powered on or in the process of starting up.

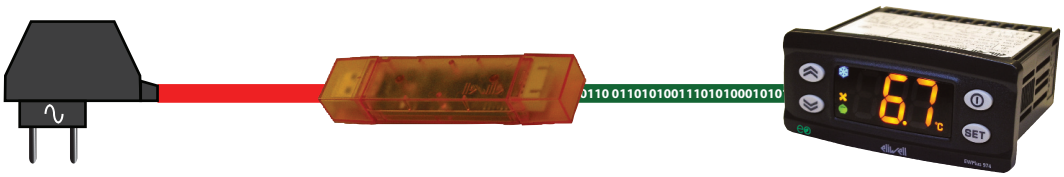
UNICARD

The Unicard, like the Copy Card, can be used to download/upload a parameter map from/to a controller.
Its flexibility enables the various devices to be customised quickly and simply.
The main features that distinguish it from the Copy Card are:

- **1)**: it can be connected directly to the computer via USB
- **2)**: it can be powered by means of a USB power supply and can directly power the controller during upload/download.

The Unicard power supply options are as follows:

A) Chiller power supply



UNICARD power supply | UNICARD | Controller

B) Field power supply

UNICARD | Controller | Controller Power Supply

UNICARD power supply | UNICARD | Controller

REGULATORS

COMPRESSOR/GENERAL

Description

The compressor is controlled by the device's relay. It will be switched on or off depending on:

- the temperature status readings from probe Pb1
- the temperature control functions set
- the defrost/coil drainage functions (see Defrost section)

See the wiring diagrams for details of how to connect the compressor to the device.
The polarity of the relay is fixed and is NOT configurable.

When an offset is activated (parameter **OSP**) from function or from digital input, the **SEt** value is replaced by the value **Set+OSP** taking into account the sign of **OSP**.
This condition of replacing **SEt** with the value **Set+OSP** is saved in the controller's non-volatile memory hence when power returns after a blackout, the device will restart in the state that was active prior to the blackout.

NOTE: digital output 1 is always set as "**Compressor**".

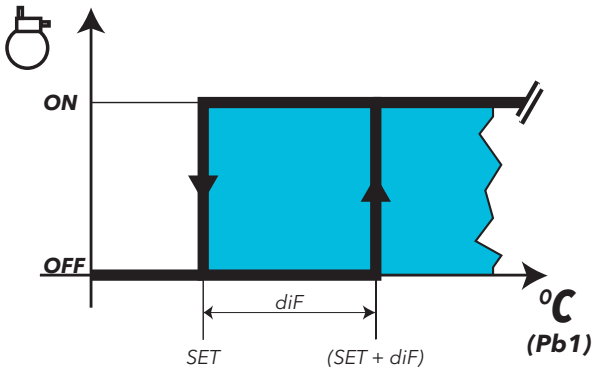
Operating conditions

The regulator is activated provided that:

- the device is ON
- there is not a control probe fault alarm "E1"
- the time set in parameter **OdO** has elapsed (if OdO≠0)
- a defrost cycle is not underway (except in FREE mode)
- there is no External Alarm blocking the compressor
- there is no Overheating alarm on probe Pb3 (when H11 = 0 and H43 ≠ 0)

(There is a fixed interval of one second between the request and activation of the relay)

The diagrams below indicate the compressor activation mode for heating/cooling based on parameters **SEt** and **diF > 0**:



User parameters

The parameters that manage this regulator are:

Label	Description	EWPlus EO Model
SEt	Control Setpoint	All
diF	diFferential. Regulator activation differential	All
HSE	Higher SEt. Maximum value settable for setpoint	All
LSE	Lower SEt. Minimum value settable for setpoint	All
OSP	Setpoint offset	All
OdO	Delay output enabling from power-on	All

COMPRESSOR/GENERAL PROTECTIONS

Description

If the cabinet probe is in error "E1", the output relay configured as compressor/general regulates in accordance with the times set in parameters **Ont** and **Oft**.

The first time to consider is **Ont**.
If **Ont > 0**, the protection programmed in parameters
dOn-**dOF**-**dbi** must be respected (*see Compressor Safety Times*).

NOTE: remember that parameter **OdO** inhibits the activation of all outputs commanding a relay for its entire duration (compressor/general, defrost, fans), excluding buzzers or alarm relays.

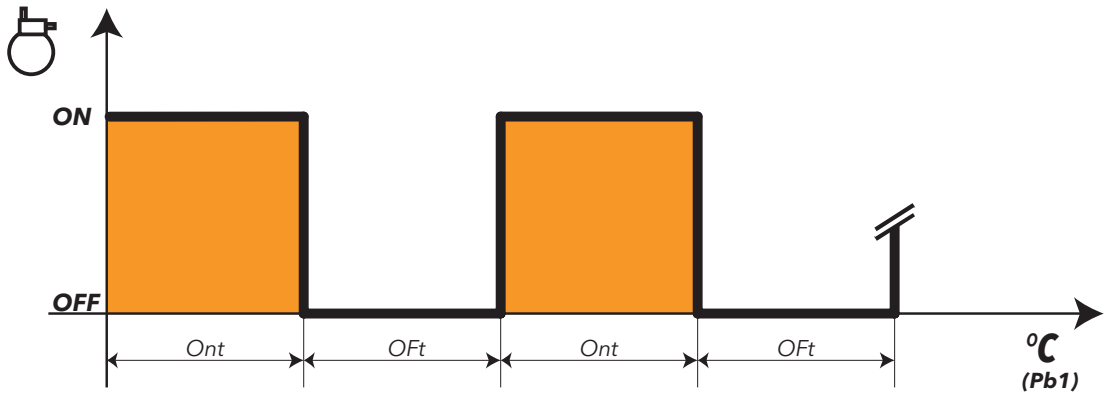
Operating conditions

The table below lists the ways the compressor relay output can be managed:

Ont	OFt	Compressor OUT
0	0	OFF
0	>0	OFF
>0	0	ON
>0	>0	DUTY CYCLE

If **Ont** > 0 and **OFt** = 0, the compressor regulator will remain on.
If **Ont** > 0 and **OFt** > 0, the compressor regulator activates in operating cycle mode irrespective of the values read by the probes (cabinet probe fault) and of requests from other utilities (**Duty Cycle** mode).
If the cabinet probe is working properly, the Duty Cycle mode does *NOT* activate as it does not have priority over normal compressor regulator settings.

The following diagram shows the **Duty Cycle** operating mode based on parameters **Ont** and **OFt > 0**:



User parameters

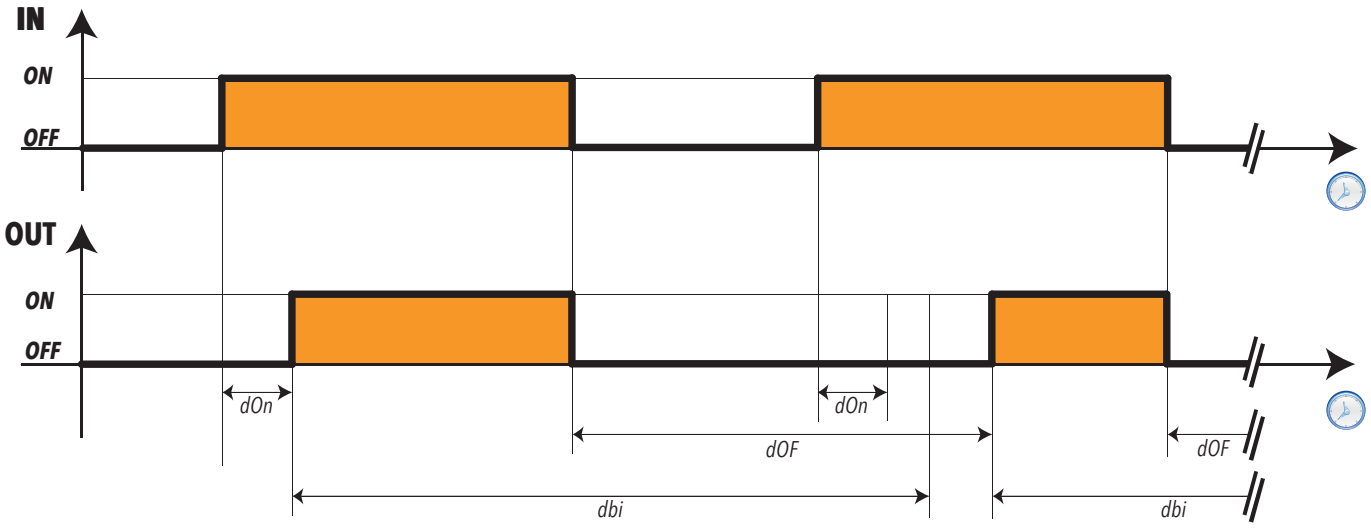
The parameters that manage this regulator are:

Label	Description	EWPlus EO Model
Ont	Compressor output ON time in the event of a faulty Pb1 probe	All
OFt	Compressor output OFF time in the event of a faulty Pb1 probe	All
dOn	Compressor output enabling delay from request	All
dOF	Compressor output enabling delay from shutdown	All
dbi	Delay between two consecutive starts of the compressor output	All
OdO	Delay output enabling from power-on	All

Compressor safety timings

Compressor on-off operations must respect the safety times that you can set using the special parameters as described below.
The compressor LED will flash to indicate when an activate compressor request has been received but a safety protection exists.
A safety time (compressor On... Off safety time) regulated by the parameter **dOF** must be respected between a switch-off and switch-on of the same compressor. This waiting time also occurs at switch-on of the device.
A safety time regulated by the parameter **dbi** must be respected between one switch-on and the next.
The safety time set in parameter **dOn** must elapse between a start-up request and actual start-up.
Times set with parameters **dOn**, **dOF** and **dbi**, if active, are not accumulative but parallel.
The following diagram illustrates the operation of the compressor protection with parameters **dOn**, **dOF**, **dbi** set where:

IN	Input state for compressor regulator.
OUT	Output state for compressor regulator.



NOTE: See the section entitled Compressor Function During Defrost for other safety measures and compressor timings.

DEFROST/COIL DRAINAGE

Description

Defrost is used to stop ice from forming on the surface of the evaporator.
Defrost (see Defrost Modes) basically heats up the evaporator by means of:

- Electrical heaters
- Hot gas
- Simply stopping the compressor and hence the "cooling" cycle

Coil drainage

On completion of defrost, given that there will be water on the evaporator, it is better not to start "cooling" right away as this would ruin the effect of the defrost by creating ice immediately.
The drainage interval is regulated via parameter ***dt***.

NOTE: parameter dt is only present on models EWPlus 971/974 EO that can control the Evaporator fans

Defrost conditions and function

Defrosting is enabled if:

- the temperature of the evaporator, read by probe Pb2, is less than the defrost end setpoint set in parameter ***dSt*** (**EWPlus 971/974 EO only with Pb2 probe present - H42 ≠ 0**)
- manual defrosting has not already been activated, in which case the request for automatic defrost will be cancelled.

Defrost requests can be made in the following ways:

Controller power-on	If parameter ***dPO*** (defrost at power-on) is programmed accordingly.
Time interval	If ***dit*** > 0 whenever the defrost time interval set in parameter ***dit*** elapses.
Manually via a key	By pressing the ⩓ key if enabled (H31 = 1) The cycle will not start if ***OdO≠0***, the request will be refused and the display will flash three times to indicate that defrost is impossible.
External request via D.I.	If D.I. appropriately configured. Activation from D.I. respects the protections of the automatic cycle. The cycle will not start if ***OdO≠0***, the request will be refused and the display will flash three times to indicate that defrost is impossible.

User parameters

The parameters that manage this regulator are:

Label	Description	EWPlus EO Model
dty	Selects defrost type	971/974
dit	Time interval between 2 consecutive defrost cycles	All
dCt	Selects the count mode for the defrost interval	All
dOH	Delay in activating defrost cycle after request	All
dEt	Defrost timeout. Determines the maximum defrost duration	All
dSt	Defrost end temperature determined by probe Pb2	971/974
dPO	Determines whether the instrument must enter defrost mode at power-on	All
Fdt	Delay in activating fans after a defrost cycle	971/974
dt	Coil drainage time	971/974
dFd	Allows exclusion of the evaporator fans to be selected or not selected during defrosting.	971/974
dAO	Temperature alarm disabling time after defrost cycle	All
dAt	Alarm signalling end of defrost due to timeout	971/974
ddL	Display mode during defrost cycle (lock display).	All
dSE	Temperature threshold for start of defrost	All
dtt	Time for which the temperature of the evaporator must remain below **dSE**	All
Ldd	Timeout value for display unlock - label dEF	All

Automatic defrost

The defrost cycle is programmed to start at intervals.

NOTE: To disable the automatic cycle, set ***dit***=0.

If ***dit***>0, then defrost cycles will be run at fixed intervals, as indicated in parameter ***dit***, and the interval time is counted as follows:

Parameter	Value	UM	Description	Notes
dCt	**0** **(dF)**	Flag	Compressor running time (DIGIFROST® method)	In this case, the counter runs only if the compressor is on. A new count starts when the defrost interval elapses and a new defrost cycle starts if conditions permit. **NOTE**: compressor running time is counted separately from the internal exchanger temperature. If the internal exchanger probe is missing or faulty, the count continues for the time the compressor is on.
	1 (rt)	Flag	Controller running time	The defrost time interval is counted continuously when the controller is on and starts at each power-on. A defrost cycle starts when the defrost interval elapses (indicated by dit) if conditions permit and the controller immediately starts counting a new defrost interval.
	2 (SC)	Flag	Compressor stop	Each time the compressor stops, a defrost cycle is run according to the mode set in parameter **dty**. **NOTE**: Parameter **dty** can be viewed and set in models EWPlus 971/974 EO. In EWPlus 961 models a defrost cycle is performed every time the compressor stops.
	3 (te)	Flag	Temperature	Defrost is activated when the evaporator temperature remains below the threshold **dSE** for the time **dtt**. The time count only starts when defrost is not active. If probe Pb2 is faulty, defrost is activated based on the interval **dit**.

IMPORTANT: Regardless of how the interval is counted, the following conditions apply:

EWPlus 961 EO:
- if the parameter **OdO** timing is in progress, defrost will not be permitted: a new interval will be counted and only at the end of this subsequent count will conditions for starting a defrost cycle be retested.

EWPlus 971/974 EO:
- if the parameter **OdO** timing is in progress or the temperature read by the evaporator probe (Pb2) is higher than **dSt**, then defrost will not be permitted: a new interval will be counted and only at the end of this subsequent count will conditions for starting a defrost cycle be retested.

Manual defrost

The device enters defrost mode when the manual defrost key is pressed (or from Digital Input if **H11 or H12 = 1** configured accordingly). Procedures for the activation of this defrost cycle are the same as for external defrost.

The defrost interval will now be counted as described for Automatic Defrost (time **dEt** is not cleared, it continues).

If the following conditions are NOT present:
- time set with parameter **OdO** has not elapsed
- evaporator temperature greater than the value set in parameter **dSt** (EWPlus 971/974 EO only)

this will be signalled on the display (screen flashes three times) and defrost will stop.

Manual defrost is always enabled except when **dit** = 0.

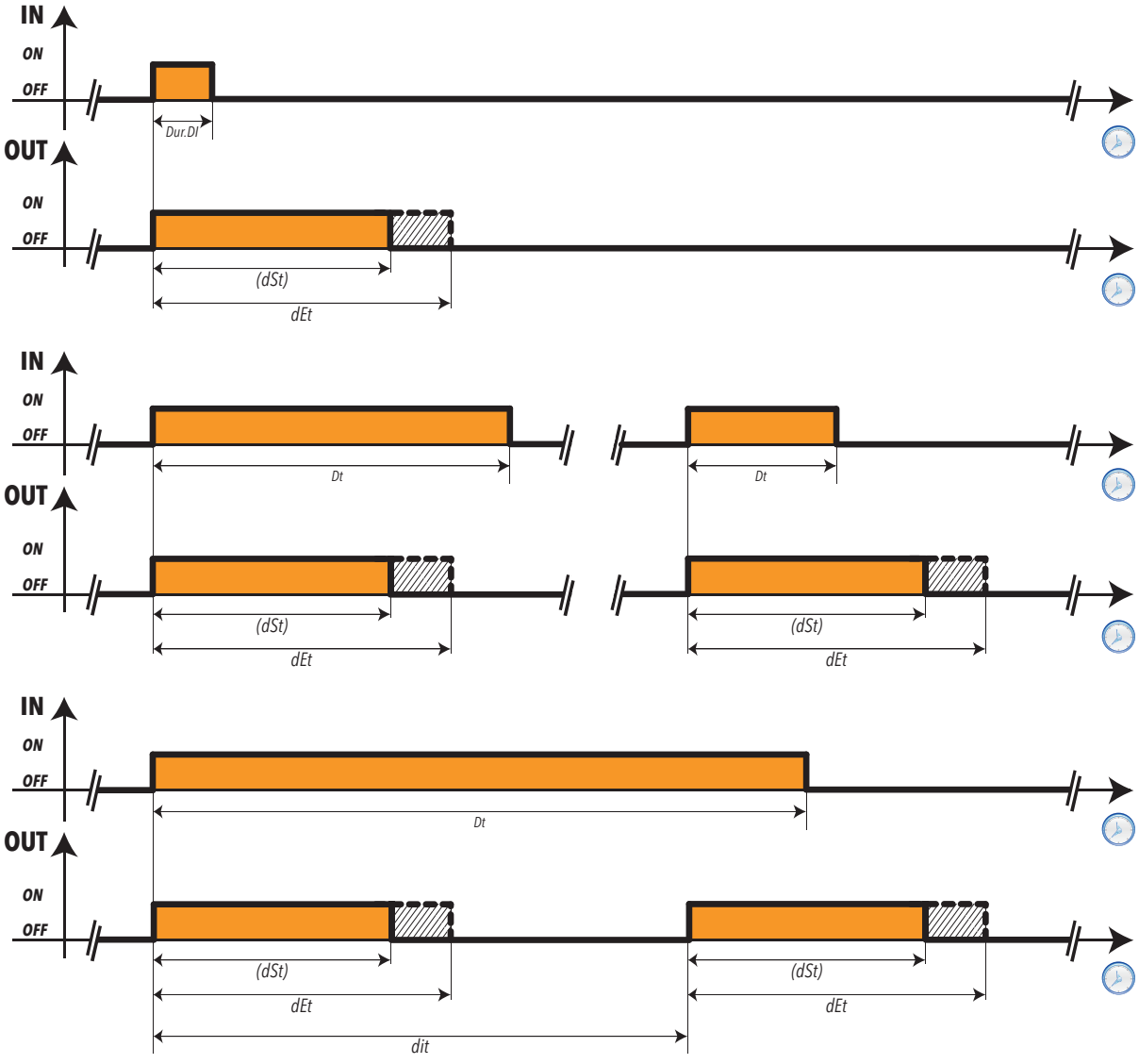
External defrost

If the Digital Input is configured for this function (if **H11 or H12 = 1**) and if conditions permit, defrost can be requested and the relative regulator activated.
Time graphs for signals in each of the various function modes are presented below.

⚠ **IMPORTANT**: Defrost activation occurs on the leading edge (toggle) of the signal and the polarity is configurable. Hence you can only activate a defrost, NOT stop one that is underway.
Defrost or coil drainage currently underway and the defrost or coil drainage interval count cannot be suspended.

IN (Digital Input)	Input state for defrost regulator, with activation from Digital Input.
OUT (Defrost)	Output state for defrost regulator.
DurDI	Digital Input duration.
NOTE	**EWPlus 971/974 EO:** ***dSt*** indicates end defrost time when setpoint temperature reached and ***dEt*** the end of defrost due to timeout. **EWPlus 961 EO:** parameter ***dSt*** is not visible, defrost always ends due to timeout **(*dEt*)**

The control diagram is as follows:



Defrost modes
Defrost can be activated in the four ways described below, as set in parameter **dtY**.

1) Defrost with electrical heaters

EWPlus 971/974 EO models only.

Defrost with electrical heaters is configured by setting **dtY = 0 EL**.
It is used in "**LOW TEMPERATURE**" applications.

The compressor stops for the duration of the defrost cycle and the relay configured as defrost regulator output, and that the electrical heaters are connected to, activates. On completion of defrost, the electrical heaters are switched off and the compressor remains off for the coil drainage time set in parameter **dt**, if it is not equal to zero.

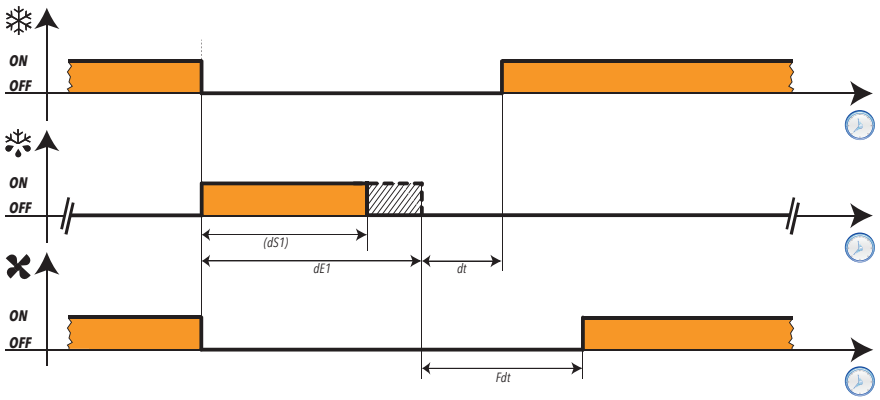
Defrost ends due to:

Evaporator probe (Pb2)	Value of H42	End of defrost description
Pb2 ABSENT	H42=0	Due to timeout set in parameter **dEt** (defrost timeout)
Pb2 PRESENT	H42=1	Temperature setpoint for the end of defrost set in parameter **dSt** reached. If this setpoint is not reached within the time set in parameter **dEt** (defrost timeout), the defrost will end due to timeout.

NOTES:

- If **dSt** intervenes before **dEt**, coil drainage (**dt** and **Fdt**) aligns with **dSt**.
- If **Fdt** < **dt** then **Fdt** = **dt**.
- During defrost, fans are OFF if parameter **dFd** is set accordingly, otherwise they will behave as set for the fan regulator.

The operating diagram is as follows:



Legend:

	Output state for **compressor** regulator
	Output state for **defrost** regulator
	Output state for **evaporator fans** regulator

2) Defrost with compressor stopped

The defrost cycle with the compressor stopped is configured by setting parameter **dtY =0 EL**.
It is used in "**NORMAL TEMPERATURE**" applications.

The compressor stops for the duration of the defrost and there is no defrost relay.

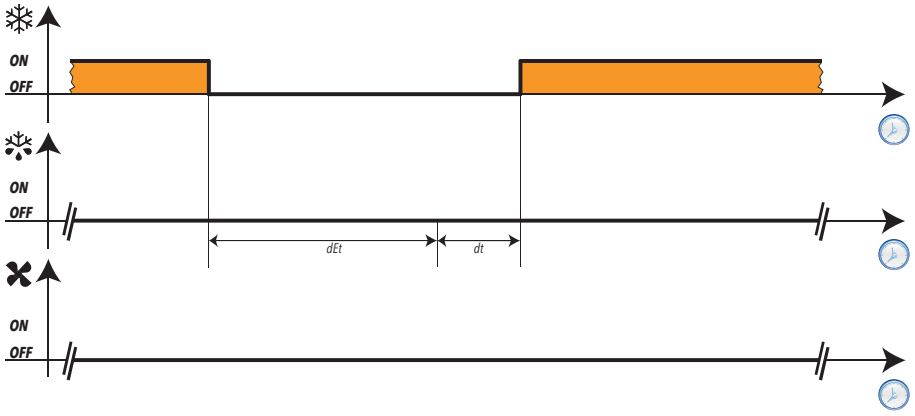
Defrost ends due to:

Evaporator probe (Pb2)	Value of H42	End of defrost description
Pb2 ABSENT	H42=0	Due to timeout set in parameter **dEt** (defrost timeout)
Pb2 PRESENT	H42=1	Temperature setpoint for the end of defrost set in parameter **dSt** reached. If this setpoint is not reached within the time set in parameter **dEt** (defrost timeout), the defrost will end due to timeout.

IMPORTANT: **on model EWPlus 961 EO parameter dt is not visible and cannot be set.**

EWPlus 971/974 EO models: on completion of defrost, the compressor relay stays de-energised during the coil drainage time set in dt (if it is not equal to zero).

The operating diagram is as follows:



Legend:

	Stato Uscita regolatore **Compressore**
	Stato Uscita regolatore **Sbrinamento**
	Stato Uscita regolatore **Ventole Evaporatore**

3) Cycle inversion defrost (hot gas)

⚠ ***EWPlus 971/974 models only.***

Hot gas defrost is configured by setting parameter **dtY = 1**.
It is used in "**LOW TEMPERATURE**" applications.

The compressor stays on for the entire duration of the defrost cycle and the relay configured as defrost regulator output, and that the solenoid valve is connected to, activates.
On completion of the defrost cycle, the solenoid valve relay is de-energised and the coil drainage phase set in parameter **dt** (if not equal to zero) is interrupted. The compressor relay is once again controlled by the compressor regulator.

Defrost ends due to:

Evaporator probe (Pb2)	Value of H42	End of defrost description
Pb2 ABSENT	H42=0	Due to timeout set in parameter dEt (defrost timeout)
Pb2 PRESENT	H42=1	Temperature setpoint for the end of defrost set in parameter dSt reached. If this setpoint is not reached within the time set in parameter dEt (defrost timeout), the defrost will end due to timeout.

⚠ **IMPORTANT**: parameters dOn, dOF and dbi (see "Compressor safety timings") have priority.

NOTES:
- If **dSt** intervenes before **dEt**, coil drainage (**dt** and **Fdt**) aligns with **dSt**.
- If **Fdt** < **dt** then **Fdt** = **dt**.
- During defrost, fans are OFF if parameter **dFd** is set accordingly, otherwise they will behave as set for the fan regulator.

The operating diagram is as follows:

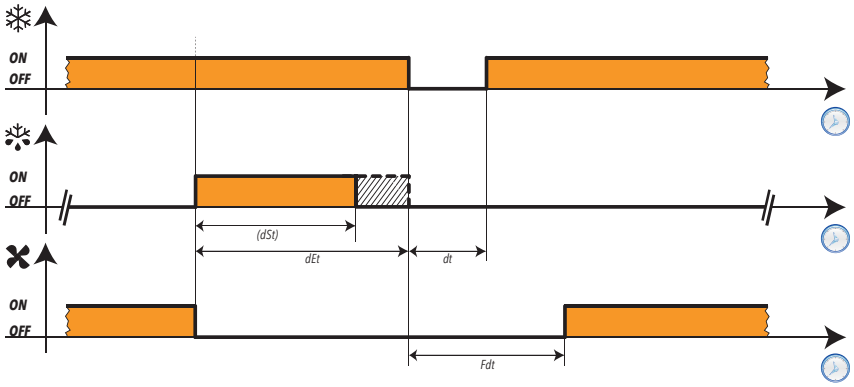


DIAGRAM 1

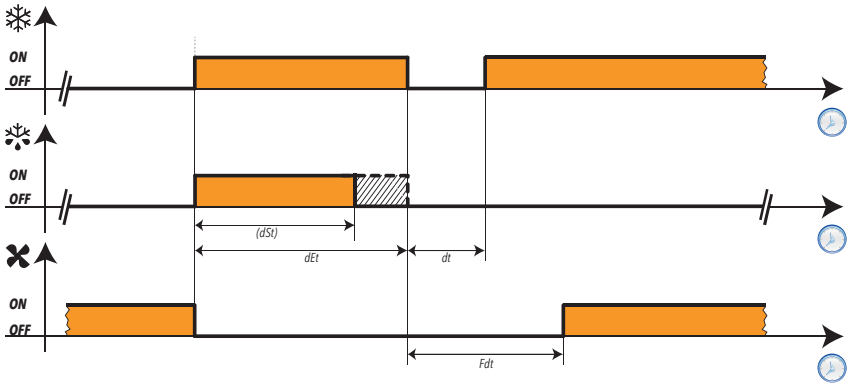


DIAGRAM 2

Legend:

❄	Stato Uscita regolatore **Compressore**
❄	Stato Uscita regolatore **Sbrinamento**
✱	Stato Uscita regolatore **Ventole Evaporatore**

4) Defrost in FREE mode

EWPlus 971/974 EO models only.

The defrost cycle with the compressor stopped is configured by setting parameter **dtY =2**.

The compressor remains under the control of the compressor regulator for the duration of the defrost cycle and the relay configured as defrost, and that the defrost heaters are connected to, activates.
The heaters are switched off on completion of the defrost cycle. During coil drainage, the compressor continues to thermoregulate.
Defrost ends in the same way as the previous case.

End of defrost due to timeout

EWPlus 971/974 EO models only.

If the defrost cycle does not terminate on reaching the end of defrost temperature set in parameter **dSt**, a maximum defrost time interval can be set in parameter **dEt**.

NOTE: Defrost can only be terminated manually by switching the controller on and off again using the ON/OFF function.

Alarm function during defrost

EWPlus 971/974 EO models only.

If the defrost cycle ends due to timeout, an alarm can be activated by configuring parameter **dAt** (see 'end of defrost due to timeout' alarm).
In the event of an environmental probe (Pb1) error, defrost cycles will still be run.
During defrost, the temperature values recorded by the Evaporator probe (Pb2) and probe 3 (Pb3) may be false readings. For this reason, the temperature alarm is excluded.

Display function during defrost

By setting parameter **ddL** (Display mode during defrost cycle - lock display), when the instrument enters defrost mode, the value shown on the display can be:

- left free to show the temperature read by the environmental probe (Pb1).
- locked at value read by the environmental probe (Pb1) at the start of the defrost cycle.
- locked to display the “dEF” (defrost) label.

Unlock display
The display can be set to unlock:

- when the defrost temperature is reached (**EWPlus 971/974 EO models only**)
- when the timeout value for unlocking the display elapses, as defined in parameter **Ldd** (Lock defrost disable).

IMPORTANT:
1) parameter **Ldd** can be used in a link network to unlock both the display and other resources.
2) **EWPlus 971/974 EO only**: if set, the display will be unlocked after the coil drainage cycle since it locks the regulators.

FANS

The following section ONLY applies to models EWPlus 971/974 EO since these are the only models with fan-related parameters.

Operating conditions

The regulator is activated provided that:

- The time set in parameter **OdO** has elapsed
- the temperature value read by the evaporator probe (Pb2), if present, is less than the value of parameter **FSt**
- during defrost it has not been excluded by parameter **dFd** (**dFd = y**)
- coil drainage is not active (**dt**)
- fans delay after defrost is not active (**Fdt**)

The request to switch fans on or off can be made in the following ways:

- by the compressor regulator to help in the "cooling" process (temperature control mode)
- by the defrost regulator to check and/or limit the diffusion of hot air

			Day		Night (Energy Saving)	
	H42	FCO	Compressor ON	Compressor OFF	Compressor ON	Compressor OFF
Probe Pb2 present	y	0	THERMOSTAT CONTROLLED	OFF	THERMOSTAT CONTROLLED	OFF
		1	THERMOSTAT CONTROLLED	ON	THERMOSTAT CONTROLLED	THERMOSTAT CONTROLLED
		2	THERMOSTAT CONTROLLED	DUTY CYCLE DAY	THERMOSTAT CONTROLLED	DUTY CYCLE NIGHT
		3	DUTY CYCLE DAY	DUTY CYCLE DAY	DUTY CYCLE NIGHT	DUTY CYCLE NIGHT
Probe Pb2 in error "E2"	y	0	DUTY CYCLE DAY	OFF	DUTY CYCLE NIGHT	OFF
		1	DUTY CYCLE DAY	DUTY CYCLE DAY	DUTY CYCLE NIGHT	DUTY CYCLE NIGHT
		2	DUTY CYCLE DAY	DUTY CYCLE DAY	DUTY CYCLE NIGHT	DUTY CYCLE NIGHT
		3	DUTY CYCLE DAY	DUTY CYCLE DAY	DUTY CYCLE NIGHT	DUTY CYCLE NIGHT
Probe Pb2 absent	n	0	ON	OFF	ON	OFF
		1	ON	DUTY CYCLE DAY*	ON	DUTY CYCLE NIGHT*
		2	ON	DUTY CYCLE DAY*	ON	DUTY CYCLE NIGHT*
		3	DUTY CYCLE DAY	DUTY CYCLE DAY	DUTY CYCLE NIGHT	DUTY CYCLE NIGHT

* see paragraph "Fan operation without probe Pb2 (H42 ≠ 0).

Fan operation in thermostat control

During "cooling", the fans operate as shown in this diagram:

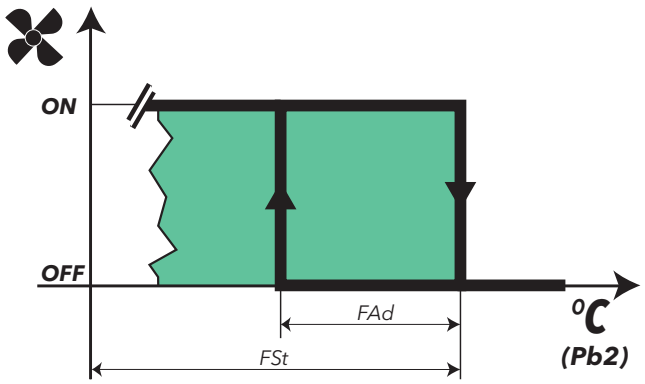
Thermostat control of fans takes place at the values set in parameters

- **FSt** (fans disabling temperature) and **FAd** (fans differential).

The fans disabling temperature, set in parameters **FSt** (fans disabling temperature) and **FAd** (fans differential), is an absolute value since **FPt = 0** (real temperature value).

Important: when the temperature approaches the start fan temperature (-50°C) the differential will always be referred to parameter **FAd** but with the opposite sign.

The fan regulator operates as indicated below:



Fan operation in Duty Cycle mode

There are two Duty Cycle modes: **Day** and **Night** (Energy Saving).
Activation of **Night** mode depends on parameter **ESF**:

ESF = n	**Night mode disabled**
ESF = y	**Night mode active when Energy Saving mode is active**

Duty Cycle operation depends on the operating mode, e.g.:

- **Day**: parameters **Fon** and **FoF** must be set accordingly;
- **Night**: parameters **Fnn** and **FnF** must be set accordingly;

The fans operate as follows:

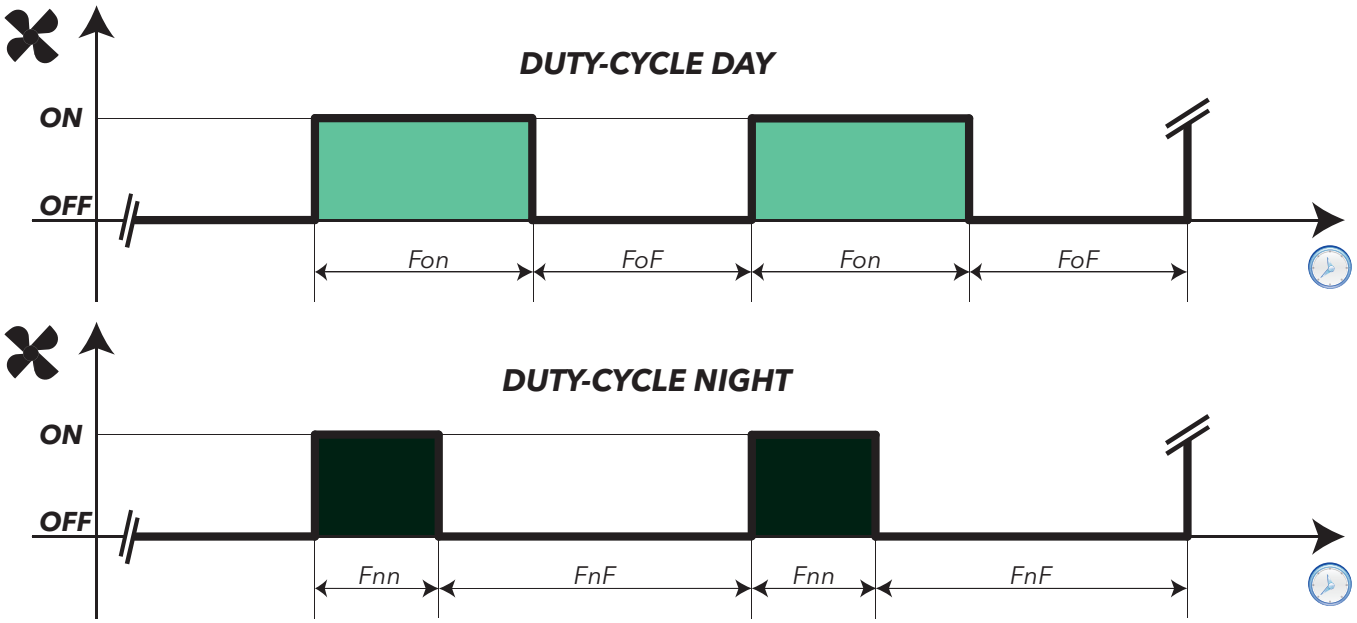
DUTY CYCLE DAY

Fon	FoF	Fan operation
0	0	**OFF**
0	≠0	**OFF**
≠0	0	**ON**
≠0	≠0	**DUTY CYCLE DAY**

DUTY CYCLE NIGHT

Fnn	FnF	Fan operation
0	0	**OFF**
0	≠0	**OFF**
≠0	0	**ON**
≠0	≠0	**DUTY CYCLE NIGHT**

The fan regulator will operate in Duty Cycle mode as shown below:



Fan operation during defrost

During defrost, the fans operate as shown in this diagram

dFd = y : Exclusion of fans during defrost	**OFF**
dFd = n : the fans are not excluded during defrost (see parameters **FCO**, **Fon**, **FoF**, **Fnn** and **FnF**)	**TEMPERATURE CONTROL / DUTY CYCLE**

Thermostat control of fans takes place at the values set in parameters:

- FSt (fans disabling temperature) and FAd (fans differential).

NOTE: during defrost with electrical heaters, the compressor is OFF but the fans work as if the compressor was still ON, unless they have been disabled during defrost (see parameter **dFd**).

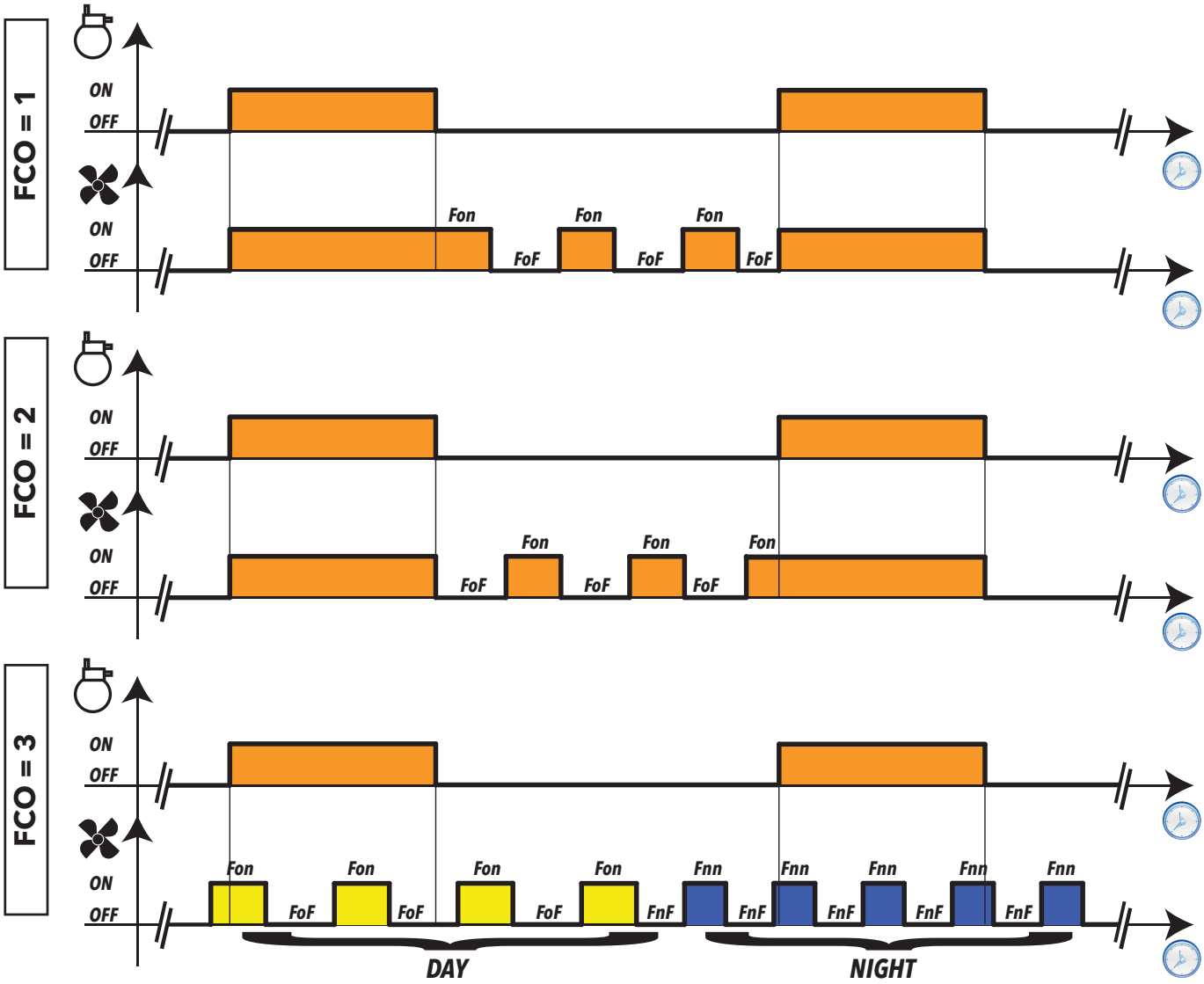
When the evaporator fans are enabled in defrost (dFd = n) and regulate on evaporator probe Pb2 in temperature controlled mode, if there is an "E2" error in probe Pb2 during defrost, the fans must always be ON, regardless of the values set by the duty cycle.

Fan operation without probe

If parameter **H42** = **n** (probe Pb2 absent), according to the value of FCO and the state of the compressor, the state of the fans may be "On", "Off", "Duty Cycle Day" and "Duty Cycle Night".

Parameter **FCO** will determine the operating mode of the evaporator fans during the "DAY" phase and during the "NIGHT" phase.

Below is an example of fan operation based on the value set for **FCO**.



Fan operation during coil drainage

If parameter **dt** ≠ **0** (coil drainage time), the fans will stay OFF for the time set in this parameter.
See "***Defrost with electrical heaters***".
Note that if **Fdt** (fan delay time) is greater than **dt** (coil drainage time) the fans will stay OFF for the time set in **Fdt** rather than **dt** (e.g. whichever timing is longer will be applied).

Post-ventilation

Parameter **FdC** delays the switching off of the fans after the compressor has stopped (increasing efficiency of the system by making better use of inertia). Post-ventilation must be active with any value of FCO and even without the probe configured.
If **FdC = 0** the function is disabled.

NOTE: Post-ventilation does not have priority over the delay set in parameter **dcd**.

User parameters

The parameters that manage the fan regulator are:

Label	Description	EWPlus EO Model
FPt	Characterises parameter "FSt" which can be expressed either as an absolute temperature value or as a value relative to the Setpoint	971/974
FSt	Evaporator fans disabling temperature	971/974
Fdt	Evaporator fans delay after defrost cycle	971/974
dFd	Evaporator fans disabling during defrost time	971/974
FCO	Evaporator fans operating mode	971/974
FAd	Evaporator fans activation differential	971/974
dt	Coil drainage time	971/974
FdC	Evaporator fans switch-off delay after compressor disabled	971/974
Fon	Evaporator fans ON time in duty cycle day mode	971/974
FoF	Evaporator fans OFF time in duty cycle day mode	971/974
Fnn	Evaporator fans ON time in duty cycle night mode	971/974
FnF	Evaporator fans OFF time in duty cycle night mode	971/974
ESF	Night mode activation (Energy saving)	971/974

AUXILIARY OUTPUT (AUX/LIGHT)

Description

If relay control is configured as AUX by setting parameter **H21** (EWPlus 961/971/974 EO), **H22** (EWPlus 971/974 EO) or **H23** (EWPlus 974 EO) to the value **H2x=5**, and by pressing the associated key **H32** (DOWN key) or **H33** (ESC key), which must be set to the value **H3x=2**, the relay activates if it was off and vice versa.

The on/off state is saved in non-volatile memory hence when power returns after a blackout, the device will restart in the state that was active prior to the blackout.

If parameter **H11** or **H12** is set to the value **H1x=3**, the AUX relay is commanded from the digital input; in this case the relay will reflect the state of the input. In this case, on/off state is not saved in non-volatile memory.

IMPORTANT: the meaning of the D.I. must always remain the same: for example, if the relay is activated by D.I. and switched off by key, when the D.I. is reset to the starting position, the relay does not change state (since it was already de-energised via key). With the instrument OFF, if set accordingly, only the digital input (D.I.) and the associated key can change the state of the output.

Operating conditions

The regulator is activated by:

- Key
- Function
- Digital Input
- Activation of Energy Saving mode

if configured accordingly.

The regulator is not active when:

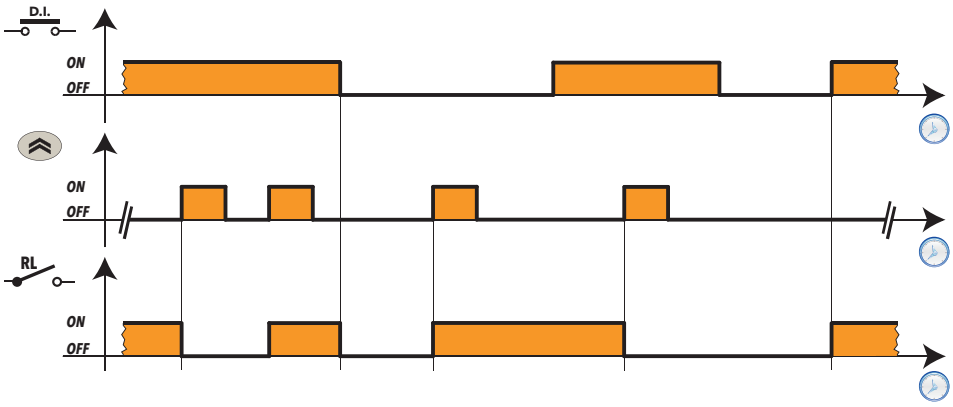
Condition	(AUX) output state	NOTES
during start-up	OFF	
during standby	state according to parameter **H08**	

The values that can be assigned to parameter **ESA** (AUX/Light output state during Energy Saving) are:

- 0: disabled (no effect on the state of AUX);
- 1: AUX off (**LIGHT OFF**);
- 2: AUX on;

NOTE: LIGHT management only occurs by setting **ESA = 1**.

The control diagram is as follows:



User parameters

The parameters that manage the auxiliary (AUX) output regulator are:

Label	Description	EWPlus EO Model
ESA	AUX state during energy saving: 0 = disabled (no effect on AUX); 1 = AUX off; 2 = AUX on	All
H11	Configuration of digital input 1 / Polarity	All
H12	Configuration of digital input 2 / Polarity	All
H21	Configuration of digital output 1	All
H22	Configuration of digital output 2	971/974
H23	Configuration of digital output 3	974
H32	Configuration of DOWN key	All
H33	ESC key configuration	All

PRESSURE SWITCH

Description

This regulator performs diagnostic operations over a digital input activated by setting parameters:

- **H11** (D.I.1) = ±7
- **H12** (D.I.2) = ±7

If a pressure switch input is activated, power to the compressor is immediately cut off, the relative alarm LED lights up to provide a visual warning and the folder **nPA** in the alarms folder **AL** is also displayed. The folder contains the label with the number of pressure switch activations (up to the maximum value set in parameter **PEn**).

When the pressure switch is deactivated because the pressure returns to normal levels, the time set in parameter **PEt** must elapse before regulation of cooling mode resumes.

If the number of activations exceeds the maximum number defined by parameter **PEn** within a time less than the value of **PEI**, the following conditions occur:

- The compressor, fans and defrost are disabled
- In the alarms folder **AL** the label **PA** (pressure alarm) is displayed in place of folder **nPA**
- **PAL** label shown on display
- The alarm relay comes on (if configured).

IMPORTANT: 1) If the number of activations exceeds the number set in **PEn** within the time limit **PEI**, the alarm is automatically reset.
2) The input must be closed on itself if not used and the input is normally closed active, or must be open if not used and normally open active, or deactivated by digital input configuration parameter.

NOTES: 1) Once the controller is in alarm state, it must be powered off then on, or RESET by activating function **rPA** in the functions folder **FPr**.
2) If parameter **PEn = 0**, the function is disabled and alarms and counters are also disabled.
3) The pressure switch alarm is not stored in EEPROM.
4) During the pressure switch activation period the defrost interval count runs as normal.

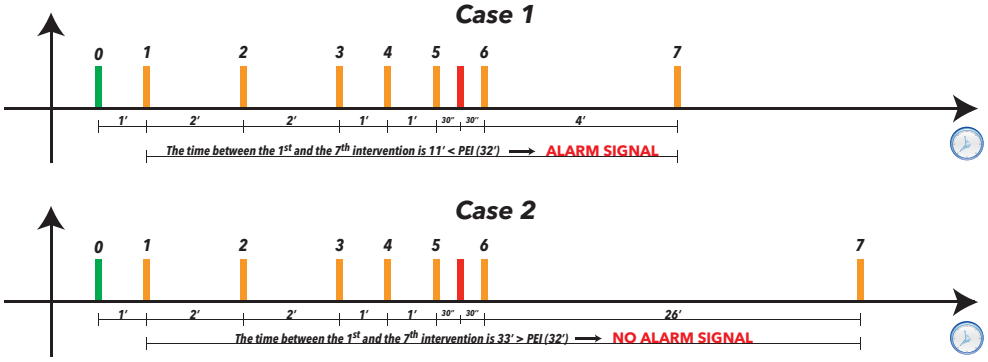
Operating conditions

The number of pressure switch errors is counted using a FIFO method. The time interval **PEI** is divided into 32 parts; the counter is incremented by one unit if there are one or more activations during one part of the entire interval **PEI**.

Two operating examples are given below: In both cases, suppose that **PEI** = 32 minutes (equal to 32 minutes/32 = 1 minute) and **PEn** = 7.

Example 1: ***ALARM SIGNALLED***. The interval for storing activations is 1 minute: all activations within that minute are counted as a single activation and the alarm (if any) is activated when the sampling interval has elapsed. In this example the pressure switch alarm is signalled because there have been 7 activations during the 32 minute time window.

Example 2: ***ALARM NOT SIGNALLED***. In this example the alarm is not activated because during the 32 minute time window the number of activations set in parameter **PEn** was not reached. The time window is a rolling window and all activations that are outside of it are deleted: the reference point is the last activation and the time **PEI** is subtracted from that point to establish how many activations are included in the count.



User parameters

The parameters that manage the pressure switch regulator are:

Label	Description	EWPlus EO Model
PEn	Number of errors allowed per maximum/minimum pressure switch input	All
PEI	Minimum/maximum pressure switch error count interval (in 32 parts)	All
PEt	Delay in activating compressor after pressure switch deactivation	All

DEEP COOLING CYCLE (DCC)

Description

This regulator means that the compressor regulates in relation to setpoint **dCS** with a differential equal to the value set in parameter **diF**. When the **DCC** (Deep Cooling Cycle) activates, the interval between defrost cycles is cleared and defrosts are disabled. The end of a **DCC** may occur due to timeout, by setting parameter **tdc≠0**, or when the setpoint **dCS** is reached if **tdc = 0**.

At the end of a **DCC** and once the time set in parameter **dcc** has elapsed, a defrost cycle is forced and the counters restart for the interval between defrost cycles (value set in parameter **dit**). If **dcc=0** the defrost starts at the end of the **DCC**.
During the **DCC** temperature alarms are disabled.
Normal temperature alarm management resumes at the end of the **DCC** when the temperature read by Pb1 returns to the control setpoint value **SEt**.

Operating conditions

Based on the value set for parameter **dCA**, activation of the Deep Cooling Cycle will be:

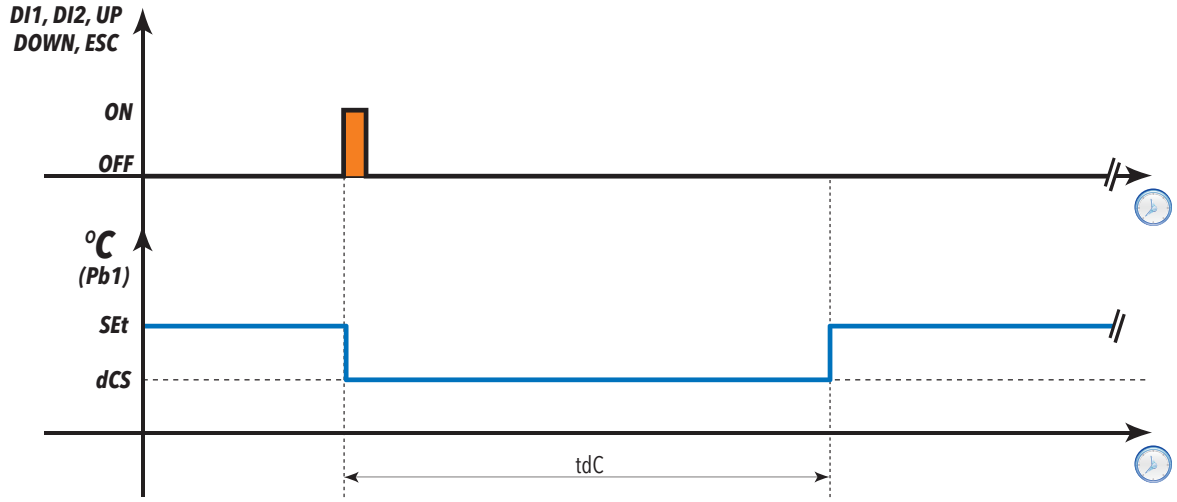
- **dCA = 0**: disabled;
- **dCA = 1**: manual (activated via key or via digital input, if appropriately configured);
- **dCA = 2**: automatic (activated if the temperature read by **Pb1 > Sid** for a time equal to **toS**);

Manual mode

Manual mode is activated by setting **dCA = 1**, consequently the Deep Cooling Cycle will be activated via digital input or via key, if appropriately configured.

In the event of a probe error and/or power failure, the Deep Cooling Cycle is stopped and standard controller operation restored.
If parameters **dCS**, **tdc** and **dcc** are modified, the Deep Cooling Cycle is recalculated with the new values set.
After a Deep Cooling cycle, the time **dcc** must elapse before a new defrost cycle can start.

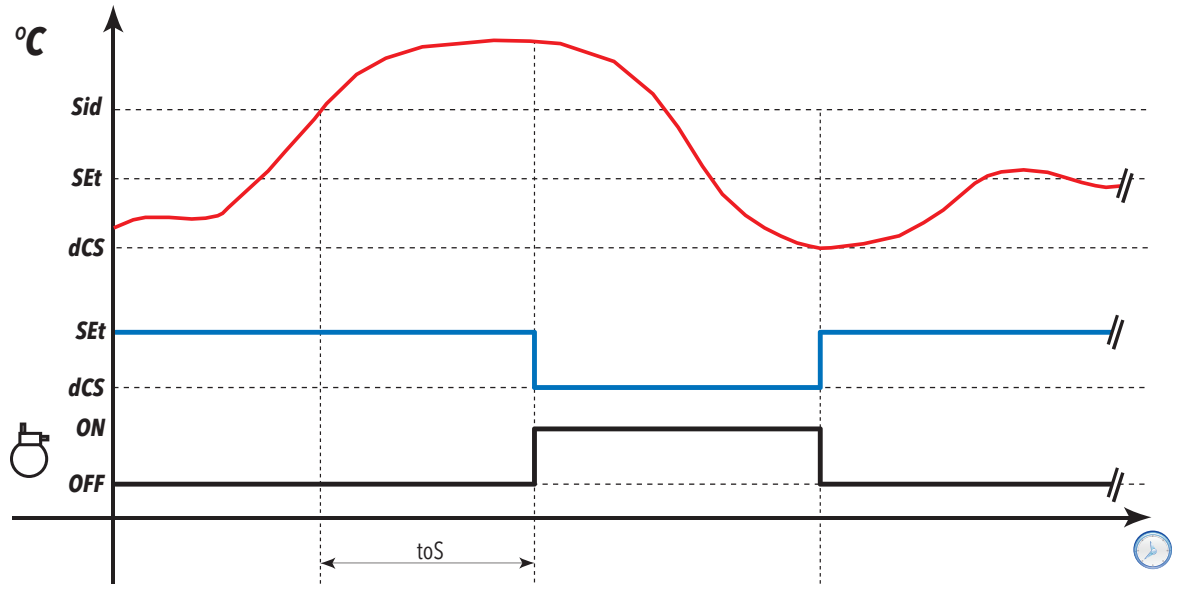
The control diagram is as follows:



Automatic mode

Automatic mode is activated by setting **dCA = 2**, consequently the Deep Cooling cycle will activate as soon as the value read by probe **Pb1** ≥ **Sid** for a time **T** ≥ **toS** and ends when the temperature **dCS** is reached.

In the event of a probe error and/or power failure, the Deep Cooling Cycle is stopped and standard controller operation restored. The control diagram is as follows:



User parameters

The parameters that control the Deep Cooling cycle are:

Label	Description	EWPlus EO Model
dCA	Enable deep cooling (**0** = disabled; **1** = manual; **2** = automatic).	All
dCS	Deep cooling setpoint	All
tdc	Deep cooling duration	All
dcc	Defrost delay after a Deep Cooling Cycle	All
Sid	Threshold for start of deep cooling	All
toS	Deep cooling activation time	All

ENERGY SAVING

Description

The EWPlus EO family stands out for its performance and flexibility thanks to special energy saving algorithms and configurations tailored to the most common applications:

- Open front bottle coolers
- Glass door bottle coolers
- Vertical glass door merchandisers.

The ECO LED will light up in all cases in which the function is active.

Operating conditions

The Energy Saving function can be enabled in the following ways:

- via the DOWN/ESC key (by setting H32/H33 = 6)
- via Digital Input DI1/DI2 (by setting H11/H12 = 9 or 10)
- remotely
- in automatic mode by means of a "virtual" door switch (see parameter (ESP≠0)

The operating algorithms are determined by parameter ESt.
The ECO LED will light up in all cases in which the function is active.

The values that can be assigned to parameter **ESt** (Energy Saving mode) are:

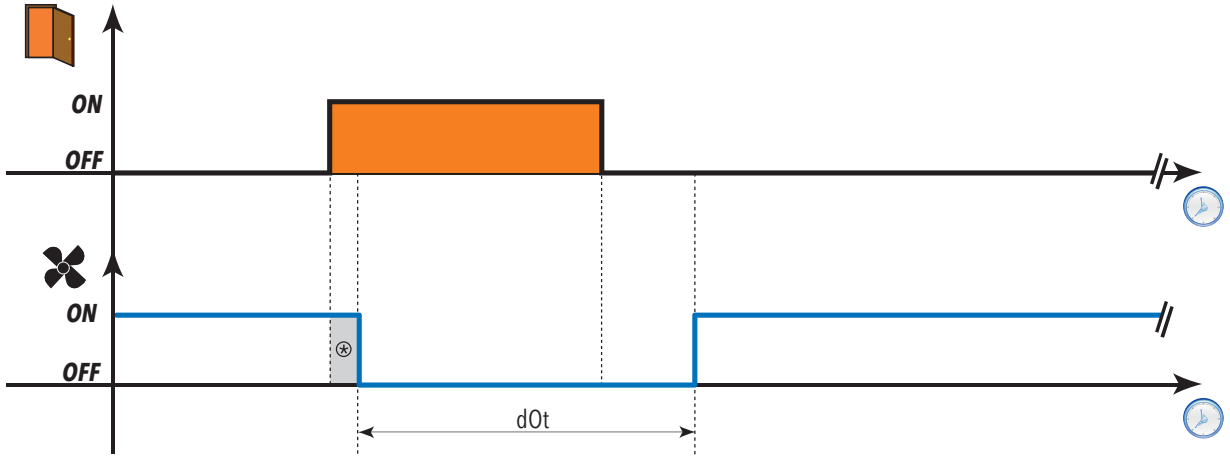
- 0: disabled;
- 1: offset on setpoint;
- 2: offset on differential;
- 3: offset on setpoint and differential;
- 4: open front bottle cooler algorithm;
- 5: glass door bottle cooler algorithm;
- 6: vertical glass door merchandiser algorithm;

The values that can be assigned to parameter **ESA** (AUX/Light output state during Energy Saving) are:

- 0: disabled (no effect on the state of AUX);
- 1: AUX off (**LIGHT OFF**);
- 2: AUX on;

Energy saving can also be enabled via a virtual door switch (only in the case of glass door bottle coolers - **ESt** = 5).
The setting of parameter **ESP** determines the sensitivity of the regulator (temperature difference measured by probe 1).
The higher the value (max 5), the higher the system's sensitivity to temperature variations.

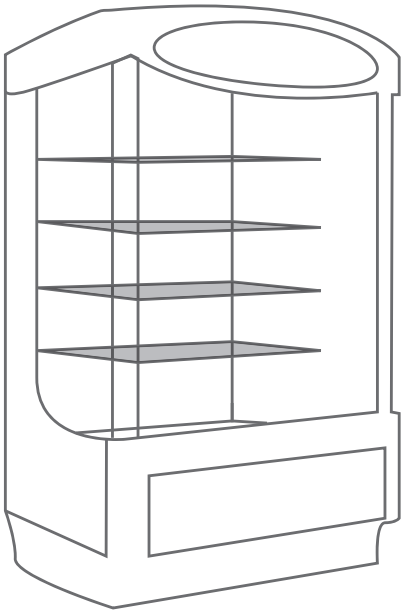
1) If using the virtual door switch (**ESP ≠ 0**) to manage Energy Saving mode only, parameter **dOt** must be set to zero (**dOt = 0**).
2) If you also want the fans to be disabled whenever the door is opened, we recommend setting **dOt > 0**.



NOTE (*): The virtual door switch uses probe **Pb1**. The algorithm can take several seconds to detect the opening of the door, depending on the structure of the chiller and the position of the probe. The best location for **Pb1** is on the "intake grill", as close to the door as possible.

BOTTLE COOLER OPEN FRONT

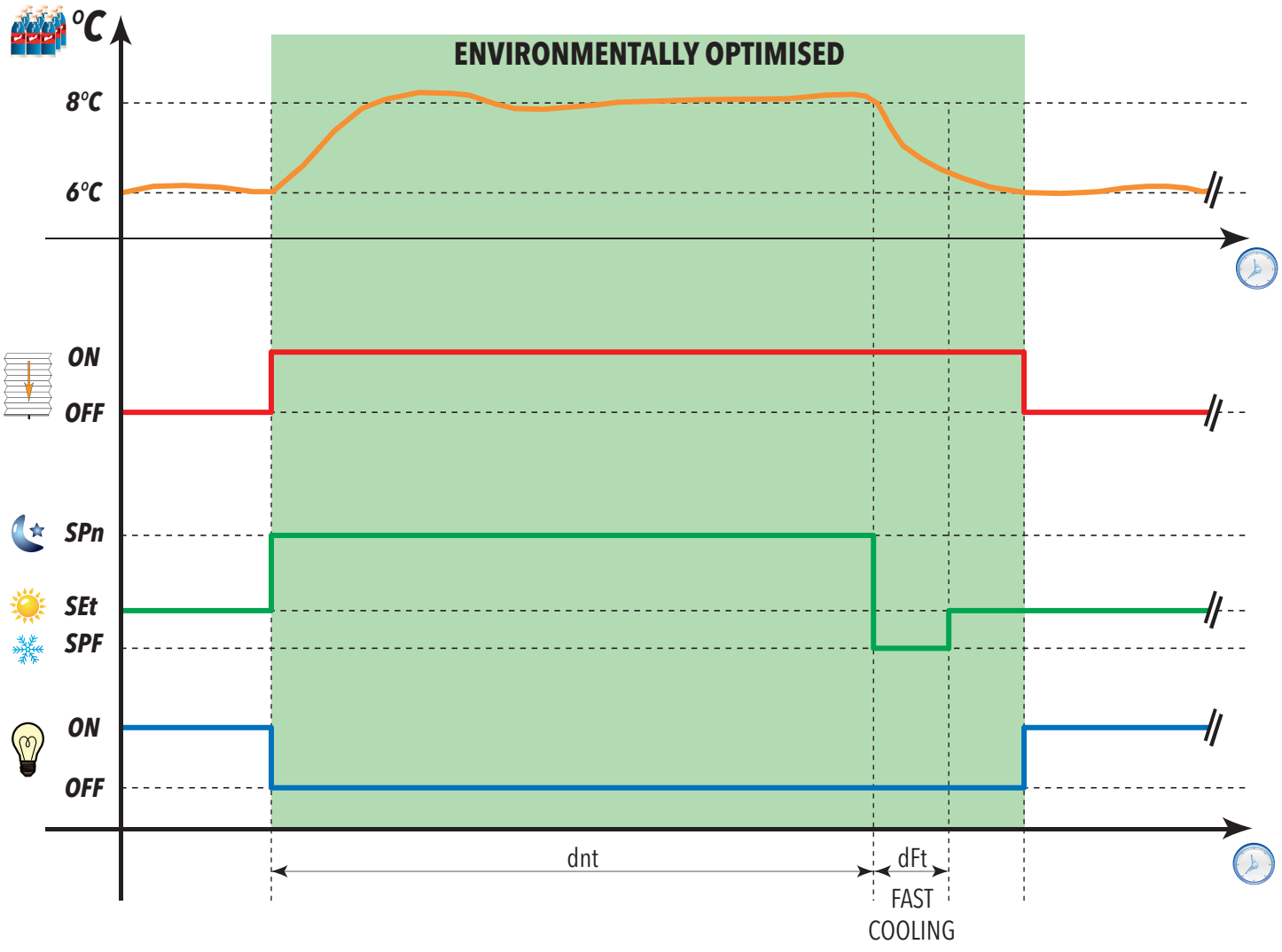
Whenever the function is enabled, the timers for counting the time **dnt** and **dFt** are reset (zeroed).
Each time that the controller is powered on, the timers for counting the time **dnt** and **dFt** are reset (zeroed) even if they have not elapsed; if however they had already elapsed, the conditions prior to switch-off are restored.
Activation and deactivation of the "Energy Saving" function only occurs via digital input (closure of night blind).
If **dnt = 0** and **dFt = 0** the Energy Saving function is disabled.



The operation of the algorithm is illustrated in the chart below.
The settings are:

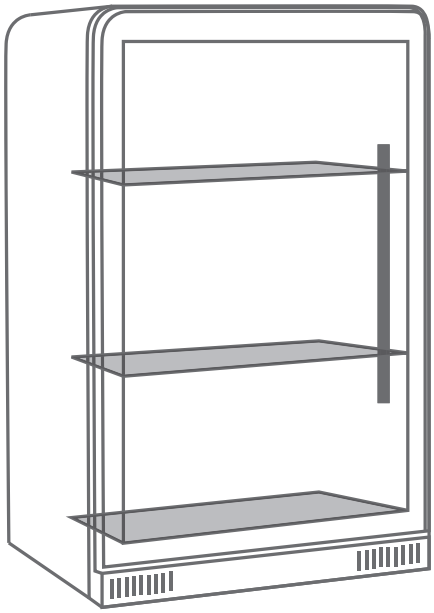
- **ESt = 4**
- **H11 = 9**
- **ESP = 0 (Physical Digital Input - real)**.

NOTE:
If the night blind is opened during the "Energy Saving" phase, the Fast Cooling phase starts immediately.
If the night blind is opened during the Fast Cooling phase, the function is terminated when the time **dFt** elapses.



BOTTLE COOLER GLASS DOOR

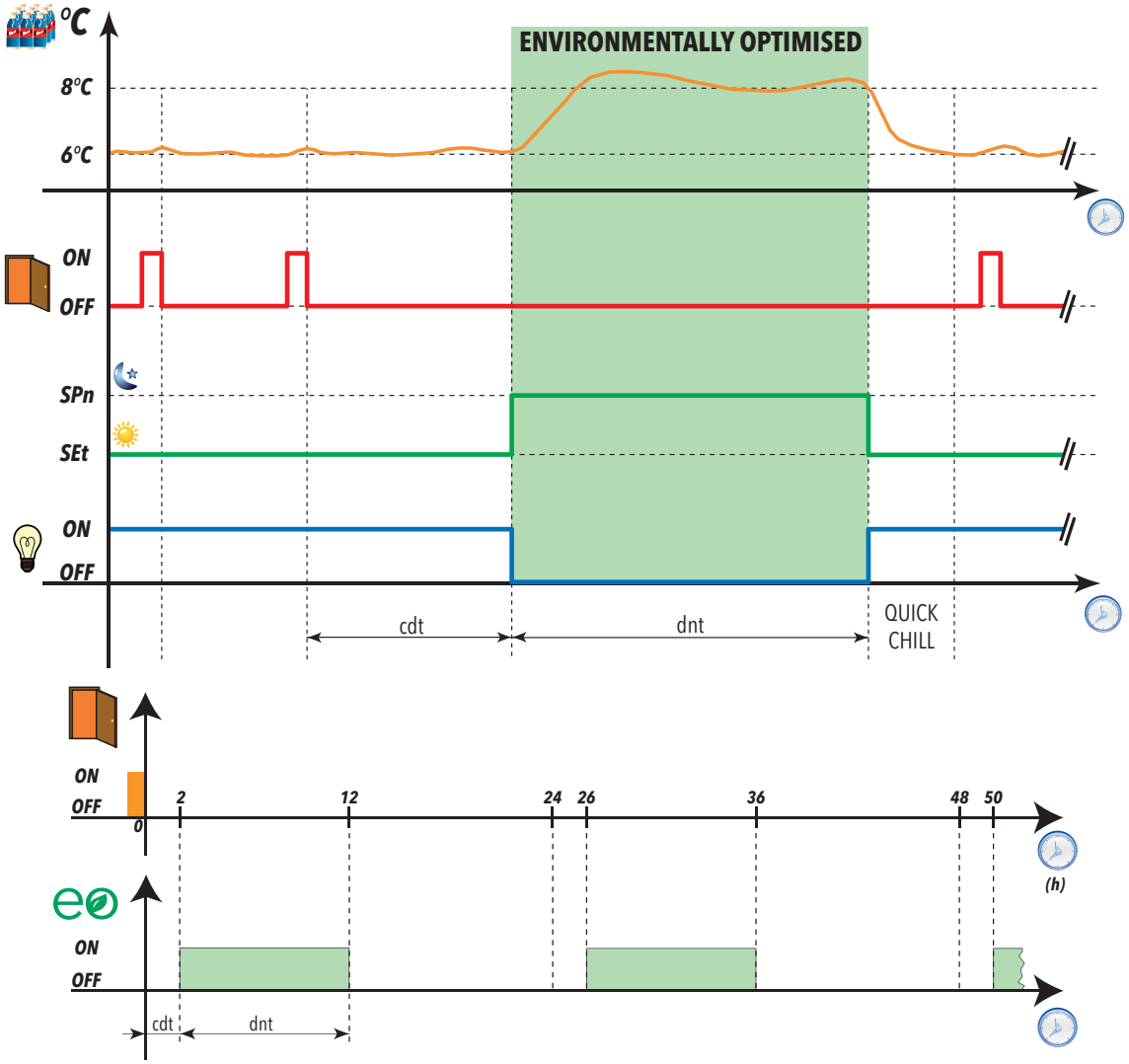
If the door remains closed for a time greater than parameter **cdt** and the SEt has been reached during this period, Energy Saving mode will be activated. It will be disabled when the time set in parameter **dnt** elapses or when the door is opened. The requirement for the temperature to have reached the value of SEt is due to the fact that, if the cooling system is not working correctly (e.g.: refrigerant gas low) or the temperature of the room is too high and the system cannot reach the optimal temperature during the day, and if Energy Saving mode is activated, when it ends the system would not be able to bring the temperature of the bottles back down to the set value.
At the end of the Energy Saving period, a mode called "Quick Chill" starts. This fully automatic mode brings the temperature of the bottles back down to the desired value in the shortest possible time (the algorithm is able to recognise and adapt to the characteristics of the application).
If **dnt = 0** Quick Chill and Energy Saving mode are disabled.



The way in which the algorithm works is illustrated in the chart below.
The settings are:

- **ESt = 5**
- **H11/H12 = 10 and ESP = 0 (in case of physical Digital Input)**
- **ESP≠0 and H11/H12 ≠ 2,4,9 and 10 (in case of virtual Digital Input)**

NOTE:
1) If **ESt = 5**, after a power cut, the device will function continuously in standard (day) mode until the door is closed. If the door is not opened/closed, then after a time **Cdt** the device will function continuously in Economy (Energy Saving) mode for a period equal to: **dnt**.
2) If the door is opened during the Energy Saving phase, the Quick Chill phase starts immediately. if the door is opened during the Quick Chill phase, the function will deactivate as normal.



VERTICAL DISPLAY CABINET WITH DOOR

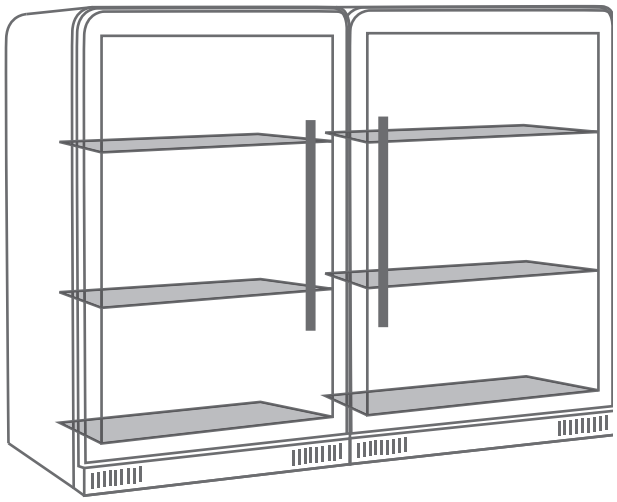
If the door remains closed for a time greater than the parameter **cdt**, Energy Saving mode is activated.
Energy Saving mode is disabled automatically based on the usage conditions of the chiller (quantity of warm air entering the chiller).
The deactivation "threshold" can be set by means of parameter **ESo**.
For example:

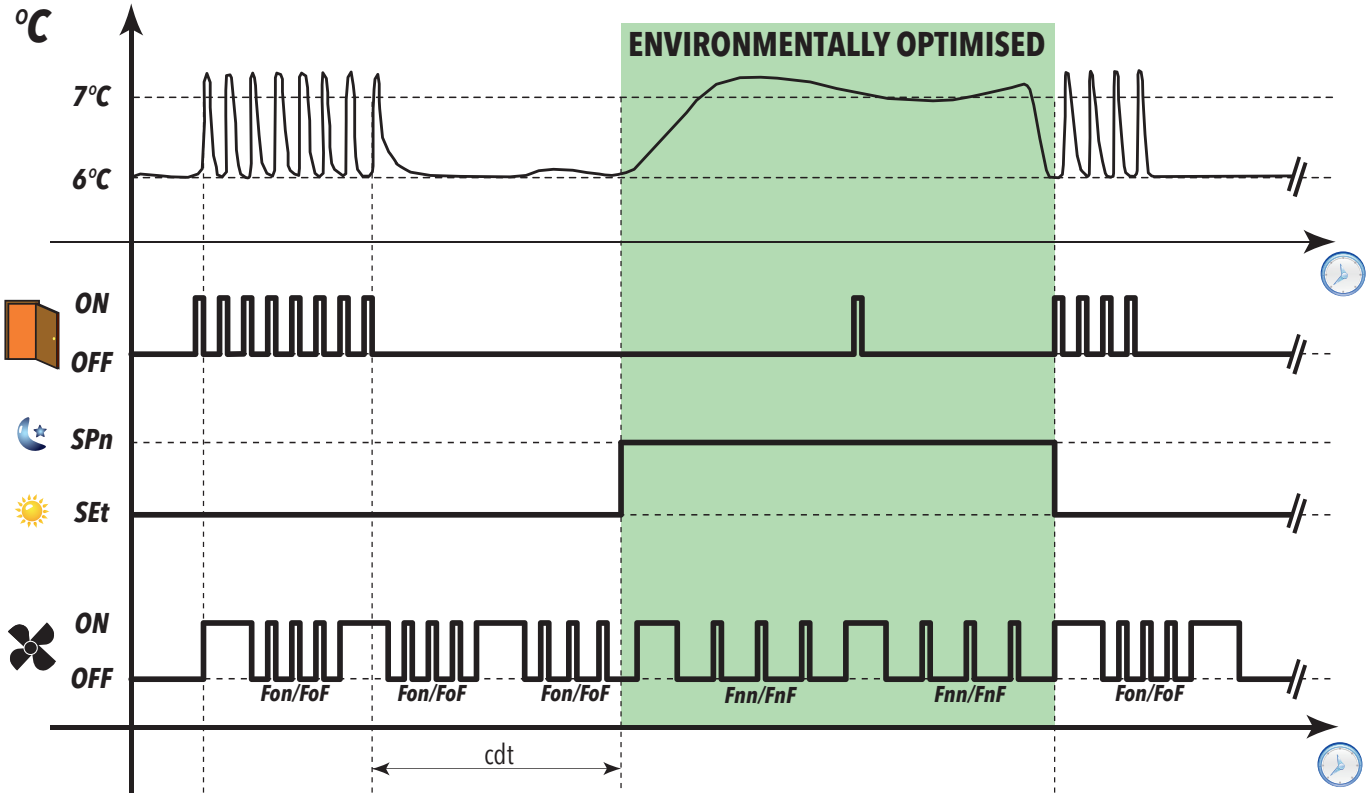
- **ESo = 0** high usage before deactivation of Energy Saving mode
- **ESo = 10** low usage before deactivation of Energy Saving mode

This mode is deactivated automatically even when a "Defrost with heaters" mode is activated.

The operation of the algorithm is illustrated in the chart below.
The settings are:

- **ESt = 6**
- **H11 = 10**
- **ESP = 0 (Physical Digital Input - real)**.





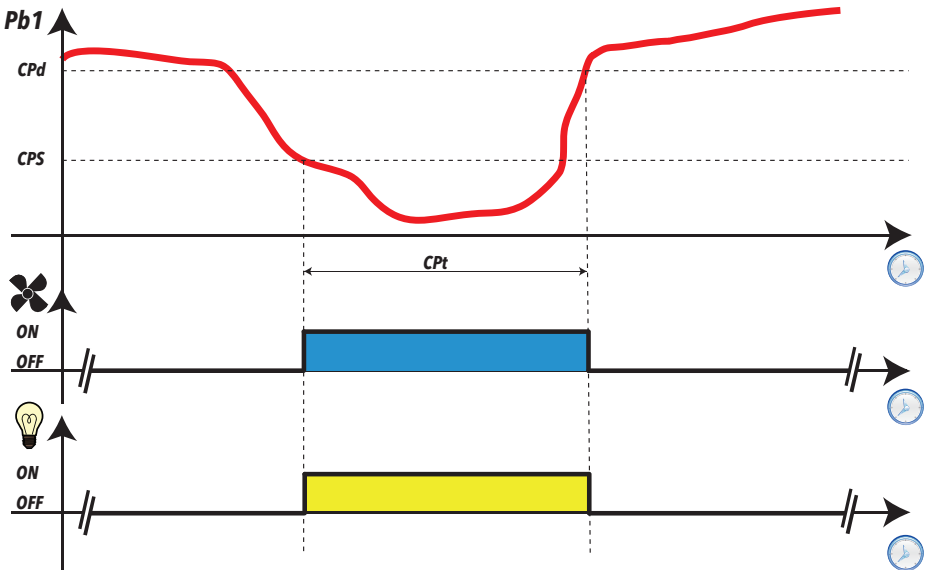
User parameters
The parameters that control the Energy Saving cycle are:

Label	Description	EWPlus EO Model
ESt	Energy Saving mode: **0**= disabled; **1**= Offset on setpoint; **2**= Offset on differential; **3**= offset on setpoint and differential; **4**= "Open front bottle cooler" algorithm; **5**= "Glass door bottle cooler" algorithm; **6**= "Vertical glass door merchandiser" algorithm	All
ESA	AUX state during energy saving: **0** = disabled (no effect on AUX); **1** = AUX off; **2** = AUX on	All
Cdt	Door close time	All
ESo	Cumulative door open time for disabling Energy Saving mode	All
OSP	Setpoint offset	All
OdF	Differential offset	All
dnt	Night mode duration	All
dFt	Fast cooling duration	All
SPn	Night mode setpoint	All
dFn	Night mode differential	All
SPF	Fast cooling setpoint	All
dFF	Fast cooling differential	All
Sid	Threshold for start of deep cooling	All
ESP	Sensitivity of virtual door regulator	All
dOt	Maximum door open time with virtual door switch	All

COOL PROTECTION

Description
When the temperature measured by probe 1 falls below the temperature set in parameter **cPS** for the time **cPt**, antifreeze protection mode is activated to heat the cabinet by activating the light and the fans, until the temperature (**cPS** + differential **cPd**) is reached. If **cPt = 0** the function is disabled.

Control diagram



User parameters
The parameters that manage the auxiliary (AUX) output regulator are:

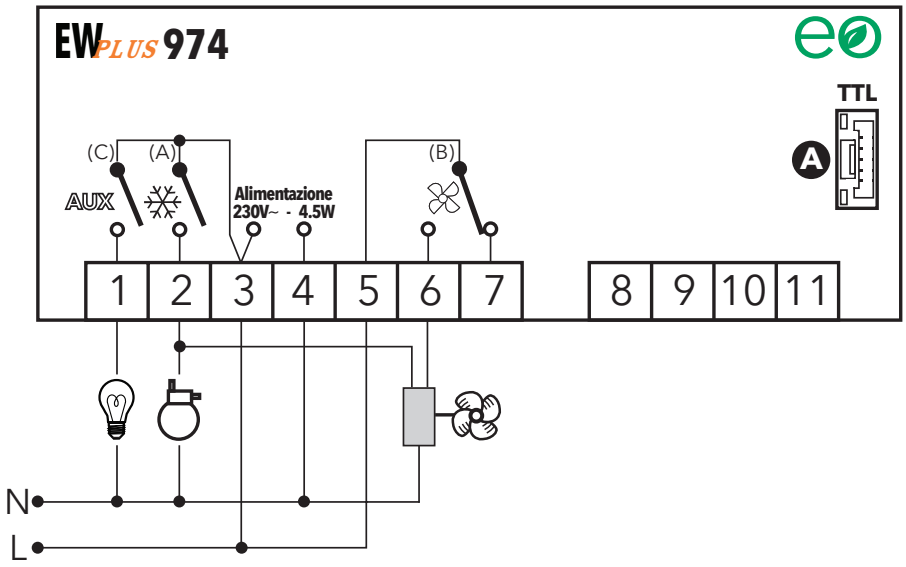
Label	Description	EWPlus EO Model
cPS	Enable utility switch-off on activation of digital input (set as door switch)	All
cPd	Digital input activation delay	All
CPt	Compressor switch off delay from door switch	All

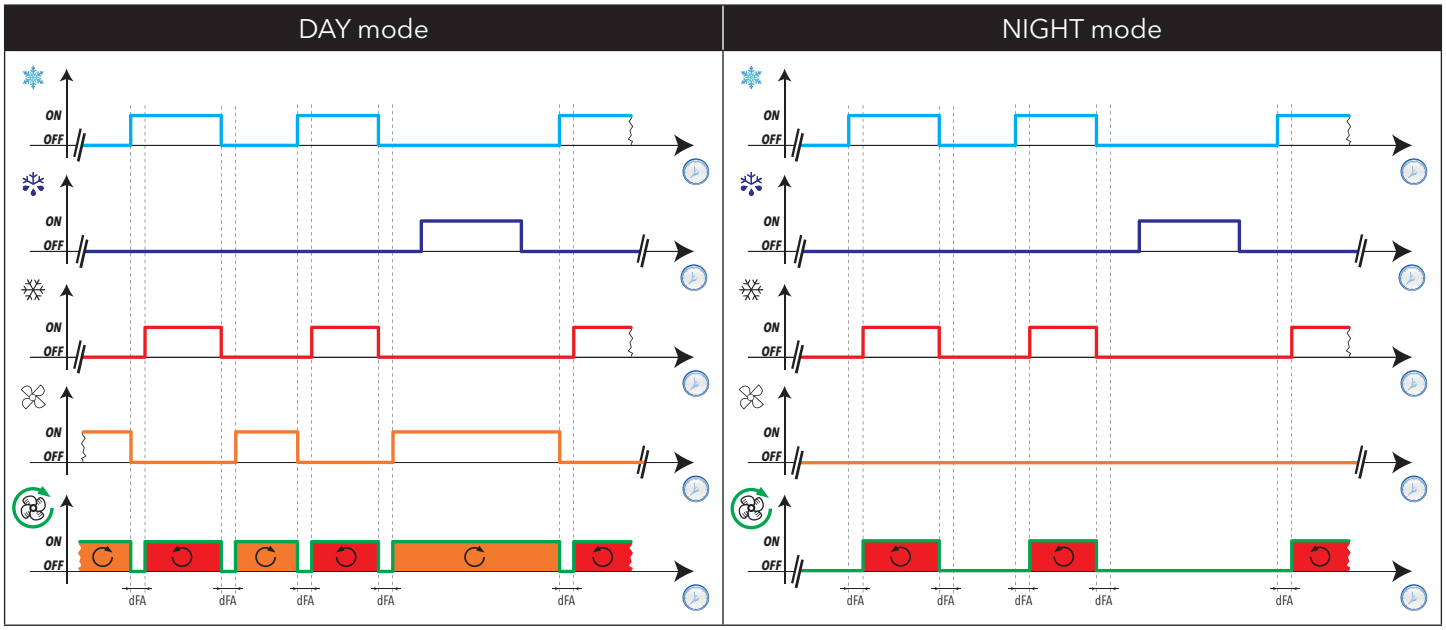
CONDENSER FANS

Operating conditions

The regulator is active if one of the relays is configured as "Condenser fans reversal" (**H21 = ±8** or **H22 = ±8** or **H23 = ±8**) and defrost with compressor stopped is configured. (**dty = +0**).

NOTE: Parameter H22 is only present on EWPlus 971/974 EO, whereas H23 is only present on EWPlus 974 EO





User parameters

The parameters that manage the condenser fans are:

Label	Description	EWPlus EO Model
dFA	Compressor and condenser fans activation delay after command	All
dty	Type of defrost. **0** = Electric defrost; **1** = Cycle inversion defrost; **2** = Free mode defrost	971/974
H21	Configurability of digital output 1.	All
H22	Configurability of digital output 2.	971/974
H23	Configurability of digital output 3.	974

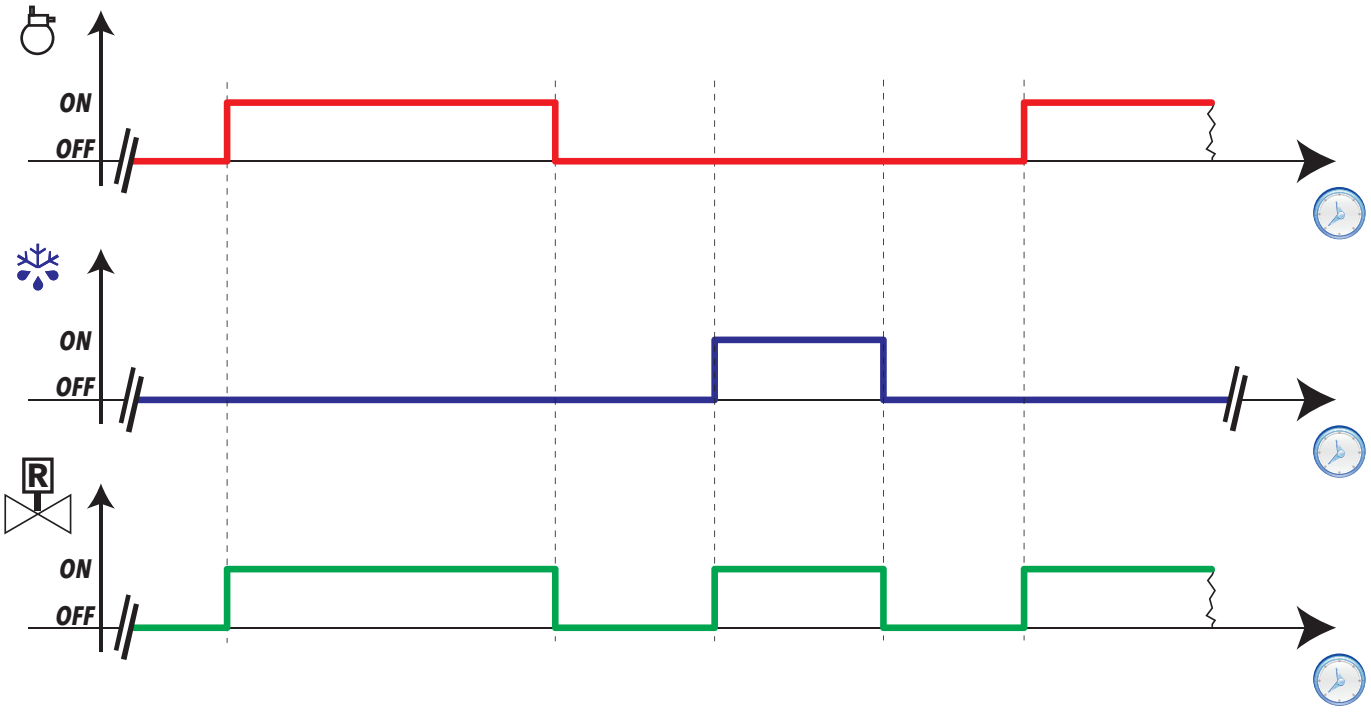
CHECK VALVE

Operating conditions

By appropriately configuring one of the digital outputs (**H21 = ±9** or **H22 = ±9** or **H23 = ±9**) it is possible to control a check valve to prevent the "migration" and resulting loss of refrigerant gas from the refrigeration circuit when the compressor is switched off.

NOTE: Parameter H22 is only present on EWPlus 971/974 EO, whereas H23 is only present on EWPlus 974 EO

The valve is active when the compressor is on or when a defrost cycle is in progress.
The valve is off when the compressor is off and no defrost cycles are active.



User parameters

The parameters that control the check valve are:

Label	Description	EWPlus EO Model
H21	Configurability of digital output 1.	All
H22	Configurability of digital output 2.	971/974
H23	Configurability of digital output 3.	974

DOOR SWITCH INPUT

Operating conditions

The door switch input is associated to an appropriately configured digital input (**H11 = ±4** or **H12 = ±4**).
By controlling the opening of the door, it is possible to deactivate the compressor output and/or the fans.
It is also possible to associate a deactivation delay to the compressor output by means of parameter **dCO**.

If the door is opened during a defrost cycle, the cycle is not shut down.
When the door is opened, the controller operates as follows based on the value of parameters **dOd** and **dCO**:

dOd	Fans (FAN)	Compressor (COMP)
dOd = 0	ON	ON
dOd = 1	OFF	ON
dOd = 2	ON	OFF after time dCO
dOd = 3	OFF	OFF after time dCO

User parameters

The parameters that manage the auxiliary (AUX) output regulator are:

Label	Description	EWPlus EO Model
dOd	Enable utility switch-off on activation of digital input (set as door switch)	All
dAd	Digital input activation delay	All
OAO	Alarms signalling delay after disabling of digital input (door closing)	All
tdO	Door open alarm delay time	All
dCO	Compressor switch off delay from door switch	All

STANDBY

Operating conditions

The Standby regulator can be activated by digital input (if configured) or by key (if programmed).

With the device OFF the display shows "OFF" and all regulators are blocked including alarms.

When the device is switched on via a key or an appropriately configured digital input, regular operation commences, the same as from power-on. After power-on, the temperature alarm is excluded for a time set in parameter **PAO**, and the delay set in parameter **OdO** is activated.
Each time that the device is switched off, all cycle times are reset.
The on/off state is saved in non-volatile memory hence when power returns after a blackout, the device will restart in the state that was active prior to the blackout.
The output from standby is linked to the delay set in parameter **OdO**.

NOTE: When the controller is switched off, all relays are de-energised except for Aux: button/aux input-light-door switch are active.

User parameters

The parameters that manage the Standby regulator are:

Label	Description	EWPlus EO Model
PAO	Alarm disabling after power-on	All
OdO	Delay output enabling from power-on	All
OAO	High and low temperature alarms disabling time after door closing	All

EWPLUS 961 TABLES

"USER" MENU PARAMETERS TABLE

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	SEt	Temperature control SEtpoint	LSE ... HSE	°C/°F	3,5	3,5	3,5	3,5
	diF	Compressor relay activation differential	0,1 ... 30,0	°C/°F	2,0	2,0	2,0	2,0
	HSE	Maximum value settable for setpoint	LSE ... 320	°C/°F	99,0	99,0	99,0	99,0
	LSE	Minimum value settable for setpoint	-67,0 ... HSE	°C/°F	-50,0	-50,0	-50,0	-50,0
	dit	Interval between the start of two consecutive defrost cycles	0 ... 250	hours	24	24	24	24
	dEt	Defrost timeout.	1 ... 250	min	30	30	30	30
	HAL	Maximum temperature alarm	LAL ... 320	°C/°F	50,0	50,0	50,0	50,0
	LAL	Minimum temperature alarm	-67,0 ... HAL	°C/°F	-50,0	-50,0	-50,0	-50,0
	tAO	Time delay for temperature alarm indication	0 ... 250	min	0	0	0	0
	dCS	Deep cooling cycle setpoint	-67,0 ... 320	°C/°F	-2,0	-2,0	-2,0	-2,0
	tdC	Deep cooling cycle duration	0 ... 255	min	0	0	0	0
	OSP	Offset on setpoint	-30,0 ... 30,0	°C/°F	0,5	0,5	1,0	1,0
	OdF	Activation differential correction	0,0 ... 30,0	°C/°F	4,0	4,0	2,0	2,0
	dnt	Night mode duration	0 ... 24	hours	11	11	10	9
	dFt	Fast cooling duration	0 ... 24	hours	0	0	1	1
	SPn	Night mode setpoint	LSE ... HSE	°C/°F	0,7	0,7	3,0	6,5
	dFn	Night mode differential	0,1 ... 30,0	°C/°F	4,0	4,0	2,0	0,1
	SPF	Fast cooling setpoint	LSE ... HSE	°C/°F	0,0	0,0	-0,5	-6,8
	dFF	Fast cooling differential	0,1 ... 30,0	°C/°F	0,1	0,1	0,1	0,1
	LOC	Basic commands edit lock	n/y	flag	n	n	n	n
PA1	PS1	PAssword1: if **PS1≠0** it is the password to the "**User**" parameters	0 ... 250	num	0	0	0	0
Pb1	CA1	Calibration 1. Temperature value to be added to the value of Pb1	-12,0 ... +12,0	°C/°F	0,0	0,0	0,0	0,0
Pb3	CA3	Calibration 3. Temperature value to be added to the value of Pb3	-12,0 ... +12,0	°C/°F	0,0	0,0	0,0	0,0
	ddL	Display mode during defrost. 0 = display the temperature read by probe **Pb1**; 1 = locks the reading at the temperature value read by **Pb1** when defrosting starts and until the next time the **SEt** value is reached; 2 = displays the label **deF** during defrosting and until the next time the **SEt** value is reached (or until **Ldd** has elapsed).	0/1/2	num	1	1	1	1
	Ldd	Timeout value for display unlock - label dEF	0 ... 255	min	30	30	30	30
-	reL	Device version. Read-only parameter	/	/	/	/	/	/
-	tAb	Parameters tAble. Reserved: read-only parameter	/	/	/	/	/	/
	PA2	Folder that permits access to the "Installer" menu. If **PS2≠0** the password will be requested.						

NOTES: * **The "USER" menu parameters also include PA2 which permits access to the "Installer" menu**
** **For the complete list of parameters, see the "Installer Menu Parameters Table".**

"INSTALLER" MENU PARAMETERS TABLE

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	SEt	Control SEtpoint with range between the minimum Setpoint LSE and the maximum Setpoint HSE. The setpoint value is located in the Machine Status menu.	LSE...HSE	°C/°F	3,5	3,5	3,5	3,5
		COMPRESSOR (folder "CP")						
	diF	diFferential. Compressor relay activation differential; the compressor stops on reaching the setpoint value (as indicated by the regulation probe) and restarts at a temperature value equal to the setpoint plus the value of the differential. **Note: cannot be equal to 0**.	0,1...30,0	°C/°F	2,0	2,0	2,0	2,0
	HSE	Higher SEt. Maximum value settable for setpoint	LSE...320	°C/°F	99,0	99,0	99,0	99,0
	LSE	Lower SEt. Minimum value settable for setpoint	-67,0...HSE	°C/°F	-50,0	-50,0	-50,0	-50,0
	Ont	Controller switch-on time in the event of faulty probe: - if **Ont** = 1 and **OFt** = 0, the compressor will always stay ON; - if **Ont** = 1 and **OFt** > 0, it operates in Duty Cycle mode.	0 ... 250	min	0	0	0	0
	OFt	Controller switch-off time in the event of a faulty probe: - if **OFt** = 1 and **Ont** = 0, the controller will always stay OFF; - if **Ont** = 1 and **OFt** > 0, it operates in Duty Cycle mode.	0 ... 250	min	1	1	1	1
	dOn	delay (at) On compressor. Compressor relay activation delay after request.	0 ... 250	secs	0	0	0	0
	dOF	delay (after power) OFF. Delay time after power-off: the delay time indicated must elapse between deactivation of the compressor relay and the next power-on.	0 ... 250	min	0	0	0	0
	dbi	Delay between power-ons. Delay time between power-ons; the delay time indicated must elapse between two consecutive compressor power-ons.	0 ... 250	min	0	0	0	0
	OdO (!)	Delay in activating outputs after the instrument is switched on or after a power failure. **0** = not active	0 ... 250	min	0	0	0	0
	dFA	Compressor and condenser fans activation delay after command	0 ... 255	secs	0	0	0	0
		DEFROST (folder "dEF")						
	dit	defrost interval time. Interval between the start of two consecutive defrost cycles.	0 ... 250	hours	24	24	24	24
	dCt	Selects the count mode for the defrost interval: 0 = compressor running time (DIGIFROST® method); Defrost active ONLY when the compressor is on. **NOTE: compressor running time is counted separately from the evaporator probe (count active also when evaporator probe missing or faulty).** 1 = appliance running time; defrost counting is always active when the machine is on and starts at each power-on. 2 = compressor stop. Every time the compressor stops, a defrost cycle is performed according to parameter dtY; 3 = not USED	0/1/2/3	num	1	1	1	1
	dOH	defrost Offset Hour. Delay for start of first defrost after request.	0 ... 59	min	0	0	0	0
	dEt	defrost Endurance time. Defrost timeout; determines the maximum defrost duration.	1 ... 250	min	30	30	30	30
	dPO	defrost (at) Power On. Determines whether the instrument must enter defrost mode (if the temperature measured by Pb2 allows this operation). **n** = no; **y** = yes.	n/y	flag	n	n	n	n
	dSE	Temperature threshold for start of defrost.	-67,0...320	°C/°F	0,0	0,0	0,0	0,0
	dtt	Time for which the temperature of the evaporator must remain below **dSE**	0 ... 255	min	0	0	0	0
		ALARMS (folder "AL")						
	Att	Can be used to select absolute (**Att=0**) or relative (**Att=1**) values for **HAL** and **LAL** parameters. **NOTE: In case of relative values (para. Att=1), the HAL parameter should be set to positive values, while the LAL parameter should be set to negative values (-LAL).**	0/1	num	1	1	1	1

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
((•))	AFd	Alarms activation differential.	1,0 ... 50,0	°C/°F	2,0	2,0	2,0	2,0
((•))	HAL	Maximum temperature alarm. Temperature value (intended either as distance from setpoint or as an absolute value based on **Att**) which, if exceeded in an upward direction, triggers the activation of the alarm signal. **See "Max/Min temperature alarms".**	LAL...320	°C/°F	50,0	50,0	50,0	50,0
((•))	LAL	Minimum temperature alarm. Temperature value (intended as distance from the set point or as an absolute value based on **Att**) which, when exceeded downwards, triggers the activation of the alarm signal. **See "Max/Min temperature alarms".**	-67,0...HAL	°C/°F	-50,0	-50,0	-50,0	-50,0
((•))	PAO	Alarm override time after device is switched on following a power failure. **This parameter refers to high/low temperature alarms only.**	0 ... 10	hours	0	0	0	0
((•))	dAO	Temperature alarm exclusion time after defrost.	0 ... 999	min	0	0	0	0
((•))	OAO	Alarm signal delay (low and high temperature) after the deactivation of the digital input (port closed).	0 ... 10	hours	0	0	0	0
((•))	tdO	Delay in door open alarm activation.	0 ... 250	min	0	0	0	0
((•))	tAO	Time delay for temperature alarm indication. **This parameter refers to high/low temperature alarms only.**	0 ... 250	min	0	0	0	0
((•))	rLO	An external alarm locks the regulators. **n** = does not lock; **y** = locks	n/y	flag	n	n	n	n
((•))	SA3	Probe 3 alarm Setpoint.	-67,0...320	°C/°F	30,0	30,0	30,0	30,0
((•))	dA3	Probe 3 alarm differential.	1,0 ... 50,0	°C/°F	1,0	1,0	1,0	1,0
		COOL PROTECTION (folder "CPr")						
	CPS	Cool protection setpoint	-67,0...320	°C/°F	-10,0	-10,0	-10,0	-10,0
	CPd	Cool protection differential	0,1...30,0	°C/°F	1,0	1,0	1,0	1,0
	Cpt	Time that the temperature remains below the cool protection setpoint (**CPS**)	0 ... 255	min	0	0	0	0
		LIGHTS & DIGITAL INPUTS (folder "Lit")						
	dOd	Digital input for switching off utilities: **0** = disabled; **1** = disables the fans; **2** = disables the compressor; **3** = disables fans and compressor.	0/1/2/3	num	1	1	1	1
	dAd	Activation delay for digital input	0 ... 255	min	0	0	0	0
	dCO	Compressor enabling delay from acknowledgement	0 ... 255	min	0	0	0	0
	dCd	Delay in activating fans after door closed	0 ... 250	secs	10	10	10	10
		PRESSURE SWITCH (folder "PrE")						
	Pen	Number of errors allowed per maximum/minimum pressure switch input	0 ... 15	num	5	5	5	5
	PEI	Minimum/maximum pressure switch error count interval	1 ... 99	min	1	1	1	1
	PEt	Delay in activating compressor after pressure switch deactivation	0 ... 255	min	0	0	0	0
		DEEP COOLING (folder "dEC")						
	dCA	Enable deep cooling (**0** = disabled; **1** = manual; **2** = automatic).	0/1/2	num	2	2	2	2
	dCS	Deep cooling setpoint	-67,0...320	°C/°F	-2,0	-2,0	-2,0	-2,0
	tdC	Deep cooling duration	0 ... 255	min	0	0	0	0
	dCC	Defrost delay after a Deep Cooling Cycle	0 ... 255	min	0	0	0	0
	Sid	Threshold for start of deep cooling	-67,0...320	°C/°F	12,0	12,0	12,0	12,0
	tOS	Deep cooling activation time	0 ... 255	min	5	5	5	5
		ENERGY SAVING (folder "EnS")						
	ESt	Energy Saving mode: **0**= disabled; **1**= Offset on setpoint; **2**= Offset on differential; **3**= offset on setpoint and differential; **4**= "Open front bottle cooler" algorithm; **5**= "Glass door bottle cooler" algorithm; **6**= "Vertical glass door merchandiser" algorithm.	0 ... 6	num	5	5	4	4
	ESA	AUX state during energy saving: **0** = disabled (no effect on AUX); **1** = AUX off; **2** = AUX on	0/1/2	num	0	0	0	0
	ESF	Night mode (energy saving) activation for fans. **n** = disabled; **y** = enabled if energy saving mode is active (**ESt ≠ 0**)	n/y	flag	y	y	y	y
	Cdt	Door close time	0 ... 255	min (*10)	6	6	6	6

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	ESo	Cumulative door open time for disabling Energy Saving mode	0 ... 10	num	0	0	0	0
	OSP	Setpoint offset	-30,0...30,0	°C/°F	0,5	0,5	1,0	1,0
	OdF	Differential offset	0,0 ... 30,0	°C/°F	4,0	4,0	2,0	2,0
	dnt	Night mode duration	0 ... 24	hours	11	11	10	9
	dFt	Fast cooling duration	0 ... 24	hours	0	0	1	1
	SPn	Night mode setpoint	LSE ... HSE	°C/°F	0,7	0,7	3,0	6,5
	dFn	Night mode differential	0,1 ... 30,0	°C/°F	4,0	4,0	2,0	0,1
	SPF	Fast cooling setpoint	LSE ... HSE	°C/°F	0,0	0,0	-0,5	-6,8
	dFF	Fast cooling differential	0,1 ... 30,0	°C/°F	0,1	0,1	0,1	0,1
	ESP	Sensitivity of virtual door regulator	0 ... 5	num	0	0	0	0
	dOt	Maximum door open time with virtual door switch	0 ... 255	secs	0	0	0	0
		COMMUNICATION (folder "Add")						
	PtS	Selection of communication protocol. **t** = Televis; **d** = Modbus	t/d	flag	t	t	t	t
	dEA	Index of the device within the family (valid values from 0 to 14)	0 ... 14	num	0	0	0	0
	FAA	Device family (valid values from 0 to 14). The pair of values FAA and dEA are the network address of the device and are given in the format "FF.DD" (where FF=FAA and DD=dEA).	0 ... 14	num	0	0	0	0
	Pty	Modbus parity bit. **n**=none; **E**=even; **o**=odd	n/E/o	flag	n	n	n	n
	StP	Modbus stop bit	1b/2b	flag	1b	1b	1b	1b
		DISPLAY (folder "DiS")						
	LOC	LOCk. Setpoint edit lock. See corresponding paragraph. You will still be able to open parameter programming and alter parameters, including the state of this parameter if you need to unlock the keyboard for example. **y** = yes; **n** = no.	n/y	flag	n	n	n	n
PA1	PS1	PAssword1. When enabled (**PS1≠0**) it is the password to the "**User**" parameters	0 ... 250	num	0	0	0	0
PA2	PS2	PAssword2. When enabled (**PS2≠0**) it is the password to the "**Installer**" parameters	0 ... 250	num	15	15	15	15
	ndt	number display type. Display with decimal point. **y** = yes; **n** = no	n/y	flag	y	y	y	y
Pb1	CA1	Calibration 1. Positive or negative temperature value to be added to the value of Pb1.	-12,0...+12,0	°C/°F	0,0	0,0	0,0	0,0
Pb3	CA3	Calibration 3. Positive or negative temperature value to be added to the value of Pb3.	-12,0...+12,0	°C/°F	0,0	0,0	0,0	0,0
	ddL	Display mode during defrost. 0 = display the temperature read by probe **Pb1**; 1 = locks the reading at the temperature value read by **Pb1** when defrosting starts and until the next time the **SEt** value is reached; 2 = displays the label **deF** during defrosting and until the next time the **SEt** value is reached (or until **Ldd** has elapsed).	0/1/2	num	1	1	1	1
	Ldd	Timeout value for display unlock - label dEF	0 ... 255	min	30	30	30	30
	dro	Select the unit of measurement used when displaying the temperature recorded by the probes. (**0** = °C, **1** = °F). **NOTE: switching between °C and °F DOES NOT modify the SEt, diF values, etc. (e.g. set=10°C becomes 10°F)**	0/1	num	0	0	0	0
	ddd	Selects type of value to display. **0** = Setpoint; **1** = probe Pb1 ; **2** = probe Pb2 ; **3** = probe Pb3	0/1/2/3	num	1	1	1	1
		CONFIGURATION (folder "CnF")						
	H08	Function when in standby mode. **0** = display off; the regulators are active and the device reactivates the display to signal any alarms. **1** = display off; regulators and alarms blocked. **2** = display shows OFF label; regulators and alarms blocked.	0/1/2	num	2	2	2	2

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
D.I.1	H11	Configuration of digital input 1/polarity. **0** = disabled; **±1** = defrost; **±2** = reduced set; **±3** = AUX; **±4** = door switch; **±5** = external alarm; **±6** = standby; **±7** = pressure switch; **±8** = Deep Cooling; **±9** = energy saving; **±10** = door switch + energy saving **NOTE: • the "+" sign indicates input active if contact is closed.** **• the "-" sign indicates input active if contact is open.**	-10 ... +10	num	10	0	9	9
D.I.2	H12	Configuration of digital input 2/polarity. Same as H11.	-10 ... +10	num	0	0	0	0
❄	H21	Configurability of digital output 1. **0** = disabled; **1** = compressor; **2** = defrost; **3** = fans; **4** = alarm; **5** = AUX; **6** = Standby; **7** = NOT USED; **8** = condenser fans reversal; **9** = check valve.	0 ... 9	num	1	1	1	1
	H25	Enable/disable buzzer. **0** = disabled; **4** = enabled; **1-2-3-5-6-7-8-9** = NOT USED;	0 ... 9	num	0	0	0	0
DOWN	H32	Configurability of DOWN key. **0** = disabled; **1** = defrost; **2** = AUX; **3** = reduced set; **4** = standby; **5** = deep cooling; **6** = energy saving	0 ... 6	num	0	0	0	0
ESC	H33	ESC key configuration. Same as H32.	0 ... 6	num	4	4	4	4
Pb3	H43	Probe Pb3 present. **n** = not present; **y** = present	n/y	flag	n	y	n	n
-	reL	Device version. Read-only parameter	/	/	/	/	/	/
-	tAb	Parameters tAble. Reserved: read-only parameter	/	/	/	/	/	/
		COPY CARD (folder "FPr")						
	UL	Transfer programming parameters from instrument to Copy Card	/	/	/	/	/	/
	Fr	Format Copy Card. Erases all data contained in the Copy Card. **NOTE: If parameter "Fr" is used, the data entered will be permanently lost. This operation cannot be reversed.**	/	/	/	/	/	/
		FUNCTIONS (folder "FnC")						
	rAP	Reset pressure switch alarms	/	/	/	/	/	/

NOTE: 1) If one or more parameters marked with (!) in folder "CnF" are modified, the controller MUST be switched off and then switched on again to ensure correct operation.

EWPLUS 971 TABLES

"USER" MENU PARAMETERS TABLE

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	SEt	Temperature control SEtpoint	LSE ... HSE	°C/°F	3,5	1,5	1,0	3,5
	diF	Compressor relay activation differential	0,1 ... 30,0	°C/°F	2,0	4,0	2,0	2,0
	HSE	Maximum value settable for setpoint	LSE ... 320	°C/°F	99,0	99,0	99,0	99,0
	LSE	Minimum value settable for setpoint	-67,0 ... HSE	°C/°F	-50,0	-50,0	-50,0	-50,0
	dty	Type of defrost. **0** = Electric defrost; **1** = Cycle inversion defrost; **2** = Defrost independent of compressor.	0/1/2	num	0	0	1	0
	dit	Interval between the start of two consecutive defrost cycles	0 ... 250	hours	24	2	6	24
	dEt	Defrost timeout.	1 ... 250	min	30	30	30	30
	dSt	Defrost end temperature (determined by probe Pb2).	-67,0 ... 320	°C/°F	8,0	3,0	8,0	8,0
	FSt	Fans disabling temperature.	-67,0 ... 320	°C/°F	50,0			50,0
	Fdt	Fan activation delay after a defrost cycle.	0 ... 250	min	0			0
	dt	Coil drainage time.	0 ... 250	min	0	0	0	0
	dFd	Allows exclusion of the evaporator fans to be selected or not selected during defrosting.	n/y	flag	y			y
	HAL	Maximum temperature alarm	LAL ... 320	°C/°F	50,0	50,0	50,0	50,0
	LAL	Minimum temperature alarm	-67,0 ... HAL	°C/°F	-50,0	-50,0	-50,0	-50,0
	tAO	Time delay for temperature alarm indication	0 ... 250	min	0	0	0	0
	dCS	Deep cooling cycle setpoint	-67,0 ... 320	°C/°F	-2,0	-2,0	-2,0	-2,0
	tdC	Deep cooling cycle duration	0 ... 255	min	0	0	0	0
	OSP	Offset on setpoint	-30,0 ... 30,0	°C/°F	0,5	1,0	0,5	0,5
	OdF	Activation differential correction	0,0 ... 30,0	°C/°F	4,0	2,0	4,0	4,0
	dnt	Night mode duration	0 ... 24	hours	11	10	10	11
	dFt	Fast cooling duration	0 ... 24	hours	0	1	1	0
	SPn	Night mode setpoint	LSE ... HSE	°C/°F	0,7	3,0	1,0	0,7
	dFn	Night mode differential	0,1 ... 30,0	°C/°F	4,0	2,0	4,0	4,0
	SPF	Fast cooling setpoint	LSE ... HSE	°C/°F	0,0	-0,5	-2,0	0,0
	dFF	Fast cooling differential	0,1 ... 30,0	°C/°F	0,1	0,1	0,1	0,1
	LOC	Basic commands edit lock	n/y	flag	n	n	n	n
PA1	PS1	PAssword1: if **PS1≠0** it is the password to the "**User**" parameters	0 ... 250	num	0	0	0	0
Pb1	CA1	Calibration 1. Temperature value to be added to the value of Pb1	-12,0 ... +12,0	°C/°F	0,0	0,0	0,0	0,0
Pb2	CA2	Calibration 2. Temperature value to be added to the value of Pb2	-12,0 ... +12,0	°C/°F	0,0	0,0	0,0	0,0
Pb3	CA3	Calibration 3. Temperature value to be added to the value of Pb3	-12,0 ... +12,0	°C/°F	0,0	0,0	0,0	0,0
	ddL	Display mode during defrost. 0 = display the temperature read by probe **Pb1**; 1 = locks the reading at the temperature value read by **Pb1** when defrosting starts and until the next time the **SEt** value is reached; 2 = displays the label **deF** during defrosting and until the next time the **SEt** value is reached (or until **Ldd** has elapsed).	0/1/2	num	1	1	1	1
	Ldd	Timeout value for display unlock - label dEF	0 ... 255	min	30	30	30	30
Pb2	H42	Evaporator probe (Pb2) present. **n** = not present; **y** = present	n/y	flag	y	y	y	y
-	reL	Device version. Read-only parameter	/	/	/	/	/	/
-	tAb	Parameters tAble. Reserved: read-only parameter	/	/	/	/	/	/
	PA2	Folder that permits access to the "Installer" menu. If **PS2≠0** the password will be requested.						

NOTES: * **The "USER" menu parameters also include PA2 which permits access to the "Installer" menu**

** **For the complete list of parameters, see the "Installer Menu Parameters Table".**

"INSTALLER" MENU PARAMETERS TABLE

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	SEt	Control SEtpoint with range between the minimum Setpoint LSE and the maximum Setpoint HSE. The setpoint value is located in the Machine Status menu.	LSE...HSE	°C/°F	3,5	1,5	1,0	3,5
		COMPRESSOR (folder "CP")						
	diF	diFferential. Compressor relay activation differential; the compressor stops on reaching the setpoint value (as indicated by the regulation probe) and restarts at a temperature value equal to the setpoint plus the value of the differential. **Note: cannot be equal to 0.**	0,1...30,0	°C/°F	2,0	4,0	2,0	2,0
	HSE	Higher SEt. Maximum value settable for setpoint	LSE...320	°C/°F	99,0	99,0	99,0	99,0
	LSE	Lower SEt. Minimum value settable for setpoint	-67,0...HSE	°C/°F	-50,0	-50,0	-50,0	-50,0
	Ont	Controller switch-on time in the event of faulty probe: - if **Ont** = 1 and **OFt** = 0, the compressor will always stay ON; - if **Ont** = 1 and **OFt** > 0, it operates in Duty Cycle mode.	0 ... 250	min	0	1	0	0
	OFt	Controller switch-off time in the event of a faulty probe: - if **OFt** = 1 and **Ont** = 0, the controller will always stay OFF; - if **Ont** = 1 and **OFt** > 0, it operates in Duty Cycle mode.	0 ... 250	min	1	1	1	1
	dOn	delay (at) On compressor. Compressor relay activation delay after request.	0 ... 250	secs	0	15	0	0
	dOF	delay (after power) OFF. Delay time after power-off: the delay time indicated must elapse between deactivation of the compressor relay and the next power-on.	0 ... 250	min	0	3	0	0
	dbi	Delay between power-ons. Delay time between power-ons; the delay time indicated must elapse between two consecutive compressor power-ons.	0 ... 250	min	0	0	0	0
	OdO (!)	Delay in activating outputs after the instrument is switched on or after a power failure. **0** = not active	0 ... 250	min	0	0	0	0
	dFA	Compressor and condenser fans activation delay after command	0 ... 255	secs	0	0	0	0
		DEFROST (folder "dEF")						
	dty	defrost type. Type of defrost. **0** = electric defrost - compressor off (OFF) during defrosting; 1 = cycle inversion defrost (hot gas); compressor on during defrosting: **2** = Free mode defrost; defrost independent of compressor.	0/1/2	num	0	0	1	0
	dit	defrost interval time. Interval between the start of two consecutive defrost cycles.	0 ... 250	hours	24	2	6	24
	dCt	Selects the count mode for the defrost interval: 0 = compressor running time (DIGIFROST® method); Defrost active ONLY when the compressor is on. **NOTE: compressor running time is counted separately from the evaporator probe (count active also when evaporator probe missing or faulty).** 1 = appliance running time; defrost counting is always active when the machine is on and starts at each power-on. 2 = compressor stop. Every time the compressor stops, a defrost cycle is performed according to parameter dtY; 3 = not USED	0/1/2/3	num	1	0	1	1
	dOH	defrost Offset Hour. Delay for start of first defrost after request.	0 ... 59	min	0	0	0	0
	dEt	defrost Endurance time. Defrost timeout; determines the maximum defrost duration.	1 ... 250	min	30	30	30	30
	dSt	defrost Stop temperature. Defrost end temperature (determined by probe Pb2).	-67,0...320	°C/°F	8,0	3,0	8,0	8,0
	dPO	defrost (at) Power On. Determines whether the instrument must enter defrost mode (if the temperature measured by Pb2 allows this operation). **n** = no; **y** = yes.	n/y	flag	n	n	n	n

<table>
<tr><th rowspan="2">Cat</th><th rowspan="2">Par</th><th rowspan="2">Description</th><th rowspan="2">Range</th><th rowspan="2">M.U.</th><th colspan="4">Value for Application</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>❄</td><td>dSE</td><td>Temperature threshold for start of defrost.</td><td>-67,0...320</td><td>°C/°F</td><td>0,0</td><td>-6,0</td><td>0,0</td><td>0,0</td></tr>
<tr><td>❄</td><td>dtt</td><td>Time for which the temperature of the evaporator must remain below dSE</td><td>0 ... 255</td><td>min</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td colspan="9">FANS (folder "FAn")</td></tr>
<tr><td>🌀</td><td>FPt</td><td>Characterises parameter “FSt” which can be expressed either as an absolute temperature value or as a value relative to the Setpoint.
0 = absolute; 1 = relative.</td><td>0/1</td><td>flag</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>🌀</td><td>FSt</td><td>Fans disabling temperature; if Pb2 > FSt, the fans are stopped. The value is either positive or negative and, depending on parameter FPt, can be either the absolute temperature or the temperature relative to the Setpoint.</td><td>-67,0 ... 320</td><td>°C/°F</td><td>50,0</td><td>-20,0</td><td>50,0</td><td>50,0</td></tr>
<tr><td>🌀</td><td>FAd</td><td>Fan activation intervention differential (see parameters “FSt” and “Fot”).</td><td>1,0 ... 50,0</td><td>°C/°F</td><td>2,0</td><td>1,0</td><td>2,0</td><td>2,0</td></tr>
<tr><td>🌀</td><td>Fdt</td><td>Fan activation delay after a defrost cycle.</td><td>0 ... 250</td><td>min</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>🌀</td><td>dt</td><td>Coil drainage time.</td><td>0 ... 250</td><td>min</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>🌀</td><td>dFd</td><td>Allows exclusion of the evaporator fans to be selected or not selected during defrosting. y = yes (fan excluded e.g. switched off); n = no.</td><td>n/y</td><td>flag</td><td>y</td><td>y</td><td>y</td><td>y</td></tr>
<tr><td>🌀</td><td>FCO</td><td>Evaporator fans operating mode. The state of the fans will be:
<table>
<tr><th></th><th></th><th colspan="2">DAY</th><th colspan="2">NIGHT</th></tr>
<tr><th>H42</th><th>FCO</th><th>COMPRESSOR ON</th><th>COMPRESSOR OFF</th><th>COMPRESSOR ON</th><th>COMPRESSOR OFF</th></tr>
<tr><td rowspan="4">H42 = y</td><td>0</td><td>Thermostat controlled</td><td>OFF</td><td>Thermostat controlled</td><td>OFF</td></tr>
<tr><td>1</td><td>Thermostat controlled</td><td>Thermostat controlled</td><td>Thermostat controlled</td><td>Thermostat controlled</td></tr>
<tr><td>2</td><td>Thermostat controlled</td><td>Duty Cycle Day</td><td>Thermostat controlled</td><td>Duty Cycle Night</td></tr>
<tr><td>3</td><td>Duty Cycle Day</td><td>Duty Cycle Day</td><td>Duty Cycle Night</td><td>Duty Cycle Night</td></tr>
<tr><td rowspan="4">H42 = n</td><td>0</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
<tr><td>1</td><td>ON</td><td>Duty Cycle Day</td><td>ON</td><td>Duty Cycle Night</td></tr>
<tr><td>2</td><td>ON</td><td>Duty Cycle Day</td><td>ON</td><td>Duty Cycle Night</td></tr>
<tr><td>3</td><td>Duty Cycle Day</td><td>Duty Cycle Day</td><td>Duty Cycle Night</td><td>Duty Cycle Night</td></tr>
</table>
Duty Cycle Day: controlled by means of parameters “Fon” and “FoF”.
Duty Cycle Night: controlled by means of parameters “Fnn” and “FnF”.</td><td>0/1/2/3</td><td>num</td><td>3</td><td>0</td><td>3</td><td>3</td></tr>
<tr><td>🌀</td><td>FdC</td><td>Evaporator fans switch-off delay after compressor disabled</td><td>0 ... 99</td><td>min</td><td>1</td><td>0</td><td>1</td><td>1</td></tr>
<tr><td>🌀</td><td>Fon</td><td>Fan ON time in duty cycle. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (probe Pb2 present)</td><td>0 ... 250</td><td>secs (*10)</td><td>12</td><td>2</td><td>12</td><td>12</td></tr>
<tr><td>🌀</td><td>FoF</td><td>Fan OFF time in duty cycle. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (probe Pb2 present)</td><td>0 ... 250</td><td>secs (*10)</td><td>6</td><td>1</td><td>6</td><td>6</td></tr>
<tr><td>🌀</td><td>Fnn</td><td>Fan ON time in duty cycle night. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (probe Pb2 present)</td><td>0 ... 250</td><td>secs (*10)</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>🌀</td><td>FnF</td><td>Fan OFF time in duty cycle night. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (probe Pb2 present)</td><td>0 ... 250</td><td>secs (*10)</td><td>12</td><td>10</td><td>12</td><td>12</td></tr>
<tr><td colspan="9">ALARMS (folder "AL")</td></tr>
<tr><td>((•))</td><td>Att</td><td>Can be used to select absolute (Att=0) or relative (Att=1) values for HAL and LAL parameters.
NOTE: In case of relative values (para. Att=1), the HAL parameter should be set to positive values, while the LAL parameter should be set to negative values (-LAL).</td><td>0/1</td><td>num</td><td>1</td><td>0</td><td>1</td><td>1</td></tr>
<tr><td>((•))</td><td>AFd</td><td>Alarms activation differential.</td><td>1,0 ... 50,0</td><td>°C/°F</td><td>2,0</td><td>2,0</td><td>2,0</td><td>2,0</td></tr>
<tr><td>((•))</td><td>HAL</td><td>Maximum temperature alarm. Temperature value (intended either as distance from setpoint or as an absolute value based on Att) which, if exceeded in an upward direction, triggers the activation of the alarm signal. See “Max/Min temperature alarms”.</td><td>LAL...320</td><td>°C/°F</td><td>50,0</td><td>50,0</td><td>50,0</td><td>50,0</td></tr>
<tr><td>((•))</td><td>LAL</td><td>Minimum temperature alarm. Temperature value (intended as distance from the set point or as an absolute value based on Att) which, when exceeded downwards, triggers the activation of the alarm signal.
See “Max/Min temperature alarms”.</td><td>-67,0...HAL</td><td>°C/°F</td><td>-50,0</td><td>-50,0</td><td>-50,0</td><td>-50,0</td></tr>
<tr><td>((•))</td><td>PAO</td><td>Alarm override time after device is switched on following a power failure.
This parameter refers to high/low temperature alarms only.</td><td>0 ... 10</td><td>hours</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>((•))</td><td>dAO</td><td>Temperature alarm exclusion time after defrost.</td><td>0 ... 999</td><td>min</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>((•))</td><td>OAO</td><td>Alarm signal delay (low and high temperature) after the deactivation of the digital input (port closed).</td><td>0 ... 10</td><td>hours</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>((•))</td><td>tdO</td><td>Delay in door open alarm activation.</td><td>0 ... 250</td><td>min</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
</table>

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	tAO	Time delay for temperature alarm indication. **This parameter refers to high/low temperature alarms only.**	0 ... 250	min	0	0	0	0
	dAt	Alarm signalling end of defrost due to timeout. **n** = alarm not activated; **y** = alarm activated.	n/y	flag	n	n	n	n
	rLO	An external alarm locks the regulators. **n** = does not lock; **y** = locks	n/y	flag	n	n	n	n
	AOP	Alarm output polarity. **0** = alarm active and output disabled; **1** = alarm active and output enabled.	0/1	num	1	1	1	1
	SA3	Probe 3 alarm Setpoint.	-67,0...320	°C/°F	30,0	30,0	30,0	30,0
	dA3	Probe 3 alarm differential.	1,0 ... 50,0	°C/°F	1,0	1,0	1,0	1,0
		COOL PROTECTION (folder "CPr")						
	CPS	Cool protection setpoint	-67,0...320	°C/°F	-10,0	-10,0	-10,0	-10,0
	CPd	Cool protection differential	0,1...30,0	°C/°F	1,0	1,0	1,0	1,0
	Cpt	Time that the temperature remains below the cool protection setpoint (**CPS**)	0 ... 255	min	0	0	0	0
		LIGHTS & DIGITAL INPUTS (folder "Lit")						
	dOd	Digital input for switching off utilities: **0** = disabled; **1** = disables the fans; **2** = disables the compressor; **3** = disables fans and compressor.	0/1/2/3	num	1	0	1	1
	dAd	Activation delay for digital input	0 ... 255	min	0	0	0	0
	dCO	Compressor enabling delay from acknowledgement	0 ... 255	min	0	0	0	0
	dCd	Delay in activating fans after door closed	0 ... 250	secs	10	10	10	10
		PRESSURE SWITCH (folder "PrE")						
	Pen	Number of errors allowed per maximum/minimum pressure switch input	0 ... 15	num	5	5	5	5
	PEI	Minimum/maximum pressure switch error count interval	1 ... 99	min	1	1	1	1
	PEt	Delay in activating compressor after pressure switch deactivation	0 ... 255	min	0	0	0	0
		DEEP COOLING (folder "dEC")						
	dCA	Enable deep cooling (**0** = disabled; **1** = manual; **2** = automatic).	0/1/2	num	2	2	2	2
	dCS	Deep cooling setpoint	-67,0...320	°C/°F	-2,0	-2,0	-2,0	-2,0
	tdC	Deep cooling duration	0 ... 255	min	0	0	0	0
	dCC	Defrost delay after a Deep Cooling Cycle	0 ... 255	min	0	0	0	0
	Sid	Threshold for start of deep cooling	-67,0...320	°C/°F	12,0	12,0	12,0	12,0
	tOS	Deep cooling activation time	0 ... 255	min	5	5	5	5
		ENERGY SAVING (folder "EnS")						
	ESt	Energy Saving mode: **0**= disabled; **1**= Offset on setpoint; **2**= Offset on differential; **3**= offset on setpoint and differential; **4**= "Open front bottle cooler" algorithm; **5**= "Glass door bottle cooler" algorithm; **6**= "Vertical glass door merchandiser" algorithm.	0 ... 6	num	5	4	6	5
	ESA	AUX state during energy saving: **0** = disabled (no effect on AUX); **1** = AUX off; **2** = AUX on	0/1/2	num	1	1	0	0
	ESF	Night mode (energy saving) activation for fans. **n** = disabled; **y** = enabled if energy saving mode is active (**ESt ≠ 0**)	n/y	flag	y	y	y	y
	Cdt	Door close time	0 ... 255	min (*10)	6	6	6	6
	ESo	Cumulative door open time for disabling Energy Saving mode	0 ... 10	num	0	0	5	0
	OSP	Setpoint offset	-30,0...30,0	°C/°F	0,5	1,0	0,5	0,5
	OdF	Differential offset	0,0 ... 30,0	°C/°F	4,0	2,0	4,0	4,0
	dnt	Night mode duration	0 ... 24	hours	11	10	10	11
	dFt	Fast cooling duration	0 ... 24	hours	0	1	1	0
	SPn	Night mode setpoint	LSE ... HSE	°C/°F	0,7	3,0	1,0	0,7
	dFn	Night mode differential	0,1 ... 30,0	°C/°F	4,0	2,0	4,0	4,0
	SPF	Fast cooling setpoint	LSE ... HSE	°C/°F	0,0	-0,5	-2,0	0,0
	dFF	Fast cooling differential	0,1 ... 30,0	°C/°F	0,1	0,1	0,1	0,1

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	ESP	Sensitivity of virtual door regulator	0 ... 5	num	0	0	0	0
	dOt	Maximum door open time with virtual door switch	0 ... 255	secs	0	0	0	0
		COMMUNICATION (folder "Add")						
	PtS	Selection of communication protocol. **t** = Televis; **d** = Modbus	t/d	flag	t	t	t	t
	dEA	Index of the device within the family (valid values from 0 to 14)	0 ... 14	num	0	0	0	0
	FAA	Device family (valid values from 0 to 14). The pair of values FAA and dEA are the network address of the device and are given in the format "FF.DD" (where FF=FAA and DD=dEA).	0 ... 14	num	0	0	0	0
	Pty	Modbus parity bit. **n**=none; **E**=even; **o**=odd	n/E/o	flag	n	n	n	n
	StP	Modbus stop bit	1b/2b	flag	1b	1b	1b	1b
		DISPLAY (folder "DiS")						
	LOC	LOCk. Setpoint edit lock. See corresponding paragraph. You will still be able to open parameter programming and alter parameters, including the state of this parameter if you need to unlock the keyboard for example. **y** = yes; **n** = no.	n/y	flag	n	n	n	n
PA1	PS1	PAssword1. When enabled (**PS1≠0**) it is the password to the "**User**" parameters	0 ... 250	num	0	0	0	0
PA2	PS2	PAssword2. When enabled (**PS2≠0**) it is the password to the "**Installer**" parameters	0 ... 250	num	15	15	15	15
	ndt	number display type. Display with decimal point. **y** = yes; **n** = no	n/y	flag	y	y	y	y
Pb1	CA1	Calibration 1. Positive or negative temperature value to be added to the value of Pb1.	-12,0...+12,0	°C/°F	0,0	0,0	0,0	0,0
Pb2	CA2	Calibration 2. Positive or negative temperature value to be added to the value of Pb2.	-12,0...+12,0	°C/°F	0,0	0,0	0,0	0,0
Pb3	CA3	Calibration 3. Positive or negative temperature value to be added to the value of Pb3.	-12,0...+12,0	°C/°F	0,0	0,0	0,0	0,0
	ddL	Display mode during defrost. 0 = display the temperature read by probe **Pb1**; 1 = locks the reading at the temperature value read by **Pb1** when defrosting starts and until the next time the **SEt** value is reached; 2 = displays the label **deF** during defrosting and until the next time the **SEt** value is reached (or until **Ldd** has elapsed).	0/1/2	num	1	1	1	1
	Ldd	Timeout value for display unlock - label dEF	0 ... 255	min	30	30	30	30
	dro	Select the unit of measurement used when displaying the temperature recorded by the probes. (**0** = °C, **1** = °F). **NOTE: switching between °C and °F DOES NOT modify the SEt, diF values, etc. (e.g. set=10°C becomes 10°F)**	0/1	num	0	0	0	0
	ddd	Selects type of value to display. **0** = Setpoint; **1** = probe Pb1 ; **2** = probe Pb2 ; **3** = probe Pb3	0/1/2/3	num	1	1	1	1
		CONFIGURATION (folder "CnF")						
	H08	Function when in standby mode. **0** = display off; the regulators are active and the device reactivates the display to signal any alarms. **1** = display off; regulators and alarms blocked. **2** = display shows OFF label; regulators and alarms blocked.	0/1/2	num	2	2	2	2
D.I.1	H11	Configuration of digital input 1/polarity. **0** = disabled; **±1** = defrost; **±2** = reduced set; **±3** = AUX; **±4** = door switch; **±5** = external alarm; **±6** = standby; **±7** = pressure switch; **±8** = Deep Cooling; **±9** = energy saving; **±10** = door switch + energy saving **NOTE: • the "+" sign indicates that the input is active if the contact is closed. • the "-" sign indicates that the input is active if the contact is open.**	-10 ... +10	num	10	9	10	10
D.I.2	H12	Configuration of digital input 2/polarity. Same as H11.	-10 ... +10	num	0	0	0	0
❄	H21	Configurability of digital output 1. **0** = disabled; **1** = compressor; **2** = defrost; **3** = fans; **4** = alarm; **5** = AUX; **6** = Standby; **7** = NOT USED; **8** = condenser fans reversal; **9** = check valve.	0 ... 9	num	1	1	1	1

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	H22	Configurability of digital output 2. Same as H21.	0 ... 9	num	5	5	2	3
	H25	Enable/disable buzzer. **0** = disabled; **4** = enabled; **1-2-3-5-6-7-8-9** = NOT USED;	0 ... 9	num	0	0	0	0
DOWN	H32	Configurability of DOWN key. **0** = disabled; **1** = defrost; **2** = AUX; **3** = reduced set; **4** = standby; **5** = deep cooling; **6** = energy saving	0 ... 6	num	2	2	0	0
ESC	H33	ESC key configuration. Same as H32.	0 ... 6	num	4	4	4	4
Pb2	H42	Evaporator probe presence. **n** = not present; **y** = present	n/y	flag	y	y	y	y
Pb3	H43	Probe Pb3 present. **n** = not present; **y** = present	n/y	flag	n	n	n	n
-	reL	Device version. Read-only parameter	/	/	/	/	/	/
-	tAb	Parameters tAble. Reserved: read-only parameter	/	/	/	/	/	/
		COPY CARD (folder "FPr")						
	UL	Transfer programming parameters from instrument to Copy Card	/	/	/	/	/	/
	Fr	Format Copy Card. Erases all data contained in the Copy Card. **NOTE: if parameter "Fr" is used, the data entered will be permanently lost. This operation cannot be reversed.**	/	/	/	/	/	/
		FUNCTIONS (folder "FnC")						
	rAP	Reset pressure switch alarms	/	/	/	/	/	/

NOTE: 1) If one or more parameters marked with (!) in folder "CnF" are modified, the controller MUST be switched off and then switched on again to ensure correct operation.

EWPLUS 974 TABLES

"USER" MENU PARAMETERS TABLE

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	SEt	Temperature control SEtpoint	LSE ... HSE	°C/°F	3,5	1,5	1,0	2,0
	diF	Compressor relay activation differential	0,1 ... 30,0	°C/°F	2,0	4,0	2,0	8,0
	HSE	Maximum value settable for setpoint	LSE ... 320	°C/°F	99,0	99,0	99,0	99,0
	LSE	Minimum value settable for setpoint	-67,0 ... HSE	°C/°F	-50,0	-50,0	-50,0	-50,0
	dty	Type of defrost. **0** = Electric defrost; **1** = Cycle inversion defrost; **2** = Defrost independent of compressor.	0/1/2	num	0	0	1	0
	dit	Interval between the start of two consecutive defrost cycles	0 ... 250	hours	24	2	6	10
	dEt	Defrost timeout.	1 ... 250	min	30	30	30	45
	dSt	Defrost end temperature (determined by probe Pb2).	-67,0 ... 320	°C/°F	8,0	3,0	8,0	7,0
	FSt	Fans disabling temperature.	-67,0 ... 320	°C/°F	50,0	-20,0	50,0	
	Fdt	Fan activation delay after a defrost cycle.	0 ... 250	min	0	0	0	
	dt	Coil drainage time.	0 ... 250	min	0	0	0	
	dFd	Allows exclusion of the evaporator fans to be selected or not selected during defrosting.	n/y	flag	y	y	y	
	HAL	Maximum temperature alarm	LAL ... 320	°C/°F	50,0	50,0	50,0	9,5
	LAL	Minimum temperature alarm	-67,0 ... HAL	°C/°F	-50,0	-50,0	-50,0	-2,0
	tAO	Time delay for temperature alarm indication	0 ... 250	min	0	0	0	30
	dCS	Deep cooling cycle setpoint	-67,0 ... 320	°C/°F	-2,0	-2,0	-2,0	-2,0
	tdC	Deep cooling cycle duration	0 ... 255	min	0	0	0	0
	OSP	Offset on setpoint	-30,0 ... 30,0	°C/°F	0,5	1,0	0,5	1,0
	OdF	Activation differential correction	0,0 ... 30,0	°C/°F	4,0	2,0	4,0	2,0
	dnt	Night mode duration	0 ... 24	hours	11	10	10	9
	dFt	Fast cooling duration	0 ... 24	hours	0	1	1	1
	SPn	Night mode setpoint	LSE ... HSE	°C/°F	0,7	3,0	1,0	6,5
	dFn	Night mode differential	0,1 ... 30,0	°C/°F	4,0	2,0	4,0	0,1
	SPF	Fast cooling setpoint	LSE ... HSE	°C/°F	0,0	-0,5	-2,0	-6,8
	dFF	Fast cooling differential	0,1 ... 30,0	°C/°F	0,1	0,1	0,1	0,1
	LOC	Basic commands edit lock	n/y	flag	n	n	n	n
PA1	PS1	PAssword1: if **PS1≠0** it is the password to the "**User**" parameters	0 ... 250	num	0	0	0	0
Pb1	CA1	Calibration 1. Temperature value to be added to the value of Pb1	-12,0 ... +12,0	°C/°F	0,0	0,0	0,0	0,0
Pb2	CA2	Calibration 2. Temperature value to be added to the value of Pb2	-12,0 ... +12,0	°C/°F	0,0	0,0	0,0	0,0
Pb3	CA3	Calibration 3. Temperature value to be added to the value of Pb3	-12,0 ... +12,0	°C/°F	0,0	0,0	0,0	0,0
	ddL	Display mode during defrost. 0 = display the temperature read by probe **Pb1**; 1 = locks the reading at the temperature value read by **Pb1** when defrosting starts and until the next time the **SEt** value is reached; 2 = displays the label **deF** during defrosting and until the next time the **SEt** value is reached (or until **Ldd** has elapsed).	0/1/2	num	1	1	1	1
	Ldd	Timeout value for display unlock - label dEF	0 ... 255	min	30	30	30	30
Pb2	H42	Evaporator probe (Pb2) present. **n** = not present; **y** = present	n/y	flag	y	y	y	y
-	reL	Device version. Read-only parameter	/	/	/	/	/	/
-	tAb	Parameters tAble. Reserved: read-only parameter	/	/	/	/	/	/
	PA2	Folder that permits access to the "Installer" menu. If **PS2≠0** the password will be requested.						

NOTES: * **The "USER" menu parameters also include PA2 which permits access to the "Installer" menu**

** **For the complete list of parameters, see the "Installer Menu Parameters Table".**

"INSTALLER" MENU PARAMETERS TABLE

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	SEt	Control SEtpoint with range between the minimum Setpoint LSE and the maximum Setpoint HSE. The setpoint value is located in the Machine Status menu.	LSE...HSE	°C/°F	3,5	1,5	1,0	2,0
		COMPRESSOR (folder "CP")						
	diF	diFferential. Compressor relay activation differential; the compressor stops on reaching the setpoint value (as indicated by the regulation probe) and restarts at a temperature value equal to the setpoint plus the value of the differential. **Note: cannot be equal to 0.**	0,1...30,0	°C/°F	2,0	4,0	2,0	8,0
	HSE	Higher SEt. Maximum value settable for setpoint	LSE...320	°C/°F	99,0	99,0	99,0	99,0
	LSE	Lower SEt. Minimum value settable for setpoint	-67,0...HSE	°C/°F	-50,0	-50,0	-50,0	-50,0
	Ont	Controller switch-on time in the event of faulty probe: - if **Ont** = 1 and **OFt** = 0, the compressor will always stay ON; - if **Ont** = 1 and **OFt** > 0, it operates in Duty Cycle mode.	0 ... 250	min	0	1	0	0
	OFt	Controller switch-off time in the event of a faulty probe: - if **OFt** = 1 and **Ont** = 0, the controller will always stay OFF; - if **Ont** = 1 and **OFt** > 0, it operates in Duty Cycle mode.	0 ... 250	min	1	1	1	1
	dOn	delay (at) On compressor. Compressor relay activation delay after request.	0 ... 250	secs	0	15	0	10
	dOF	delay (after power) OFF. Delay time after power-off: the delay time indicated must elapse between deactivation of the compressor relay and the next power-on.	0 ... 250	min	0	3	0	2
	dbi	Delay between power-ons. Delay time between power-ons; the delay time indicated must elapse between two consecutive compressor power-ons.	0 ... 250	min	0	0	0	2
	OdO (!)	Delay in activating outputs after the instrument is switched on or after a power failure. **0** = not active	0 ... 250	min	0	0	0	0
	dFA	Compressor and condenser fans activation delay after command	0 ... 255	secs	0	0	0	10
		DEFROST (folder "dEF")						
	dty	defrost type. Type of defrost. **0** = electric defrost - compressor off (OFF) during defrosting; 1 = cycle inversion defrost (hot gas); compressor on during defrosting: **2** = Free mode defrost; defrost independent of compressor.	0/1/2	num	0	0	1	0
	dit	defrost interval time. Interval between the start of two consecutive defrost cycles.	0 ... 250	hours	24	2	6	10
	dCt	Selects the count mode for the defrost interval: 0 = compressor hours of operation (DIGIFROST® method); Defrost active ONLY with the compressor on. **NOTE: compressor running time is counted separately from the evaporator probe (count active also when evaporator probe missing or faulty).** 1 = appliance running time; defrost counting is always active when the machine is on and starts at each power-on. 2 = compressor stop. Every time the compressor stops, a defrost cycle is performed according to parameter dtY; 3 = not USED	0/1/2/3	num	1	0	1	1
	dOH	defrost Offset Hour. Delay for start of first defrost after request.	0 ... 59	min	0	0	0	0
	dEt	defrost Endurance time. Defrost timeout; determines the maximum defrost duration.	1 ... 250	min	30	30	30	45
	dSt	defrost Stop temperature. Defrost end temperature (determined by probe Pb2).	-67,0...320	°C/°F	8,0	3,0	8,0	7,0
	dPO	defrost (at) Power On. Determines whether the instrument must enter defrost mode (if the temperature measured by Pb2 allows this operation). **n** = no; **y** = yes.	n/y	flag	n	n	n	y

<table>
<tr><th rowspan="2">Cat</th><th rowspan="2">Par</th><th rowspan="2">Description</th><th rowspan="2">Range</th><th rowspan="2">M.U.</th><th colspan="4">Value for Application</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr><td>❄</td><td>dSE</td><td>Temperature threshold for start of defrost.</td><td>-67,0...320</td><td>°C/°F</td><td>0,0</td><td>-6,0</td><td>0,0</td><td>-6,0</td></tr>
<tr><td>❄</td><td>dtt</td><td>Time for which the temperature of the evaporator must remain below dSE</td><td>0 ... 255</td><td>min</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td colspan="9">FANS (folder "FAn")</td></tr>
<tr><td>🌀</td><td>FPt</td><td>Characterises parameter “FSt” which can be expressed either as an absolute temperature value or as a value relative to the Setpoint.
0 = absolute; 1 = relative.</td><td>0/1</td><td>flag</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>🌀</td><td>FSt</td><td>Fans disabling temperature; if Pb2 > FSt, the fans are stopped. The value is either positive or negative and, depending on parameter FPt, can be either the absolute temperature or the temperature relative to the Setpoint.</td><td>-67,0 ... 320</td><td>°C/°F</td><td>50,0</td><td>-20,0</td><td>50,0</td><td>50,0</td></tr>
<tr><td>🌀</td><td>FAd</td><td>Fan activation intervention differential (see parameters “FSt” and “Fot”).</td><td>1,0 ... 50,0</td><td>°C/°F</td><td>2,0</td><td>1,0</td><td>2,0</td><td>1,0</td></tr>
<tr><td>🌀</td><td>Fdt</td><td>Fan activation delay after a defrost cycle.</td><td>0 ... 250</td><td>min</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>🌀</td><td>dt</td><td>Coil drainage time.</td><td>0 ... 250</td><td>min</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>🌀</td><td>dFd</td><td>Allows exclusion of the evaporator fans to be selected or not selected during defrosting. y = yes (fan excluded e.g. switched off); n = no.</td><td>n/y</td><td>flag</td><td>y</td><td>y</td><td>y</td><td>y</td></tr>
<tr><td>🌀</td><td>FCO</td><td>Evaporator fans operating mode. The state of the fans will be:
<table>
<tr><th></th><th></th><th colspan="2">DAY</th><th colspan="2">NIGHT</th></tr>
<tr><th>H42</th><th>FCO</th><th>COMPRESSOR ON</th><th>COMPRESSOR OFF</th><th>COMPRESSOR ON</th><th>COMPRESSOR OFF</th></tr>
<tr><td rowspan="4">H42 = y</td><td>0</td><td>Thermostat controlled</td><td>OFF</td><td>Thermostat controlled</td><td>OFF</td></tr>
<tr><td>1</td><td>Thermostat controlled</td><td>Thermostat controlled</td><td>Thermostat controlled</td><td>Thermostat controlled</td></tr>
<tr><td>2</td><td>Thermostat controlled</td><td>Duty Cycle Day</td><td>Thermostat controlled</td><td>Duty Cycle Night</td></tr>
<tr><td>3</td><td>Duty Cycle Day</td><td>Duty Cycle Day</td><td>Duty Cycle Night</td><td>Duty Cycle Night</td></tr>
<tr><td rowspan="4">H42 = n</td><td>0</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
<tr><td>1</td><td>ON</td><td>Duty Cycle Day</td><td>ON</td><td>Duty Cycle Night</td></tr>
<tr><td>2</td><td>ON</td><td>Duty Cycle Day</td><td>ON</td><td>Duty Cycle Night</td></tr>
<tr><td>3</td><td>Duty Cycle Day</td><td>Duty Cycle Day</td><td>Duty Cycle Night</td><td>Duty Cycle Night</td></tr>
</table>
Duty Cycle Day: controlled by means of parameters “Fon” and “FoF”.
Duty Cycle Night: controlled by means of parameters “Fnn” and “FnF”.</td><td>0/1/2/3</td><td>num</td><td>3</td><td>0</td><td>3</td><td>1</td></tr>
<tr><td>🌀</td><td>FdC</td><td>Evaporator fans switch-off delay after compressor disabled</td><td>0 ... 99</td><td>min</td><td>1</td><td>0</td><td>1</td><td>0</td></tr>
<tr><td>🌀</td><td>Fon</td><td>Fan ON time in duty cycle. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (probe Pb2 present)</td><td>0 ... 250</td><td>secs (*10)</td><td>12</td><td>2</td><td>12</td><td>2</td></tr>
<tr><td>🌀</td><td>FoF</td><td>Fan OFF time in duty cycle. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (probe Pb2 present)</td><td>0 ... 250</td><td>secs (*10)</td><td>6</td><td>1</td><td>6</td><td>1</td></tr>
<tr><td>🌀</td><td>Fnn</td><td>Fan ON time in duty cycle night. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (probe Pb2 present)</td><td>0 ... 250</td><td>secs (*10)</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>🌀</td><td>FnF</td><td>Fan OFF time in duty cycle night. Fans used in duty cycle mode; valid when FCO = dc and H42=1 (probe Pb2 present)</td><td>0 ... 250</td><td>secs (*10)</td><td>12</td><td>10</td><td>12</td><td>10</td></tr>
<tr><td colspan="9">ALARMS (folder "AL")</td></tr>
<tr><td>((•))</td><td>Att</td><td>Can be used to select absolute (Att=0) or relative (Att=1) values for HAL and LAL parameters.
NOTE: In case of relative values (para. Att=1), the HAL parameter should be set to positive values, while the LAL parameter should be set to negative values (-LAL).</td><td>0/1</td><td>num</td><td>1</td><td>0</td><td>1</td><td>1</td></tr>
<tr><td>((•))</td><td>AFd</td><td>Alarms activation differential.</td><td>1,0 ... 50,0</td><td>°C/°F</td><td>2,0</td><td>2,0</td><td>2,0</td><td>1,0</td></tr>
<tr><td>((•))</td><td>HAL</td><td>Maximum temperature alarm. Temperature value (intended either as distance from setpoint or as an absolute value based on Att) which, if exceeded in an upward direction, triggers the activation of the alarm signal. See “Max/Min temperature alarms”.</td><td>LAL...320</td><td>°C/°F</td><td>50,0</td><td>50,0</td><td>50,0</td><td>9,5</td></tr>
<tr><td>((•))</td><td>LAL</td><td>Minimum temperature alarm. Temperature value (intended as distance from the set point or as an absolute value based on Att) which, when exceeded downwards, triggers the activation of the alarm signal.
See “Max/Min temperature alarms”.</td><td>-67,0...HAL</td><td>°C/°F</td><td>-50,0</td><td>-50,0</td><td>-50,0</td><td>-2,0</td></tr>
<tr><td>((•))</td><td>PAO</td><td>Alarm override time after device is switched on following a power failure.
This parameter refers to high/low temperature alarms only.</td><td>0 ... 10</td><td>hours</td><td>0</td><td>0</td><td>0</td><td>2</td></tr>
<tr><td>((•))</td><td>dAO</td><td>Temperature alarm exclusion time after defrost.</td><td>0 ... 999</td><td>min</td><td>0</td><td>0</td><td>0</td><td>60</td></tr>
<tr><td>((•))</td><td>OAO</td><td>Alarm signal delay (low and high temperature) after the deactivation of the digital input (port closed).</td><td>0 ... 10</td><td>hours</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>((•))</td><td>tdO</td><td>Delay in door open alarm activation.</td><td>0 ... 250</td><td>min</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
</table>

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	tAO	Time delay for temperature alarm indication. **This parameter refers to high/low temperature alarms only.**	0 ... 250	min	0	0	0	30
	dAt	Alarm signalling end of defrost due to timeout. **n** = alarm not activated; **y** = alarm activated.	n/y	flag	n	n	n	n
	rLO	An external alarm locks the regulators. **n** = does not lock; **y** = locks	n/y	flag	n	n	n	n
	AOP	Alarm output polarity. **0** = alarm active and output disabled; **1** = alarm active and output enabled.	0/1	num	1	1	1	1
	SA3	Probe 3 alarm Setpoint.	-67,0...320	°C/°F	30,0	30,0	30,0	30,0
	dA3	Probe 3 alarm differential.	1,0 ... 50,0	°C/°F	1,0	1,0	1,0	1,0
		COOL PROTECTION (folder "CPr")						
	CPS	Cool protection setpoint	-67,0...320	°C/°F	-10,0	-10,0	-10,0	-10,0
	CPd	Cool protection differential	0,1...30,0	°C/°F	1,0	1,0	1,0	1,0
	Cpt	Time that the temperature remains below the cool protection setpoint (**CPS**)	0 ... 255	min	0	0	0	0
		LIGHTS & DIGITAL INPUTS (folder "Lit")						
	dOd	Digital input for switching off utilities: **0** = disabled; **1** = disables the fans; **2** = disables the compressor; **3** = disables fans and compressor.	0/1/2/3	num	1	0	1	0
	dAd	Activation delay for digital input	0 ... 255	min	0	0	0	0
	dCO	Compressor enabling delay from acknowledgement	0 ... 255	min	0	0	0	0
	dCd	Delay in activating fans after door closed	0 ... 250	secs	10	10	10	0
		PRESSURE SWITCH (folder "PrE")						
	Pen	Number of errors allowed per maximum/minimum pressure switch input	0 ... 15	num	5	5	5	5
	PEI	Minimum/maximum pressure switch error count interval	1 ... 99	min	1	1	1	1
	PEt	Delay in activating compressor after pressure switch deactivation	0 ... 255	min	0	0	0	0
		DEEP COOLING (folder "dEC")						
	dCA	Enable deep cooling (**0** = disabled; **1** = manual; **2** = automatic).	0/1/2	num	2	2	2	2
	dCS	Deep cooling setpoint	-67,0...320	°C/°F	-2,0	-2,0	-2,0	-2,0
	tdC	Deep cooling duration	0 ... 255	min	0	0	0	0
	dCC	Defrost delay after a Deep Cooling Cycle	0 ... 255	min	0	0	0	0
	Sid	Threshold for start of deep cooling	-67,0...320	°C/°F	12,0	12,0	12,0	12,0
	tOS	Deep cooling activation time	0 ... 255	min	5	5	5	5
		ENERGY SAVING (folder "EnS")						
	ESt	Energy Saving mode: **0**= disabled; **1**= Offset on setpoint; **2**= Offset on differential; **3**= offset on setpoint and differential; **4**= "Open front bottle cooler" algorithm; **5**= "Glass door bottle cooler" algorithm; **6**= "Vertical glass door merchandiser" algorithm.	0 ... 6	num	5	4	6	4
	ESA	AUX state during energy saving: **0** = disabled (no effect on AUX); **1** = AUX off; **2** = AUX on	0/1/2	num	1	1	0	1
	ESF	Night mode (energy saving) activation for fans. **n** = disabled; **y** = enabled if energy saving mode is active (**ESt ≠ 0**)	n/y	flag	y	y	y	y
	Cdt	Door close time	0 ... 255	min (*10)	6	6	6	6
	ESo	Cumulative door open time for disabling Energy Saving mode	0 ... 10	num	0	0	5	0
	OSP	Setpoint offset	-30,0...30,0	°C/°F	0,5	1,0	0,5	1,0
	OdF	Differential offset	0,0 ... 30,0	°C/°F	4,0	2,0	4,0	2,0
	dnt	Night mode duration	0 ... 24	hours	11	10	10	9
	dFt	Fast cooling duration	0 ... 24	hours	0	1	1	1
	SPn	Night mode setpoint	LSE ... HSE	°C/°F	0,7	3,0	1,0	6,5
	dFn	Night mode differential	0,1 ... 30,0	°C/°F	4,0	2,0	4,0	0,1
	SPF	Fast cooling setpoint	LSE ... HSE	°C/°F	0,0	-0,5	-2,0	-6,8
	dFF	Fast cooling differential	0,1 ... 30,0	°C/°F	0,1	0,1	0,1	0,1

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	ESP	Sensitivity of virtual door regulator	0 ... 5	num	0	0	0	0
	dOt	Maximum door open time with virtual door switch	0 ... 255	secs	0	0	0	0
		COMMUNICATION (folder "Add")						
	PtS	Selection of communication protocol. **t** = Televis; **d** = Modbus	t/d	flag	t	t	t	t
	dEA	Index of the device within the family (valid values from 0 to 14)	0 ... 14	num	0	0	0	0
	FAA	Device family (valid values from 0 to 14). The pair of values FAA and dEA are the network address of the device and are given in the format "FF.DD" (where FF=FAA and DD=dEA).	0 ... 14	num	0	0	0	0
	Pty	Modbus parity bit. **n**=none; **E**=even; **o**=odd	n/E/o	flag	n	n	n	n
	StP	Modbus stop bit	1b/2b	flag	1b	1b	1b	1b
		DISPLAY (folder "DiS")						
	LOC	LOCk. Setpoint edit lock. See corresponding paragraph. You will still be able to open parameter programming and alter parameters, including the state of this parameter if you need to unlock the keyboard for example. **y** = yes; **n** = no.	n/y	flag	n	n	n	n
PA1	PS1	PAssword1. When enabled (**PS1≠0**) it is the password to the "**User**" parameters	0 ... 250	num	0	0	0	0
PA2	PS2	PAssword2. When enabled (**PS2≠0**) it is the password to the "**Installer**" parameters	0 ... 250	num	15	15	15	15
	ndt	number display type. Display with decimal point. **y** = yes; **n** = no	n/y	flag	y	y	y	y
Pb1	CA1	Calibration 1. Positive or negative temperature value to be added to the value of Pb1.	-12,0...+12,0	°C/°F	0,0	0,0	0,0	0,0
Pb2	CA2	Calibration 2. Positive or negative temperature value to be added to the value of Pb2.	-12,0...+12,0	°C/°F	0,0	0,0	0,0	0,0
Pb3	CA3	Calibration 3. Positive or negative temperature value to be added to the value of Pb3.	-12,0...+12,0	°C/°F	0,0	0,0	0,0	0,0
	ddL	Display mode during defrost. 0 = display the temperature read by probe **Pb1**; 1 = locks the reading at the temperature value read by **Pb1** when defrosting starts and until the next time the **SEt** value is reached; 2 = displays the label **deF** during defrosting and until the next time the **SEt** value is reached (or until **Ldd** has elapsed).	0/1/2	num	1	1	1	1
	Ldd	Timeout value for display unlock - label dEF	0 ... 255	min	30	30	30	30
	dro	Select the unit of measurement used when displaying the temperature recorded by the probes. (**0** = °C, **1** = °F). **NOTE: switching between °C and °F DOES NOT modify the SEt, diF values, etc. (e.g. set=10°C becomes 10°F)**	0/1	num	0	0	0	0
	ddd	Selects type of value to display. **0** = Setpoint; **1** = probe Pb1 ; **2** = probe Pb2 ; **3** = probe Pb3	0/1/2/3	num	1	1	1	1
		CONFIGURATION (folder "CnF")						
	H08	Function when in standby mode. **0** = display off; the regulators are active and the device reactivates the display to signal any alarms. **1** = display off; regulators and alarms blocked. **2** = display shows OFF label; regulators and alarms blocked.	0/1/2	num	2	2	2	2
D.I.1	H11	Configuration of digital input 1/polarity. **0** = disabled; **±1** = defrost; **±2** = reduced set; **±3** = AUX; **±4** = door switch; **±5** = external alarm; **±6** = standby; **±7** = pressure switch; **±8** = Deep Cooling; **±9** = energy saving; **±10** = door switch + energy saving **NOTE: • the "+" sign indicates that the input is active if the contact is closed.** **• the "-" sign indicates that the input is active if the contact is open.**	-10 ... +10	num	10	9	10	9
D.I.2	H12	Configuration of digital input 2/polarity. Same as H11.	-10 ... +10	num	0	0	0	0
❄	H21	Configurability of digital output 1. **0** = disabled; **1** = compressor; **2** = defrost; **3** = fans; **4** = alarm; **5** = AUX; **6** = Standby; **7** = NOT USED; **8** = condenser fans reversal; **9** = check valve.	0 ... 9	num	1	1	1	1

Cat	Par	Description	Range	M.U.	Value for Application			
					1	2	3	4
	H22	Configurability of digital output 2. Same as H21.	0 ... 9	num	3	3	2	8
	H23	Configurability of digital output 3. Same as H21.	0 ... 9	num	5	5	3	5
	H25	Enable/disable buzzer. **0** = disabled; **4** = enabled; **1-2-3-5-6-7-8-9** = NOT USED;	0 ... 9	num	0	0	0	0
DOWN	H32	Configurability of DOWN key. **0** = disabled; **1** = defrost; **2** = AUX; **3** = reduced set; **4** = standby; **5** = deep cooling; **6** = energy saving	0 ... 6	num	2	2	0	2
ESC	H33	ESC key configuration. Same as H32.	0 ... 6	num	4	4	4	4
Pb2	H42	Evaporator probe presence. **n** = not present; **y** = present	n/y	flag	y	y	y	y
Pb3	H43	Probe Pb3 present. **n** = not present; **y** = present	n/y	flag	n	n	n	n
-	reL	Device version. Read-only parameter	/	/	/	/	/	/
-	tAb	Parameters tAble. Reserved: read-only parameter	/	/	/	/	/	/
		COPY CARD (folder "FPr")						
	UL	Transfer programming parameters from instrument to Copy Card	/	/	/	/	/	/
	Fr	Format Copy Card. Erases all data contained in the Copy Card. **NOTE: if parameter "Fr" is used, the data entered will be permanently lost. This operation cannot be reversed.**	/	/	/	/	/	/
		FUNCTIONS (folder "FnC")						
	rAP	Reset pressure switch alarms	/	/	/	/	/	/

NOTE: 1) If one or more parameters marked with (!) in folder "CnF" are modified, the controller MUST be switched off and then switched on again to ensure correct operation.

ALARMS AND SIGNALS TABLE

When an alarm condition is detected, the alarm icon " ((•)) " will come on.
If present and enabled, the buzzer and alarm relay will also activate.
To silence the buzzer, press and release any key, the relative icon will continue to flash.
All alarms reset automatically (e.g. they switch off when the cause of the alarm is removed) except for pressure switch alarms, which must be reset manually using function **rAP**.

The alarm codes are as follows:

Code	Description	LED ((•))	Buzzer and alarm relay	Reset	Related parameters for ENABLING ALARM	Alarms by Model		
						961 EO	971 EO	974 EO
E1	Probe Pb1 error	ON	Active	Automatic	Ont, OFt	X	X	X
E2	Probe Pb2 error	ON	Active	Automatic			X	X
E3	Probe Pb3 error	ON	Active	Automatic		X	X	X
AH1	Pb1 HIGH alarm	ON	Active	Automatic	SEt, Att, Afd, HAL, LAL, PAO, dAO, OAO, tAO	X	X	X
AL1	Pb1 LOW alarm	ON	Active	Automatic	SEt, Att, Afd, HAL, LAL, PAO, dAO, OAO, tAO	X	X	X
Ad2	Defrost end due to timeout	ON	Not active	Automatic	dEt, dAt	X	X	X
Ad3	defrost end due to timeout (with **dCt=3)**	ON	Not active	Automatic	dCt, dEt, dAt	X	X	X
EA	External alarm	ON	Active	Automatic	rLO, dAd	X	X	X
OPd	Door open alarm	ON	Not active	Automatic	dAd, tdO	X	X	X
COH	compressor overheating alarm	ON	Not active	Automatic	SA3, dA3	X	X	X
nPA	Pressure switch alarm	ON	Not active	Automatic	PEn, PEI, PEt	X	X	X
PAL	Pressure switch alarm	ON	Not active	Manual	PEn, PEI, PEt	X	X	X

NOTES:
1) If alarm exclusion times have been set (see “AL” folder in the parameters table) the alarm will not be signalled.
2) With the exception of faulty probe alarms and the compressor overheating alarm, all other alarms will record the corresponding label in the folder AL in the "MACHINE STATUS" menu.
3) Faulty probe alarms will be indicated on the display by means of label E1, E2 or E3 depending on whether the fault relates to probe Pb1, Pb2* or Pb3 respectively. (*** Probe Pb2 is only present in models EWPlus 971/974 EO**).

Cause/effect table

Controllers in the EWPlus EO family are able to perform complete diagnostics of the system and report any operating trouble with specific alarms, display and record particular events, defined by the user to have greater control over the system.

Label	Fault	Cause	Effects	Remedy
E1	Probe 1 faulty (cabinet)	• measured values outside operating range • probe faulty / short-circuit / open-circuit	• E1 label shown on display • Alarm icon permanently on • High/low alarm regulator disabled • Compressor operation based on parameters "**Ont**" and "**OFt**".	• Check the probe wiring • Replace probe When error has been removed, regulation continues as normal
E2	Probe 2 faulty (defrost) **EWPlus 971/974 EO only**	• measured values outside operating range • probe faulty / short-circuit / open-circuit	• **E2** label shown on display • Alarm icon permanently on • Defrost will end due to timeout (**dEt**) • The evaporator fans will work in Duty Cycle mode.	• Check the probe wiring • Replace probe When error has been removed, regulation continues as normal
E3	Probe3 faulty	• Measured values are outside operating range • Probe faulty / short-circuited / open	• E3 label shown on display • Alarm icon permanently on • No effect on control	• Check the probe wiring • Replace probe
AH1	HIGH temperature alarm Pb1	Value read by probe Pb1 > **HAL** after time of "**tAO**". (see "MAX/MIN TEMPERATURE ALARMS")	• Label **AH1** recorded in folder **AL** • No effect on control	• Wait until temperature value read by Pb1 returns below (**HAL-AFd**).
AL1	LOW temperature alarm Pb1	Value read by Pb1 < **LAL** after time of "**tAO**". (see "MAX/MIN TEMPERATURE ALARMS")	• Label **AL1** recorded in folder **AL** • No effect on control	• Wait for the temperature value read by Pb1 to come back above (**LAL+AFd**).
Ad2	Defrost end due to timeout	End of defrost cycle due to timeout rather than due to defrost end temperature being read by Pb2.	• Label **Ad2** recorded in **AL** • Alarm icon permanently on	• Wait for the next defrost cycle for automatic reset
Ad3	Defrost end due to timeout	activation of defrost due to temperature irrespective of dAt. (active if **dCt = 3**)	• Label **Ad3** recorded in **AL** • Alarm icon permanently on	• Wait for the next defrost cycle for automatic reset
EA	External alarm	Digital input activated **(H11 = ±5)**	• Label **EA** recorded in folder **AL** • Alarm icon permanently on • Regulation blocked if **rLO** = y	• check and remove external cause of alarm on D.I.
OPd	Door open alarm	Digital input activated **(H11 = ±4)** (for a time greater than tdO)	• Label **Opd** recorded in **AL** • Alarm icon permanently on • Regulator locked	• Close the door • Delay function defined by **OAO**
COH	Overheating alarm	Value set by parameter SA3 exceeded.	• Display of label **COH** • Alarm icon permanently on • Regulation locked (Compressor)	• wait for the temperature to return to a value of **SA3** (Setpoint) minus **dA3** (differential).
nPA	General Pressure switch alarm	Activation of pressure switch alarm by general pressure switch regulator. **(H11 = ±7)**	If the number **N** of pressure switch activations is **N** < **PEn**: • Folder **nPA** recorded in folder AL with the number of pressure switch activations • Regulation locked (Compressor and Fans)	• Check and remove the cause which triggered the alarm on D.I. Auto reset
PAL	General Pressure switch alarm	Activation of pressure switch alarm by general pressure switch regulator. **(H11 = ±7)**	If the number **N** of pressure switch activations is **N** = **PEn**: • Label **PAL** displayed • Label **PA** recorded in folder AL deleting folder **nPA** from folder AL • Alarm LED permanently on • Regulation locked (Compressor and Fans)	• Switch the device off and back on again • Reset alarms by entering the functions folder and selecting the **rAP** function (Manual Reset)

DESCRIPTION OF ALARMS

PROBE ALARM

OPERATING CONDITIONS

When one of the probes is out of the nominal operating range or in the case of an open probe or a probe in short circuit, an alarm is generated if this condition persists for longer than 10 seconds.
The alarm condition is indicated on the display by means of the following error codes:

- **E1** = Environmental probe Pb1 faulty
- **E2** = Defrost probe Pb2 faulty (**EWPlus 971/974 EO only**)
- **E3** = Probe Pb3 faulty

The alarm LED and alarm relay are activated.
When active, error code **E1** remains permanently on.
Error code **E2** alternates with the temperature read by the cabinet probe every 2 seconds.
Codes **E1**, **E2** and **E3**, when occurring at the same time, are shown in the following sequence: E1 x 2 sec, E2 x 2 sec, E3 x 2 sec etc.

ACTIONS ON CURRENT REGULATION

Probe Pb1: An error condition in the cabinet probe causes one of the following actions:

- Code E1 is shown on the display
- Activation and permanent display of alarm icon and activation of buzzer/alarm relay (if present)
- Activation of compressor as shown by parameters **Ont** and **Oft**
- Disabling of maximum and minimum alarm regulator.

When the probe error condition ceases, regulation resumes as normal.
During the probe error, the defrost interval count continues as normal.

Probe Pb2: A defrost probe error causes the following actions:

- Code E2 is shown on the display
- Activation and permanent display of alarm icon and activation of buzzer/alarm relay (if present)
- End of defrost due to timeout (if enabled)

When the defrost probe error condition ceases, regulation resumes as normal: if a defrost was in progress, it may terminate on reaching the end of defrost setpoint.
The probe fault alarm is not stored by the controller.

Probe Pb3: An overheating probe error causes the following actions:

- Code E3 is shown on the display
- Activation and permanent display of alarm icon and activation of buzzer/alarm relay (if present)

The probe fault alarm is not stored by the controller.

SIGNALLING

Code	Meaning	EWPlus EO Model
E1	Probe Pb1 error	All
E2	Probe Pb2 error	All
E3	Probe Pb3 error	All

ALARM ACKNOWLEDGEMENT

In the alarm condition, it is possible to acknowledge the alarm and/or relay configured as an alarm, even if the alarm condition persists, by pressing any key or using the corresponding function in the menu The alarm LED will start to blink.
Eliminating the cause of the alarm disarms the acknowledgement.
The probe fault alarm is not stored by the controller.

USER PARAMETERS

Label	Description	EWPlus EO Model
Ont	ON time for compressor output with faulty regulation probe	All
OFt	OFF time for compressor output with faulty regulation probe	All

MINIMUM AND MAXIMUM TEMPERATURE ALARM

OPERATING CONDITIONS

The alarm regulation is carried out on environmental probe Pb1. The temperature limits defined in parameters **HAL** and **LAL** are determined by parameter **Att** which specifies if they represent the absolute temperature value or a setpoint differential (in the case of offset on the entered setpoint, the high and low alarms will refer to this new control setpoint).

- If **Att** =0 **Ab(solute)**, the temperature limits for probe Pb1 are absolute.
- If **Att** =1 **rE(lative)**, the temperature limits for probe Pb1 refer to the **SEt**.

NOTE: to obtain the minimum alarm below the setpoint in the case of **Att**=1 (relative) it is necessary to set **LAL** < 0

ALARM CONDITION

A maximum/minimum alarm is generated when the Pb1 temperature is:

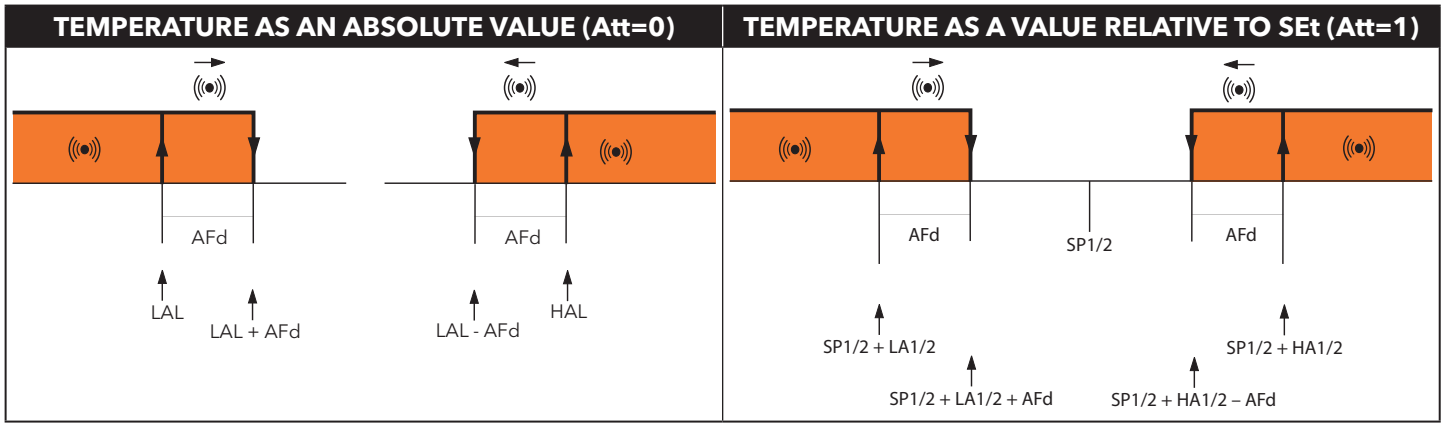
- Maximum alarm: ≥ **HAL** if **Att=Ab(solute)** and ≥ (**Set + HAL**) if **Att=rE(lative)**
- Minimum alarm: ≤ **LAL** if **Att=Ab(solute)** and ≤ (**Set + LAL**) if **Att=rE(lative)**

If **Att = Ab(solute)** the values of **HAL and LAL** must be with sign, if **Att = rE(lative)** it will be necessary that **HAL > 0 and LAL < 0**.

When one of the two aforementioned conditions occurs, if no alarm override times apply (see alarm override parameters), the alarm LED lights up, the buzzer sounds (if present) and/or the relay configured as alarm activates.

The maximum/minimum alarm will be reset when the temperature of probe Pb1 is:

- Reset from maximum alarm: ≤ (**HAL - AFd**) if **Att=Ab(solute)** and ≤ (**Set + HAL - AFd**) if **Att=rE(lative)**
- Reset from minimum alarm: ≥ (**LAL + AFd**) if **Att=Ab(solute)** and ≥ (**Set + LAL + AFd**) if **Att=rE(lative)**



NOTES:
- During a defrost cycle, high and low temperature alarms are overridden.
- Occurrence of this alarm does not effect any regulation in progress.

SIGNALLING

Code	Meaning	EWPlus EO Model
AH1	High temperature alarm referred to probe Pb1	All
AL1	Low temperature alarm referred to probe Pb1	All

ALARM ACKNOWLEDGEMENT

In the alarm condition, it is possible to acknowledge the buzzer (if present) and/or relay configured as an alarm, even if the alarm condition persists, by pressing any key or using the corresponding function in the menu. The alarm LED will start to blink.
Eliminating the cause of the alarm disarms the acknowledgement.
The probe fault alarm is not stored by the controller.

USER PARAMETERS

Label	Description	EWPlus EO Model
Att	HAL and LAL parameter mode (absolute or relative)	All
Afd	Alarm activation differential	All
HAL	Maximum alarm threshold	All
LAL	Minimum alarm threshold	All
PAO	Temperature alarms disabling time from power-on	All
dAO	Temperature alarm disabling time after defrost cycle	All
OAO	High and low temperature alarms disabling time after door closing	All
tAO	Temperature alarms delay time	All

DEFROST ALARM

ALARM SIGNALLING DEROST END DUE TO TIMEOUT

OPERATING CONDITIONS

The regulator is activated without any delay in the case of end of defrost due to timeout, instead of probe 2 reaching the defrost end temperature.
The action consists of:

- Permanent illumination of alarm LED
- Recording of label **Ad2** in the alarms menu.

Automatic reset occurs with the start of the next defrost cycle.
The alarm LED can be switched off using the normal acknowledgement procedure, although the alarm signal is only actually cancelled at the start of the next defrost cycle.

SIGNALLING

Code	Meaning	EWPlus EO Model
Ad2	Defrost alarm on Pb2	All

USER PARAMETERS

Label	Description	EWPlus EO Model
dEt	Defrost timeout	All
dAt	Alarm signalling end of defrost due to timeout	All

EXTERNAL ALARM

OPERATING CONDITIONS

In the case of activation of the digital input, the alarm regulator is activated with the delay set in parameter **dAd**, and this alarm persists until the next time the digital input is deactivated.
The action consist of:

- Permanent illumination of alarm LED
- Recording of label **EA** in the alarms menu
- Activation of the buzzer (if present and enabled)
- Activation of the relay configured as alarm (if enabled)
- Deactivation of the compressor, defrost and fan regulators depending on the configuration of parameter **rLO**.

It is possible to acknowledge the buzzer (if present) / alarm relay but the regulators still remain locked until the next time the digital input is deactivated.

The values that can be assigned to parameter **rLo** are:

- **rLO = n**: An external alarm does not lock the regulators;
- **rLO = y**: An external alarm locks the regulators.

SIGNALLING

Code	Meaning	EWPlus EO Model
EA	External alarm	All

USER PARAMETERS

Label	Description	EWPlus EO Model
rLO	An external alarm locks the regulators	All
dAd	D.I. activation delay	All

DOOR OPEN ALARM

OPERATING CONDITIONS

The door switch alarm is associated to a specially configured digital input:

- **H11 = ± 4**
- **H12 = ± 4 (EWPlus 971/974/978 only)**

On activation of the digital input (door open) and after delay **tdO** has elapsed, the door open alarm must be signalled in the alarms folder and the LED and alarm relay must light up. The label **OPd** is displayed.
The action consist of:

- Permanent illumination of alarm LED
- Recording of label **OPd** in the alarms menu.
- Activation of the relay configured as alarm

Parameter **tdO** will start to decrement once the time set in parameter **dAd** has elapsed.
As in the case of the other alarms, the relay may be deactivated by pressing an acknowledgement key, the alarm LED will blink and label **OPd** will remain in the alarms menu until the door is closed.
If the door is opened, the regulator will operate based on the value of parameter **dOd**. The values that can be assigned to the parameter are:

- **dOd = 0**: No resource is locked;
- **dOd = 1**: Fans are locked (FAN);
- **dOd = 2**: Compressor is locked (COMPR);
- **dOd = 3**: both Fans (FAN) and Compressor (COMPR) are locked

If the door open alarm blocks the compressor, it can still be re-activated even if the door remains open by setting parameter **dCO**.

SIGNALLING

Code	Meaning	EWPlus EO Model
OPd	Door open alarm	All

USER PARAMETERS

Label	Description	EWPlus EO Model
dAd	D.I. activation delay	All
dOd	Digital input for switching off utilities: **0** = disabled; **1** = disables the fnas; **2** = disables the compressor; **3** = disables fans and compressor.	All
dCO	Compressor enabling delay from acknowledgement	All
tdO	Open door disabling time	All

COMPRESSOR OVERHEATING ALARM

OPERATING CONDITIONS

Probe Pb3 is associated to a "Compressor Overheating" alarm triggered when the value set in parameter SA3 is exceeded.
This alarm is reset automatically when the temperature returns to a value of:

Value Pb3 < **SA3 - dA3** (Setpoint - differential).

The compressor will at that point be free to restart, if requested, respecting the relevant protections. The alarm will be treated like a normal temperature alarm, therefore for the alarm signalling delays refer to the standard delays.

Activation of the alarm results in:

- Display of label **COH**
- Illumination of alarm LED
- Activation of the buzzer (if present and enabled)
- Activation of the relay configured as alarm (if enabled)
- Deactivation of compressor relay

SIGNALLING

Code	Meaning	EWPlus EO Model
COH	compressor overheating alarm	All

USER PARAMETERS

Label	Description	EWPlus EO Model
SA3	Probe 3 alarm setpoint	All
dA3	Probe 3 alarm differential	All

Modbus is a client/server protocol for communication between devices connected in a network.
Modbus devices communicate using a master-slave technique in which only one device (master) can send messages.
The other devices in the network (slave) respond, returning the data requested by the master or executing the action contained in the message sent. A slave is a device connected to a network that processes information and sends the results to the master using the Modbus protocol. The master device can send messages to individual slaves or to the entire network (broadcast) whilst slaves can only respond individually to the master.
The Modbus standard used by Eliwell employs the RTU code for data transmission.

DATA FORMAT (RTU)

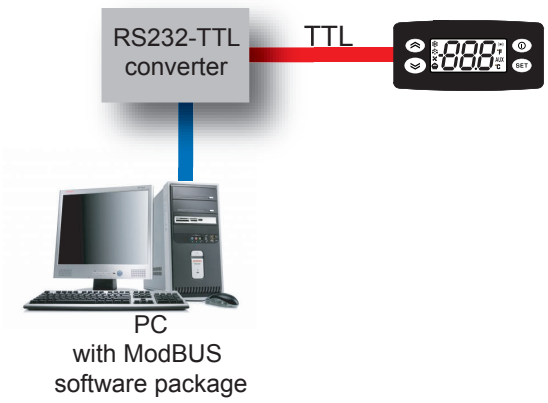
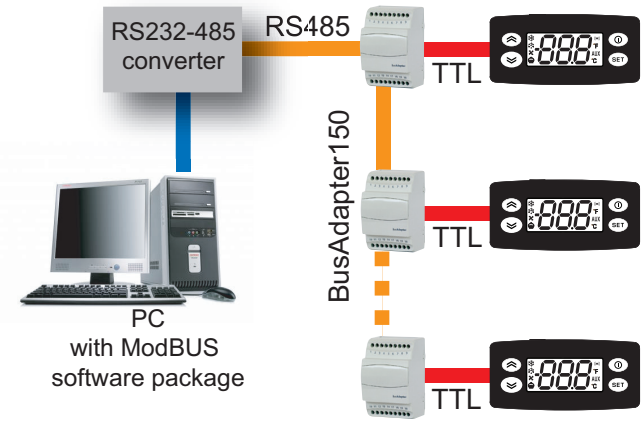
The coding model used defines the structure of messages transmitted on the network and the way in which this information is deciphered. The type of coding is usually selected on the basis of specific parameters (baud rate, parity, etc.); furthermore, some devices support only specific coding models, although it must be the same one for all devices connected in a Modbus network.
The protocol uses the RTU binary method with bytes configured as follows: **8 bit for data, even parity bit (configurable), 1 stop bit.**

NOTE: the transmission speed must be set at 9600 baud.
Parameter setting allows the full configuration of the device
They can be modified using:

- Device keypad
- Copy Card
- Sending data via Modbus protocol directly to an individual controller or broadcasting it, using the address 0 (broadcast)

NETWORK

The 2 connection diagrams for using Modbus are shown below:

ModBus - device connection diagram Single via TTL	**ModBus connection to multiple devices Via RS485**
	

Connessione PC / Interfaccia	Cavo RS232
Connessione Dispositivo / Bus Adapter	Cavo TTL connettore 5 vie (30cm) (disponibili ulteriori misure/lunghezze)
Bus Adapter	BA150
Connessione Bus Adapter / Interfaccia	Cavo RS485 schermato e twistato (esempio: cavo Belden modello 8762)

MODBUS COMMANDS AVAILABLE AND DATA AREAS

The following commands are implemented:

Modbus command	Description of command
3	Read 16 consecutive registers for Client side Read 1 single register for parameters
16	Write 15 consecutive registers for Client side Write 1 register for the parameters
43	Read device ID It is possible to read the following 3 fields:

Field code	Field description
0	Manufacturer ID (="Invensys")
1	Device model/polycarbonate ID
2	Device family (MSK442)/version ID

Length restrictions

Maximum length in bytes of messages sent to device	30 BYTES
Maximum length in bytes of messages received by the device	30 BYTES

ADDRESS CONFIGURATION

The TTL serial - which we will also call COM1 – can be used to configure the device, parameters, states, and variables with Modbus via the Modbus protocol.
The address of a device within a ModBus message is made up of one byte and is formed by the family code and the instrument code, indicated by dBA, made up of parameters FAA and dEA respectively.
The address (Device Address) is thus formed of two nibbles:

dEA: low nibble
FAA: high nibble

To calculate the address starting from parameters FAA and dEA:

dBA = FAA x 16 + dEA

The address 0 is used for broadcast messages that all slaves recognise. Slaves don't respond to broadcast messages.
The parameters for configuring the device are:

Parameter	Description	Values	Range
PtS	Select COM1 (TTL) protocol	p	t = Televis d = Modbus
dEA	Device index in family	0	0 ... 14
FAA	Device family	0	0 ... 14
Pty	Modbus protocol parity bit	n	• n= NONE • E= EVEN • o= ODD
StP	Modbus protocol stop bit	1b	• 1b= 1 BIT • 2b= 2 BIT

NOTE: To guarantee correct operation, the controller must be switched off and switched on again after modification of parameters Pty and StP.

PARAMETER VISIBILITY AND VALUES

There are 3 hardware models (EWPlus 961, EWPlus 971 and EWPlus 974) with varying numbers of inputs/outputs.
Depending on the model, some configuration parameters may not (usually) be visible and/or be of no significance given that the associated resource is not present.
In the parameter/visibility table, parameters that are not present will be indicated in the default column by means of a grey rectangle.

IMPORTANT:
1) When not indicated otherwise, the parameter is always visible and modifiable, unless customised settings have been configured via serial.
2) If folder visibility is modified, the new setting will apply to all parameters in the folder.

PARAMETER/VISIBILITY TABLE AND CLIENT TABLE

The tables below list all information required to read, write and decode all accessible resources in the device. There are three tables:

- The "**PARAMETERS TABLE**" contains all device configuration parameters stored in the controller's non-volatile memory, including visibility
- The "**FOLDER VISIBILITY TABLE**" indicates the visibility of the folders containing the parameters
- The "**CLIENT TABLE**" includes all I/O and alarm status resources available in the volatile memory of the instrument.

Description of columns:

FOLDER
This indicates the label of the folder containing the parameter in question.

LABEL
This indicates the label used to display the parameters in the menu of the controller.

VALUE PAR. ADDRESS
The whole part represents the address of the MODBUS register containing the value of the resource to be read or written in the controller. The value after the point indicates the position of the most significant data bit inside the register; if not indicated it is taken to be zero. This information is always provided when the register contains more than one information item, and it is necessary to distinguish which bits actually represent the data (the working size of the data indicated in the column DATA SIZE is also taken into consideration).
Given that the modbus registers have the size of one WORD (16 bit), the index number after the point can vary from 0 (least significant bit –LSb–) to 15 (most significant bit –MSb–).
Examples (in binary form the least significant bit is the first on the right):

VAL PAR. ADDRESS	DATA SIZE	Value	Content of register	
8806	WORD	1350	1350	(0000010101000110)
8806	BYTE	70	1350	(00000101**01000110**)
8806.8	BYTE	5	1350	(**00000101**01000110)
8806.14	1 BIT	0	1350	(0**0**000010101000110)
8806.7	4 BIT	10	1350	(00000**1010**1000110)

IMPORTANT: when the register contains more than one piece of data, the write procedure is as follows:

- Read current value of register
- Modify bits for the resource concerned
- Write register

VIS PAR. ADDRESS
The same as above. In this case, the MODBUS register address contains the visibility value of the parameter.
By default all parameters have:

- Data size 2 bit
- Range 0…3
- **Visibility 3
- U.M. num

****Value Meaning**

- Value 3 = parameter or folder always visible
- Value 2 = **manufacturer level**; these parameters can only be viewed by enter the manufacturer's password (see parameter UI28) (all parameters declared as always visible, parameters visible at the installer level and manufacturer's level will be visible)
- Value 1 =**installer level**; these parameters can only be viewed by enter the installer's password (see parameter UI17) (all parameters declared as always visible and parameters visible at the installer level)
- Value 0 = parameter or folder NOT visible

1. Parameters and/or folders with a level of visibility <>3 (password-protected) will be visible only if the correct password is entered (installer or manufacturer) following this procedure:
2. Parameters and/or folders with a level of visibility =3 are always visible even without a password: in this case, the following procedure is not necessary.

Examples (in binary form the least significant bit is the first on the right):
Default visibility:

VAL PAR. ADDRESS	DATA SIZE	Value	Content of register	
49336.6	2 BIT	3	65535	----------(0000000**11**11111111111111)
49337	2 BIT	3	65535	(0000000011111**11**11111111)
49337.2	2 BIT	3	65535	(000000001111**11**1111111111)
49337.4	2 BIT	3	65535	(00000000111**11**111111111111)
49337.6	2 BIT	3	65535	(0000000**11**11111111111111)

R/W
Indicates if resources are read/write, read-only or write-only:

R	The resource is read-only
W	The resource is write-only
RW	The resource can be both read and written to

DESCRIPTION
This is the description of the meaning of the **parameters** in the **LABEL** column.

DATA SIZE
Indicates the size of the data in bits.

WORD	=	16 bit
Byte	=	8 bit
"n" bit	=	0...15 bit based on the value of "n"

CPL
When the field indicates "Y", the value read by the register needs to be converted because the value represents a number with a sign. In the other cases the value is always positive or null.
To carry out conversion, proceed as follows:

- If the value in the register is between 0 and 32.767, the result is the value itself (zero and positive values)
- If the value in the register is between 32.768 and 65.535, the result is the value of the register - 65.536 (negative values)

RANGE
Describes the interval of values that can be assigned to the parameter. It can be correlated with other instrument parameters (indicated with the parameter label).

DEFAULT
Indicates the factory setting for the standard model of the instrument.

UM
Measurement unit for values converted according to the rules indicated in the CPL and EXP columns.

PARAMETER TABLE

Folder	Label	Address Value	Address Visibility	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	M.U.
	SEt	16416	49335	RW	Control Setpoint	WORD	Y	LSE ... HSE	°C/°F
CP	diF	16386	49335,2	RW	Activation differential	WORD		0,1 ... 30,0	°C/°F
CP	HSE	16418	49335,4	RW	Maximum value settable for setpoint	WORD	Y	LSE ... HdL	°C/°F
CP	LSE	16420	49335,6	RW	Minimum value settable for setpoint	WORD	Y	LdL ... HSE	°C/°F
CP	Ont	49203	49336,6	RW	ON time for compressor output with faulty Pb1 probe	BYTE		0 ... 250	min
CP	OFt	49204	49337	RW	OFF time for compressor output with faulty Pb1 probe	BYTE		0 ... 250	min
CP	dOn	49205	49337,2	RW	Compressor output enabling delay from request	BYTE		0 ... 250	secs
CP	dOF	49206	49337,4	RW	Compressor output enabling delay from shutdown	BYTE		0 ... 250	min
CP	dbi	49207	49337,6	RW	Delay between two consecutive starts of the compressor output	BYTE		0 ... 250	min
CP	OdO (!)	49208	49338	RW	Delay output enabling from power-on	BYTE		0 ... 250	min
CP	dFA	49288	49338,2	RW	Compressor and condenser fans activation delay after command	BYTE		0 ... 255	secs
dEF	dtY	49209	49338,4	RW	Type of defrost	BYTE		0 ... 2	num
dEF	dit	49252	49338,6	RW	Interval between defrost cycles	BYTE		0 ... 250	hours
dEF	dCt	49212	49339,4	RW	Defrost interval count mode	BYTE		0 ... 3	num
dEF	dOH	49213	49339,6	RW	Defrost cycle enabling delay from request	BYTE		0 ... 59	min
dEF	dEt	49214	49340	RW	Defrost timeout	BYTE		1 ... 250	min
dEF	dSt	16390	49340,2	RW	Defrost end temperature	WORD	Y	-67,0 ... 320	°C/°F
dEF	dPO	49215	49340,4	RW	Defrost enabling request from power-on	BYTE		0 ... 1	flag
dEF	dSE	16498	49341,2	RW	Temperature threshold for defrost start	BYTE	Y	-67,0 ... 320	°C/°F
dEF	dtt	49289	49341,4	RW	Time for which the temperature of the evaporator must remain below the threshold	BYTE		0 ... 255	min
Fan	FPt	49217	49341,6	RW	FSt parameter mode (absolute or relative)	BYTE		0 ... 1	flag
Fan	FSt	16394	49342	RW	Evaporator fans disabling temperature	WORD	Y	-67,0 ... 320	°C/°F
Fan	FAd	16398	49342,4	RW	Evaporator fans activation differential	WORD		1,0 ... 50,0	°C/°F
Fan	Fdt	49218	49342,6	RW	Evaporator fans delay after defrost cycle	BYTE		0 ... 250	min
Fan	dt	49219	49343	RW	Coil drainage time	BYTE		0 ... 250	min
Fan	dFd	49220	49343,2	RW	Evaporator fans disabling during defrost time	BYTE		0 ... 1	flag
Fan	FCO	49221	49343,4	RW	Evaporator fans status with OFF compressor output	BYTE		0 ... 3	num
Fan	FdC	49222	49343,6	RW	Evaporator fans switch-off delay after compressor disabled	BYTE		0 ... 99	min
Fan	Fon	49223	49344	RW	Evaporator fans ON time in Duty Cycle mode	BYTE		0 ... 250	secs*10
Fan	FoF	49224	49344,2	RW	Evaporator fans OFF time in Duty Cycle mode	BYTE		0 ... 250	secs*10
Fan	Fnn	49291	49344,4	RW	Evaporator fans ON time in duty cycle night mode	BYTE		0 ... 250	secs*10
Fan	FnF	49292	49344,6	RW	Evaporator fans OFF time in duty cycle night mode	BYTE		0 ... 250	secs*10
AL	Att	49227	49345	RW	HAL and LAL parameter mode (absolute or relative)	BYTE		0 ... 1	num
AL	AFd	16400	49345,2	RW	Alarm activation differential	WORD		1,0 ... 50,0	°C/°F
AL	HAL	16422	49345,4	RW	Maximum alarm threshold	WORD	Y	LAL ... 320	°C/°F
AL	LAL	16424	49345,6	RW	Minimum alarm threshold	WORD	Y	-67,0 ... HAL	°C/°F
AL	PAO	49228	49346	RW	Alarm disabling after power-on	BYTE		0 ... 10	hours
AL	dAO	16402	49346,2	RW	Temperature alarm disabling time after defrost cycle	WORD		0 ... 999	min
AL	OAO	49229	49346,4	RW	High and low temperature alarms disabling time after door closing	BYTE		0 ... 10	hours
AL	tdO	49230	49346,6	RW	Open door disabling time	BYTE		0 ... 250	min
AL	tAO	49231	49347	RW	Temperature alarms delay time	BYTE		0 ... 250	min
AL	dAt	49232	49347,2	RW	Alarm signalling end of defrost due to timeout	BYTE		0 ... 1	flag
AL	rLO	49233	49347,4	RW	An external alarm blocks the regulators	BYTE		0 ... 1	flag
AL	AOP	49234	49347,6	RW	Alarm output polarity	BYTE		0 ... 1	num
AL	SA3	16500	49348,2	RW	Alarm setpoint for probe 3	WORD	Y	-67,0 ... 320	°C/°F
AL	dA3	16502	49348,4	RW	Probe 3 alarm activation differential	WORD		1,0 ... 50,0	°C/°F
CPr	CPS	16504	49348,6	RW	Cool protection setpoint	WORD	Y	-67,0 ... 320	°C/°F
CPr	CPd	16506	49349	RW	Cool protection differential	WORD		0,1 ... 30,0	°C/°F
CPr	CPt	49294	49349,2	RW	Time that the temperature remains below the cool protection setpoint	BYTE		0 ... 255	min
Lit	dOd	49201	49349,4	RW	Enable utility switch-off on activation of door switch	BYTE		0 ... 3	num
Lit	dAd	49202	49349,6	RW	Activation delay for digital inputs	BYTE		0 ... 255	min

Folder	Label	Address Value	Address Visibility	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	M.U.
Lit	dCO	49295	49350	RW	Delay in deactivating compressor after door opened	BYTE		0 ... 255	min
Lit	dcd	49310	49350,2	RW	Delay in activating fan after door closed	BYTE		0 ... 250	secs
PrE	PEn	49261	49350,4	RW	Number of errors allowed for min/max pressure switch input	BYTE		0 ... 15	num
PrE	PEi	49284	49350,6	RW	Minimum/maximum pressure switch error count interval	BYTE		1 ... 99	min
PrE	PEt	49285	49351	RW	Delay in activating compressor after pressure switch deactivation	BYTE		0 ... 255	min
dEC	dCA	49324	49351,2	RW	Enable deep cooling	BYTE		0 ... 2	num
dEC	dCS	16496	49351,4	RW	Deep cooling setpoint	WORD	Y	-67,0 ... 320	°C/°F
dEC	tdC	49286	49351,6	RW	Deep cooling duration	BYTE		0 ... 255	min
dEC	dcc	49287	49352	RW	Defrost delay after deep cooling	BYTE		0 ... 255	min
dEC	Sid	16550	49352,2	RW	Threshold for start of deep cooling	WORD	Y	-67,0 ... 320	°C/°F
dEC	toS	49323	49352,4	RW	Time above threshold for start of deep cooling	BYTE		0 ... 255	min
EnS	ESt	49301	49352,6	RW	Type of action for Energy Saving function	BYTE		0 ... 6	num
EnS	ESA	49302	49353	RW	AUX state during Energy Saving	BYTE		0 ... 2	num
EnS	ESF	49293	49353,2	RW	Night mode activation (Energy Saving)	BYTE		0 ... 1	flag
EnS	Cdt	49296	49353,4	RW	Door close time	BYTE		0 ... 255	min*10
EnS	ESo	49297	49353,6	RW	Timeout for disabling energy saving mode (door switch)	BYTE		0 ... 10	num
EnS	OSP	16388	49354	RW	Setpoint offset	WORD	Y	-30,0 ... 30,0	°C/°F
EnS	OdF	16510	49354,2	RW	Activation differentials correction	WORD		0,0 ... 30,0	°C/°F
EnS	dnt	49303	49354,4	RW	Night mode duration	BYTE		0 ... 24	hours
EnS	dFt	49304	49354,6	RW	Fast cooling mode duration	BYTE		0 ... 24	hours
EnS	SPn	16508	49355	RW	Night mode setpoint	WORD	Y	LSE ... HSE	°C/°F
EnS	dFn	16512	49355,2	RW	Night mode offset	WORD		0,1 ... 30,0	°C/°F
EnS	SPF	16546	49355,4	RW	Fast cooling setpoint	WORd	Y	LSE ... HSE	°C/°F
EnS	dFF	16548	49355,6	RW	Fast cooling offset	WORD	Y	0,1 ... 30,0	°C/°F
EnS	ESP	49313	49356,4	RW	Sensitivity of virtual door regulator	BYTE		0 ... 5	num
EnS	dOt	49325	49364,4	RW	Maximum door open time	BYTE		0 ... 255	secs
Add	F-PtS	49305	49326,2	RW	Protocol selection	BYTE		0 ... 1	flag
Add	F-dEA	49225	49326,4	RW	Device address	BYTE		0 ... 14	num
Add	F-FAA	49226	49326,6	RW	Family address	BYTE		0 ... 14	num
Add	F-PtY	49306	49327	RW	MODBUS parity bit	BYTE		0 ... 2	flag
Add	F-StP	49307	49327,2	RW	MODBUS stop bit	BYTE		0 ... 1	flag
diS	LOC	49236	49356,6	RW	Enable keypad lock	BYTE		0 ... 1	flag
diS	PS1	49253	49357	RW	Password 1 value	BYTE		0 ... 250	num
diS	PS2	49254	49357,2	RW	Password 2 value	BYTE		0 ... 250	num
diS	ndt	49237	49357,4	RW	Display with decimal point	BYTE		0 ... 1	flag
diS	CA1	16404	49357,6	RW	Cell probe calibration	WORD	Y	-12,0 ... 12,0	°C/°F
diS	CA2	16406	49358	RW	Evaporator probe calibration	WORD	Y	-12,0 ... 12,0	°C/°F
diS	CA3	16514	49358,2	RW	Probe 3 calibration	WORD	Y	-12,0 ... 12,0	°C/°F
diS	ddL	49239	49359,2	RW	Resource locking after defrost end	BYTE		0 ... 2	num
diS	Ldd	49290	49359,4	RW	Display lock timeout from defrost end	BYTE		0 ... 255	min
diS	dro	49256	49359,6	RW	°C/°F selection	BYTE		0 ... 1	num
diS	ddd	49240	49360	RW	Selection of main display value	BYTE		0 ... 3	num
CnF	H08	49258	49361	RW	Standby mode	BYTE		0 ... 2	num
CnF	H11	16412	49361,2	RW	Configurability and polarity of digital input 1	WORD	Y	-10 ... 10	num
CnF	H12	16494	49361,4	RW	Configurability and polarity of digital input 2	WORD	Y	-10 ... 10	num
CnF	H21	49242	49361,6	RW	Configurability of digital output 1	BYTE		0 ... 9	num
CnF	H22	49243	49362	RW	Configurability of digital output 2	BYTE		0 ... 9	num
CnF	H23	49244	49362,2	RW	Configurability of digital output 3	BYTE		0 ... 9	num
CnF	H25	49246	49362,6	RW	Configurability of digital output 5 (Buzzer)	BYTE		0 ... 9	num
CnF	H32	49248	49363,2	RW	Configurability of DOWN key	BYTE		0 ... 6	num
CnF	H33	49249	49363,4	RW	Configurability of ESC key	BYTE		0 ... 6	num
CnF	H42	49251	49364	RW	Evaporator probe present	BYTE		0 ... 1	flag
CnF	H43	49308	49364,2	RW	Probe Pb3 present	BYTE		0 ... 1	flag
CnF	rEL	---	49327,6	RW	Device version visibility	2 BIT		0 ... 3	num
CnF	tAb	---	49328	RW	Parameters table visibility	2 BIT		0 ... 3	num

Folder	Label	Address Value	Address Visibility	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	M.U.
FPr	UL	---	49333,2	RW	Visibility of function for transferring programming parameters from instrument to Copy Card	2 BIT		0 ... 3	num
FPr	Fr	---	49333,6	RW	Visibility of Copy Card formatting function	2 BIT		0 ... 3	num
FnC	rAP	---	49334,4	RW	Pressure switch alarms reset visibility	2 BIT		0 ... 3	num
APPLICATION 1 PARAMETERS									
	V1-SEt	16618	49544	RW	Control Setpoint	WORD	Y	LSE ... HSE	°C/°F
V1	V1-diF	16620	49544,2	RW	Activation differential	WORD		0,1 ... 30,0	°C/°F
V1	V1-HSE	16622	49544,4	RW	Maximum value settable for setpoint	WORD	Y	LSE ... HdL	°C/°F
V1	V1-LSE	16624	49544,6	RW	Minimum value settable for setpoint	WORD	Y	LdL...HSE	°C/°F
V1	V1-Ont	49457	49545,6	RW	ON time for compressor output with faulty Pb1 probe	BYTE		0 ... 250	min
V1	V1-OFt	49458	49546	RW	OFF time for compressor output with faulty Pb1 probe	BYTE		0 ... 250	min
V1	V1-dOn	49459	49546,2	RW	Compressor output enabling delay from request	BYTE		0 ... 250	secs
V1	V1-dOF	49460	49546,4	RW	Compressor output enabling delay from shutdown	BYTE		0 ... 250	min
V1	V1-dbi	49461	49546,6	RW	Delay between two consecutive starts of the compressor output	BYTE		0 ... 250	min
V1	V1-OdO	49462	49547	RW	Delay output enabling from power-on	BYTE		0 ... 250	min
V1	V1-dFA	49463	49547,2	RW	Defrost delay after deep cooling	BYTE		0 ... 255	secs
V1	V1-dtY	49464	49547,4	RW	Type of defrost	BYTE		0 ... 2	num
V1	V1-dit	49465	49547,6	RW	Interval between defrost cycles	BYTE		0 ... 250	hours
V1	V1-dCt	49468	49548,4	RW	Defrost interval count mode	BYTE		0 ... 3	num
V1	V1-dOH	49469	49548,6	RW	Defrost cycle enabling delay from request	BYTE		0 ... 59	min
V1	V1-dEt	49470	49549	RW	Defrost timeout	BYTE		1 ... 250	min
V1	V1-dSt	16626	49549,2	RW	Defrost end temperature	WORD	Y	-67,0 ... 320	°C/°F
V1	V1-dPO	49471	49549,4	RW	Defrost enabling request from power-on	BYTE		0 ... 1	flag
V1	V1-dSE	16630	49550,2	RW	Temperature threshold for defrost start	BYTE	Y	-67,0 ... 320	°C/°F
V1	V1-dtt	49473	49550,4	RW	Time for which the temperature of the evaporator must remain below the threshold	BYTE		0 ... 255	min
V1	V1-FPt	49474	49550,6	RW	FSt parameter mode (absolute or relative)	BYTE		0 ... 1	flag
V1	V1-FSt	16632	49551	RW	Evaporator fans disabling temperature	WORD	Y	-67,0 ... 320	°C/°F
V1	V1-FAd	16636	49551,4	RW	Evaporator fans activation differential	WORD		1,0 ... 50,0	°C/°F
V1	V1-Fdt	49475	49551,6	RW	Evaporator fans delay after defrost cycle	BYTE		0 ... 250	min
V1	V1-dt	49476	49552	RW	Coil drainage time	BYTE		0 ... 250	min
V1	V1-dFd	49477	49552,2	RW	Evaporator fans disabling during defrost time	BYTE		0 ... 1	flag
V1	V1-FCO	49478	49552,4	RW	Evaporator fans status with OFF compressor output	BYTE		0 ... 3	num
V1	V1-FdC	49479	49552,6	RW	Evaporator fans switch-off delay after compressor disabled	BYTE		0 ... 99	min
V1	V1-Fon	49480	49553	RW	Evaporator fans ON time in Duty Cycle mode	BYTE		0 ... 250	secs*10
V1	V1-FoF	49481	49553,2	RW	Evaporator fans OFF time in Duty Cycle mode	BYTE		0 ... 250	secs*10
V1	V1-Fnn	49482	49553,4	RW	Evaporator fans ON time in duty cycle night mode	BYTE		0 ... 250	secs*10
V1	V1-FnF	49483	49553,6	RW	Evaporator fans OFF time in duty cycle night mode	BYTE		0 ... 250	secs*10
V1	V1-Att	49484	49554	RW	HAL and LAL parameter mode (absolute or relative)	BYTE		0 ... 1	num
V1	V1-AFd	16638	49554,2	RW	Alarm activation differential	WORD		1,0 ... 50,0	°C/°F
V1	V1-HAL	16640	49554,4	RW	Maximum alarm threshold	WORD	Y	LAL ... 320	°C/°F
V1	V1-LAL	16642	49554,6	RW	Minimum alarm threshold	WORD	Y	-67,0 ... HAL	°C/°F
V1	V1-PAO	49485	49555	RW	Alarm disabling after power-on	BYTE		0 ... 10	hours
V1	V1-dAO	16644	49555,2	RW	Temperature alarm disabling time after defrost cycle	WORD		0 ... 999	min
V1	V1-OAO	49486	49555,4	RW	High and low temperature alarms disabling time after door closing	BYTE		0 ... 10	hours
V1	V1-tdO	49487	49555,6	RW	Open door disabling time	BYTE		0 ... 250	min
V1	V1-tAO	49488	49556	RW	Temperature alarms delay time	BYTE		0 ... 250	min
V1	V1-dAt	49489	49556,2	RW	Alarm signalling end of defrost due to timeout	BYTE		0 ... 1	flag
V1	V1-rLO	49490	49556,4	RW	An external alarm blocks the regulators	BYTE		0 ... 1	flag
V1	V1-AOP	49491	49556,6	RW	Alarm output polarity	BYTE		0 ... 1	num
V1	V1-SA3	16646	49557,2	RW	Alarm setpoint for probe 3	WORD	Y	-67,0 ... 320	°C/°F
V1	V1-dA3	16648	49557,4	RW	Probe 3 alarm activation differential	WORD		1,0 ... 50,0	°C/°F
V1	V1-CPS	16650	49557,6	RW	Cool protection setpoint	WORD	Y	-67,0 ... 320	°C/°F
V1	V1-CPd	16652	49558	RW	Cool protection differential	WORD		0,1 ... 30,0	°C/°F

Folder	Label	Address Value	Address Visibility	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	M.U.
V1	V1-CPt	49493	49558,2	RW	Time that the temperature remains below the cool protection setpoint	BYTE		0 ... 255	min
V1	V1-dOd	49494	49558,4	RW	Enable utility switch-off on activation of door switch	BYTE		0 ... 3	num
V1	V1-dAd	49495	49558,6	RW	Activation delay for digital inputs	BYTE		0 ... 255	min
V1	V1-dCO	49496	49559	RW	Delay in deactivating compressor after door opened	BYTE		0 ... 255	min
V1	V1-dcd	49497	49559,2	RW	Delay in activating fan after door closed	BYTE		0 ... 250	secs
V1	V1-PEn	49498	49559,4	RW	Number of errors allowed per maximum/minimum pressure switch input	BYTE		0 ... 15	num
V1	V1-PEi	49499	49559,6	RW	Minimum/maximum pressure switch error count interval	BYTE		1 ... 99	min
V1	V1-PEt	49500	49560	RW	Delay in activating compressor after pressure switch deactivation	BYTE		0 ... 255	min
V1	V1-dCA	49501	49560,2	RW	Enable deep cooling	BYTE		0 ... 2	num
V1	V1-dCS	16654	49560,4	RW	Deep cooling setpoint	WORD	Y	-67,0 ... 320	°C/°F
V1	V1-tdC	49502	49560,6	RW	Deep cooling duration	BYTE		0 ... 255	min
V1	V1-dcc	49503	49561	RW	Defrost delay after deep cooling	BYTE		0 ... 255	min
V1	V1-Sid	16656	49561,2	RW	Threshold for start of deep cooling	WORD	Y	-67,0 ... 320	°C/°F
V1	V1-toS	49504	49561,4	RW	Time above threshold for start of deep cooling	BYTE		0 ... 255	min
V1	V1-ESt	49505	49561,6	RW	Type of action for Energy Saving function	BYTE		0 ... 6	num
V1	V1-ESA	49506	49562	RW	AUX state during Energy Saving	BYTE		0 ... 2	num
V1	V1-ESF	49507	49562,2	RW	Night mode activation (Energy Saving)	BYTE		0 ... 1	flag
V1	V1-Cdt	49508	49562,4	RW	Door close time	BYTE		0 ... 255	min*10
V1	V1-ESo	49509	49562,6	RW	Timeout for disabling energy saving mode (door switch)	BYTE		0 ... 10	num
V1	V1-OSP	16658	49563	RW	Setpoint offset	WORD	Y	-30,0 ... 30,0	°C/°F
V1	V1-OdF	16660	49563,2	RW	Activation differentials correction	WORD		0,0 ... 30,0	°C/°F
V1	V1-dnt	49510	49563,4	RW	Night mode duration	BYTE		0 ... 24	hours
V1	V1-dFt	49511	49563,6	RW	Fast cooling mode duration	BYTE		0 ... 24	hours
V1	V1-SPn	16662	49564	RW	Night mode setpoint	WORD	Y	LSE ... HSE	°C/°F
V1	V1-dFn	16664	49564,2	RW	Night mode offset	WORD		0,1 ... 30,0	°C/°F
V1	V1-SPF	16666	49564,4	RW	Fast cooling setpoint	WORd	Y	LSE ... HSE	°C/°F
V1	V1-dFF	16668	49564,6	RW	Fast cooling offset	WORD	Y	0,1 ... 30,0	°C/°F
V1	V1-ESP	49513	49565,4	RW	Sensitivity of virtual door regulator	BYTE		0 ... 5	num
V1	V1-dOt	49538	49573,4	RW	Maximum door open time	BYTE		0 ... 255	secs
V1	V1-LOC	49514	49565,6	RW	Enable keypad lock	BYTE		0 ... 1	flag
V1	V1-PS1	49515	49566	RW	Password 1 value	BYTE		0 ... 250	num
V1	V1-PS2	49516	49566,2	RW	Password 2 value	BYTE		0 ... 250	num
V1	V1-ndt	49517	49566,4	RW	Display with decimal point	BYTE		0 ... 1	flag
V1	V1-CA1	16672	49566,6	RW	Cell probe calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V1	V1-CA2	16674	49567	RW	Evaporator probe calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V1	V1-CA3	16676	49567,2	RW	Probe 3 calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V1	V1-ddL	49519	49568,2	RW	Resource locking after defrost end	BYTE		0 ... 2	num
V1	V1-Ldd	49520	49568,4	RW	Display lock timeout from defrost end	BYTE		0 ... 255	min
V1	V1-dro	49521	49568,6	RW	°C/°F selection	BYTE		0 ... 1	num
V1	V1-ddd	49522	49569	RW	Selection of main display value	BYTE		0 ... 3	num
V1	V1-H08	49526	49570	RW	Standby mode	BYTE		0 ... 2	num
V1	V1-H11	16682	49570,2	RW	Configurability and polarity of digital input 1	WORD	Y	-10 ... 10	num
V1	V1-H12	16684	49570,4	RW	Configurability and polarity of digital input 2	WORD	Y	-10 ... 10	num
V1	V1-H21	49527	49570,6	RW	Configurability of digital output 1	BYTE		0 ... 9	num
V1	V1-H22	49528	49571	RW	Configurability of digital output 2	BYTE		0 ... 9	num
V1	V1-H23	49529	49571,2	RW	Configurability of digital output 3	BYTE		0 ... 9	num
V1	V1-H25	49531	49571,6	RW	Configurability of digital output 5 (Buzzer)	BYTE		0 ... 9	num
V1	V1-H32	49533	49572,2	RW	Configurability of DOWN key	BYTE		0 ... 6	num
V1	V1-H33	49534	49572,4	RW	Configurability of ESC key	BYTE		0 ... 6	num
V1	V1-H42	49536	49573	RW	Evaporator probe present	BYTE		0 ... 1	flag
V1	V1-H43	49537	49573,2	RW	Probe Pb3 present	BYTE		0 ... 1	flag
V1	V1-UL	---	49542,2	RW	Visibility of function for transferring programming parameters from instrument to Copy Card	2 BIT		0 ... 3	num
V1	V1-Fr	---	49542,6	RW	Visibility of Copy Card formatting function	2 BIT		0 ... 3	num
V1	V1-rAP	---	49543,4	RW	Pressure switch alarms reset visibility	2 BIT		0 ... 3	num

Folder	Label	Address Value	Address Visibility	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	M.U.
APPLICATION 2 PARAMETERS									
	V2-SEt	16814	49740	RW	Control Setpoint	WORD	Y	LSE ... HSE	°C/°F
V2	V2-diF	16816	49740,2	RW	Activation differential	WORD		0,1 ... 30,0	°C/°F
V2	V2-HSE	16818	49740,4	RW	Maximum value settable for setpoint	WORD	Y	LSE ... HdL	°C/°F
V2	V2-LSE	16820	49740,6	RW	Minimum value settable for setpoint	WORD	Y	LdL...HSE	°C/°F
V2	V2-Ont	49653	49741,6	RW	ON time for compressor output with faulty Pb1 probe	BYTE		0 ... 250	min
V2	V2-OFt	49654	49742	RW	OFF time for compressor output with faulty Pb1 probe	BYTE		0 ... 250	min
V2	V2-dOn	49655	49742,2	RW	Compressor output enabling delay from request	BYTE		0 ... 250	secs
V2	V2-dOF	49656	49742,4	RW	Compressor output enabling delay from shutdown	BYTE		0 ... 250	min
V2	V2-dbi	49657	49742,6	RW	Delay between two consecutive starts of the compressor output	BYTE		0 ... 250	min
V2	V2-OdO	49658	49743	RW	Delay output enabling from power-on	BYTE		0 ... 250	min
V2	V2-dFA	49659	49743,2	RW	Defrost delay after deep cooling	BYTE		0 ... 255	secs
V2	V2-dtY	49660	49743,4	RW	Type of defrost	BYTE		0 ... 2	num
V2	V2-dit	49661	49743,6	RW	Interval between defrost cycles	BYTE		0 ... 250	hours
V2	V2-dCt	49664	49744,4	RW	Defrost interval count mode	BYTE		0 ... 3	num
V2	V2-dOH	49665	49744,6	RW	Defrost cycle enabling delay from request	BYTE		0 ... 59	min
V2	V2-dEt	49666	49745	RW	Defrost timeout	BYTE		1 ... 250	min
V2	V2-dSt	16822	49745,2	RW	Defrost end temperature	WORD	Y	-67,0 ... 320	°C/°F
V2	V2-dPO	49667	49745,4	RW	Defrost enabling request from power-on	BYTE		0 ... 1	flag
V2	V2-dSE	16826	49746,2	RW	Temperature threshold for defrost start	BYTE	Y	-67,0 ... 320	°C/°F
V2	V2-dtt	49669	49746,4	RW	Time for which the temperature of the evaporator must remain below the threshold	BYTE		0 ... 255	min
V2	V2-FPt	49670	49746,6	RW	FSt parameter mode (absolute or relative)	BYTE		0 ... 1	flag
V2	V2-FSt	16828	49747	RW	Evaporator fans disabling temperature	WORD	Y	-67,0 ... 320	°C/°F
V2	V2-FAd	16832	49747,4	RW	Evaporator fans activation differential	WORD		1,0 ... 50,0	°C/°F
V2	V2-Fdt	49671	49747,6	RW	Evaporator fans delay after defrost cycle	BYTE		0 ... 250	min
V2	V2-dt	49672	49748	RW	Coil drainage time	BYTE		0 ... 250	min
V2	V2-dFd	49673	49748,2	RW	Evaporator fans disabling during defrost time	BYTE		0 ... 1	flag
V2	V2-FCO	49674	49748,4	RW	Evaporator fans status with OFF compressor output	BYTE		0 ... 3	num
V2	V2-FdC	49675	49748,6	RW	Evaporator fans switch-off delay after compressor disabled	BYTE		0 ... 99	min
V2	V2-Fon	49676	49749	RW	Evaporator fans ON time in Duty Cycle mode	BYTE		0 ... 250	secs*10
V2	V2-FoF	49677	49749,2	RW	Evaporator fans OFF time in Duty Cycle mode	BYTE		0 ... 250	secs*10
V2	V2-Fnn	49678	49749,4	RW	Evaporator fans ON time in duty cycle night mode	BYTE		0 ... 250	secs*10
V2	V2-FnF	49679	49749,6	RW	Evaporator fans OFF time in duty cycle night mode	BYTE		0 ... 250	secs*10
V2	V2-Att	49680	49750	RW	HAL and LAL parameter mode (absolute or relative)	BYTE		0 ... 1	num
V2	V2-AFd	16834	49750,2	RW	Alarm activation differential	WORD		1,0 ... 50,0	°C/°F
V2	V2-HAL	16836	49750,4	RW	Maximum alarm threshold	WORD	Y	LAL ... 320	°C/°F
V2	V2-LAL	16838	49750,6	RW	Minimum alarm threshold	WORD	Y	-67,0 ... HAL	°C/°F
V2	V2-PAO	49681	49751	RW	Alarm disabling after power-on	BYTE		0 ... 10	hours
V2	V2-dAO	16840	49751,2	RW	Temperature alarm disabling time after defrost cycle	WORD		0 ... 999	min
V2	V2-OAO	49682	49751,4	RW	High and low temperature alarms disabling time after door closing	BYTE		0 ... 10	hours
V2	V2-tdO	49683	49751,6	RW	Open door disabling time	BYTE		0 ... 250	min
V2	V2-tAO	49684	94752	RW	Temperature alarms delay time	BYTE		0 ... 250	min
V2	V2-dAt	49685	49752,2	RW	Alarm signalling end of defrost due to timeout	BYTE		0 ... 1	flag
V2	V2-rLO	49686	49752,4	RW	An external alarm blocks the regulators	BYTE		0 ... 1	flag
V2	V2-AOP	49687	49752,6	RW	Alarm output polarity	BYTE		0 ... 1	num
V2	V2-SA3	16842	49753,2	RW	Alarm setpoint for probe 3	WORD	Y	-67,0 ... 320	°C/°F
V2	V2-dA3	16844	49753,4	RW	Probe 3 alarm activation differential	WORD		1,0 ... 50,0	°C/°F
V2	V2-CPS	16846	49753,6	RW	Cool protection setpoint	WORD	Y	-67,0 ... 320	°C/°F
V2	V2-CPd	16848	49754	RW	Cool protection differential	WORD		0,1 ... 30,0	°C/°F
V2	V2-CPt	49689	49754,2	RW	Time that the temperature remains below the cool protection setpoint	BYTE		0 ... 255	min

Folder	Label	Address Value	Address Visibility	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	M.U.
V2	V2-dOd	49690	49754,4	RW	Enable utility switch-off on activation of door switch	BYTE		0 ... 3	num
V2	V2-dAd	49691	49754,6	RW	Activation delay for digital inputs	BYTE		0 ... 255	min
V2	V2-dCO	49692	49755	RW	Delay in deactivating compressor after door opened	BYTE		0 ... 255	min
V2	V2-dcd	49693	49755,2	RW	Delay in activating fan after door closed	BYTE		0 ... 250	secs
V2	V2-PEn	49694	49755,4	RW	Number of errors allowed per maximum/minimum pressure switch input	BYTE		0 ... 15	num
V2	V2-PEi	49695	49755,6	RW	Minimum/maximum pressure switch error count interval	BYTE		1 ... 99	min
V2	V2-PEt	49696	49756	RW	Delay in activating compressor after pressure switch deactivation	BYTE		0 ... 255	min
V2	V2-dCA	49697	49756,2	RW	Enable deep cooling	BYTE		0 ... 2	num
V2	V2-dCS	16850	49756,4	RW	Deep cooling setpoint	WORD	Y	-67,0 ... 320	°C/°F
V2	V2-tdC	49698	49756,6	RW	Deep cooling duration	BYTE		0 ... 255	min
V2	V2-dcc	49699	49757	RW	Defrost delay after deep cooling	BYTE		0 ... 255	min
V2	V2-Sid	16852	49757,2	RW	Threshold for start of deep cooling	WORD	Y	-67,0 ... 320	°C/°F
V2	V2-toS	49700	49757,4	RW	Time above threshold for start of deep cooling	BYTE		0 ... 255	min
V2	V2-ESt	49701	49757,6	RW	Type of action for Energy Saving function	BYTE		0 ... 6	num
V2	V2-ESA	49702	49758	RW	AUX state during Energy Saving	BYTE		0 ... 2	num
V2	V2-ESF	49703	49758,2	RW	Night mode activation (Energy Saving)	BYTE		0 ... 1	flag
V2	V2-Cdt	49704	49758,4	RW	Door close time	BYTE		0 ... 255	min*10
V2	V2-ESo	49705	49758,6	RW	Timeout for disabling energy saving mode (door switch)	BYTE		0 ... 10	num
V2	V2-OSP	16854	49759	RW	Setpoint offset	WORD	Y	-30,0 ... 30,0	°C/°F
V2	V2-OdF	16856	49759,2	RW	Activation differentials correction	WORD		0,0 ... 30,0	°C/°F
V2	V2-dnt	49706	49759,4	RW	Night mode duration	BYTE		0 ... 24	hours
V2	V2-dFt	49707	49759,6	RW	Fast cooling mode duration	BYTE		0 ... 24	hours
V2	V2-SPn	16858	49760	RW	Night mode setpoint	WORD	Y	LSE ... HSE	°C/°F
V2	V2-dFn	16860	49760,2	RW	Night mode offset	WORD		0,1 ... 30,0	°C/°F
V2	V2-SPF	16862	49760,4	RW	Fast cooling setpoint	WORd	Y	LSE ... HSE	°C/°F
V2	V2-dFF	16864	49760,6	RW	Fast cooling offset	WORD	Y	0,1 ... 30,0	°C/°F
V2	V2-ESP	49709	49761,4	RW	Sensitivity of virtual door regulator	BYTE		0 ... 5	num
V2	V2-dOt	49734	49769,4	RW	Maximum door open time	BYTE		0 ... 255	hours
V2	V2-LOC	49710	49761,6	RW	Enable keypad lock	BYTE		0 ... 1	flag
V2	V2-PS1	49711	49762	RW	Password 1 value	BYTE		0 ... 250	num
V2	V2-PS2	49712	49762,2	RW	Password 2 value	BYTE		0 ... 250	num
V2	V2-ndt	49713	49762,4	RW	Display with decimal point	BYTE		0 ... 1	flag
V2	V2-CA1	16868	49762,6	RW	Cell probe calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V2	V2-CA2	16870	49763	RW	Evaporator probe calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V2	V2-CA3	16872	49763,2	RW	Probe 3 calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V2	V2-ddL	49715	49764,2	RW	Resource locking after defrost end	BYTE		0 ... 2	num
V2	V2-Ldd	49716	49764,4	RW	Display lock timeout from defrost end	BYTE		0 ... 255	min
V2	V2-dro	49717	49764,6	RW	°C/°F selection	BYTE		0 ... 1	num
V2	V2-ddd	49718	49765	RW	Selection of main display value	BYTE		0 ... 3	num
V2	V2-H08	49722	49766	RW	Standby mode	BYTE		0 ... 2	num
V2	V2-H11	16878	49766,2	RW	Configurability and polarity of digital input 1	WORD	Y	-10 ... 10	num
V2	V2-H12	16880	49766,4	RW	Configurability and polarity of digital input 2	WORD	Y	-10 ... 10	num
V2	V2-H21	49723	49766,6	RW	Configurability of digital output 1	BYTE		0 ... 9	num
V2	V2-H22	49724	49767	RW	Configurability of digital output 2	BYTE		0 ... 9	num
V2	V2-H23	49725	49767,2	RW	Configurability of digital output 3	BYTE		0 ... 9	num
V2	V2-H25	49727	49767,6	RW	Configurability of digital output 5 (Buzzer)	BYTE		0 ... 9	num
V2	V2-H32	49729	49768,2	RW	Configurability of DOWN key	BYTE		0 ... 6	num
V2	V2-H33	49730	49768,4	RW	Configurability of ESC key	BYTE		0 ... 6	num
V2	V2-H42	49732	49769	RW	Evaporator probe present	BYTE		0 ... 1	flag
V2	V2-H43	49733	49769,2	RW	Probe Pb3 present	BYTE		0 ... 1	flag
V2	V2-UL	---	49738,2	RW	Visibility of function for transferring programming parameters from instrument to Copy Card	2 BIT		0 ... 3	num
V2	V2-Fr	---	49738,6	RW	Visibility of Copy Card formatting function	2 BIT		0 ... 3	num
V2	V2-rAP	---	49739,4	RW	Pressure switch alarms reset visibility	2 BIT		0 ... 3	num

Folder	Label	Address Value	Address Visibility	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	M.U.
APPLICATION 3 PARAMETERS									
	V3-SEt	17010	49936	RW	Control Setpoint	WORD	Y	LSE ... HSE	°C/°F
V3	V3-diF	17012	49936,2	RW	Activation differential	WORD		0,1 ... 30,0	°C/°F
V3	V3-HSE	17014	49936,4	RW	Maximum value settable for setpoint	WORD	Y	LSE ... HdL	°C/°F
V3	V3-LSE	17016	49936,6	RW	Minimum value settable for setpoint	WORD	Y	LdL...HSE	°C/°F
V3	V3-Ont	49849	49937,6	RW	ON time for compressor output with faulty Pb1 probe	BYTE		0 ... 250	min
V3	V3-OFt	49850	49938	RW	OFF time for compressor output with faulty Pb1 probe	BYTE		0 ... 250	min
V3	V3-dOn	49851	49938,2	RW	Compressor output enabling delay from request	BYTE		0 ... 250	secs
V3	V3-dOF	49852	49938,4	RW	Compressor output enabling delay from shutdown	BYTE		0 ... 250	min
V3	V3-dbi	49853	49938,6	RW	Delay between two consecutive starts of the compressor output	BYTE		0 ... 250	min
V3	V3-OdO	49854	49939	RW	Delay output enabling from power-on	BYTE		0 ... 250	min
V3	V3-dFA	49855	49939,2	RW	Defrost delay after deep cooling	BYTE		0 ... 255	secs
V3	V3-dtY	49856	49939,4	RW	Type of defrost	BYTE		0 ... 2	num
V3	V3-dit	49857	49939,6	RW	Interval between defrost cycles	BYTE		0 ... 250	hours
V3	V3-dCt	49860	49940,4	RW	Defrost interval count mode	BYTE		0 ... 3	num
V3	V3-dOH	49861	49940,6	RW	Defrost cycle enabling delay from request	BYTE		0 ... 59	min
V3	V3-dEt	49862	49941	RW	Defrost timeout	BYTE		1 ... 250	min
V3	V3-dSt	17018	49941,2	RW	Defrost end temperature	WORD	Y	-67,0 ... 320	°C/°F
V3	V3-dPO	49863	49941,4	RW	Defrost enabling request from power-on	BYTE		0 ... 1	flag
V3	V3-dSE	17022	49942,2	RW	Temperature threshold for defrost start	BYTE	Y	-67,0 ... 320	°C/°F
V3	V3-dtt	49865	49942,4	RW	Time for which the temperature of the evaporator must remain below the threshold	BYTE		0 ... 255	min
V3	V3-FPt	49866	49942,6	RW	FSt parameter mode (absolute or relative)	BYTE		0 ... 1	flag
V3	V3-FSt	17024	49943	RW	Evaporator fans disabling temperature	WORD	Y	-67,0 ... 320	°C/°F
V3	V3-FAd	17028	49943,4	RW	Evaporator fans activation differential	WORD		1,0 ... 50,0	°C/°F
V3	V3-Fdt	49867	49943,6	RW	Evaporator fans delay after defrost cycle	BYTE		0 ... 250	min
V3	V3-dt	49868	49944	RW	Coil drainage time	BYTE		0 ... 250	min
V3	V3-dFd	49869	49944,2	RW	Evaporator fans disabling during defrost time	BYTE		0 ... 1	flag
V3	V3-FCO	49870	49944,4	RW	Evaporator fans status with OFF compressor output	BYTE		0 ... 3	num
V3	V3-FdC	49871	49944,6	RW	Evaporator fans switch-off delay after compressor disabled	BYTE		0 ... 99	min
V3	V3-Fon	49872	49945	RW	Evaporator fans ON time in Duty Cycle mode	BYTE		0 ... 250	secs*10
V3	V3-FoF	49873	49945,2	RW	Evaporator fans OFF time in Duty Cycle mode	BYTE		0 ... 250	secs*10
V3	V3-Fnn	49874	49945,4	RW	Evaporator fans ON time in duty cycle night mode	BYTE		0 ... 250	secs*10
V3	V3-FnF	49875	49945,6	RW	Evaporator fans OFF time in duty cycle night mode	BYTE		0 ... 250	secs*10
V3	V3-Att	49876	49946	RW	HAL and LAL parameter mode (absolute or relative)	BYTE		0 ... 1	num
V3	V3-AFd	17030	49946,2	RW	Alarm activation differential	WORD		1,0 ... 50,0	°C/°F
V3	V3-HAL	17032	49946,4	RW	Maximum alarm threshold	WORD	Y	LAL ... 320	°C/°F
V3	V3-LAL	17034	49946,6	RW	Minimum alarm threshold	WORD	Y	-67,0 ... HAL	°C/°F
V3	V3-PAO	49877	49947	RW	Alarm disabling after power-on	BYTE		0 ... 10	hours
V3	V3-dAO	17036	49947,2	RW	Temperature alarm disabling time after defrost cycle	WORD		0 ... 999	min
V3	V3-OAO	49878	49947,4	RW	High and low temperature alarms disabling time after door closing	BYTE		0 ... 10	hours
V3	V3-tdO	49879	49947,6	RW	Open door disabling time	BYTE		0 ... 250	min
V3	V3-tAO	49880	49948	RW	Temperature alarms delay time	BYTE		0 ... 250	min
V3	V3-dAt	49881	49948,2	RW	Alarm signalling end of defrost due to timeout	BYTE		0 ... 1	flag
V3	V3-rLO	49882	49948,4	RW	An external alarm blocks the regulators	BYTE		0 ... 1	flag
V3	V3-AOP	49883	49948,6	RW	Alarm output polarity	BYTE		0 ... 1	num
V3	V3-SA3	17038	49949,2	RW	Alarm setpoint for probe 3	WORD	Y	-67,0 ... 320	°C/°F
V3	V3-dA3	17040	49949,4	RW	Probe 3 alarm activation differential	WORD		1,0 ... 50,0	°C/°F
V3	V3-CPS	17042	49949,6	RW	Cool protection setpoint	WORD	Y	-67,0 ... 320	°C/°F
V3	V3-CPd	17044	49950	RW	Cool protection differential	WORD		0,1 ... 30,0	°C/°F
V3	V3-CPt	49885	49950,2	RW	Time that the temperature remains below the cool protection setpoint	BYTE		0 ... 255	min

Folder	Label	Address Value	Address Visibility	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	M.U.
V3	V3-dOd	49886	49950,4	RW	Enable utility switch-off on activation of door switch	BYTE		0 ... 3	num
V3	V3-dAd	49887	49950,6	RW	Activation delay for digital inputs	BYTE		0 ... 255	min
V3	V3-dCO	49888	49951	RW	Delay in deactivating compressor after door opened	BYTE		0 ... 255	min
V3	V3-dcd	49889	49951,2	RW	Delay in activating fan after door closed	BYTE		0 ... 250	secs
V3	V3-PEn	49890	49951,4	RW	Number of errors allowed per maximum/minimum pressure switch input	BYTE		0 ... 15	num
V3	V3-PEi	49891	49951,6	RW	Minimum/maximum pressure switch error count interval	BYTE		1 ... 99	min
V3	V3-PEt	49892	49952	RW	Delay in activating compressor after pressure switch deactivation	BYTE		0 ... 255	min
V3	V3-dCA	49893	49952,2	RW	Enable deep cooling	BYTE		0 ... 2	num
V3	V3-dCS	17046	49952,4	RW	Deep cooling setpoint	WORD	Y	-67,0 ... 320	°C/°F
V3	V3-tdC	49894	49952,6	RW	Deep cooling duration	BYTE		0 ... 255	min
V3	V3-dcc	49895	49953	RW	Defrost delay after deep cooling	BYTE		0 ... 255	min
V3	V3-Sid	17048	49953,2	RW	Threshold for start of deep cooling	WORD	Y	-67,0 ... 320	°C/°F
V3	V3-toS	49896	49953,4	RW	Time above threshold for start of deep cooling	BYTE		0 ... 255	min
V3	V3-ESt	49897	49953,6	RW	Type of action for Energy Saving function	BYTE		0 ... 6	num
V3	V3-ESA	49898	49954	RW	AUX state during Energy Saving	BYTE		0 ... 2	num
V3	V3-ESF	49899	49954,2	RW	Night mode activation (Energy Saving)	BYTE		0 ... 1	flag
V3	V3-Cdt	49900	49954,4	RW	Door close time	BYTE		0 ... 255	min*10
V3	V3-ESo	49901	49954,6	RW	Timeout for disabling energy saving mode (door switch)	BYTE		0 ... 10	num
V3	V3-OSP	17050	49955	RW	Setpoint offset	WORD	Y	-30,0 ... 30,0	°C/°F
V3	V3-OdF	17052	49955,2	RW	Activation differentials correction	WORD		0,0 ... 30,0	°C/°F
V3	V3-dnt	49902	49955,4	RW	Night mode duration	BYTE		0 ... 24	hours
V3	V3-dFt	49903	49955,6	RW	Fast cooling mode duration	BYTE		0 ... 24	hours
V3	V3-SPn	17054	49956	RW	Night mode setpoint	WORD	Y	LSE ... HSE	°C/°F
V3	V3-dFn	17056	49956,2	RW	Night mode offset	WORD		0,1 ... 30,0	°C/°F
V3	V3-SPF	17058	49956,4	RW	Fast cooling setpoint	WORd	Y	LSE ... HSE	°C/°F
V3	V3-dFF	17060	49956,6	RW	Fast cooling offset	WORD	Y	0,1 ... 30,0	°C/°F
V3	V3-ESP	49905	49957,4	RW	Sensitivity of virtual door regulator	BYTE		0 ... 5	num
V3	V3-dOt	49930	49965,4	RW	Maximum door open time	BYTE		0 ... 255	secs
V3	V3-LOC	49906	49957,6	RW	Enable keypad lock	BYTE		0 ... 1	flag
V3	V3-PS1	49907	49958	RW	Password 1 value	BYTE		0 ... 250	num
V3	V3-PS2	49908	49958,2	RW	Password 2 value	BYTE		0 ... 250	num
V3	V3-ndt	49909	49958,4	RW	Display with decimal point	BYTE		0 ... 1	flag
V3	V3-CA1	17064	49958,6	RW	Cell probe calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V3	V3-CA2	17066	49959	RW	Evaporator probe calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V3	V3-CA3	17068	49959,2	RW	Probe 3 calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V3	V3-ddL	49911	49960,2	RW	Resource locking after defrost end	BYTE		0 ... 2	num
V3	V3-Ldd	49912	49960,4	RW	Display lock timeout from defrost end	BYTE		0 ... 255	min
V3	V3-dro	49913	49960,6	RW	°C/°F selection	BYTE		0 ... 1	num
V3	V3-ddd	49914	49961	RW	Selection of main display value	BYTE		0 ... 3	num
V3	V3-H08	49918	49962	RW	Standby mode	BYTE		0 ... 2	num
V3	V3-H11	17074	49962,2	RW	Configurability and polarity of digital input 1	WORD	Y	-10 ... 10	num
V3	V3-H12	17076	49962,4	RW	Configurability and polarity of digital input 2	WORD	Y	-10 ... 10	num
V3	V3-H21	49919	49962,6	RW	Configurability of digital output 1	BYTE		0 ... 9	num
V3	V3-H22	49920	49963	RW	Configurability of digital output 2	BYTE		0 ... 9	num
V3	V3-H23	49921	49963,2	RW	Configurability of digital output 3	BYTE		0 ... 9	num
V3	V3-H25	49923	49963,6	RW	Configurability of digital output 5 (Buzzer)	BYTE		0 ... 9	num
V3	V3-H32	49925	49964,2	RW	Configurability of DOWN key	BYTE		0 ... 6	num
V3	V3-H33	49926	49964,4	RW	Configurability of ESC key	BYTE		0 ... 6	num
V3	V3-H42	49928	49965	RW	Evaporator probe present	BYTE		0 ... 1	flag
V3	V3-H43	49929	49965,2	RW	Probe Pb3 present	BYTE		0 ... 1	flag
V3	V3-UL	---	49934,2	RW	Visibility of function for transferring programming parameters from instrument to Copy Card	2 BIT		0 ... 3	num
V3	V3-Fr	---	49934,6	RW	Visibility of Copy Card formatting function	2 BIT		0 ... 3	num
V3	V3-rAP	---	49935,4	RW	Pressure switch alarms reset visibility	2 BIT		0 ... 3	num

Folder	Label	Address Value	Address Visibility	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	M.U.
APPLICATION 4 PARAMETERS									
	V4-SEt	17206	50132	RW	Control Setpoint	WORD	Y	LSE ... HSE	°C/°F
V4	V4-diF	17208	50132,2	RW	Activation differential	WORD		0,1 ... 30,0	°C/°F
V4	V4-HSE	17210	50132,4	RW	Maximum value settable for setpoint	WORD	Y	LSE ... HdL	°C/°F
V4	V4-LSE	17212	50132,6	RW	Minimum value settable for setpoint	WORD	Y	LdL...HSE	°C/°F
V4	V4-Ont	50045	50133,6	RW	ON time for compressor output with faulty Pb1 probe	BYTE		0 ... 250	min
V4	V4-OFt	50046	50134	RW	OFF time for compressor output with faulty Pb1 probe	BYTE		0 ... 250	min
V4	V4-dOn	50047	50134,2	RW	Compressor output enabling delay from request	BYTE		0 ... 250	secs
V4	V4-dOF	50048	50134,4	RW	Compressor output enabling delay from shutdown	BYTE		0 ... 250	min
V4	V4-dbi	50049	50134,6	RW	Delay between two consecutive starts of the compressor output	BYTE		0 ... 250	min
V4	V4-OdO	50050	50135	RW	Delay output enabling from power-on	BYTE		0 ... 250	min
V4	V4-dFA	50051	50135,2	RW	Defrost delay after deep cooling	BYTE		0 ... 255	secs
V4	V4-dtY	50052	50135,4	RW	Type of defrost	BYTE		0 ... 2	num
V4	V4-dit	50053	50135,6	RW	Interval between defrost cycles	BYTE		0 ... 250	hours
V4	V4-dCt	50056	50136,4	RW	Defrost interval count mode	BYTE		0 ... 3	num
V4	V4-dOH	50057	50136,6	RW	Defrost cycle enabling delay from request	BYTE		0 ... 59	min
V4	V4-dEt	50058	50137	RW	Defrost timeout	BYTE		1 ... 250	min
V4	V4-dSt	17214	50137,2	RW	Defrost end temperature	WORD	Y	-67,0 ... 320	°C/°F
V4	V4-dPO	50059	50137,4	RW	Defrost enabling request from power-on	BYTE		0 ... 1	flag
V4	V4-dSE	17218	50138,2	RW	Temperature threshold for defrost start	BYTE	Y	-67,0 ... 320	°C/°F
V4	V4-dtt	50061	50138,4	RW	Time for which the temperature of the evaporator must remain below the threshold	BYTE		0 ... 255	min
V4	V4-FPt	50062	50138,6	RW	FSt parameter mode (absolute or relative)	BYTE		0 ... 1	flag
V4	V4-FSt	17220	50139	RW	Evaporator fans disabling temperature	WORD	Y	-67,0 ... 320	°C/°F
V4	V4-FAd	17224	50139,4	RW	Evaporator fans activation differential	WORD		1,0 ... 50,0	°C/°F
V4	V4-Fdt	50063	50139,6	RW	Evaporator fans delay after defrost cycle	BYTE		0 ... 250	min
V4	V4-dt	50064	50140	RW	Coil drainage time	BYTE		0 ... 250	min
V4	V4-dFd	50065	50140,2	RW	Evaporator fans disabling during defrost time	BYTE		0 ... 1	flag
V4	V4-FCO	50066	50140,4	RW	Evaporator fans status with OFF compressor output	BYTE		0 ... 3	num
V4	V4-FdC	50067	50140,6	RW	Evaporator fans switch-off delay after compressor disabled	BYTE		0 ... 99	min
V4	V4-Fon	50068	50141	RW	Evaporator fans ON time in Duty Cycle mode	BYTE		0 ... 250	secs*10
V4	V4-FoF	50069	50141,2	RW	Evaporator fans OFF time in Duty Cycle mode	BYTE		0 ... 250	secs*10
V4	V4-Fnn	50070	50141,4	RW	Evaporator fans ON time in duty cycle night mode	BYTE		0 ... 250	secs*10
V4	V4-FnF	50071	50141,6	RW	Evaporator fans OFF time in duty cycle night mode	BYTE		0 ... 250	secs*10
V4	V4-Att	50072	50142	RW	HAL and LAL parameter mode (absolute or relative)	BYTE		0 ... 1	num
V4	V4-AFd	17226	50142,2	RW	Alarm activation differential	WORD		1,0 ... 50,0	°C/°F
V4	V4-HAL	17228	50142,4	RW	Maximum alarm threshold	WORD	Y	LAL ... 320	°C/°F
V4	V4-LAL	17230	50142,6	RW	Minimum alarm threshold	WORD	Y	-67,0 ... HAL	°C/°F
V4	V4-PAO	50073	50143	RW	Alarm disabling after power-on	BYTE		0 ... 10	hours
V4	V4-dAO	17232	50143,2	RW	Temperature alarm disabling time after defrost cycle	WORD		0 ... 999	min
V4	V4-OAO	50074	50143,4	RW	High and low temperature alarms disabling time after door closing	BYTE		0 ... 10	hours
V4	V4-tdO	50075	50143,6	RW	Open door disabling time	BYTE		0 ... 250	min
V4	V4-tAO	50076	50144	RW	Temperature alarms delay time	BYTE		0 ... 250	min
V4	V4-dAt	50077	50144,2	RW	Alarm signalling end of defrost due to timeout	BYTE		0 ... 1	flag
V4	V4-rLO	50078	50144,4	RW	An external alarm blocks the regulators	BYTE		0 ... 1	flag
V4	V4-AOP	50079	50144,6	RW	Alarm output polarity	BYTE		0 ... 1	num
V4	V4-SA3	17234	50145,2	RW	Alarm setpoint for probe 3	WORD	Y	-67,0 ... 320	°C/°F
V4	V4-dA3	17236	50145,4	RW	Probe 3 alarm activation differential	WORD		1,0 ... 50,0	°C/°F
V4	V4-CPS	17238	50145,6	RW	Cool protection setpoint	WORD	Y	-67,0 ... 320	°C/°F
V4	V4-CPd	17240	50146	RW	Cool protection differential	WORD		0,1 ... 30,0	°C/°F
V4	V4-CPt	50081	50146,2	RW	Time that the temperature remains below the cool protection setpoint	BYTE		0 ... 255	min

Folder	Label	Address Value	Address Visibility	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	M.U.
V4	V4-dOd	50082	50146,4	RW	Enable utility switch-off on activation of door switch	BYTE		0 ... 3	num
V4	V4-dAd	50083	50146,6	RW	Activation delay for digital inputs	BYTE		0 ... 255	min
V4	V4-dCO	50084	50147	RW	Delay in deactivating compressor after door opened	BYTE		0 ... 255	min
V4	V4-dcd	50085	50147,2	RW	Delay in activating fan after door closed	BYTE		0 ... 250	secs
V4	V4-PEn	50086	50147,4	RW	Number of errors allowed per maximum/minimum pressure switch input	BYTE		0 ... 15	num
V4	V4-PEi	50087	50147,6	RW	Minimum/maximum pressure switch error count interval	BYTE		1 ... 99	min
V4	V4-PEt	50088	50148	RW	Delay in activating compressor after pressure switch deactivation	BYTE		0 ... 255	min
V4	V4-dCA	50089	50148,2	RW	Enable deep cooling	BYTE		0 ... 2	num
V4	V4-dCS	17242	50148,4	RW	Deep cooling setpoint	WORD	Y	-67,0 ... 320	°C/°F
V4	V4-tdC	50090	50148,6	RW	Deep cooling duration	BYTE		0 ... 255	min
V4	V4-dcc	50091	50149	RW	Defrost delay after deep cooling	BYTE		0 ... 255	min
V4	V4-Sid	17244	50149,2	RW	Threshold for start of deep cooling	WORD	Y	-67,0 ... 320	°C/°F
V4	V4-toS	50092	50149,4	RW	Time above threshold for start of deep cooling	BYTE		0 ... 255	min
V4	V4-ESt	50093	50149,6	RW	Type of action for Energy Saving function	BYTE		0 ... 6	num
V4	V4-ESA	50094	50150	RW	AUX state during Energy Saving	BYTE		0 ... 2	num
V4	V4-ESF	50095	50150,2	RW	Night mode activation (Energy Saving)	BYTE		0 ... 1	flag
V4	V4-Cdt	50096	50150,4	RW	Door close time	BYTE		0 ... 255	min*10
V4	V4-ESo	50097	50150,6	RW	Timeout for disabling energy saving mode (door switch)	BYTE		0 ... 10	num
V4	V4-OSP	17246	50151	RW	Setpoint offset	WORD	Y	-30,0 ... 30,0	°C/°F
V4	V4-OdF	17248	50151,2	RW	Activation differentials correction	WORD		0,0 ... 30,0	°C/°F
V4	V4-dnt	50098	50151,4	RW	Night mode duration	BYTE		0 ... 24	hours
V4	V4-dFt	50099	50151,6	RW	Fast cooling mode duration	BYTE		0 ... 24	hours
V4	V4-SPn	17250	50152	RW	Night mode setpoint	WORD	Y	LSE ... HSE	°C/°F
V4	V4-dFn	17252	50152,2	RW	Night mode offset	WORD		0,1 ... 30,0	°C/°F
V4	V4-SPF	17254	50152,4	RW	Fast cooling setpoint	WORd	Y	LSE ... HSE	°C/°F
V4	V4-dFF	17256	50152,6	RW	Fast cooling offset	WORD	Y	0,1 ... 30,0	°C/°F
V4	V4-ESP	50101	50153,4	RW	Sensitivity of virtual door regulator	BYTE		0 ... 5	num
V4	V4-dOt	50126	50161,4	RW	Maximum door open time	BYTE		0 ... 255	secs
V4	V4-LOC	50102	50153,6	RW	Enable keypad lock	BYTE		0 ... 1	flag
V4	V4-PS1	50103	50154	RW	Password 1 value	BYTE		0 ... 250	num
V4	V4-PS2	50104	50154,2	RW	Password 2 value	BYTE		0 ... 250	num
V4	V4-ndt	50105	50154,4	RW	Display with decimal point	BYTE		0 ... 1	flag
V4	V4-CA1	17260	50154,6	RW	Cell probe calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V4	V4-CA2	17262	50155	RW	Evaporator probe calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V4	V4-CA3	17264	50155,2	RW	Probe 3 calibration	WORD	Y	-12,0 ... 12,0	°C/°F
V4	V4-ddL	50107	50156,2	RW	Resource locking after defrost end	BYTE		0 ... 2	num
V4	V4-Ldd	50108	50156,4	RW	Display lock timeout from defrost end	BYTE		0 ... 255	min
V4	V4-dro	50109	50156,6	RW	°C/°F selection	BYTE		0 ... 1	num
V4	V4-ddd	50110	50157	RW	Selection of main display value	BYTE		0 ... 3	num
V4	V4-H08	50114	50158	RW	Standby mode	BYTE		0 ... 2	num
V4	V4-H11	17270	50158,2	RW	Configurability and polarity of digital input 1	WORD	Y	-10 ... 10	num
V4	V4-H12	17272	50158,4	RW	Configurability and polarity of digital input 2	WORD	Y	-10 ... 10	num
V4	V4-H21	50115	50158,6	RW	Configurability of digital output 1	BYTE		0 ... 9	num
V4	V4-H22	50116	50159	RW	Configurability of digital output 2	BYTE		0 ... 9	num
V4	V4-H23	50117	50159,2	RW	Configurability of digital output 3	BYTE		0 ... 9	num
V4	V4-H25	50119	50159,6	RW	Configurability of digital output 5 (Buzzer)	BYTE		0 ... 9	num
V4	V4-H32	50121	50160,2	RW	Configurability of DOWN key	BYTE		0 ... 6	num
V4	V4-H33	50122	50160,4	RW	Configurability of ESC key	BYTE		0 ... 6	num
V4	V4-H42	50124	50161	RW	Evaporator probe present	BYTE		0 ... 1	flag
V4	V4-H43	50125	50161,2	RW	Probe Pb3 present	BYTE		0 ... 1	flag
V4	V4-UL	---	50130,2	RW	Visibility of function for transferring programming parameters from instrument to Copy Card	2 BIT		0 ... 3	num
V4	V4-Fr	---	50130,6	RW	Visibility of Copy Card formatting function	2 BIT		0 ... 3	num
V4	V4-rAP	---	50131,4	RW	Pressure switch alarms reset visibility	2 BIT		0 ... 3	num

FOLDER VISIBILITY TABLE

Label	ADDRESS	R/W	DESCRIPTION	DATA SIZE	RANGE	Address by Application				M.U.
						APP.1	APP.2	APP.3	APP.4	
vis_CP	49330	RW	CP (Compressor) folder visibility	2 BIT	0 ... 3	49539	49735	49931	50127	num
vis_dEF	49330,2	RW	dEF (Defrost) folder visibility	2 BIT	0 ... 3	49539,2	49735,2	49931,2	50127,2	num
vis_FAn	49330,4	RW	FAn (Fans) folder visibility	2 BIT	0 ... 3	49539,4	49735,4	49931,4	50127,4	num
vis_AL	49330,6	RW	AL (Alarms) folder visibility	2 BIT	0 ... 3	49539,6	49735,6	49931,6	50127,6	num
vis_CPr	49331	RW	CPr (Cool protection) folder visibility	2 BIT	0 ... 3	49540	49736	49932	50128	num
vis_Lit	49331,2	RW	Lit (Lights & Digital Inputs) folder visibility	2 BIT	0 ... 3	49540,2	49736,2	49932,2	50128,2	num
vis_PrE	49331,4	RW	PrE (Pressure switch) folder visibility	2 BIT	0 ... 3	49540,4	49736,4	49932,4	50128,4	num
vis_dEC	49331,6	RW	dEC (Deep cooling) folder visibility	2 BIT	0 ... 3	49540,6	49736,6	49932,6	50128,6	num
vis_EnS	49332	RW	EnS (Energy saving) folder visibility	2 BIT	0 ... 3	49541	49737	49933	50129	num
vis_Add	49326	RW	Add (Communication) folder visibility	2 BIT	0 ... 3					num
vis_diS	49332,2	RW	diS (Display) folder visibility	2 BIT	0 ... 3	49541,2	49737,2	49933,2	50129,2	num
vis_CnF	49332,4	RW	CnF (Configuration) folder visibility	2 BIT	0 ... 3	49541,4	49737,4	49933,4	50129,4	num
vis_FPr	49332,6	RW	FPr (Copy Card) folder visibility	2 BIT	0 ... 3	49541,6	49737,6	49933,6	50129,6	num
vis_FnC	49333	RW	FnC (Functions) folder visibility	2 BIT	0 ... 3	49542	49738	49934	50130	num
vis_PA2	49370,3	RW	Display folder PA2 (Password for accessing **Installer** parameters)	2 BIT	0 ... 3	49579,3	49775,3	49971,3	50167,3	num

CLIENT TABLE

LABEL	ADDRESS	R/W	DESCRIPTION	DATA SIZE	RANGE	M.U.
AI1	305	R	Analogue input (view) 1	WORD	-67,0 ... 320	°C/°F
AI2	307	R	Analogue input (view) 2	WORD	-67,0 ... 320	°C/°F
AI3	309	R	Analogue input (view) 3	WORD	-67,0 ... 320	°C/°F
DI1	33066,7	R	Digital input 1	1 BIT	0 ... 1	flag
DI2	33066,2	R	Digital input 2	1 BIT	0 ... 1	flag
E1	32876,1	R	Analogue input 1 fault	1 BIT	0 ... 1	flag
E2	32876,2	R	Analogue input 2 fault	1 BIT	0 ... 1	flag
E3	32877	R	Analogue input 3 fault	1 BIT	0 ... 1	flag
PA	32876,3	R	Critical pressure	1 BIT	0 ... 1	flag
nPA	32878,5	R	Pressure switch	1 BIT	0 ... 1	flag
EA	32876,4	R	External	1 BIT	0 ... 1	flag
AH1	32876,5	R	Analogue input 1 high threshold exceeded	1 BIT	0 ... 1	flag
AL1	32876,6	R	Analogue input 1 low threshold exceeded	1 BIT	0 ... 1	flag
OPd	32876,7	R	Door open	1 BIT	0 ... 1	flag
Tout_SBR	32878	R	Defrost timeout	1 BIT	0 ... 1	flag
COH	32876	R	Overtemperature alarm	1 BIT	0 ... 1	flag
RL1	32827,4	R	Command 1 output	1 BIT	0 ... 1	flag
RL2	32827,3	R	Command 2 output	1 BIT	0 ... 1	flag
RL3	32827,2	R	Command 3 output	1 BIT	0 ... 1	flag
RL4	32827,1	R	Command 4 output	1 BIT	0 ... 1	flag
RL5	32827	R	Command 5 output	1 BIT	0 ... 1	flag
Comp	32887,3	R	Compressor	1 BIT	0 ... 1	flag
DEFRON	32887,4	R	Defrost status	2 BIT	0 ... 1	num
Fan	32889,7	R	Evaporator fans	1 BIT	0 ... 1	flag
Alarm	32892,5	R	Alarm	1 BIT	0 ... 1	flag
Reduced set	32882	R	Reduced set (Economy setpoint)	1 BIT	0 ... 1	flag
AUX	32882,4	R	Auxiliary relay control output	1 BIT	0 ... 1	flag
modify parameters	32882,5	R	Parameters changed	1 BIT	0 ... 1	flag
stand-by	32883	R	Stand-by	1 BIT	0 ... 1	flag
Economy	33448	R	Energy saving function	1 BIT	0 ... 1	flag
Att_Sbr	32865	R	Manual defrost activation	1 BIT	0 ... 1	flag
Att_SetR	32865,1	R	Economy mode On	1 BIT	0 ... 1	flag
Disatt_SetR	32865,2	R	Economy mode Off	1 BIT	0 ... 1	flag
TelRSetPar	32865,3	R	Reset changed parameters indicator	1 BIT	0 ... 1	flag
ROnAux	32865,4	R	Auxiliary output On	1 BIT	0 ... 1	flag
ROffAux	32865,5	R	Auxiliary output Off	1 BIT	0 ... 1	flag
ROnOn	32865,6	R	Instrument on	1 BIT	0 ... 1	flag
ROffOff	32865,7	R	Instrument off	1 BIT	0 ... 1	flag
AttEnSav	32866	R	Energy saving function activation	1 BIT	0 ... 1	flag
DisattEnSav	32866,1	R	Energy saving function activation	1 BIT	0 ... 1	flag

ELECTRICAL CONNECTIONS

Important! Make sure the machine is switched off before working on the electrical connections.

The device is equipped with screw-on or removable terminal boards to connect electrical cables, the cross-section of which must not exceed 2.5mm2 (one wire per terminal for power connections): see the rating plate on the device for terminal ratings. Do not exceed the maximum permitted current; for higher loads, use a contactor with sufficient power capacity. Make sure that the power supply is of the correct voltage for the device.

Probes have no connection polarity and can be extended using a normal bipolar cable (note that the extension of the probes influences the instrument's electromagnetic compatibility -EMC: take great care with the wiring). Probe cables, power supply cables and the TTL serial cables should be routed separately from power cables.

DISCLAIMER

LIABILITY AND RESIDUAL RISKS

ELIWELL CONTROLS SRL declines all liability for damage due to:
- installation/use other than expressly specified and, in particular, in conflict with the safety prescriptions set down in regulations and/or specified in this document;
- use on panels that do not provide adequate protection against electric shocks, water or dust in the adopted mounting conditions;
- use on panels allowing access to dangerous parts without having to use tools;
- tampering with and/or modification of the product;
- installation/use on panels that do not comply with statutory laws and regulations.

CONDITIONS OF USE

Permitted use

For safety reasons, the device must be installed and used according to the instructions provided. In particular, parts carrying dangerous voltages must not be accessible in normal conditions. The device must be adequately protected from water and dust with regard to the application, and must only be accessible using tools (with the exception of the front panel). The device is suitable for use in household refrigeration appliances and/or similar equipment and has been tested for safety aspects in accordance with the harmonised European reference standards.

Improper use

Any use other than that expressly permitted is prohibited. The relays provided are of a functional type and can be subject to failure: any protection devices required by product standards, or suggested by common sense for obvious safety requirements, must be installed externally to the controller.

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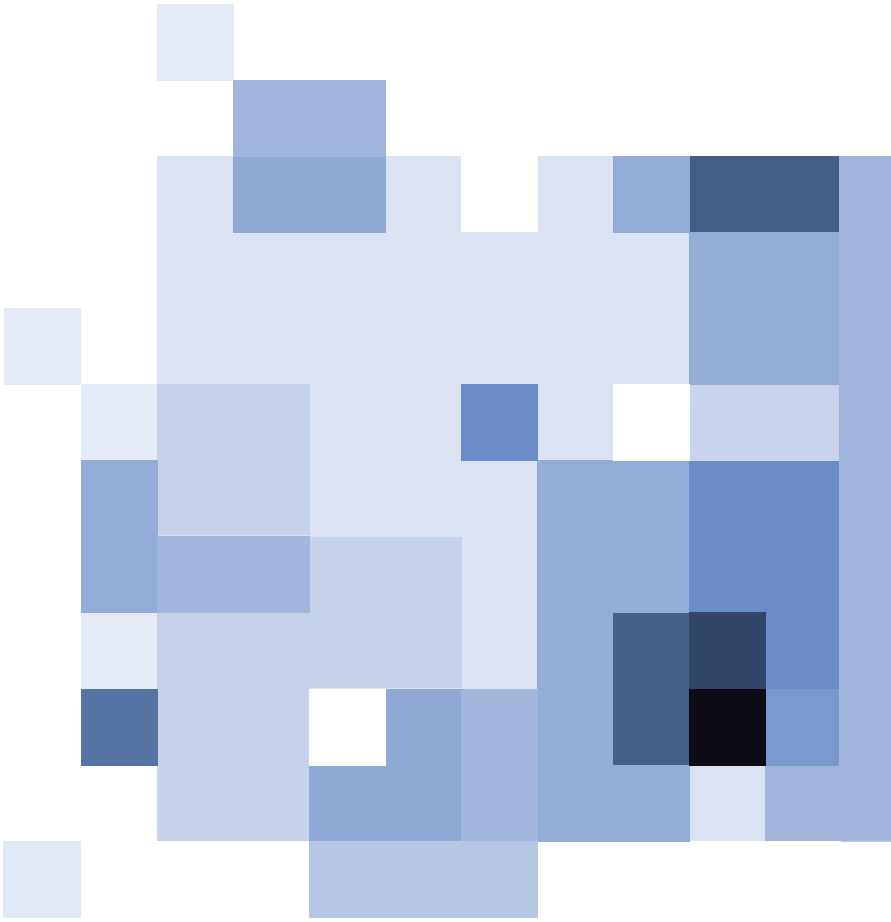

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