eliwell

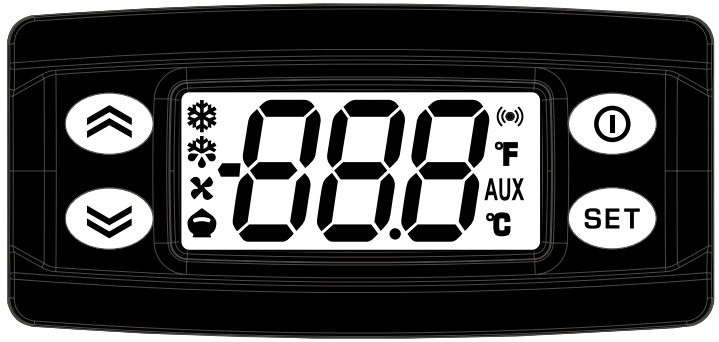
by Schneider Electric

EWPlus 978

EN

Electronic controllers for refrigeration units

USER INTERFACE



EWPlus 978

KEYS

UP
Press and release
- Scrolls through menu items
- Increases values

Press for at least 5 secs
- Activates the Manual Defrost function

STAND-BY (ESC) - ON/OFF
Press and release
- Returns to the previous menu level
- Confirm parameter value

Press for at least 5 secs
- Activates the Stand-by function (when outside the menus)

DOWN
Press and release
- Scrolls through menu items
- Decreases values

Press for at least 5 secs
- Configurable function by user (par. **H32**)

SET (ENTER)
Press and release
- Displays alarms (if active)
- Opens the Machine Status menu

Press for at least 5 secs
- Opens the Programming menu
- Confirms commands

LEDS

	**Reduced SET / Economy LED** Permanently on: Energy Saving active Flashing: Reduced set active Quick flashing: Access to level 2 parameters Off: Otherwise	AUX	**AUX LED** Permanently on: Aux active Off: Aux not active
	**Compressor LED** Permanently on: Compressor active Flashing: Delay, protection or blocked start-up Off: Otherwise		**Defrost LED** Permanently on: Defrost active Flashing: Manual or D.I. activation Off: Otherwise
	**Alarm LED** Permanently on: Alarm on Flashing: Alarm acknowledged Off: Otherwise		**Fan LED** Permanently on: Fans active Off: Otherwise
°C	**°C LED** Permanently on: °C setting (**dro** = 0) Off: Otherwise	°F	**°F LED** Permanently on: °F setting (**dro** = 1) Off: Otherwise

NOTE: When switched on, the device performs a Lamp Test; the display and icons will flash for several seconds to check that they all function correctly. After the lamp test, the label **CuS** and its value will be shown for 2 secs.

ELECTRICAL WIRING

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power from all equipment including connected devices, prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Replace and secure all covers, accessories, hardware, cables and wires.
- For all the devices where this is provided, confirm that a proper ground connection exists before applying power to the unit.
- Use only the specified voltage when operating this device and any associated products

Failure to follow these instructions will result in death or serious injury.

This device has been designed to operate outside of any hazardous location.
Only install this device in zones known to be free of hazardous atmosphere.

⚠ DANGER

LOOSE WIRING CAUSES ELECTRIC SHOCK

Tighten connections in conformance with the torque specifications.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

POTENTIAL OF OVERHEATING AND FIRE

- Do not use with loads other than those indicated in the technical specification.
- Do not exceed the maximum permitted current; for higher loads, use a contactor with sufficient power capacity.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

POTENTIAL FOR EXPLOSION

Install and use this equipment in non-hazardous locations only.

Failure to follow these instructions will result in death or serious injury.

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel.
No responsibility is assumed by Eliwell for any consequences arising out of the use of this material.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Install and operate this equipment in an enclosure appropriately rated for its intended environment.
- Power line and output circuits must be wired and fused in compliance with local and national regulatory requirements for the rated current and voltage of the particular equipment.
- Do not use this equipment in safety-critical machine functions.
- Do not disassemble, repair, or modify this equipment.
- Do not mount devices in extremely damp and/or dirt-laden areas.

Failure to follow these instructions can result in death, serious injury, or equipment damage

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION DUE TO CONNECTION

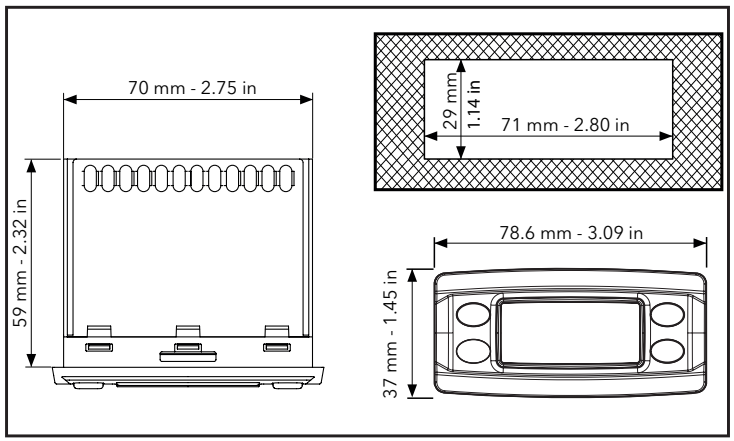
Signal leads (probes, digital inputs, communication and the electronic supply) must be routed separately from power cables.

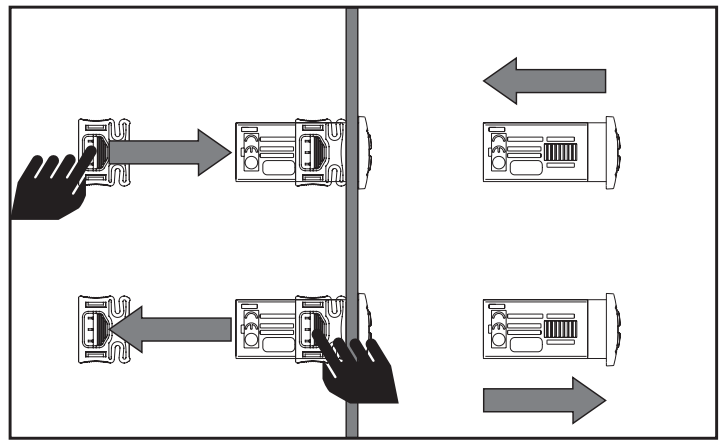
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Probes (NTC) have no connection polarity and can be extended using a regular bipolar cable (note that the extension of the probes affects the EMC electromagnetic compatibility of the instrument: pay extreme attention to wiring).

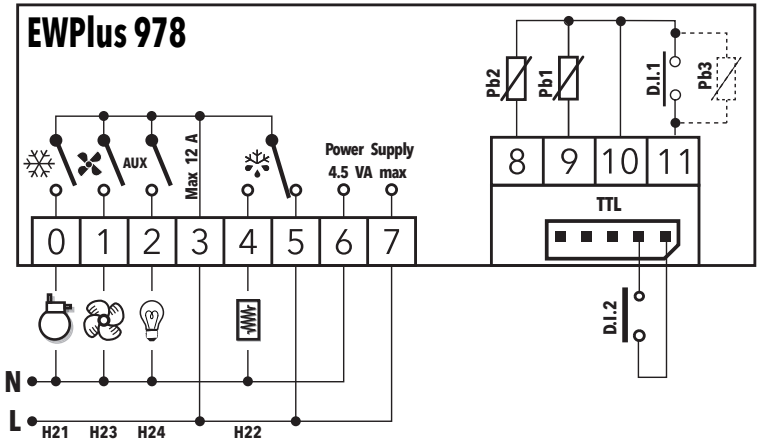
MOUNTING - DIMENSIONS

The instrument is designed for panel mounting. Make a hole of 2.80x1.14 in (71x29 mm), insert the instrument and fix it using the brackets provided. Do not mount the instrument in humid and/or dirty places; it is suitable for use in ordinary polluted places. Ventilate the place in proximity to the instrument colling slits.





CONNECTIONS



TERMINALS	
0-3	Compressor relay - ❄
1-3	Fans relay - ✣
2-3	AUX relay - **AUX**
3-4-5	Defrost relay - ❄
6-7	Power Supply input (115 Vac or 230 Vac)
N-L	Power Supply (115 Vac or 230 Vac)
8-10	Pb1 Probe
9-10	Pb2 Probe
10-11	Digital Input D.I.1 (**H11**≠0 and **H43**=n) or Pb3 Probe (**H11**=0 and **H43**=y)
TTL	TTL input or D.I.2 (**H12**≠0)

TECHNICAL DATA (EN60730-2-9)

Classification:	Operating (Not safety) controls for incorporation
Mounting:	Panel mounting with 2.80x1.14 in. (71x29 mm) drilling template
Control type:	1.B
Pollution rating:	2
Insulation material class:	IIIa
Overvoltage category class:	II
Nominal impulsive voltage:	2500 V
Temperature:	Operating: -5 ... 65 °C (23 ... 149 °F) - Storage: –30 ... 85 °C (-22 ... 185 °F)
Power Supply:	115 Vac or 230 Vac (±10 %) 50/60 Hz
Consumption:	4.5 VA max
Fire resistance class:	D
Software class:	A

NOTE: Check the power supply specified on the instrument label; for relay and power supply capacities, contact Sales office.

FURTHER INFORMATION

Input Characteristics

Display Range:	**NTC**: -50.0 ... 110 °C (-58.0 ... 230 °F) (on display with 3 digits + sign)
Accuracy:	Better than 0.5 % of full-scale + 1 digit
Resolution:	0.1 °C (0.1 °F up to 199; 1 °F beyond)
Buzzer:	YES (it depends on the model)
Analogue Inputs:	2 NTC inputs
Digital Inputs:	2 voltage-free D.I (*****)

Note: - (*****) 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 (**H12**≠ 0)

Output Characteristics

Digital Outputs:

Relay	EN60730 (240 Vac)	UL60730 - 115 Vac	UL60730 - 230 Vac	Cycles
Compressor	10(6) A	10 FLA / 60 LRA	10 FLA / 60 LRA	30k
AUX	5(2) A	5 A resistive 2 FLA / 12 LRA	5 A resistive 2 FLA / 12 LRA	/
Defrost	NO 8(4) A - NC 6(3) A	NO 8 A - NC 6 A resistive NO 2.9 FLA / 17.4 LRA	NO 8 A - NC 6 A resistive NO 2.9 FLA / 17.4 LRA	/
Fans	5(2) A	5 A resistive 2 FLA / 12 LRA	5 A resistive 2 FLA / 12 LRA	/

Mechanical Characteristics

Container:	PC+ABS UL94 V-0 resin plastic casing, polycarbonate window, thermoplastic rubber keys
Dimensions:	Front 3.09x1.45 in (78.6x37 mm), depth 2.32 in (59 mm) (excluding terminals)
Terminals:	Disconnectable terminals with pitch 0.2 in. (**5** mm), for cables with a 13 AWG (2.5 mm^2) section
Connectors:	TTL (Molex 5268) for connection to UNICARD/Copycard/MFK (maximum length = 118 in. - 3 m)
Humidity:	Operating / Storage: 10 ... 90 % RH (non-condensing)

Regulations

Food safety: This device complies with standard EN 13485 as follows:
- suitable for storage
- application: air
- climate range A
- measurement class 1 in the range from -25 ... 15 °C (-13 ... 59 °F) (*****)

(*** exclusively using Eliwell NTC probes**)

Relays tested according to 33.5 of IEC 60079-15:2005

NOTE: The technical characteristics provided in this document concerning the measurement (range, accuracy, resolution, etc.) refer to the instrument itself only and not to any provided accessories, such as the probes.

Approvals

UL60730 E233482

DIAGNOSTICS

Alarms are always indicated by the buzzer (if present) and the alarm icon (•). To switch off the buzzer, press and release any key, the relative icon will continue to flash.

NOTES: If alarm exclusion times have been set (see **AL** folder in the parameters table) the alarm will not be signalled.

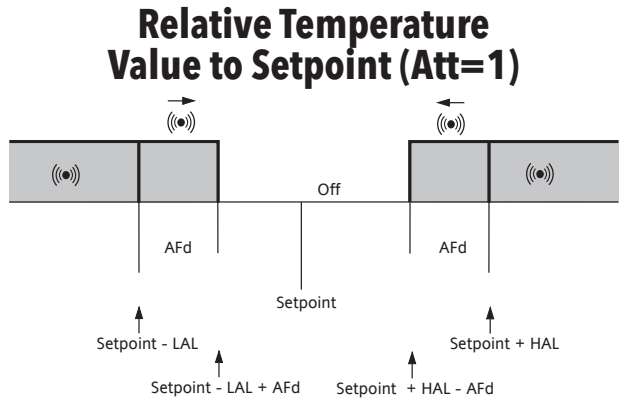
ALARMS

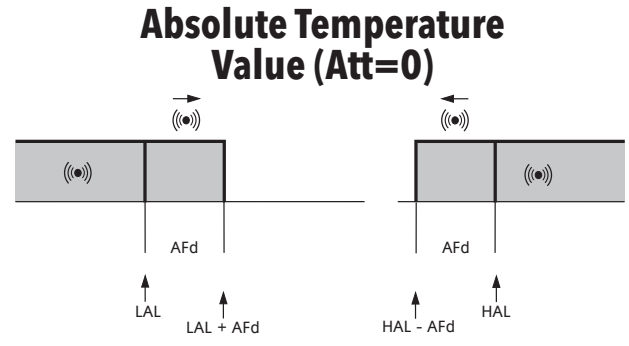
Label	Desciption	Cause	Effects	Remedy
E1	Pb1 probe error	• Reading of out of range operating values • Probe inoperable / short-circuited / open	• Display label **E1** • Alarm icon permanently ON • Min/max alarm regulator disabled • Compressor operation according to **Ont** and **OFt** parameters.	• Check probe type (NTC) • Check the probe wiring • Replace probe
E2	Pb2 probe error	• Reading of out of range operating values • Probe inoperable / short-circuited / open	• Display label **E2** • Alarm icon permanently ON	• Check probe type (NTC) • Check the probe wiring • Replace probe

Label	Desciption	Cause	Effects	Remedy
E3	Pb3 probe error	• Reading of out of range operating values • Probe inoperable / short-circuited / open	• Display label **E3** • Alarm icon permanently ON • The defrost cycle will end due to Time-out (Parameter **dEt**)	• Check probe type (NTC) • Check the probe wiring • Replace probe
AH1	Pb1 probe HIGH Temperature alarm	Value read by Pb1 > **HAL** after time of **tAO**. (see 'MAX/MIN TEMP. ALARMS ')	• Registration **AH1** label in the **AL** folder • No effect on regulation • Label **AH1** displayed alternately with the actual value read by the probe Pb1	Wait until temperature value read by Pb1 returns below **HAL**.
AL1	Pb1 probe LOW Temperature alarm	Value read by Pb1 < **LAL** after time of **tAO**. (see 'MAX/MIN TEMP. ALARMS')	• Registration **AL1** label in the **AL** folder • No effect on regulation • Label **AL1** displayed alternately with the actual value read by the probe Pb1	Wait until temperature value read by Pb1 to come back obove **LAL**
EA	External alarm	Digital input activated (**H11** = ±5)	• Registration **EA** label in the **AL** folder • Alarm icon permanently ON • Regulation blocked if **rLO**= y	Check and remove the external cause which generate alarm on D.I.
OPd	Door Open alarm	Digital input activated (**H11** = ±4) (for a longer time than **tdO**)	• Registration **OPd** label in the **AL** folder • Alarm icon permanently ON • Regulator blocked	• Close the door • Delay function defined by **OAO**

Label	Desciption	Cause	Effects	Remedy
Ad2	Defrosting for time-out	End of defrosting because of time instead of because of reaching the defrost end temperature detected by the Pb2 probe.	• Registration **Ad2** label in the **AL** folder • Alarm icon permanently ON	Wait until the next defrost for automatic return
COH	Alarm due to Over Heating	The alarm Pb3 probe exceeded the value set by parameter **SA3**.	• Label **COH** • Alarm icon permanently on • Regulation locked (Compressor)	Wait for the temperature to return to a value of **SA3** (Setpoint) minus **dA3** (differential).

MAX/MIN TEMPERATURE ALARM





	Relative Temperature Value to Setpoint (Att=1)	Absolute Temperature Value (Att=0)
Minimum temperature alarm	Temp. ≤ **Set + LAL ***	Temp. ≤ **LAL** (**LAL** with sign)
Maximum temperature alarm	Temp. ≥ **Set + HAL ****	Temp. ≥ **HAL** (**HAL** with sign)
Returning from minimum temperature alarm	Temp. ≥ **Set + LAL + AFd** o ≥ **Set -** I**LAL**I **+ AFd** (LAL < 0)	Temp. ≥ **LAL + AFd**
Returning from maximum temperature alarm	Temp. ≤ **Set + HAL - AFd** (HAL > 0)	Temp. ≤ **HAL - AFd**

*** se LAL is negative, Set + LAL < Set**
**** se HAL is negative, Set + HAL < Set**

INSTRUMENT ON/OFF

The instrument can be turned off by pressing the button ⏻ for more than 5 seconds. In this condition, the instrument displays the message OFF.

ACCESSING AND USING THE MENUS

Resources are organized into 2 menus which are accessed as explained below:

- **Machine Status** menu: press and release the set key.
- **Programming** menu: press for at least 5 secs the set key.

Either do not press any keys for 15 seconds (time-out) or press the ⏻ key once, to confirm the last value displayed and return to the previous screen.

PASSWORD

PA1 Password: It allows access to the **User** parameters. In the standard configuration the password is disabled (**PA1** = 0).
To enable it (**PA1** ≠ 0) enter the 'Programming' menu by pressing the ∧ and ∨ keys, scroll the parameters until **PS1** label is displayed, press the set key to display the current value, change it by using the ∧ and ∨ keys and then press the set key to save it. If the password is already enabled, you will be required to enter it to access the **Programming** menu. To enter it:

PA2 Password: It allows access to the **Installer** parameters. In the standard configuration the password is enabled (**PA2** = 15).
To change it (**PA2**≠15): press and hold set for longer than 5 seconds, scroll through the parameters using ∧ and ∨ until you see the label **PA2**, press set, set the value '15' using ∧ and ∨, then confirm using set. Scroll through the folders until you see the label **diS** and press set to enter. Scroll through the parameters with ∧ and ∨ until you see the label **PS2**, press set to display the value, change it using ∧ and ∨, then save it by pressing set or ⏻ keys. The visibility of the **PA2** label will be:

1) If PA1 ≠0 and PA2 ≠0: By pressing the set key for more than 5 seconds, **PA1** and **PA2** labels will be displayed at the same level and it will be possible to access either the **User** parameters or the **Installer** parameters.

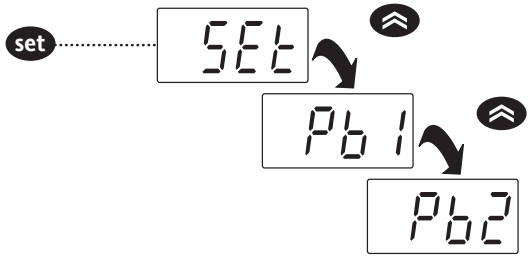
2) Otherwise: The **PA2** password is present between the **User** parameters. If **PA2** is enabled, you will be required to enter it to access the **Installer** parameters. To enter it follow the steps described for the **PA1** password.

NOTE: If the password is incorrect, the instruments display the PA1/PA2 label and you will have to repeat the entry procedure.

'MACHINE STATUS' MENU

Access the 'Machine Status' menu by pressing and releasing the set key. If no alarms are active, the **SEt** label appears.

By pressing the ∧ and ∨ keys you can scroll all folders in the **Machine Status** menu:



- **AL**: Alarms folder (**only visible if an alarm is active)**;
- **SEt**: Set point setting folder;
- **Pb1**: probe 1 folder;
- **Pb2**: probe 2 folder;
- **Pb3**: probe 3 folder.
- **APP**: **H60** parameter value folder.

Setting the Set point: To display the Set point value press the set key when the **SEt** label is displayed. The Set point value appears on the display. To change the Set point value, press the ∧ and ∨ keys within 15 seconds. Press set to confirm the modification.

Probes display: When the Pb1, Pb2 or Pb3 label is displayed, press set and the associated probe value will appear.

MANUAL ACTIVATION OF THE DEFROSTING CYCLE

To manually activate the defrost cycle, hold down the ∧ key for 5 seconds. If the defrost conditions are not satisfied:

- the parameter **OdO** ≠ 0;
- the evaporator probe Pb2 temperature is higher than the defrost end temperature;

The display will flash 3 times, to indicate that the operation will not be carried out.

SET POINT EDIT LOCK

It is possible to disable the keypad on this device. The keypad can be locked by programming the **LOC** parameter (See **diS** folder). With the keypad locked you can still access the 'Machine Status' menu by pressing set to display the Set point, but you cannot edit them. To disable the keypad lock, repeat the locking procedure.

'PROGRAMMING' MENU

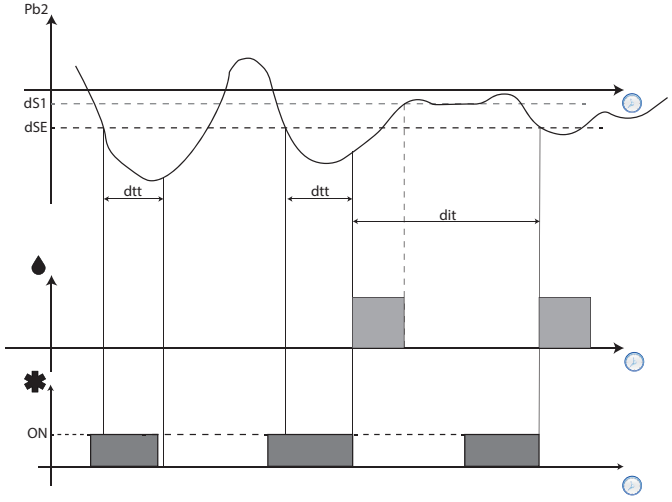
To access the **Programming** menu press for at least 5 secs the set key. If specified, the **PA1** for the **User** parameters and the **PA2** for the **Installer** parameters access PASSWORD will be requested (see Par. **PASSWORD**)

User parameters: At the access, the display will show the first parameter (**dF1**). By pressing the ⌃⌃ and ⌄⌄ keys you can scroll all parameters in the current level. Select the desired parameter using the ⌃⌃ and ⌄⌄ keys. Press set to see the current value of the selected parameter. Press ⌃⌃ and ⌄⌄ to change the value and then press set to save it.

Installer parameters: At the access, the display will show the first folder (**CP**). By pressing the ⌃⌃ and ⌄⌄ keys you can scroll all folders in the current level. Select the desired folder using the set keys. Press ⌃⌃ and ⌄⌄ to change the value and then press set to save it.

NOTE: switch the device off and on again each time the parameter configuration is changed.

SMART DEFROST



Smart defrost will activate if:

- Pb2 temperature < **dSE**;
- The compressor must be on for at least the time indicated by parameter **dtt**.

In the case of a defrosting probe in error or not connected, smart defrost can be started automatically if **dit** > 0.

Smart defrost will not activate if:

- Pb2 temperature > **dS1**.

USING THE UNICARD

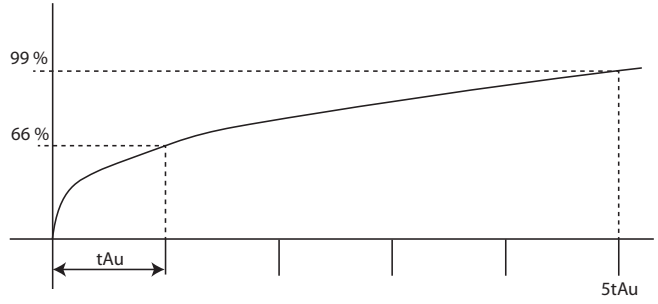
The UNICARD must be connected to the TTL serial port and allows the rapid programming of instrument parameters. Access the 'Installer' parameters by entering **PA2**, then scroll through the folders with the ⌃ and ⌄ until the **FPr** folder is displayed.

Press **set** to select the folder, scroll the parameters with ⌃ and ⌄, then press **set** to select the function (e.g. **UL**).

- **Upload (UL)**: select **UL** and press **set**. 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**.
- **Format (Fr)**: this command is used to format the UNICARD (which is necessary when using the card for the first time). **NOTE**: the **Fr** parameter deletes all data present. This operation cannot be reversed.
- **Download (dL)**: Connect the UNICARD when the instrument is switched off. At power-on, data will automatically start downloading from the UNICARD to the instrument. At the end of the lamp test, the display will show **dLy** if the operation was successful and **dLn** if not successful.

NOTES: After the parameters have been downloaded, the device uses the downloaded parameter map settings.

DISPLAY FILTER

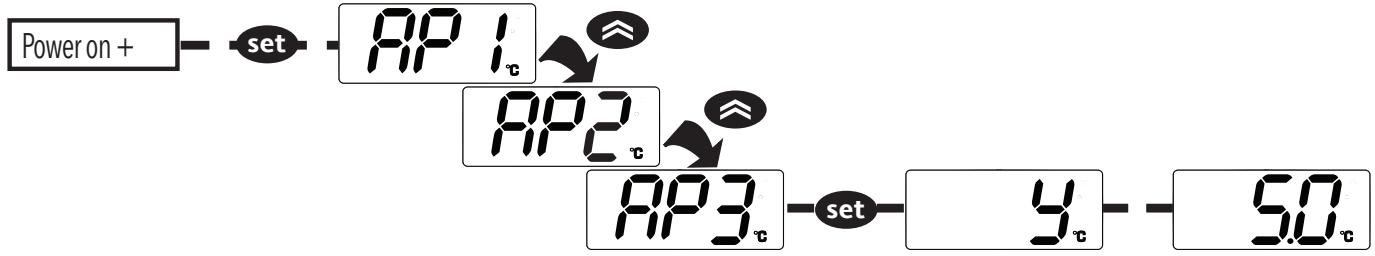


- **FiS** = 0 The filter is disable;
- **FiS** = 1 the filter is set in function of **tAu** and **5tAu**. With the **Fit** parameter, the filter can be applied only when the temperature rise or both when the temperature rise (**Fit**=n(0)) or rise/fall (**Fit**=y(1)). **tAu** it's the time that the display temperature takes to reach the 66 % of the final value, **5tAu** it's the time that the display temperature takes to reach the 99 % of the final value;
- **FiS** = 2, The temperature display change 1 °C / °F every **tAu** value.

LOADING DEFAULT APPLICATIONS

The procedure used to load one of the default applications is:

- when the instrument switches on, press and hold the set key: the label **AP1** will appear;;
- scroll through the various applications (**AP1-AP2-AP3**) using the ∧ and ∨ keys;
- select the desired application using the set key (**AP3** in the example) or cancel the procedure by pressing the ⏻ key or alternatively wait for the timeout;
- if the operation is successful, the display will show **y**, otherwise **n** will appear;
- after a few seconds the instrument will return to the main display.



LOADING APPLICATIONS WHEN EXITING STAND-BY MODE

The procedure for loading one of the preset applications when exiting stand-by mode is:

- set the instrument in stand-by mode by pressing the ⏻ button for time **H02**;
- exit stand-by mode by pressing the ⏻ button for time **H02**;
- within 10 seconds of exiting stand-by mode, press the ⏻ button for time **H02**: the **AP1** label will appear;
- scroll through the various applications (**AP1-AP2-AP3**) using the ∧ and ∨ keys;
- select the desired application using the set key (**AP3** in the example) or cancel the procedure by pressing the ⏻ key or alternatively wait for the timeout;
- if the operation is successful, the display will show **y**, otherwise **n** will appear;
- after a few seconds the instrument will return to the main display.

PARAMETERS TABLE

PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
SEt	/	Temperature SEtpoint.	°C/°F	LSE ... HSE	35.0	35.0	35.0
		COMPRESSOR ('CP' folder)					
dF1	1&2	Relay compressor tripping differential. The compressor stops on reaching the Setpoint value (as indicated by the adjustment probe), and restarts at temperature value equal to the Setpoint plus the value of the differential. **Note: dF1 ≠ 0.**	°C/°F	0.1 ... 30.0	2.0	2.0	2.0
HSE	1&2	Maximum possible setpoint value.	°C/°F	LSE ... HdL	230	230	230
LSE	1&2	Minimum possible setpoint value.	°C/°F	LdL ... HSE	-55.0	-55.0	-55.0
Cit	2	Minimum compressor output activation time.	min	0 ... 250	0	0	0
CAt	2	Maximum compressor output activation time.	min	0 ... 250	0	0	0
Ont	2	Compressor activation time in the event of inoperable probe. • If **OFt**=1 and **Ont**=0, the compressor is always off. • If **OFt**=1 and **Ont**>0 it operated in duty cycle mode.	min	0 ... 250	1	1	1
OFt	2	Compressor deactivation time if probe is inoperable. • If **Ont**=1 and **OFt**=0, the compressor is always on. • If **Ont**=1 and **OFt**>0 it operated in duty cycle mode.	min	0 ... 250	1	1	1
dOn	2	Delay time in activating the compressor relay after switch-on of instrument.	s	0 ... 250	0	0	0
dOF	2	Delay after switch off; the indicated time must elapse between switch-off of the compressor relay and the successive switch-on.	min	0 ... 250	0	0	0
dbi	2	Delay between switch-on; the indicated time must elapse between two successive switch-on of the compressor.	min	0 ... 250	0	0	0

PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
OdO	2	Delay time in activating the outputs after switch-on of the instrument or after a power outage.	min	0 ... 250	0	0	0
dFA	2	Condenser fan and compressor activation delay from the call.	s	0 ... 255	0	0	0
CP2	1&2	Second compressor step activation delay.	s	0 ... 255	5	5	5
CS2	2	Second compressor forced activation time.	min	0 ... 250	0	0	0
		DEFROST ('dEF' folder)					
dty	1&2	Type of defrosting. **0** = Electric defrost - compressor off (OFF) during defrosting; **1** = Reverse cycle defrost (hot gas); compressor on (ON) during defrosting; **2** = Free defrost; defrosting independently of compressor; **3** = Modulated - compressor off (OFF) during defrosting.	num	0 ... 3	0	0	0
dit	1&2	defrost interval time. Interval between the start of two successive defrosting operations.	hours	0 ... 250	4	4	4
dt1	2	Unit of measure for defrosting intervals (**dit** parameter). **0** = Hours; **1** = Minutes; **2** = Seconds.	num	0 ... 2	0	0	0
dt2	2	Unit of measure for defrosting duration (**dEt** parameter). **0** = Hours; **1** = Minutes; **2** = Seconds.	num	0 ... 2	1	1	1

PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
dCt	2	Selection of count mode for the defrosting interval. **0** = Compressor operating hours (DIGIFROST® method); Defrosting active only if compressor is on; **1** = Real Time - equipment operating hours; defrost counting is always active when the machine is on and start every time the instrument switch on; **2** = Compressor stop. Each time the compressor stops a defrosting cycle is performed according to parameter **dtY**; **3** = Temperature. Defrost is active when the Evaporator temperature it remain below the thereshold of **dSE** parameters for **dtt** time; **4** = Smart. Defrost is active when the Evaporator temperature it remain below the thereshold of **dSE** parameters for **dtt** time and the compressor is on; **5** = Demand. Defrost is active when the difference between evaporator temperature and regulation temperature is higher than **dSE** parameter for **dtt** time.	num	0 ... 5	1	1	1
dOH	2	Start-of-defrosting delay time from the call.	min	0 ... 59	0	0	0
dEt	1&2	Defrosting time-out; determines duration of defrosting.	min	1 ... 250	30	30	30
dS1	1&2	End of defrosting temperature.	°C/°F	-67.0 ... 320	45.0	45.0	45.0
dS2	1&2	End of defrosting temperature evaporator 2.	°C/°F	-67.0 ... 320	50.0	50.0	50.0
dPO	2	Determines if at the start-up the instrument must enter defrosting (if the temperature measured by the evaporator allows this operation). **n**(0) = No; **y**(1) = Yes (defrosts when switching on)..	flag	n/y	n	n	n
Cod	2	OFF compressor time before defrosting.	min	0 ... 60	0	0	0
dSE	2	Temperature threshold for starting defrosting.	°C/°F	-67.0 ... 320	-30.0	-30.0	-30.0
dtt	2	Time the evaporator temperature must remain below the threshold.	min	0 ... 255	0	0	0

PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
		EVAPORATOR FAN ('FAn' folder)					
FPt	2	Characterizes the **FSt** parameter that can be expressed or as an absolute temperature value or as a value related to Setpoint. **0** = Absolute; **1** = Relative.	flag	0/1	0	0	0
FSt	1&2	Fan lock temperature; if the value, read by the evaporator probe, is higher than the set value, fans stop.	°C/°F	-67.0 ... 320	50.0	50.0	50.0
FSS	1&2	Evaporator fan activation temperature difference.	°C/°F	0.0 ... 100	0.0	0.0	0.0
FOt	2	Evaporator fan activation temperature.	°C/°F	-67.0 ... 320	-50.0	-50.0	-50.0
FAd	2	Fan starting differential (see par. **FSt**).	°C/°F	1.0 ... 50.0	2.0	2.0	2.0
Fdt	1&2	Delay time in activating fans after a defrost operation.	min	0 ... 250	0	0	0
dt	1&2	Dripping time.	min	0 ... 250	2	2	2
dFd	1&2	Allows to select the evaporator probes exclusion during defrost. **n**(0) = No; **y**(1) = Yes (fan disable).	flag	n/y	y	y	y

<table>
<tr><th rowspan="2">PAR.</th><th rowspan="2">LEV.</th><th rowspan="2">DESCRIPTION</th><th rowspan="2">M.U.</th><th rowspan="2">RANGE</th><th colspan="3">DEFAULT</th></tr>
<tr><th>AP1</th><th>AP2</th><th>AP3</th></tr>
<tr><td>FCO*</td><td>2</td><td>Allows to select compressor fans lock OFF (switched off).
<table>
<tr><th colspan="2" rowspan="2">H42 FCO</th><th colspan="2">DAY</th><th colspan="2">NIGHT</th></tr>
<tr><th>COMPR. ON</th><th>COMPR. OFF</th><th>COMPR. ON</th><th>COMPR. OFF</th></tr>
<tr><td rowspan="7">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>Dutycycle day</td><td>Thermostat controlled</td><td>Dutycycle night</td></tr>
<tr><td>3</td><td>Dutycycle day</td><td>Dutycycle day</td><td>Dutycycle night</td><td>Dutycycle night</td></tr>
<tr><td>4</td><td>Thermostat controlled</td><td>OFF</td><td>Thermostat controlled</td><td>OFF</td></tr>
<tr><td>5</td><td>Thermostat controlled</td><td>Thermostat controlled</td><td>Thermostat controlled</td><td>Thermostat controlled</td></tr>
<tr><td>6</td><td>Thermostat controlled</td><td>Thermostat controlled</td><td>Thermostat controlled</td><td>Thermostat controlled</td></tr>
<tr><td rowspan="7">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>Dutycycle day</td><td>ON</td><td>Dutycycle night</td></tr>
<tr><td>2</td><td>ON</td><td>Dutycycle day</td><td>ON</td><td>Dutycycle night</td></tr>
<tr><td>3</td><td>Dutycycle day</td><td>Dutycycle day</td><td>Dutycycle night</td><td>Dutycycle night</td></tr>
<tr><td>4</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
<tr><td>5</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
<tr><td>6</td><td>Dutycycle day</td><td>Dutycycle day</td><td>Dutycycle night</td><td>Dutycycle night</td></tr>
</table></td><td>num</td><td>0...6</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>FdC</td><td>2</td><td>Evaporator fan shutoff delay after compressor deactivation.</td><td>min</td><td>0 ... 99</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>FOn*</td><td>2</td><td>Evaporator fan On time in cyclical regulator mode.</td><td>s x10</td><td>0 ... 250</td><td>6</td><td>6</td><td>6</td></tr>
<tr><td>FOF*</td><td>2</td><td>Evaporator fan Off time in cyclical regulator mode.</td><td>s x10</td><td>0 ... 250</td><td>6</td><td>6</td><td>6</td></tr>
<tr><td colspan="8">* NOTA: if exceeding 100K cycles, please consult with Sales first.</td></tr>
<tr><td></td><td></td><td>ALARMS (‘AL’ folder)</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Att</td><td>2</td><td>Allow you to select if the parameters HAL and LAL will have absolute (Att=0) or relative (Att=1) value.</td><td>flag</td><td>0/1</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>AFd</td><td>2</td><td>Alarm differential.</td><td>°C/°F</td><td>1.0 ... 50.0</td><td>2.0</td><td>2.0</td><td>2.0</td></tr>
<tr><td>HAL</td><td>1&2</td><td>Temperature value (in relative value) which if exceeded in an upward direction triggers the activation of the alarm signal.</td><td>°C/°F</td><td>LAL ... 320</td><td>50.0</td><td>50.0</td><td>50.0</td></tr>
</table>

PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
LAL	1&2	Temperature value (in relative value), which if exceeded in a downward direction, triggers the activation of the alarm signal.	°C/°F	-67.0 ... HAL	-50.0	-50.0	-50.0
PAO	2	Alarm exclusion time after instrument switch on, after a power outage.	minx10	0 ... 10	6	6	6
dAO	2	Temperature alarm exclusion time after defrost.	min	0 ... 999	60	60	60
OAO	2	Alarm signaling delay after digital input disabling (door close). Alarm is only for high-low temperature alarms.	minx10	0 ... 10	0	0	0
tdO	2	Alarm activation delay time open door.	min	0 ... 250	0	0	0
tAO	1&2	Temperature alarm signal delay time.	min	0 ... 250	0	0	0
dAt	2	Alarm for defrosting ended due to time out. **n**(0) = Alarm deactivated; **y**(1) = Alarm activated.	flag	n/y	n	n	n
rLO	2	External alarm locks the regulators **n**(0) = Don't lock regulators; **y**(1) = Lock regulators.	flag	n/y	n	n	n
AOP	2	Alarm output polarity **n**(0) = Alarm activated and output disabled; **y**(1) = Alarm activated and output enabled.	flag	n/y	y	y	y
SA3	2	Alarm set point for probe 3.	°C/°F	-67.0 ... 320	50.0	50.0	50.0
dA3	2	Probe 3 alarm tripping differential.	°C/°F	1.0 ... 50	1.0	1.0	1.0

PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
		DOOR SWITCH ('Lit' folder)					
dOd	2	Enabling of user shutoff upon activation of the door switch. **0** = Deactivated; **1** = Fan deactivated; **2** = Compressor deactivated; **3** = Fan and compressor deactivated.	num	0 ... 3	0	0	0
dAd	2	Digital input activation delay.	min	0 ... 255	0	0	0
dSd	2	Aux output activation when door opened. **n**(0) = Does not activate AUX output; **y**(1) = Activates the AUX output.	flag	n/y	y	y	y
		ENERGY SAVING ('EnS' folder)					
OSP	2	Temperature Value to be added to the setpoint if reduced set is enabled (Economy function).	°C/°F	-30.0 ... 30.0	3.0	3.0	3.0
		COMMUNICATION ('Add' folder)					
PtS	2	Protocol selection. **t**(0) = Televis; **d**(1) = Modbus.	flag	t/d	d**		
dEA	2	Device address in family (valid values from 0 to 14).	num	0 ... 14	1**		
FAA	2	Device family (valid values from 0 to 14). The **FAA** and **dEA** values represent the network address of the equipment and are indicated in the following format 'FF.DD' (where FF=**FAA** and DD=**dEA**).	num	0 ... 14	0**		
PtY	2	MODBUS parity bit. **n**(0) = None; **E**(1) = Even; **o**(2) = Odd.	num	n/E/o	n**		
StP	2	MODBUS stop bit. **1b**(0) = 1 bit; **2b**(1)= 2 bit.	flag	1b/2b	1b**		
**** Parameter not present in vectors**							

PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
		DISPLAY ('diS' folder)					
LOC	1&2	LOCK. Setpoint change shutdown. There is still the possibility to enter into parameters programming and modify these, including the status of this parameter to permit keyboard shutdown. **n**(0) = No; **y**(1) = Yes.	flag	n/y	n	n	n
PS1	1&2	PAssword 1. When enabled (**PS1** ≠ 0) it constitutes the access key for 'User' parameters.	num	0 ... 250	0	0	0
PS2	2	PAssword 2. When enabled (**PS2** ≠ 0) it constitutes the access key for 'Installer' parameters.	num	0 ... 250	15	15	15
ndt	2	View with decimal point. **n**(0) = No; **y**(1) = Yes (display with decimal).	flag	n/y	y	y	y
CA1	1&2	CAlibration 1. Positive or negative temperature value added to the value read by probe 1.	°C/°F	-12.0 ... 12.0	0.0	0.0	0.0
CA2	1&2	CAlibration 2. Positive or negative temperature value added to the value read by probe 2.	°C/°F	-12.0 ... 12.0	0.0	0.0	0.0
CA3	1&2	CAlibration 3. Positive or negative temperature value added to the value read by probe 3.	°C/°F	-12.0 ... 12.0	0.0	0.0	0.0
CAI	2	Calibration activation. **0** = Only the temperature shown is modified. **1** = Only the temperature used by the regulators is modified; the display remains unchanged. **2** = Temperature displayed is modified, which is also the one used by the regulators.	num	0 ... 2	2	2	2
LdL	2	Minimum visible value.	°C/°F	-67.0 ... HdL	-55.0	-55.0	-55.0
HdL	2	Maximum visible value.	°C/°F	LdL ... 320	230	230	230

PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
ddL	1&2	Viewing mode during defrosting. **0** = Shows the temperature read by the room probe; **1** = Locks the reading on the temperature value read by room probe when defrosting starts, and until the next time the Setpoint value is reached; **2** = Displays the label '**dEF**' during defrosting, and until the next time the Setpoint value is reached.	num	0/1/2	2	2	2
Ldd	1&2	Display lock time out from end of defrosting.	min	0 ... 255	30	30	30
drO	2	Select °C or °F for displaying the temperature read by the thermostat probe. (**0** = °C, **1** = °F). **NOTE**: the switch between °C and °F DO NOT modify setpoint, differential, etc. (for example set=10 °C become 10 °F).	flag	0/1	1	1	1
ddd	2	Selection of type of value to be displayed. **0** = Setpoint; **1** = Pb1 probe; **2** = Pb2 probe; **3** = Pb3 probe.	num	0 .. 3	1	1	1
FiS	2	Filter selection. (See '**DISPLAY FILTER**'). **0** = Filter disable; **1** = Filter use **tAu** and **5tAu**; **2** = Filter use only **tAu**.	num	0 ... 2	2**		
Fit	2	Filter mode. **n**(0) = Active only when the temp. rise; **y**(1) = Always active (rise and fall).	flag	n/y	n**		
tAu	2	Filter time constant.	min	0 ... 250	20**		
**** Parameter not present in vectors**							

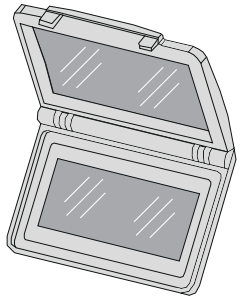
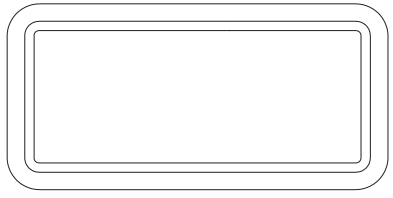
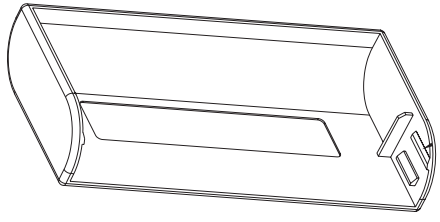
PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
		CONFIGURATION ('CnF' folder) Switch the device off and on again each time the parameter configuration is changed.					
H02	2	Function activation time from keypad.	s	0 ... 15	3	3	3
H06	2	Instrument off active light/auxiliary digital input or key **n**(0) = Deactivated; **y**(1) = Activated.	flag	n/y	y	y	y
H08	2	Stand-by operating mode. **0** = Display switch off; **1** = Display switch off, loads and alarms stopped; **2** = Display with OFF label, loads and alarms stopped.	num	0/1/2	2	2	2
H11	2	Configuration of digital inputs 1/polarity D.I.1. **0** = Disabled; **±1** = Defrosting; **±2** = Reduced set; **±3** = AUX; **±4** = Door switch; **±5** = External alarm; **±6** = Stand-by (ON-OFF); **±7, ±8** = Not used; **±9** = Energy saving; **±10** = Door switch + Energy saving. **NOTE**: -the '**+**' sign indicates that the input is activated when the contact is closed. -The '**-**' sign indicates that the input is activated when the contact is open.	num	-10 ... 10	0	0	0
H12	2	Configuration of digital inputs 2/polarity D.I.2. Same as **H11**.	num	-10 ... 10	0	0	0

PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
H21	2	Digital output 1 configurability. **0** = Disabled; **1** = Compressor; **2** = Defrost; **3** = Fan; **4** = Alarm; **5** = AUX; **6** = Standby. **7** = Not used; **8** = Condenser fan change rotation; **9** = Retain valve; **10** = Evaporator 2nd defrost; **11** = 2nd Compressor; **12** = Drip pan Heaters.	num	0 ... 12	1	1	1
H22	2	Configurability of digital output 2. Same as **H21**.	num	0 ... 12	2	2	2
H23	2	Configurability of digital output 3. Same as **H21**.	num	0 ... 12	3	3	3
H24	2	Configurability of digital output 4. Same as **H21**.	num	0 ... 12	5	5	5
H25	2	Enable/disable the buzzer. **0** = Disabled; **4** = Enabled; **1**-**2**-**3**-**5**-**6**-**7**-**8**-**9**-**10**-**11**-**12** = Not used.	num	0 ... 12	0	0	0

PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
H31	2	UP key configurability. **0** = Disabled; **1** = Defrost; **2** = AUX; **3** = Reduced set; **4** = Stand-by; **5** = Not used; **6** = Energy saving.	num	0 ... 6	1	1	1
H32	2	DOWN key configurability. Same as **H31**	num	0 ... 6	0	0	0
H33	2	ESC key configurability. Same as **H31**.	num	0 ... 6	4	4	4
H41	2	Pb1 probe present. **n**(0) = Not present; **y**(1) = Present.	flag	n/y	y	y	y
H42	1&2	Pb2 probe present. **n**(0) = Not present; **y**(1) = Present.	flag	n/y	y	y	y
H43	1&2	Pb3 probe present. **n**(0) = Not present; **y**(1) = Present; **2EP**(2)= Evaporator 2nd defrost.	flag	n/y/2EP	2EP	2EP	2EP

PAR.	LEV.	DESCRIPTION	M.U.	RANGE	DEFAULT		
					AP1	AP2	AP3
H45	1&2	Defrosting input mode for applications with dual evaporator. **0**= Only first evaporator; **1**= If at least one of the evaporators is below its end of defrost temperature; **2**= Only if both evaporators are below the respective end defrost temperature; **3**= 1st evaporator and 2nd evaporator activated alternately.	num	0 ... 3	3	3	3
H60	2	Parameter vector selector: read only parameter.	num	1 ... 3	1**		
CuS	1&2	Customer model code.	num	0 ... 999	1**		
**** Parameter not present in vectors**							
reL	1&2	Device version: read only parameter.	/	/	/	/	/
tAb	1&2	Reserved: read only parameter.	/	/	/	/	/
		COPY CARD / UNICARD ('Fpr' folder)					
UL	2	Upload. Programming parameter transfer from instrument to UNICARD.	/	/	/	/	/
Fr	2	Erasing all data in the UNICARD.	/	/	/	/	/

ACCESSORIES

	Plexiglas protection for controllers: • Protects the facade in external areas or those that are particularly dirty.
	Silicon gasket to protect against humidity: • Increases the protection of the controller against humidity and dirty.
	Ant-drip protection at the back: • Protects electric connectors against dripping liquids.

RESPONSIBILITY AND RESIDUAL RISKS

In addition to the exclusions provided in the Warranty terms, ELIWELL CONTROLS SRL shall not be liable for any damages deriving from:

- Installation and/or use other than that prescribed and, in particular, that does not comply with applicable regulatory and safety standards, including the standards provided herein;
- Installation and/or use on boards which do not guarantee adequate protection against electric shock, water, dust, or access to dangerous parts;
- Installation and/or use on boards that do not comply with applicable regulatory and safety standards;
- tampering with and/or alteration of the products.

CONDITIONS OF USE

Permitted use

For safety reasons the instrument must be installed and used according to the instruction provided and in particular, under normal conditions, parts bearing dangerous voltage levels must not be accessible. The device must be adequately protected from water and dust as per the application and must also only be accessible via the use of tools (with the exception of the frontlet).
The device is ideally suited for use on household appliances and/or similar refrigeration equipment and has been tested with regard to the aspects concerning European reference standards on safety.

Unpermitted use

Any other use other than that permitted is de facto prohibited. It should be noted that the relay contacts provided are of a practical type and therefore subject to fault. Any protection devices required by product standards or dictated by common sense due to obvious safety reasons should be applied externally.

DISCLAIMER

DISPOSAL

The appliance (or the product) must be disposed of separately in compliance with the local standards in force on waste disposal.

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NSF COMPONENT

Certified System ™ ISO 9001

ENVIRONMENTAL SYSTEM CERTIFICATION ISO 14001 DNV

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