RTX600 - RTN600

Controllers for freezer cabinet and cold rooms with built-in compressor.

- DIN (RTX600) rail or panel-mounted (RTN600)
- Energy Saving algorithms
- 8 preloaded applications
- Single defrost / double evaporator
- Frame heater
- Local network auto-configuration
- Direct load connection
- 2-step compressor management or single-step management of 2 compressors
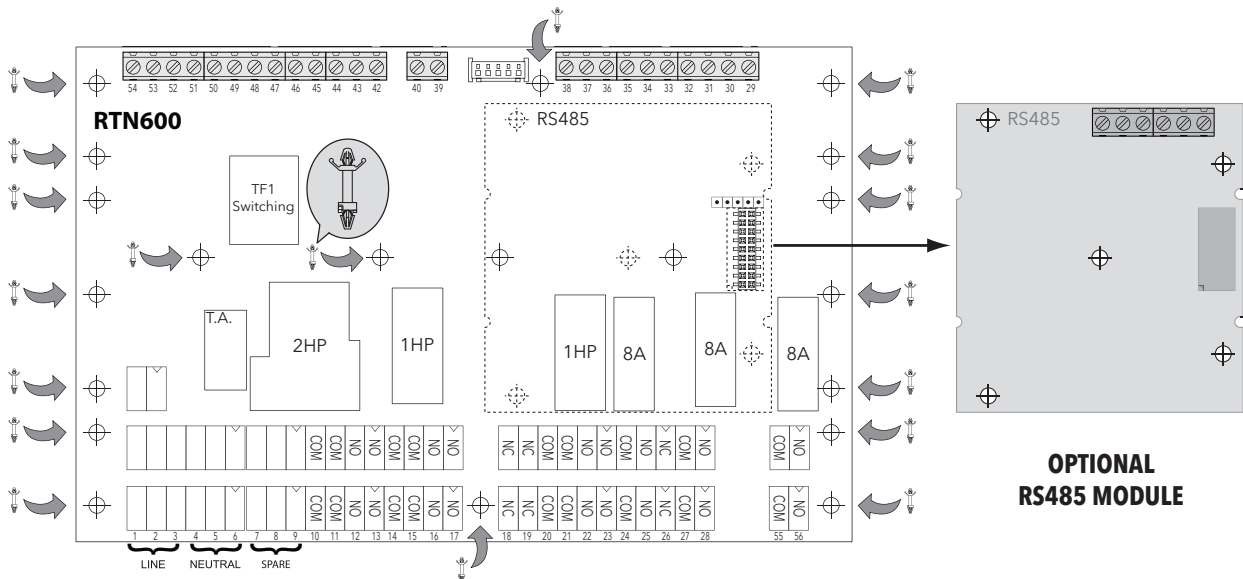- Supply voltage control LVD (OPTIONAL)

MECHANICAL INSTALLATION

Do not install the device in places subject to high humidity and/or dirt; it is intended for use in sites with ordinary or normal levels of pollution. Keep the area around the instrument cooling slots adequately ventilated.

RTX600

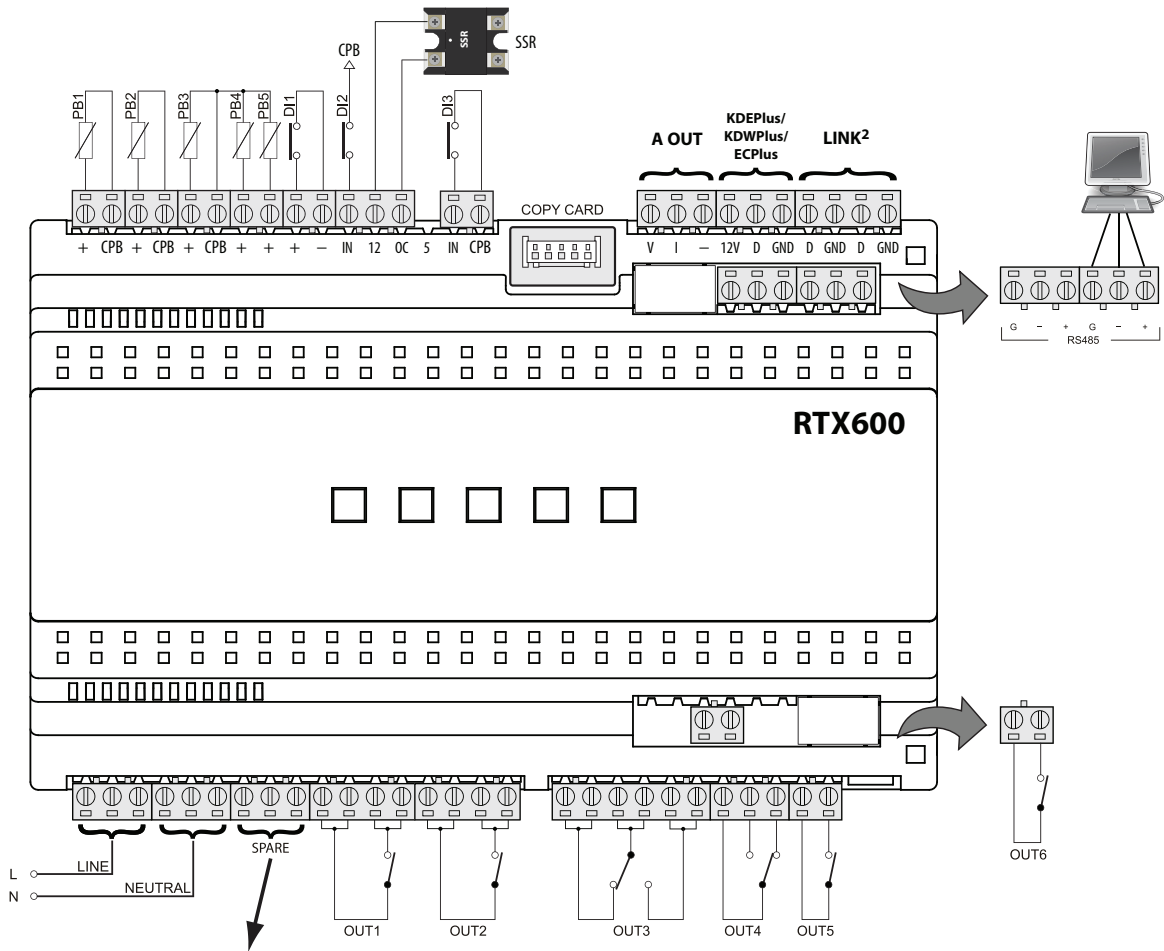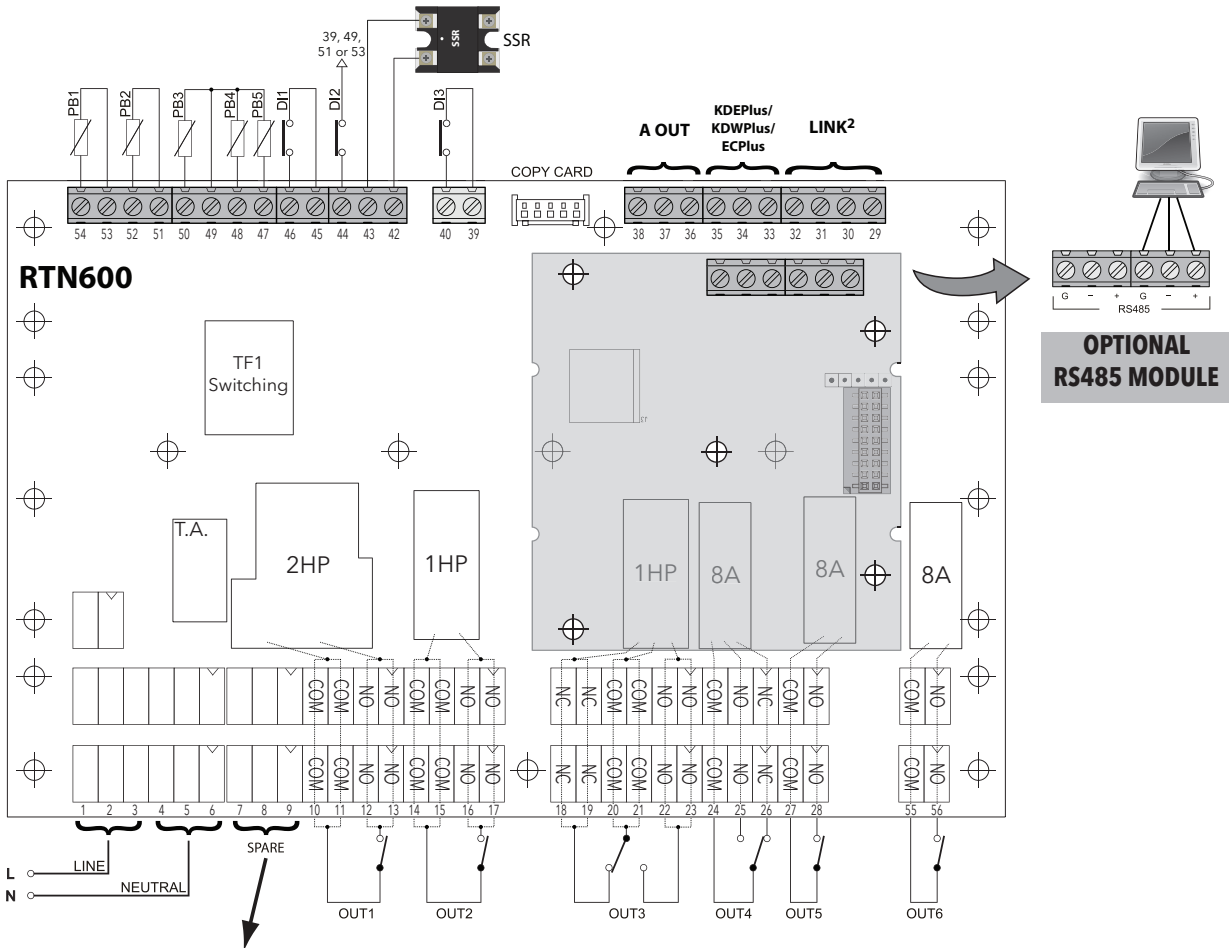### RTN600

OPTIONAL
RS485 MODULE
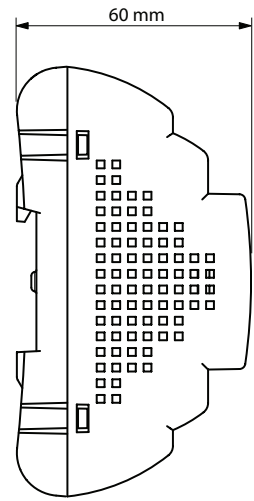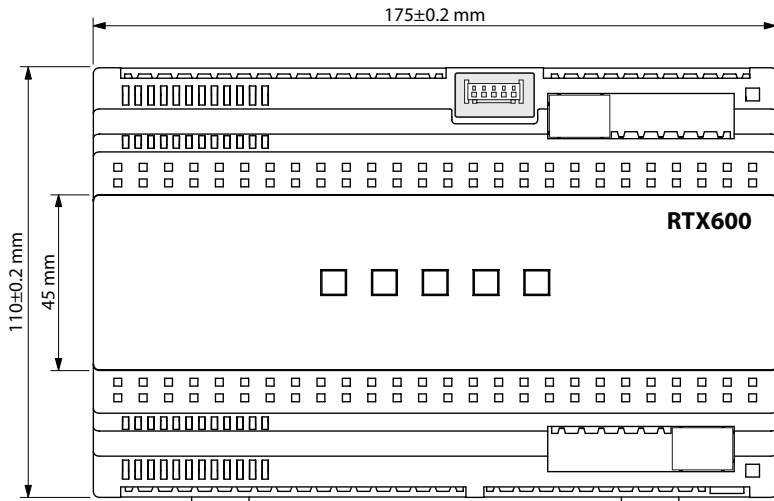
: identifies all holes to be used to assemble spacers.

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WIRING DIAGRAMS

SPARE: These are supporting terminals that are not connected internally.

SPARE: These are supporting terminals that are not connected internally.

DEFAULT APPLICATIONS

DESCRIPTION OF APPLICATIONS

APP1 (Dairy Products and Fruit/Vegetables):
HT vertical open display cabinet - resistance defrost.

APP2 (Frozen Foods):
LT vertical glass door cabinet - resistance defrost.

APP3 (Frozen Foods):
LT island - single evaporator - resistance defrost.

APP4 (Cold cuts):
NT Glass Door Cabinet - single evaporator - resistance defrost.

APP5 (Frozen Foods):
LT/LT Combi - single evaporator.

APP6 (Frozen Foods and Fruit/Vegetables):
Cold Room.

APP7 (Frozen Foods):
LT island - single evaporator - hot gas defrost.

APP8 (Frozen Foods):
LT vertical glass door cabinet - resistance defrost - frame heater with probe.

FUNCTION	APP1	APP2	APP3	APP4	APP5	APP6	APP7	APP8
INPUTS								
PB1 (NTC)	**VIRT1***	**REG1**	**REG1**	**REG1**	**REG1**	**REG1**	**REG1**	**REG1**
PB2 (NTC)	**VIRT2***				**REG2****			
PB3 (NTC)	[defrost]	[defrost]	[defrost]/[fan]	[defrost]/[fan]	[defrost]/[fan]	[defrost]/[fan]	[defrost]/[fan]	[defrost]
PB4 (NTC)								Frame Heater 0...10V output
PB5 (digital input)								
DI1 (par. **H18**)		[door]				[door]		[door]
DI2 (par. **H16**)								
DI3 (par. **H17**)								
OUTPUTS								
OUT1 (16A relay)	[compressor]	[compressor]	[compressor]	[compressor]	[compressor]	[compressor]	[compressor]	[compressor]
OUT2 (16A relay)	[fan]	[fan]	[fan]	[fan]	[fan]	[fan]	[fan]	[fan]
OUT3 (16A relay)	[defrost]	[defrost]	[defrost]	[defrost]	[defrost]	[defrost]	[defrost]	[defrost]
OUT4 (8A relay)	[resistance] (AUX)	((•))	((•))	((•))	((•))	((•))	((•))	((•))
OUT5 (8A relay)	[light]	[light]	[light]	[light]	[light]	[light]	[light]	[light]
OUT6 (8A relay)	((•))						[valve]	
DAC								Frame Heater 0...10V output
OC	Frame Heater	Frame Heater	Frame Heater	Frame Heater	Frame Heater		Frame Heater	

NOTE:
* : Regulation via virtual probe is based on the value of Pbi = [**VIRT1** x H72 + **VIRT2** x (100 - H72)]/100
   (where **VIRT1** = value of temperature probe selected with H70 and **VIRT2** = value of temperature probe selected with con H71)
** : Thermostat 2 control probe (compressor ON when both thermostats are requested, otherwise OFF).

REGULATION

Depending on the application selected, the RTX600/RTN600 regulates as follows:

• Standard Regulation (AP1-AP2-AP3-AP4-AP6-AP7-AP8):

The regulator will activate when the temperature exceeds T > SP1+dF1 and disables when T < SP1.

For these applications, the regulation differential is managed as a relative value.

• Double "parallel" thermostat (AP5)

Regulation is based on 2 thermostats (T1 and T2) connected "in parallel".

This regulator activates cold only if both thermostats have been requested, and disables it when both thermostats have been satisfied. If one or both of the thermostats has a probe error, the regulation will use the probe error parameters.

LOCAL AND MONITORING NETWORK

It is possible to connect up to a maximum of 8 RTX600/RTN600 instruments in a LINK[2] local network and to connect only one instrument to the Televis/Modbus monitoring network.

Within each subnetwork, the addresses of the individual devices, characterized by parameters dEA and FAA, must be preset ensuring that each pairing is unique.

N.B.: we suggest assigning the same value of FAA to all the instruments in a sub-network so that they can be identified more easily.

See the example connection LINK[2] + Monitoring network below:

CASE A	FAA = 1 dEA = 0	FAA = 2 dEA = 0	FAA = 2 dEA = 1	FAA = 2 dEA = 7
CASE B	FAA = 1 dEA = 0	FAA = 1 dEA = 1	FAA = 2 dEA = 0	FAA = 2 dEA = 6

The related parameters are as follows:

PAR.	DESCRIPTION	RANGE	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP8	M.U.
L00	Selects which probe to share: **diS** (0) = disabled **Pb1** (1) = will share probe Pb1 **Pb2** (2) = will share probe Pb2 **Pb3** (3) = will share probe Pb3 **Pb4** (4) = will share probe Pb4 **Pb5** (5) = will share probe Pb5 **Pbi** (6) = will share probe Pb6	diS, Pb1...Pb5, Pbi	diS	diS	diS	diS	diS	diS	diS	diS	num
L01	Shares the displayed value with the LAN.	0/1/2	0	0	0	0	0	0	0	0	num
L02	Sends setpoint value to the LAN network when it has been modified. **no** (0) = no; **yES** (1) = yes.	no/yES	no	no	no	no	no	no	no	no	flag
L03	Enables sending the defrost request to the LAN network. **no** (0) = no; **yES** (1) = yes.	no/yES	no	no	no	no	no	no	no	no	flag
L04	Defrost end mode. **ind** (0) = independent; **dEP** (1) = dependent.	no/yES	ind	ind	ind	ind	ind	ind	ind	ind	flag
L05	Enables synchronization of the Standby command. **no** (0) = no; **yES** (1) = yes.	no/yES	no	no	no	no	no	no	no	no	flag
L06	Enables synchronization of the lights command. **no** (0) = no; **yES** (1) = yes.	no/yES	no	no	no	no	no	no	no	no	flag
L07	Enables synchronization of the Energy Saving command. **no** (0) = no; **yES** (1) = yes.	no/yES	no	no	no	no	no	no	no	no	flag
L08	Enables synchronization of the AUX command. **no** (0) = no; **yES** (1) = yes.	no/yES	no	no	no	no	no	no	no	no	flag
L10	Sets the time delay to be set after the end of dependent defrosts.	0...250	30	30	30	30	30	30	30	30	min

FRAME HEATER

This regulator makes it possible to activate the anti-sweat heaters of a display window or refrigerated cabinet.
The instrument can be used to control an OC relay output (external SSR controlled by means of an Open Collector output) or an analogue output (0...10V, 4...20mA). Some connection examples are given below:

with external SSR
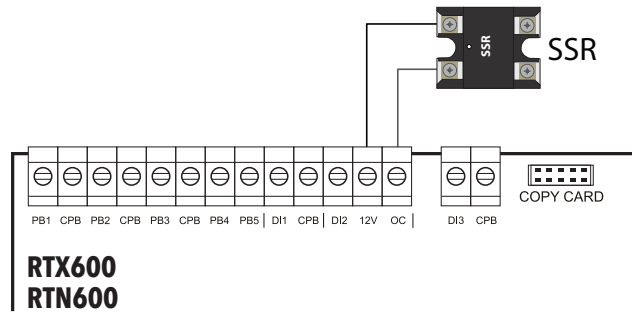
| with CFS-xx/I on 4...20mA output | with CFS-xx/I on 0...10V output |
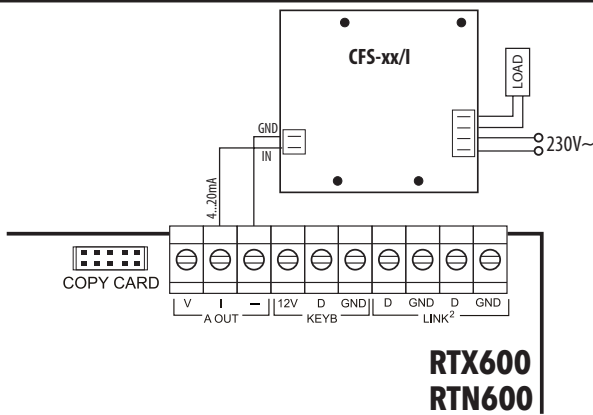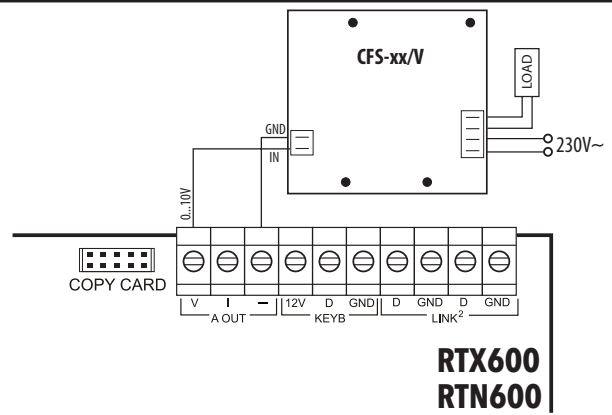
Modules CFS-xx/I and CFS-xx/V control the voltage of a load and have input values of I = 4...20mA or V = 0...10V.

Control can be:

- Fixed Duty Cycle (with actuation percentage fixed at FH4).
- Modulating based on the value read by the frame heater probe (see chart).

Par.	DESCRIPTION	RANGE	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP8	M.U.
FH	Selects which probe will be used by the anti-sweat heaters (Frame Heater): **diS** (0) = disabled; **dc** (1) = operates in Duty Cycle mode **Pb1** (2) = will use probe Pb1; **Pb2** (3) = will use probe Pb2 **Pb3** (4) = will use probe Pb3; **Pb4** (5) = will use probe Pb4 **Pb5** (6) = will use probe Pb5; **Pbi** (7) = will use virtual probe	diS, dc, Pb1...Pb5, Pbi	dc	dc	dc	dc	dc		dc	Pb4	num
FHt	Frame Heater running time. **NOTE** = only used when OC output is used with SSR relay.	1...2500	30	30	30	30	30		30	30	sec*10
FH0	Sets setpoint for Frame Heater.	-58,0...302	0	0	0	0	0		0	0	°C/°F
FH1	Sets offset for Frame Heater.	0,0...25,0	0	0	0	0	0		0	100	°C/°F
FH2	Sets band for Frame Heater.	0,0...25,0	0	0	0	0	0		0	100	°C/°F
FH3	Sets minimum percentage for Frame Heater.	0...100	0	0	0	0	0		0	20	%
FH4	Sets maximum percentage for day Duty Cycle.	0...100	75	75	75	75	75		75	100	%
FH5	Sets maximum percentage for night Duty Cycle.	0...100	50	50	50	50	50		50	80	%
FH6	Sets percentage during defrost.	0...100	100	100	100	100	100		100	100	%

CONNECTIONS WITH USER TERMINAL AND REMOTE DISPLAY

Each power board can be connected to a single KDEPlus or KDWPlus keypad (user terminal) and if required to an ECHO module (remote display) by means of the connector located on the keypad.

RTX600-RTN600 + KDEPlus CONNECTION

L = max. 15m

COPY CARD

V | I | C | 12V | D | GND | D | GND | D | GND
A OUT | | KEYB | | LINK²

RTX600 RTN600

DATI | 12V | GND | ECHO
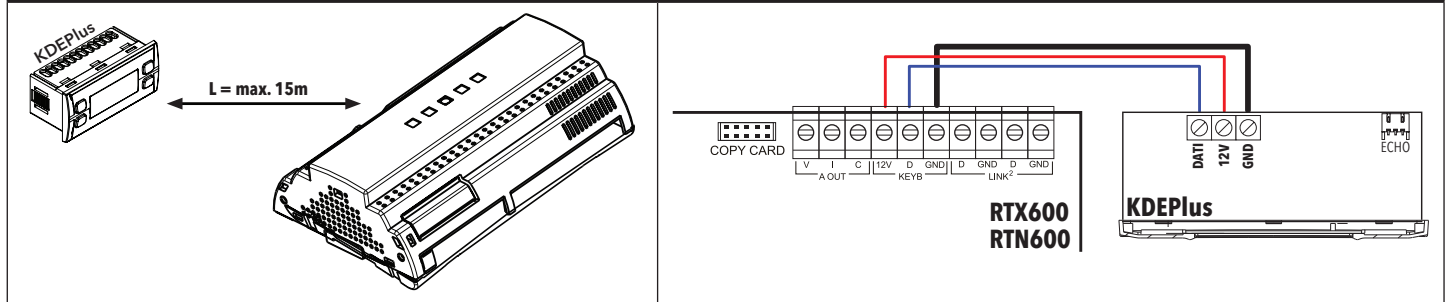
KDEPlus

RTX600-RTN600 + ECPlus CONNECTION

L = max. 100m

D
GND
12V

COPY CARD

V | I | C | 12V | D | GND | D | GND | D | GND
A OUT | | KEYB | | LINK²

RTX600 RTN600
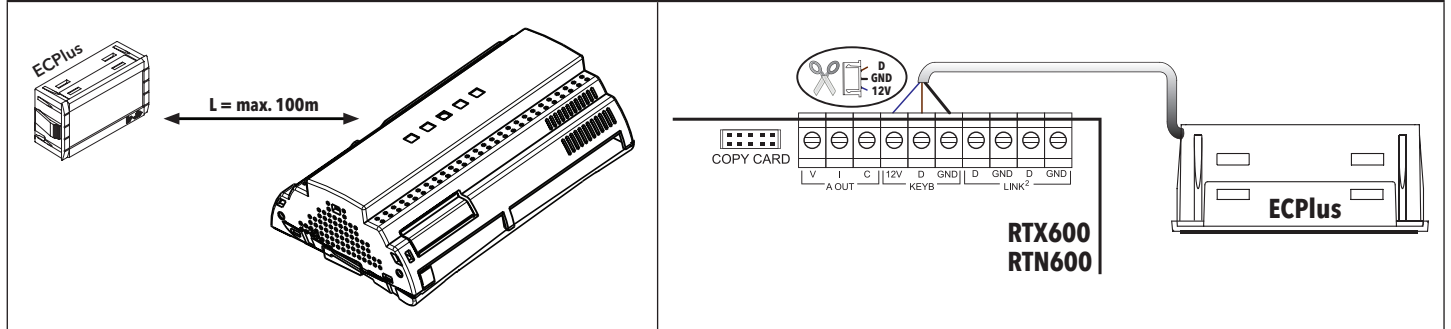
ECPlus

RTX600-RTN600 + KDEPlus + ECPlus CONNECTION

L = max. 15m

L2 < (100 - L) m

ECPlus

COPY CARD

V | I | C | 12V | D | GND | D | GND | D | GND
A OUT | | KEYB | | LINK²

RTX600 RTN600

DATI | 12V | GND | ECHO
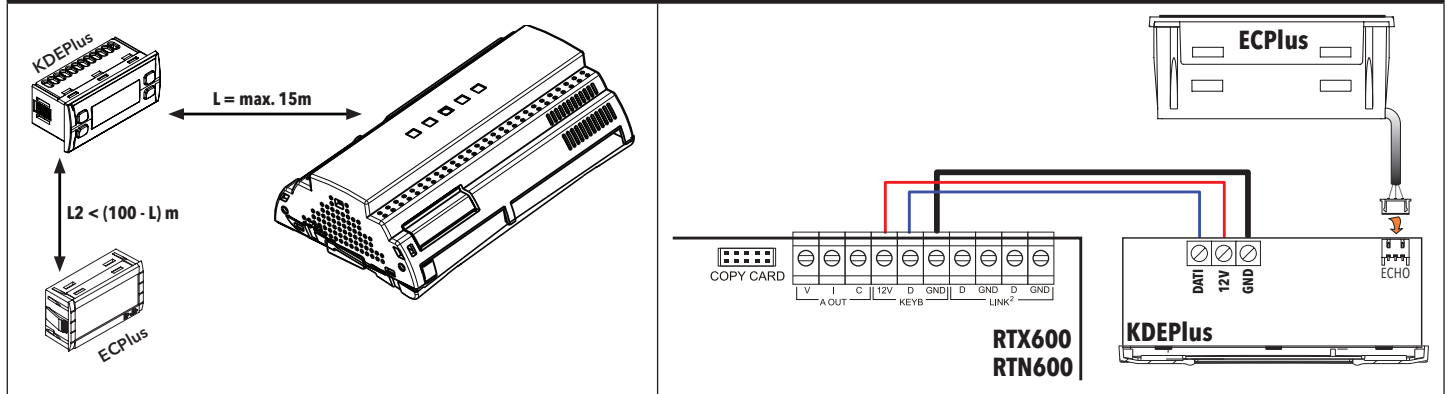
KDEPlus

RTX600-RTN600 + KDWPlus + ECPlus CONNECTION

L = max. 15m

L2 < (100 - L) m

ECPlus

D
GND
12V

GND
12V
D

38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 30 | 29

COPY CARD

V | I | C | 12V | D | GND | D | GND | D | GND
A OUT | | KEYB | | LINK²

RTX600 RTN600
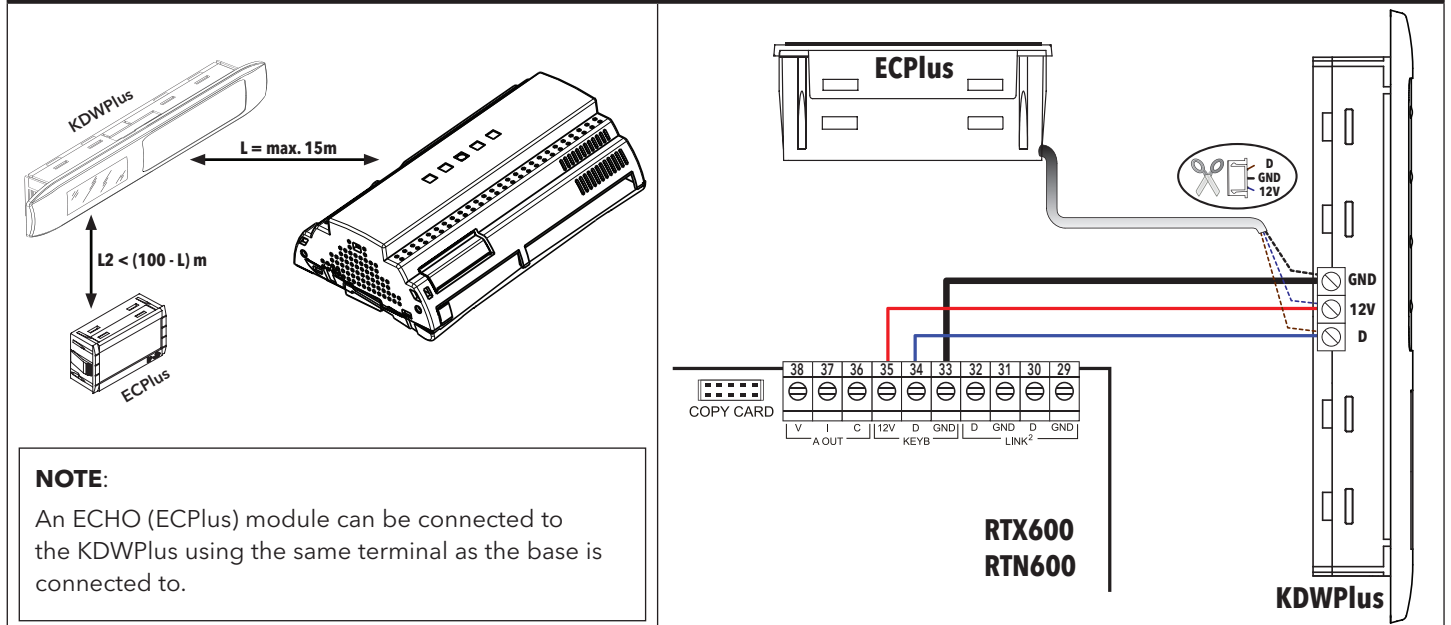
KDWPlus

NOTE:

An ECHO (ECPlus) module can be connected to the KDWPlus using the same terminal as the base is connected to.

KDEPlus and KDWPlus KEYPAD INTERFACE

KDEPlus	KDWPlus
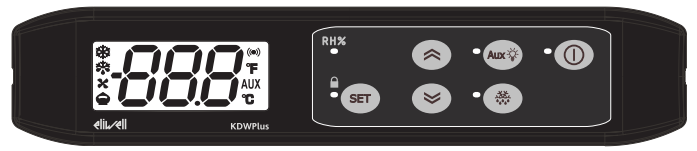
KDEPlus KEYS		KDWPlus KEYS	
UP	Press and release	**UP**	Press and release
	Scroll through menu options		**Scroll through menu options**
	Increases values		**Increases values**
	Press for at least 5 sec		Press for at least 5 sec
	Defrost manual activation		**User-configurable function** (par. H31)
	User-configurable function (par. H31)		
DOWN	Press and release	**DOWN**	Press and release
	Scroll through menu options		**Scroll through menu options**
	Decreases values		**Decreases values**
	Press for at least 5 sec		Press for at least 5 sec
	User-configurable function (par. H32)		**User-configurable function** (par. H32)
STANDBY (ESC)	Press and release	**STANDBY**	Press and release
	Returns to the previous menu level		**Returns to the previous menu level**
	Confirms parameter value		**Confirms parameter value**
	Press for at least 5 secs		Press for at least 5 secs
	Manual activation of Stand-by		**Manual activation of Stand-by**
	User-configured function (par. H33)		**User-configured function** (par. H33)
SET (ENTER)	Press and release	**SET (ENTER)**	Press and release
	Displays any alarms (if active)		**Displays any alarms** (if active)
	Opens Machine Status menu		**Opens Machine Status menu**
	Confirms commands		**Confirms commands**
	Press for at least 5 sec		Press for at least 5 sec
	Opens Programming menu		**Opens Programming menu**
		DEFROST (ESC)	Press and release
			Manual defrost activation
			Returns to the previous menu level
		AUX/LIGHT	Press and release
			Activates the AUX output / Switches on the light

NOTE:
The 2 KDEPlus and KDWPlus keypads are equivalent and guarantee the same functions.

ICONS/DISPLAY

	Reduced Set/Economy LED			**Alarms LED**	
	Permanently on:	Energy Saving active		Permanently on:	alarm present
	Blinking:	reduced setpoint active		Blinking:	alarm acknowledged
	Off:	otherwise		Off:	otherwise
	Compressor LED			**Defrost LED**	
	Permanently on:	compressor on		Permanently on:	output active
	Blinking:	delay, protection or start blocked		Blinking:	activated manually or from DI
	Off:	otherwise		Off:	otherwise
	Fans LED			**Aux LED**	
	Permanently on:	fans on	AUX	Permanently on:	aux output active and/or light on
	Off:	otherwise		Blinking:	Deep cooling on
°C	**°C LED**		°F	**°F LED**	
	Permanently on:	°C setting (dro =0)		Permanently on:	°F setting (dro =1)
	Off:	otherwise		Off:	otherwise

LED (KDWPlus ONLY)

RH%	Forces fan on (Hxx = 15)	🔒	Locked keypad
Aux☀	Light relay on from key	❄	Defrost ON
⏻	Device off		

LOADING DEFAULT APPLICATIONS

The procedure for loading one of the default applications is:
- At power-on of the device, keep the (SET) key pressed: the label "AP1" will appear.
- Scroll through the various applications ("AP1"... "AP8") using the (∧) and (∨) keys.
- Select the application you want using the (SET) key ("AP3" in the example) or cancel the operation by pressing the (⏻) key or by 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:
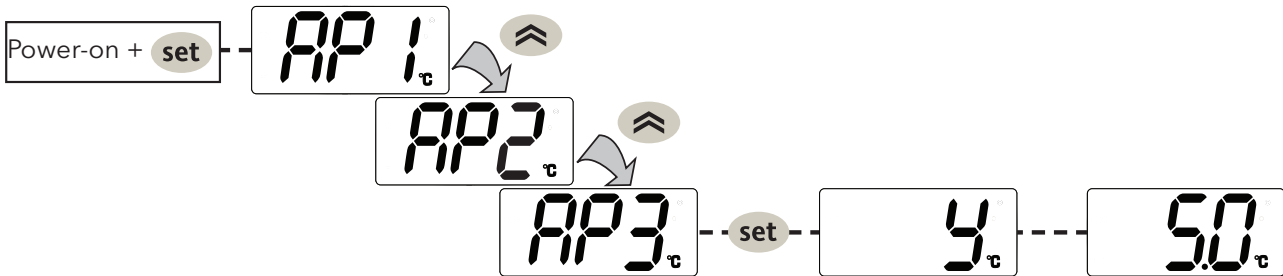
RESET PROCEDURE

RTX600 and **RTN600** 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 restores the instrument to its initial state, returning all parameters to their default values. This means that all changes made to operating parameters will be lost.

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 through all the folders in the menu:
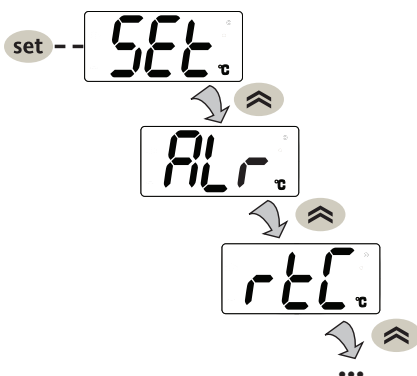
- SEt: setpoint programming;
- ALr: alarms folder (only visible if an alarm is active).
- rtC: clock parameters folder - contains:
    - dAy: day of week
    - h: hours
    - ':   minutes
- Pb1...Pb5:   value of probes Pb1...Pb5
- idF: firmware mask number;
- reL: FW release number;
- tAb: E2 map code;
- LAn: displays how many instruments of the Link2 have been recognized (if the instrument is off the network **LAn=0**).

Programming the setpoint: To display the Setpoint value press the (SET) key 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.

Displaying the probes: When labels Pb1 ... Pb5 are displayed, pressing the key shows the value measured by the associated probe (NOTE: the value cannot be modified).

PROGRAMMING MENU

To access the "Programming" menu hold down the (SET) key for more than 5 seconds. If enabled, the instrument will request an access PASSWORD, either **PA1** for "User" parameters or **PA2** for "Installer" parameters (see "PASSWORD" section).

"**User**" parameters: When accessed the display will show the first parameter (e.g. "**diF**"). Press (∧) and (∨) to scroll through all of the parameters in the current level. Select the desired parameter by pressing (SET) Press (∧) and (∨) to change it and (SET) to save the changes.

"**Installer**" parameters: When accessed the display will show the first folder (e.g. "**CP**").
(For the list of "Installer" parameters, see the User Manual which can be downloaded from the Eliwell website).

NOTE: It is strongly recommended that you switch the device off and on again each time the parameter configuration is changed, in order to prevent malfunctioning of the configuration and/or ongoing timings.

KEYBOARD SHARED ON LINK²

From each device of a Link² network it is possible, using the local keyboard, to navigate in any one of the other devices connected in the Link².

This menu is activated, from the default menu, by simultaneously holding down the ⊛ and ⓪ keys for 5 seconds. When remote display is active, the **°C** and **°F** icons blink.

Depending on the protocol used, you will be asked to type in the following values:

- Televis Protocol: **FAA** and **dEA**
- Modbus Protocol: **Adr**

To return to the default menu:

- Hold down the ⊛ and ⓪ keys for 5 seconds;
- By time-out, 60 seconds after a key was last pressed.

During "remote control of the display", the local keyboard (of the device of which the display has been remote controlled) is blocked. It is released 3 seconds after the release of the viewing of the display.

If the connection is lost during "remote control" viewing, the display will show:
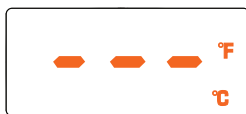
PASSWORDS

Password **PA1**: allows access to the "User" parameters. By default the password is disabled (**PS1=0**).
Password **PA2**: allows access to "Installer" parameters. By default the password is enabled (**PS2=15**).
                (For more details, see the User Manual which can be downloaded from the Eliwell website).

The visibility of "PA2" is:

1) **PA1** and **PA2≠0**: Press and hold ⒮ⒺⓉ for longer than 5 seconds to display PA1 and PA2. You can then decide whether to access the "User" parameters (PA1) or the "Installer" parameters (PA2).
2) **Otherwise**:   Password **PA2** is at the end of the level1 parameters. If enabled, it will be required in order to access "Installer" parameters.

Press ⒮ⒺⓉ for password entering, use ⊛ / ⊜ for value changing and ⒮ⒺⓉ for confirmation.

NOTE: If the entered value is incorrect, the label PA1/PA2 will be displayed once again and the procedure must be repeated.

FIRMWARE BOOT LOADER

The instrument is equipped with a Boot Loader, so it is possible to update the Firmware directly on the field.
Updating may be carried out using UNICARD or MULTI FUNCTION KEY (MFK).

Updating procedure:

- Connect the UNICARD/MFK equipped with the application;
- Power the instrument if it is off, otherwise switch it off and on again
  NOTE: the UNICARD/MFK can be connected even with the instrument powered.
- Wait until the led of the UNICARD/MFK is blinking (operation in progress);
- The operation will be concluded when the Led of the UNICARD/MFK is:
  - **ON**:   operation concluded correctly;
  - **OFF**:   operation not performed (application not compatible ...)
  ATTENTION: the led display is guaranteed only for UNICARDS produced from week 18-12 onward.

In order to download the Firmware application on the UNICARD (in CLONE mode as used for parameters maps) you must use the Device Manager (version 05.00.06 or later), which you can download from the Eliwell site after having registered at level 2.

NOTE: with this version of the Device Manager the UNICARD can be connected DIRECTLY without using the DMI.

CLOCK (RTC)

The clock can be used to set defrost times (6 time bands for weekdays and 6 time bands for weekends/public holidays), periodic defrost (every **n** days) and daily events (1 event for weekdays and 1 event for weekends/public holidays).

Description	Range	UM
Current time: minutes	0...59	min
Current time: hours	0...23	hours
Current time: day (**0** = Sunday; **1** = Monday; ... ; **6** = Saturday)	0...6	days

Time band defrosts and periodic defrost operate in a mutually exclusively way (they do not operate at the same time). If defrost by RTC has been enabled and the clock has failed, the defrost will run according to the mode set in **dit** (provided ≠ 0).

UNICARD / MULTI FUNCTION KEY

The Unicard/Multi Function Key must be connected to the serial port (TTL); it allows the rapid programming of instrument parameters. Access the "Installer" parameters by entering PA2, scroll through the folders using (⌃) and (⌄) until folder FPr is displayed. Select it using (SET), scroll through the parameters using (⌃) and (⌄) and select the function using (SET) (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/Multi function key (recommended when using for the first time). **IMPORTANT!**: the Fr parameter deletes all data present. This operation cannot be reversed.
- **Download**: Connect the Unicard/Multi Function Key with the instrument switched off. At power-on, data will automatically start downloading from the Unicard/Multi Function Key to the controller. At the end of the lamp test, the display will show "**dLy**" if the operation was successful and "**dLn**" if it failed.

NOTE: After the download, the instrument will use the newly uploaded map settings.
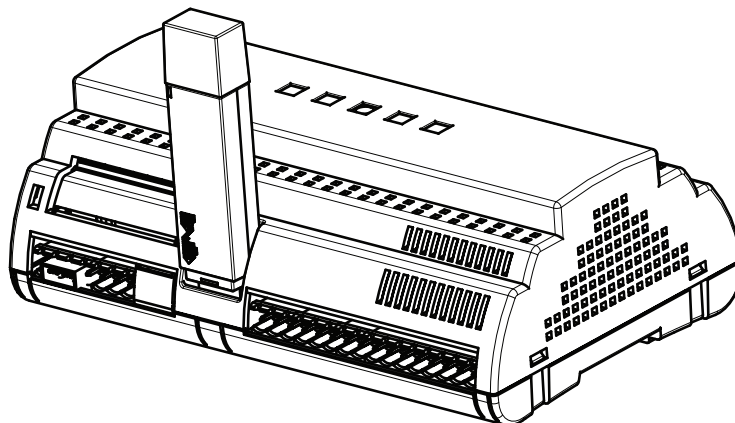
DEVICE MANAGER

RTX600 and RTN600 can interface with "Device Manager" software through the DMI interface.
This connection allows the value/visibility of fixed parameters and parameters present in vectors to be controlled via computer. The connection takes place directly on the instrument in the case of Unicard.

'USER' PARAMETERS TABLE

NOTE: for the full list of parameters, refer to the user manual available on the Eliwell website

PAR.	DESCRIPTION	M.U.	RANGE	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP8
SP1	Temperature control SEtpoint **The SEtpoint is only visible in the "machine status" menu.**	°C/°F	-58.0...302	3.0	-22.0	-22.0	3.0	-22.0	-22.0	-22.0	-22.0
SP2	Temperature control SEtpoint second thermostat (only if **rE≠0**). **The SEtpoint is only visible in the "machine status" menu.**	°C/°F	-58.0...302					-22.0			
COMPRESSOR (CP)											
rE	Sets the type of control to be performed: **0**: single thermostat; **1**: double thermostat in series; **2**: double thermostat in parallel; **3**: not used; **4**: two independent regulators.	num	0 ... 4					2			
rP1	Determines which is the control probe 1. **diS** (0) = disabled; **Pb1** (1) = will use probe Pb1 **Pb2** (2) = will use probe Pb2 **Pb3** (3) = will use probe Pb3 **Pb4** (4) = will use probe Pb4 **Pb5** (5) = will use probe Pb5 **Pbi** (6) = will use virtual probe **LP** (7) = will use the remote probe	num	dis/Pb1 Pb2/Pb3 Pb4/Pb5 Pbi/LP	Pbi	Pb1	Pb1	Pb1	Pb1	Pb1	Pb1	Pb1
rP2	Determines which is the control probe of thermostat 2 (only if **rE≠0**). **diS** (0) = disabled; **Pb1** (1) = will use probe Pb1 **Pb2** (2) = will use probe Pb2 **Pb3** (3) = will use probe Pb3 **Pb4** (4) = will use probe Pb4 **Pb5** (5) = will use probe Pb5	num	dis/Pb1 Pb2/Pb3 Pb4/Pb5					Pb2			
dF1	Activation differential (absolute or relative). **NOTA: dF1 ≠ 0.**	°C/°F	-58.0...302	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
dF2	Activation differential of the second thermostat (absolute or relative) (only if **rE≠0**). **NOTA: dF2 ≠ 0.**	°C/°F	-58.0...302					4.0			
HS1	Maximum value assignable to setpoint SP1. **NOTE: The two setpoints** **are interdependent: HS1 cannot be less than LS1 and vice versa.**	°C/°F	LS1...302	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0
LS1	Minimum value assignable to setpoint SP1. **NOTE: The two setpoints** **are interdependent: LS1 cannot be greater than HS1 and vice versa.**	°C/°F	-58.0...HS1	-10.0	-35.0	-35.0	-10.0	-35.0	-35.0	-35.0	-35.0
HS2	Maximum value assignable to setpoint SP2 (only if **rE≠0**). **NOTE: The two setpoints** **are interdependent: HS2 cannot be less than LS2 and vice versa.**	°C/°F	LS2...302					0.0			
LS2	Minimum value assignable to setpoint SP2 (only if **rE≠0**). **NOTE: The two setpoints** **are interdependent: LS2 cannot be greater than HS2 and vice versa.**	°C/°F	-58.0...HS2					-35.0			
Cit	Compressor minimum running time before switching off. If **Cit = 0** it is not active.	min	0 ... 250	5	5	5	5	5	5	5	5
CAt	Compressor maximum running time before switching off. If **CAt = 0** it is not active.	min	0 ... 250	0	0	0	0	0	0	0	0
Ont	Controller switch-on time in the event of faulty probe. - if **Ont** = 1 and **OFt** = 0, the compressor stays on permanently (ON). - if **Ont** > 0 and **OFt** > 0, it operates in Duty Cycle mode.	min	0 ... 250	3	3	3	3	3	3	3	3
OFt	Controller switch-off time in the event of a faulty probe. - if **OFt** = 1 and **Ont** = 0, the compressor will always stay off (OFF). - if **Ont** > 0 and **OFt** > 0, it operates in Duty Cycle mode.	min	0 ... 250	3	3	3	3	3	3	3	3
dOn	Delay time between power-ons; the delay time indicated must elapse between two consecutive compressor power-ons.	min	0 ... 250	0	0	0	0	0	0	0	0
dOF	Delay after switching off; the delay time indicated must elapse between deactivation of the compressor relay and the next switch-on.	min	0 ... 250	2	2	2	2	2	2	2	2
dbi	Delay time between power-ons; the delay time indicated must elapse between two consecutive compressor power-ons.	min	0 ... 250	0	0	0	0	0	0	0	0
OdO	Delay in activating outputs after the instrument is switched on or after a power failure. **0 = not active**	min	0 ... 250	0	0	0	0	0	0	0	0
DEFROST (dEF)											
dP1	Selects which probe will be used by defrost 1: **diS** (0) = disabled **Pb1** (1) = will use probe Pb1 **Pb2** (2) = will use probe Pb2 **Pb3** (3) = will use probe Pb3 **Pb4** (4) = will use probe Pb4 **Pb5** (5) = will use probe Pb5 **Pbi** (6) = will use virtual probe **LP** (7) = will use the remote probe	num	diS Pb1 ... Pb5, Pbi, LP	Pb3	Pb3	Pb3	Pb3	Pb3	Pb3	Pb3	Pb3
dty	defrost type. Type of defrost. **0** = electrical defrost (using heaters) or air defrost. **1** = inverse cycle defrost. **2** = hot gas defrost for plug-in applications (with integrated compressor). **3** = hot gas defrost for applications with remote control (e.g. ducted counters). **4** = electrical defrost (using heaters) or air defrost with energy saving algorithms.	num	0 ... 4	4	4	4	4	4	0	2	4
dit	Interval between the start of two consecutive defrost cycles. **0** = function disabled (**defrost NEVER run**).	hours	0 ... 250	0	0	0	0	0	0	0	0

PAR.	DESCRIPTION	M.U.	RANGE	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP8
	NOTE: for the full list of parameters, refer to the user manual available on the Eliwell website										
dCt	Selects the count mode for the defrost interval: **0** = defrost disabled **1** = compressor running hours (DIGIFROST® method); defrost active ONLY when the compressor is on. **N.B.**: compressor running time is counted separately from the evaporator probe (count active even if the evaporator probe is absent or faulty). **2** = appliance running hours; the defrost count is always active when the machine is on and starts at each power-on. **3** = compressor stop. Every time the compressor stops, a defrost cycle is run depending on parameter dtY. **4** = RTC **5** = temperature	num	0 ... 5	4	4	4	4	4	4	4	4
dE1	Evaporator 1 defrost time-out; determines the maximum duration of defrost.	min	1 ... 250	30	30	30	30	30	30	30	30
dS1	Defrost 1 end temperature (determined by evaporator probe 1).	°C/°F	-58.0...302	7.0	7.0	7.0	7.0	7.0	12.0	12.0	7.0
dSS	Start defrost temperature threshold (only if dCt = 5 - temperature).	°C/°F	-58.0...302	-5.0	-30.0	-30.0	-5.0	-30.0	-30.0	-30.0	-30.0
dPO	Determines whether the instrument must enter defrost mode at power-on (if the temperature measured by the evaporator allows this operation). **no** (0) = no, does not defrost at switch on **yES** (1) = yes, defrost at switch on.	flag	no/yES	no	no	no	no	no	no	no	no
tcd	Minimum time that must elapse with the compressor ON or OFF before defrost is activated.	min	-60 ... 60							3	
ndE	Defrost duration in minutes (only if set "for hot gas").	min	0 ... 250							15	
PdC	Hot gas extraction time at defrost end.	min	0 ... 250							0	
tPd	Minimum pump down time that must elapse before defrost starts.	min	0 ... 255							0	
dPH	Periodic defrost start time. **0 ... 23** = start hour; **24** = disabled.	hours	0 ... 24	24	24	24	24	24	24	24	24
dPn	Periodic defrost start minutes.	min	0 ... 59	0	0	0	0	0	0	0	0
dPd	Interval between one defrost and next (periodic function).	days	1 ... 7	1	1	1	1	1	1	1	1
Fd1	Weekend/public holiday 1. **0 ... 6** = start day; **7** = disabled.	days	0 ... 7	0	0	0	0	0	0	0	0
Fd2	Weekend/public holiday 2. **0 ... 6** = start day; **7** = disabled.	days	0 ... 7	7	7	7	7	7	7	7	7
d1H	Start time weekday defrost 1. **0 ... 23** = start hour; **24** = disabled.	hours	0 ... 24	7	0	0	7	0	7	0	0
d1n	Start time minutes weekday defrost 1.	min	0 ... 59	0	0	0	0	0	0	0	0
d2H	Start time weekday defrost 2. **d1H ... 23** = start hour; **24** = disabled.	hours	0 ... 24	21	6	6	21	6	21	6	6
d2n	Start time minutes weekday defrost 2.	min	0 ... 59	0	0	0	0	0	0	0	0
d3H	Start time weekday defrost 3. **d2H ... 23** = start hour; **24** = disabled.	hours	0 ... 24	24	12	12	24	12	24	12	12
d3n	Start time minutes weekday defrost 3.	min	0 ... 59	0	0	0	0	0	0	0	0
d4H	Start time weekday defrost 4. **d3H ... 23** = start hour; **24** = disabled.	hours	0 ... 24	24	18	18	24	18	24	18	18
d4n	Start time minutes weekday defrost 4.	min	0 ... 59	0	0	0	0	0	0	0	0
d5H	Start time weekday defrost 5. **d4H ... 23** = start hour; **24** = disabled.	hours	0 ... 24	24	24	24	24	24	24	24	24
d5n	Start time minutes weekday defrost 5.	min	0 ... 59	0	0	0	0	0	0	0	0
d6H	Start time weekday defrost 6. **d5H ... 23** = start hour; **24** = disabled.	hours	0 ... 24	24	24	24	24	24	24	24	24
d6n	Start time minutes weekday defrost 6.	min	0 ... 59	0	0	0	0	0	0	0	0
F1H	Start time weekend/public holiday defrost 1. **0 ... 23** = start hour; **24** = disabled.	hours	0 ... 24	12	0	0	12	0	12	0	0
F1n	Start time minutes weekend/public holiday defrost 1.	min	0 ... 59	0	0	0	0	0	0	0	0
F2H	Start time weekend/public holiday defrost 2. **F1H ... 23** = start hour; **24** = disabled.	hours	0 ... 24	23	6	6	23	6	23	6	6
F2n	Start time minutes weekend/public holiday defrost 2.	min	0 ... 59	0	0	0	0	0	0	0	0
F3H	Start time weekend/public holiday defrost 3. **F2H ... 23** = start hour; **24** = disabled.	hours	0 ... 24	24	12	12	24	12	24	12	12
F3n	Start time minutes weekend/public holiday defrost 3.	min	0 ... 59	0	0	0	0	0	0	0	0
F4H	Start time weekend/public holiday defrost 4. **F3H ... 23** = start hour; **24** = disabled.	hours	0 ... 24	24	18	18	24	18	24	18	18
F4n	Start time minutes weekend/public holiday defrost 4.	min	0 ... 59	0	0	0	0	0	0	0	0
F5H	Start time weekend/public holiday defrost 5. **F4H ... 23** = start hour; **24** = disabled.	hours	0 ... 24	24	24	24	24	24	24	24	24
F5n	Start time minutes weekend/public holiday defrost 5.	min	0 ... 59	0	0	0	0	0	0	0	0
F6H	Start time weekend/public holiday defrost 6. **F5H ... 23** = start hour; **24** = disabled.	hours	0 ... 24	24	24	24	24	24	24	24	24
F6n	Start time minutes weekend/public holiday defrost 6.	min	0 ... 59	0	0	0	0	0	0	0	0
	FAN (FAn)										
FP1	Selects which probe will be used by the evaporator fans in normal operation: **diS** (0) = disabled **Pb1** (1) = will use probe Pb1 **Pb2** (2) = will use probe Pb2 **Pb3** (3) = will use probe Pb3 **Pb4** (4) = will use probe Pb4 **Pb5** (5) = will use probe Pb5 **Pbi** (6) = will use virtual probe **LP** (7) = will use the remote probe	num	diS Pb1 ... Pb5, Pbi, LP	diS	diS	Pb3	Pb3	Pb3	Pb3	Pb3	diS
FSt	Fans block temperature; if the value read is greater than FSt, the fans are stopped. The value is positive or negative (only if **FP1 ≠ diS**).	°C/°F	-58.0...302	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FAd	Fan activation differential (only if **FP1 ≠ diS**).	°C/°F	0.1 ... 25.0	0.1	0.1	4.0	4.0	4.0	4.0	4.0	0.1
Fdt	Fans activation delay after a defrost cycle.	min	0 ... 250							1	

PAR.	DESCRIPTION	M.U.	RANGE	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP8
	NOTE: for the full list of parameters, refer to the user manual available on the Eliwell website										
dt	drainage time. Coil drainage time.	min	0 ... 250	0	5	5	5	5	5	3	0
dFd	Evaporator fans operating mode during defrost. **OFF** (0) = Fans Off; **On** (1) = Fans On.	flag	OFF/On			On	On	On	On	OFF	
FCO	Evaporator fans operating mode. The state of the fans will be: (see table below)	num	0 ... 4			1	1	1	0	1	
FdC	Evaporator fans switch-off delay after compressor disabled.	min	0 ... 250						5		
FOn	Fan ON time in duty cycle day. Fans used in duty cycle mode; applies when Dutycycle mode is enabled (see **FCO**) and FP1 is present.	min	0 ... 250		1	1	1	1	1	1	1
FOF	Fan OFF time in duty cycle day. Fans used in duty cycle mode; applies when Dutycycle mode is enabled (see **FCO**) and FP1 is present.	min	0 ... 250		0	0	0	0	0	0	0
Fnn	Fan ON time in duty cycle night. Fans used in duty cycle mode; applies when Dutycycle mode is enabled (see **FCO**) and FP1 is present.	min	0 ... 250		2	1	1	1	1	1	2
FnF	Fan OFF time in duty cycle night. Fans used in duty cycle mode; applies when Dutycycle mode is enabled (see **FCO**) and FP1 is present.	min	0 ... 250		2	0	0	0	0	0	2
	ALARM (AL)										
rA1	Selects probe 1 which will be used for temperature alarms: **diS** (0) = disabled; **Pb1** (1) = will use probe Pb1; **Pb2** (2) = will use probe Pb2; **Pb3** (3) = will use probe Pb3; **Pb4** (4) = will use probe Pb4; **Pb5** (5) = will use probe Pb5; **Pbi** (6) = will use virtual probe	num	diS Pb1 ... Pb5, Pbi	Pbi	Pb1	Pb1	Pb1	Pb1	Pb1	Pb1	Pb1
rA2	Selects probe 2 which will be used for temperature alarms. Same as **rA1**.	num	diS Pb1 ... Pb5, Pbi					Pb2			
Att	Parameters **HAL** and **LAL** mode intended as the absolute temperature value or differential in relation to the setpoint. **AbS** (0)= absolute value; **reL** (1)= relative value. **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).**	flag	AbS/rEL	rEL	rEL	rEL	rEL	rEL	rEL	rEL	rEL
AFd	Alarms activation differential.	°C/°F	0.1 ... 25.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
HA1	Probe 1 maximum 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"**.	°C/°F	LA1...302	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
LA1	Probe 1 minimum alarm. Temperature value (intended as distance from setpoint or as an absolute value based on Att) which, when exceeded downwards, triggers the activation of the alarm signal. **See "Max/Min temperature alarms"**.	°C/°F	-58.0...HA1	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
HA2	Probe 2 maximum 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 (only if **rA2 ≠ diS**). **See "Max/Min temperature alarms"**.	°C/°F	LA2...302					5.0			
LA2	Probe 2 minimum alarm. Temperature value (intended as distance from setpoint or as an absolute value based on Att) which, when exceeded downwards, triggers the activation of the alarm signal (only if **rA2 ≠ diS**). **See "Max/Min temperature alarms"**.	°C/°F	-58.0...HA2					-5.0			
PAO	Alarm override time after device is switched on following a power failure. **This parameter refers to high/low temperature alarms only.**	hours	0 ... 10	3	3	3	3	3	3	3	3
dAO	Temperature alarm exclusion time after defrost.	min	0 ... 250	30	30	30	30	30	30	30	30
OAO	Alarm signal delay (low and high temperature) after the deactivation of the digital input (port closed).	hours	0 ... 10						10		
tdO	Delay in door open alarm activation.	min	0 ... 250						10		
tA1	Time delay for temperature alarm indication. **This parameter refers to high/low temperature alarms LA1 and HA1 only.**	min	0 ... 250	0	0	0	0	0	0	0	0
tA2	Time delay for temperature alarm indication (only if **rA2 ≠ diS**). **This parameter refers to high/low temperature alarms LA2 and HA2 only.**	min	0 ... 250					0			

FCO detail — Evaporator fans operating mode. The state of the fans will be:

FP1	FCO	DAY COMPRESSOR ON	DAY COMPRESSOR OFF	NIGHT COMPRESSOR ON	NIGHT COMPRESSOR OFF
FP1 present	0	Thermostat controlled	OFF	Thermostat controlled	OFF
	1	Thermostat controlled	Thermostat controlled	Thermostat controlled	Thermostat controlled
	2	Thermostat controlled	Thermostat controlled	Thermostat controlled	Thermostat controlled
	3	Thermostat controlled	Duty cycle Day	Thermostat controlled	Duty cycle Night
	4	Thermostat controlled	Duty cycle Day	Thermostat controlled	Duty cycle Night
FP1 Absent	0	ON	OFF	ON	OFF
	1	ON	ON	ON	ON
	2	Duty cycle Day	Duty cycle Day	Duty cycle Night	Duty cycle Night
	3	ON	Duty cycle Day	ON	Duty cycle Night
	4	ON	Duty cycle Day	ON	Duty cycle Night

Duty cycle Day: controlled by means of parameters "**FOn**" and "**FOF**".
Duty cycle Night: controlled by means of parameters "**Fnn**" and "**FnF**".

PAR.	DESCRIPTION	M.U.	RANGE	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP8
NOTE: for the full list of parameters, refer to the user manual available on the Eliwell website										
dAt	Alarm signaling end of defrost due to timeout. **no** (0) = does not activate alarm; **yES** (1) = activates alarm.	flag	no/yES	no	no	no	no	no	no	no	no
EAL	Regulators blocked by external alarm. **0** = does not block any resource; **1** = blocks the compressor and defrost. **2** = blocks the compressor, defrost and fans.	num	0/1/2						0		
tP	All keys acknowledge an alarm. **no** (0) = no; **yES** (1) = yes.	flag	no/yES						no		
	LIGHTS & DIGITAL INPUTS (Lit)										
dSd	Enables light relay from door switch. **no** (0) = light does not turn on when door opened; **yES** (1) = light turns on when door opened (if it was off).	flag	no/yES						yES		
dLt	Light relay (room light) deactivation (switch-off) delay. The light relay remains on for dLt minutes when the door is closed if parameter **dSd** is set to switch on the light.	min	0 ... 250						0		
OFL	Light key always disables the light relay. Enables switching off with chiller light switch even if the delay after closing the door set by **dLt** is enabled. **no** (0) = no; **yES** (1) = yes.	flag	no/yES						no		
dOd	Enable utility switch-off on activation of door switch. **0** = disabled **1** = fans disabled. **2** = disables the compressor. **3** = disables fans and compressor.	num	0 ... 3						1		
dOA	Forced action of digital input (only if **PEA ≠ 0**): **0** = compressor activated **1** = fans activated **2** = compressor and fans activated **3** = compressor disabled **4** = fans disabled **5** = compressor and fans disabled	num	0 ... 5						2		
PEA	Selection of a digital input with resource blocking/unblocking function. **0** = function disabled **1** = associated with door switch **2** = associated with external alarm **3** = associated with external alarm and door switch	num	0 ... 3						1		
dCO	Delay activating/deactivating compressor after request.	min	0 ... 250						5		
dFO	Delay activating/deactivating fans after request.	min	0 ... 250						5		
ASb	Activation by key of AUX or LIGHT input when the controller is in standby. **no** (0) = disables relay until return from stand-by **yES** (1) = the state of relay doesn't change and it can be activated/disabled from hotkey	flag	no/yES						no		
	LINK² (Lin)										
L00	Selects which probe to share: **diS** (0) = disabled **Pb1** (1) = will share probe Pb1 **Pb2** (2) = will share probe Pb2 **Pb3** (3) = will share probe Pb3 **Pb4** (4) = will share probe Pb4 **Pb5** (5) = will share probe Pb5 **Pb6** (6) = will share probe Pb6	num	diS Pb1 ... Pb5, Pbi	diS	diS	diS	diS	diS		diS	diS
L01	Shares the displayed value with the LAN. **0** = prevents the value displayed on the instrument being sent to the LINK² network **1** = enables sending of the value displayed on the instrument to the LINK² network **2** = displays the value of the instrument that has set L01 = 1	num	0/1/2	0	0	0	0	0		0	0
L02	Sends setpoint value to the LINK² network after it has been modified. **no** (0)=no; **yES** (1)=yes	flag	no/yES	no	no	no	no	no		no	no
L03	Enables sending the defrost request to the LINK² network. **no** (0) = no; **yES** (1) = yes.	flag	no/yES	no	no	no	no	no		no	no
L04	Defrost end mode. **ind** (0) = independent; **dEP** (1) = dependent.	flag	ind/dEP	ind	ind	ind	ind	ind		ind	ind
L05	Enables synchronization of the Standby command. **no** (0) = no; **yES** (1) = yes.	flag	no/yES	no	no	no	no	no		no	no
L06	Enables synchronization of the lights command. **no** (0) = no; **yES** (1) = yes.	flag	no/yES	no	no	no	no	no		no	no
L07	Enables synchronization of the Energy Saving command. **no** (0) = no; **yES** (1) = yes.	flag	no/yES	no	no	no	no	no		no	no
L08	Enables synchronization of the AUX command. **no** (0) = no; **yES** (1) = yes.	flag	no/yES	no	no	no	no	no		no	no
L10	Sets the time delay to be set after the end of dependent defrosts.	min	0 ... 250	30	30	30	30	30		30	30
	PRESSURE SWITCH (PrE)										
PEn	Number of errors allowed per pressure switch input. 0 = disabled	num	0 ... 15	0	0	0	0	0	0	0	0
PEi	Pressure switch error count interval.	min	1 ... 250	1	1	1	1	1	1	1	1
	ENERGY SAVING (EnS)										
ESt	Type of event activated by RTC: **0** = disabled; **1** = Energy Saving; **2** = Energy Saving + Light off; **3** = Energy Saving + Light off + AUX output on; **4** = instrument off.	num	0 ... 4	3	2	2	2	2		2	2
ESF	Night mode (energy saving) activation for fans. **no** (0) = disabled; **yES** (1) = enabled if energy saving mode is on (**ESt ≠ 0** and **ESt ≠ 4**).	flag	no/yES		yES	no	no	no	no	no	yES
Cdt	Door close time.	min*10	0 ... 255		0			0			30
ESo	Cumulative door opening time to disable Energy Saving mode.	num	0 ... 10		0			0			5
OS1	Offset setpoint 1 (SP1).	°C/°F	-50.0...50.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
OS2	Offset setpoint 2 (SP2) (only if **rE≠0**).	°C/°F	-50.0...50.0					3.0			
Od1	Energy Saving Offset 1 glass door display cabinets.	°C/°F	-50.0...50.0		1.0			0.0			1.0
dn1	Activation differential 1 in energy saving mode.	°C/°F	-58.0...302	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
dn2	Activation differential 2 in energy saving mode (only if **rE≠0**).	°C/°F	-58.0...302					4.0			
EdH	Start time hours weekday Energy Saving. **0 ... 23** = start hour; **24** = disabled.	hours	0 ... 24	21	21	21	21	21		21	21

PAR.	DESCRIPTION	M.U.	RANGE	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP8
Edn	Start time minutes weekday Energy Saving.	min	0 ... 59	0	0	0	0	0		0	0
Edd	Duration of weekday Energy Saving.	hours	1 ... 72	10	10	10	10	10		10	10
EFH	Start time hours weekend/public holiday Energy Saving. **0 ... 23** = start hour; **24** = disabled	hours	0 ... 24	0	0	0	0	0		0	0
EFn	Start time minutes weekend/public holiday Energy Saving.	min	0 ... 59	0	0	0	0	0		0	0
EFd	Duration of weekend/public holiday Energy Saving.	hours	1 ... 72	24	24	24	24	24		24	24
	FRAME HEATER (FrH)										
FH	Selects which probe will be used by the anti-sweat heaters (Frame Heater): **diS** (0) = disabled **dc** (1) = operates in Duty Cycle mode **Pb1** (2) = will use probe Pb1 **Pb2** (3) = will use probe Pb2 **Pb3** (4) = will use probe Pb3 **Pb4** (5) = will use probe Pb4 **Pb5** (6) = will use probe Pb5 **Pbi** (7) = will use virtual probe	num	diS, dc, Pb1 ... Pb5, Pbi	dc	dc	dc	dc	dc		dc	Pb4
FHt	Anti-sweat heater running time. **NOTE** = only used when OC output is used with SSR relay.	sec*10	1 ... 2500	30	30	30	30	30		30	30
FH0	Configuration of relative setpoint for frame heater (only if **FH ≠ diS** and **FH ≠ dc**).	°C/°F	-58.0...302	0.0	0.0	0.0	0.0	0.0		0.0	0.0
FH1	Configuration of relative offset for frame heater (only if **FH ≠ diS** and **FH ≠ dc**).	°C/°F	0.0 ... 25.0	0.0	0.0	0.0	0.0	0.0		0.0	10.0
FH2	Configuration of relative band for frame heater (only if **FH ≠ diS** and **FH ≠ dc**).	°C/°F	0.0 ... 25.0	0.0	0.0	0.0	0.0	0.0		0.0	10.0
FH3	Configuration of minimum percentage for frame heater (only if **FH ≠ diS** and **FH ≠ dc**).	%	0 ... 100	0	0	0	0	0		0	20
FH4	Configuration of maximum percentage for day Duty Cycle.	%	0 ... 100	75	75	75	75	75		75	100
FH5	Configuration of maximum percentage for night Duty Cycle.	%	0 ... 100	50	50	50	50	50		50	80
FH6	Configuration of percentage during defrosting.	%	0 ... 100	100	100	100	100	100		100	100
	COMMUNICATION (Add)										
PtS	Select protocol: **t** (0) = Televis; **d** (1) = Modbus.	flag	t/d	t **Parameter not present in vectors)**							
dEA	Device address: indicates the device address to the management protocol.	num	0 ... 14	0 **(Parameter not present in vectors)**							
FAA	Family address: indicates the device family to the management protocol.	num	0 ... 14	0 **(Parameter not present in vectors)**							
Adr	Modbus protocol controller address (only if **PtS = d**).	num	1 ... 250	1 **(Parameter not present in vectors)**							
bAU	Baudrate selection **96** (0) = 9600; **192** (1) = 19200; **384** (2) = 38400.	num	96/192/384	96 **(Parameter not present in vectors)**							
Pty	Sets Modbus parity bit: **n** (0) = none; **E** (1) = equal; **o** (2) = unequal (only if **PtS = d**).	num	n/E/o	n **(Parameter not present in vectors)**							
	DISPLAY (diS)										
LOC	LOCk. Setpoint edit lock. You can still access the parameter programming menu and edit the parameters, including this parameter, in order to allow keypad unlocking. **no** (0) = no; **yES** (1) = yes.	flag	no/yES	no	no	no	no	no	no	no	no
ndt	Display with decimal point. **no** (0) = no; **yES** (1) = yes (displayed with decimal point).	flag	no/yES	yES	yES	yES	yES	yES	yES	yES	yES
CA1	Probe **Pb1** calibration. Positive or negative temperature value added to the value read by **Pb1**. This sum is used both for the temperature displayed and for regulation.	°C/°F	-30.0...30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CA2	Probe **Pb2** calibration. Positive or negative temperature value added to the value read by **Pb2**. This sum is used both for the temperature displayed and for regulation.	°C/°F	-30.0...30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CA3	Probe **Pb3** calibration. Positive or negative temperature value added to the value read by **Pb3**. This sum is used both for the temperature displayed and for regulation.	°C/°F	-30.0...30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CA4	Probe **Pb4** calibration. Positive or negative temperature value added to the value read by **Pb4**. This sum is used both for the temperature displayed and for regulation.	°C/°F	-30.0...30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CA5	Probe **Pb5** calibration. Positive or negative temperature value added to the value read by **Pb5**. This sum is used both for the temperature displayed and for regulation.	°C/°F	-30.0...30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LdL	Minimum value that can be displayed by the device.	°C/°F	-58.0 ... HdL	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0
HdL	Maximum value that can be displayed by the device.	°C/°F	LdL ... 302	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
ddL	Display mode during defrost. **0** = displays the temperature read by probe. **1** = blocks the reading at the temperature value read by the probe when defrosting starts and until the next time the SEt is reached. **2** = displays label **dEF** during defrost and until the SEt is reached (or until **Ldd** elapses).	num	0/1/2	0	0	0	0	0	0	0	0
Ldd	Timeout value for display unlock - label **dEF**.	min	0 ... 250	0	0	0	0	0	0	0	0
ddd	Selects type of value to display. **SP1** (0) = Setpoint SP1 **Pb1** (1) = will use probe Pb1 **Pb2** (2) = will use probe Pb2 **Pb3** (3) = will use probe Pb3 **Pb4** (4) = will use probe Pb4 **Pb5** (5) = will use probe Pb5 **Pbi** (6) = will use virtual probe **LP** (7) = will use LINK[2] network probe	num	SP1, Pb1 ... Pb5, Pbi, LP	Pbi	Pb1	Pb1	Pb1	Pb1	Pb1	Pb1	Pb1

PAR.	DESCRIPTION	M.U.	RANGE	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP8
	NOTE: for the full list of parameters, refer to the user manual available on the Eliwell website										
	HACCP (HCP)										
rPH	Selects which probe will be used by the HACCP alarms. **diS** (0) = disabled **Pb1** (1) = will use probe Pb1 **Pb2** (2) = will use probe Pb2 **Pb3** (3) = will use probe Pb3 **Pb4** (4) = will use probe Pb4 **Pb5** (5) = will use probe Pb5	num	diS Pb1 ... Pb5	diS	diS	diS	diS	diS	diS	diS	diS
	CONFIGURATION (CnF) ➡ If one or more parameters present in this forder will be change, the controller **MUST** be power-off and than power-on.										
H00	Select type of probe used (Pb1 ... Pb5). **ntc** (0) = NTC; **Ptc** (1) = PTC; **Pt1** (2) = PT1000	num	ntc/Ptc/Pt1	ntc	ntc	ntc	ntc	ntc	ntc	ntc	ntc
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.	num	0/1/2	2	2	2	2	2	2	2	2
H15	Configuration of digital input 5/polarity (PB5). **0** = disabled; **±1** = defrost start; **±2** = defrost end; **±3** = Light; **±4** = energy saving; **±5** = AUX; **±6** = external alarm; **±7** = Standby; **±8** = door switch; **±9** = preheat alarm; **±10** = generic pressure switch; **±11** = maximum pressure switch; **±12** = maximum pressure switch; **±13** = deep cooling; **±14** = not used; **±15** = force fans ON; **±16** = force OF1 (remote offset); **±17** = general input. **NOTE:** - The "+" sign indicates that the input is active when the contact is closed. - The "−" sign indicates that the input is active when the contact is open.	num	-17 ... 17	17	0	0	0	0	0	0	0
H16	Configuration of digital input 6/polarity (DI2). Same as **H15**.	num	-17 ... 17	0	0	0	0	0	0	0	0
H17	Configuration of digital input 7/polarity (DI3). Same as **H15**.	num	-17 ... 17	0	0	0	0	0	0	0	0
H18	Configuration of digital input 8/polarity (DI1). Same as **H15**.	num	-17 ... 17	0	8	0	0	0	8	0	8
d15	Delay to activate digital input 5 (PB5).	min	0 ... 255	0	0	0	0	0	0	0	0
d16	Delay to activate digital input 6 (DI2).	min	0 ... 255	0	0	0	0	0	0	0	0
d17	Delay to activate digital input 7 (DI3).	min	0 ... 255	0	0	0	0	0	0	0	0
d18	Delay to activate digital input 8 (DI1).	min	0 ... 255	0	0	0	0	0	0	0	0
H24	Configuration of digital output 4 (OUT 4). **0** = disabled; **1** = compressor 1; **2** = defrost 1 / hot gas valve; **3** = evaporator fans; **4** = alarm; **5** = AUX; **6** = stand-by; **7** = light; **8** = frame heater; **9** = defrost 2; **10** = compressor 2; **11** = not used; **12** = AUX regulator; **13** = hot gas on evaporator suction valve.	num	0 ... 13	5	4	4	4	4	4	4	4
H25	Configuration of digital output 5 (OUT 5). Same as **H24**.	num	0 ... 13	7	7	7	7	7	7	7	7
H26	Configuration of digital output 6 (OUT 6/SSR). Same as **H24**.	num	0 ... 13	4	0	0	0	0	0	13	0
H27	Configuration of digital output 7 (Open Collector). Same as **H24**.	num	0 ... 13	8	8	8	8	8	0	8	0
H32	DOWN key configuration. **0** = Disabled; **1** = Defrost; **2** = Reduced set; **3** = Light; **4** = Energy saving; **5** = AUX; **6** = Standby; **7** = Deep cooling; **8** = Defrost start/stop.	num	0 ... 8	■	■	■	■	■	0	■	■
H33	ESC key configuration. Same as **H32**.	num	0 ... 8	6	6	6	6	6	6	6	6
H50	Configuration of analogue output type. **010** (0) = 0-10V output; **420** (1) = 4-20mA output	flag	010/420	■	■	■	■	■	■	■	010
H51	Regulator associated with analogue output; **diS** (0) = disabled **FH** (1) = Frame Heater	flag	diS/FH	■	■	■	■	■	■	■	FH
H60	Display of selected application. **0** = disabled; **1** = Vector 1 (AP1); **2** = Vector 2 (AP2); **3** = Vector 3 (AP3); **4** = Vector 4 (AP4); **5** = Vector 5 (AP5); **6** = Vector 6 (AP6); **7** = Vector 7 (AP7); **8** = Vector 8 (AP8).	num	0 ... 8	1 **(Parameter not present in vectors)**							
H70	Select 1st probe to use as virtual probe. **diS** (0) = disabled **Pb1** (1) = will use probe Pb1 **Pb2** (2) = will use probe Pb2 **Pb3** (3) = will use probe Pb3 **Pb4** (4) = will use probe Pb4 **Pb5** (5) = will use probe Pb5	num	diS Pb1 ... Pb5	Pb1	■	■	■	■	■	■	■
H71	Select 2nd probe to use as virtual probe. Same as **H70**.	num	0 ... 5	Pb2	■	■	■	■	■	■	■
H72	% calculation used by day virtual probe	%	0 ... 100	50	■	■	■	■	■	■	■
H73	% calculation used by night virtual probe (in Energy Saving mode)	%	0 ... 100	50	■	■	■	■	■	■	■
	COPY CARD (FPr)										
UL	Upload. Transfer programming parameters from instrument to Copy Card.	/	/	/ **(Parameter not present in vectors)**							
dL	Download. Transfer programming parameters from Copy Card to instrument.	/	/	/ **(Parameter not present in vectors)**							
Fr	Formatting. Delete data on Copy Card. **IMPORTANT: if parameter "Fr" is used, the data entered will be permanently lost. This operation cannot be reversed.**	/	/	/ **(Parameter not present in vectors)**							

PAR.	DESCRIPTION		M.U.	RANGE	AP1	AP2	AP3	AP4	AP5	AP6	AP7	AP8
	FUNCTION (FnC)											

The following functions are available:

Function	Function label ACTIVE	Function label not active	Alarm signalling
Manual defrost	dEF + LED blinking	dEF	Defrost icon blinking
AUX (ON = on; OFF = off)	Aon	AoF	AUX icon ON
Reset pressure switch alarms	rAP	rAP	Alarm icon ON
Stand-by	OFF	OFF	Stand-by led ON (only KDWPlus)

N.B.:
- To modify the status of a given function, press the 'set' key
- If the instrument is switched off, the function labels will return to the default status.

DIAGNOSTICS

Alarms are always indicated by the buzzer (if present) and the alarm icon (•).
To silence 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 indicated.

'ALARMS' TABLE

Label	Fault	Cause	Effects	Remedy
E1	Probe Pb1 faulty	• Measured values are outside operating range • Probe faulty/short-circuited/open	• Label **E1** displayed • Alarm icon permanently on	• Check probe type (**H00**) • Check the probe wiring • Replace probe
E2	Probe Pb2 faulty	• Measured values are outside operating range • Probe faulty/short-circuited/open	• Label **E2** displayed • Alarm icon permanently on	• Check probe type (**H00**) • Check the probe wiring • Replace probe
E3	Probe Pb3 faulty	• Measured values are outside operating range • Probe faulty/short-circuited/open	• Label **E3** displayed • Alarm icon permanently on	• Check probe type (**H00**) • Check the probe wiring • Replace probe
E4	Probe Pb4 faulty	• Measured values are outside operating range • Probe faulty/short-circuited/open	• Label **E4** displayed • Alarm icon permanently on	• Check probe type (**H00**) • Check the probe wiring • Replace probe
E5	Probe Pb5 faulty	• Measured values are outside operating range • probe faulty/short-circuited/open	• Label **E5** displayed • Alarm icon permanently on	• Check probe type (**H00**) • Check the probe wiring • Replace probe
EL	LINK[2] probe faulty	• Measured values are outside operating range • Probe faulty/short-circuited/open	• Label **EL** displayed • Alarm icon permanently on	• Check the probe type • Check the probe wiring • Replace probe
Ei	VIRTUAL probe faulty	• Measured values are outside operating range • Probe faulty/short-circuited/open	• Label **Ei** displayed • Alarm icon permanently on	• Check the probe type • Check the probe wiring • Replace probe
AH1	HIGH temperature alarm 1	Value read by probe 1 > HA1 after time set in tA1. (see "MAX/MIN TEMP. ALARMS)	• Label **AH1** recorded in folder ALr • No effect on control	Wait until value read by probe selected by **rA1** returns below (**HA1-AFd**).
AL1	LOW temperature alarm 1	Value read by probe 1 > LA1 after time set in tA1. (see "MAX/MIN TEMPERATURE ALARMS")	• Label **AL1** recorded in folder ALr • No effect on control	Wait until value read by probe selected by **rA1** returns above (**LA1+AFd**).
AH2	HIGH temperature alarm 2	Value read by probe 2 > HA2 after time set in tA2. (see "MAX/MIN TEMPERATURE ALARMS")	• Label **AH2** recorded in folder ALr • No effect on control	Wait until value read by probe selected by **rA2** returns below (**HA2-AFd**).
AL2	LOW temperature alarm 2	Value read by probe 2 > LA2 after time set in tA2. (see "MAX/MIN TEMPERATURE ALARMS")	• Label **AL2** recorded in folder ALr • No effect on control	Wait until value read by probe selected by **rA2** returns above (**LA2+AFd**).
EA	External alarm	Digital input activated	• Label **EA** recorded in folder ALr • Alarm icon permanently on • Regulation blocked as requested by **EAL**	Check and remove external cause of alarm on D.I.
OPd	Alarm Door open	Digital input activated (for a time greater than tdO)	• Label **Opd** recorded in folder ALr • Alarm icon permanently on • Regulation blocked as requested by **dOd**	• Close the door • Alarm signal delay defined by **OAO**
Ad2	End defrost by time-out	End of defrost cycle due to timeout rather than due to defrost end temperature being read by Pb2.	• Label **Ad2** recorded in folder ALr • Alarm icon permanently on	Wait for the next defrost cycle for automatic reset.

Label	Fault	Cause	Effects	Remedy
Prr	Preheat alarm	Alarm for preheat input regulator ON	• Label **Prr** displayed. • Compressor icon blinking • Regulation locked (Compressor and Fans) **N.B.**: defrost also blocked if it's hot gas.	Preheat input regulator off
E10	Clock Alarm	• Clock (RTC) battery dead. • RTC failure.	• Label **E10** recorded in folder ALr • Functions associated with clock not available	Connect the instrument to the power supply.
nPA	General pressure switch alarm	Activation of pressure switch alarm by general pressure switch.	If the number of pressure switch activations is $n < PEn$: • Folder **nPA** recorded in folder ALr with the number of pressure switch activations • Regulation blocked	Check and remove the cause that triggered the alarm on the digital input (auto reset).
PA	General pressure switch alarm	Activation of pressure switch alarm by general pressure switch.	If the number of pressure switch activations is $n = PEn$: • Label **PA** displayed • Label **PA** recorded in folder ALr • Alarm LED on • Relay activated (if configured) • Regulation blocked	• Switch the device off and back on again. • Reset alarms from functions folder, pressing the rAP function (Manual Reset).
LPA	Minimum pressure switch alarm	Activation of pressure switch alarm by low pressure switch regulator.	If the number of pressure switch activations is $n < PEn$: • Folder **LPA** recorded in folder ALr with the number of pressure switch activations • Regulation blocked	Check and remove the cause that triggered the alarm on the digital input (auto reset).
PA	Minimum pressure switch alarm	Activation of pressure switch alarm by low pressure switch regulator.	If the number of pressure switch activations is $n = PEn$: • Label **PA** displayed • Label **PA** recorded in folder ALr • Alarm LED on • Relay activated (if configured) • Regulation blocked	• Switch the device off and back on again • Reset alarms from functions folder, pressing the rAP function (Manual Reset).
HPA	Maximum pressure switch alarm.	Activation of pressure switch alarm by high pressure switch regulator.	If the number of pressure switch activations is $n < PEn$: • Folder **HPA** recorded in folder ALr with the number of pressure switch activations • Regulation blocked	Check and remove the cause that triggered the alarm on the digital input (auto reset).
PA	Maximum pressure switch alarm.	Activation of pressure switch alarm by high pressure switch regulator.	If the number of pressure switch activations is $n = PEn$: • Label **PA** displayed • Label **PA** recorded in folder ALr • Alarm LED on • Relay activated (if configured) • Regulation blocked	• Switch the device off and back on again • Reset alarms from functions folder, pressing the rAP function (Manual Reset).

TECHNICAL SPECIFICATIONS (EN 60730-2-9)

Classification:	Electronic automatic control (not safety) device for incorporation
Mounting:	DIN rail.
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:	SMPS 100-240 V~ ±10% 50/60 Hz
Power consumption:	7.5W max
Fire resistance category:	D
Software class:	A
RTC battery life:	In absence of external power, the clock battery will last 4 days.

FURTHER INFORMATION

Input Characteristics

Measurement range:	**NTC**: -50.0°C ... +110°C; **PTC**: -55.0°C ... +150°C; **PT1000**: -60.0°C ... +150°C
	(on 3-digit display with +/- sign)
Accuracy:	±1.0° for temperatures below -30°C
	±0.5° for temperatures between -30°C and +25°C
	±1.0° for temperatures above +25°C
Resolution:	1 or 0.1°C
Buzzer:	NO
Analogue/Digital Inputs:	5 configurable NTC/PTC/PT1000/DI inputs
	3 multi-function, voltage-free digital inputs (DI)

Output Characteristics

Digital Outputs:	**OUT1**: 1 SPST relay: 2HP max 240V~
	OUT2: 1 SPST relay: 1HP max 250V~
	OUT3: 1 SPDT relay: 1HP max 250V~
	OUT4: 1 SPDT relay: 8(4)A max 250V~
	OUT5: 1 SPST relay: 8(4)A max 250V~
	OUT6: 1 SPST relay: 8(4)A max 250V~
OC (Open Collector) Output:	**OC:** 1 multifunctional output: 12V⎓ 20mA
DAC output:	**A-OUT:** 1 multifunctional output: 0...10V / 4...20mA

Mechanical Characteristics

Container:	PC+ABS resin casing, UL94 V-0
Dimensions:	10 DIN-rail
Terminals:	Disconnectable (RTX600) or screw (RTN600) for wires with cross-section of 2.5 mm^2
Connectors:	TTL for Unicard / Device Manager connection (via DMI)
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 EN13485 as follows:
	- suitable for storage
	- application: air
	- climate range: A
	- measurement class 1 in the range from -25°C to 15°C (*)
	(*with **Eliwell probes only**)

NOTE: The technical specifications stated in this document regarding measurement (range, accuracy, resolution, etc.) refer to the instrument alone 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.

ELECTRICAL CONNECTIONS

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

The instrument is equipped with screw connectors to connect power cables with maximum cross-section of 2.5 mm^2 (one wire per terminal). Make sure that the power supply is of the correct voltage for the device.

Temperature probes (NTC, PTC, PT1000) have no connection polarity and can be extended using a normal bipolar cable (note that the extension of the probes influences the instrument's EMC electromagnetic compatibility: take great care with the wiring).

Ratiometric or **pressure probes** (4...20mA), have a connection polarity.
Probe cables, power supply cables and the RS485 serial cable should be routed separately from power cables.

DISCLAIMER

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RESPONSIBILITY 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.

eliwell

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ENVIRONMENTAL SYSTEM CERTIFICATION
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