EWPlus 978 - 230V~

Electronic controllers for refrigeration units

USER INTERFACE

EW PLUS 978

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

	Reduced SET / Economy LED			**Fans LED**	
	Permanently on:	Energy Saving active		Permanently on:	fans active
	Flashing:	reduced setpoint active		Off:	in all other cases
	Quick flashing:	access to level2 parameters			
	Off:	in all other cases			
	Compressor LED			**Defrost LED**	
	Permanently on:	compressor active		Permanently on:	output active
	Flashing:	delay, protection or activation blocked		Flashing:	activated manually or from DI
	Off:	in all other cases		Off:	in all other cases
	Alarms LED		AUX	**Aux LED**	
	Permanently on:	alarm active		Permanently on:	Aux output active
	Flashing:	alarm acknowledged		Flashing:	Deep cooling Cycle active
	Off:	in all other cases		Off:	Aux output not active
°C	**°C LED**		°F	**°F LED**	
	Permanently on:	°C setting (dro = 0)		Permanently on:	°F setting (dro =1)
	Off:	in all other cases		Off:	in all other cases

KEYS

UP
Press and release
Scroll through menu options
Increase values

Hold down for at least 5 sec
User-configurable function
(see parameter H31)

DOWN
Press and release
Scroll through menu options
Decrease values

Hold down for at least 5 sec
User-configurable function
(see parameter H32)

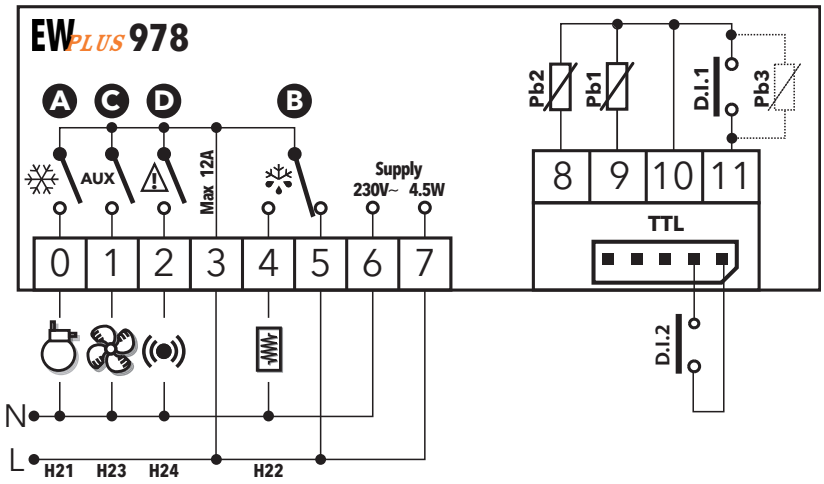
STANDBY (ESC)
Press and release
Return to the previous menu level
Confirm parameter value

Hold down for at least 5 sec
User-configurable function
(see parameter H32)

SET (ENTER)
Press and release
Display alarms (if present)
Open Machine Status menu

Hold down for at least 5 sec
Open Programming menu
Confirm commands

CONNECTIONS



TERMINALS

N-L	Supply voltage 230V~		**6-7**	Power input 230V~ (Supply)
3-0	N.O. Relay Compressor	**(A - ❄)** - Parameter H21	**8-10**	Probe Pb2
3-1	N.O. Relay AUX	**(C - AUX)** - Parameter H22	**9-10**	Probe Pb1
3-2	N.O. Relay External Alarm	**(D - ⚠)** - Parameter H23	**11-10**	D.I.1 (**H11≠0** and **H43=n**) or Probe Pb3 (**H11=0** and **H43=y**)
3-4	N.O. Relay Defrost	**(B - ❄)** - Parameter H24	**TTL**	TTL Input or Digital Input 2 (H12≠0)
3-5	N.C. Relay Defrost		**NOTE**: for relay and power supply capacities, contact the Sales Office.	

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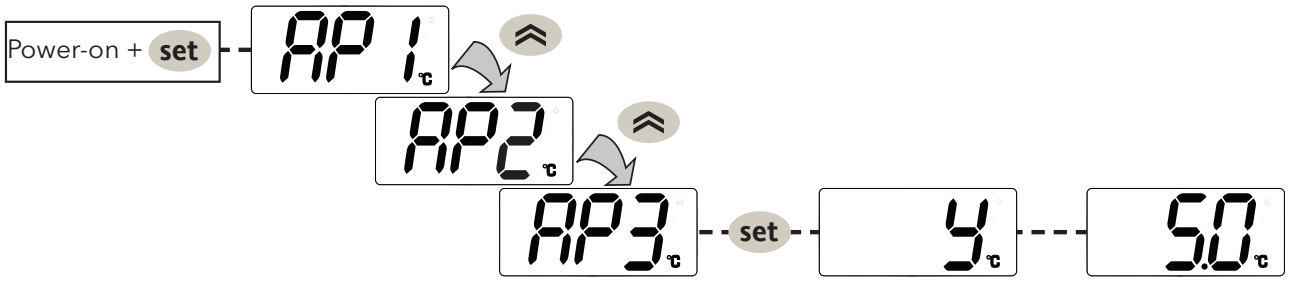
F = Functions H = Inputs and Outputs R = Relay Output	EWPlus 978		
	AP1	AP 2	AP 3
F - End of defrost due to timeout	X	X	X
T - End of defrost due to temperature	X	X	X
F - Pb1 alarm	X	X	X
F - Pb3 alarm (Evaporator 2)		X	
H - Pb1 present	X	X	X
H - Pb2 present	X	X	X
H - Pb3 / D.I.1 enabled		Pb3	
R - Compressor	X	X	X
R - Compressor 2	X	X	X
R - Defrost	X	X	X
R - Evaporator 2 defrost		X	
R - Fans	X		X

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;
- browse 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; alternatively wait for the timeout;
- if the operation is successful, the display will show "**y**", if not it will show "**n**";
- after a few seconds the instrument will return to the main display.



RESET PROCEDURE

EWPlus 978 instruments can be **RESET** and the default factory settings restored in a simple and user-friendly way.
Simply reload one of the basic applications by following the procedure described in the paragraph "Loading default applications".

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

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

ACCESSING AND USING THE MENUS

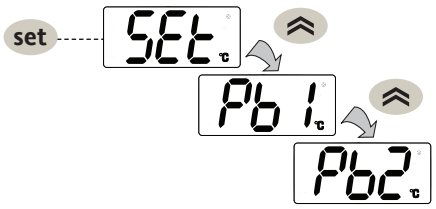
The resources are organised into 2 menus which are accessed as follows:

- "**Machine Status**" menu: press and release the **set** key.
- "**Programming**" menu: hold down the **set** key for 5 seconds.

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

"MACHINE" STATUS MENU

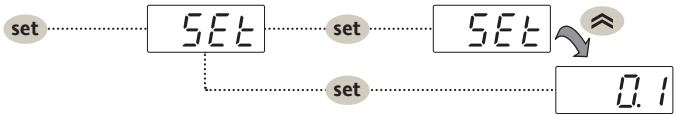
Access the "Machine Status" menu by pressing and releasing the **set** key. If no alarms are active, the "SEt" label appears.
By pressing the ⌃⌃ and ⌄⌄ keys you can scroll through all the folders in the menu:



- AL: alarms folder (**only visible if an alarm is active**);
- SEt: setpoint configuration folder;
- Pb1: probe 1 - Pb1 folder;
- Pb2: probe 2 - Pb2 folder - Pb2*****;
- Pb3: probe 3 - Pb3 folder- Pb3******;

*** folder displayed if Pb2 present (H42 = y)**
**** folder displayed if Pb3 present (H11 = 0 and H43 = y)**

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.



SETPOINT EDIT LOCK: The keypad can be locked by programming the "LOC" parameter.
With the keypad locked you can still access the "Machine Status" menu by pressing **set** to display the Setpoint, but you cannot edit it.
To disable the keypad lock, repeat the locking procedure.

PROBES DISPLAY: When the label Pb1, Pb2 or Pb3 is displayed, press **set** and the associated probe value will appear
NOTE: 1) the value cannot be modified.

MANUAL DEFROST CYCLE ACTIVATION

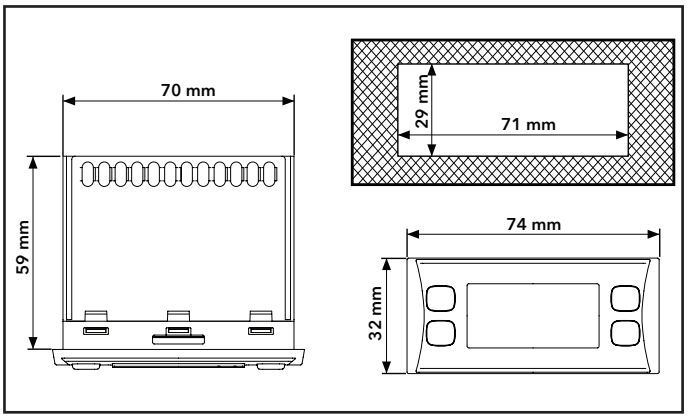
Hold down the ⌃⌃ key for longer than 5 seconds. It is only activated if the temperature conditions are fulfilled.
Otherwise, the display will blink 3 times to indicate that the operation will not be performed.

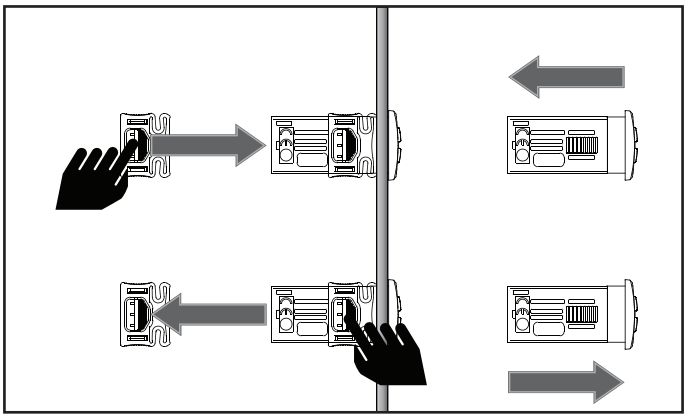
INSTRUMENT ON/OFF

The instrument can be switched off by pressing the ⏻ key for longer than 5 seconds.
In this condition, the adjustment algorithms and defrost cycles are disabled and the text "OFF" will appear on the display.

MOUNTING - DIMENSIONS

The device is designed for panel mounting. Drill a 29x71 mm hole and insert the instrument; secure it with the special brackets provided.
Do not install the device in places subject to high humidity and/or dirt; it is intended for use in sites with ordinary class of pollution.
Keep the area around the instrument cooling slots adequately ventilated.





DIAGNOSTICS

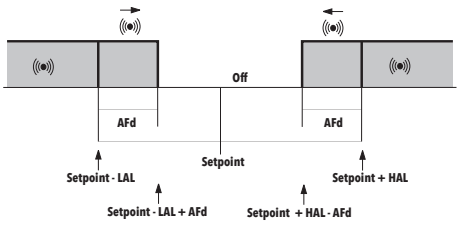
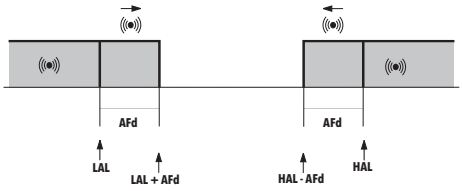
Alarms are always indicated by the buzzer (if present) and the alarm icon (((•))).
To switch off the buzzer, press and release any key, the relative icon will continue to flash.
NOTES: If alarm exclusion times have been set (see "**AL**" folder in the parameters table) the alarm will not be signalled.

- **E1**: if the cold room probe fails (Pb1), the indication "E1" will appear on the display.
- **E2**: if the Evaporator probe fails (Pb2), the indication "E2" will appear on the display.
- **E3**: if the Evaporator 2 probe fails (Pb3), the indication "E3" will appear on the display.

ALARMS

Label	Fault	Cause	Effects	Remedy
E1	Probe1 faulty (cold room)	• measured values outside operating range • probe faulty / short-circuit / open-circuit	• Label **E1** displayed • Alarm icon permanently on • Controller disabled max/min alarms • Compressor operation based on parameters "**Ont**" and "**OFt**".	• check probes wiring • replace probe
E2	Probe2 faulty (defrost)	• measured values outside operating range • probe faulty / short-circuit / open-circuit	• Label **E2** displayed • Alarm icon permanently on • Defrost will end due to timeout (**dEt**) • The evaporator fans will be: ON if the compressor is ON and will operate based on parameter **FCO** if the compressor is OFF.	• check probes wiring • replace probe
E3	Probe3 faulty (evaporator 2)	• measured values outside operating range • probe faulty / short-circuit / open-circuit	• Label **E3** displayed • Alarm icon permanently on	• check probes wiring • replace probe
AH1	Pb1 HIGH temperature alarm	• value read by probe Pb1 > HAL after time "**tAO**". (see "MAX/MIN TEMP. ALARMS")	• Label **AH1** recorded in folder AL • No effect on control	• Wait for temperature value read by Pb1 to return below HAL.
AL1	Pb 1 LOW temperature alarm	• value read by probe Pb1 < HAL after time "**tAO**". (see "MAX/MIN TEMP. ALARMS")	• Label **AL1** recorded in folder AL • No effect on control	• Wait for temperature value read by Pb1 to return above LAL.
EA	External alarm	• digital input activated (H11 = ±5)	• Label **EA** recorded in folder AL • Alarm icon permanently on • Regulation blocked if **rLO** = y	• check and remove external cause of alarm on D.I.
OPd	Door open alarm	• activation of digital input (H11 = ±4) (for a time greater than **tdO**)	• Label **Opd** recorded in AL folder • Alarm icon permanently on • Regulator locked if **dOd** ≠ 0	• close the door • delay function defined by **OAO**
Ad2	Defrost due to timeout	• End of defrost cycle due to timeout rather than due to defrost end temperature being read by Pb2.	• Label **Ad2** recorded in AL folder • Alarm icon permanently on	• Wait for the next defrost cycle for automatic reset.
COH	Overheating alarm	Pb3 exceeded the value set by parameter SA3.	• Label **COH** displayed • Alarm icon permanently on • Regulation locked (Compressor)	• wait for the temperature to return to a value of **SA3** (Setpoint) minus **dA3** (differential).
nPA	General pressure alarm	Activation of pressure switch alarm by general pressure switch.	If the number **N** of pressure switch activations is **N**<**PEn**: • Folder **nPA** recorded in folder AL with the number of pressure switch activations • Regulation locked (Compressor and Fans)	• Check and remove the cause which triggered the alarm on D.I. (Auto Reset).
PAL	General pressure alarm	Activation of pressure switch alarm by general pressure switch.	If the number **N** of pressure switch activations is **N**=**PEn**: • Label **PAL** displayed • Label **PA** recorded in AL folder • Alarm icon permanently on • Regulation locked (Compressor and Fans)	• Switch the device off and back on again • Reset alarms by entering the functions folder and selecting the **rAP** function (Manual Reset)

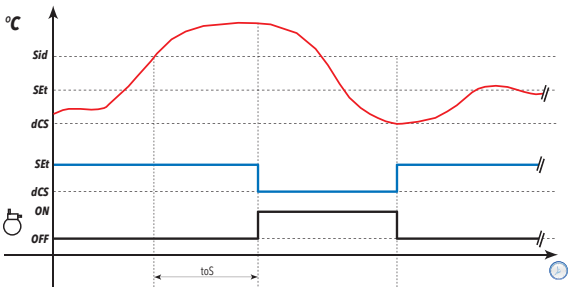
MAX/MIN TEMPERATURE ALARMS

	Temperature value relative to setpoint value (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)
Reset from minimum temperature alarm condition	Temp. ≥ **Set + LAL + AFd** or ≥ **Set - |LAL| + AFd** (LAL < 0)	Temp. ≥ **LAL + AFd**
Reset from maximum temperature alarm condition	Temp. ≤ **Set + HAL - AFd** (HAL > 0)	Temp. ≤ **HAL - AFd**
	*** If LAL is negative, Set + LAL < Set** *** If HAL is negative, Set + HAL < Set**	

AUTOMATIC DEEP COOLING CYCLE - DCC

On activation of **DCC** (Deep Cooling Cycle), the compressor regulator will regulate in relation to the setpoint **dCS**, with a differential equal to the value **diF**; the interval between defrosts is reset to zero and defrosts are disabled.

If **tdC = 0**, **DCC** will end when the setpoint **dCS** is reached.
If **tdC ≠ 0**, **DCC** will end after a time set in parameter **tdC**.



TECHNICAL SPECIFICATIONS (EN 60730-2-9)

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

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

FURTHER INFORMATION

Input Characteristics

Display range:	**NTC**: -50.0°C ... +110°C (on 3-digit display with +/- sign)
Accuracy:	Better than 0.5% of full-scale +1 digit.
Resolution:	0.1 °C
Buzzer:	NO
Analogue Inputs:	2 NTC*
Digital Inputs:	2 voltage-free digital inputs (**D.I.1** and **D.I.2**)
	NOTE: - (*) D.I.1 can also be configured as a probe input (**H11** = 0 e **H43** = y)
	- D.I.2, if activated, should be connected to terminals 1-2 of the TTL connector (**H12** ≠ 0)

Output Characteristics

Digital Outputs:	1 Compressor relay	(**A**) :	IEC 60730-1 10(6)A max 250V~
			UL60730 (A) 1.5Hp (10FLA - 60LRA) max 240V~
	1 Defrost relay	(**B**) :	NO 8(4)A NC 6(3)A max 250V~
	1 Defrost 2 relay	(**C**) :	NO 5(2)A max 250V~
	1 Aux/Fans relay	(**D**) :	NO 5(2)A max 250V~

Mechanical Characteristics

Container:	PC+ABS UL94 V-0 resin casing, polycarbonate window, thermoplastic resin keys
Dimensions:	front 74x32 mm, depth 59 mm (without terminals)
Terminals:	screw/disconnectable terminals for wires with cross-section of 2.5mm²
Connectors:	TTL for connection to Copy Card + **D.I.2**
Humidity:	Usage / Storage: 10...90% RH (non-condensing)

Regulations

Electromagnetic compatibility:	The device complies with Directive 2004/108/EC
Safety:	The device complies with Directive 2006/95/EC
Food Safety:	The device complies with standard EN13485 as follows:
	- suitable for storage
	- application: air
	- climate range A
	- measurement class 1 in the range from -25°C to 15°C
	(**exclusively using Eliwell NTC probes**)

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

ELECTRICAL CONNECTIONS

Important! Make sure the machine is switched off before working on the electrical connections.
The instrument is equipped with screw or disconnectable terminal boards for connection of wires having a maximum cross section of 2.5 mm^2 (a single conductor per terminal for the power feeding connections): refer to the label on the instrument for details of the terminal ratings. Do not exceed the maximum permitted current; for higher loads, use a contactor with sufficient power capacity. Make sure that the power supply is of the correct voltage for the device. Probes have no connection polarity and can be extended using a normal bipolar cable (note that the extension of the probes influences the instrument's electromagnetic compatibility -EMC: take great care with the wiring).
Probe cables, power supply cables and the TTL serial cables should be routed separately from power cables.

PASSWORDS

Password PA1: allows access to the "**User**"parameters. By default the password is disabled (**PS1=0**).
To enable it (**PS1≠0**): press and hold **set** for longer than 5 seconds, scroll through the parameters using ⌃ and ⌄ until you see the label **PS1**, press **set** to display the value, modify it using ⌃ and ⌄, then save it by pressing **set** or ⏻.
If enabled, it will be required in order to access the User parameters.

Password PA2: allows access to the "**Installer**"parameter. By default the password is enabled (**PS2=15**).
To modify it (**PS2≠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, modify it using ⌃ and ⌄, then save it by pressing **set** or ⏻. The visibility of **PA2** is:

1) **PA1 e PA2 ≠ 0**: Press and hold **set** 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 amongst the level1 parameters. If enabled, it will be required when accessing the "Installer" parameters; to enter it, proceed as instructed for password **PA1**.

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

USING THE UNICARD/COPYCARD

The Unicard/Copycard must be connected to the TTL serial port and 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/Copycard (which is necessary when using the card for the first time). **IMPORTANT**: the **Fr** parameter deletes all data present. This operation cannot be reversed.
- **Download**: Connect the Unicard/Copycard when the instrument is switched off. At power-on, data will automatically start downloading from the Unicard/Copycard to the instrument. At the end of the lamp test, the display will show "**dLy**" if the operation was successful and "**dLn**" if not.

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

PROGRAMMING MENU

To access the "Programming" menu hold down the **set** key for longer 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"). Press ⌃ and ⌄ to scroll through all of the folders in the current level. Select the desired folder using **set**. Press ⌃ and ⌄ to scroll through the parameters in the current folder and select the parameter using **set**.
Press ⌃ and ⌄ to change it and **set** to save the changes.

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.

DESCRIPTION OF EWPlus 978 FAMILY

EWPlus 978 instruments are versatile controllers that can handle 2 compressors and 1 or 2 defrosts.

EWPlus 978 instruments have: **4** relay outputs, **2** temperature sensors (regulation and evaporator),
1 multifunctional Digital (D.I.1)/Temperature (Pb3) input and **1** Digit Input (D.I.2) that can be activated on TTL

The second probe can be used to control the defrost cycle and the evaporator fans.
The 4 relay outputs can be used to control:

- compressor
- evaporator fans
- AUX output
- condenser fans reversal
- evaporator 2 defrost
- defrosting elements
- alarms
- stand-by
- check valve
- compressor 2

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

- activation
- AUX management
- external alarm
- pressure switch
- Energy Saving
- reduced SET
- door switch
- stand-by
- deep-cooling
- door switch + Energy Saving

"USER" MENU PARAMETERS TABLE

Param.	DESCRIPTION	RANGE	M.U.	AP1	AP2	AP3
SEt	Temperature control SEtpoint.	LSE ... HSE	°C/°F	0.0	0.0	0.0
dF1	Compressor relay activation differential. (**dF1 must be ≠ 0**).	0.1 ... 30.0	°C/°F	2.0	2.0	2.0
HSE	Maximum value that can be assigned to the setpoint.	LSE ... 320	°C/°F	99.0	99.0	99.0
LSE	Minimum value that can be assigned to the setpoint.	-58.0 ... HSE	°C/°F	-50.0	-50.0	-50.0
CP2	Delay before activation of compressor step 2	0 ... 255	sec	5	5	5
dty	Type of defrost (**0** = electric, **1** = reverse cycle, **2** = Free).	0/1/2	num	0	0	0
dit	Interval between the start of two consecutive defrost cycles.	0 ... 250	hours	6	6	6
dEt	Defrost time-out; determines the maximum defrost duration	1 ... 250	min	30	30	30
dS1	Defrost end temperature (determined by probe Pb2).	-67.0 ... 320	°C/°F	8.0	8.0	8.0
dS2	Evaporator 2 defrost end temperature (determined by probe Pb3).	-67.0 ... 320	°C/°F		8.0	
FSt	Fans stop temperature; if **Pb2 > FSt**, the fans are stopped. The value is either positive or negative and, depending on parameter **FPt**, can be either the absolute temperature or the temperature relative to the setpoint.	-50.0 ... 150	°C/°F	50.0		50.0
FSS	Evaporator fans activation temperature differential.	0.0 ... 100.0	°C/°F	0.0		0.0
Fdt	Fan activation delay after a defrost cycle.	0 ... 250	min	0		0
dt	drainage time. Coil drainage time.	0 ... 250	min	0	0	0
dFd	Allows exclusion of the evaporator fans to be selected or not selected during defrosting. **n** (0) = no; **y** (1) = yes.	n/y	flag	y		y
HAL	Maximum temperature alarm. Temperature value which if exceeded in an upward direction triggers the activation of the alarm signal.	LAL ... 320	°C/°F	50.0	50.0	50.0
LAL	Minimum temperature alarm. Temperature value which if exceeded in a downward direction triggers the activation of the alarm signal.	-67.0 ... HAL	°C/°F	-50.0	-50.0	-50.0
tAO	Time delay for temperature alarm indication.	0 ... 250	min	0	0	0
OSP	Offset on setpoint	-30.0 ... 30.0	°C/°F	0.0	0.0	0.0
OdF	Activation differential correction	0.0 ... 30.0	°C/°F	0.0	0.0	0.0
LOC	LOCk. Basic commands modification lock. **n** (0) = no; **y** (1) = yes.	n/y	flag	n	n	n
PS1	PAssword 1. When enabled (**PS1 ≠ 0**), this password provides access to level1 parameters (**User**).	0 ... 250	num	0	0	0
CA1	Calibration 1. Value to be added to the value read by **Pb1**.	-12.0 ... 12.0	°C/°F	0.0	0.0	0.0
CA2	Calibration 2. Value to be added to the value read by **Pb2**.	-12.0 ... 12.0	°C/°F	0.0	0.0	0.0
CA3	Calibration 3. Value to be added to the value read by **Pb3**.	-12.0 ... 12.0	°C/°F	0.0	0.0	0.0
ddL	Display mode during defrost. **0** = displays the temperature read by probe **Pb1**; **1** = locks the reading at the temperature value read by probe **Pb1** when defrosting starts and until the next time the **SEt*** is reached; **2** = displays the label **deF** during defrosting and until the next time the **SEt*** is reached (or until **Ldd** has elapsed). **(* See parameter dCS and "Deep Cooling Cycle" paragraph)**	0/1/2	num	1	1	1
Ldd	Timeout value for display unlock - label **dEF**	0 ... 255	min	30	30	30
H42	Presence of Evaporator probe (**Pb2**). **n** (0) = not present; **y** (1) = present.	n/y	flag	y	y	y
H43	Probe 3 (**Pb3**) present. **n** (0) = not present; **y** (1) = present; **2EP** (2) = evaporator 2 defrost.	n/y/2EP	flag	n	2EP	n
H45	Start defrost mode for applications with double evaporator. **0** = evaporator 1 only; **1** = if at least one of the evaporators is below its defrost end temperature Pb2 value < **dS1** (evaporator 1) **or** Pb3 value < **dS2** (evaporator 2); **2** = if both evaporators are below their respective defrost end temperature Pb2 value < **dS1** (evaporator 1) **and** Pb3 value < **dS2** (evaporator 2). **3** = evaporator 1 and evaporator 2 activated alternately	0/1/2/3	num		2	
rEL	Firmware release. Reserved: read-only parameter	/	/	/	/	/
tAb	Parameters tAble. Reserved: read-only parameter	/	/	/	/	/

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

"INSTALLER" MENU PARAMETERS table

Param.	DESCRIPTION	RANGE	M.U.	AP1	AP2	AP3
SEt	Temperature control SEtpoint. **The SEtpoint is only visible in the "machine status" menu.**	LSE ... HSE	°C/°F	0.0	0.0	0.0
	COMPRESSOR (folder "CP")					
dF1	diFferential. Compressor relay activation differential. **NOTE: dF1 cannot be equal to 0.**	0.1 ... 30.0	°C/°F	2.0	2.0	2.0
HSE	Maximum value that can be assigned to the setpoint. **NOTE: The two setpoints are interdependent: HSE cannot be less than LSE and vice versa.**	LSE ... 320	°C/°F	99.0	99.0	99.0
LSE	Minimum value that can be assigned to the setpoint. **NOTE: The two setpoints are interdependent: LSE cannot be greater than HSE and vice versa.**	-58.0 ... HSE	°C/°F	-50.0	-50.0	-50.0
Ont	Controller switch-on time in the event of faulty probe. - if **Ont** = 1 and **OFt** = 0, the compressor stays on permanently (ON), - if **Ont** > 0 and **OFt** > 0, it operates in Duty Cycle mode.	0 ... 250	min	0	0	0
OFt	Controller switch-off time in the event of a faulty probe. - if **OFt** = 1 and **Ont** = 0, the compressor stays off permanently (OFF), - if **Ont** > 0 and **OFt** > 0, it operates in Duty Cycle mode.	0 ... 250	min	1	1	1
dOn	Compressor relay activation delay after request.	0 ... 250	sec	0	0	0
dOF	Delay after switching off and subsequent switch-on.	0 ... 250	min	0	0	0
dbi	Delay between two consecutive compressor switch-ons	0 ... 250	min	0	0	0
OdO (!)	Delay in activating outputs after the instrument is switched on or after a power failure. **0 = not active**	0 ... 250	min	0	0	0
CP2	Delay before activation of compressor step 2	0 ... 255	sec	5	5	5
	DEFROST (folder "dEF")					
dty	defrost type. Type of defrost. **0** = electric defrosting - compressor off (OFF) during defrosting **1** = reverse cycle defrost (hot gas) - compressor ON during defrosting **2** = Free: defrost independent of compressor	0/1/2	num	0	0	0
dit	Interval between the start of two consecutive defrost cycles. **0** = function disabled (**defrost NEVER performed**)	0 ... 250	hours	6	6	6
dCt	Selects the count mode for the defrost interval: **0** = compressor running hours (DIGIFROST® method); Defrost active ONLY when the compressor is on. **NOTE: compressor running hours are counted separately from the evaporator probe (count active also when evaporator probe missing or faulty).** **1** = appliance running time; defrost counting is always active when the machine is on and starts at each power-on; **2** = compressor stop. Every time the compressor stops, a defrost cycle is performed according to parameter dtY; **3** = not USED	0/1/2/3	num	1	1	1
dOH	Defroststart delay time after request.	0 ... 59	min	0	0	0
dEt	Defrost time-out; determines the maximum defrost duration	1 ... 250	min	30	30	30
dS1	Defrost end temperature (determined by probe Pb2).	-67.0 ...320	°C/°F	8.0	8.0	8.0
dS2	Evaporator 2 defrost end temperature (determined by probe Pb3).	-67.0 ...320	°C/°F		8.0	
dPO	Determines if the device should switch to defrost at switch-on (depending on the evaporator temperature read). **n** (0) = no, no defrost at switch-on; **y** (1) = yes, defrost at switch-on.	n/y	num	n	n	n
	FAN REGULATOR (folder FAn) (NOTE: for these parameters, Evaporator means Evaporator 1)					
FPt	Characterises parameter "FSt" which can be expressed either as an absolute temperature value or as a value relative to the setpoint. **0** = absolute; **1** = relative.	0/1	flag	0		0
FSt	Fans stop temperature; if **Pb2 > FSt**, the fans are stopped. The value is either positive or negative and, depending on parameter **FPt**, can be either the absolute temperature or the temperature relative to the setpoint.	-67.0 ...320	°C/°F	50.0		50.0
FSS	Evaporator fans activation temperature differential. • If **FSS = 0**, the differential is disabled. • If **FSS > 0**, the regulator will be active in parallel with the temperature control regulator and the fans output will be activated if at least one of the two regulators require it to be activated (output ON); it will be deactivated if both regulators are switched off (output OFF). With **FSS > 0** temperature control of fans occurs based on the difference between the temperature of the main control probe (**ST1**) and that of the evaporator (**ST2**). If **ST1-ST2 > FSS** with differential equal to parameter **FAd** but with the opposite sign, fans switch-on will be forced.	0.0 ... 100.0	°C/°F	0.0		0.0
FAd	Fans activation intervention differential (see par. "**FSt**").	1.0 ... 50.0	°C/°F	2.0		2.0
Fdt	Fans activation delay after a defrost cycle.	0 ... 250	min	0		0
dt	drainage time. Coil drainage time.	0 ... 250	min	0	0	0
dFd	Allows exclusion of the evaporator fans to be selected or not selected during defrosting. **n** (0) = no; **y** (1) = yes.	n/y	flag	y		y

Param.	DESCRIPTION	RANGE	M.U.	AP1	AP2	AP3
FCO	Evaporator fans operating mode. The state of the fans will be: **H42 = y** **H42 = n** **Duty cycle Day**: controlled by means of parameters "**Fon**" and "**FoF**". **Duty cycle Night**: controlled by means of parameters "**Fnn**" and "**FnF**".	0/1/2/3	num	1		1
Fon	Fans ON time in duty cycle. Fans used in duty cycle mode; valid when **FCO = dc** and **H42=1** (probe Pb2 present)	0 ... 250	min	0		0
FoF	Fans OFF time in duty cycle. Fans used in duty cycle mode; valid when **FCO = dc** and **H42=1** (probe Pb2 present)	0 ... 250	min	0		0
	ALARMS (folder AL)					
Att	**HAL** and **LAL** parameters mode, i.e. the absolute temperature value or differential in relation to the setpoint. **0** = absolute value; **1** = relative value. **NOTE: In case of relative values (par. Att=1), the HAL parameter should be set to positive values, while the LAL parameter should be set to negative values (-LAL).**	0/1	num	1	1	1
AFd	Alarms activation differential.	1.0 ... 50.0	°C/°F	2.0	2.0	2.0
HAL (!)	Maximum temperature alarm. Temperature value (intended either as distance from setpoint or as an absolute value based on **Att**) which, if exceeded in an upward direction, triggers the activation of the alarm signal. **See "Max/Min temperature alarms".**	LAL to 320	°C/°F	50.0	50.0	50.0
LAL (!)	Minimum temperature 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".**	-67.0 to HAL	°C/°F	-50.0	-50.0	-50.0
PAO (!)	Alarm override time after device is switched on following a power failure. **This parameter refers to high/low temperature alarms only.**	0 ... 10	hours	0	0	0
dAO	Temperature alarm exclusion time after defrost.	0 ... 999	min	0	0	0
OAO	Alarm signal delay (low and high temperature) after the deactivation of the digital input (port closed).	0 ... 10	hours	0	0	0
tdO	Delay in door open alarm activation.	0 ... 250	min	0	0	0
tAO	Time delay for temperature alarm indication. **This parameter refers to high/low temperature alarms only.**	0 ... 250	min	0	0	0
dAt	Alarm signalling end of defrost due to timeout. **n** (0) = alarm not activated; **y** (1) = alarm activated.	n/y	flag	n	n	n
rLO	Regulators locked by external alarm. **n** (0) = does not lock; **y** (1) = locks.	n/y	flag	n	n	n
SA3	Alarm setpoint for probe **Pb3**.	-67.0 ... 320	°C/°F	50.0	50.0	50.0
dA3	Probe **Pb3** alarm activation differential.	1.0 ... 50.0	°C/°F	1.0	1.0	1.0
	LIGHTS AND DIGITAL INPUTS (folder Lit)					
dOd	Enable utility switch-off on activation of door switch. **0** = disabled **1** = disables fans **2** = disables the compressor; **3** = disables fans and compressor	0/1/2/3	num	0	0	0
dAd	Digital input activation delay.	0 ... 255	min	0	0	0
dCO	Delay in deactivating compressor after door opened	0 ... 255	min	0	0	0
dCd	Delay in activating fans after door closed	0 ... 250	sec	0	0	0
	PRESSURE SWITCH (folder PrE)					
PEn	Number of errors allowed per pressure switch input. **0** = disabled	0 ... 15	num	0	0	0
PEI	Pressure switch error count interval.	1 ... 99	min	1	1	1
PEt	Delay in activating compressor after pressure switch deactivation	0 ... 255	min	0	0	0
	DEEP COOLING (folder dEC)					
dCS	Deep cooling setpoint	-67.0 ... 320	°C/°F	-30.0	-30.0	-30.0
tdC	Deep cooling duration	0 ... 255	min	60	60	60
dcc	Defrost delay after deep cooling	0 ... 255	min	10	10	10
Sid	Threshold for start of deep cooling	-67.0 ... 320	°C/°F	30.0	30.0	30.0
toS	Deep cooling activation time	0 ... 255	min	0	0	0
	ENERGY SAVING (folder EnS)					
ESt	Energy Saving mode: **0**= disabled; **1**= Offset on setpoint; **2**= Offset on differential; **3**= offset on setpoint and differential; **4**= "Open front bottle cooler" algorithm; **5**= "Glass door bottle cooler" algorithm; **6**= "Vertical glass door merchandiser" algorithm	0 ... 6	num	0	0	0
OSP	Offset setpoint	-30.0 ... 30.0	°C/°F	0.0	0.0	0.0
OdF	Differential offset	0.0 ... 30.0	°C/°F	0.0	0.0	0.0
	DISPLAY (folder diS)					
LOC	LOCk. Setpoint edit lock. You will still be able to open parameter programming and alter parameters, including the state of this parameter if you need to unlock the keyboard for example. **n** (0) = no; **y** (1)= yes.	n/y	flag	n	n	n
PS1	PAssword 1. When enabled (**PS1** ≠ **0**), this password provides access to level1 parameters (**User**).	0 ... 250	num	0	0	0
PS2	PAssword 2. When enabled (**PS2** ≠ **0**), this password provides access to level2 parameters (**Installer**).	0 ... 250	num	0	0	0

Param.	DESCRIPTION	RANGE	M.U.	AP1	AP2	AP3
ndt	Display with decimal point. **n** (0) = no (integers only); **y** (1) = yes (display with decimal point).	n/y	flag	y	y	y
CA1	Calibration 1. Positive or negative temperature value added to the value read by **Pb1**. This sum is used both for the temperature displayed and for regulation.	-12.0...12.0	°C/°F	0.0	0.0	0.0
CA2	Calibration 2. Positive or negative temperature value added to the value read by **Pb2**. This sum is used both for the temperature displayed and for regulation.	-12.0...12.0	°C/°F	0.0	0.0	0.0
CA3	Calibration 3. Positive or negative temperature value added to the value read by **Pb3**. This sum is used both for the temperature displayed and for regulation.	-12.0...12.0	°C/°F	0.0	0.0	0.0
ddL	Display mode during defrost. **0** = displays the temperature read by probe **Pb1**; **1** = locks the reading at the temperature value read by probe **Pb1** when defrosting starts and until the next time the SEt is reached; **2** = displays the label **deF** during defrosting and until the next time the **SEt*** is reached (or until **Ldd** has elapsed). **(* See parameter dCS and "Deep Cooling Cycle" paragraph)**	0/1/2	num	1	1	1
Ldd	Timeout value for display unlock - label **dEF**	0 ... 255	min	30	30	30
dro	Selection of °C or °F to display the probe value. **0** = °C, **1** = °F. **NOTE: switching from °C to °F or vice versa DOES NOT modify the setpoint, differential, etc. (e.g. set=10°C becomes 10°F).**	0/1	num	0	0	0
ddd	Selects type of value to display. **0** = setpoint; **1** = probe Pb1; **2** = probe Pb2; **3** = probe Pb3.	0/1/2/3	num	1	1	1
	CONFIGURATION (folder CnF) - NOTE: the instrument must be switched off and then on again each time the configuration of parameters in folder CnF is modified in order to prevent malfunction of the configuration and/or ongoing timings.					
H08	Function when in standby mode. **0** = display off; the regulators are active and the device reactivates the display to signal any alarms; **1** = display off; regulators and alarms blocked; **2** = display shows OFF label; regulators and alarms blocked.	0/1/2	num	2	2	2
H11	Configuration of digital input 1/polarity (DI1). **0** = disabled; **± 1** = defrost; **± 2** = reduced set; **± 3** = AUX; **± 4** = door switch; **± 5** = external alarm; **± 6** = stand-by (ON-OFF); **± 7** = pressure switch; **± 8** = deep cooling; **± 9** = energy saving; **± 10** = door switch + energy saving. **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**	-10 ... 10	num	0	0	0
H12	Configuration of digital input 2/polarity (DI2). Same as H11.	-10 ... 10	num	0	0	0
H21	Configuration of digital output 1 (Ⓐ). **0** = disabled; **1** = compressor; **2** = defrost; **3** = Fans; **4** = alarm; **5** = AUX; **6** = Stand-by; **7** = not used; **8** = condenser fans reversal; **9** = check valve; **10** = evaporator 2 defrost; **11** = compressor 2.	0 ... 11	num	1	1	1
H22	Configuration of digital output 2 (Ⓑ). Same as H21.	0 ... 11	num	2	2	2
H23	Configuration of digital output 3 (Ⓒ). Same as H21.	0 ... 11	num	3	3	3
H24	Configuration of digital output 4 (Ⓓ). Same as H21.	0 ... 11	num	5	5	5
H31	UP key configuration. **0** = disabled; **1** = defrost; **2** = AUX; **3** = reduced set; **4** = Stand-by; **5** = deep cooling; **6** = energy saving	0 ... 6	num	1	1	1
H32	DOWN key configuration. Same as H32.	0 ... 6	num	0	0	0
H33	ESC key configuration. Same as H32.	0 ... 6	num	4	4	4
H42	Presence of Evaporator probe (**Pb2**). **n** (0) = not present; **y** (1) = present.	n/y	flag	y	y	y
H43	Probe 3 (**Pb3**) present. **n** (0) = not present; **y** (1) = present; **2EP** (2) = evaporator 2 defrost.	n/y/2EP	flag	n	2EP	n
H45	Start defrost mode for applications with double evaporator. **0** = evaporator 1 only; **1** = if at least one of the evaporators is below its defrost end temperature Pb2 value < **dS1** (evaporator 1) **or** Pb3 value < **dS2** (evaporator 2); **2** = if both evaporators are below their respective defrost end temperature Pb2 value < **dS1** (evaporator 1) **and** Pb3 value < **dS2** (evaporator 2). **3** = evaporator 1 and evaporator 2 activated alternately	0/1/2/3	num		2	
reL	Firmware version. Device software release: read-only parameter	/	/	/	/	/
tAb	Parameters tAble. Reserved: read-only parameter	/	/	/	/	/
	COPY CARD (folder Fpr)					
UL	Upload. Transfer programming parameters from instrument to CopyCard	/	/	/	/	/
Fr	Formatting. Deletes data on Copy Card **IMPORTANT: If parameter "Fr" is used, the data entered will be permanently lost.** **This operation cannot be reversed.**	/	/	/	/	/
	FUNCTIONS (folder "FnC")					

The following function is available inside folder "FnC":

Function	Function label ACTIVE	Function label not active	Alarm signalling
Reset pressure switch alarms	rAP	rAP	Led ON

NOTES:
- 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.

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.

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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 Controls s.r.l.
Via dell'Industria, 15 • Z.I. Paludi
32010 Pieve d'Alpago (BL) ITALY
Telephone +39 0437 986 111
Fax +39 0437 989 066
www.eliwell.com

Technical Customer Support:
Technical helpline +39 0437 986 300
E-mail: techsuppeliwell@invensys.com

Sales:
Telephone +39 0437 986 100 (Italy)
+39 0437 986 200 (other countries)
E-mail: saleseliwell@invensys.com

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