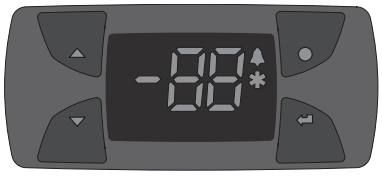
nEW 961 - 971 - 971 SPDT - 974

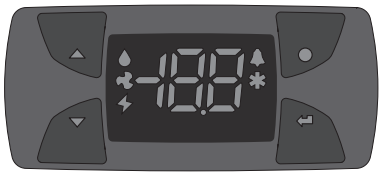
Electronic controllers for refrigerating units

by Schneider Electric

USER INTERFACE



nEW 961



nEW 971/971 SPDT/974

	Defrost LED		**Alarm LED**	
	On fixed:	automatic defrost active	On fixed:	presence of an alarm
	Flashing:	manual defrost active	Flashing:	alarm silenced
	Off :	otherwise	Off :	otherwise
	Evaporator fan LED		**Compressor LED**	
	On fixed:	fans active	On fixed:	compressor active
	Off :	otherwise	Flashing:	delay, protection or activation blocked
			Off :	otherwise
	AUX LED		**NOTE**: When switched on, the instrument performs a lamp test and for a few seconds, the display and LEDs flash to check their condition and proper operation. After the lamp test, the label **Cu** and its value will be shown for 2 secs.	
	On fixed:	AUX output active		
	Off :	otherwise		

KEYS

UP

Press and release
- Scrolls the menu items
- Increases the values

Press for at least 5 sec
- Function configurable by the user (see parameter **H1**) (see paragraph **Key Functions**)

DOWN

Press and release
- Scrolls the menu items
- Decreases the values

Press for at least 5 sec
- Function configurable by the user (see parameter **H2**) (see paragraph **Key Functions**)

ESC

Press and release
- Returns up one level with respect to the current menu
- Confirms the parameter value

Press for at least 5 sec
- Function configurable by the user (see parameter **H3**) (see paragraph **Key Functions**)

SET (ENTER)

Press and release
- Accesses the machine status menu and displays any alarms (if present)

Press for at least 5 sec
- Accesses the programming menu
- Confirms the commands

ELECTRIC CONNECTIONS

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

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

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

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

DANGER

LOOSE OR BARE WIRING CAUSES ELECTRIC SHOCK

- Insulate electrical connections with suitable Faston covers.
- Make sure the cables are properly connected to the female Fastons before continuing with the wiring process.

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

DANGER

POTENTIAL OF OVERHEATING AND FIRE

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

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

DANGER

POTENTIAL FOR EXPLOSION

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

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

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

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

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

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

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION DUE TO CONNECTION

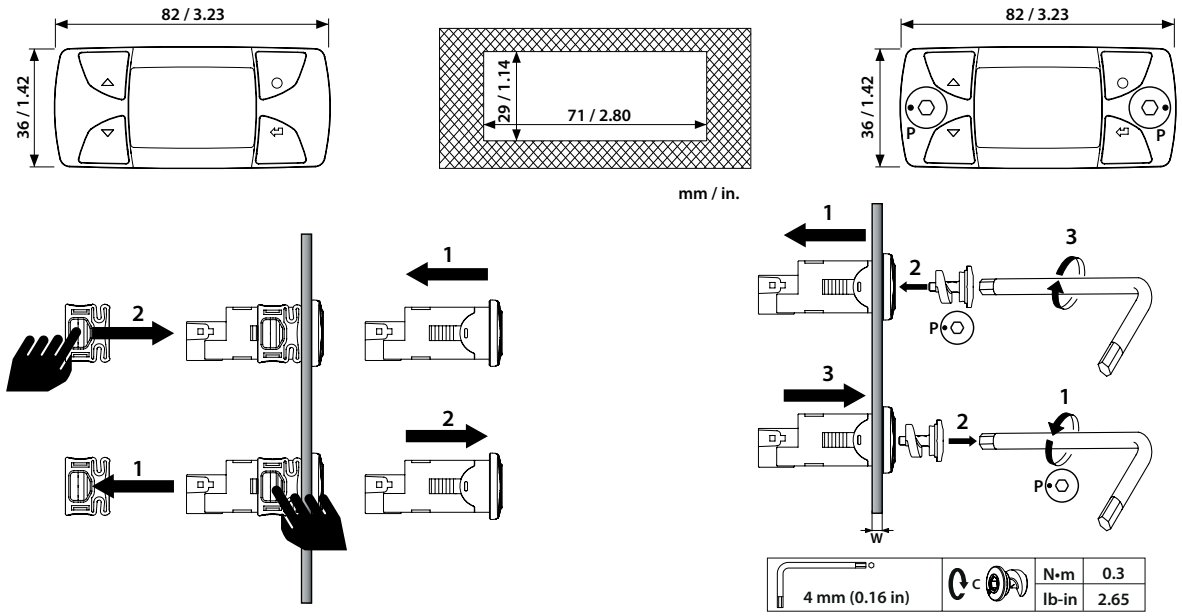
Signal leads (probes, digital inputs, communication and the signal electronic supply) must be routed separately from power and supply cables.

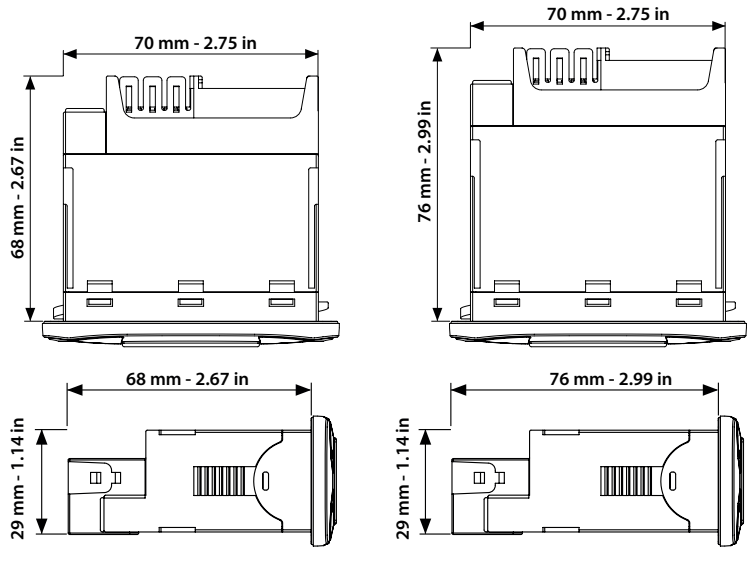
Failure to follow these instructions can result in death, serious injury, or equipment damage.

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

MOUNTING - DIMENSIONS

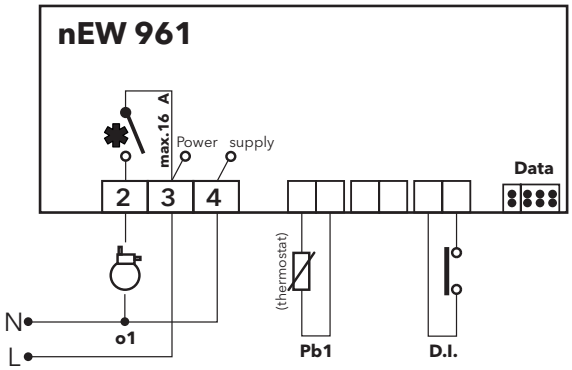
The instrument is designed to be panel mounted. Make a 71x29 mm (2.80x1.14 in.) hole and insert the instrument, fastening it with the provided brackets. Do not assemble the instrument in areas subject to high humidity and/or dirt. It is in fact suited for use in areas with ordinary or normal levels of pollution.
Keep the area surround the instrument's cooling slits well aerated.





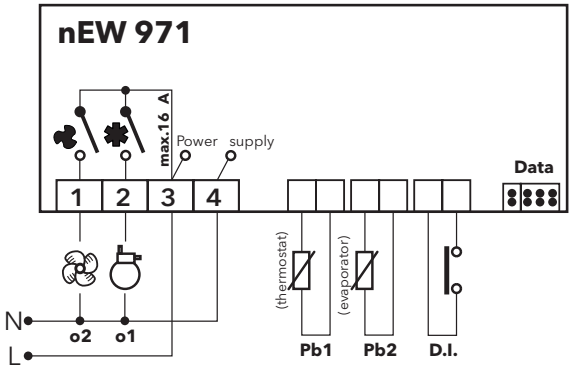
CONNECTIONS

nEW 961



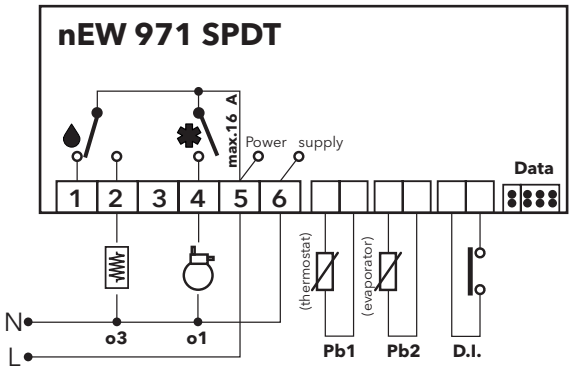
TERMINALS	
2-3	Compressor relay
3-4	Power supply input 100 ... 240 Vac
N-L	Power supply 100 ... 240 Vac
Pb1	Pb1 probe
D.I.	Digital input
Data	CopyCard/DMI adapter port for nEW

nEW 971



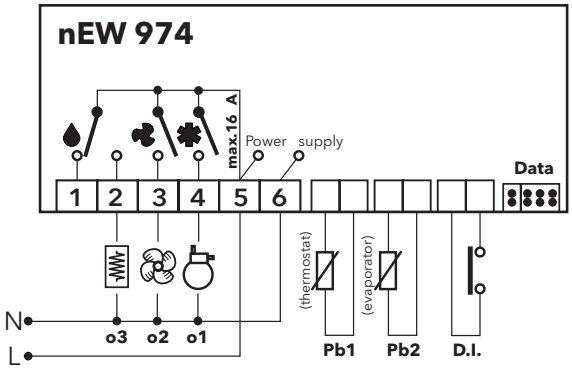
TERMINALS	
1-3	Fan relay
2-3	Compressor relay
3-4	Power supply input 100 ... 240 Vac
N-L	Power supply 100 ... 240 Vac
Pb2	Pb2 probe
Pb1	Pb1 probe
D.I.	Digital input
Data	CopyCard/DMI adapter port for nEW

nEW 971 SPDT



TERMINALS	
1-2-5	Defrosting relay
4-5	Compressor relay
5-6	Power supply input 100 ... 240 Vac
N-L	Power supply 100 ... 240 Vac
Pb2	Pb2 probe
Pb1	Pb1 probe
D.I.	Digital input
Data	CopyCard/DMI adapter port for nEW

nEW 974



TERMINALS	
1-2-5	Defrosting relay
3-5	Fan relay
4-5	Compressor relay
5-6	Power supply input 100 ... 240 Vac
N-L	Power supply 100 ... 240 Vac
Pb2	Pb2 probe
Pb1	Pb1 probe
D.I.	Digital input
Data	CopyCard/DMI adapter port for nEW

TECHNICAL DATA (EN 60730-2-9)

Classification:	operating (Not safety) controls for incorporation
Assembly:	on a panel, with a drilling template 71x29 mm (2.80x1.14 in.)
Type of action:	1.B
Degree of pollution:	2
Insultation material group:	IIIa
Overvoltage category:	II
Rated impulsive voltage:	2500 V
Temperature:	Operating: -20 … 60 °C / -4 ... 140 °F Storage: –30 … 85 °C / -22 ... 185 °F
Power supply:	100 ... 240 Vac (±10%) 50/60 Hz
Consumption:	3.2 W max
Fire resistance category:	D
Software class:	A

NOTE: check the power supply declared on the label of the instrument: consult the Sales office regarding the availability of power supply and relay capacity.

FURTHER INFORMATION

Input characteristics

Display ranges:	**nEW 961**	: –50.0...90.0 °C / -58.0...99.0 °F (on the display with 2 digits + sign)
	nEW 971/971 SPDT/ 974	: –50...110 °C / -58.0...199 °F (on the display with 2 ½ digits + sign)
Accuracy:	Best of 0.5 % of the full-scale +1 digit	
Resolution:	0.1 °C / 0.1 °F	
Analog inputs:	**nEW 961**	: 1 NTC input
	nEW 971/971 SPDT/974	: 2 NTC inputs
Digital inputs:	1 voltage free digital input	

Output characteristics

Digital outputs:

nEW 961: 1 compressor relay:	UL60730	2 Hp (12 FLA-72 LRA) @ 240 Vac or 1 Hp (16 FLA-96 LRA) @ 120 Vac - 100k cycles
nEW 971: 1 compressor relay:	UL60730	2 Hp (12 FLA-72 LRA) @ 240 Vac or 1 Hp (16 FLA-96 LRA) @ 120 Vac - 100k cycles
1 fans relay:	5 A resistive (2 FLA-12 LRA) @ 240 Vac or 120 Vac	
nEW 971 SPDT: 1 compressor relay:	UL60730	2 Hp (12 FLA-72 LRA) @ 240 Vac or 1 Hp (16 FLA-96 LRA) @ 120 Vac - 100k cycles
1 defrosting relay:	NO 8 A - NC 6 A resistive NO 2.9 FLA-17.4 LRA @ 240 Vac - 120 Vac	
nEW 974: 1 compressor relay:	UL60730	2 Hp (12 FLA-72 LRA) @ 240 Vac or 1 Hp (16 FLA-96 LRA) @ 120 Vac - 100k cycles
1 defrosting relay:	NO 8 A - NC 6 A resistive NO 2.9 FLA-17.4 LRA @ 240 Vac - 120 Vac	
1 fans relay:	5 A resistive (2 FLA-12 LRA) @ 240 Vac or 120 Vac	

Mechanical characteristics

Container:	Resin body PC+ABS UL94 V-0, polycarbonate cover, thermoplastic resin keys
Dimensions:	Front panel 82x36 mm (3.23x1.42 in.); depth (excluding terminals): - **nEW 961/971**: 68 mm (2.68 in.) - **nEW 971 SPDT/974**: 76 mm (2.99 in.)
Terminals:	Faston / RAST (6.3 mm / 0.25 in.) with patch **5.08** mm (0.2 in.) Operating temperature of female connectors: 125 °C / 257 °F minimum, cables with a 2.5 mm^2 (13 AWG) section
Humidity:	Operating / Storage: 10…90 % RH (non-condensing)

Regulations

Food Security: The device complies with standard EN13485 as follows:

- suitable for conservation
- application air
- climatic environment A
- measurement class 1 in a range from -25 ... 15 °C / -13 ... 59 °F (*****)

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

Approvals

UL: UL60730: file E233482

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

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

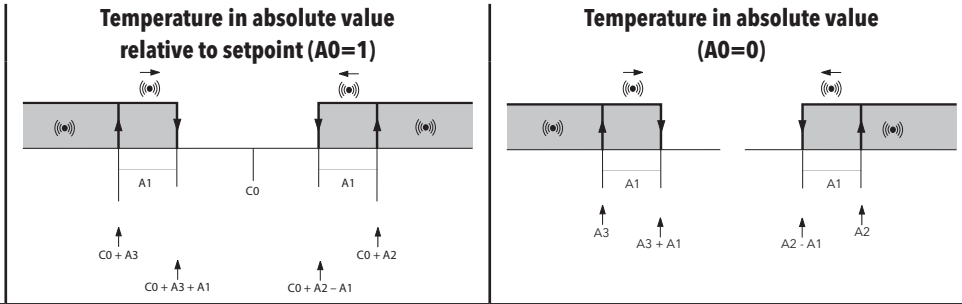
DIAGNOSTICS

The alarm condition is always signaled by the alarm icon 🔔.
To turn off the relative icon will continue flashing.
NOTE: If alarm exclusion times are in progress (**AL** folder of the parameter table), the alarm is not signaled.

ALARMS

Label	Description	Cause	Effects	Troubleshooting
E1	Pb1 probe error (cell)	• Reading of values outside the operating range • Probe is inoperable /short circuit/open	• Display of label **E1** • Fixed alarm icon • Disabling of the max/min alarm regulator • Compressor operation based on the parameters **P0** and **P1**	• Check the type of probe (NTC) • Check the probe wiring • Replace the probe
E2	Pb2 probe error (defrosting) (**nEW 971/971 SPDT/974** only)	• Reading of values outside the operating range • Probe is inoperable/short circuit/open	• Display of label **E2** • Fixed alarm icon • Defrosting ends due to time out (**d3**) • The evaporator fans are disabled	• Check the type of probe (NTC) • Check the probe wiring • Replace the probe
Ht	HIGH alarm Pb1 temperature	Value read by Pb1 **> A2** after time equal to **A7**. (see 'TEMP. ALARMS MAX/MIN')	• Recording of label **Ht** in the AL folder • Fixed alarm icon • No effect on regulation	Wait for the value ready by Pb1 to return below **A2-A1**
Lt	LOW alarm Pb1 temperature	Value read by Pb1 **< A3** after time equal to **A7**. (see 'TEMP. ALARMS MAX/MIN')	• Recording of label **Lt** in the AL folder • Fixed alarm icon • No effect on regulation	Wait for the value ready by Pb1 to return above **A3+A1**.
EA	External alarm	Activation of the digital input (**i3 = 6**)	• Recording of label **EA** in the AL folder • Fixed alarm icon	Check and remove the external cause that caused the alarm on D.I.
ES	Energy Saving + reduced set point	• Activation of the digital input (**i3 = 1,5, 8**) • Activation from key if **H1...3=2** (see paragraph **Key Functions**)	• Display of label **ES** alternating with the setpoint value • Regulation to the value set at **C5** parameter.	• D.I. Open • Press associated with the function key
OP	Alarm Door open	Activation of the digital input (**i3 = 4**) (for a time greater than **r1**)	• Recording of label **OP** in the AL folder • Fixed alarm icon	• Close the door • Delayed function defined by **A6**

MAX/MIN TEMPERATURE ALARMS



	Temperature in absolute value relative to setpoint (A0=1)	Temperature in absolute value (A0=0)
Minimum temperature alarm	Temp. ≤ **SP + A3 ***	Temp. ≤ **A3** (**A3** with sign)
Maximum temperature alarm	Temp. ≥ **SP + A2 ****	Temp. ≥ **A2** (**A2** with sign)
Deactivation of the minimum temperature alarm	Temp. ≥ **SP + A3 + A1** o ≥ **SP - |A3| + A1** (A3 < 0)	Temp. ≥ **A3 + A1**
Deactivation of the maximum temperature alarm	Temp. ≤ **SP + A2 - A1** (A2 > 0)	Temp. ≤ **A2 - A1**
	*** if A3 is negative, SP + A3 < SP** **** if A2 is negative, SP + A2 < SP**	

PASSWORD

Password Ur: permits access to the **User** parameters. By default, the password is not enabled (**Ur=0**).
To enable it (**y8≠0**): press for more than 5 seconds, scroll the parameters with and until finding the label **y8**, press to display its value, change it with and and save it by pressing or . If enabled, it will be requested to access the User parameters.
Password In: permits access to the **Installer** parameters. By default, the password is enabled (**In=15**).
To change it (**y9≠15**): press for more than 5 seconds, scroll the parameters with and until finding the label **In**, press , set the value '15' with and and confirm with . Scroll the parameters with and until finding the label **y9**, press to display the value, change it with and and save it by pressing or . The visibility of **In** is:

1. **Ur≠0** and **In ≠0**: Pressing for more than 5 seconds displays **Ur** and **In**. It is possible to decide whether to access the **User** parameters (**Ur**) or the **Installer** parameters (**In**).
2. **Otherwise:** The password **In** is among the **User** parameters. If enabled, it will be requested to access the **Installer** parameters and to enter it, proceed as described for the password **Ur**.

NOTE: If the entered value is incorrect, the label Ur / In will be displayed again. Repeate the procedure.

MENU ACCESS AND USE

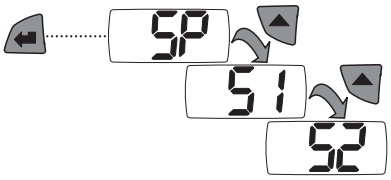
The resources are organized in 2 menus that are accessed as follows:

- **Machine status** menu: by pressing and releasing the button .
- **Programming** menu: pressing the button for more than 5 seconds.

If the keypad is not pressed for more than 15 seconds (time-out) or pressing the button once confirms the last value shown on the display and the previous view is displayed.

'MACHINE STATUS' MENU

Press and release the button to access the **Machine status** menu. If no alarms are in progress, the label **SP** is displayed. Press the buttons and to scroll all the menu folders:



- **SP**: Setpoint setting folder;
- **S1**: probe 1 - Pb1 value folder;
- **S2**: probe 2 - Pb2 value folder (**nEW 971/971 SPDT/974** only);
- **AL**: alarm folder (**if there are no active alarms, the label '--' appears**);
- **rE**: Firmware release.

SET THE SETPOINT: To view the Setpoint value, press the button when the label **SP** is displayed. The Setpoint value appears on the display. To change the Setpoint value, press the buttons and within 15 sec. To confirm the change, press or .

LOCK SETPOINT CHANGE: The keypad can be locked by suitably programming the parameter **y4**. If the keypad is locked, it is possible to access the **Machine status** menu by pressing the button and view the Setpoint, but the value cannot be changed. To unlock the keypad, repeat the procedure used for locking it.

PROBE DISPLAY: If the labels **S1** or **S2*** are present, pressing the button displays the value measured by the associated probe.

NOTE: • (*) **S2** is only present in models **nEW 971/971 SPDT/974**;
• the displayed value **CANNOT** be changed.

'PROGRAMMING' MENU

To enter the 'Programming' menu, press the button for more than 5 seconds. If required, an access PASSWORD **Ur** will be requested for the **User** parameters and **In** for the **Installer** parameters (see the **PASSWORD** paragraph).

'**User**' parameters: Upon access, the display shows the first parameter (**C1**).

Press and to scroll all the parameters for the current level. Select the desired parameter by pressing .

Press and to change it and or to save the change.

'**Installer**' parameters: Upon access, the display shows the first parameter (**C1**).

Press and to scroll all the parameters for the current level. Select the desired parameter by pressing .

Press and to change it and or to save the change.

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

KEY FUNCTIONS

Through parameters **H1**, **H2** and **H3**, it is possible to assign one of the 3 functions listed below:

- **0** = Disabled;
- **1** = Manual defrost (label **dF**);
- **2** = Energy Saving (label **EA**);
- **3** = Stand-by (label **St**);
- **4** = Not used.

Key functions can be activated as follows:

1. Press the corresponding key for at least 6 seconds;
2. When the label associated to the function appear, press the SEt key for at least 2 seconds. If conditions is allowed, the function will be activated.

To disable the function, repeat the same procedure.

With the instrument in **stand-by** mode, its operation depends on the **y3** parameter:

- **y3=0**: display off; the regulators and the icons are active and the instrument signals possible alarms by activating the alarm icon. (to display the alarm, access the **AL** folder of the **Machine status** menu);
- **y3=1**: display off; the regulators and the alarms are blocked;
- **y3=2**: the display shows the label **OF**; the regulators and alarms are blocked.

Manual activation of the defrost cycle is achieved by setting the Manual Defrost function (**Hx** = 1) at the press of a button and following the activation procedure described above. If the conditions for defrosting are not met:

- the parameter **P5 ≠ 0**;
- the temperature of the evaporator probe Pb2 is higher than the end of defrost temperature (only **nEW 971/971 SPDT/974**).

The display flashes 3 times to signal that the operation will not be carried out.

SMART DEFROST

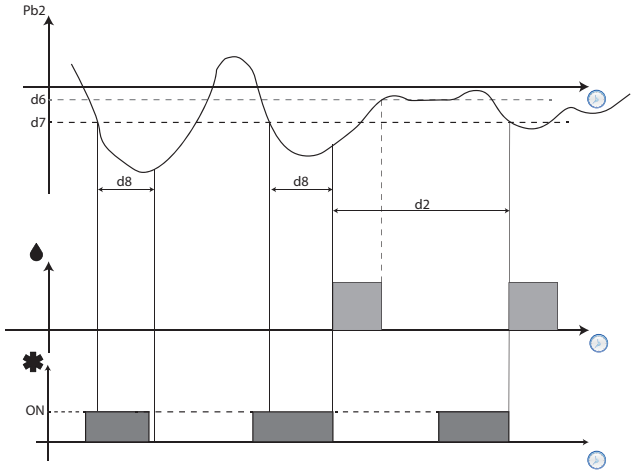


Fig.1 Smart Defrost Operation Diagram

Smart defrost will activate if:

- Temperature Pb2 < **d7;**
- The compressor must be on for at least a time > **d8**.

In the case of a defrosting probe in error or not connected, smart defrost can be started automatically if **d2** > 0.

Smart defrost will not activate if:

- Temperature Pb2 > **d7.**

FILTER DISPLAY

The temperature shown on the display can be filtered through a low-pass filter the input for which is the probe temperature.
If the temperature exceeds -5.0 °F for longer than 15 min, the filter is automatically deactivated.

The filter is reactivated when the temperature read by the probe falls below -5.0 °F. Below is an example of filter operation:

FILTER DISPLAY OPERATION																	
J1 = 10; J2 = 1.						J1 = 10; J2 = 4.						J1 = 10; J2 = 7.					
Interval	Time [sec]	Time [min]	Δ%	Filtered Disp. temp.	Actual Display	Interval	Time [sec]	Time [min]	Δ%	Filtered Disp. temp.	Actual Display	Interval	Time [sec]	Time [min]	Δ%	Filtered Disp. temp.	Actual Display
0	0	0.0	0.0%	35.00	35	0	0	0.0	0.0%	35.00	35	0	0	0.0	0.0%	35.00	35
1	10	0.2	20.0%	36.00	36	1	10	0.2	2.5%	35.13	35	1	10	0.2	0.3%	35.02	35
2	20	0.3	36.0%	36.80	37	2	20	0.3	4.9%	35.25	35	2	20	0.3	0.6%	35.03	35
3	30	0.5	48.8%	37.44	37	3	30	0.5	7.3%	35.37	35	3	30	0.5	0.9%	35.04	35
4	40	0.7	59.0%	37.95	38	4	40	0.7	9.6%	35.48	35	4	40	0.7	1.2%	35.06	35
5	50	0.8	67.2%	38.36	38	5	50	0.8	11.9%	35.59	36	5	50	0.8	1.5%	35.07	35
6	60	1.0	73.8%	38.69	39	6	60	1.0	14.1%	35.70	36	6	60	1.0	1.8%	35.09	35
7	70	1.2	79.0%	38.95	39	7	70	1.2	16.2%	35.81	36	7	70	1.2	2.1%	35.10	35
8	80	1.3	83.2%	39.16	39	8	80	1.3	18.3%	35.92	36	8	80	1.3	2.4%	35.12	35
9	90	1.5	86.6%	39.33	39	9	90	1.5	20.4%	36.02	36	9	90	1.5	2.7%	35.13	35
10	100	1.7	89.3%	39.46	39	10	100	1.7	22.4%	36.12	36	10	100	1.7	3.0%	35.15	35
…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
35	350	5.8	100.0%	40.00	40	35	350	5.8	58.8%	37.94	38	35	350	5.8	10.0%	35.50	35
36	360	5.0	100.0%	40.00	40	36	360	5.0	59.8%	37.99	38	36	360	5.0	10.3%	35.51	36

Tab.1 Example of filter display operation

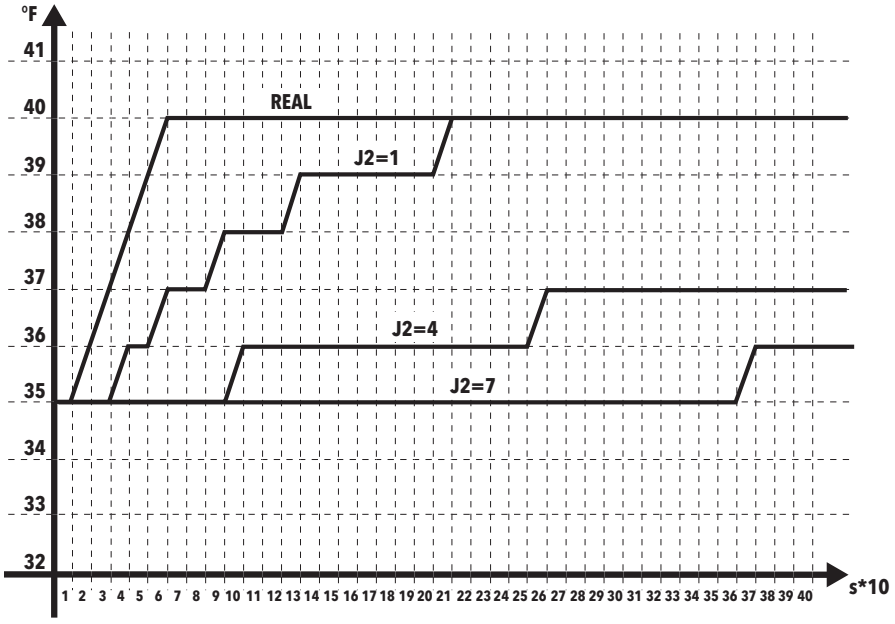


Fig.2 Filter Display Operation Diagram

The diagram shows an example of filter operation with regard to the real change in (unfiltered) temperature and the following conditions:

- **J1** = 10 s;
- **J2** = 1 , 4 , 7.

PARAMETERS TABLE

PAR.	DESCRIPTION	RANGE	M.U.	nEW MODELS				LEVEL
				961	971	971 SPDT	974	
SP	Temperature regulation SEtpoint. **The SEtpoint is displayed only in the 'Machine Status' menu.**	C2 ... C3	°C/°F	35.0	35.0	35.0	35.0	/
	COMPRESSOR							
C1	Compressor relay activation differential. The compressor stops when reaching the entered Setpoint (upon indication of the regulation probe) and restarts at a temperature value equal to the setpoint plus the value of the differential. **NOTE: C1 cannot have the value 0.**	1.0 ... 30.0	°C/°F	2.0	2.0	2.0	2.0	User/Inst
C2	Minimum value that can be attributed to the setpoint. **NOTE: The two sets are interdependent: C2 cannot be greater than C3 and vice versa.**	-58.0 ... C3	°C/°F	-58.0	-58.0	-58.0	-58.0	User/Inst
C3	Maximum value that can be attributed to the setpoint. **NOTE: The two sets are interdependent: C3 cannot be less than C2 and vice versa.**	C2 ... 199	°C/°F	99.0	199	199	199	User/Inst
C4	Select Cool/Heat. **0**=Cool; **1**=Heat.	0/1	flag	0	0	0	0	User/Inst
C5	Temperature value to be added algebraically to the setpoint in the case of an enabled reduced set (Economy function).	-30.0 ... 30.0	°C/°F	3.0	3.0	3.0	3.0	Inst
P0	Regulator switch-on time for inoperable probe: • if **P0 = 1** and **P1 = 0**, the compressor always remains ON; • if **P0 > 0** and **P1 > 0**, it operates in duty cycle mode.	0 ... 99	min	1	1	1	1	Inst
P1	Regulator switch-off time for inoperable probe: • if **P1 = 1** and **P0 = 0**, the compressor always remains OFF; • if **P0 > 0** and **P1 > 0**, it operates in duty cycle mode.	0 ... 99	min	1	1	1	1	Inst
P2	Compressor relay activation delay time from call.	0 ... 99	sec	0	0	0	0	Inst
P3	Delay time after switch off and the next switch on.	0 ... 99	min	0	0	0	0	Inst
P4	Delay time between two subsequent compressor starts.	0 ... 99	min	0	0	0	0	Inst
P5	Output activation delay time from the switch on of the instrument or after a power outage. **0** = Not active.	0 ... 99	min	0	0	0	0	Inst
P6	Compressor OFF before to activate the defrost output.	0 ... 99	min	0	0	0	0	User/Inst
P7	Compressor ON before to activate the defrost output.	0 ... 99	min	0	0	0	0	User/Inst
P8	Minimum compressor time ON.	0 ... 99	min	0	0	0	0	User/Inst
P9	Maximum compressor time ON.	0 ... 99	min	0	0	0	0	User/Inst
	DEFROSTING							
d0	Selection of the defrosting interval calculation mode: **0** = Defrost disabled; **1** = Hours of compressor operation (DIGIFROST® method); defrosting active ONLY with compressor on; **NOTE: the operation time of the compressor is calculated independently of the evaporator probe (the calculation is active even if the evaporator probe is absent or inoperable).** **2** = Hours of device operation, the defrosting calculation is always active when the machine is on and starts at every power-on of instrument; **3** = Stop compressor. Each time the compressor stops, a defrosting cycle is performed in function of **d1**; **4** = Temperature. Defrost is active when the evaporator temperature remains below the threshold of parameters **d7** for a period of **d8**; (only **nEW 971/971 SPDT/974**); **5** = Smart Defrost. Defrost is active when the Evaporator temperature remains below the threshold of parameters **d7** for a period of **d8** and the compressor is on; (See **'Smart Defrost'**); **6** = Not used.	0 ... 6	num	2	2	2	2	Inst
d1	Type of defrost. **0** = Electric defrost - end of defrost due to time-out (time **d3**); **1** = Cycle inversion defrost (hot gas) - end of defrost due to time-out (time **d3**); **2** = Electric defrost - end defrost due to temperature (parameter **d6**) (only **nEW 971/971 SPDT/974**); **3** = Cycle inversion defrost (hot gas) - end defrost due to temperature (parameter **d6**) (only **nEW 971/971 SPDT/974**); **4**= Not used.	0 ... 4	num		2	2	2	User/Inst
d2	Time interval between the start of two subsequent defrost operations. **0** = Function disabled (**defrost NEVER takes place**).	0 ... 99	hours	6	6	6	6	User/Inst
d3	Defrost time-out; determines the maximum defrost duration.	1 ... 99	min	30	30	30	30	User/Inst
d5	Delay time for starting the first defrost from the call.	0 ... 99	min	0	0	0	0	Inst
d6	End of defrost temperature (measured by the evaporator probe).	-58.0 ... 199	°C/°F		45.0	45.0	45.0	User/Inst
d7	Temperature threshold for switching on Smart defrost.	-58.0 ... 199	°C/°F	-30.0	-30.0	-30.0	-30.0	Inst

PAR.	DESCRIPTION	RANGE	M.U.	nEW MODELS				LEVEL
				961	971	971 SPDT	974	
d8	Time the evaporator temperature must remain below the threshold - Smart defrost.	1 ... 99	min	1	1	1	1	Inst
d9	Determines if upon switching on, the instrument must activate defrosting (providing that the temperature measured on the evaporator permits it). **0** = No, does not defrost when switching on; **1** = Yes, defrosts when switching on.	0/1	flag	0	0	0	0	Inst
	FANS							
F0	Evaporator fan operating mode. The valve status will be: When the fans operate in duty-cycle, the parameters **F7** and **F8** determine the fan ON and OFF times. **F0** / **COMPRESSOR ON** / **COMPRESSOR OFF** 0 / Fan OFF / Fan OFF 1 / Fan always ON / Fan always OFF 2 / Fan always ON / Fan in duty cycle 3 / Fan in duty cycle / Fan in duty cycle 4 / Temperature-controlled fan - if probe 2 is inoperable or not present, fan always ON / Fan always OFF 5 / Temperature-controlled fan - if probe 2 is inoperable or not present, fan always ON / Temperature-controlled fan - if probe 2 is inoperable or not present, fan always OFF 6 / Temperature-controlled fan - if probe 2 is inoperable or not present, fan in duty cycle / Temperature-controlled fan - if probe 2 is inoperable or absent, fan in duty cycle **NOTE:** Contact the sales office if the application is required for use for more than 100k cycles.	0 ... 6	num		1	1	1	Inst
F1	Characterizes the parameter **F2** which can be expressed as an absolute temperature value or as a value relative to the Setpoint. **0** = Absolute; **1** = Relative.	0/1	flag		0	0	0	Inst
F2	Fan stopping temperature; if Pb2 > **F2**, the fans are stopped.	-58.0 ... 199	°C/°F		50.0	50.0	50.0	User/Inst
F3	Fan activation differential.	1.0 ... 25.0	°C/°F		2.0	2.0	2.0	Inst
F4	Dripping time.	0 ... 99	min		2	2	2	User/Inst
F5	Used to select or deselect the exclusion of the evaporator fans during defrosting. **0** = No; **1** = Yes.	0/1	flag		1	1	1	User/Inst
F6	Evaporator fans switch-Off delay after compressor disabled.	0 ... 99	min		0	0	0	User/Inst
F7	Fan ON time per duty cycle. **NOTE:** Contact the sales office if the application is required for use for more than 100k cycles.	0 ... 99	secx10		30	30	30	Inst
F8	Fan OFF time per duty cycle. **NOTE:** Contact the sales office if the application is required for use for more than 100k cycles.	0 ... 99	secx10		30	30	30	Inst
	DOOR MICRO SWITCH							
r0	Enabling of user shutoff upon activation of the door micro switch (door open). **0** = Fan and compressor deactivation; **1** = Fan deactivation. Fan deactivation after time **r1**; **2** = Fan and compressor deactivation. Fan deactivation after time **r1**; **3** = Compressor deactivation; **4** = Fan deactivation after time **r4** and compressor deactivation after time **r1**; **5** = Fan and compressor deactivation. Fan reactivation after time **r4** and compressor reactivation after time **r1**.	0 ... 5	num	0	0	0	0	Inst
r1	Door open alarm activation delay time (with **r2**=1). Compressor shutoff (**r0** = 1 or 4) / activation (**r0** = 2 or 5) delay after door opening / closing.	0 ... 99	min	0	0	0	0	Inst
r2	Enables/disables door open alarm. **0** = Alarm disabled; **1** = Alarm enabled.	0/1	flag	0	0	0	0	Inst
r3	Fan OFF stay time after door closing.	0 ... 99	min	0	0	0	0	Inst
r4	Fan shutoff (**r0** = 4) / activation (**r0** = 5) delay from door opening / closing.	0 ... 99	min		0	0	0	Inst
	ALARMS							
A0	Parameter **A2** and **A3** mode understood as absolute temperature value or as a differential with respect to the Setpoint. **0** = Absolute value; **1** = Relative value.	0/1	flag	0	0	0	0	Inst
A1	Alarm activation differential.	1.0 ... 25.0	°C/°F	2.0	2.0	2.0	2.0	Inst
A2	Maximum alarm. Temperature value (understood as the distance from the Setpoint or as an absolute value in function of **A0**) that when exceeded, causes alarm activation. See '**Max/Min temperature alarms**'.	A3 ... 199	°C/°F	99.0	99.0	99.0	99.0	User/Inst
A3	Minimum alarm. Temperature value (understood as the distance from the Setpoint or as an absolute value in function of **A0**) that when undershot, causes alarm activation. See '**Max/Min temperature alarms**'.	-58.0 ... A2	°C/°F	-50.0	-50.0	-50.0	-50.0	User/Inst
A4	Alarm exclusion time when switching on the instrument, after a power outage. **Refers only to high (A2) and low (A3) temperature alarms.**	0 ... 99	minx10	0	0	0	0	Inst

PAR.	DESCRIPTION	RANGE	M.U.	nEW MODELS				LEVEL
				961	971	971 SPDT	974	
A5	Exclusion time for temperature alarms after a thaw cycle.	0 ... 99	minx10	0	0	0	0	Inst
A6	Exclusion time high and low temperature alarms after closing the door.	0 ... 99	minx10	0	0	0	0	Inst
A7	Temperature alarm signaling delay time. **Refers only to high (A2) and low (A3) temperature alarms.**	0 ... 99	min	0	0	0	0	User/Inst
A9	Regulators blocked by external alarm. **0** = Does not block any resource; **1** = Blocks the compressor; **2** = Blocks the compressor and defrosting; **3** = Blocks the compressor, defrosting and fans.	0/1/2/3	num	0	0	0	0	Inst
	DISPLAY							
Y0	Select °C or °F to display the value from the probes (**0** = °C, **1** = °F). **NOTE: changing from °C to °F or vice versa does NOT change the setpoint, differential values, etc. (example: set=10°C becomes 10°F).**	0/1	flag	1	1	1	1	Inst
Y1	Calibration 1. Positive or negative temperature values that are summed to those read by **Pb1**. This sum is used for the displayed temperature as well as for the regulation.	-30.0 ... 30.0	°C/°F	0.0	0.0	0.0	0.0	User/Inst
Y2	Calibration 2. Positive or negative temperature values that are summed to those read by **Pb2**. This sum is used for the displayed temperature as well as for the regulation.	-30.0 ... 30.0	°C/°F		0.0	0.0	0.0	User/Inst
Y3	Stand-by operating mode. **0** = Display off; the regulators and icons are active and the instrument signals possible alarms by activating the alarm icon; **1** = Display off; the regulators and the alarms are blocked; **2** = The display shows the label 'OF'; the regulators and alarms are blocked.	0 ... 2	num	0	0	0	0	Inst
Y4	Setpoint change lock. It is still possible to enter parameter programming and change them, including the status of this parameter in order to unlock the keypad. **0** = No; **1** = Yes.	0/1	flag	0	0	0	0	User/Inst
Y5	Selection of the type of value to show on the display. **0** = Setpoint; **1** = Pb1 probe; **2** = Pb2 probe.	0/1/2	num	1	1	1	1	Inst
Y6	Display mode during defrosting. **0** = Displays the value selected with **y5** (value on the display without changes); **1** = Blocks the reading of the value shown on the display when defrosting is activated and until **SP** is reached (or until end cycle **y7**); **2** = Shows **dE** during defrosting and until **SP** is reached (or until end cycle **y7**).	0/1/2	num	2	2	2	2	User/Inst
Y7	Display unlocking time-out value - label **dE**.	0 ... 99	min	30	30	30	30	User/Inst
o9	Display with decimal point. **0** = No (only integers); **1** = Yes (display with decimal).	0/1	flag	1	1	1	1	Inst
Y8	PAssword 1. When enabled (**y8≠0**) it represents the access key for the user parameters (**User**).	0 ... 99	num	0	0	0	0	User/Inst
Y9	PAssword 2. When enabled (**y9≠0**) it represents the access key for the installer parameters (**Inst**).	0 ... 99	num	15	15	15	15	Inst
	CONFIGURATION - NOTE: switch the device off and on again each time the parameter configuration is changed.							
i2	**Pb2** input configuration. **0** = Not present; **1** = Analog input (Probe); **2** = Digital input (D.I.).	0/1/2	num		1	1	1	Inst
i3	Digital input 1 configuration. **0** = Disabled; **1** = Reduced set / energy saving; **2** = Defrosting; **3** = Stand-by; **4** = Door micro switch; **5** = Reduced set / AUX; **6** = External alarm; **7** = AUX; **8** = Not used.	0 ... 8	num	0	0	0	0	Inst
i4	Digital input 2 configuration (only if **i2 = 2**). Analogous to a **i3**.	0 ... 8	num		0	0	0	Inst
i5	Digital input 1 polarity. **0** = NO (active due to open contact); **1** = NC (active due to contact closed).	0/1	flag	0	0	0	0	Inst
i6	Digital input 2 polarity. **0** = NO (active due to open contact); **1** = NC (active due to contact closed).	0/1	flag		0	0	0	User/Inst
i7	Digital input activation delay.	0 ... 99	secx10	0	0	0	0	Inst

PAR.	DESCRIPTION	RANGE	M.U.	nEW MODELS				LEVEL
				961	971	971 SPDT	974	
o1	Digital output 1 configuration. **0** = Disabled; **1** = Compressor; **2** = Defrosting; **3** = Evaporator fans; **4** = AUX; **5** = Alarm; **6** = Stand-by.	0 ... 6	num	1	1	1	1	Inst
o2	Digital output 2 configuration. Analogous to a **o1**.	0 ... 6	num		2		3	Inst
o3	Digital output 3 configuration. Analogous to a **o1**.	0 ... 6	num			2	2	Inst
L1	Association of auxiliary output regulator (AUX). **0** = Not associated; **1** = Associated to the status of the door micro switch. Regulator ON when the digital input is active and regulator OFF when the digital input is deactivated; **2** = Not used.	0/1/2	num		0	0	0	Inst
H1	Configuration of the **UP** key (see paragraph **Key Functions**). **0** = Disabled; **1** = Manual defrosting; **2** = Set-point offset / energy saving; **3** = Stand-by; **4** = AUX.	0 ... 4	num	0	0	0	0	User/Inst
H2	Configuration of the **DOWN** key (see paragraph **Key Functions**). **0** = Disabled; **1** = Manual defrosting; **2** = Set-point offset / energy saving; **3** = Stand-by; **4** = AUX.	0 ... 4	num	0	0	0	0	Inst
H3	Configuration of the **ESC** key (see paragraph **Key Functions**). **0** = Disabled; **1** = Manual defrosting; **2** = Set-point offset / energy saving; **3** = Stand-by; **4** = AUX.	0 ... 4	num	0	0	0	0	User/Inst
J1	Sampling interval for filtering 1.	1 ... 250	sec	1	1	1	1	Inst
J2	Disable/select temperature filter mode.	0 ... 7	num	0	0	0	0	Inst
Cu	Serial number.	(*)	num	0	0	0	0	User/Inst
tb	tAble of parameters. Reserved: **read only parameter**.	/	/	/	/	/	/	User/Inst
	COPY CARD							
UL	Upload. Transfer of the programming parameters from the instrument to Copy Card.	/	/	/	/	/	/	User/Inst

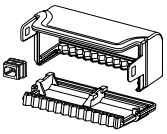
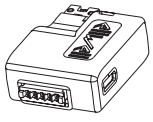
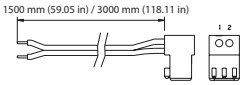
(*) For **nEW 961** models: 0 ... 99; for **nEW 971/971 SPDT/974** models: 0 ... 199.

DEVICE MANAGER

Connection between Device Manager and device can be made using the CopyCard for nEW (optional) only.
The communication settings for correct operation are as follows:

- Protocol: **Modbus**
- Speed: **9600**
- Parity: **None**
- Stop Bit: **1 BIT**

ACCESSORIES

	**Rear protection (IP22)** The kit includes: • protective top cover for the probes and relay outputs • lower cover • protective cap for the CopyCard connector
	**CopyCard for nEW** The new Copycard for the **nEW** has the following connectors: • edge connector for the connection to the instrument • mini-usb connector for the connection to the power supply (using a network-USB power supply or a USB battery) • TTL connector for the connection to DMI
	**Cable for the digital inputs** A 1.5 m (4.92 ft) & 3 m (9.84 ft) cable is available with a LUMBERG connector for the connection of the digital inputs.
	**NTC probe** A 1.5 m (4.92 ft) & 3 m (9.84 ft) NTC probe is available with a point terminal to connect to analog inputs

RESPONSIBILITY AND RESIDUAL RISKS

ELIWELL CONTROLS SRL is not liable for damage caused by:

- installation/use other than what is intended and, in particular, in deviation from the safety regulations set forth by the standards and/or included in this document;
- use on panels that do not guarantee suitable protection against electrical shock, water and dust in the assembly conditions;
- use on panels that permit access to hazardous parts without the use of tools;
- product tampering and/or alteration;
- installation/use in panels that do not comply with standards and the provisions of current law.

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The same applies to people or companies involved in the creation and preparation of this manual. ELIWELL CONTROLS SRL reserves the right to make any design or functional change to this document without notice and at any moment.

CONDITIONS OF USE

Permitted use

For purposes of instrument safety, it must be installed and used in accordance with the provided instructions and in particular, in normal conditions, dangerous energized parts must not be accessible. The device must be suitably protected against water and dust based on the application and must also be accessible only with the use a tool (with the exception of the front panel). The device is suited for being integrated in equipment for domestic use and/or similar for refrigeration purposes and has been checked in relation to aspects regarding safety on the basis of the harmonized European standards of reference.

Prohibited use

Any use other than what is permitted is in fact prohibited. Please note that the relay contacts provided are a functional type and are subject to faults: any protective devices indicated by product regulations or suggested as a result of common sense with regard to obvious safety needs must be implemented outside of the instrument.

DISPOSAL

The equipment (or product) must be collected separately in compliance with current regulations on disposal.

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MADE IN ITALY

NSF COMPONENT

Certified System ISO 9001

ENVIRONMENTAL SYSTEM CERTIFICATION ISO 14001 DNV

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