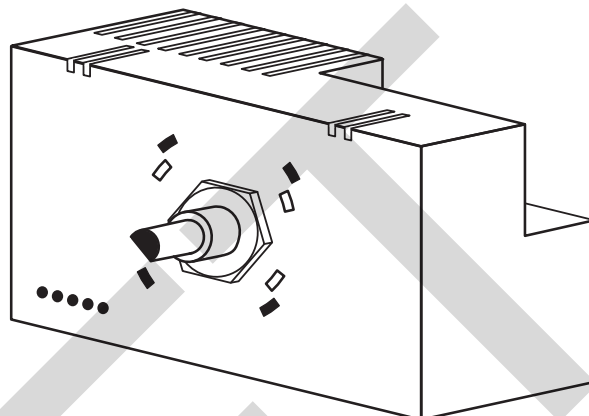
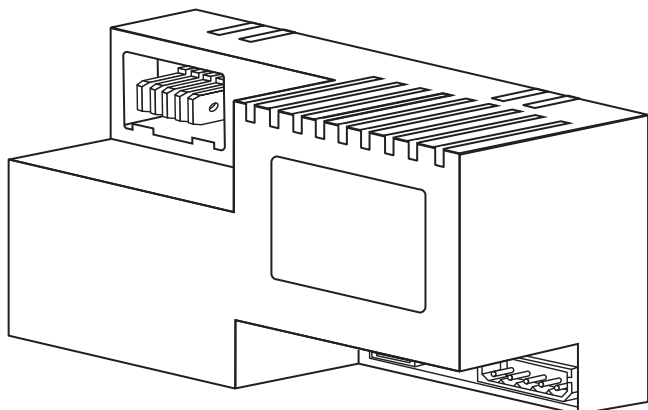


# RB 261 - RB 271

Electronic thermostat for refrigeration units

**eliwell**  
by Schneider Electric



## USER INTERFACE

Typical applications could be: freezer, bottle chiller, ice cream cabinet.

The display is not usually required in these markets. In fact, the device does not have a user interface with display.

## FUNCTIONS

The main function of the device is to control the temperature of a cooling device, using the temperature probe, on the basis of a setpoint. The setpoint can be set by:

1. remote setting via serial communication port (Docking Station or Bluetooth Dongle)
2. manual adjustment via external knob (Models **RB 261/KN** and **RB 271/KN**)

**NOTE:** The knob is used to adjust the trigger values based on the temperature to be reached.

The device can work in two different operating modes:

- temperature adjustment (controlling the compressor)
- defrosting (supplying a resistive load)

## ELECTRICAL CONNECTIONS

### **DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- Turn off all devices, including connected devices, before removing any covers or doors, or installing/uninstalling accessories, hardware, cables, or wires.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Before powering the unit back up, fit back and fix all the covers, hardware components and wiring.
- Check the earthing connections on all earthed devices.
- Use only the specified voltage when operating this equipment and any associated products.
- Do not disassemble, repair, or modify this equipment.

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

### **DANGER**

#### **LOOSE WIRING CAN RESULT IN ELECTRIC SHOCK AND FIRE**

- Insulate electrical connections with suitable Faston covers.
- Make sure the wires are properly connected to the female Fastons before carrying out the wiring.

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

Use copper conductors (obligatory).

### **DANGER**

#### **POTENTIAL OF OVERHEATING AND FIRE**

Use this device only at the specified voltage.

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

This device is designed to operate outside of any dangerous location.  
Install this device only in areas known to be free from dangerous surroundings.

**⚠ DANGER**

**POTENTIAL FOR EXPLOSION**

- Install and use this equipment in non-hazardous locations only.
- Do not exceed the temperature and humidity ranges defined in the technical specification.
- Do not install in environments in which condensation may form.

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

Electrical equipment must be installed, used and repaired by qualified personnel only.  
Eliwell accepts no responsibility for any consequences resulting from the use of this material.

**⚠ DANGER**

**UNINTENDED EQUIPMENT OPERATION DUE TO CONNECTIONS**

Every terminal on the instrument has a dangerous electric potential. Only use probes with double insulation.

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

**⚠ 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 and secured by a keyed or tooled locking mechanism.
- 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 unless the equipment is otherwise designated as functional safety equipment and conforming to applicable regulations and standards.
- Do not disassemble, repair, or modify this equipment.

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

**⚠ NOTICE**

**UNINTENDED EQUIPMENT OPERATION DUE TO ELECTROSTATIC DISCHARGE**

Before handling the device, always discharge the static electricity from the body by touching an earthed surface or type-approved antistatic mat.

**Failure to follow these instructions can result in equipment damage.**

**MOUNTING - DIMENSIONS**

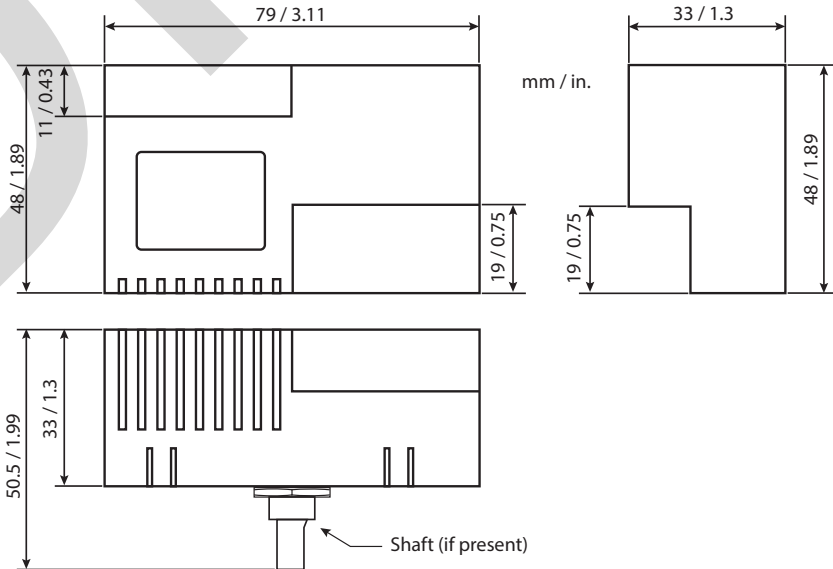
The device is designed for panel mounting.

The device can be mounted from the front, on the outside of the refrigerator cabinet, to allow the user to set the thermostat using the knob (Models **RB 261/KN** and **RB 271/KN**).

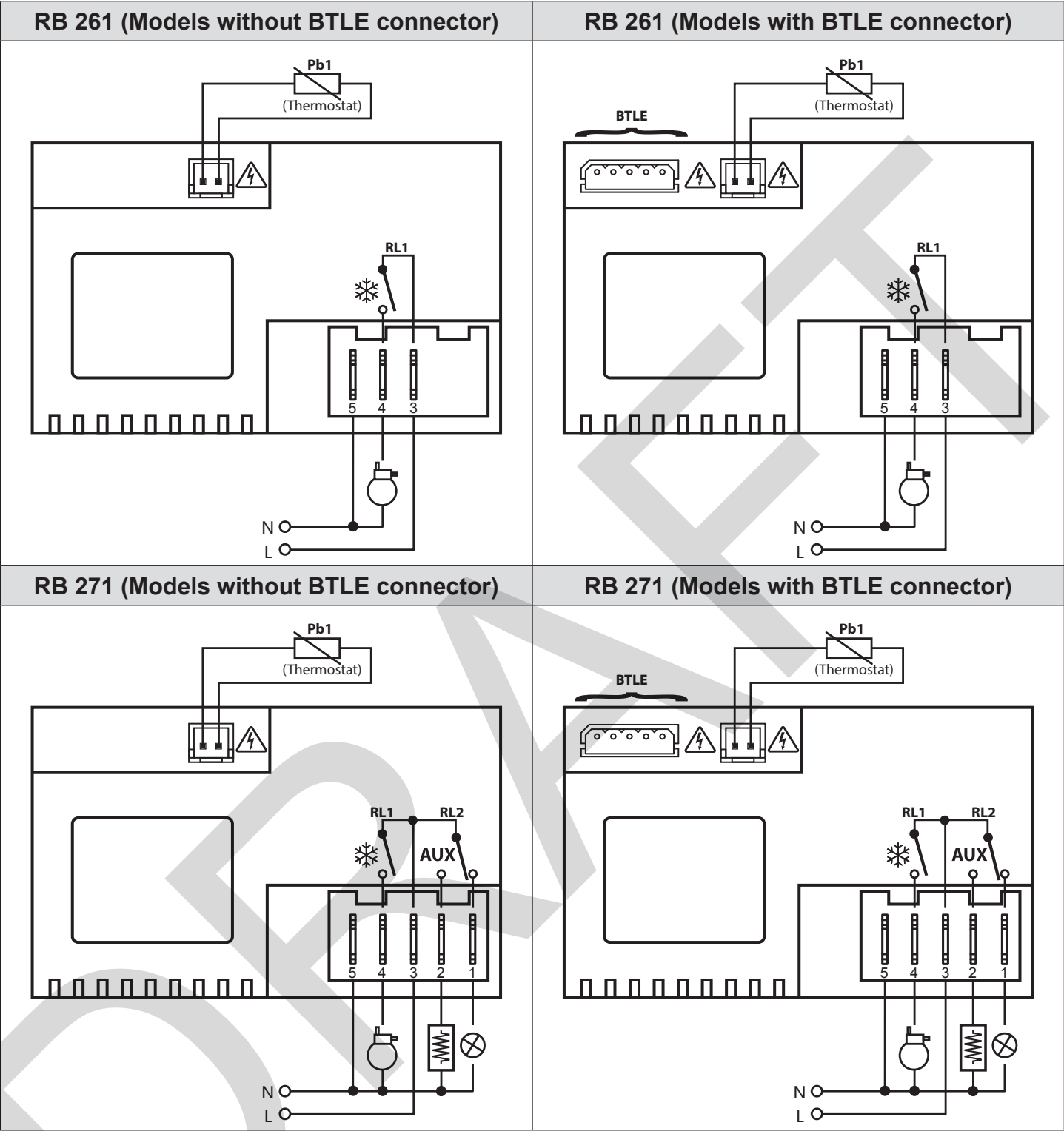
Otherwise, the device can be mounted inside, on the back of the freezer, and can only be set by the installer using serial port communication via BTLE. In this case the product operates blindly, without a shaft or knob (Models **RB 261** and **RB 271**).

In both cases, a plastic bracket or alternatively a standard M10 nut should be used to fix it to the cabinet.

Do not mount the device in places exposed to high levels of dirt or humidity. The device is suitable for use in environments with normal levels of pollution. Keep the area around the instrument cooling slots adequately ventilated.



CONNECTIONS



Terminal	Function		
1-3	Relay RL2 NC (AUX 2)	3	Line Phase Input
2-3	Relay RL2 NA (AUX 1)	5	Line Neutral Input
4-3	Relay RL1 (Compressor)	N-L	Power line 230 Vac
Pb1	Probe Pb1	BTLE	Connector for the Bluetooth Dongle

**DANGER**

**UNINTENDED EQUIPMENT OPERATION DUE TO CONNECTIONS**  
The BTLE port is only compatible with the Bluetooth Dongle and connection should take place while the device is not powered.  
Do not connect the DMI directly as doing so may damage the PC ports.  
**Failure to follow these instructions will result in death or serious injury.**

## TECHNICAL DATA

The product also complies with the following harmonized standards: EN 60730-1 and EN 60730-2-9.

Device construction:	Built-in electronic control device
Application:	Operating control (not safety) device
Mounting method:	Panel mounting, with any necessary hole for knob shaft (Ø 6 mm - 0.24 in.)
Type of action:	1.B
Pollution class:	2
Over-voltage category:	II
Nominal pulse voltage:	2500 V
Power supply (non-insulated):	230 Vac (±10%) 50 Hz
Environmental operating conditions:	Temperature: -5...55°C ( 23...131°F) / Humidity: 10...90% RH (non-condensing)
Transportation and storage conditions:	Temperature: -30...85°C (-22...185°F) / Humidity: 10...90% RH (non-condensing)
Material class:	IIla
Fire resistance category:	D
Software class:	A
Operating time:	Long period

Loads:

Model	Relay	Output Output	EU 230 Vac	USA max 240 Vac	Interface User	Communication (*)
RB 261	RL1	Compressor	10(4) A	4 FLA - 20 LRA	No display	with Docking Station
	RL1	Compressor	10(4) A	4 FLA - 20 LRA	No display	with Bluetooth Dongle
RB 261/KN	RL1	Compressor	10(4) A	4 FLA - 20 LRA	Knob	with Docking Station
	RL1	Compressor	10(4) A	4 FLA - 20 LRA	Knob	with Bluetooth Dongle
RB 271	RL1	Compressor	10(4) A	4 FLA - 20 LRA	No display	with Docking Station
	RL2	Auxiliary	3(1.3) A	4 FLA - 8 LRA		
	RL1	Compressor	10(4) A	4 FLA - 20 LRA	No display	with Bluetooth Dongle
	RL2	Auxiliary	3(1.3) A	4 FLA - 8 LRA		
RB 271/KN	RL1	Compressor	10(4) A	4 FLA - 20 LRA	Knob	with Docking Station
	RL2	Auxiliary	3(1.3) A	4 FLA - 8 LRA		
	RL1	Compressor	10(4) A	4 FLA - 20 LRA	Knob	with Bluetooth Dongle
	RL2	Auxiliary	3(1.3) A	4 FLA - 8 LRA		

**NOTE:** Check the power supply rating on the device label.

## FURTHER INFORMATION

### Mechanical Characteristics

Container:	PC+ABS UL94 V-0 resin casing
Dimensions:	front panel 79x48 mm (3.11x1.89 in.); depth 33 mm (1.30 in.) (without shaft)
Terminals:	Faston (6.3 mm / 0.25 in.) and quick disconnect (probe)
Connectors:	{ - Quick disconnect JST (used to connect probe Pb1) - TTL serial port (used to connect the Bluetooth Dongle)

### Input Characteristics

Analogue input:	1 NTC (10 KΩ 1% - BETA 3435)
Display range:	-50 ... 110°C (-58 ... 199°F)
Accuracy:	Better than 0.5% of integral-scale + 1 digit
Resolution:	0.1°C (0.1°F)
Sensor protection rating:	IP68 (double insulation)
Casing diameter:	5x20 mm (0.2x0.79 in.)
Cable type	thermoplastic rubber (outer) + polypropylene (inner)
Length:	3 m (118.11 in)

**NOTE:** The technical specifications stated in this document regarding the measurement (range, accuracy, resolution, etc.) refer strictly to the instrument and not to any accessories provided, such as the probes.

## PARAMETER TABLE

PAR.	DESCRIPTION	RANGE	UM	DEFAULT
P02	Configuration of analogue input 2. <b>0</b> = disabled; <b>1</b> = Analogue input.	0/1	flag	0
d02	Configuration of digital input 2. <b>0</b> = disabled; <b>1</b> = defrost; <b>2</b> = alarm.	0/1/2	num	0
C01	Calibration of probe Pb1.	-30.0...30.0	°C/°F	0.0
LSE	Minimum value that can be assigned to the set point.	-58.0...99.0	°C/°F	-5.0
HSE	Maximum value that can be assigned to the set point.	-58.0...99.0	°C/°F	5.0
LdF	Low temperature differential.	0.1...30.0	°C/°F	2.0
HdF	High temperature differential.	0.1...30.0	°C/°F	2.0
Ont	Compressor switch-on time in the event of probe error.	0...255	min	1
Oft	Compressor switch-off time in the event of probe error.	0...255	min	0
dOn	Compressor relay activation delay after request.	0...255	s	0
dOF	Delay after switching off and subsequent switch-on.	0...255	s	0
dbi	Delay between two consecutive compressor switch-ons.	0...255	min	0
OdO	Delay in activating outputs after the instrument is switched on or after a power failure. <b>0 = not active.</b>	0...255	min	0
dCt	Selects the count mode for the defrost interval. <b>0</b> = defrost disabled; <b>1</b> = compressor running time; <b>2</b> = instrument running time; <b>3</b> = compressor stop time.	0...3	num	2
dit	Interval between the start of two consecutive defrost cycles. If <b>dt0</b> = 0, the value will be in hours; if <b>dt0</b> = 1, the value will be in minutes.	0...255	see <b>dt0</b>	6
dEt	Defrost timeout; determines the maximum defrost duration. If <b>dt0</b> = 0, the value will be in minutes; if <b>dt0</b> = 1, the value will be in seconds.	0...255	see <b>dt0</b>	30
dt0	Unit of measurement for parameters <b>dit</b> and <b>dEt</b> .	0/1	flag	0
dOH	Defroststart delay time after request.	0...255	min	0
dPO	Determines whether or not the instrument defrosts at power-up. <b>0</b> = no, does not start defrost at power-on; <b>1</b> = yes, starts defrost at power-on.	0/1	flag	0
Att	Parameters <b>HAL</b> and <b>LAL</b> mode as the absolute temperature value or differential in relation to the Setpoint. <b>0</b> = absolute value; <b>1</b> = relative value. <b>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).</b>	0/1	flag	1
HAL	Maximum alarm. Temperature value (either as distance from <b>SEt</b> or as an absolute value based on <b>Att</b> ) above which the probe will trigger activation of the alarm signal.	LAL...99.0	°C/°F	50.0
LAL	Minimum alarm. Temperature value (either as distance from <b>SEt</b> or as an absolute value based on <b>Att</b> ) beneath which the probe will trigger activation of the alarm signal.	-58.0...HAL	°C/°F	-50.0
AFd	Alarms cut-in differential.	0.1...25.0	°C/°F	1.0
PAO	Alarm exclusion time after device is switched on following a power failure. <b>This parameter refers to high/low temperature alarms only.</b>	0...255	min*10	18
DAO	Temperature alarm exclusion time after defrost.	0...255	min*10	6
tAO	Delay preceding temperature alarm signal. <b>This parameter refers to high/low temperature alarms only.</b>	0...255	min	0
dro	Selection of °C or °F to display the probe value. <b>0</b> = °C, <b>1</b> = °F. <b>Switching between °C and °F or vice-versa DOES NOT modify the setpoint, differential, etc.</b>	0/1	flag	0
Pty	Sets the Modbus parity bit (1 stop bit). <b>0</b> = none; <b>1</b> = parity; <b>2</b> = disparity.	0/1/2	num	1
Adr	Modbus protocol controller address	1...255	num	1
tAb	table of parameters. Reserved: read-only parameter.	/	/	/

## DEVICE MANAGER

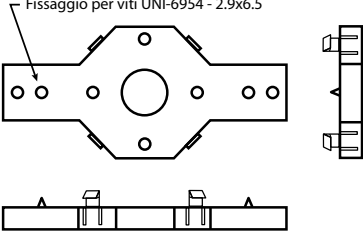
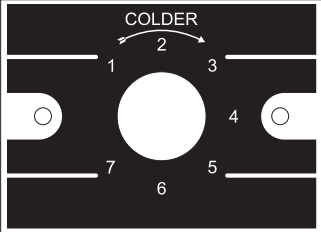




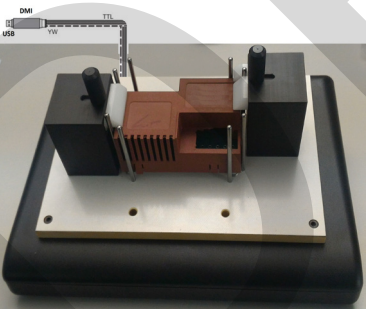
Connection between the Device Manager and the Instrument can only take place via serial port using the external configuration interface (Docking Station in conjunction with the DMI/USB interface for connection to PC) or the Bluetooth Dongle interface (for connection to a smart device).

The MODBUS protocol communication settings are as follows:

- Protocol: ModBus
- Speed: 9600
- Parity: select using parameter **PtY**
  - Parity (1 stop bit)
  - Disparity (1 stop bit)
  - None (1 stop bit)
- Stop Bit: 1 stop bit

ACCESSORIES

Depending on the model, a series of accessories is available:

	Plastic mounting bracket
	Dial Plate
	Standard 33 mm (1.3 in.) or 55 mm (2.17 in.) knob
	Bluetooth Dongle (BTLE)
	Cable for digital input/output via Bluetooth Dongle (BLTE) (Models with BTLE connector): <ul style="list-style-type: none"><li>• BTLE connector reference: JST S5B-XH-A</li><li>• L0 connector reference: MOLEX 22-03-5055</li></ul>
	NTC in double insulation with female JST connector.
	Docking station & DMI

## CONDITIONS OF USE

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### Permitted use

For safety reasons, the device must be installed and used in accordance with the instructions provided. In particular, parts carrying dangerous voltages must not be accessible under 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 harmonized European reference standards.

### Prohibited 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.

## LIABILITY AND RESIDUAL RISKS

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ELIWELL CONTROLS SRL declines any liability for damage due to:

- installation/uses other than those expressly specified and, in particular, failure to comply with the safety requirements of established standards and/or instructions specified in this document;
- use on panels that do not provide adequate protection against electric shocks, water or dust when assembled;
- 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 which are not compliant with current standards and regulations.

## DISCLAIMER

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## DISPOSAL

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The equipment (or product) must be subjected to separate waste collection in compliance with the local legislation on waste disposal.

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code 9IS24xxx-0.00 • L0 • EN • rel.12/17

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