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EV84A
CLIMATE CONTROL UNIT FOR
FLOOR-MOUNTED HEATING/COOLING SYSTEM
CONTROL

Use

This electronic control unit allows you to automatically adjust the temperature of delivered water depending on the external temperature changes, by controlling the mixing valve and the respective circulating pump (if available in the system to be controlled). A humidostat input (normally open) is also available, which turns the system off if the humidity level exceeds a given limit value.

Operation

The purpose of the EV84A unit is to keep the delivered water temperature constant, depending on the external temperature. When the program is selected, the device calculate the FLOW TEMPERATURE: the latter is calculated through interpolation by using the set flow temperature values for four external temperature values:

Winter: TextMin, 0° , 10° , TextMax
Summer: TextMin, 27° , 30° , TextMax

Selecting a language

The language used for displaying the menus can be selected during the installation phase. Keep button "+" depressed, with the control unit OFF, then power the control unit. When the "SCELTA LINGUA:" icon appears, release button "+" and scroll through the available languages by means of buttons "+" and "–". Once the desired language has been found, press button ">". The unit will display the information in the chosen language:

```
SCELTA LINGUA:
-> ENGLISH
```

Adjustment curves

The control unit features a "Summer" curve and a "Winter" curve: both of which are used to calculate the flow temperature. The curve can be selected by means of the SUMMER/WINTER manual control, which consists of a clean contact on terminal block "A" terminals 7 and 8.

The "Winter" and "Summer" curves represent the flow temperature values depending on the external temperature.

The curves are calibrated by setting the four flow temperature values relative to four external temperature values.

"Winter" curve
Adjustment broken line

The two extreme points of the broken line (TextMin – TextMax) can be customized for possible system operation optimization.
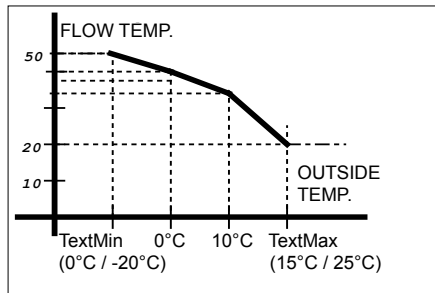
Flow temperature limit values that can be set:
Max. flow temperature: 50°C
Min. flow temperature: 20°C

"Winter" curve preset values

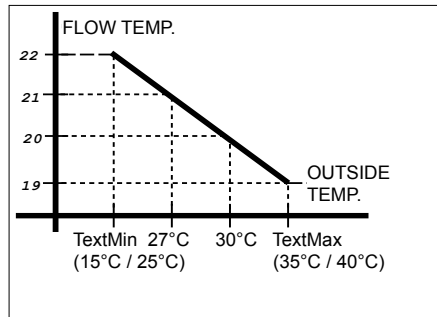|	Curve point 1		Curve point 2		Curve point 3		Curve point 4	
	r1	r2	r1	r2	r1	r2	r1	r2
External temp. limits	15	25	10	0	0		0	-20
Preset external temp.	20		10		0		-15	
Flow temp. limits	20	45	20 45		20	45	20	45
Preset flow temp.	22		27		34		42	

The Text_Max may range from 15°C (min.) to 25°C (max.).
The Text_Min may range from –20°C (min.) to 0°C (max.).
The flow temperature relative to an external temperature will always fall into the flow temperature values set at its two extreme points.

"Summer" curve
Adjustment broken line
The two extreme points of the broken line (TextMin – TextMax) can be customized for possible system operation optimization.

Flow temperature limit values that can be set:
Max. flow temperature: 25°C
Min. flow temperature: 15°C

"Summer" curve preset values

	Curve point 1		Curve point 2		Curve point 3		Curve point 4	
	r1	r2	r1	2	r1	r2	r1	r2
External temp. limits	40	35	30		27		25	20
Preset external temp.	35		30		27		23	
Flow temp. limits	15	25	15	25	15	25	15	25
Preset flow temp.	19		20		21		22	

The "Summer" curve Text_Max may range from 35°C (min.) to 40°C (max.).
The "Summer" curve Text_Min may range from 20°C (min.) to 25°C (max.).
The flow temperature relative to an external temperature will always fall into the flow temperature values set at its two extreme points.

Output relays

The three output relays perform the following functions:
• circulating pump control;
• valve opening control;
• valve closing control.

The mixing valve is controlled to open/close through the two relays to allow the flow temperature to reach the temperature value requested by the control unit.

Circulating pump

The circulating pump (if any) is actuated to allow water to circulate in the heating system. It will be turned off only in the following cases:
• if the external and/or flow probe is damaged;
• if the selected program is "Valve Closes" manual;
• if, during the "Winter" operation, the flow temperature falls below a certain value to be set in the configuration menu;
• if, during the "Summer" operation, the flow temperature goes above a certain value to be set in the configuration menu;
• if the limit threshold is exceeded (see the limit probe);
• if the humidity level is too high during the "Summer" operation (i.e. the humidostat contact is closed through short-circuit).

Time programming

Time programming can be achieved, with an ON time and an OFF time for every day of the week.
A backup battery makes it possible to have a charge reserve of more than 5 years, which helps keep the time updated in the event that the control unit is not powered.

Operation programs
The climate control unit is able to work with various programs that can be selected by the user:

• **Valve opens**
Both the circulating pump and the mixing valve opening in manual mode will be activated.

• **Valve closes**
The circulating pump operation will be deactivated and the valve closing in manual mode will be activated.

• **Comfort**
The flow temperature to be adjusted is the one that the control unit calculates through the adjustment broken line.

• **Economy (Winter Curve)**
The flow temperature to be adjusted is the one of the "Comfort" program: – 3°C. The requested flow temperature will in any case limited to 20°C.

• **Economy (Summer Curve)**
The flow temperature to be adjusted is the one of the "Comfort" program: + 3°C. The requested flow temperature will in any case limited to 25°C.

• **Automatic**
If the current time is found between the ON time and the OFF time, the instructions of the "Comfort" program will be carried out; otherwise, the instructions of the "Economy" program will be carried out.

• **Fixed Point**
The flow temperature to be adjusted is the one set in the CONFIGURATION menu as Fixed Point Temperature. This value (default: 25°C) can be changed from 10°C (min.) to 45°C (max.). This program can be used as the antifreeze function.

Switch-on time optimization
(Winter curve only)
As with the flow temperature, the preliminary switch-on time will be calculated automatically through interpolation, by using the set values of the preliminary switch-on times for four external temperature values (TextMin - 0 - 10° - TextMax). Here too, the advance relative to an external temperature will always fall within the advance values set at both of its extreme points. The four advance values are set to zero.

ADVANCE HOURS

Outside Temp.

TextMin 0°C 10°C TextMax
(0°C / -20°C) (15°C / 25°C)
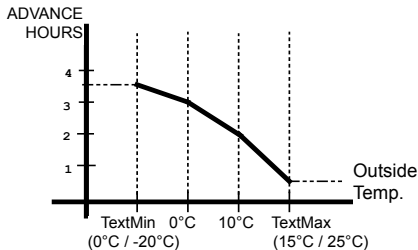
Probes
• External temperature probe with thermoplastic case with sensor of the NTC1K type - code EC14
• Flow probe (contact or immersion or water trap types) with sensor of the NTC10K type - codes EC15 - EC16 – EC17 respectively
• Limit probe: the same as flow probe
• Humidostat ON/OFF digital input

Limit probe
"Winter" operation
When the temperature detected by the limit probe exceeds the "Winter" limit threshold (set in the "Limit probe" menu), the control unit will actuate the valve closing and turn the circulating pump off.

"Winter" limit threshold values:
15°C to 60°C   Values that can be set
-----°   Excludes the function

"Summer" operation :
When the temperature detected by the limit probe falls below the "Summer" limit threshold (set in the "Limit probe" menu), the control unit will actuate the valve closing and turn the circulating pump off.
"Summer" limit threshold values:
5°C to 30°C   Values that can be set
-----°   Excludes the function

To remedy control transients (if any), a delay time of 0 to 5 minutes can be introduced between the threshold overcoming and the coming into action of the limit function.

The normal control unit operation will be resumed only when the temperature reaches a value equal to:
  Recovery value = Threshold value – Recovery diff. (Winter)
  Recovery value = Threshold value + Recovery diff. (summer)
The recovery differential can be set between 1°C and 10°C.
The threshold overcoming will be signalled on the display by the OVERCOMING LIMIT THRESHOLD message.

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Probe failure

During normal operation, the control unit is able to detect any malfunction of the connected probes and properly actuate the valve and the pump:

a) Flow probe broken

The pump will be kept OFF and the mixing valve will be actuated to close. The FAILURE FLOW SENSOR message will appear on the display.

b) External probe broken

The pump will be kept OFF and the mixing valve will be actuated to close. The FAILURE OUTSIDE SENSOR message will appear on the display.

c) Limit probe broken (only if the threshold has been set)

The control unit will keep on working correctly, yet FAILURE LIMIT SENSOR message will appear on the display.

Operating conditions

The operating conditions will be selected automatically by the control unit depending on the selected program; they will determine the pump and mixing valve operation. The operating conditions are indicated as follows:

• **COMFORT**

This is obtained by setting the "COMFORT" program or the "Automatic" program, and the current time will be included between the ON time and the OFF time.

• **ECONOMY**

This is obtained by setting the "ECONOMY" program or the "Automatic" program, and the current time will be outside the ON and OFF time.

• **FIXED POINT**

This is obtained by setting the "Fixed point" program.

• **FORCED**

The forced condition indicates that the control unit has decided to turn the system on before the set time, in accordance with the optimization data.
This condition will be terminated at the ON time.

• **SENSOR FAILURE**

This condition occurs when a probe is damaged and the resulting reading is wrong.

- **LIMIT LEVEL**

This condition occurs when the limit threshold is exceeded (as described above).

- **HIGH HUMIDITY**

If the "Summer" operation has been set and the humidostat input is in short circuit condition for at least 5 consecutive minutes, the "High humidity" condition will come into action: the valve will be closed and the pump will be turned off until the humidostat input status changes. If the humidostat is not connected, this condition will never occur.
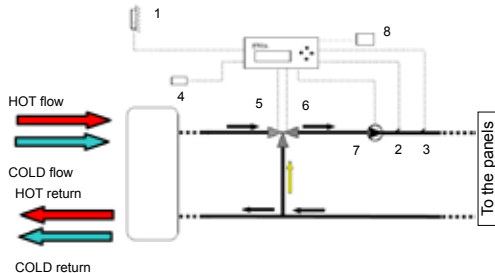
"Summer"/"Winter" switch

Shifting from heating to cooling, and vice versa, can be achieved manually by inserting a switch between terminal block "A" contacts 7 and 8.

In particular, if the contact is opened, the control unit will perform the "Winter" adjustment; on the contrary, if the contact is closed, the control unit will perform the "Summer" adjustment.

During the winter, the mixing valve will be actuated to open when the flow temperature is lower than the requested temperature; on the contrary, during the summer, the valve will be actuated to open when the flow temperature is higher than the requested temperature.

Example of adjustment system

1	External probe	5	Valve open control
2	Flow probe	6	Valve close control
3	Limit probe (optional item)	7	Pump control
4	"Summer"/"Winter" switch	8	Humidostat

INSTALLATION

Control unit installation
Install the equipment onto a DIN bar inside a panel, so as to ensure adequate protection.

External probe installation
Install the external probe on the N/NW side of the building, at approximately half the building height and in any case at least 2.5 m high from the ground, far from heat sources, aerators and protrusions. Connect the probe with the climate control unit by means of a 1 mm2 two-wire cable up to a distance of 100 m.

Flow probe and Limit probe installation
EC15: Fit the contact probe into the water pipe by using a special clip, by ensuring good thermal conductivity by means of conducting paste.
EC16: Insert the immersion probe into the special curve available in the pipe.
Install the probes next to the control centre manifold, then connect them to the regulator by means of a two-wire cable of at least 1 mm2 at a maximum distance of 200 m.
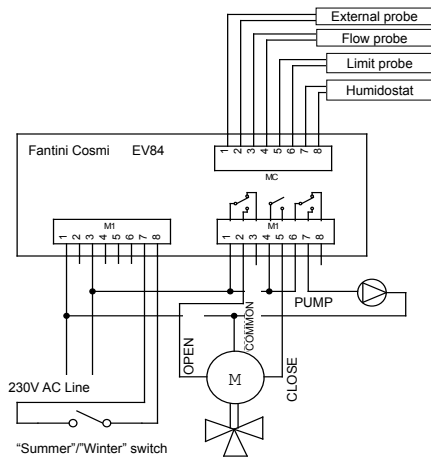
Humidostat installation
Fit the humidostat onto an internal wall, then connect it with the control unit by means of a 1 mm2 two-wire cable up to a maximum distance of 100 m.
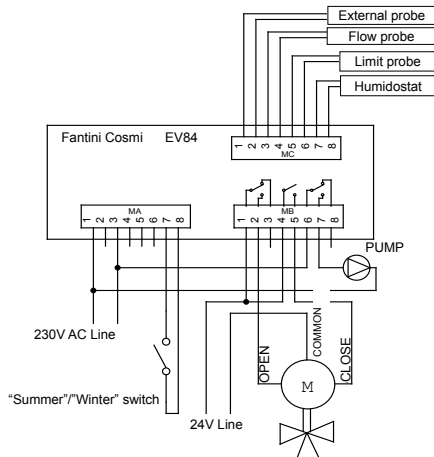
Terminal block wiring diagram

230 Vac valve wiring diagram

External probe
Flow probe
Limit probe
Humidostat

Fantini Cosmi   EV84

1 2 3 4 5 6 7 8
MC

M1

1 2 3 4 5 6 7 8

M1

1 2 3 4 5 6 7 8

PUMP

230V AC Line

OPEN
COMMON
CLOSE

M

"Summer"/"Winter" switch

24 Vac valve wiring diagram

External probe
Flow probe
Limit probe
Humidostat

Fantini Cosmi   EV84

1 2 3 4 5 6 7 8
MC

MA

1 2 3 4 5 6 7 8

MB

1 2 3 4 5 6 7 8

PUMP

230V AC Line

"Summer"/"Winter" switch

24V Line

OPEN
COMMON
CLOSE
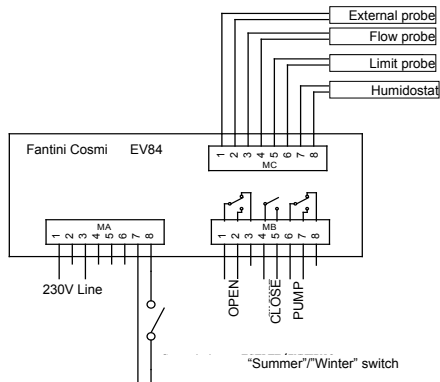
M

Calibration and adjustment

Factory-set configuration
The EV84A climate control unit is factory-set with all the parameters set to the so-called "standard" operation. However, these parameters can be customized depending on the type of system. In the event that you wish to set the default data again, power off and then power on again by keeping the "+" button depressed. In this way, you will go back to the language setting menu and the modified parameters will be replaced with the standard factory-set ones. The passwords will be set again, too.
All the configuration parameters will be stored into a non-volatile (EEPROM) memory even when the mains supply is not available.

Adjustment
Use the "+" and "–" buttons to modify the parameters and scroll the main menu up and down. Use the ">" and "<" buttons to enter the menu and scroll through the parameters to be set.

Password
The control unit provides for a password that will allow you to modify all the control unit adjustment parameters.

The password consists of four alphanumeric characters. It has been set by default as follows:
'1000'
The code of this password can be customized as described hereinafter..

CONTROL UNIT CONFIGURATION MENU

Main menu
The available menu varies depending on the entered password:

No password:
• Information
• Password LEV.1
  END OF MENU

Password entered:
• Information
• Password LEV.1
• Set Curr. Time
• Program
• Progr. Times
• Winter Curve
• Summer Curve
• Optimization
• Configuration
• Limit Sensor
  END OF MENU

Information

MENU EV84S2
>Information

MONDAY   11.24
NOV/04/2005

Submenu 1: Indicates the current date and time.

Current op. :
COMFORT

Submenu 2: Indicates the condition existing at that instant.

Flow T.:   41,5 °
Outside T: 12,5 °

Flow Temperature
calculat..: 25,0 °

Humidity index:
LOW HUMIDITY

Curve Selection:
WINTER

Valve: CLOSES
Pump: START

Advance hrs.
Calculat.: 01.30 h

Calculated time
ON: 04,15

Firmware
EV84S2
Revision: 00

Submenu 3: Indicates the flow temperature and the external temperature read by the probes.

Submenu 4: Indicates the flow temperature (calculated by the control unit) that you wish to obtain.

Submenu 5: Indicates the humidity value detected by the humidostat. If the latter is not connected, the read humidity will always be low.

Submenu 6: Indicates the season selected through the external switch.

Submenu 7: Indicates the current status of the valve (Closes/Opens/Stop) and the pump (Stop/Start).

Submenu 8: Indicates the preliminary switch-on time calculated in case of "Automatic" program and set optimization.

Submenu 9: If the control unit calculates a preliminary switch-on time, the switch-on time will be displayed as well.

Submenu 10: Indicates the control unit manufacturer and firmware revisions.

N.B. If the probes are damaged, the temperature values in submenu 3 will be replaced with dashes.

The calculated flow temperature (submenu 4) will also be replaced with dashes when for instance, the probe is broken and no adjustment is made.

Likewise, the values (submenus 7 and 8) will be replaced with dashes when you are out of the preliminary switch-on period.

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Password

```
>Information
> Password LEV.1
```

```
Enter Password
Level 1:    0000
```

```
New Code: 0000
Confirm  : 0000
```

Submenu 1: This menu is used to enter the level 1 password. The next submenu can be accessed only if the correct code is entered.

Submenu 2: This menu is used to modify the level 1 password. Enter the new code and repeat it in the "Confirm" field.

Entering the password

To enter the new code, the four characters shall be entered both into the "New Code" field and the "Confirm" field. To confirm, the cursor shall blink on the last character of "Confirm", and the " > " forward button shall be pressed.

New code:	1	A	2	1
Confirm:	1	A	2	1

When you are in this position and press the "Forward" button, the new PASSWORD will be confirmed automatically and you will go back to the "Enter Password" submenu 1.

Current time setting

```
>Password LEV.1
>Set Current Time
```

```
Time selection
   WINTER
```

```
MONDAY   11.24
NOV/04/2005
```

Submenu 1: The type of time (WINTER/SUMMER) can be set. The time will be automatically corrected, i.e. one hour more (when shifting from "Winter" to "Summer") or one hour less (when shifting from "Summer" to "Winter").

Submenu 2: Allows you to set the time, day and date. The position of the blinking cursor will indicate the item you will be modifying.

Program

```
> Set Current time
 >Program
```

```
Program:
  AUTOMATIC
```

Submenu 1: Allows you to choose the most suitable operation program.

Programming time
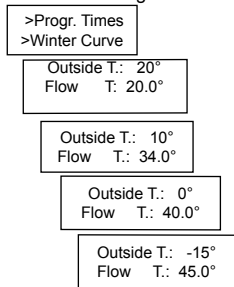
```
> Program
>Progr. Times
```

```
ON:    07.00
OFF:   22.00
```

Submenu 1: Allows you to select the switch-on time and switch-off time (calculated flow temperature: 3°C) for the automatic program.

"Winter" curve
This menu is used to set the four flow temperature values for the four external temperature values relative to the "Winter" curve.
The two extreme values of the external temperature will be set through this menu.

```
>Progr. Times
>Winter Curve
    Outside T.:  20°
    Flow    T.: 20.0°
        Outside T.:  10°
        Flow    T.: 34.0°
            Outside T.:   0°
            Flow    T.: 40.0°
                Outside T.:  -15°
                Flow    T.: 45.0°
```

Submenu 1: By moving the blinking cursor, you can modify the external temperature value between 15°C and 25°C, as well as the value of the corresponding flow temperature.
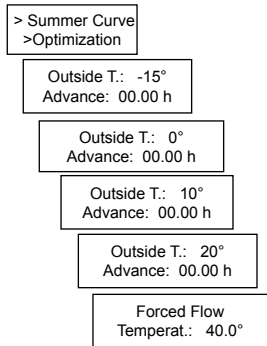**Submenu 2:** Allows you to modify the value of the flow temperature relative to an external temperature of 10°C.
Submenu 3: Allows you to modify the value of the flow temperature relative to an external temperature of 0°C.

Submenu 4: By moving the blinking cursor, you can modify the external temperature value between 0°C and –20°C, as well as the value of the corresponding flow temperature.

"Summer" curve
This menu is used to set the four flow temperature values for the four external temperature values relative to the "Summer" curve.
The two extreme values of the external temperature will be set through this menu.
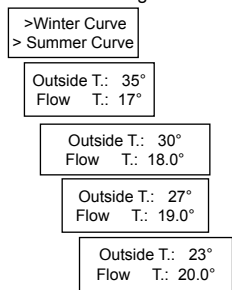
```
>Winter Curve
> Summer Curve
    Outside T.:  35°
    Flow    T.: 17°
        Outside T.:  30°
        Flow    T.: 18.0°
        Outside T.:  27°
        Flow    T.: 19.0°
            Outside T.:  23°
            Flow    T.: 20.0°
```

Submenu 1: By moving the blinking cursor, you can modify the external temperature value between 35°C and 40°C, as well as the value of the corresponding flow temperature.
Submenu 2: Allows you to modify the value of the

flow temperature relative to an external temperature of 30°C.

Submenu 3: Allows you to modify the value of the flow temperature relative to an external temperature of 27°C.

Submenu 4: By moving the blinking cursor, you can modify the external temperature value between 20°C and 25°C, as well as the value of the corresponding flow temperature.

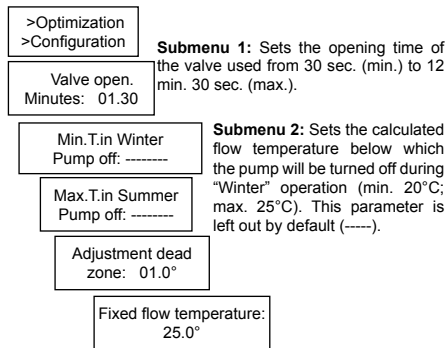**Submenu 1:** Allows you to modify the advance time relative to the minimum external temperature value.

Submenu 2: Allows you to modify the advance time for an external temperature of 0°C.

Submenu 3: Allows you to modify the advance time for an external temperature of 10°C.

Submenu 4: Allows you to modify the advance time relative to the maximum external temperature value.

Submenu 5: Allows you to choose the value of the flow temperature to be adjusted during the preliminary switch-on period (forced operating condition).

Optimization

Optimization will be used only for the winter.

> Summer Curve
>Optimization

Outside T.: -15°
Advance: 00.00 h

Outside T.: 0°
Advance: 00.00 h

Outside T.: 10°
Advance: 00.00 h

Outside T.: 20°
Advance: 00.00 h

Forced Flow
Temperat.: 40.0°

Configuration

>Optimization
>Configuration

Valve open.
Minutes: 01.30

Min.T.in Winter
Pump off: --------

Max.T.in Summer
Pump off: --------

Adjustment dead
zone: 01.0°

Fixed flow temperature:
25.0°

Submenu 1: Sets the opening time of the valve used from 30 sec. (min.) to 12 min. 30 sec. (max.).

Submenu 2: Sets the calculated flow temperature below which the pump will be turned off during "Winter" operation (min. 20°C; max. 25°C). This parameter is left out by default (-----).

Submenu 3: Sets the calculated flow temperature above which the pump will be turned off during "Summer" operation (min. 20°C; max. 25°C). This parameter is left out by default (-----).

Submenu 3: This parameter sets the dead zone within which the valve will not be actuated (min. +/-1°C; max. +/-4°C).

Submenu 4: Sets the flow temperature to be used when the "Fixed point" program is selected (min. 10°C; max. 45°C).

Limit probe

```
>Configuration
>Limit Sensor
```

```
Set Win. :   -----
Measured:  35,0°
```

```
Set Sum. :   -----
Measured:  35.0°
```

```
Divfferential
Value   :   10,0°
```

```
Function Delay
Time   : 2 min
```

Submenu 1: Allows you to set the intervention limit threshold for "Winter" operation from 15°C (min.) to 60°C (max.) (this value is left out by default). Moreover, the "Measured" line reads the temperature value read by the probe (if the latter is not connected, dashes will be displayed).

Submenu 2: Allows you to set the intervention limit threshold for "Summer" operation from 5°C (min.) to 3°C (max.) (this value is left out by default). Moreover, the "Measured" line reads the temperature value read by the probe (if the latter is not connected, dashes will be displayed).

Submenu 3: Sets the recovery differential used when the threshold is exceeded (min. 1°C; max. 10°C).

Submenu 4: Allows you to set a delay time between the threshold overcoming and the coming into action of the protection (min. 0 min.; max. 5 min.).

Dimensions (mm)
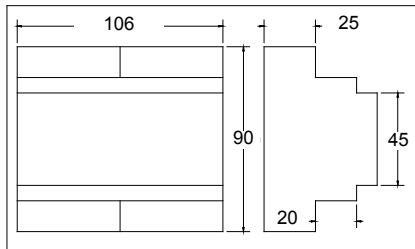
Technical features

Power supply	230VAC +/- 10%
Consumption	4VA
Protecion degree	IP40 (rear panel mounting)
Contact capacity	5(3) A 250 VAC
Ambient temperature	T45
Terminal blocks	Removable
Memory data storage period	5 years
Pollution degree	2
Impulse voltage	4000V
Software	Class A
Compliance with	EN 60730-1
ErP classification: ErP Class VI; 4% (EU Reg. 811/2013 - 813/2013)	

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EAC CE

GB79363B