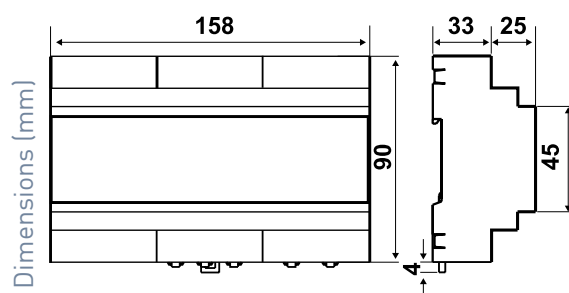# EV85
Digital controller for heating systems with remote control, DIN-rail mounting (9 modules)

The unit regulates water delivery temperature of the heating systems. It is suitable for all heating systems types of apartment buildings, factories, schools, cottages, etc.

Dimensions (mm)

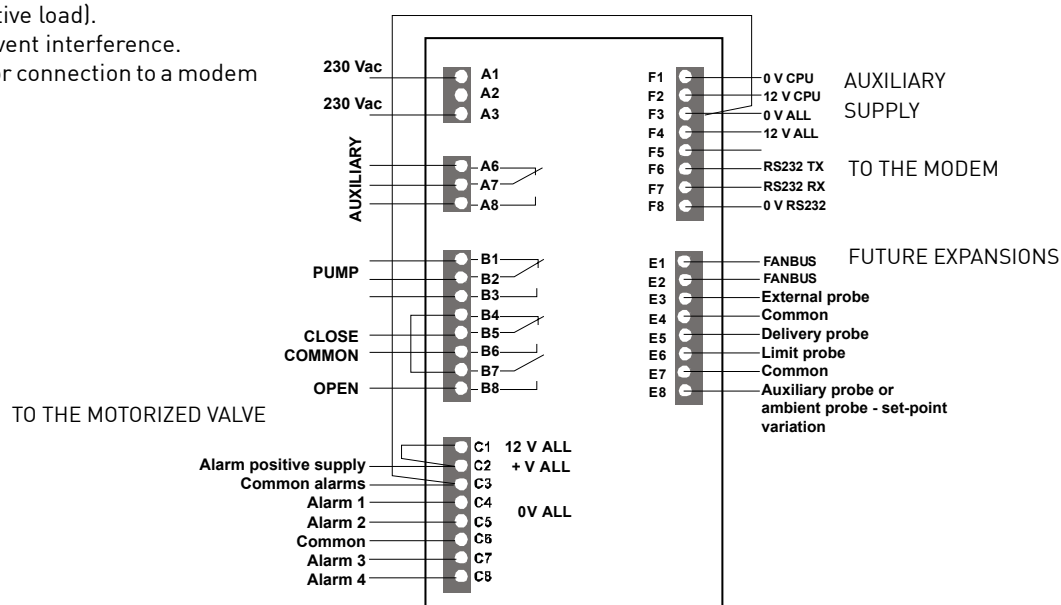|	Power supply	Contacts rating	Operation admissible temperature	Protection degree
EV85	230Vac 50 Hz	5A - 250Vac	0 ÷ 50 °C	IP40 (back panel)

ELECTRICAL FEATURES

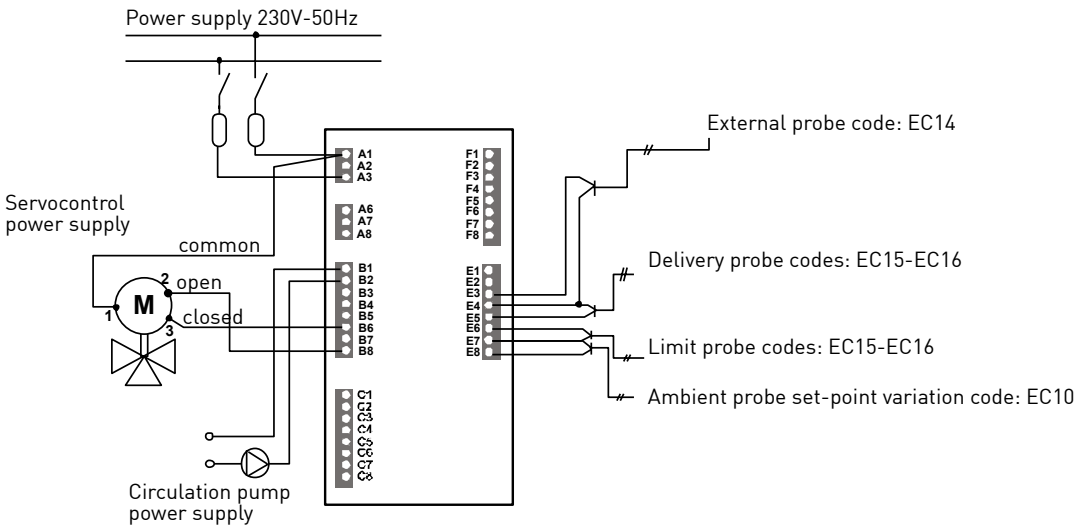Power supply: 230Vac 50Hz.
Consumption: 7 VA.
Contacts rating: 5A- 230Vac (resistive load).
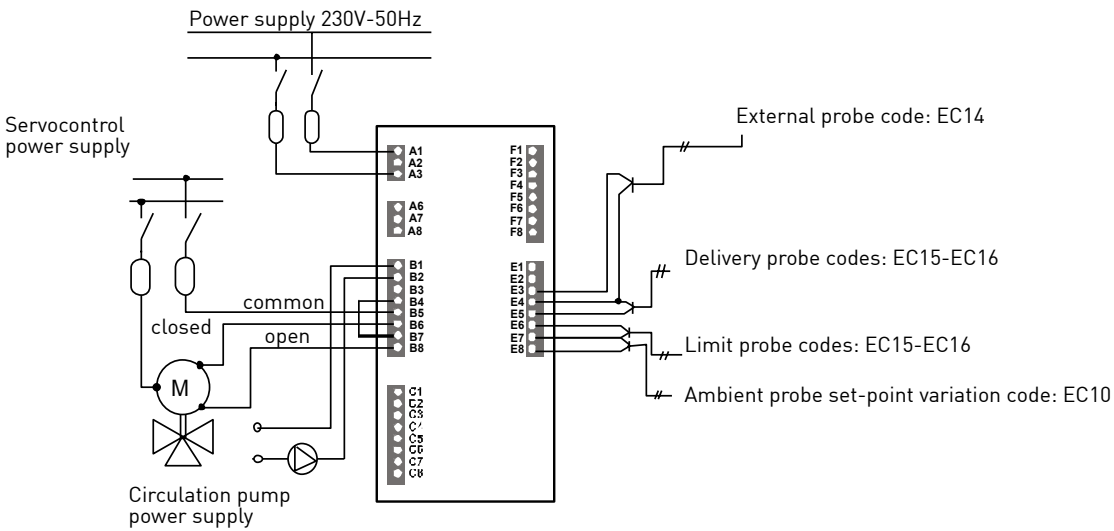4 optoisolated alarm inputs to prevent interference.
1 communication channel RS232 for connection to a modem or directly to a computer.
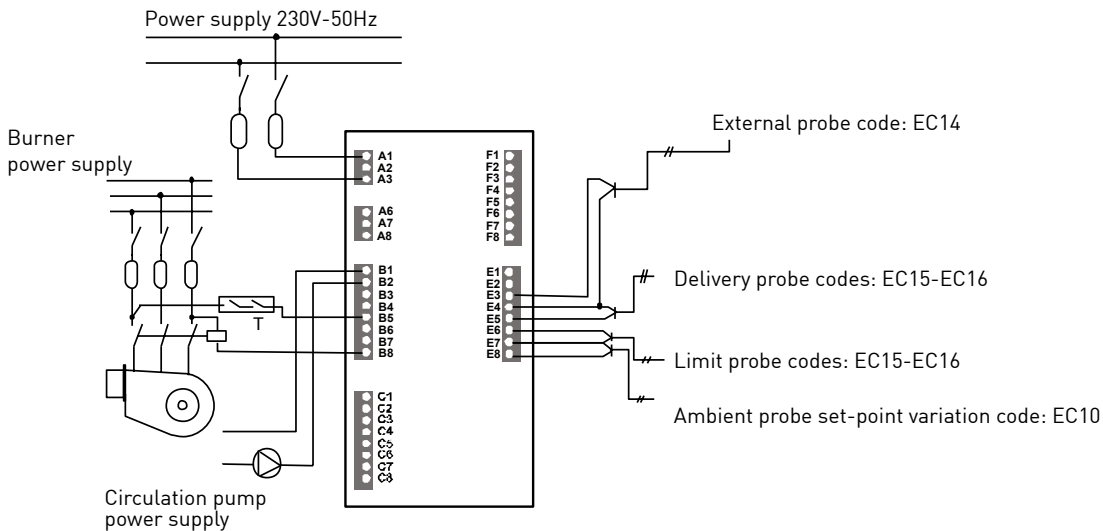
230 Vac — A1
230 Vac — A2
— A3

AUXILIARY — A6
— A7
— A8

PUMP — B1
— B2
— B3
— B4
CLOSE — B5
COMMON — B6
— B7
OPEN — B8

TO THE MOTORIZED VALVE

Alarm positive supply — C1   12 V ALL
Common alarms — C2   + V ALL
Alarm 1 — C3
Alarm 2 — C4
Common — C5   0V ALL
Alarm 3 — C6
Alarm 4 — C7
— C8

F1 — 0 V CPU   AUXILIARY
F2 — 12 V CPU   SUPPLY
F3 — 0 V ALL
F4 — 12 V ALL
F5
F6 — RS232 TX   TO THE MODEM
F7 — RS232 RX
F8 — 0 V RS232

E1 — FANBUS   FUTURE EXPANSIONS
E2 — FANBUS
E3 — External probe
E4 — Common
E5 — Delivery probe
E6 — Limit probe
E7 — Common
E8 — Auxiliary probe or ambient probe - set-point variation

ELECTRICAL DIAGRAM FOR THE CONTROL OF THE MOTORIZED MIXING VALVES WITH SERVOCONTROLS SUPPLIED AT 230V 50HZ

Power supply 230V-50Hz

Servocontrol power supply

common

2 open

1 M

3 closed

Circulation pump power supply

A1 A2 A3
A6 A7 A8
B1 B2 B3 B4 B5 B6 B7 B8
C1 C2 C3 C4 C5 C6 C7 C8

F1 F2 F3 F4 F5 F6 F7 F8
E1 E2 E3 E4 E5 E6 E7 E8

External probe code: EC14

Delivery probe codes: EC15-EC16

Limit probe codes: EC15-EC16

Ambient probe set-point variation code: EC10

ELECTRICAL DIAGRAM FOR THE CONTROL OF THE MOTORIZED MIXING VALVES WITH SERVOCONTROLS SUPPLIED WITH VOLTAGES DIFFERENT THAN 230V 50HZ

Power supply 230V-50Hz

Servocontrol power supply

common

closed

open

M

Circulation pump power supply

A1 A2 A3
A6 A7 A8
B1 B2 B3 B4 B5 B6 B7 B8
C1 C2 C3 C4 C5 C6 C7 C8

F1 F2 F3 F4 F5 F6 F7 F8
E1 E2 E3 E4 E5 E6 E7 E8

External probe code: EC14

Delivery probe codes: EC15-EC16

Limit probe codes: EC15-EC16

Ambient probe set-point variation code: EC10

ELECTRICAL DIAGRAM FOR THE ON - OFF CONTROL OF THE BURNER

Power supply 230V-50Hz

Burner power supply

T

Circulation pump power supply

A1 A2 A3
A6 A7 A8
B1 B2 B3 B4 B5 B6 B7 B8
C1 C2 C3 C4 C5 C6 C7 C8

F1 F2 F3 F4 F5 F6 F7 F8
E1 E2 E3 E4 E5 E6 E7 E8

External probe code: EC14

Delivery probe codes: EC15-EC16

Limit probe codes: EC15-EC16

Ambient probe set-point variation code: EC10

OPERATION

Indicator led for following commands:
- valve opens
- valve closes
- circulation pump
- auxiliary relay
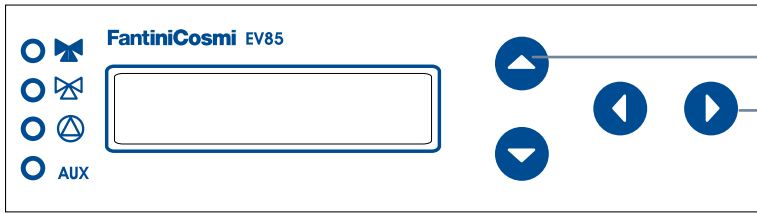
Using the 2 keys (ˆ and ˅) can be scrolled various menus and can be modified the parameters.

The 2 keys (‹ and ›) are used to enter in the menu and to pass from one page to another.

The controller calculates delivery temperature value as a function of the following parameters:
- desired ambient temperature (preset);
- external temperature (detected by the probe);
- regulation broken curve (preset);
- ambient temperature calculated by the controller (optional);
- ambient temperature detected by the ambient probe (optional).

By means of controller it is possible to choose the desired output type:
- mixing valve control (relay "opens" and "closes");
- 2-stage output (relay "opens"=stage 1 and "closes"=stage 2);
- 4-stage output (relay "opens"=stage 1, "closes"=stage 2, "pump"=stage 3 and "aux"=stage 4) .

N.B. with 4-stage operation the two relays (pump control and auxiliary) cannot be used for another purposes.
It compares the theoretical (calculated) delivery temperature value with the real value, measured by the relative probe and acts on the regulation valve to obtain the desired temperature.
Programming can be made via GSM phone.

LANGUAGE SELECTION
During installation is possible to choose the language, used to view the menu.
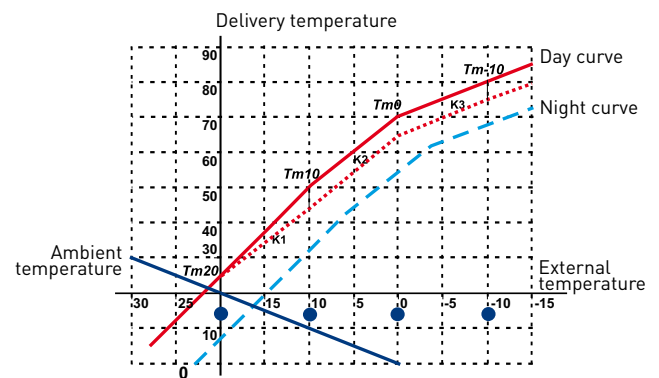
REGULATION BROKEN CURVE
The relation that establishes the delivery temperature value as a function of the external temperature depends of the thermal features of the building, and for optimum comfort, must be found experimentally.
The search is favored by the broken curve in 4 points, which may be corrected only in the desired point.
After each adjustment, while setting the regulation curve to obtain the desired ambient temperature for any external temperature value, it is advisable to wait at least 24 hours for giving to the system time for adapting to the new settings.
To have a different ambient temperature, for example night temperature, the curve must be moved parallel to the day curve.

SWITCH-ON TIME OPTIMIZATION
Optimization is intended as automatic determination of the switch-on advance time required to obtain the desired ambient temperature at the preset time.
When this function is activated, instead of setting the switch-on time, is set the time at which the desired day ambient temperature is required; then the controller, as a function of the various parameters, calculates how much time earlier has to be activated the system.
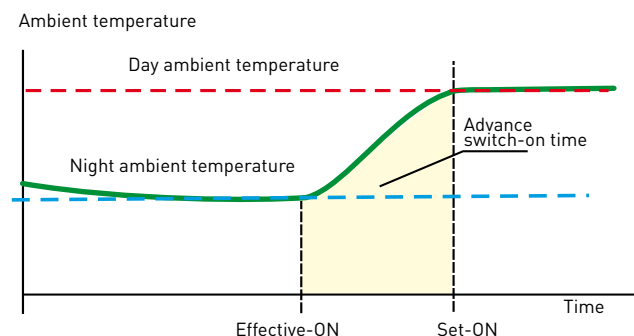
OPTIMIZATION AS A FUNCTION OF THE EXTERNAL TEMPERATURE
After setting the relation that links the advance time to 4 external temperature values (20, 10, 0, -10°C), the controller automatically calculates the time for any intermediate value of the external temperature (for external temperature values of over 20°C the advance time is zero).

REGULATION BROKEN CURVE
EXAMPLE OF THE CURVE FOR SYSTEM WITH RADIATORS

SWITCH-ON TIME OPTIMIZATION

LIMIT PROBE

The limit probe can be used to limit the value of the delivery temperature.

When the temperature measured by the probe drops below a certain value (minimum limit used as anti-condensation) or rises above a preset value (maximum limit used, for example, in panel systems), the controller reduces the delivery temperature value proportionally.

CIRCULATION PUMP CONTROL

The EV85 controller is designed to automatically control the circulation pump.

OPTIMIZATION AS A FUNCTION OF THE EXTERNAL TEMPERATURE

2- OR 4-STAGE OPERATION

The controller compares the value of delivery temperature, calculated according to the external temperature, with that measured by the probe and, if this temperature drops below the preset differential value, the first stage is turned on; if the deviation between the two temperatures is equal to double differential value, will be turned on even the second stage and so on to stages 3 and 4.
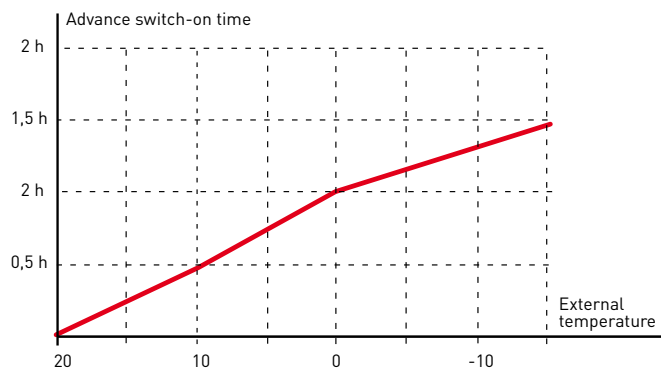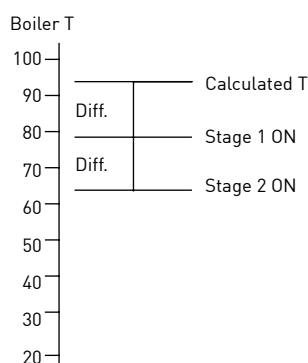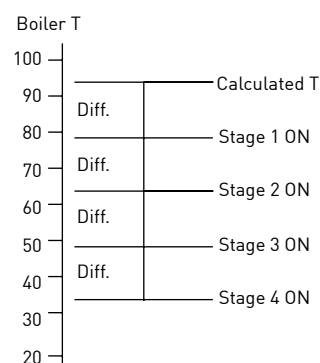

2-STAGE OUTPUT
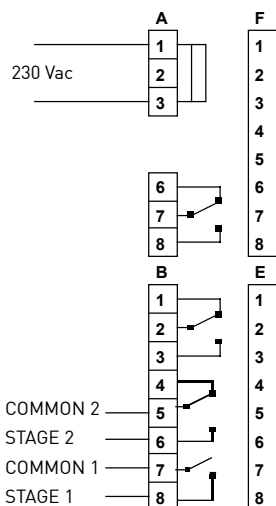
4-STAGE OUTPUT
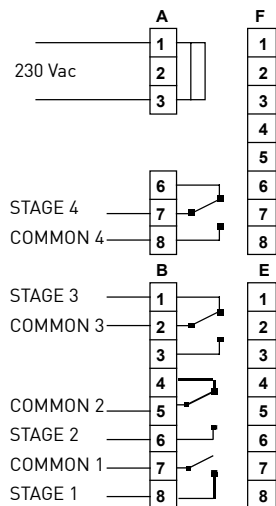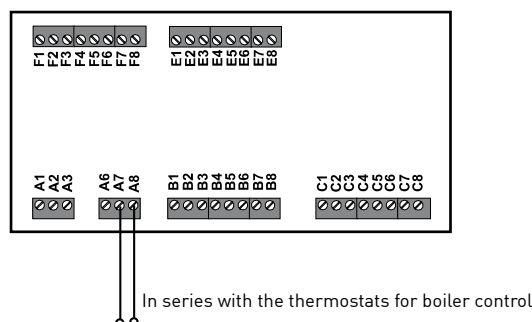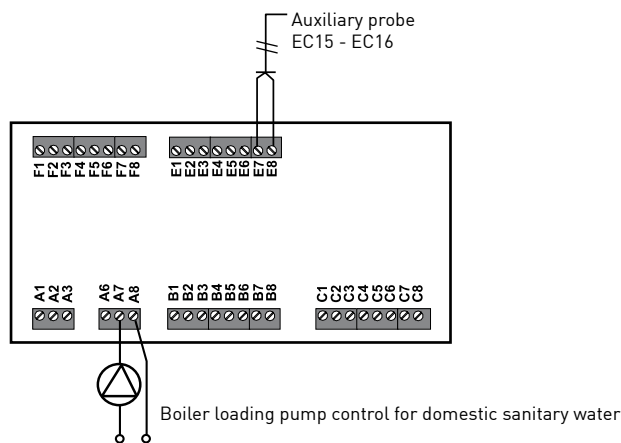
2-STAGE OUTPUT

4-STAGE OUTPUT
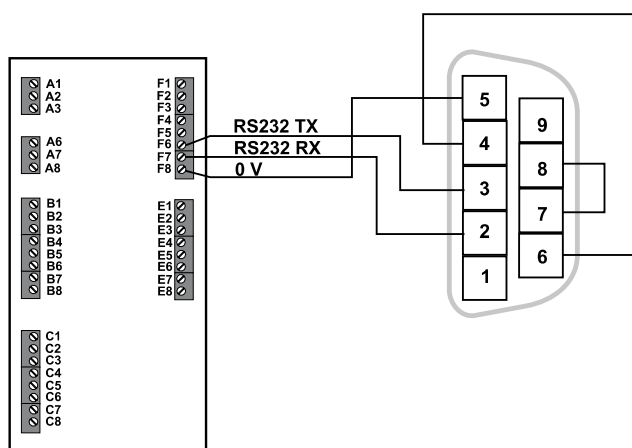
AUXILIARY REGULATION

The auxiliary measurement probe and the control relay (terminals A6-A7-A8) are part of an auxiliary controller built into the EV85 remote heat controller which can be used in various ways:

- measurement probe not connected: the output relay follows the time programming of the clock and can be used for example to switch the boiler on or off; it is mandatory to set ---- on the desired value (menu O2).
- measurement probe connected (terminals E7-E8): this mode provides an ON-OFF thermostat with remote probe. From the menu O1 the fixed temperature option can be selected to control the pump of a domestic hot water storage tank at a constant temperature or, again from the menu O1, by selecting the sliding temperature option, a controller is obtained to control the boiler at a sliding temperature (in this case the set-point value represents the amount of degrees the boiler must be regulated above the delivery temperature calculated by the heat controller).

N.B. The control relay (terminals A7-A8) is placed in series to the users (pump or boiler).
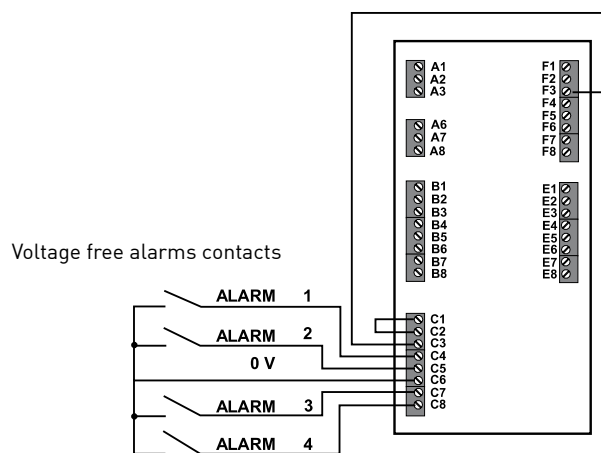

Auxiliary probe EC15 - EC16

Boiler loading pump control for domestic sanitary water

In series with the thermostats for boiler control

ALARMS AND SERIAL COMMUNICATION

Connections of the male connector DB9 (RS323) for connection to the modem.
N.B: Jumpers 7-8 and 4-6 must be realized inside the connector

N.B. The 12Vdc power supply is taken from the controller by means of the jumpers C1-C2 and C3-F3

REMOTE CONTROL

By connecting the EV85 controller to a GSM modem it is possible to receive SMS alarm messages after switching one of the two available alarm contacts.

To connect the controller to a GSM modem, follow the instructions relative to the wiring diagram, or use the TCEV80 cable.

N.B. The maximum length between the controller and the modem is 15 metres.

If the management takes place through a GSM modem is sufficient to use a cell phone.

If is used a GSM modem in data mode, it is necessary to use a Personal Computer with a control software available only in Italian language provided by Fantini Cosmi or downloaded via Internet.

By sending appropriate SMS messages to the modem connected to the controller is possible to read and modify remotely the following parameters:

- times programming;
- day, night and antifreeze temperature settings;
- regulation broken curve values;
- auxiliary preset temperature;
- measured temperatures reading;
- alarm calls cancellation.

DATA CONNECTION

Personal computer

SMS CONNECTION

Mobile phone
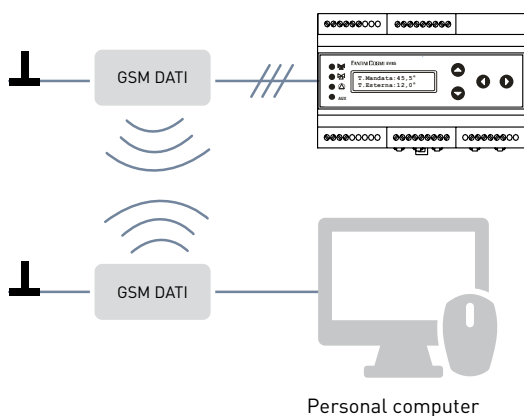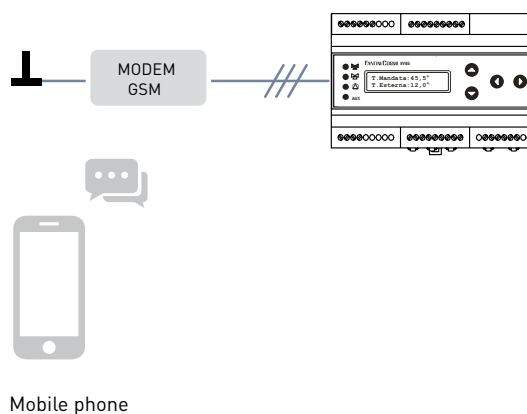
STANDARDS AND HOMOLOGATIONS

Complies with the law 373, law n.10 dated 9 of January 1991 and D.P.R.412 dated 26 of August 1993.
In conformity with EN 60730-2-9; EN 60730-2-7 standards

INSTALLATION

DIN-rail mounting (9 modules).
To ensure an adequate protection install the device on the DIN-rail within a framework.
The removable terminals facilitate the wiring and a possible replacement.

FEATURES

Control of 1 modulating mixing valve.
Control of the circulation pump (with shut-down delay).
Control of one ON-OFF auxiliary user (domestic water).
1 RS232 communication channel for connection to a modem o directly to a PC.
Weekly programming with 3 time bands per day.
Automatic switching from summer time to winter time and vice versa.
Recorder of the temperatures and events of the last 48 hours (datalogger).
Visualization of all preset temperatures and parameters.
LED to indicate relays status.
Clock charge reserve: over 5 years.
Alphanumeric display with 2 lines each with 16 characters with timed backlighting.
All functions are executed through the menu.
Removable terminal board for easy wiring.

ACCESSORIES

EM70S
GSM-modem with power supply unit and antenna.

EC14
External probe

N70A
Power supply unit and battery charger.

EC15
Contact delivery probe with clamp for fixing on the pipe.

1590029
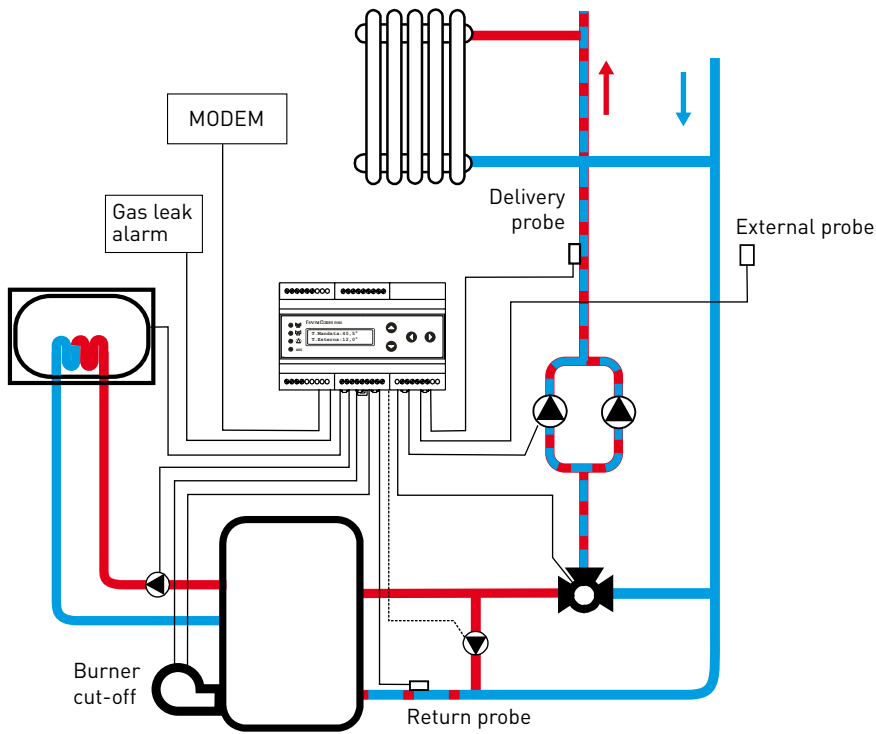Rechargeable battery 12V-1,2Ah.

EC16
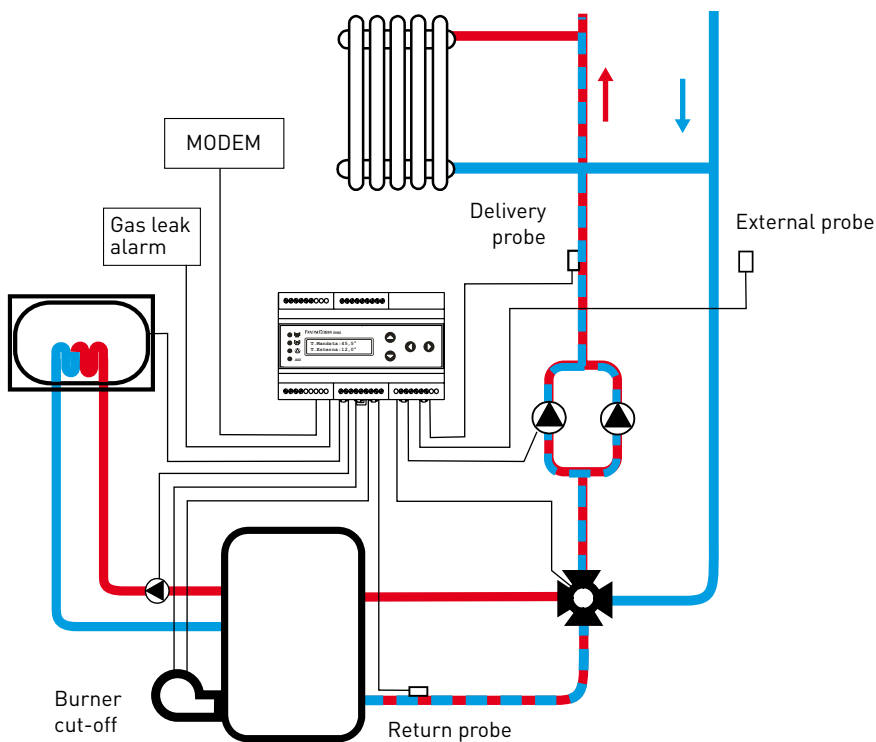Immersion delivery probe with protection casing and conic thread connection G 1/2.
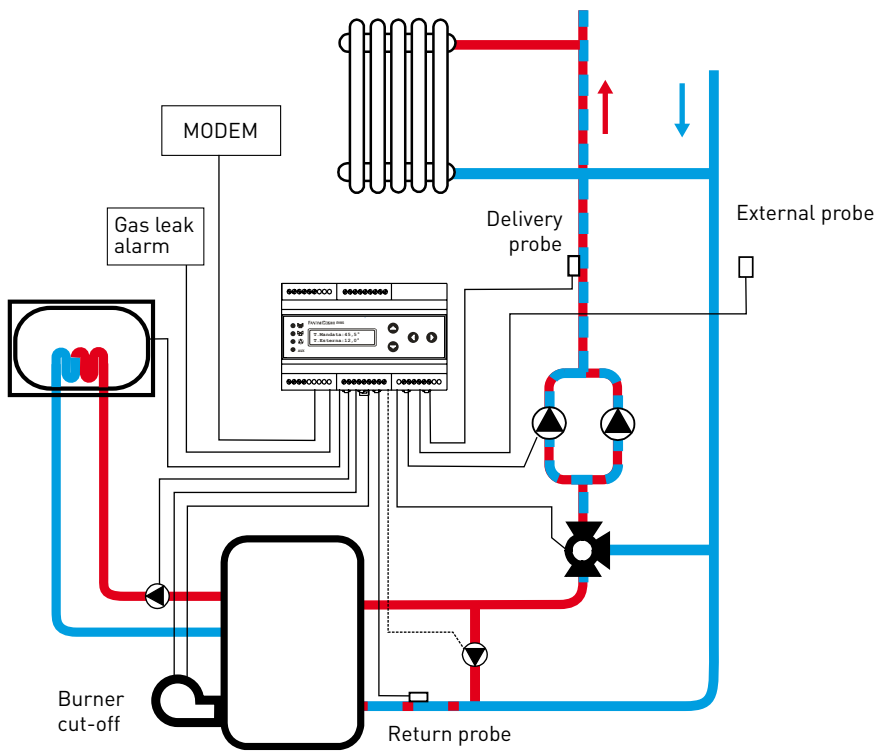
EC10
Ambient probe

SYSTEM EXAMPLES

SYSTEM WITH 3-WAY ROTOR MOTORIZED VALVE

MODEM

Gas leak alarm

Delivery probe

External probe

Burner cut-off

Return probe

SYSTEM WITH 4-WAY ROTOR MOTORIZED VALVE

MODEM

Gas leak alarm

Delivery probe

External probe

Burner cut-off

Return probe

SYSTEM WITH 3-WAY SECTOR MOTORIZED VALVE

MODEM

Gas leak alarm

Delivery probe

External probe

Burner cut-off

Return probe

SYSTEM WITH BURNER CONTROL

MODEM

Gas leak alarm

Delivery probe

External probe

Burner cut-off