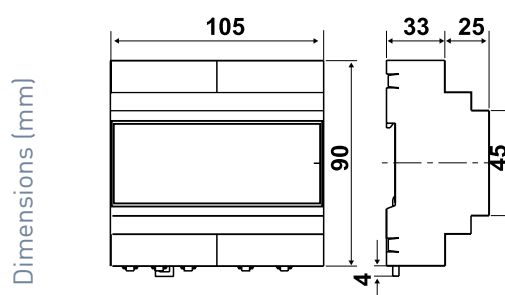# EV40

Regulation control unit for thermal solar panel systems and solar cooling

EV40 differential control unit is suitable for the regulation and control of thermal solar panel systems, both of the vacuum tubes and flat plate types, with fluid forced circulation. It is able to control both heating and cooling of the environment through the management of the systems with solar cooling. Eight system types are available, according to the specific required application.
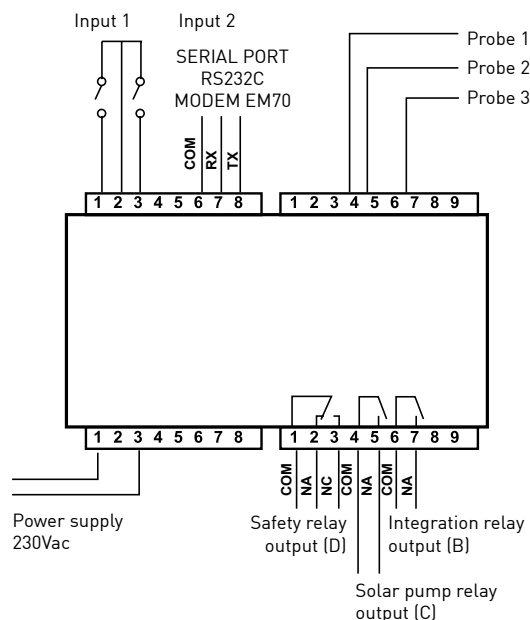

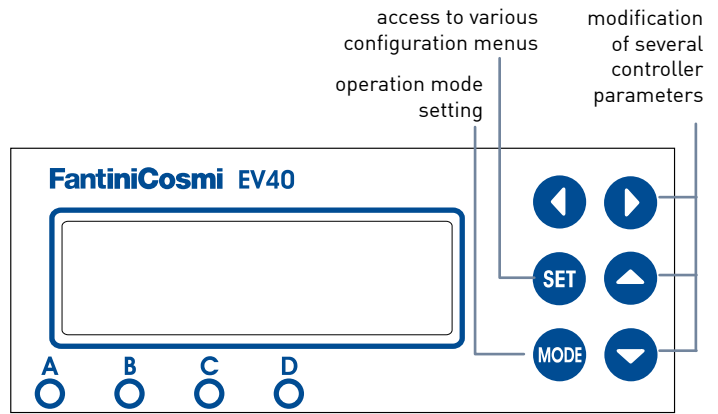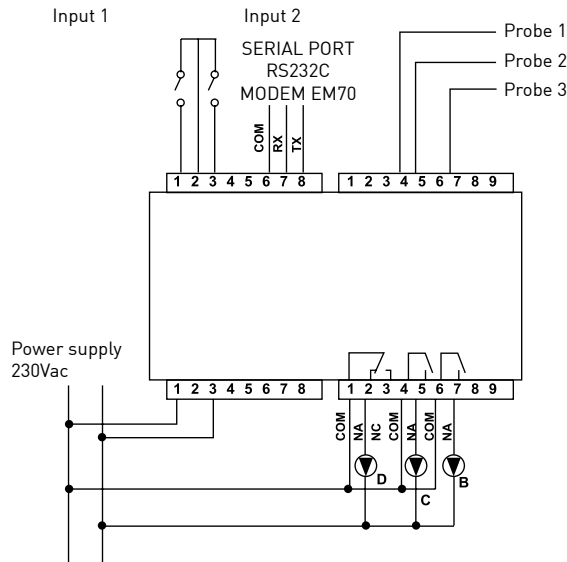|	Power supply	Contacts rating	Operating ambient temperature	Consumption	Protection degree
EV40	230V 50Hz	5(3)A	0 ÷ 50 °C	5 VA	IP40 (back panel)

ELECTRICAL FEATURES

Power supply: 230 Vac.
Consumption: 5VA.
Analog inputs: collector probe, boiler probe and integration probe NTC 1k-200°C (EC21).
2 optoisolated inputs.
Output relays:
- 1 relay for collector circulation pump;
- 1 relay for integration pump or for deviation valve;
- 1 relay with programmable function.

Contacts rating: 5(3)A 230Vac.
Serial port RS232: for remote control with GSM modem (by means of SMS).

GENERAL ELECTRICAL WIRING DIAGRAM

ELECTRICAL DIAGRAM FOR CONNECTION TO THE PUMPS

Input 1

Input 2

SERIAL PORT
RS232C
MODEM EM70

COM RX TX

Probe 1
Probe 2
Probe 3

1 2 3 4 5 6 7 8   1 2 3 4 5 6 7 8 9

Power supply
230Vac

1 2 3 4 5 6 7 8   1 2 3 4 5 6 7 8 9

COM NA NC COM NA COM NA

D   C   B

access to various
configuration menus

modification
of several
controller
parameters

operation mode
setting

FantiniCosmi EV40

A   B   C   D

SET

MODE

The indication LED will turn on when the control unit energizes the corresponding relay:
B = Integration Relay (or secondary relay)
C = Solar Pump Relay (or primary relay)
D = Safety Relay (or auxiliary relay)

OPERATION

The EV40 differential control unit is suitable for the regulation and control of thermal solar panel systems, both of the vacuum tubes and flat plate types, with fluid forced circulation.
It is able to control both heating and cooling of the environment through the management of the systems with solar cooling. Eight system types are available, according to the specific required application.
The control unit is fitted with three analogue inputs for temperatures reading (from 0 to 150°C), and with two relays operating the solar pump. If required, it can be fitted with another electromechanical actuator which will be different according to the type of selected system.
A third relay can be programmed to cover different auxiliary functions, for example, the integration of the boiler electrical resistance.
Furthermore, EV40 control unit can be linked to an EM70 modem in order to remotely program and manage the system using SMS messages, or just to know its current status.

8 SYSTEM TYPES SELECTED BY MEANS OF THE GRAPHICAL MENU:

- basic system;
- system with heat integration;
- system with lower probe;
- system with 2 solar collectors;
- system with heat exchanger (e.g., for pool);
- system with 2 priority tanks: 1 pump and 1 valve;
- system with 2 priority tanks: 2 pumps;
- drainback system.

EXAMPLE OF BASIC SYSTEM

Solar collector

T1

EV40

TC

T2

Sanitary hot water

Hot water

Boiler

Accumulator

Cold water inlet

This is the forced circulation system as simple as possible: the solar pump (C) is operated by the control unit when the temperature difference between the solar collector (T1) and the accumulator, also called boiler, (T2) reaches the value specified in the Parameter called T (see next section for Parameter description) and it turns off when this difference drops to ΔToff Parameter level. In this simple type of system, probe 3 is not used for regulation, and therefore it may be used, for instance like probe for the Thermostat Function of Relay D.

PROGRAMMABLE RELAY HAS THE FOLLOWING FUNCTIONS:

- solar fluid cooling command (in case of overheating);
- thermostat with Tset programmable from 0 to 144°C, used also for integration of electrical resistance or boiler;
- timer: the relay turns on and off at the prescribed times;
- "alarm" function: the relay turns on when only one, either or both optoisolated inputs are closed.
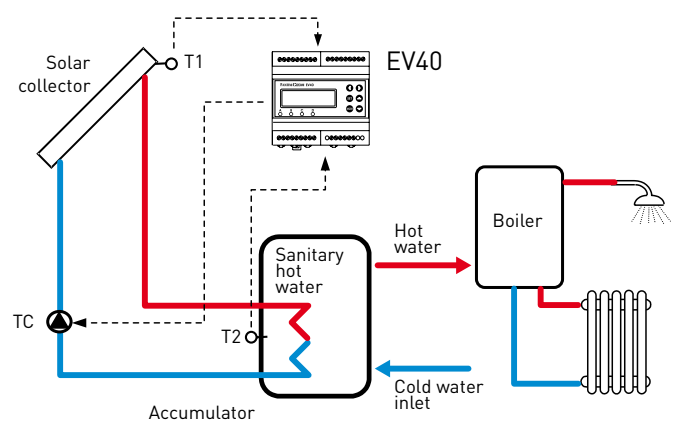
REMOTE CONTROL

If the system is connected to a Fantini Cosmi EM70S modem for remote control, is possible to receive an SMS to a specified mobile phone number in order to change the status of the programmable relay.
By setting the function of this relay is possible to realize, for example, a simple antiintrusion system (alarm function) or an irrigation control (timer function), or to control the temperature of an environment (thermostat function), etc.
Possibility to monitor the entire system and change all the settings via SMS (with EM70S modem).
Possibility to receive SMS messages to any status variations of the programmable relay (with EM70S modem).

FUNCTIONS
Possibility to completely turn off the system (OFF mode), keeping it always switched on (ON mode) or to program the time and days of startup (AUTO mode).

ANTIFREEZE FUNCTION
When the liquid temperature in the collector approaches to a certain value (from -9 to +10 ° C), the circuit starts to increase the temperature.

FUNCTION COLLECTOR PROBE ON PIPE
In certain system types with the collector probe fitted downstream on the pipe, in a distant area from the solar collector.

PUMP ANTIBLOCKING FUNCTION.

POWER AND ENERGY CALCULATION IN REAL TIME.

TOTAL OPERATION HOURS OF THE SYSTEM
Counts total operation hours of the system.

SUMMER TIME
Automatic or manual application and calculation of the summer time.

TEMPERATURE CALCULATION
Calculation of the solar fluid freezing temperature according to the percentage of antifreezing agent in the mixture.

PROBES AUTOMATIC CORRECTION
Possibility to automatically correct probes imprecision.

5 CUSTOMIZABLE LIMIT TEMPERATURES
5 "limit" temperatures, customizable, for the system correct management and protection of its hydraulic and electromechanical components.

STANDARDS AND HOMOLOGATIONS
In conformity with EN60730-1 standards

CE EAC

INSTALLATION
DIN-rail mounting (6 modules).
To ensure an adequate protection install the device on the DIN-rail within a framework.
The removable terminals simplify the wiring and a possible replacement.

FEATURES
Backlighting LCD display with graphic visualization of the system and its data.
6 buttons for selection.
3 LED for relays status indication.
DIN Container: 6 modules.
Disconnection type: 1B (micro-disconnection).
Pulse voltage: 4000V.
Software class: A.
Clock charge reserve: 5 years.
Probes measurement range: 0 ÷ 150°C (+/-1°C).

ACCESSORIES

EM70S
GSM-modem with power supply unit and antenna.

1590029
Rechargeable battery 12V-1.2Ah.
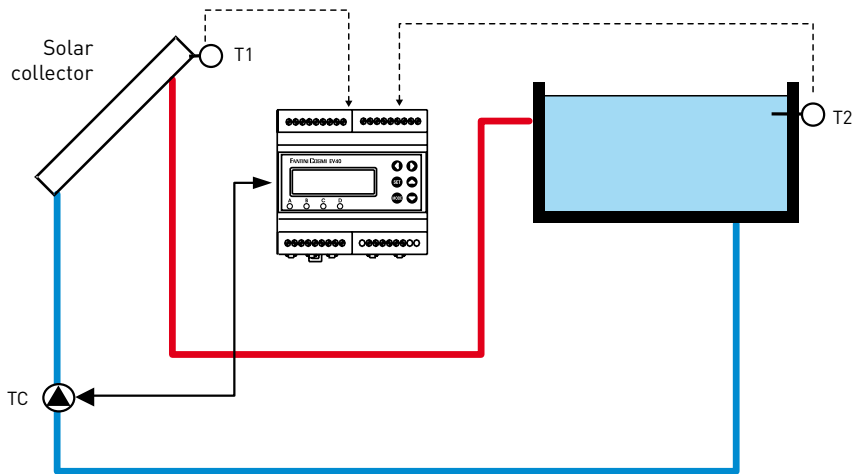

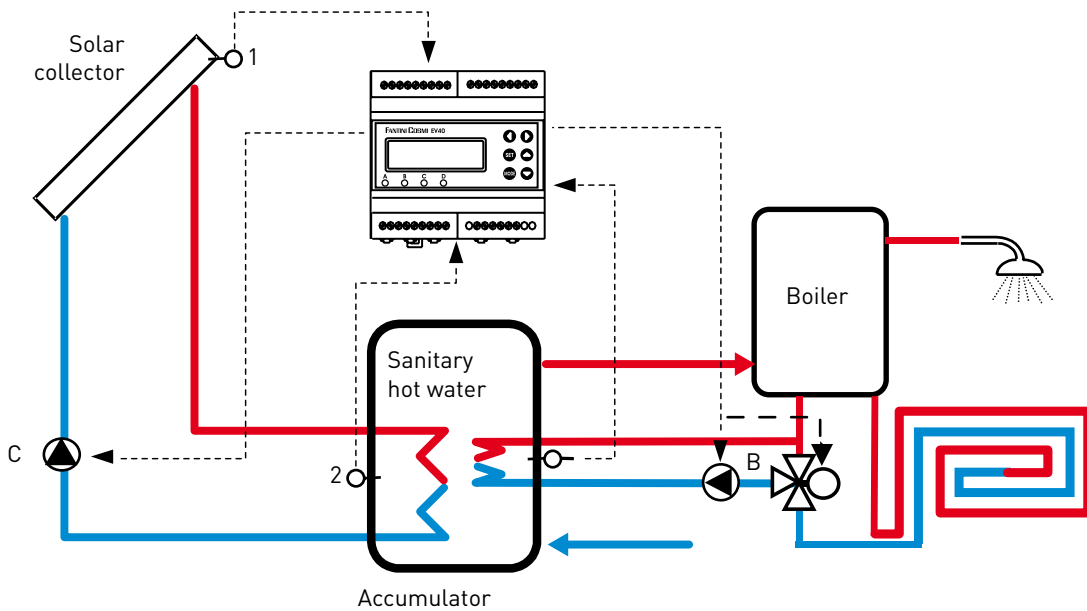**N70A**
Power supply unit and battery charger.

EC21
Probe for high temperatures

EXAMPLES OF THE SYSTEM

EXAMPLE OF BASIC SYSTEM WITH POOL

EXAMPLE OF BASIC SYSTEM WITH RADIANT PANELS INTEGRATION

EXAMPLE OF BASIC SYSTEM WITH INTEGRATION OF HIGH TEMPERATURE RADIATORS