

- **ECO** Timed thermostat is a wall-fitted electronic control device that allows temperature control related to time.
This device executes actions of **1B class (CEI 107-70)** and it is built for installation in a common domestic environment

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SAFETY WARNINGS

During the installation and operation of the instrument, follow the instructions below:

- 1) The instrument should be installed by qualified personnel**
- 2) Do not power or connect the instrument if any part of it is damaged**
- 3) Switch off the power supply while installing the instrument**
- 4) Follow the connection diagrams in this manual and on the instrument**

TECHNICAL SPECIFICATIONS

- Display: LCD
- Programming: weekly/daily
- Precision: $\pm 0,5\text{ }^{\circ}\text{C}$
- Power supply: 2 alkaline 1,5 V AA batteries
- Autonomy: minimum 12 months with alkaline batteries 1800 mA/h (at 23 $^{\circ}\text{C}$)
- Charge reserve: about 1 minute (to substitute batteries)
- Battery charge status control
- Output two-step relay load:
maximum 5(1)A 250 V AC
- Two temperatures **“SUN”** and **“MOON”** are adjustable by one-turn trimpot:
 - “○” 6 $^{\circ}\text{C}$ \div 35 $^{\circ}\text{C}$ **“comfort”** adjustment
 - “☾” 6 $^{\circ}\text{C}$ \div 20 $^{\circ}\text{C}$ **“saving”** adjustment
- ON-OFF temperature regulation with 0.3 $^{\circ}\text{C}$ differential (off while on SET)
- Week day display: Italian (English on request).
- Daily resolution: 1 hour (minimum interval between settings).
- Measured temperature display: 0 $^{\circ}\text{C}$ \div +37,7 $^{\circ}\text{C}$
- Measured temperature resolution: 0,1 $^{\circ}\text{C}$
- Measure refresh: 1/60 seconds
- Protection level: IP40
- Working temperature: 0 $^{\circ}\text{C}$ \div +50 $^{\circ}\text{C}$
- Storage temperature: -10 $^{\circ}\text{C}$ \div + 65 $^{\circ}\text{C}$
- Testing on each piece

CONTROL ELEMENTS AND DISPLAY INDICATIONS

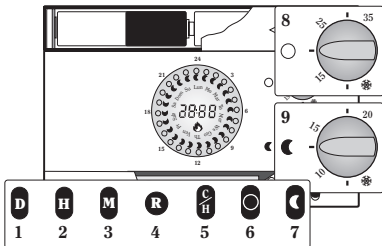
- 1) **Key “D” (Dalay):**
sets week day (only for weekly version)

Table 1

- 2) **Key “H” (Hours):**
increases hour field

- 3) **Key “M” (Minutes):**
increases minutes field

- 4) **Key “R” (Reset):**
sets to zero and restarts the instrument

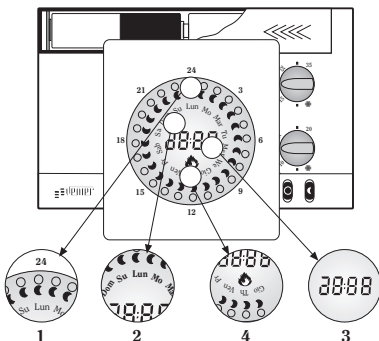


- 5) **Key “C/H”:** displays measured temperature alternating with hour; allows return to normal operation
- 6) **Key “○”:** displays “comfort” temperature set; programs “comfort” temperature event
- 7) **Key “☾”:** displays “saving” temperature set; programs “saving” temperature event
- 8) **Knob “○”:** sets “comfort” temperature
- 9) **Knob “☾”:** sets “saving” temperature

Four display fields are identified:

- 1) Graphic field for time programming with **24** “○” symbols and **24** “☾” symbols related to hours **0÷23**
- 2) Week day field (**only for weekly version**) with signs **Mon ÷ Sun** (in italian)
- 3) Numeric field for time and temperature
- 4) “☼” symbol to signal load activation

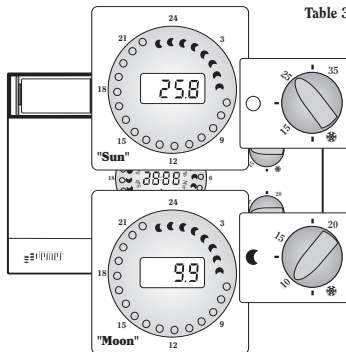
Table 2



GENERAL OPERATION

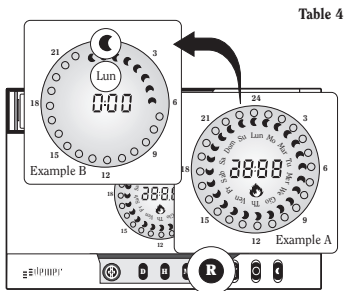
- The chrono thermostat allows temperature control related to time
- Setting can vary each hour by switching on one of two settings “○” or “☾” set by rotating knobs. **(Table 3)**
- Programming status of sets timing is displayed on LCD display by the two symbols “○” or “☾” for each hour in the day
- Regulation is made by activation of a two-step relays (250 V - 5 A)

Table 3



FIRST START

- Insert batteries and press key **“R” (Reset)** by means of a pencil
- **This operation deletes all data and programs previously set and initializes the default (starting state)**

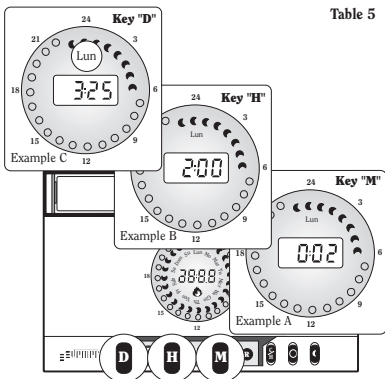


- All display segments are switched on and the relay is activated for 3 seconds (**Table 4 ex. A**)
- The clock starts from flashing **“0:00”**
- Days start from **“Mon” (only for weekly version)**
- Display shows default programming with graphic segment flashing on **“0:00”** hour position (**Table 4 ex. B**)

CLOCK SETTING

- **This function is possible only when time is displayed on the numeric field**

- Press key **“M”**, minutes are increased continuously from **“00” to “59”**; (holding the key, autorepeat function is activated). (**Table 5 ex. A**)
- Press key **“H”**, hours are increased continuously from **“0” to “23”**; (holding the key, peat function is activated). (**Table 5 ex. B**)



- Press key “D” days are continuously increased from “Mon” to “Sun” (only for weekly version). **(Table 5 ex. C)**
- **The chronothermostat is now already functioning with a preset program!!!**
- If no further operation is made (custom programming) the chronothermostat will work executing every day this preset program.
It will keep “○” temperature from **7:00 AM to 10:59 PM** and “☾” temperature from **11:00 PM to 6:59 AM**

CUSTOM PROGRAMING

- **Besides “basic operation” with preset program, the chrono thermostat can operate by executing any program set by the user**

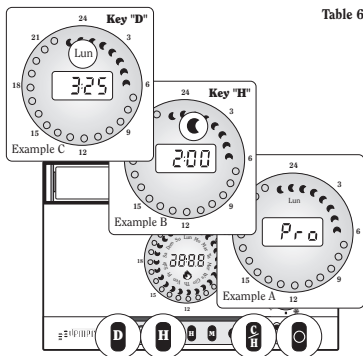
- Press key “○” (or “☾”) for more than 2 seconds, on numeric field the “PRO” sign will be displayed and the graphic field will flash except for the symbol for the current hour which the current program state.

(Table 6 ex. A)

- In this state by pressing keys “○” or “☾” it is possible to set temperature (comfort or saving) for current hour.

When the variation is done the next hour is displayed with the rest of the graphic field still flashing

- Pressing again keys “○” or “☾” setting can be changed passing then to the next hour
- By key “H” it is possible to choose the hour to be modified, each pressure moves the cursor one hour clockwise. **(Table 6 ex. B)**
- By key “D” it is possible to choose week day to be modified, each pressure



moves the cursor one day clockwise (only for weekly version).

(Table 6 ex. C)

- By key “C/H” programing state is terminated to return to normal operation
- **At the end of programing, current hour is displayed on numeric filed and set regulation is executed**

* **Note:**

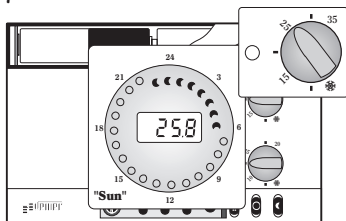
During all the time spent in set mode, chronothermostat regulation is suspended.

If no key is pressed during setting or programing, the chronothermostat returns to normal operation after 45 seconds

TEMPERATURE SETTING AND DISPLAY

- “○” and “☾” temperatures are set by the user by means of two knobs an temperatures are indicated by figures printed around them
- By pressing key “○” set temperature for this knob is displayed
- By pressing key “☾” set temperature for this knob is displayed
- By pressing key “C/H” time or current temperature is displayed again, according to previous status. **(Table 7)**

Table 7



ANTIFOULING

- If during all day no switching occurred, at noon the load is switched on for 2 minutes
- This to avoid fouling of any controlled valve or pump

KEYS SPEED

- During normal operation a key must be pressed for about 1 second before it is

acknowledged. Then all valid keys will operate instantly

- By pressing keys “**H**” or “**M**” the value in the field is increased at constant speed
- If the key is pressed for more than 1 second, the value changes with a constant acceleration to a speed of ten per second

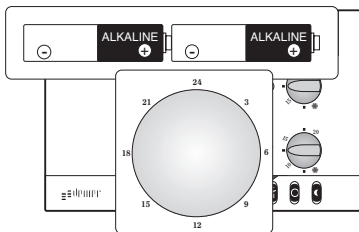
KIND OF REGULATION

- Temperature regulation type **ON-OFF** with fixed differential at 0.3 °C and switchoff on **SET** value
- Regulation is executed each minute or at the end of all set and programming state at 45 second period end
- Relays command uses following logic:
 - **Tset - Tmeas > 0.3 then relays ON**
 - **Tset - Tmeas <= 0 then relays OFF**
 - **Tset = temperature corresponding to current time setting**
 - **Tmeas = measured environment temperature**

BATTERY REPLACEMENT

- When batteries are near to discharge all display flashes while executing all functions
- At this point substitution is recommended
- Slide to the left the upper cover and, when batteries are removed, display shuts off and all functions are suspended, (except for clock refresh), until battery replacement

Table 8



■ Maximum replacement time is 1 minute

- * **Note:** When batteries are replaced the chronothermostat doesn't start right away, but after a time from 5 to 10 seconds, during which internal voltage rises to normal operation values. If low batteries are placed, wait time can be much longer

**WARNING**

Inverse polarity battery insertion will cause the complete discharge of backup battery losing then all programs set. It will be then necessary to start with “**first start**” procedure

REFERENCE STANDARDS

■ FOR SAFETY:

- **CEI 107-70 (91):** “Automatic electrical control devices for domestic use or similar; **part 1: General rules**”, with variants **V1 (92)** and **V2 (94)**

■ FOR ELECTROMAGNETIC COMPATIBILITY:

- **CEI-EN 50082-1 (92):** “Generic rule for immunity in residential, commercial and light industry environments”, relating to immunity
- **CEI-EN 55014 (94):** “Limits and methods of measurement of radio disturbance characteristics for motor or termic electro domestic appliances and similar, of electric tools and similar electric appliances”, relating to emissions