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MODULATING TEMPERATURE CONTROLLER

RTM 880 Eng.

- Power supply 220/240 V ac; constructed in DIN 144 x 144 case with IP 40 protection
- Modulating control of temperature at fixed point with PI control action
- 1 voltage-free SPDT output
- Digital readout of temperature on numerical display
- Adjustable Proportional band and Integral time
- Controls reversible actuators with running times : 100, 200, 600 seconds
- Summer-Winter switch.

APPLICATION

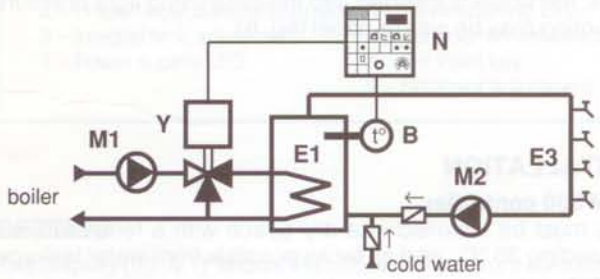
RTM 880 is designed for the control of a mixing valve operated by a reversible actuator with three-wire electric control (common, opens, closes) to maintain a temperature at a fixed point.
Typical installations :

- Production of DHW
- Heating of swimming pool water
- Two-pipe distribution of hot and cold water for fan coil systems.

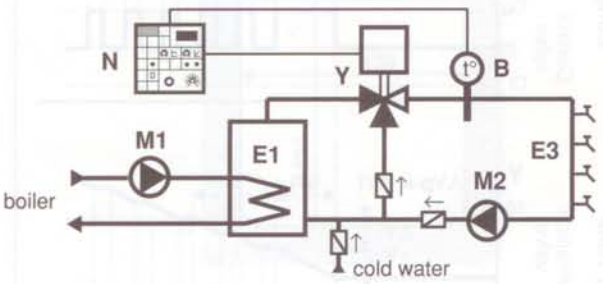
SCHEMATIC DIAGRAMS

fig. 1

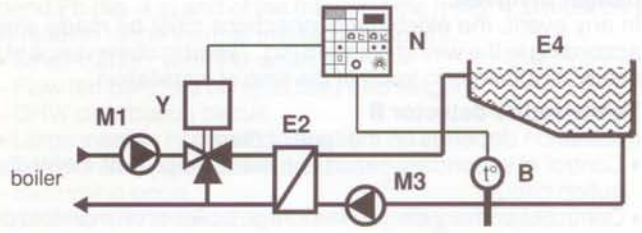
Control DHW system on primary circuit



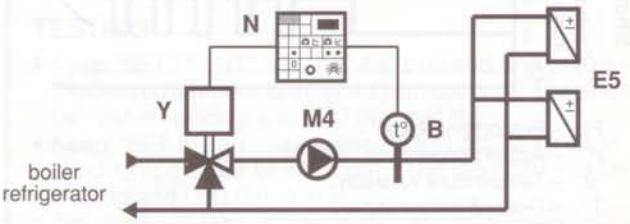
Control DHW system on secondary circuit



Control heat exchanger swimming pool water



Control fan coil system Summer – Winter at a fixed point



B – Temperature detector
N – RTM 880
Y – Mixing valve

M1 – Primary circuit pump
M2 – DHW pump
M3 – Swimming pool pump

M4 – Fan coil pump
E1 – Storage heat exchange
E2 – Rapid heat exchanger

E3 – DHW outlets
E4 – Swimming pool
E5 – Fan coil system

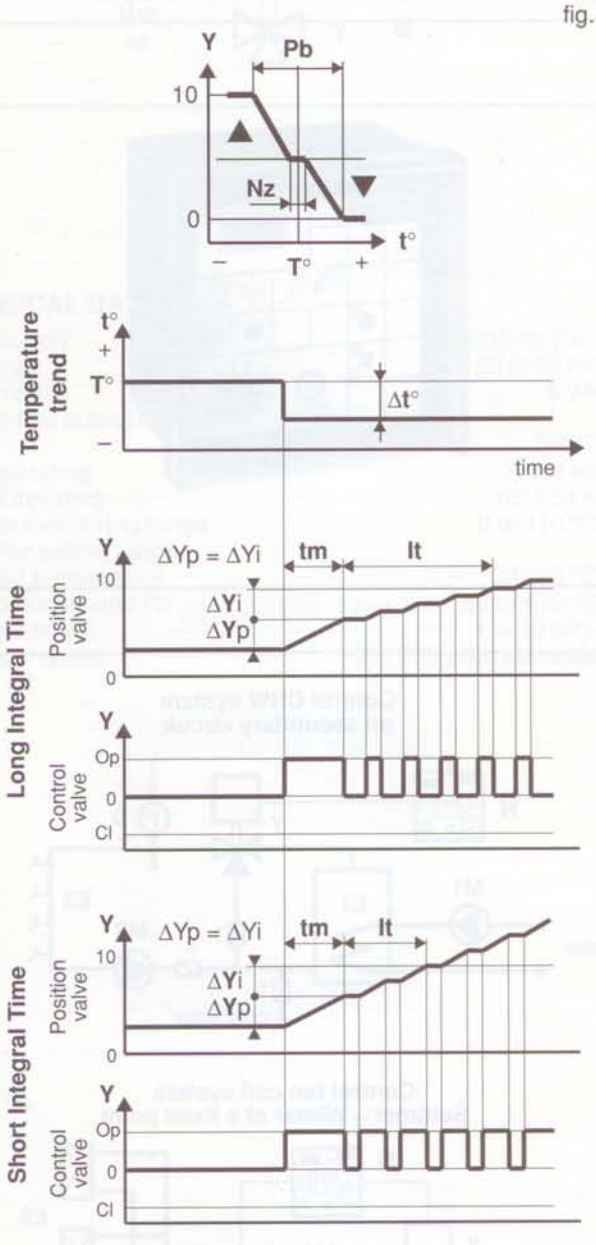
Code	Description	Temperature	Proport. band	Integral time
RTM 880	Modulating temperature controller	0 to 80 °C	± 2 to ± 10 °C	1 to 10 min.

ACCESSORIES

No.	Description	Model	Sensing element	Code	Data sheet
1	Immersion temperature detector	**SIH 010**	NTC 10 kΩ	B	N 140
or	Surface temperature detector	**SCH 010**	NTC 10 kΩ	B	N 130
or	Cable-type temperature detector (separate pocket)	**SAF 010**	NTC 10 kΩ	B	N 145

OPERATIONAL DIAGRAMS

fig. 2



Pb – Proportional band
t° – Actual temperature
Δt° – Temperature variation
T° – Desired temperature
tm – Time taken by actuator
It – Integral time
Y – Valve
ΔYi – Valve correction effected in Integral time It
ΔYp – Incremental movement valve set by P function
Zn – Neutral zone

OPERATION

RTM 880 compares the real value of the temperature t°, measured by the detector B, with the desired value T°.
In the event of a difference, RTM 880 produces a modulating signal for the control of valve Y, proportional to the difference itself and to the Proportional band Pb set (fig. 2).
RTM 880 provides for fine adjustment by sending corrective impulses to the valve in relation to the Integral time It set.
The neutral zone Zn is fixed and is narrow enough to allow an immediate intervention in the event of a minimum temperature error.
The progressive control of the valve is in relation to the duration of the opening and closing signals, which in turn depends on the speed of the actuator controlled, and this has to be set by means of the internal programmer (fig. 3).

CONSTRUCTION

Constructed in a DIN 43700 standard 144 x 144 case (fig. 5). This is in shockproof plastic and contains, on the base, the two terminal blocks into which the tabs of the printed circuit are inserted. The cover, in transparent plastic, is hinged on the left-hand side of the case and is provided with a mechanical closure.
The electronic unit is constructed according to Italian Electrotechnical Committee (CEI) standards and is constructed as a single unit comprising the printed circuit and the controls facia; the whole is inserted into the case using light pressure.
Mounting may be wall or panel (fig. 6).

INSTALLATION

RTM 880 controller

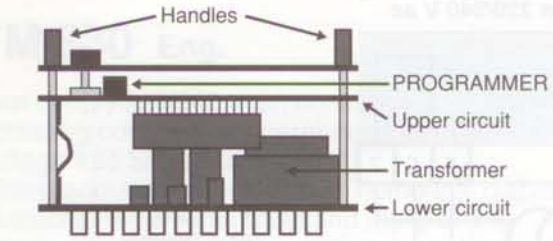
This must be installed in a dry space with a temperature not exceeding 35 °C, and as far as possible from water leakage or sprays.
If installed in spaces classified as "dangerous" it must be mounted inside a cabinet for electrical appliances constructed according to the regulations in force for the type of danger involved.
In any event, the electrical connections must be made strictly according to the wiring diagram (fig. 7) and in observance of the safety regulations in force at the time of installation.

Temperature detector B

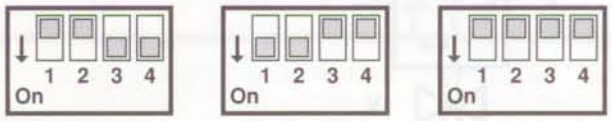
Installation depends on the type of plant :
- Control of secondary circuit : on manifold pipe of DHW distribution circuit.
- Control of primary circuit : in storage boiler or on manifold pipe of distribution circuit.
- Control of swimming pool water : on return pipe as near as possible to pool.

PROGRAMMER

fig. 3



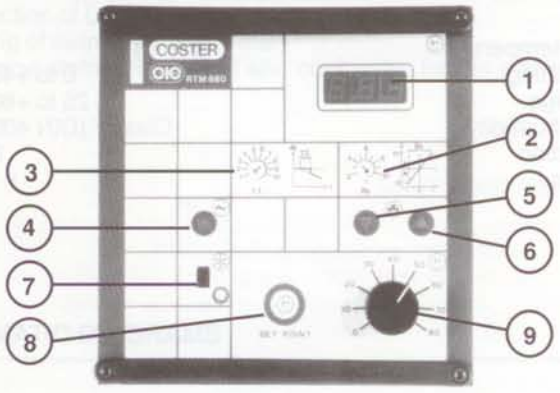
Programmer speed actuators



100 sec. 200 sec. 600 sec.

FACIA

fig. 4



1 – Display
2 – Proportional band adjustment
3 – Integral time adjustment
4 – Power supply LED
5 – Valve closing LED
6 – Valve opening LED
7 – Summer-Winter switch
8 – Set Point key
9 – Set Point adjustment

SETTING

The display (fig. 4.1) shows the actual temperaure measured by the detector B. By pressing the button 'SET POINT" (fig. 4.8), on the display appears the value of the desired temperature T° which can be adjusted using the potentiometer (fig. 4.9).
To obtain good control the correct values of the Proportional band Pb (fig. 4.2) and of the Integral time It (fig. 4.3) must be set in relation to the thermal inertia of the plant.

- Small inertia : wide Pb, short It

– Flow temperature of rapid heat exchangers
– DHW distribution circuit.

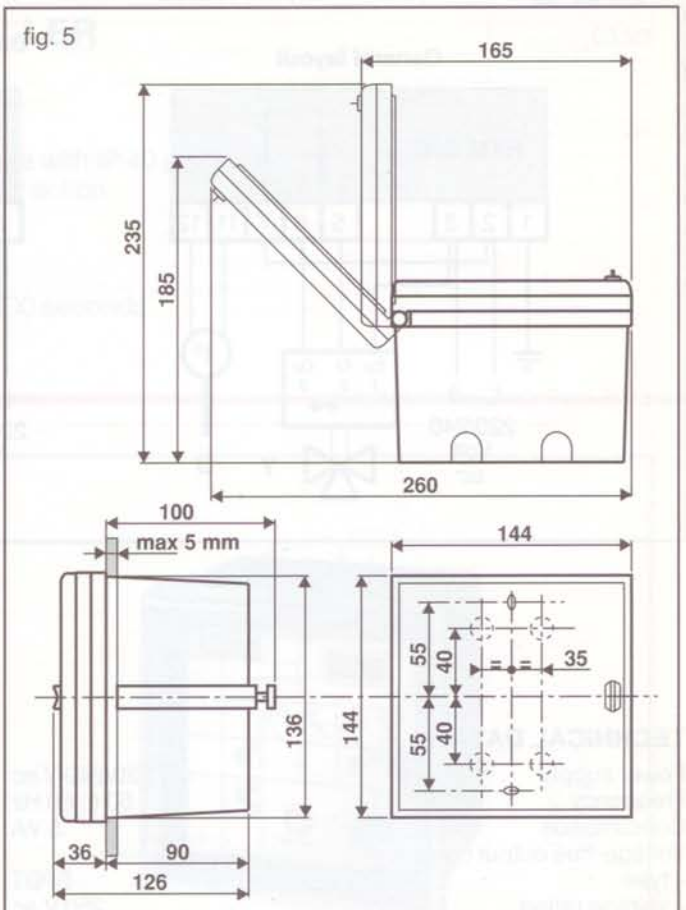
- Large inertia : narrow Pb, long It

– Temperature storage heat exchangers
– Swimming pools

If situations with unstable actual temperature should arise :
– Caused by too frequent and wide oscillations of the valve : increase Pb and, if necessary, also It
– Caused by excessive stability of the valve : reduce Pb and, if necesary, also It.

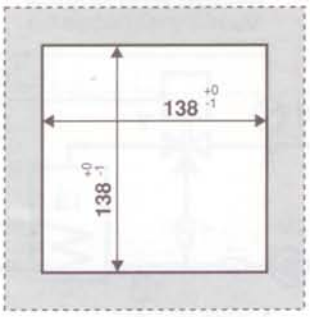
OVERALL DIMENSIONS

fig. 5



CUT-OUT FOR PANEL MOUNTING

fig. 6



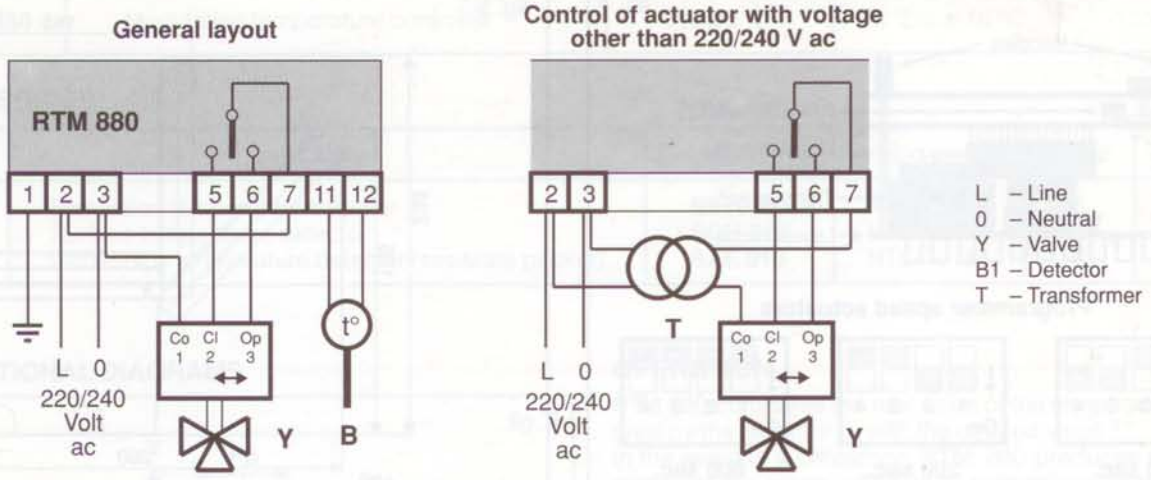
TESTING

- Keep "SET POINT" key (fig. 4.8) pressed and adjust value of the desired temperature (fig. 4.6) to maximum. The result should be : valve opening and LED (fig. 4.6) lit.
- Keep "SET POINT" key pressed and adjust value of the desired temperature to minimum. The result should be : valve closing and LED (fig. 4.5) lit.

If the valve actuator moves in the opposite direction invert the electrical connections of terminals 2 and 3 on the actuator.

WIRING DIAGRAMS

fig. 7



TECHNICAL DATA

Power supply	220/240 V ac
Frequency	50 to 60 Hz
Consumption	5 VA
Voltage-free output contact :	
– type	SPDT
– voltage rating	250 V ac
– capacity rating	10 (2,5) A
Detector monitoring range	0 to 110 °C
Controller setting range :	
– desired temperature	0 to 80 °C
– Proportional band Pb	±2 to ±10 °C
– Integral time It	1 to 10 min.
– actuator speed	100 ; 200 ; 600 seconds

Room temperature :	
– operating	0 to +45 °C
– storage	– 25 to +60 °C
Room humidity	Class F (DIN 40040)
Protection	IP40
Weight	1.1 kg

COSTER
CONTROLS TEMPERATURE ENERGY

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