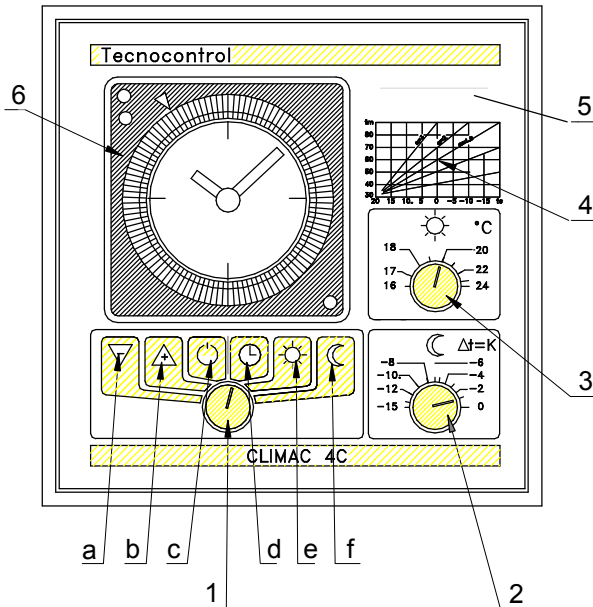




RE150 (CLIMA4C)

Electronic climatic controller



Technical Specifications

Operational Temperature:	0÷40 °C
Storage Temperature:	-10 ÷ +50 °C
Operational Humidity:	15 ÷ 90% RH
Power Supply:	230Vac-50Hz (-15/+10%)
Power consumption:	2,8 VA
Outside temperature Probe	to be wall-mounted
Hot water temperature Probe:	to be installed on the pipe
Installation:	to be board or wall mounted
Contacts rating:	230 Vca-1A
Size	144x144x110mm
Drilling template:	141x141mm
Rating	IP44
Weight:	0,7 Kg
Servomotors for valves:	Tecnocontrol SM-series
Mixing valves connectable to the CLIMAC 4C	Tecnocontrol VM-series

EN OVERVIEW

- 1 Six-position rotary switch for the selection of the following functions:
 - a Closes: closing of the mixing valve.
 - b Opens: opening of the mixing valve.
 - c Antifreeze operation.
 - d Operation as per set program.
 - e "Comfort" Mode (i.e. continual operation at a set room temperature).
 - f "Reduced" Mode (i.e. continual operation at a set reduced temperature).
- 2 Knob for the adjustment of the decrease temperature.
- 3 Knob for the adjustment of the room temperature ("Comfort" Mode).
- 4 Heating slopes.
- 5 Handle to get access to the terminal board.
- 6 Electromechanical time switch (mod. RE150 for daily time; mod. RE152 for weekly time).

USE OF THE CLIMAC 4C

The CLIMAC 4C climatic controller has been designed to provide the maximum comfort conditions in the most different environments. The CLIMAC 4C guarantees the optimization of the combustible consumption by controlling the hot water flow temperature in the heating plants. It fits any climatic areas as well as any heating system such as radiators, radiating panels, convectors and floor heating system.

INSTRUMENT DESCRIPTION

The instrument controlling system comprises of the following elements:

- **An outside temperature probe**, for the outside temperature measurement;
- **A hot water flow temperature probe**, for the hot-water flow temperature measurement;
- **A servomotor (if installed)**, for the automatic activation of the mixing valve (the servomotor is not included in the Controller equipment).

ELECTRONIC CONTROLLER CLIMAC C4

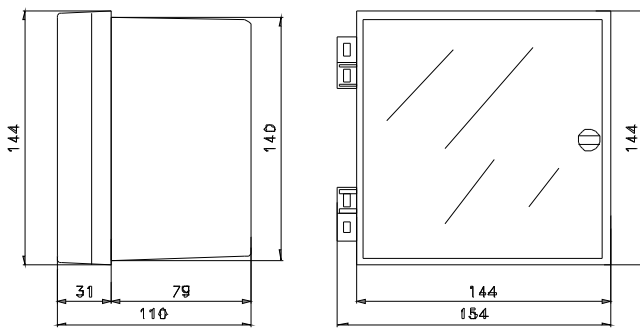
The Climac C4 instrument has been designed for optimizing the adjustment of the room temperature. First this electronic Compensator measures the outside temperature (outside the building) by means of the outside temperature probe, then compares it to the heating flow measured before the mixing valve (hot water flow temperature probe), and finally it opportunely activates the servomotor of the valve so as to attain the User-set room temperature value.

This Controller guarantees a high intervention rapidity following to the climatic conditions changes. Moreover, the instrument compensation is linear, thus avoiding the irritating occurrence of continual room temperature fluctuations which usually occur with an off/on controller with thermostat Systems.

The timer allows selecting different room temperatures following different set times (a typical distinction is between night and day).

The instrument is to be board-mounted and its DIN size is 144 mm x 144 mm (see Fig. 2). It is provided of a Plexiglas transparent cover to be opened by means of a suitable handle.

Figure 2 - CLIMAC C4 dimensions



INSTALLATION

Outside Temperature Probe installation

The outside temperature probe should be fixed on an outside wall of the building. It should be protected from the sun rays and be placed far from heating sources. To fix it, use the suitable supporting fork and position the outside temperature probe with the wiring access downwards. Remove the outside temperature probe cover, insert the 2 x 1.5 mm² wire in the metal strain relief, then connect the wires. Replace the cover being sure of the cover gum-sealing tightness.

Hot Water Flow Temperature probe

The hot water flow temperature probe should be placed on the hot water pipe after the circulation pump if this is installed, at a distance of at least one meter from the mixing valve and in the upper part of the pipe if this has been installed horizontally. The best operational condition of the controller system depends on a good thermal contact between the pipe and the probe. To improve the thermal conduction, it is recommended to place the thermal conductive paste for thermostats between the probe copper plate and the pipe.

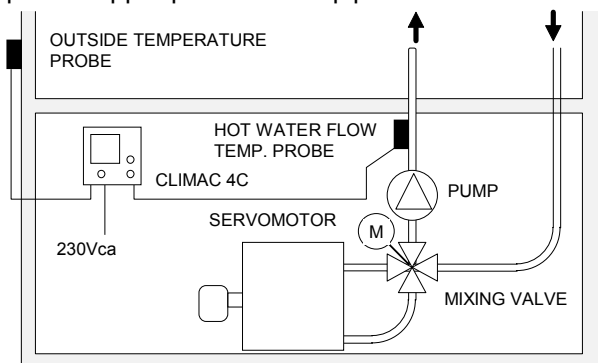


Fig.3 - General Diagram of heating plant with automatic control.

Climac 4C installation

The Controller can be mounted on board on cabinet making a 141 mm x 141 mm hole by means of the supplied big spring. The instrument can be fixed also to the wall by means of the three breakable holes which have been arranged on the bottom of the case. The non-revisable EXTRACTABLE terminals results to be accessible after opening the front panel by means of the suitable handle.

The power supply should be connected both to the "N" (Neutral) and "L" (Phase) terminals. The outside temperature probe should be connected both to the "A" and "A" terminals. The hot water flow temperature probe should be connected both to the "V" and "V" terminals. The instrument-servomotor connection should be executed using the "B" (Opens) terminal, the "W" (Closes)

terminal, and the "R" (Common) terminal, as is shown in Figure 4.

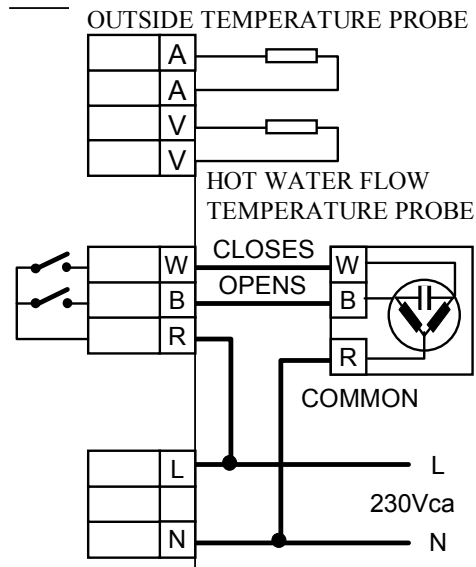


Fig.4 - Wiring diagram

NOTE: The Climac 4C can be set for the direct control either of the burner or the circulation pump. To obtain one of these options, the jumper should be shifted from the "NORMAL" position to the "ON/OFF" position (See Figure 5). The jumper is placed on the upper part of the Printed Circuit Board, and is accessible from the back of the plate. In this case, the "R" (Common) terminal and the "B" (Opens) terminal will be used for the controlling of either a relay or a remote-control switch to which either the burner or the pumps will be connected. (See Figure 4).

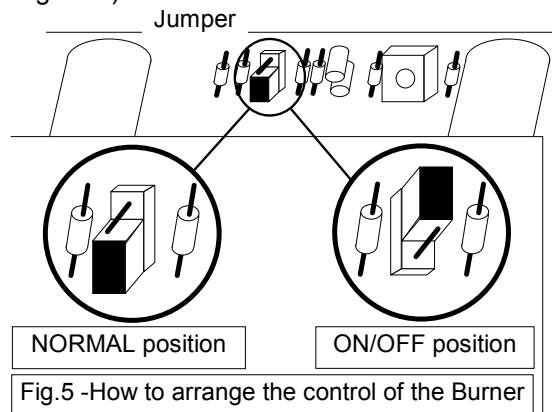


Fig.5 -How to arrange the control of the Burner

Testing the probes

After installing both the probes and the Climac 4C, it is recommended to use a Tester to check both that the probes are isolated towards earth and that their ohm resistance corresponds to the values shown in the two Tables below, before executing the wiring-terminal connections. As an example, suppose that the resistance of the outside temperature probe is about 1,865 Ohm at a 20°C temperature while the resistance of the hot water flow temperature probe is about 7,423 at a 70°C temperature. Should the resistance value result to be either zero or infinity, it means that the probe is defective.

Outside temperature probe

T°C	+20	+15	+10	+5	0	-5	-10	-15
Ohm	1865	2338	2953	3763	4836	6275	8222	10887

Hot water temperature probe

T°C	30	35	40	50	60	70	80	85
Ohm	27839	22703	19400	13826	10055	7423	5555	4820

STARTING THE MIXING VALVE

The mixing valve should be brought manually in its intermediate position (valve opening at 50%). Connect the Controller to the AC power source. Shift the switch on the "opens" position and check that the mixing valve is clockwise rotating so as to increase the hot water flow towards the heating plant. Then shift the switch on the "closes" position and check that the mixing valve is anti-clockwise rotating. Check also that the mixing valve makes the 90° complete excursion passing from "VALVE CLOSES" to "VALVE OPENS". Should the servomotor rotate towards the wrong direction, invert the connections at the "B" and "W" terminals of the Controller. Should the servomotor always rotate towards the same direction when the rotary switch is either in the "OPENS" position or the "CLOSES" position, it means that there is an inversion either between the "B" and "N" terminals or between the "W" and "N" terminals.

DAILY SWITCH TIME (Mod. RE150)

This time switch has a reserve of charge of 72 hours after 120 hours from powering. The switching minimum interval is 20 minutes.

Setting the hour

To set the hour, turn the internal disc on which the minute hand is engraved until the triangular mark (placed on the left side of the clock face) show the desired time on the external ring.

Programming the intervention time-segments

Shift the riders towards the exterior just next to the desired hours on the programming disc. Each rider corresponds to a 10-minute time interval.

Should a group of riders be shifted towards the exterior (appearance of a red area), the time interval with the activation of the "Reduced" function is programmed. On the opposite, should a group of riders be shifted towards the interior (the red area is not visible), the time interval with the activation of the "Comfort" function is programmed.

WEEKLY SWITCH TIME (Mod. RE152)

This time switch has a reserve of charge of 72 hours after 120 hours from powering. The switching minimum interval is 2 hours.

Setting the hour and the day

On the weekly time switch clock face, the days are represented by numbers included between 1 and 7 (1 corresponds to Monday, 7 corresponds to Sunday).

To set the hour, turn the internal disc on which the minute hand is engraved until the triangular mark (placed on the left side of the clock face) shows both the current hour and day.

Then set the right hour on the 12-hour clock face.

Programming the intervention time-segments

Shift the riders towards the exterior just next to the desired hours on the programming disc. Each rider corresponds to a 1-hour time interval.

Should a group of riders be shifted towards the exterior (appearance of a red area), the time interval with the activation of the "Reduced" function is programmed. On the opposite, should a group of riders be shifted towards the interior (the red area is not visible), the time interval with the activation of the "Comfort" function is programmed.

USE OF THE PLANT

NOTE: The "α" calibration potentiometer and the "Tm20" calibration potentiometer must not be touched by people who do not know perfectly the Controller and the potentiometer functions.

- 1 The knobs for the "Reduced" mode and the "Comfort" mode can be used by the User to select the desired temperature. Note that these potentiometers modify the hot water temperature (shifting the calibration curve parallel to it).

CAUTION: The complete anticlockwise rotation of the "Reduced" mode potentiometer causes the keeping close of the valve thus interrupting the heating during the night.

- 2 When the house is not inhabited for short periods, the switch can be turned towards the "Reduced" mode position so as to obtain the "Hot water" mode knob-arranged temperature value both night and day.
- 3 Should it be desirable to prolong the set temperature for the day (because of parties prolonging late in the night, invalids at home, night work, etc.), the switch will be turned towards the "Comfort" mode position.

STARTING THE ELECTRONIC CONTROLLER

- 1 Adjust the "COMFORT" and "REDUCED" knobs in order to obtain the desired temperature. As an example, adjust "Comfort" at +20°C and "REDUCED" at -4°C, which corresponds to a 16°C night decrease temperature (20°C - 4°C = 16°C).

CAUTION - Adjusting the "Reduced" temperature means making the difference with the "Comfort" temperature previously set.

- 2 The Tm20 and "α" (heating slopes) adjustment Trimmers are both placed on the Printed Circuit Board.
- 3 Adjust the Tm20 trimmer following the Table below:

	RADIATORS AND PLATES	CONVECTORS	RADIATING PANELS
Tm 20	25 °C	28,5 °C	20 °C

NOTE: The temperatures mentioned above are valid for a 10°C max temperature drop in the heating elements (temperature variation between the hot water heating flow and the return water flow).

Should the temperature drop exceed this 10°C value, the "Tm20" hot water flow temperature should be increased of approximately 0.5°C for each degree exceeding the temperature drop (as an example, suppose the temperature drop is 11°C instead of 10°C. Therefore the "Tm20" should be increased of about 0.5°C).

- 4 - Adjust the "α" (heating slopes) trimmer according to the type of heating bodies, the max hot water flow temperature, and the outside temperature average temperature as shown in the Table below:

HEATING BODIES	MAX HOT WATER FLOW TEMPERATURE	OUTSIDE TEMPERATURE				
		+5	0	-5	-10	-15
RADIATORS AND PLATES	85	--	3	2,4	2	1,7
	80	--	2,7	2,2	1,8	1,6
	75	3	2,5	2	1,7	1,4
CONVECTORS	90	--	3	2,4	2	1,7
	85	--	2,7	2,2	1,8	1,6
	80	3,3	2,5	2	1,7	1,4
RADIATING PANELS	55	2,3	1,7	1,4	1,2	1
	50	2	1,5	1,2	1	0,85
	45	1,7	1,4	1	0,8	0,7

- 5 Put the slide switch in the TEST position to check calibration. With this position a +5°C outside temperature is simulated. The switch is placed on the lower side of the Printed Circuit Board. Once running, the mixing valve will assume a position so as to give a hot water flow temperature corresponding to the +5C outside temperature.

WARNING: The TEST control is placed inside the Controller and is accessible by means of the little handle. After the testing operation it should be reset in the starting position.

- 6 Turn the switch towards the "AUTOMATIC" position. In this position, the hot water flow temperature to the heating plant will be programmed by the time switch so as to maintain the selected "Comfort" mode or "Reduced" mode temperature in the rooms. The mixing valve will assume a position so as to give a hot water flow temperature corresponding to both the outside temperature and the set room temperature.

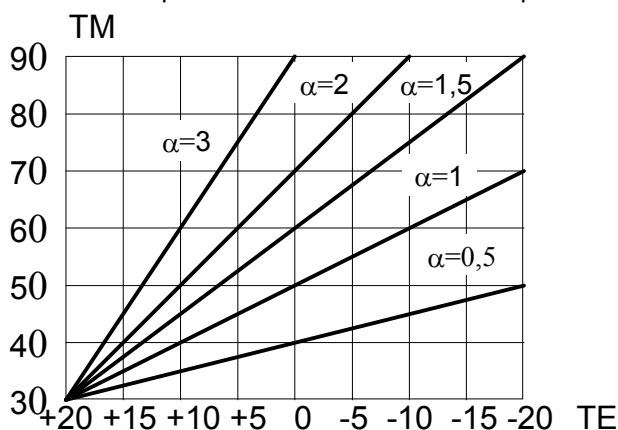


Fig.6 - Heating slopes

CONTROLLER SETTING-UP

The purpose of the electronic Controller is to adjust the hot water flow temperature depending on the outside temperature and according to the selected calibration curve. The insider temperature also depends on particular conditions concerning both the building and the heating bodies. Therefore it may be necessary to proceed to various temperature adjustments in order to obtain the final desired temperature. After some days' heating plant running, it can be assumed that the inside temperature has reached a steady state. Should this temperature not be the one desired, it is necessary to proceed to the adjustment of both the "α" and Tm20 potentiometers.

CAUTION - For a good calibration of the instrument, it is advisable to have the technician execute one setting-up during the cold season (winter) and another setting-up during the mid-season (autumn or spring).

SETTING-UP OF THE CONTROLLER DURING THE COLD SEASON

During winter time the adjustment to execute should be about the "α" heating slopes since this adjustment is more efficient when the outside temperature is low.

Turn the "α" potentiometer to execute the adjustment. The necessary adjustment to obtain a 1°C variation of the room temperature depends on the "heating slope" in use, as shown in the table above.

"α" heating slope	0,5	1	2	3
"α" ADJUSTMENT	0,06	0,08	0,12	0,16

Example: Suppose the slope in use is 0.5. Therefore, the "α" slope should be increased of 0.06 in order to obtain a 1°C increase of the room temperature.

SETTING-UP OF THE CONTROLLER DURING THE MID-SEASON

During the mid-season, the potentiometer to use is the Tm20 one.

This potentiometer shifts the heating slope parallel to itself, therefore the adjustment results to be efficient in case of both an outside low temperature (-10°C) and a medium outside temperature (+20°C). The following Table shows the Tm20 adjustments to carry out in order to obtain a 1°C room temperature variation according to the "α" heating slope.

Tm20 ADJUSTMENT

"α" GRADIENT	0,4	1	2	3
Tm20 ADJUSTMENT	1,5	2	3	4

CAUTION: Suppose the Controller still presents the "cold season" adjustment. During the spring season, should the room temperature be different from the one desired, both the Tm20 potentiometer and the "α" heating slope potentiometer will be adjusted referring to both the Tables above.

Example: Suppose that a Controller whose "α" heating slope is = 2 gives a 20°C room temperature during winter but a +21°C room temperature during spring (the outside temperature is +15°C). To rectify the 1°C error, the "Tm20" will be reduced of 3°C and contemporarily the "α" heating slope will be increased of 0.12 so as to avoid modifying the hot water flow temperature during the winter season.

CAUTIONS

- Should the Controller be used with floor heating, it is recommended to install a safety thermostat on the hot water pipe so as to obtain a further protection from any Controller malfunctions or wrong adjustments.
- The CLIMAC 4C installation should be executed in conformity with the dispositions in force.