

Diagram Tm-Te with Tamb. set at 10°C. When Te=10°C, Tm=10°C

Diagram Tm-Te with Tamb. set at 20°C. When Te=20°C, Tm=20°C

Diagram Tm-Te with Tamb. set at 30°C. When Te=30°C, Tm=30°C

| IDENTIFICATION PROBLEMS | | |
|---|---|--|
| SYMPTOM | PROBABLE REASON | REMEDY |
| Green led in the frontal is ON even if the working mode selector is in OFF position. | Green led only indicates the presence of voltage at the AC mains inputs. | It's a correct working mode. |
| The regulator is OFF even if the working mode selector is not in OFF position. | General fuse blown or AC mains not present. | Verify the integrity of general fuse and, if blown, replace only with one of similar characteristics. Check for the quality of AC mains (230V~ -15% +10% 50Hz). |
| The regulator always drives the servomotor in the "close" direction. | The remote commander jumper (J1) is in position A (enabled) but the remote commander is not connected. | Check for the correct position of jumper J1 according to the presence (or not) of the remote commander, as well as for the relevant wiring. The resistance measured on the wires of the remote commander with a multimeter (leaving the regulator unconnected) must be between 1000 Ohms (+5°C) and 2000 Ohms (-5°C). |
| The regulator always drives the servomotor in the "close" or "open" direction without even stopping. | The regulator cannot "sense" correctly the probes. Possibly a short-circuit is present on the probes inputs, a probe could be unconnected, damaged or the probes could have been swapped. | Check for the connections of the probes. For a more precise inspection measure the resistance of the probes, when not connected to the regulator. The resistance measured must comply with the values indicated in the table below. |
| The servomotor is driven to the "close" direction when more heating is required and vice-versa. | The wirings between the regulator and the servomotor are swapped. | Swap the wirings for "open" and "close" either on the servomotor or on the regulator. |
| When the working mode selector (6) is in the OFF position, the servomotor is driven in the "close" direction. | When the mode selector is switched to 'OFF' position, the servomotor is driven to a "close" direction so that the mixing valve gets completely closed. This activation time (6 or 11 minutes) depends on the type of servomotor selected with the switch (6). | Attendere il tempo di chiusura del servomotore (o 6 o 11 minuti, a seconda della selezione sull'interruttore 6). Si tratta di una modalità di funzionamento normale. Just wait for the 'closing time' of the servomotor (6 or 11 minutes, according to switch (6) position) to expire. It's a normal operating mode for the regulator. |
| The time programmer stops in case of mains blackout. | The back-up battery is damaged or discharged. | Replace the back-up battery with a NiCd, 1.2V= rechargeable one. |
| The supply pipe water doesn't reach a sufficient temperature to provide a correct heating. | The maximum temperature limitation function is enabled. | Disable the maximum temperature limitation function (switch (1)) or increase the limit set by the trimmer PT1 (clockwise rotation). |
| The circulation pump always works, even when the working mode selector is in OFF position. | The external temperature is lower than 3°C and the antifreeze function is set, therefore the circulation pump is active. | This is a normal operating mode for the regulator. |

| PROBE RESISTANCE (Se and Sm) | | | | | | | | | | | | | |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Temp. (°C) | -40 | -30 | -20 | -10 | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| Rs (ohm) | 1155 | 1267 | 1387 | 1515 | 1650 | 1792 | 1942 | 2100 | 2265 | 2437 | 2617 | 2805 | 3000 |

In the view of a constant development of their products, the manufacturer reserves the right for changing technical data and features without prior notice. The consumer is guaranteed against any lack of conformity according to the European Directive 1999/44/EC as well as to the manufacturer's document about the warranty policy. The full text of warranty is available on request from the seller.

CLIMATE REGULATOR WITH MOTORIZED VALVE OR BURNER DRIVE



- 230V~ power supply
- Delivery pipe temperature against external temperature
- Microprocessor based PI temperature regulation
- Valve drive output for reversing servo-motor (3 points) or ON-OFF for burner
- "Comfort" - 'Reduced' switching programmer, daily or weekly
- Output contacts rating: 5 (1) A @ 250V~
- Heating curve correction (steepness) knob
- Remote commander for room temperature adjustment (optional)
- Easy to replace programming clock
- Replaceable programmer charge backup
- Periodic circulation pump activation for anti grip purpose
- Delayed and adjustable circulation pump turn-off time
- Delivery water minimum and maximum temperature limitation
- Cut-off facility at (adjustable) external temperature reach out
- Servo-motor type selection switch: 2 .. 5 min. or 5 .. 10 min.
- Possibility to disable the antifreeze function
- Operation with radiators, fan-coils or underfloor heating systems

OVERVIEW

The device (Fig. 1) has been designed to assure comfort in rooms optimizing in the meantime the fuel consumption through control of water temperature in the heating plant delivery pipe. The regulator fits all climate zone as well as all heating systems including radiators, radiant panels, fans or floor heating systems. Regulation is performed through the use of an electric reversing servo-motor (3 points drive) or through a burner (2 points drive).

OPERATION

The purpose of the climate regulator is to control and regulate the delivery water temperature (Tm) in the heating system against two parameters:

- External temperature (Te)
- Regulation line steepness (k)

Regulation is performed through the use of a 3-way or a 4-way mixing valve, according to selection made via the proper selector. Changing the room temperature regulators position (Comfort or Reduced) result in a movement of the straight line to another one parallel to the one set before. The (optional) remote commander allows a change of further ± 5°C for the room temperature set on the regulator itself. This takes to the room comfort together with a great saving in terms of energy.

The electro-mechanical programmer (daily or weekly) allows to switch between two different regulated room temperatures. According to the function selector position these are:

- Comfort - Reduced
- Comfort - Off

Panel function

Following are the functions present on the front panel:

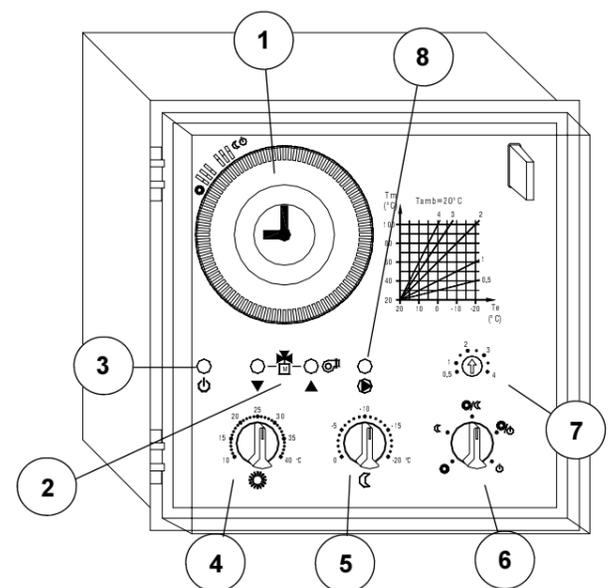
- Regulation line steepness adjustment
- Day temperature adjustment: 10°C .. 40°C
- Night reduction adjustment: 0°C .. -20°C
- Time programmer mode selector:

- Fixed comfort
- Fixed reduced
- Day comfort, night reduced
- Day comfort, night Off
- Off

Underfloor heating systems

In case this device is used for regulating underfloor heating systems, please respect the following indicative guideline:

- Enable the delivery water temperature limitation, setting dip-switch n°1 in 'enabled' position ▲ (see Fig. 6).
- Adjust the maximum delivery water temperature at about 45°C, through trimmer PT1 (see Fig. 6)..
- Adjust the regulation curve steepness at a value between 0.5°C (minimum) and 1°C (maximum) (see 7 in Fig. 1).
- Please consider anyway that the best parameters regulation can only be attained after real tests performed on the specific real heating system.



1. Time programmer (daily or weekly).
2. Opening-closing valve or burner-active indicators.
3. Mains line indicator.
4. Comfort temperature adjustment knob.
5. Reduced temperature adjustment knob.
6. Working mode selector.
7. Regulation line steepness adjustment.
8. Active circulation pump indicator.

Fig. 1: Device functions, adjustments and indicators.

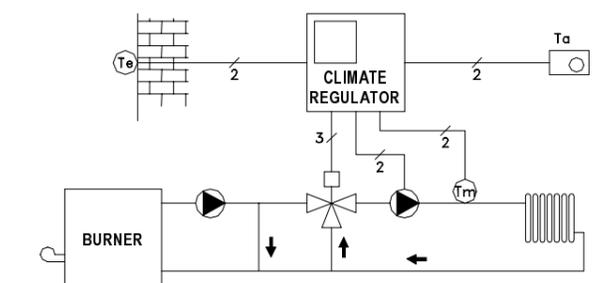


Fig. 2: Typical servo-motor plant.

Note: For those versions which do not include the programmer, it can be purchased separately.

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GENERAL

The device fits in a standard casing (142 x 142 mm) according to DIN 43700 standards. Mounting can be chosen between wall type and panel type; in this latest case after having prepared the panel hole according to the measures in figure 8. The contacts array are removable for the installer simplicity and can be accessed raising the front cover.

MOUNTING AND INSTALLATION

Mounting of the device must be executed according to the safety rules indicated in the present instruction sheet as well as according the general electrical safety rules.

Please check for the humidity and temperature limits within which the regulator will have to work: they must be compliant to what indicated in the technical features paragraph in this sheet.

External temperature probe

This probe must be mounted on the north facing wall of the building, paying attention to avoiding direct exposure to sunlight, heat sources or even air flows.

Delivery water pipe temperature probe

This probe must be mounted on the delivery water pipe in the position indicated in the drawing, taking particular care of the thermal coupling, between the pipe and the probe.

Room remote commander (optional)

This remote has to be mounted in a easy reachable position on a domestic internal wall. The wiring cable must be screened bipolar one with a preferred length of less than 25 meters.

The room remote commander has to be enabled through a proper setting of the jumper J1 (see Fig. 10 and 11).

N.B.: It's important to disable the room remote commander when not in use, setting the jumper J1 in B position.

CHECK

Electrical wiring check

Check the following points:

- Wirings 7 and 8 power supply must be of 230V~ -15% +10%.
- Probes terminals (close to regulator): verify a resistance about 2000 Ohm at the probe.
- Wirings coming from the remote commander (optional): a resistance must be found between roughly 2000 Ohm (knob completely counter-clockwise turned) and 1000 Ohm (knob completely clockwise turned).
- Wirings 11, 12, 13, 14: check the wirings between the regulators and the burner or the servo-motor, according to the diagram in figures 10 and 11.

SETTING

- Set the clock-pins in the desired position, remembering that the "Comfort" temperature is in the **internal** position, and the "Reduced" or OFF is in the **external** position.
- Select working mode according to the heating plant with switch 5 (servo-motor or burner mode).
- Enable, when required, the maximum temperature limitation through the switch 1. When enabled, regulate the maximum temperature allowed through the trimmer PT1 (30°C .. 90°C).
- Enable, when required, the minimum temperature limitation through the switch 2. When enabled, regulate the minimum temperature allowed through the trimmer PT2 (20°C .. 50°C).
- Enable, if required, the cut-off function through the switch 3. This function turn off the heating plant when the external temperature reach out the one set on trimmer PT3 (10°C ...30°C).
- Enable, when desired, the turn-off delay for the circulation pump, by setting the switch 4. The delay is set by trimmer PT4 (1 min. .. 12 min.).
- Select the type of servo-motor used by the switch 6. This selection si to be set in order to match the driving pulses with the servomotor speed.
- The device is factory set with the antifreeze function enabled. If this function is enabled, when the device is turned off (selector in "OFF" position) and the external temperature falls below 3°C the circulation pump is automatically started so that water cannot freeze inside the pipes. If needed this function can be disabled through switch 7, as explained in Fig. 6.
- Note: in order to completely close the mixing valve, when selector 6 is in "off" position, the regulator drives for 6 or 11 minutes (according to the setting made on switch 6) the servomotor toward the "cold" direction.

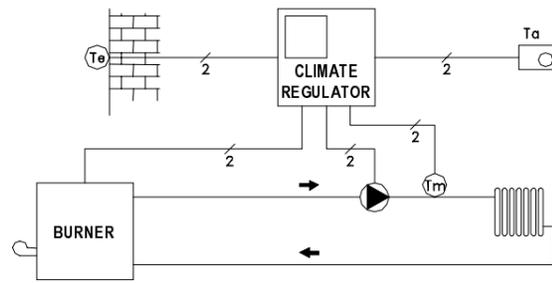


Fig. 3: Typical burner plant.

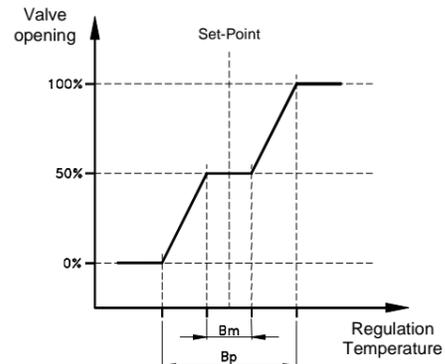


Fig. 4: Three-point regulation characteristic.

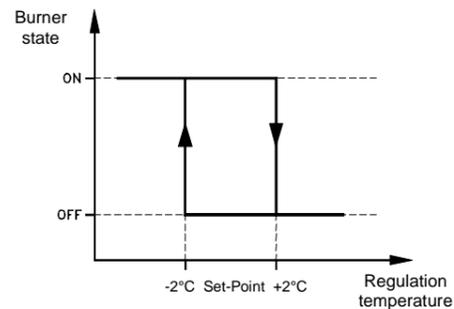


Fig. 5: Two-point regulation characteristic

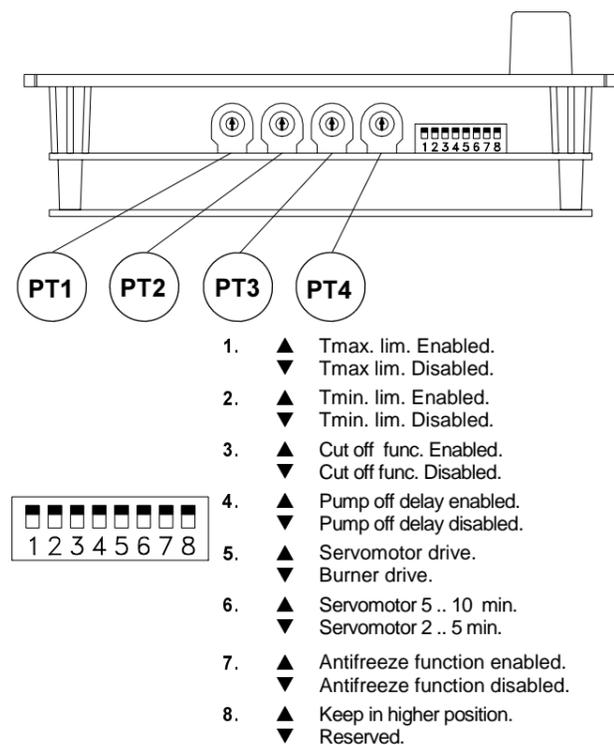


Fig. 6: Dip switches and trimmers.

Regulation line adjustment

The regulation line (k) sets the relationship between the temperature "sensed" from the external probe and the corresponding delivery water temperature. According to this line steepness, a decrease of, say, 5 degrees of the external temperature, results in an increase of respectively, 5 degrees when the steepness is set to 1 and 10 degrees when is set to 2.

In others words, the line steepness states by which factor a variation of the external temperature is multiplied in order to get the corresponding delivery water temperature.

The best value for this steepness (k) has to be found through further adjustments after starting from an initial value which consider both of the following parameters:

- Climate zone (Te variation across one year).
- Heating element (faster or slower in exchanging the heat with the ambient).

In the case regulator is used to drive floor heating plant or similar systems, it is mandatory the use of a safety thermostat coupled to the delivery pipe in order to reach a further protection against mis-working or wrong sets of the regulator itself.

TECHNICAL FEATURES

| | |
|---------------------------|--|
| Power supply: | 230V~ -15% +10% 50Hz |
| Electrical absorption: | 3VA |
| Protection grade: | IP 30 |
| Contacts rating: | 5 (1) A @ 250V~ |
| Short circuit protection: | Fuse 100mA slow-blow |
| Servo-motor type: | 2min. .. 5min. 5min. .. 10min. |
| Operating temperature: | 0°C .. 40°C |
| Storage temperature: | -10°C .. +50°C |
| Humidity limits: | 20% .. 80% RH (non condensing) |
| Case: | Material: ABS V0 self-extinguishing Color: Anthracite grey (RAL 7016) |
| Size: | 154 x 143 x 110 mm (W x H x D) |
| Weight: | ~ 1120 gr. |
| Panel hole size: | 142 x 142 mm |

WARNING

- For remote version all wirings must be made using wires with 1,5 mm² minimum section and no longer than 25 m. Do not use same duct for signal wires and mains.
- The appliance must be wired to the electric mains through a switch capable of disconnecting all poles compliant to the current safety standards and with a contact separation of at least 3 mm in all poles.
- Installation and electrical wirings of this appliance must be made by qualified technicians and in compliance with the current standards.
- Before wiring the appliance be sure to turn the mains power off.

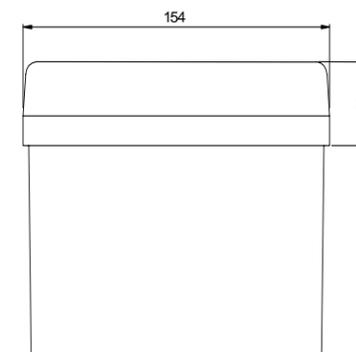


Fig. 7: Maximum overall size.

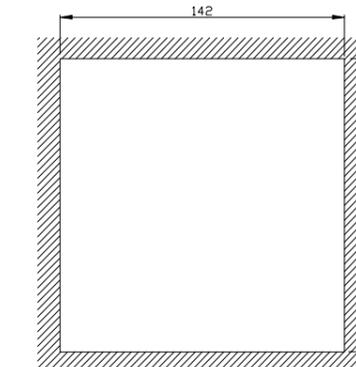


Fig. 8: Mounting hole mask.

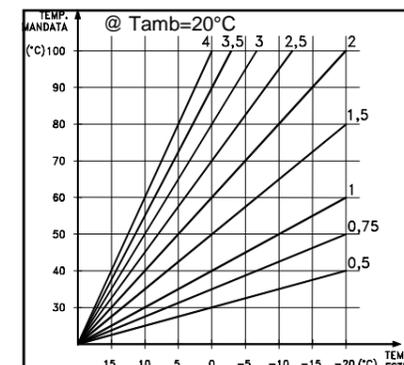


Fig. 9: Regulation lines graph.

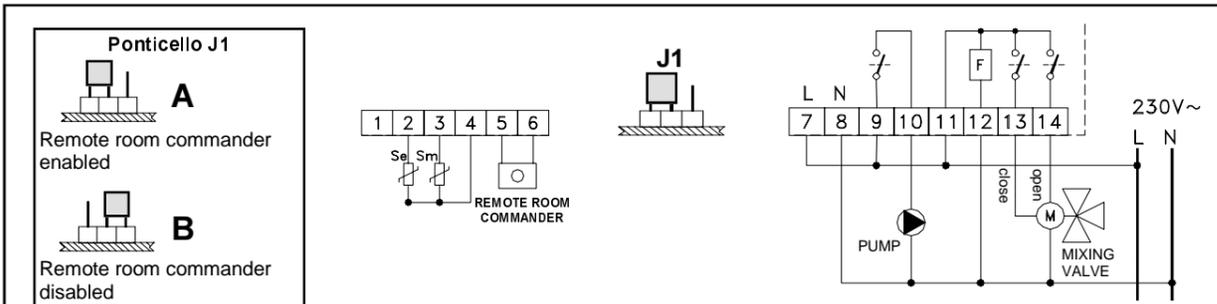


Fig. 10: Electrical wirings for a servo-motor type heating plant.

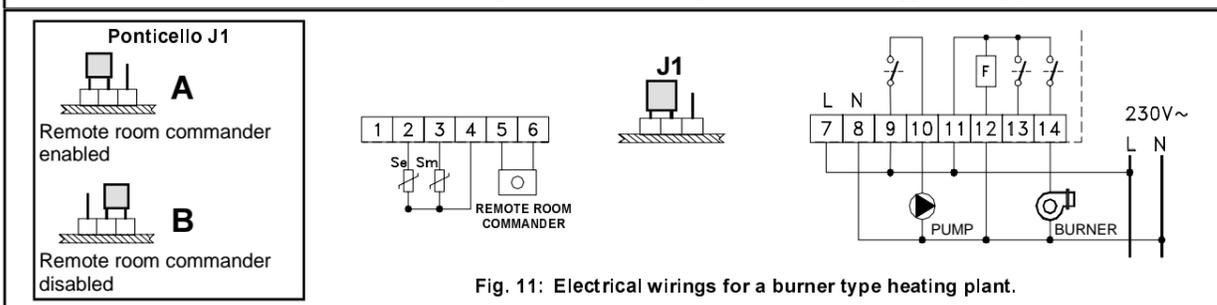


Fig. 11: Electrical wirings for a burner type heating plant.