

# Differential temperature regulators and thermostats

## 257 series



BSI EN ISO 9001:2000  
Cert. n° FM 21654



UNI EN ISO 9001:2000  
Cert. n° 0003



01143/07 GB



### Function

The differential regulator acquires the temperature signals from the probes installed at the panel outlet and in the boiler, calculates the difference between the two temperatures and, by comparison with the set value, commands the primary solar circuit circulation pump. The thermostat controls the storage temperature and activates thermal integration from alternative sources to solar energy (water heaters, electricity, etc.). In addition, it can control the diverter valves in solar panels with natural circulation in order to utilize the albeit minimal available energy.

### Product range

- Code **257020** Differential temperature regulator for solar heating systems, with relay output. Complete with box, contact probe and immersion probe with pocket.
- Code **257030** Thermostat for solar heating systems, with relay output. For thermal integration control and diverter valves. Complete with box and contact probe.
- Code **257040** Regulator and thermostat for solar heating systems, with relay output. Complete with box, 1 contact probe and 2 immersion probes with pocket.
- Code **257010** Differential temperature regulator for solar heating systems with relay output. Complete with contact probe and immersion probe with pocket.

### Technical specifications

#### Differential temperature regulator

Electric supply: 230 V  $\pm$  6% - 50 Hz  
 Power consumption: 1,45 VA  
 Contacts rating on switch-over: 6 A (230 V)  
 $\Delta$ T adjustment range: 2–20 K  
 Hysteresis: 2 K ( $\pm$  1 K)  
 Max ambient temperature: 50°C  
 Insulation test: 4 kV  
 Dimensions: 3 DIN

#### Thermostat

Electric supply: 230 V  $\pm$  6% - 50 Hz  
 Power consumption: 1,45 VA  
 Contacts rating on switch-over: 6 (2) A (230 V)  
 Adjustable temperature range: 20–90°C  
 Hysteresis: 1 K  
 Max ambient temperature: 50°C  
 Alarm output contact: 24 V / 20 mA  
 Insulation test: 4 kV  
 Dimensions: 3 DIN

### Boxes

Dimensions: - Code 257001: 4 DIN  
 - Code 257003: 6 DIN  
 Protection class: IP 65

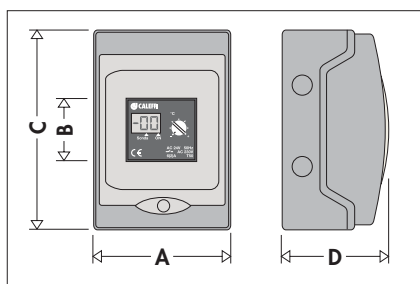
### Temperature probes

NTC type  
 Working range: -20–100°C  
 Two-wire cable  
 Length of cable: 2 m (can be extended to 200 m in case of a cable with 0,5 mm<sup>2</sup> cross-section)

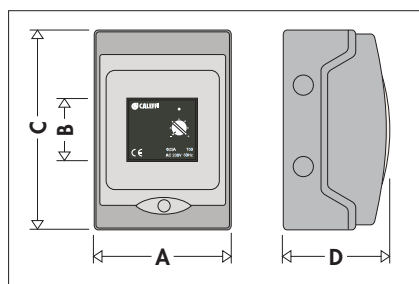
### Probe resistance values table

°C	$\Omega$	°C	$\Omega$	°C	$\Omega$	°C	$\Omega$	°C	$\Omega$	°C	$\Omega$
-20	14616	$\pm 0$	5634	20	2431	40	1154	62	556	82	306
-18	13211	2	5155	22	2247	44	1004	64	522	84	290
-16	11958	4	4721	24	2079	46	938	66	491	86	274
-14	10839	6	4329	26	1925	48	876	68	462	88	260
-12	9838	8	3974	28	1785	50	819	70	434	90	246
-10	8941	10	3652	30	1657	52	767	72	409	92	233
-8	8132	12	3360	32	1539	54	718	74	386	94	221
-6	7405	14	3094	34	1430	56	673	76	364	96	210
-4	6752	16	2852	36	1331	58	631	78	343	98	199
-2	6164	18	2632	38	1239	60	592	80	324	100	189

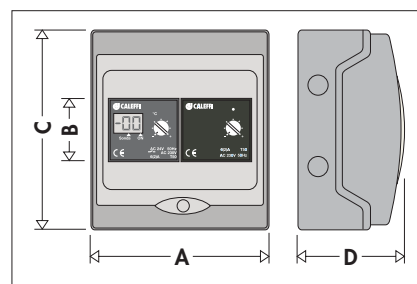
### Dimensions



Code	A	B	C	D	Weight (Kg)
257020	122	47	200	112	1,2

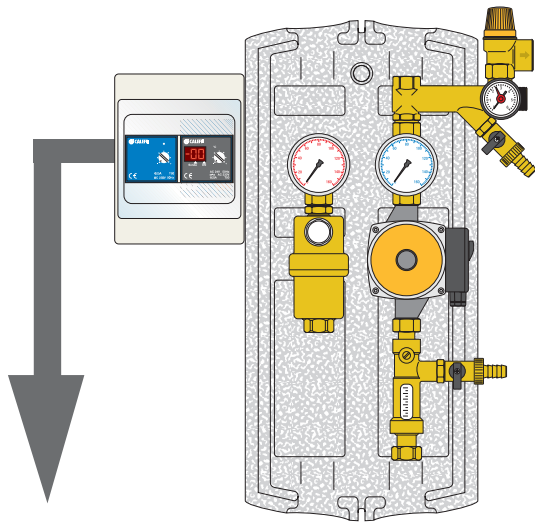


Code	A	B	C	D	Weight(Kg)
257030	122	47	200	112	1,4

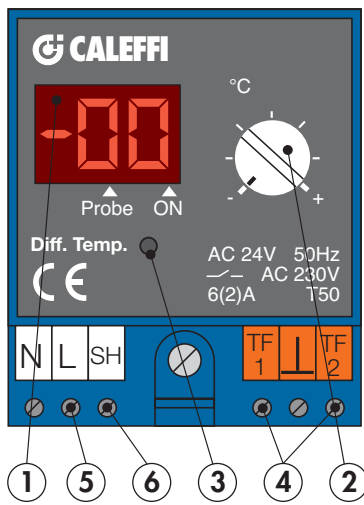


Code	A	B	C	D	Weight(Kg)
257040	160	47	200	112	1,83

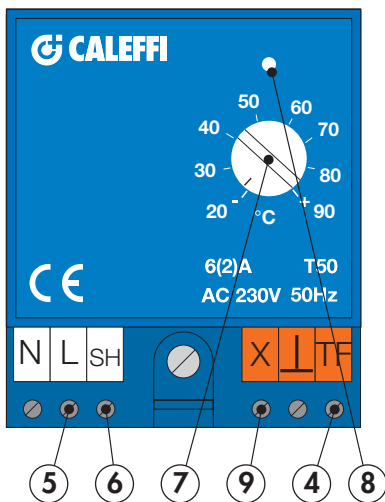
## Characteristic components



### Differential temperature regulator

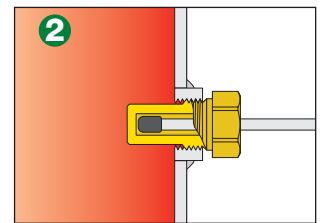
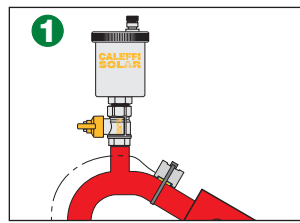
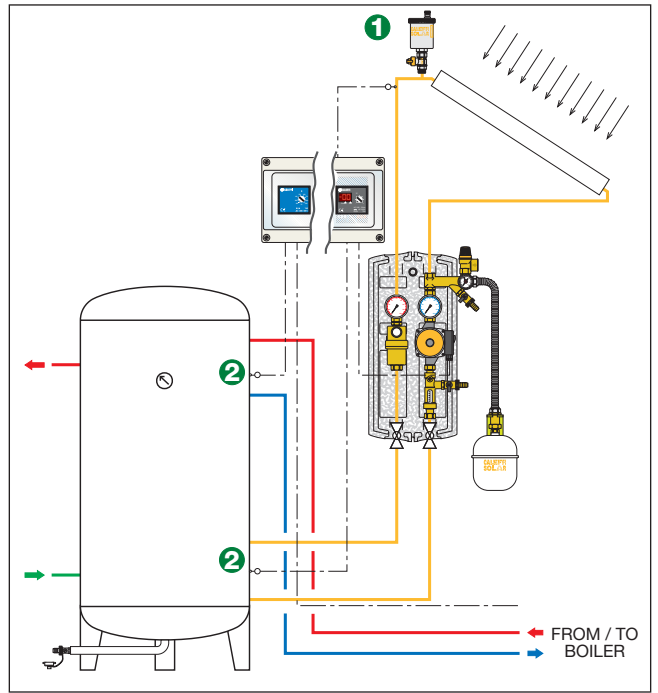


### Thermostat



- 1) Display indicating differential temperature or temperatures of single probes
- 2) Selector for setting the differential temperature trigger value
- 3) Button to select the display of operating parameter
- 4) Connection to temperature probes
- 5) Electric supply
- 6) Actuating relay output
- 7) Selector for setting thermostat actuation temperature
- 8) Thermostat operation indicator LED
- 9) Probe fault alarm output

## Operation



### Differential temperature regulator

The differential temperature regulator, using the two probes, measures the difference in temperature between probe (1) in the solar panel and probe (2) in the boiler. The differential temperature value can be read on the two digit display.

If the  $\Delta T$  detected value exceeds the set value, the output contact is activated and may, for example, trigger the pump in the solar system circulation unit.

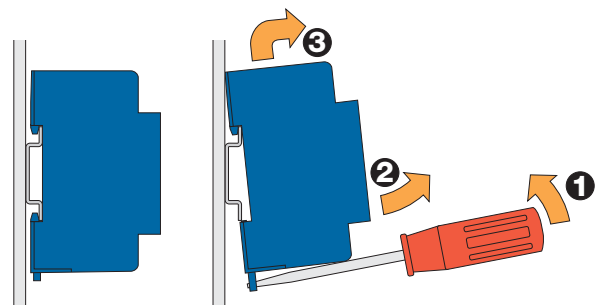
It is recommended to set the  $\Delta T$  value between 5°C and 8°C, since this value optimises operation while taking into account the heat loss occurring within the solar system pipes. It also allow to activate the circulator only when the available thermal energy is higher than the consumed electricity.

### Thermostat

The thermostat, using the probe, measures the temperature of the natural or forced circulation solar storage, according to the type of application; should it be below the set value, the thermostat will activate a contact powering the device connected to it. On solar regulator systems, a value equal to or greater than 55°C is set. It is recommended to carry out periodic heat treatment to the hot water storage to prevent any possible growth of Legionella.

### Assembly

The regulator and the thermostat are set up for assembly on a DIN bar, in a box or in a wiring cabinet.



## Components and accessories



**257**

Differential temperature regulator for solar heating systems, with relay output. Complete with contact probe and immersion probe with 1/4" pocket. Characteristics as for code 257020.



Code

**257010**



**257**

Differential temperature regulator for solar heating systems, with relay output. Characteristics as for code 257020.



Code

**257000**



**257**

Thermostat for solar heating systems, with relay output. For thermal integration control and diverter valves. Characteristics as for code 257030.



Code

**257002**



**150**

Pocket for immersion probe code 150006.

Code

**150029** 1/4" M



**257**

Box complete with DIN bar, for 257 series regulator or thermostat. Protection class: IP 65.

Code

**257001**



**257**

Double box complete with DIN bar, for 257 series regulator and thermostat. Protection class: IP 65.

Code

**257003**



**150**

Contact probe for 257 series regulator or thermostat and for 1520 series regulator (flow or return). Length of cable: 2 m.

Code

**150009**



**150**

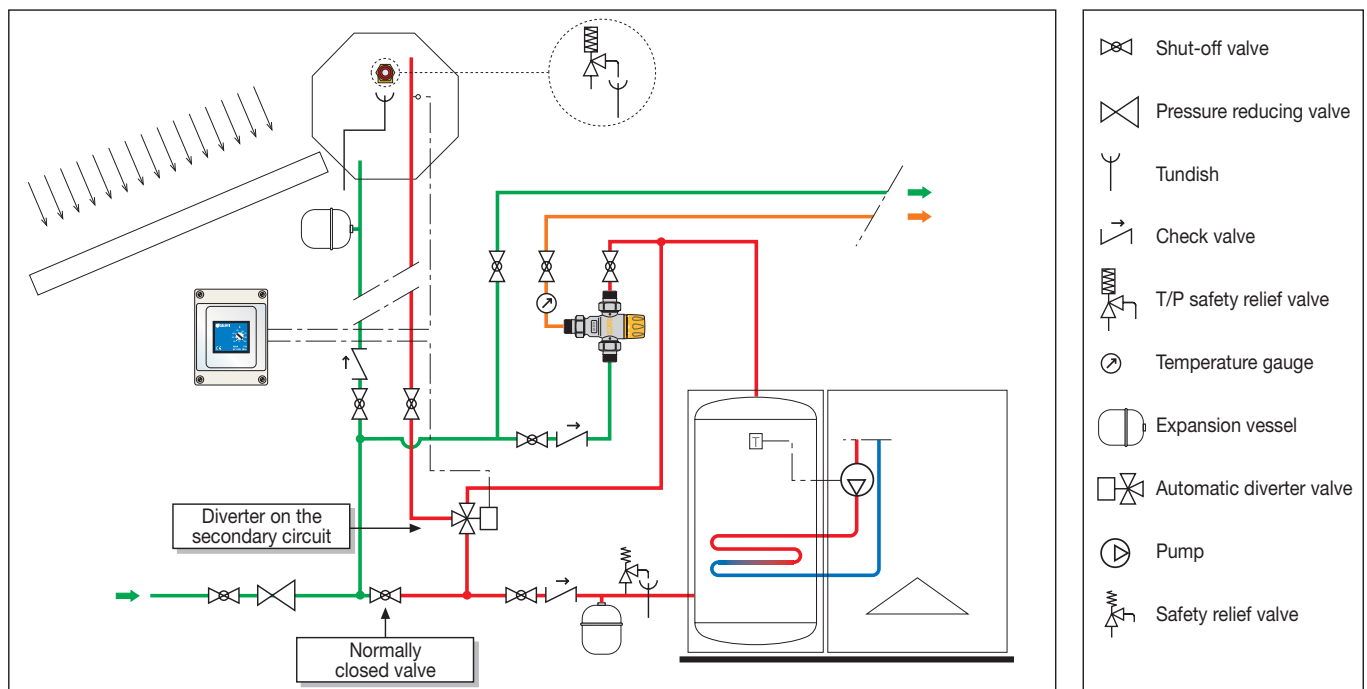
Immersion probe for series 257 regulator or thermostat and for series 1520 regulator. Length of cable: 2 m.

**150006**

## Application diagrams

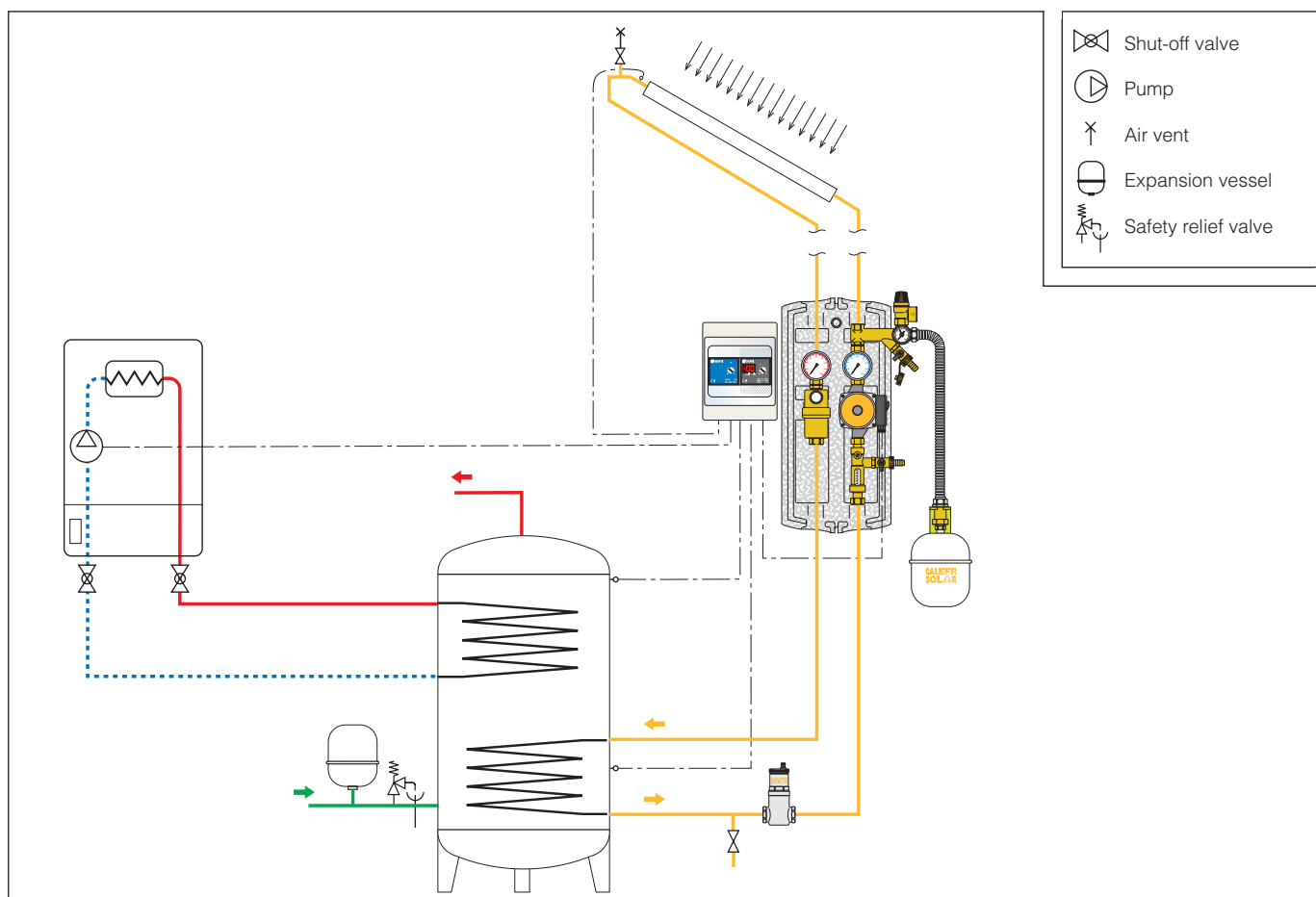
### Example of connection between thermostat and natural circulation solar heating system.

The device controls the diverter valve according to the temperature detected in the solar water storage. If the temperature is not sufficient, the domestic water is passed through the hot water storage controlled by the boiler.



### Example of combined connection of thermostat and regulator to a forced circulation solar heating system.

The regulator controls the circulation unit pump according to the temperature detected on the solar panel and in the lower part of the water storage. If the temperature detected in the upper part of the storage is insufficient, the thermostat integrates it by starting the pump.



## SPECIFICATION SUMMARIES

### Code 257020

Differential temperature regulator for solar heating systems, complete with box, contact probe and immersion probe with pocket. Electrical supply 230 V  $\pm$  6% - 50 Hz. Nominal power consumption 1,45 VA. Contact rating 6 A (230 V).  $\Delta T$  adjustment range 2–20 K. Hysteresis 2 K ( $\pm$  1 K). Maximum ambient temperature 50°C. Insulation test 4 kV. Dimensions 3 DIN. Box: Dimensions 4 DIN. Dimensions (w x h x d) 122 x 200 x 112 mm. Protection class IP 65.

### Code 257030

Thermostat for solar heating systems. Complete with box and contact probe. Electrical supply 230 V  $\pm$  6% - 50 Hz. Nominal power consumption 1,45 VA. Contacts rating on switch-over 6 (2) A (230 V). Adjustable temperature range 20–90°C. Hysteresis 1 K. Maximum ambient temperature 50°C. Alarm output contact 24 V, 20 mA. Insulation test 4 kV. Dimensions 3 DIN. Box: dimensions 4 DIN. Dimensions (w x h x d) 122 x 200 x 112 mm. Protection class IP 65.

### Code 257040

Regulator and thermostat for solar heating systems. Complete with box, 1 contact probe and 2 immersion probes with pocket. Regulator: electrical supply 230 V  $\pm$  6% - 50 Hz. Nominal power consumption 1,45 VA. Contacts rating on switch-over 6 A (230 V).  $\Delta T$  adjustment range 2–20 K. Hysteresis 2 K ( $\pm$  1 K). Maximum ambient temperature 50°C. Insulation test 4 kV. Dimensions 3 DIN. Thermostat: electrical supply 230 V  $\pm$  6% - 50 Hz. Nominal power consumption 1,45 VA. Contacts rating on switch-over 6 (2) A (230 V). Adjustable temperature range 20–90°C. Hysteresis 1 K. Maximum ambient temperature 50°C. Alarm output contact 24 V / 20 mA. Insulation test 4 kV. Dimensions 3 DIN. Box: dimensions 6 DIN. Dimensions (w x h x d) 160 x 200 x 112 mm. Protection class IP 65.

We reserve the right to make changes and improvements to the products and related data in this publication, at any time and without prior notice.



CALEFFI S.P.A. · I · 28010 FONTANETO D'AGOGNA (NO) · S.R. 229, N.25 · TEL. +39 0322 8491 R.A. · FAX +39 0322 863723

· www.caleffi.com · info@caleffi.com ·

© Copyright 2007 Caleffi S.P.A.