ON-OFF TEMPERATURE CONTROLLER & DIFFERENTIAL THERMOSTAT WITH TWO DETECTORS

RTP 318 C2 Eng.

- **On-Off control of a set-point temperature**
- **On-Off control of difference between two temperatures**
- **Power supply 230 V~ ; DIN rail mounting, three units**

1. APPLICATION

RPT 318 controller is designed for On-Off control of a set-point temperature, or the difference between two tempe- ratures: e.g. control of pump, valve, solar panels, various alarms).

2. OPERATIONS

– On-Off thermostat with NTC 10 kΩ (0…99 °C) **B1** detector; or with NTC 1 kΩ (-19.9…+40 °C) **B3** detector ;
– On-Off differential thermostat with **B1** and **B2** (0…99°C) or with **B1** (0…99°C) and **B3** (-19.9…+40°C);;
– One On-Off SPDT relay output.

3. DETECTORS

No.	Description		Type	Sensing element	Input	Data sheet
1 or 2	Temperature detector	Immersion (0…99°C)	**SIH 010**	NTC 10 kΩ	B1 or B1+ B2	N 140
	or	Surface (0…99°C)	**SCH 010**	NTC 10 kΩ	B1 or B1+ B2	N 130
	or	Room (0…40°C)	**SAB 010**	NTC 10 kΩ	B1	N 111
	or	Air duct (0…99°C)	**STA 010**	NTC 10 kΩ	B1	N 150
	or	Cable-type (0…99°C)	**SAF 010**	NTC 10 kΩ	B1	N 145
1	Outside temperature detector (−19.9…+40°C)		**SAE 001**	NTC 1 KΩ	B3	N 120
	or	Cable-Type (−19.9…+40°C)	**SAF 001**	NTC 1 KΩ	B3	N 145

4. TECHNICAL DATA (default values in bold type)

• Electrical

Power supply	230 V~ ± 10%
Frequency	50…60 Hz
Consumption	3 VA
Protection	IP40
Radio disturbances	VDE0875/0871
Vibration test	with 2g(DIN 40 046)
Voltage-free output contacts:	
Maximum switched voltage	250 V~
Maximum switched current	5 (1) A
Construction standards	Italian Electrotech. Committee CEI
Software	Class A

• Mechanical

Enclosure	DIN 3E module
Mounting	on DIN 35 rail

Materials:	NYLON, ABS
Permitted ambient temperature :	
Operating	0…45 °C
Storage	− 25…+ 60 °C
Permitted ambient humidity	Class F DIN 40040
Weight	0.27 kg

• Setting ranges

Desired temperature :	
with B1 detector	0…**50**…99 °C
with B3 detector	-19.9…**20**…40 °C
Desired differential :	
with B1 detector	0…**5**…99 °C
with B3 detector	0…**2**…60 °C
Temperature difference (with B1 & B2 or with B1 & B3):	
switching on	0…**20**…99 °C
switching off	0…**5**…99 °C
Control output	On-Off switching

5. OVERALL DIMENSIONS
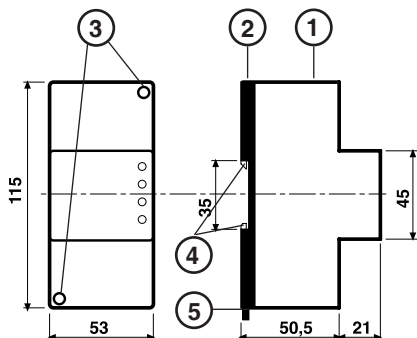
1 – Protective cover for electronic components
2 – Base with transformer, relay and terminal blocks
3 – Screws for securing base and cover
4 – DIN rail securing elements
5 – DIN rail release lever

6. FACIA
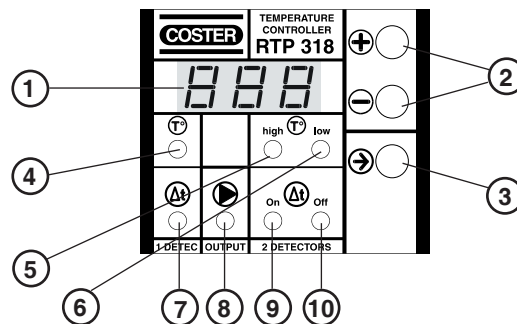

1 - 3-digit numerical display
2 - + and – keys for adjusting parameters
3 - → key for displaying parameters
4 - Actual or desired temperature
5 - Actual temperature high detector
6 - Actual temperature low detector
7 - Thermostat differential
8 - Control output LEDs
9 - Difference between high and low T when On
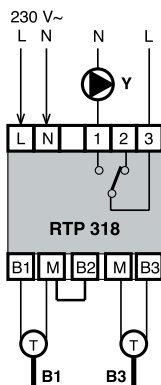10 - Difference between high and low T when Off

7. WIRING DIAGRAMS

THERMOSTAT
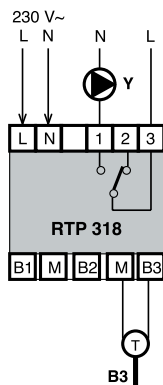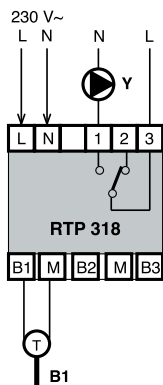
THERMOSTAT FOR DIFFERENTIAL BETWEEN TWO TEMPERATURES

B1 – NTC 10 kΩ (0…99 °C) detector
B2 – NTC 10 kΩ (0…99 °C) detector
B3 – NTC 1 kΩ (−19.9…40 °C) detector
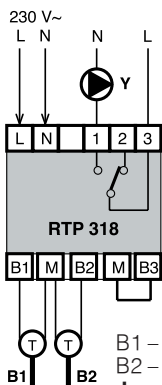
B1 – high temp.
B2 – low temp.
Jumper B3-M

B1 – high temperature
B3 – low temperature
Jumper B2-M

8. OPERATION

8.1 Thermostat scale 0…99° or scale -19.9...+ 40° : the controller compares desired temperature T° with temperature t° measured by detector **B1** or **B3** and switches the output relay according to the variation and the differential set..

8.2 Thermostat differential between two temperatures scale 0…99° : the controller compares the difference between high temperature **B1** and low temperature **B2** (B3-M jumper) or **B3** (B2-M jumper) and switches the output relay according to On and Off differences set..

9. SETTING PARAMETERS

9.1 As Thermostat

- **Actual temperature**: display normally shows temperature **B1** or **B3**; LED **T°** (**6.4**) always lit..
- **Desired temperature (set-point):** press → key: display flashes with value of default desired temperature and LED **T°** (**6.4**) flashes. Enter desired value using + or – keys.
  (You can also set the desired temperature by pressing + or – key from the first page).
  By pressing → key twice the actual temperature returns to the display.
- **On-Off differential:** press → key until LED Δ**T**(**6.7**) and display flash. Using + or – keys enter desired value.
  Press → key to return to first page.
  After about a minute, if no key is pressed, the actual temperature is shown on the display.
- **Output LED (6.8)** : indicates status of control switches: Lit = 1-3 closed, 2-3 open; Unlit = 1-3 open, 2-3 closed. The relay control responds with a slight delay to avoid operational malfunctioning..

9.2 As differential thermostat

- **Actual temperatures**: normally the display shows **B1** temperature (high temperature), LED **T° high** (**6.4**) always lit. By pressing → display shows **B2** or **B3** temperature (low temperature), LED **T° low** (**6.6**) always lit.
- **Difference On temperature (1-3 closed, 2-3 open)**: press → until LED Δ**T On** (**6.9**) flashes; with + or – enter the difference (High temp. – Low temp.) for relay On..
- **Difference Off temperature (1-3 open, 2-3 closed)**: press → until LED Δ**T Off** (**6.10**) flashes; with + or – enter the difference (High temp. – Low temp.) for relay Off. After about a minute, or pressing →, you return to the high temperature measurement.
- **Output LED (6.8)**: indicates status of control switches: Lit = 1-3 closed, 2-3 open; Unlit = 1-3 open, 2-3 closed. The relay control responds with a slight delay in order to avoid operational malfunctioning.

Thermostat

Differential thermostat
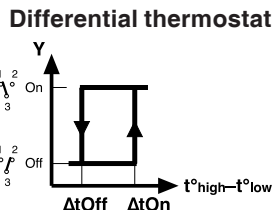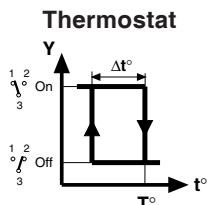
10. FAULTS IN DETECTORS OR CONNECTIONS:

- Any fault or malfunctioning in detectors or their connections is indicated by "**Err**" appearing on the display.

Amendment to data sheet

Date	Revision No.	Page	Section	Amendment description
18.07.04 LB		1-2	Various	Added possibility of differential thermostat between B1 NTC10 Ω (0…99°C)and B3 NTC1kΩ (-19.9…+40°C).
15.04.08 LB	**01**	1	3. DETECTORS	Adjust cable type data of SAF 010 detector