

BOURDON
The Original by Baumer



Main Features

- Excellent repeatability
- Dead band adjustment for regulation
- Fix dead band for control and alarm
- Capillary 1 to 20 meters

Applications

- Power generation safety equipment

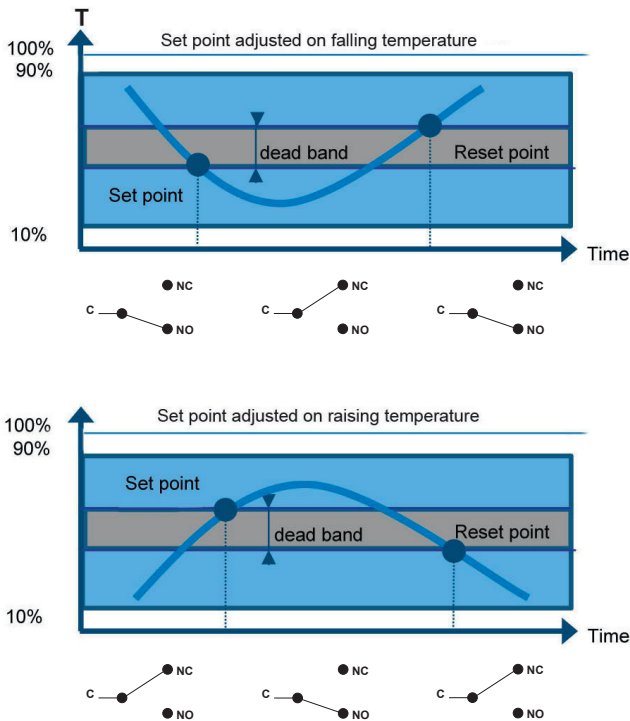
Technical Data

| | | | |
|--------------------|---|-----------------------|---|
| Temperature range | -46 ... 0 °C to 200 ... 270 °C | Ground connection | Via internal terminal block |
| Temperature | Process: -46 ... +270 °C Ambient: -30 ... + 55 °C Storage: -40 ... + 55 °C | Electrical connection | Terminal block with plastic cable gland for Ø 7 to 10.5 mm |
| Repeatability | ± 1% F.S. / constant temperature cycle | Electrical function | See ordering code details on page 5 |
| CE conformity | Low Voltage Directive 2014/35/EU | Adjustment | 2 external adjustment screws on top of the case for set point and dead band |
| Protection rating | IP 66 (EN 60529) | | |
| Process connection | Stainless steel 1.4404 (316L) | | |
| Bulb | Stainless steel 1.4435/1.4404 (316L) | | |
| Capillary | RTA: Copper alloy RTN: Stainless steel 1.4404 (316L) For types of protection see ordering details on page 5 | | |
| Scale | Internal. Accuracy on reading ± 5% F.S. | | |
| Cover | Zamak blue painted Captive stainless steel screws | | |
| Case | Black Zamak | | |
| Mounting | Wall mounting bracket | | |

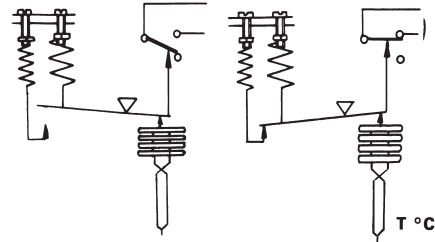
Options

| | |
|--|-----------|
| Customer specific set point adjustment | Code SETP |
| Mounting on 2" pipe | Code 0407 |
| Stainless steel tag plate and wire | Code 9941 |
| Lead seal of the adjustment screws | Code 8990 |
| Nuclear cleanliness (RTN only) | Code 0838 |
| Electrical connection: stainless steel connector (Souriau) | Code 2298 |
| Mobile plug for stainless steel connector (Souriau) | Code 2249 |

Principle



A vapour filled flexible sensing element actuates a microswitch by means of a lever. The set point is adjusted by means of a compressible spring installed in opposition.



Set point and reset point must be between 10% and 90% of the selected scale.

Standard factory adjustment

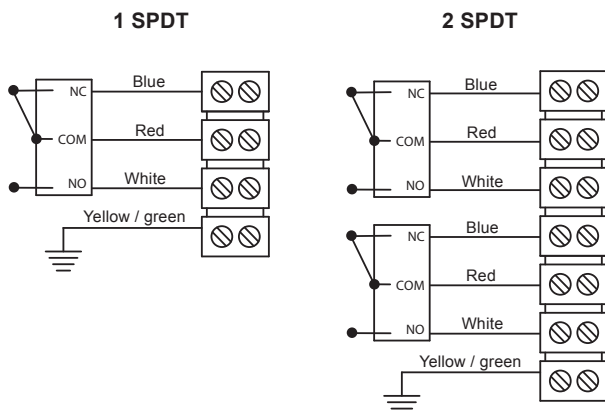
Setpoint at 50% of the scale on falling temperature

Customer specific factory adjustment (option SETP)

The following specifications have to be given with the order:

- Setpoint value
- Adjustment on falling or raising temperature
- Dead band value (as needed) when using an adjustable dead band switch

Electrical connections



Micro switches characteristics

| Switch code | A (B) | M (K) | C (W) | E (F) | H | D (V) | J |
|---|----------------|--------------|-----------------|-----------------|--------------|--------------------------|--------------|
| Type | Standard | Gold contact | Hermetic | Ultra sensitive | Manual reset | Ultra sensitive Hermetic | Manual reset |
| 6 Vdc | 0.4 ... 10 A | 10 ... 50 mA | 5 mA ... 4 A | 0.4 ... 1 A | N/A | 0.4 ... 4 A | N/A |
| 12 Vdc | 0.4 ... 10 A | 10 ... 50 mA | 5 mA ... 4 A | 0.4 ... 1 A | N/A | 0.4 ... 4 A | N/A |
| 24 Vdc | 0.4 ... 6 A | 10 ... 50 mA | 5 mA ... 4 A | 0.4 ... 1 A | 0.1 ... 8 A | 0.4 ... 4 A | 0.1 ... 8 A |
| 30 Vdc | 0.4 ... 6 A | 10 ... 50 mA | 5 mA ... 3 A | 0.4 ... 1 A | 0.1 ... 8 A | 0.4 ... 2 A | 0.1 ... 8 A |
| 48 Vdc | 0.4 ... 6 A | 10 ... 50 mA | 5 mA ... 3 A | N/A | N/A | N/A | N/A |
| 110 Vdc | 0.1 ... 0.5 A | 10 ... 50 mA | 5 mA ... 1 A | N/A | N/A | N/A | N/A |
| 220 Vdc | 0.1 ... 0.25 A | 10 ... 50 mA | 5 mA ... 0.5 A | N/A | N/A | N/A | N/A |
| 115 Vac | 0.4 ... 10 A | 10 ... 50 mA | 50 mA ... 3 A | 0.4 ... 10 A | 0.1 ... 10 A | N/A | 0.1 ... 10 A |
| 250 Vac | 0.2 ... 10 A | N/A | 50 mA ... 2.5 A | 0.2 ... 10 A | 0.1 ... 5 A | N/A | 0.1 ... 5 A |
| Dielectric rigidity between contacts and ground | 2000 V | 2000 V | 1500 V | 2000 V | 2000 V | 1000 V | 2000 V |

Adjustable ranges

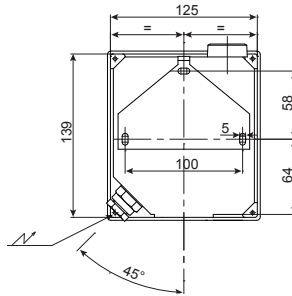
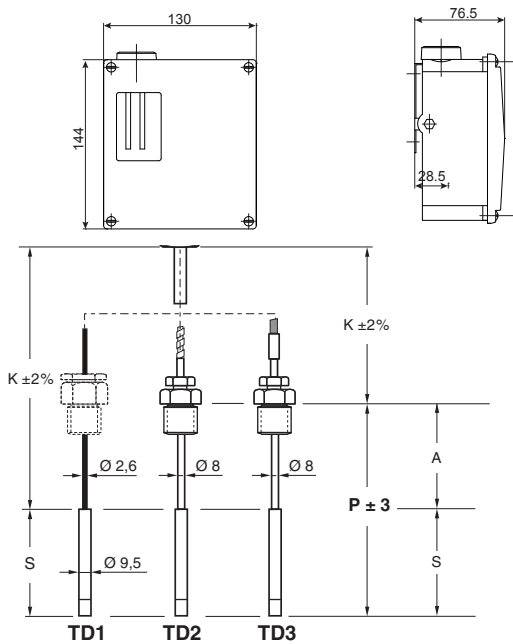
| Scale | T _{Max} accidental | Code | Micro-switch dead band ⁽¹⁾ | | | | | | | | | | |
|-------------|--------------------------------|------------|---------------------------------------|---------|---------|--------|-----------------|-----|--------|-----|-----|--------|---|
| | | | Adjustable dead band | | | | Fixed dead band | | | | | | |
| | | | A (B*) | | M (K*) | | C (W*) | | E (F*) | | H | D (V*) | J |
| | | | 10% | 90% | 10% | 90% | 10% | 90% | 10% | 90% | 10% | 90% | |
| °C | | | | | | | | | | | | | |
| -46 ... 0 | 40 | 400 | 4 - 9 | 2 - 9 | 8 - 12 | 4 - 12 | 1.5 | 0.8 | 5 | 2.5 | | | |
| -20 ... 20 | 60 | 401 | 3 - 8 | 1.5 - 6 | 6 - 10 | 4 - 10 | 1 | 0.5 | 4 | 2 | | | |
| 0 ... 45 | 60 | 402 | 4 - 9 | 2 - 9 | 7 - 12 | 4 - 12 | 1.5 | 0.7 | 5 | 2.5 | | | |
| 40 ... 120 | 145 | 403 | 5 - 16 | 3 - 16 | 10 - 20 | 6 - 20 | 2 | 1.2 | 6 | 4 | | | |
| 100 ... 160 | 180 | 414 | 5 - 12 | 3 - 12 | 9 - 15 | 5 - 15 | 2 | 1 | 6 | 3 | | | |
| 20 ... 80 | 100 | 415 | 5 - 12 | 3 - 12 | 9 - 15 | 5 - 15 | 2 | 1 | 6 | 3 | | | |
| 160 ... 250 | 290 | 406 | 6 - 18 | 4 - 18 | 11 - 22 | 7 - 22 | 2.5 | 1.2 | 8 | 4.5 | | | |
| 70 ... 150 | 175 | 408 | 5 - 16 | 4 - 16 | 10 - 20 | 6 - 20 | 2 | 1 | 6 | 4 | | | |
| 130 ... 190 | 210 | 412 | 5 - 12 | 3 - 12 | 9 - 15 | 5 - 15 | 2 | 1 | 6 | 3 | | | |
| 200 ... 270 | 290 | 413 | 5 - 12 | 3 - 12 | 9 - 15 | 5 - 15 | 2 | 1 | 6 | 3 | | | |

(*) For version with 2 microswitches lower values of the dead band must be multiplied x 1.5

⁽¹⁾ The value of the dead band is depending on the value of the set point.

This table contains the dead band values for set point adjustment at 10% and 90% of the selected scale. For adjustable dead band the lower value corresponds to the dead band spring totally released and the higher corresponds to the dead band spring fully tensed. For other set points the dead band value can be calculated by linear interpolation between the values at 10% and 90%.

Dimensions (mm)



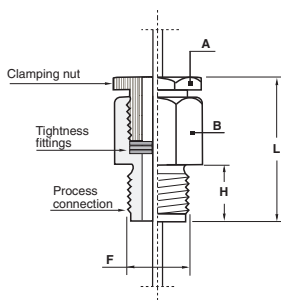
- S** = Bulb length (temperature sensitive part, see tables below)
- A** = Additional stem length
For versions TD2/3, $A_{min} = 25$ mm
For version TD1 there is no additional stem length ($A=0$).
The sliding connection is mounted on the capillary.
- P** = Immersion length ($P = S + A$)
- P_{min}** = Minimum immersion length ($P_{min} = S + A_{min}$)
- K** = Capillary length

Bulb length (S) according to the capillary length (K) and the temperature range (code)

| Bulb Ø 14 mm | Code | 400 | 401 | 402 | 403 | 406 | 408 | 412 | 413 | 414 | 415 |
|------------------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| K = 0 ... 2 m | S / mm | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| K = 3 ... 7 m | S / mm | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| K = 8 ... 16 m | S / mm | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| K = 17 ... 20 m | S / mm | 180 | 180 | 180 | 180 | 180 | 180 | 180 | – | 180 | 180 |

| Bulb Ø 9.5 mm | Code | 400 | 401 | 402 | 403 | 406 | 408 | 412 | 413 | 414 | 415 |
|------------------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| K = 0 ... 2 m | S / mm | 155 | 155 | 155 | 155 | 155 | 155 | 155 | 155 | 155 | 155 |
| K = 3 ... 7 m | S / mm | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| K = 8 ... 16 m | S / mm | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| K = 17 ... 20 m | S / mm | 370 | 370 | 370 | 370 | 370 | 370 | 370 | – | 370 | 370 |

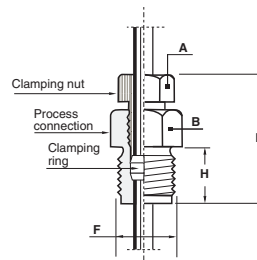
Stainless steel sliding male connection (TD1)



| Thread and sizes | | |
|------------------|---------|---------|
| F | G 1/2 | 1/2 NPT |
| H | 18 | 21 |
| L | 43 | 46 |
| A | 27/flat | 27/flat |
| B | 27/flat | 27/flat |

Waterproof after tightening mounted on the capillary.

Stainless steel sliding male connection (TD2/3)



| Thread and sizes | | |
|------------------|---------|---------|
| F | G 1/2 | 1/2 NPT |
| H | 18 | 21 |
| L | 36 | 40 |
| A | 17/flat | 17/flat |
| B | 23/flat | 23/flat |

After tightening of the clamping nut, the stem is fixed in the process connection. Tight up to 40 bar.

Ordering details RTNA4 - RTAA4

| | | RT | - | A | . | 4xx | . | | | | | | / |
|---|--|--|---|---|---|-----|---|--|--|--|--|---|---|
| Model | | RT | - | | | | | | | | | | |
| Industrial temperature switch | | | | | | | | | | | | | |
| Type of the bulb | | | | | | | | | | | | | |
| Stainless steel bulb and Copper alloy capillary | | | | A | | | | | | | | | |
| Stainless steel bulb and capillary | | | | N | | | | | | | | | |
| Approval | | | | | | | | | | | | | |
| Standard version without ATEX/IECEX approval | | | | A | | | | | | | | | |
| Type of micro switches | | | | | | | | | | | | | |
| | | Deadband | | | | | | | | | | | |
| 1 SPDT standard changeover switch | | Adjustable | | A | | | | | | | | | |
| 2 SPDT standard changeover switch | | Adjustable | | B | | | | | | | | | |
| 1 SPDT hermetically changeover switch | | Adjustable | | C | | | | | | | | | |
| 2 SPDT hermetically changeover switch | | Adjustable | | W | | | | | | | | | |
| 1 SPDT ultra sensitive changeover switch | | Fix | | E | | | | | | | | | |
| 2 SPDT ultra sensitive changeover switch | | Fix | | F | | | | | | | | | |
| 1 SPDT hermetically, ultra sensitive changeover switch | | Fix | | D | | | | | | | | | |
| 2 SPDT hermetically, ultra sensitive changeover switch | | Fix | | V | | | | | | | | | |
| 1 SPDT gold contact changeover switch | | Adjustable | | M | | | | | | | | | |
| 2 SPDT gold contact changeover switch | | Adjustable | | K | | | | | | | | | |
| 1 SPDT changeover switch, manual reset, opening on raising pressure | | Fix | | H | | | | | | | | | |
| 1 SPDT changeover switch, manual reset, opening on falling pressure | | Fix | | J | | | | | | | | | |
| Temperature range (°C) | | | | | | | | | | | | | |
| -46 ... 0 | | | | | | 400 | | | | | | | |
| -20 ... 20 | | | | | | 401 | | | | | | | |
| 0 ... 45 | | | | | | 402 | | | | | | | |
| 40 ... 120 | | | | | | 403 | | | | | | | |
| 100 ... 160 | | | | | | 414 | | | | | | | |
| 20 ... 80 | | | | | | 415 | | | | | | | |
| 160 ... 250 | | | | | | 406 | | | | | | | |
| 70 ... 150 | | | | | | 408 | | | | | | | |
| 130 ... 190 | | | | | | 412 | | | | | | | |
| 200 ... 270 | | | | | | 413 | | | | | | | |
| Type of capillary | | | | | | | | | | | | | |
| TD1 | | Capillary without protection | | | | | | | | | | 1 | |
| TD2 | | Capillary with stainless steel protection | | | | | | | | | | 2 | |
| TD3 | | Capillary with stainless steel protection and PVC coating | | | | | | | | | | 3 | |
| Capillary length (K) | | | | | | | | | | | | | |
| 1 meter | | | | | | | | | | | | | 1 |
| 2 meters | | | | | | | | | | | | | 2 |
| 3 meters | | | | | | | | | | | | | 3 |
| 4 meters | | | | | | | | | | | | | 4 |
| 5 meters | | | | | | | | | | | | | 5 |
| 6 meters | | | | | | | | | | | | | 6 |
| 7 meters | | | | | | | | | | | | | 7 |
| 8 meters | | | | | | | | | | | | | 8 |
| 9 meters | | | | | | | | | | | | | 9 |
| 10 meters | | | | | | | | | | | | | A |
| 11 meters | | | | | | | | | | | | | B |
| 12 meters | | | | | | | | | | | | | C |
| 13 meters | | | | | | | | | | | | | D |
| 14 meters | | | | | | | | | | | | | E |
| 15 meters | | | | | | | | | | | | | F |
| 16 meters | | | | | | | | | | | | | G |
| 17 meters | | | | | | | | | | | | | H |
| 18 meters | | | | | | | | | | | | | J |
| 19 meters | | | | | | | | | | | | | K |
| 20 meters | | | | | | | | | | | | | L |
| Immersion length (P) | | Immersion length (P) = Bulb length (S) + additional stem length (A) | | | | | | | | | | | |
| P = S + 25 mm | | (For S, see tables on page 4) | | | | | | | | | | | 0 |
| P = 150 mm | | (not for TD1) | | | | | | | | | | | 3 |
| P = 160 mm | | (not for TD1) | | | | | | | | | | | 2 |
| P = 250 mm | | (not for TD1) | | | | | | | | | | | 4 |
| P = 400 mm | | (not for TD1) | | | | | | | | | | | 5 |
| P = 600 mm | | (not for TD1) | | | | | | | | | | | 6 |
| P = 1000 mm | | (not for TD1) | | | | | | | | | | | D |
| Bulb diameter | | | | | | | | | | | | | |
| Ø 14 mm (standard) | | | | | | | | | | | | | E |
| Ø 9.5 mm | | | | | | | | | | | | | C |
| Process connection | | | | | | | | | | | | | |
| Without | | | | | | | | | | | | | 0 |
| G1/2 | | | | | | | | | | | | | 3 |
| 1/2 NPT | | | | | | | | | | | | | 6 |
| Options to be added behind the / (see example below) | | | | | | | | | | | | | / |

Ordering example with options

| | | | | | | | | | | | | | | | | |
|----|---|---|---|---|---|-----|---|---|---|---|---|---|---|------|---|------|
| RT | - | A | A | A | . | 400 | . | 2 | 1 | 2 | E | 3 | / | 0407 | - | 9941 |
|----|---|---|---|---|---|-----|---|---|---|---|---|---|---|------|---|------|

