Baumer
Passion for Sensors

# CombiTemp TCR6

Standard RTD temperature sensor

## Main features

- Sensor and connection in stainless steel, AISI 316L
- DIN form B housing
- Robust design

## Applications

- Industrial applications with industrial process connection
- Pipe systems
- Heating systems
- Water systems
- Tanks and vessels

## Technical specification

| | |
|---|---|
| Housing | DIN form B, Aluminium |
| El. connection | M20 or M16 |
| Output | Pt100/Pt1000 resistance signal<br>Ceramic terminal block.<br>4...20 mA temperature transmitter |
| Sensor tube material | Stainless steel AISI 316L (1.4404) |
| Sensor diameter outside | Ø 6, Ø 8 or Ø 10 mm |
| Sensor length | Standard tip <3000 mm<br>Fast response tip <300 mm |
| Standard response tip<br>Fast response tip | As outside sensor diameter<br>Ø 4 x 20 mm |
| Max. flow velocity | Air : 40 m/sec<br>Liquid : 5m/sec. |

## Sensor element, Pt100 - DIN/EN/IEC 60751

| | |
|---|---|
| Pt100 DIN class B | ± (0.3 + 0.005xt) °C |
| Pt100 1/3 DIN class B | ± 1/3 x (0.3 + 0.005xt) °C |
| Pt100 1/6 DIN class B | ± 1/6 x (0.3 + 0.005xt) °C |
| Pt100 DIN class A | ± (0.15 + 0.002xt) °C |
| Single element | 1 x Pt100 |
| Double element | 2 x Pt100 |
| Connection | 2-wire or 4-wire |

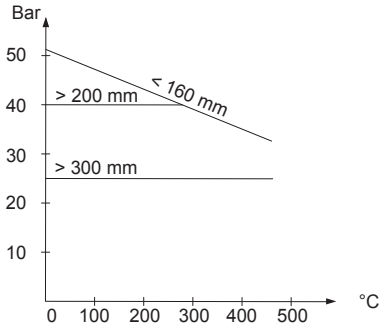
## Sensor element, Pt1000 - DIN/EN/IEC 60751

| | |
|---|---|
| Pt1000 DIN 1/3 DIN class B | ± 1/3 x (0.3 + 0.005xt) °C |
| Single element | 1 x Pt1000 |
| Connection | 2-wire |

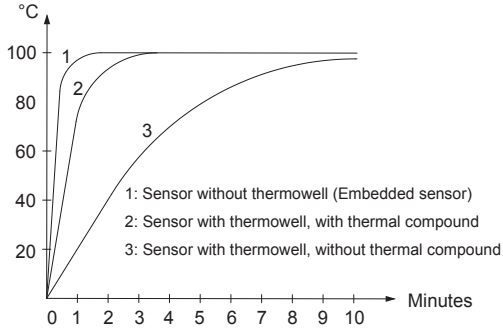
## Environment

| | | |
|---|---|---|
| Ambient temperature | w.terminal block<br>w. transmitter | -40...160 °C<br>-40...85 °C |
| Process temperature | -50...400 °C, option: <600 °C | |
| Protection class | IP65 | |
| Humidity | <100% RH, condensing | |
| Vibrations | GL, test 2 | |

### Pressure




### Response time




Note: When a pocket is used, the time delay increases. The delay is the time duration for the sensor to reflect the correct temperature after a sudden temperature change in the media.



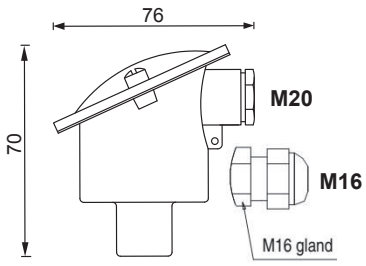
EN/2018-04-24

# CombiTemp TCR6

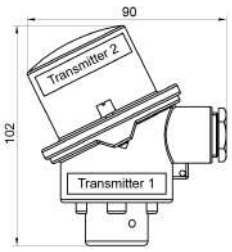
## Standard RTD temperature sensor

## Dimensions (mm), connection diagram and construction details

**Standard head**




**Head with two transmitters**

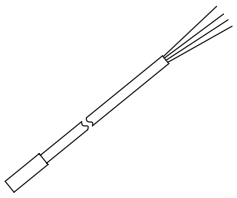



**Embedded sensor**

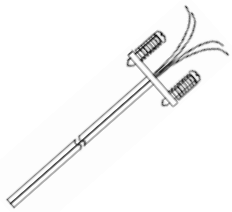
Not with replaceable sensor

Faster response time see page 1

**Cable sensor insert**

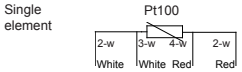


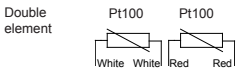
**Insert acc. to DIN 43762**

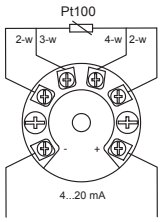


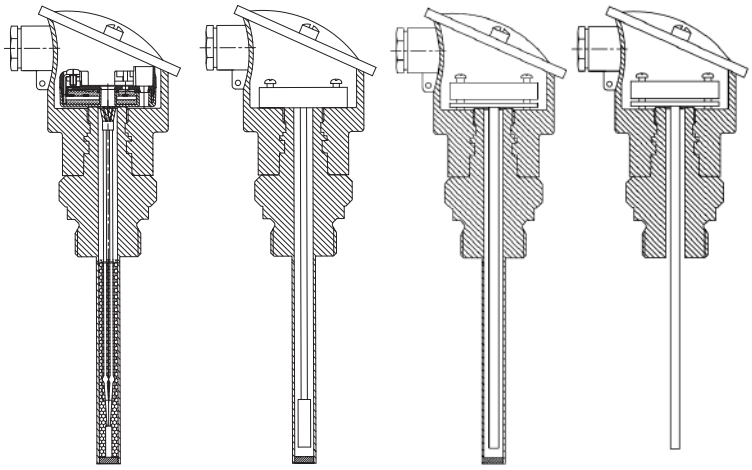
**Ceramic terminal block**

**Temperature transmitter**



With embedded sensor | With cable sensor insert | With insert | With insert no immersion tube

### Transmitter, type FlexTop 2202 - Standard

| | |
|---|---|
| Input | Pt100 |
| Output | 4...20 mA |
| Accuracy | |
| Input | <0.25°C |
| Output | <0.1% signal span (16mA) |
| Range | -200...850°C |
| Minimum span | 25°C |
| Supply | 8...35 VDC |
| Programmability | By FlexProgrammer 9701 |
| For further information please see data sheet for FlexTop 2202 | |

### Transmitter, type FlexTop 2211 - Performance

| | |
|---|---|
| Input | Pt100 / Pt1000 (universal) |
| Output | 4...20 mA |
| Accuracy | |
| Input | <0.1°C |
| Output | <0.1% signal span (16mA) |
| Range | -200...850°C |
| Minimum span | 25°C |
| Supply | 8...35 VDC |
| Programmability | By FlexProgrammer 9701 |
| For further information please see data sheet for FlexTop 2211 | |

### Transmitter, type FlexTop 2221 - Standard

| | |
|---|---|
| Input | Pt100 / Pt1000 (universal) |
| Output | 4...20 mA / HART |
| Accuracy | |
| Input | <0.1°C |
| Output | <0.1% signal span (16mA) |
| Range | -200...850°C |
| Minimum span | 25°C |
| Supply | 8...35 VDC |
| Programmability | By FlexProgrammer 9701<br>By HART terminal/modem |
| For further information please see data sheet for FlexTop 2221 | |

# CombiTemp TCR6

Standard RTD temperature sensor

## ATEX data for temperature transmitters

### Transmitter, type FlexTop 2202 - ATEX

| | |
|---|---|
| Approval | Ex ia IIC T5/T6, ATEX II 1G<br>Ex nA II T5, ATEX II 3G |
| Supply | 8...28 VDC |
| Internal inductivity<br>Internal capacity | $L_i$ ≤ 10 µH<br>$C_i$ ≤ 10 nF |
| Temperature class | T1...T5: -40 <Tamb < 85°C<br>T6: -40 <Tamb < 50°C |
| Barrier data | U: ≤ 28 VDC<br>I: ≤ 0.1A<br>P: ≤ 0.75 W |

### Transmitter, type FlexTop 2211 - ATEX

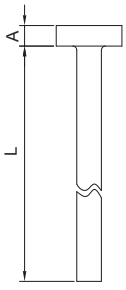
| | |
|---|---|
| Approval | Ex ia IIC T5/T6, ATEX II 1G<br>Ex nA II T5, ATEX II 3G |
| Supply | 6.5...30 VDC |
| Internal inductivity<br>Internal capacity | $L_i$ ≤ 1 5 µH<br>$C_i$ ≤ 5 nF |
| Temperature class | T1...T5: -40 <Tamb <85°C<br>T6: -40 <Tamb <50°C |
| Barrier data | U: ≤ 30 VDC<br>I: ≤ 0.1A<br>P: ≤ 0.75 W |

### Transmitter, type FlexTop 2221 - ATEX

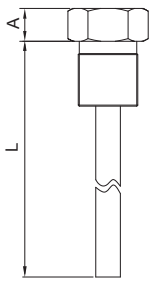
| | |
|---|---|
| Approval | Ex ia IIC T5/T6, ATEX II 1G<br>Ex nA II T5, ATEX II 3G |
| Supply | 8...30 VDC (Ex nA : 12...30 VDC) |
| Internal inductivity<br>Internal capacity | $L_i$ ≤ 15 µH<br>$C_i$ ≤ 5 nF |
| Temperature class | T1...T5: -40 <Tamb < 85°C<br>T6: -40 <Tamb < 50°C |
| Barrier data | U: ≤ 30 VDC<br>I: ≤ 0.1A<br>P: ≤ 0.75 W |

## Dimensions (mm) for process connections and immersion tube

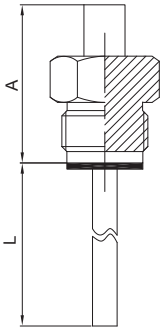
**Tube without connection** — **10**



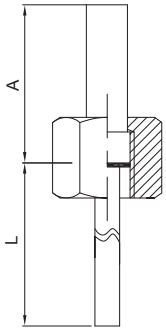

**Nipple male** — **12...18**




**Rotating male nipple** — **33...36**




**Rotating female union** — **23...24**

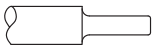



| Connection | Code | A | A/F | L |
|---|---|---|---|---|
| Without | 10 | 5 | Ø18 | 20...3.000 |
| G½, R½ | 12/13 | 10 | 22.0 | 35...3.000 |
| M18, M20 | 16/17 | 10 | 22.0 | 35...3.000 |
| ½" NPT | 18 | 10 | 22.0 | 35...3.000 |
| G½ nipple | 33 | 38 | 27.0 | 20...3.000 |
| G¾ nipple | 35 | 38 | 32.0 | 20...3.000 |
| G1 nipple | 36 | 38 | 36.0 | 20...3.000 |
| G½ union | 23 | 38 | 27.0 | 20...3.000 |
| G¾ union | 24 | 38 | 32.0 | 20...3.000 |

Standard Tip

Ø6, Ø8, Ø10

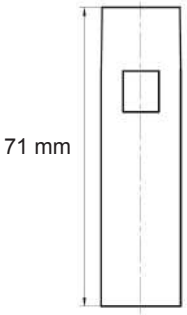
Fast response tip

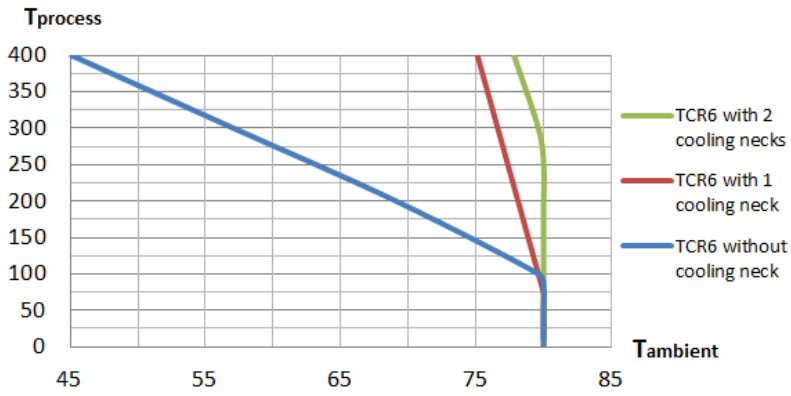


Ø4 × 20 mm

Ø6, Ø8, Ø10

Cooling neck



# CombiTemp TCR6

Standard RTD temperature sensor

## Ordering details TCR6

| TCR6 | – | xxxx | . | x | x | x | x | . | x | x | xx | . | x | x | x | x | . | xxxx |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Model**

| | |
|---|---|
| Standard temperature sensor, CombiTemp TCR6 | TCR6 |

–

**Electrical connection**

| | | |
|---|---|---|
| Cable gland, M16 | | 1520 |
| Cable gland, M16, shielded | | 1620 |
| Cable gland, M20 (standard) | | 1720 |
| Cable gland, M16 | for dual transmitter | 2520 |
| Cable gland, M16, shielded | for dual transmitter | 2620 |
| Cable gland, M20 (standard) | for dual transmitter | 2720 |

**Terminal block/Transmitter**

| | | | |
|---|---|---|---|
| Flying leads | Pt100 output | | 0 |
| Ceramic terminal block | Pt100 output | | 1 |
| FlexTop 2202 | 4…20 mA | ±0.25°C | 2 |
| FlexTop 2211 | 4…20 mA | ±0.10°C | 3 |
| FlexTop 2221 | 4…20 mA + HART® | ±0.10°C | 4 |
| 2 × FlexTop 2202 | 4…20 mA | ±0.25°C | A |
| 2 × FlexTop 2211 | 4…20 mA | ±0.10°C | B |
| 2 × FlexTop 2221 | 4…20 mA + HART® | ±0.10°C | C |

**Safety**

| | | |
|---|---|---|
| Standard | | 0 |
| ATEX, ia | Not available for dual transmitter | 1 |
| ATEX, nA | Not available for dual transmitter | 3 |
| Ex ia II 1 G Eex ia IIC, Zone 0, Simple apparatus | No transmitter | 9 |

**Configuration**

| | |
|---|---|
| No configuration | 0 |
| Configuration of range | 1 |

**Sensor element**

| | |
|---|---|
| None (for Cable Sensor) | 0 |
| 1 × Pt100 Cl. B | 1 |
| 2 × Pt100 Cl. B | 2 |
| 1 × Pt100 Cl. 1/3 B | 5 |
| 2 × Pt100 Cl. 1/3 B | 6 |
| 1 × Pt100 Cl. 1/6 B | 7 |
| 2 × Pt100 Cl. 1/6 B | 8 |
| 1 × Pt100 Cl. A | A |
| 2 × Pt100 Cl. A | B |
| 1 × Pt100 Cl. B < 600°C | C |
| 1 × Pt1000, cl. B | J |
| 1 × Pt1000, cl. 1/3 B | K |

**Sensor insert type**

| | | | |
|---|---|---|---|
| Embedded | 2-wire | sensor element | 1 |
| Embedded | 4-wire | sensor element | 2 |
| Embedded | 2x2-wire | sensor element | 4 |
| Insert, DIN 43762 | 2-wire | sensor element | 5 |
| Insert, DIN 43762 | 4-wire | sensor element | 6 |
| Insert, DIN 43762 | 2x2-wire | sensor element | 7 |
| Cable sensor | 4-wire, Ø8 mm only | Pt100, 1/1 DIN B | A |
| Cable sensor | 4-wire, Ø8 mm only | Pt100, 1/3 DIN B | B |
| Cable sensor | 4-wire, Ø8 mm only | Pt100, 1/6 DIN B | C |
| Cable sensor | 4-wire, Ø8 mm only | Pt100, 1/1 DIN A | D |

**Cooling neck**

| | |
|---|---|
| None | 0 |
| 71 mm | 1 |
| 142 mm | 2 |
| 213 mm | 3 |

**Process connection**

| | | | |
|---|---|---|---|
| Tube without connection | | | 10 |
| Nipple, male | G½ | DIN3852 form A | 12 |
| Nipple, male | R½ | ISO 7/1 | 13 |
| Nipple, male | M18×1.5 | ISO 261 | 16 |
| Nipple, male | M20×1.5 | ISO 261 | 17 |
| Nipple, male | ½"NPT-14 | ANSI/ASME B1.20.1 | 18 |
| Rotating male nipple | G½ | ISO 228/1 incl. NBR gasket | 33 |
| Rotating male nipple | G¾ | ISO 228/1 incl. NBR gasket | 35 |
| Rotating male nipple | G1 | ISO 228/1 incl. NBR gasket | 36 |
| Rotating female union | G½ | ISO 228/1 incl. NBR gasket | 23 |
| Rotating female union | G¾ | ISO 228/1 incl. NBR gasket | 24 |

**Seal**

| | | |
|---|---|---|
| No seal | | 0 |
| NBR gasket | (-40...108°C) for rotating nipple and union only | 1 |

Continued on page 5

# CombiTemp TCR6

Standard RTD temperature sensor

## Ordering details TCR6

| TCR6 | – | xxxx | . | x | x | x | x | . | x | x | xx | . | x | x | x | x | . | xxxx |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Continued from page 4

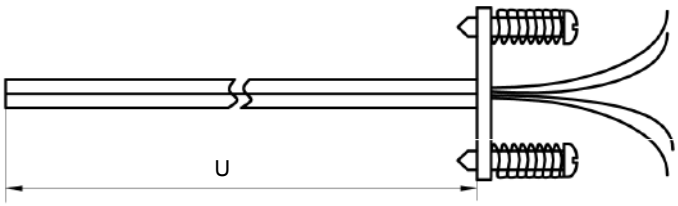
| | | | | |
|---|---|---|---|---|
| **Sensor diameter** | | | | |
| Ø6.0 mm | Welded | | | 5 |
| Ø8.0 mm | Welded | | | 6 |
| Ø10 mm | Welded | | | 8 |
| **Sensor tip** | | | | |
| Standard | Normal response | | | 1 |
| Fast | Fast response | Not for cable sensor | Ø4 mm - Max. 300 mm | 2 |
| Insert only | Open | No immersion tube below process connection | | A |
| **Approvals** | | | | |
| Without | | | | 0 |
| DNV marine approval | | | | 3 |

**Sensor tube length**
Length in mm (e.g. 60 mm = 0060) xxxx

# Insert TNR6, DIN 43762

For TCR6 standard RTD temperature sensor

## Insert as to DIN 43762, spring loaded




## Specifications

| | |
|---|---|
| Material | AISI 316L (1.4404) |
| Sensor diameter | Ø5,6 mm |
| Sensor | As per below |

## Ordering details TNR6

| TNR6 | – | x | x | x | x | . | x | x | x | x |
|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Terminal block/Transmitter** | | | | | |
| Flying leads | Pt100 output | | | 0 | |
| Ceramic terminal block | Pt100 output | | | 1 | |
| FlexTop 2202 | 4…20 mA | ±0.25°C | | 2 | |
| FlexTop 2211 | 4…20 mA | ±0.10°C | | 3 | |
| FlexTop 2221 | 4…20 mA + HART® | ±0.10°C | | 4 | |
| **Configuration** | | | | | |
| No configuration | | | | 0 | |
| Configuration of range | | | | 1 | |
| **Sensor element** | | | | | |
| None (for Cable Sensor) | | | | | 0 |
| 1 × Pt100 Cl. B | | | | | 1 |
| 2 × Pt100 Cl. B | | | | | 2 |
| 1 × Pt100 Cl. 1/3 B | | | | | 5 |
| 2 × Pt100 Cl. 1/3 B | | | | | 6 |
| 1 × Pt100 Cl. 1/6 B | | | | | 7 |
| 2 × Pt100 Cl. 1/6 B | | | | | 8 |
| 1 × Pt100 Cl. A | | | | | A |
| 2 × Pt100 Cl. A | | | | | B |
| 1 × Pt100 Cl. B < 600°C | | | | | C |
| 1 × Pt1000, cl. B | | | | | J |
| 1 × Pt1000, cl. 1/3 B | | | | | K |
| **Sensor insert type** | | | | | |
| Insert, DIN 43762 | 2-wire | sensor element | | | 5 |
| Insert, DIN 43762 | 4-wire | sensor element | | | 6 |
| Insert, DIN 43762 | 2x2-wire | sensor element | | | 7 |

**Insert tube length**
Length in mm x x x x

| | |
|---|---|
| Insert length, standard: | A + L + 26 mm |
| Insert length, with 1 cooling neck | A + L + 97 mm |
| Insert length, with 2 cooling necks | A + L + 168 mm |
| Insert length, with 3 cooling necks | A + L + 239 mm |

For length A please see page 3
For length L please see sensor length above for TCR6

Baumer
Passion for Sensors

# Thermowell for TCR6

## Type ZPT4

### Main features

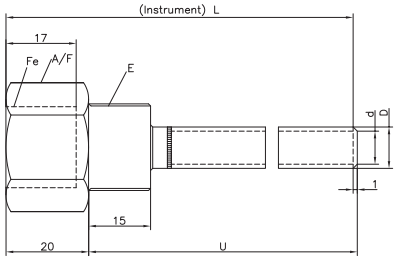
- Stainless steel, AISI 316
- Robust design

### Applications

- For threaded process connection - Ø6 and Ø8 sensor
- For hygienic process connection - Ø6 sensor

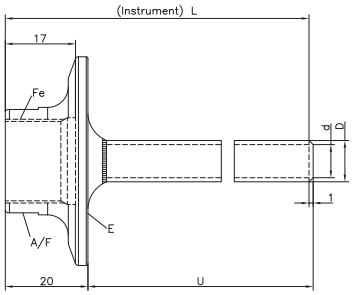
## Dimensions (mm)

**Threaded industrial type**




| | |
|---|---|
| L | Instrument length, up to 3 m |
| Fe | G½ |
| A/F | 27 mm |
| E | R½, G½A, G¾A or M20×1,5 |
| D | Ø10 or Ø12 mm |
| d | Ø8 or Ø10 mm |
| U | Insertion length |

**Hygienic type, Clamp DN 25 / DN 38, Ra 0,8 µm**




| | |
|---|---|
| L | Instrument length, up to 3 m |
| Fe | G½ |
| A/F | 25 mm |
| E | Clamp, ISO 2852 DN 38 |
| D | Ø10 mm |
| d | Ø8 mm |
| U | Insertion length |

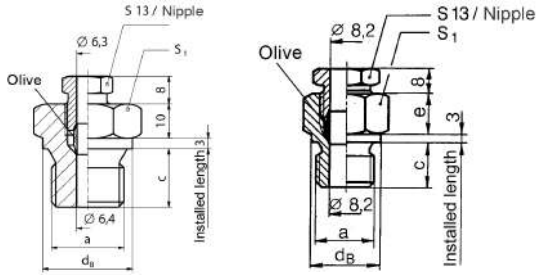
## Ordering details ZPT4

| | ZPT4 | _ | 5 | xx | 6 | x | . | xxxx |
|---|---|---|---|---|---|---|---|---|
| **Model** | | | | | | | | |
| Thermowell | ZPT4 | | | | | | | |
| **Instrument connection** | | | | | | | | |
| Female thread G½ | | | 5 | | | | | |
| **Process connection** | | | | | | | | |
| R½ (½" BSPT) | | | | 14 | | | | |
| G½ | | | | 15 | | | | |
| G¾ | | | | 34 | | | | |
| M20x1.5 | | | | 54 | | | | |
| Clamp ISO 2852 DN 25/DN38 | | | | 38 | | | | |
| **Material** | | | | | | | | |
| Stainless steel AISI 316L/1.4404 | | | | | 6 | | | |
| **Sensor diameter** | | | | | | | | |
| Ø6 (outside Ø10 mm) | | | | | | 5 | | |
| Ø8 (outside Ø12 mm) | | | | | | 7 | | |
| | | | | | | | . | |
| **Length (L)*** | | | | | | | | |
| mm (60 mm = 0060) | | | | | | | | xxxx |

*When ordering the TCR6 with rotating male nipple (code 33) the length has to be L + 20 mm

# Accessories

## Mounting accessories: Compression gland




| | A | C | $D_2$ | $S_1$ |
|---|---|---|---|---|
| 6 mm sensor | G 1/2 A | 15 | 26 | 27 |
| - | G 3/4 A | 16 | 32 | 32 |
| - | G 1 A | 19 | 39 | 41 |
| - | 1/2 NPT | 20 | - | 27 |
| - | M20 | 14 | 27 | 27 |
| Ø8 mm sensor | G 1/4 A | 13 | 19 | 19 |
| - | G 1/2 A | 15 | 26 | 27 |
| - | G 3/4 A | 16 | 32 | 32 |
| - | 1/4 NPT | 16 | - | 17 |
| - | 1/2 NPT | 20 | - | 27 |
| - | M20 | 14 | 27 | 27 |

## Ordering details

| | | T08406 . XXXX |
|---|---|---|
| **Model** | | |
| Compression gland | T 08406 | |
| **Process connection** | | |
| Ø6 mm sensor | G 1/2 A | 0016 |
| - | G 3/4 A | 0017 |
| - | G 1 A | 0020 |
| - | 1/2 NPT | 0019 |
| - | M20 | 2020 |
| Ø8 mm sensor | G 1/4 A | 1500 |
| - | G 1/2 A | 0003 |
| - | G 3/4 A | 0006 |
| - | 1/4 NPT | 1300 |
| - | 1/2 NPT | 0009 |
| - | M20 | 1020 |

## Material

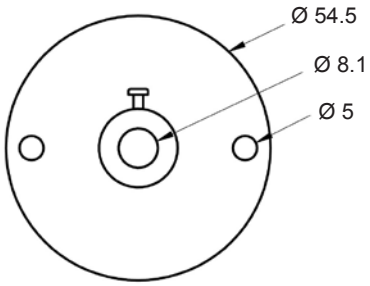
| | |
|---|---|
| Material | AISI 316L (1.4435) |

## Ventilation duct flange, Ø8 mm sensor only

| | |
|---|---|
| Material | Stainless steel, AISI 316 |
| Sensor diameter | Ø 8mm |

## Dimentions for ventilation duct flang

Ventilation duct flange Order : **ZPX1-002**




## Ordering details

| | |
|---|---|
| **Model** | |
| Duct flange | ZPX1-002 |

## Thermal compound

Recommended within the temperature range of -40 ... +180 °C


## Ordering details for thermal compound

| | |
|---|---|
| **Model** | |
| 6 gram in plastic bag | ZPX1-001 |