

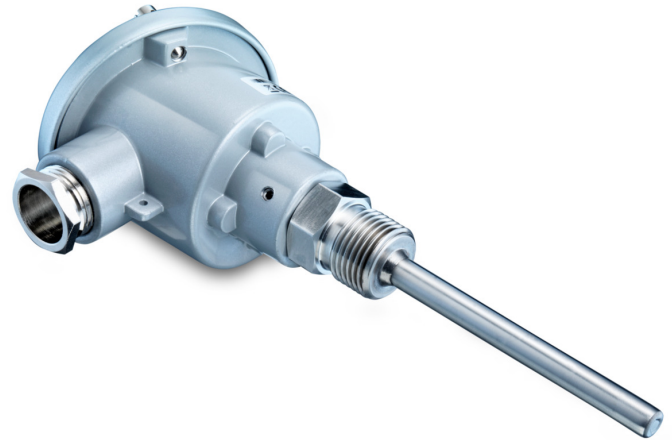
TCR6

Standard RTD temperature sensor

TCR6-####-##0#-####-####-####

Overview

- Housing DIN form B
- Immersion depth to 3000 mm
- 4 ... 20 mA or HART output
- Pt100 class A/B, Pt1000-configurable



Picture similar



EN 50155



Technical data

Performance characteristics

| | |
|---------------------------------|-----------------------------------|
| Pt100 accuracy class (EN 60751) | 1/1 B ± (0.3 + 0.005 × t)°C |
| | 1/1 A ± (0.15 + 0.002 × t)°C |
| | 1/3 B ± 1/3 × (0.3 + 0.005 × t)°C |
| | 1/6 B ± 1/6 × (0.3 + 0.005 × t)°C |

| | |
|----------------------------------|-----------------------------------|
| Pt1000 accuracy class (EN 60751) | 1/1 B ± (0.3 + 0.005 × t)°C |
| | 1/3 B ± 1/3 × (0.3 + 0.005 × t)°C |

| | |
|--------------------|-----------------|
| Max. flow velocity | 40 m/s , gases |
| | 5 m/s , liquids |

| | |
|----------------------------|-------------------------------|
| Thermal response time, T50 | ≤ 1.5 s , Ø4 mm |
| | ≤ 6.1 s , Ø6 mm |
| | ≤ 7.6 s , Ø8 mm |
| | ≤ 13.6 s , Ø8 mm with insert |
| | ≤ 11.1 s , Ø10 mm |
| | ≤ 28.1 s , Ø10 mm with insert |

| | |
|------------------|-----------------------------------------|
| Process pressure | Refer to section "Operating conditions" |
|------------------|-----------------------------------------|

| | |
|---------------------|-----------------------------------------|
| Process temperature | Refer to section "Operating conditions" |
|---------------------|-----------------------------------------|

Process connection

| | |
|---------------------|-----------------------------------------|
| Connection variants | Refer to section "Dimensional drawings" |
|---------------------|-----------------------------------------|

| | |
|---------------|----------------|
| Sensor length | 20 ... 3000 mm |
|---------------|----------------|

| | |
|-------------------------|---------|
| Sensor diameter outside | ø 6 mm |
| | ø 8 mm |
| | ø 10 mm |

| | |
|-------------------|------------------------|
| Mounting position | Any, top, bottom, side |
|-------------------|------------------------|

| | |
|-----------------------|---------|
| Standard response tip | ø 6 mm |
| | ø 8 mm |
| | ø 10 mm |

| | |
|-------------------|--------|
| Fast response tip | ø 4 mm |
|-------------------|--------|

| | |
|----------------------|--------------------|
| Sensor tube material | AISI 316L (1.4404) |
|----------------------|--------------------|

| | |
|--------------------------------|-------------|
| Surface roughness wetted parts | Ra ≤ 0.8 µm |
|--------------------------------|-------------|

Ambient conditions

| | |
|-----------------------------|----------------------------------|
| Operating temperature range | -40 ... 160 °C , with Pt100 |
| | -40 ... 85 °C , with transmitter |

| | |
|---------------------------|---------------|
| Storage temperature range | -40 ... 85 °C |
|---------------------------|---------------|

| | |
|---------------------------------|-------|
| Degree of protection (EN 60529) | IP 65 |
|---------------------------------|-------|

| | |
|----------|-------------------------|
| Humidity | ≤ 100 % RH , condensing |
|----------|-------------------------|

| | |
|---------------------------------------|----------------------------------------------------------------|
| Vibration (sinusoidal) (EN 60068-2-6) | 1.6 mm p-p (2 ... 25 Hz), 4 g (25 ... 100 Hz), 1 octave / min. |
|---------------------------------------|----------------------------------------------------------------|

Output signal

| | |
|---------------------|--------------------|
| Without transmitter | 1 x Pt100, 2-wire |
| | 1 x Pt100, 4-wire |
| | 2 x Pt100, 2-wire |
| | 1 x Pt1000, 2-wire |

| | |
|------------------|------------------------------|
| With transmitter | 4 ... 20 mA , 2-wire |
| | 4 ... 20 mA , 2-wire + HART® |

Housing

| | |
|-------|------------|
| Style | DIN form B |
|-------|------------|

| | |
|--------------|-----------------------------------------|
| Overall size | Refer to section "Dimensional drawings" |
|--------------|-----------------------------------------|

| | |
|----------|-----------|
| Material | Aluminium |
|----------|-----------|

Electrical connection

| | |
|-----------|-----------------------------------|
| Connector | M12-A, 4-pin, nickel plated brass |
|-----------|-----------------------------------|

| | |
|-------------|------------------------------|
| Cable gland | M16x1.5, nickel plated brass |
| | M20x1.5, nickel plated brass |
| | M20x1.5, plastic |
| | M20x1.5, stainless steel |

ATEX II 1 G Ex ia IIC T6...T5

| | |
|------------------------------------------|-----------------------------|
| Maximum values for barrier selection, Ui | 28 V DC , with FlexTop 2202 |
| | 30 V DC , with FlexTop 2212 |
| | 30 V DC , with FlexTop 2222 |

| | |
|------------------------------------------|-----------------------------|
| Maximum values for barrier selection, Ii | 0.1 A , with FlexTop 2202 |
| | 0.095 A , with FlexTop 2212 |
| | 0.095 A , with FlexTop 2222 |

TCR6

Standard RTD temperature sensor

TCR6 #####.#0# #####.#####

Technical data

ATEX II 1 G Ex ia IIC T6...T5

| | |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Maximum values for barrier selection, Pi | 0.7 W , with FlexTop 2202 0.75 W , with FlexTop 2212 0.75 W , with FlexTop 2222 |
| Internal capacitance, Ci | 10 nF , with FlexTop 2202 11 nF , with FlexTop 2212 11 nF , with FlexTop 2222 |
| Internal inductance, Li | 10 µH , with FlexTop 2202 24 µH , with FlexTop 2212 24 µH , with FlexTop 2222 |
| Temperature class, T1 ... T4 | -40 < Tamb < 80 °C , with FlexTop 2212 -40 < Tamb < 80 °C , with FlexTop 2222 |
| Temperature class, T5 | -40 < Tamb < 71 °C , with FlexTop 2212 -40 < Tamb < 71 °C , with FlexTop 2222 |
| Temperature class, T1 ... T5 | -40 < Tamb < 85 °C , with FlexTop 2202 |
| Temperature class, T6 | -40 < Tamb < 50 °C , with FlexTop 2202 -40 < Tamb < 56 °C , with FlexTop 2212 -40 < Tamb < 56 °C , with FlexTop 2222 |

ATEX II 3 G Ex ec IIC T5

| | |
|------------------------------|--------------------|
| Voltage supply range, Un | 30 V DC , max. |
| Current rating, In | ≤ 0.02 A |
| Temperature class, T1 ... T5 | -40 < Tamb < 80 °C |

Compliance and approvals

| | |
|----------------------|------------------------------------------------------------------------------------------------------------------------------|
| EMC | EN 61326-1 |
| Railway applications | EN 50155 |
| Explosion protection | ATEX II 1 G Ex ia IIC T6...T4 IECEx Ex ia IIC T6...T4 ATEX II 3 G Ex ec IIC T5 Ex ia Simple apparatus, gas and dust |

Transmitter

FlexTop 2202

| | |
|---------------------|----------------------------------------------------------------|
| Input | Pt100 |
| Input Accuracy | ≤ ± 0.25 °C |
| Min. measuring span | 25 °C |
| Output | 4 ... 20 mA , 2-wire |
| Output Accuracy | ≤ ± 0.1 % , measuring span ≤ ± 0.016 mA |
| Power supply | 8 ... 35 V DC |
| Programmability | With FlexProgrammer 9701 |
| Please note | For further information please see data sheet for FlexTop 2202 |

FlexTop 2212

| | |
|---------------------|----------------------------------------------------------------|
| Input | Pt100 Pt1000 |
| Input Accuracy | ≤ ± 0.06 °C |
| Min. measuring span | 10 °C |
| Output | 4 ... 20 mA , 2-wire 20 ... 4 mA , programmable |
| Output Accuracy | ≤ ± 0.025 % , measuring span ≤ ± 0.004 mA |
| Power supply | 7 ... 40 V DC |
| Programmability | With FlexProgram |
| Please note | For further information please see data sheet for FlexTop 2212 |

FlexTop 2222

| | |
|---------------------|----------------------------------------------------------------|
| Input | Pt100 Pt1000 |
| Input Accuracy | ≤ ± 0.06 °C |
| Min. measuring span | 10 °C |
| Output | 4 ... 20 mA , 2-wire + HART® 20 ... 4 mA , programmable |
| Output Accuracy | ≤ ± 0.025 % , measuring span ≤ ± 0.004 mA |
| Power supply | 7 ... 40 V DC |
| Programmability | With FlexProgram With HART® modem |
| Please note | For further information please see data sheet for FlexTop 2222 |

Factory settings FlexTop 2202

| | |
|------------------------|--------------|
| Output range | 0 ... 120 °C |
| Damping | 0 s |
| Output at sensor fault | 23 mA |

Factory settings FlexTop 2212

| | |
|------------------------|--------------|
| Output range | 0 ... 100 °C |
| Damping | 0 s |
| Output at sensor fault | 23 mA |

Factory settings FlexTop 2222

| | |
|------------------------|--------------|
| Output range | 0 ... 100 °C |
| Damping | 0 s |
| Output at sensor fault | 23 mA |

TCR6

Standard RTD temperature sensor

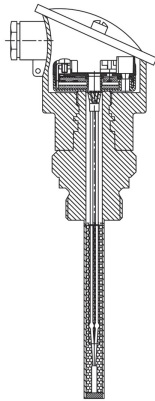
TCR6-####.#0#.####.####.####

Operating conditions

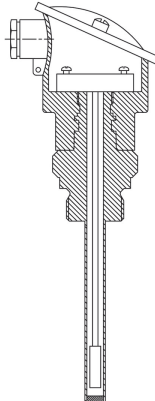
| Ordering key | Process connection | BCID | Process pressure (bar) | Process temperature Standard @ Tamb ≤ 45°C (° C) | Continuous | |
|-------------------------|-------------------------------------------|------|---------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| | | | | | Process temperature with cooling neck 71 mm @ Tamb ≤ 70°C (° C) | Process temperature with cooling neck 142 mm / 213 mm @ Tamb ≤ 70°C (° C) |
| TCR6-####.#10.####.#### | Sleeve Ø 6 | T65 | -1 ... 40 | -50 ... 400 | -50 ... 400 | -50 ... 600 |
| TCR6-####.#12.####.#### | G 1/2 A ISO 228-1 | G06 | -1 ... 100 | -50 ... 400 | -50 ... 400 | -50 ... 600 |
| TCR6-####.#13.####.#### | R 1/2 ISO 7-1 | R06 | -1 ... 100 | -50 ... 400 | -50 ... 400 | -50 ... 600 |
| TCR6-####.#16.####.#### | M18 × 1.5 ISO 261 / ISO 965 | M07 | -1 ... 100 | -50 ... 400 | -50 ... 400 | -50 ... 600 |
| TCR6-####.#17.####.#### | M20 × 1.5 ISO 261 / ISO 965 | M08 | -1 ... 100 | -50 ... 400 | -50 ... 400 | -50 ... 600 |
| TCR6-####.#18.####.#### | 1/2-14 NPT | N02 | -1 ... 100 | -50 ... 400 | -50 ... 400 | -50 ... 600 |
| TCR6-####.#23.####.#### | G 1/2 A ISO 228-1 female thread | G23 | -1 ... 100 | -50 ... 400 | -50 ... 400 | -50 ... 600 |
| TCR6-####.#24.####.#### | G 3/4 A ISO 228-1 female thread | G24 | -1 ... 100 | -50 ... 400 | -50 ... 400 | -50 ... 600 |
| TCR6-####.#33.####.#### | Rotating male nipple G 1/2 A ISO 228-1 | G06 | -1 ... 100 | -50 ... 400 | -50 ... 400 | -50 ... 600 |
| TCR6-####.#35.####.#### | Rotating male nipple G 3/4 A ISO 228-1 | G10 | -1 ... 100 | -50 ... 400 | -50 ... 400 | -50 ... 600 |
| TCR6-####.#36.####.#### | Rotating male nipple G 1 A ISO 228-1 | G11 | -1 ... 100 | -50 ... 400 | -50 ... 400 | -50 ... 600 |

A process temperature up to 600 °C is only possible with Pt100 element code 'C'.

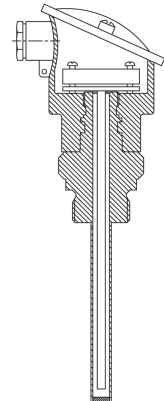
Dimensional drawings (mm)



With embedded sensor



With cable sensor insert



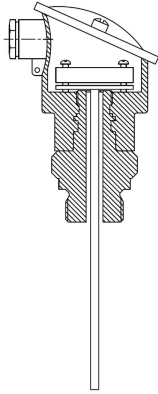
With DIN 43762 insert

TCR6

Standard RTD temperature sensor

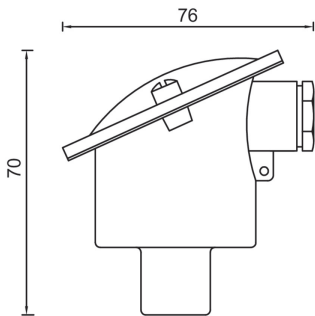
TCR6-####-##0#-####-####-####

Dimensional drawings (mm)

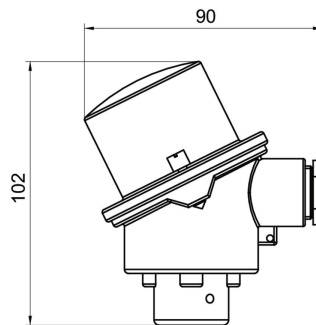


With insert DIN 43762, no immersion tube

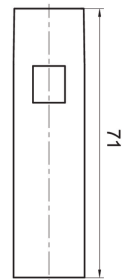
Housing



DIN Form B housing

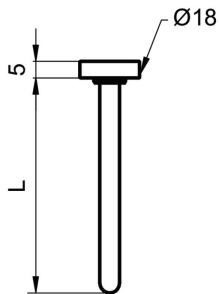


DIN Form B housing, dual transmitter

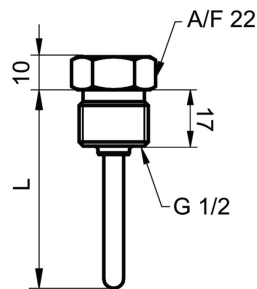


Cooling neck

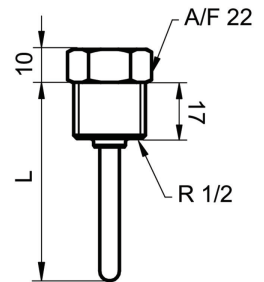
Process connection



Without thread (BCID: T65)



G 1/2 A ISO 228-1 (BCID: G06)



R 1/2 ISO 7/1 (BCID: R01)

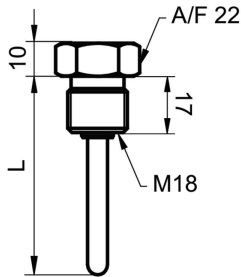
TCR6

Standard RTD temperature sensor

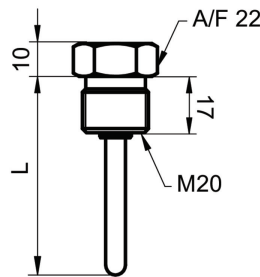
TCR6-####-##0#-####-####-####

Dimensional drawings (mm)

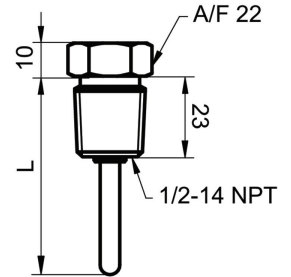
Process connection



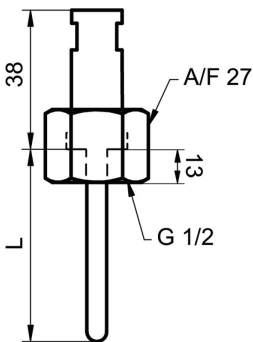
M18 × 1.5 ISO 261 / ISO 965 (BCID: M07)



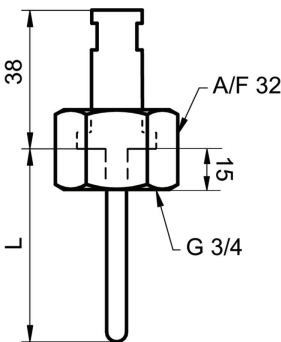
M20 × 1.5 ISO 261 / ISO 965 (BCID: M08)



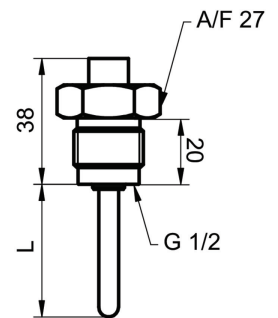
1/2-14 NPT (BCID: N02)



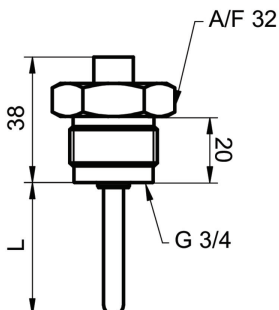
Rotating female union G 1/2 A ISO 228-1 (BCID: G23)



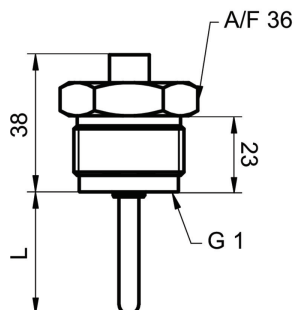
Rotating female union G 3/4 A ISO 228-1 (BCID: G24)



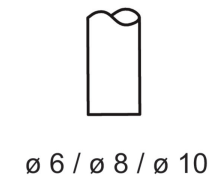
Rotating male nipple G 1/2 A ISO 228-1 (G06)



Rotating male nipple G 3/4 A ISO 228-1 (G10)



Rotating male nipple G 1 A ISO 228-1 (G11)



Standard response tip

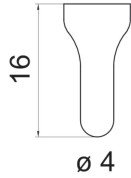
TCR6

Standard RTD temperature sensor

TCR6-####-##0#-####-####-####

Dimensional drawings (mm)

Process connection



Fast response tip

TCR6

Standard RTD temperature sensor

TCR6-####-##0#-####-####-####

Electrical connection

| Output type | Equivalent circuit | Electrical connection | Function | Pin assignment |
|-------------------------|--------------------|-----------------------|--------------|----------------|
| Pt100 (Single element) | | | Pt100 11 | Long |
| | | | Pt100 12 | Short |
| | | | Pt100 11 | 1, 2 |
| | | | Pt100 12 | 3, 4 |
| | | | Pt100 11 | 1, 2 |
| | | | Pt100 12 | 3, 4 |
| Pt100 (Double element) | | | Pt100 11 | Long |
| | | | Pt100 12 | Long |
| | | | Pt100 21 | Short |
| | | | Pt100 22 | Short |
| | | | Pt100 11 | 1 |
| | | | Pt100 12 | 2 |
| | | | Pt100 21 | 3 |
| | | | Pt100 22 | 4 |
| 4 ... 20 mA, 2-wire | | | +Vs | 1 |
| | | | lout | 2 |
| | | | +Vs | 1 |
| | | | lout | 3 |
| | | | N.C. | 2, 4 |
| | | | Frame ground | Plug thread |
| 2 x 4 ... 20 mA, 2-wire | | | +Vs1 | 1 |
| | | | lout1 | 2 |
| | | | +Vs2 | 3 |
| | | | lout2 | 4 |
| | | | | |

TCR6

Standard RTD temperature sensor

TCR6-####-##0#-####-####-####

Electrical connection

Ordering key - Configuration possibilities see website

| Product | TCR6 | - | #### | . | # | # | # | # | . | # | # | ## | . | # | # | # | # | . | #### |
|-------------------------------------------------------------------------------------------------------------------------------|------|---|------|---|---|---|---|---|---|---|---|----|---|---|---|---|---|---|------|
| Product | TCR6 | | | | | | | | | | | | | | | | | | |
| Electrical connection/Housing | | | | | | | | | | | | | | | | | | | |
| Electrical connection: M12-A, 4-pin; Housing: DIN form B | | | | | | | | | | | | | | | | | | | 1120 |
| Electrical connection: M16x1.5 cable gland, nickel plated brass; Housing: DIN form B | | | | | | | | | | | | | | | | | | | 1520 |
| Electrical connection: M16x1.5 cable gland, nickel plated brass, shielded; Housing: DIN form B | | | | | | | | | | | | | | | | | | | 1620 |
| Electrical connection: M20x1.5 cable gland, nickel plated brass Housing: DIN form B ⁽¹⁾ | | | | | | | | | | | | | | | | | | | 1720 |
| Electrical connection: M20x1.5 cable gland, Plastic; Housing: DIN form B | | | | | | | | | | | | | | | | | | | 1710 |
| Electrical connection: M20x1.5 cable gland, Stainless steel AISI 304; Housing: DIN form B | | | | | | | | | | | | | | | | | | | 1730 |
| Electrical connection: M16x1.5 cable gland, nickel plated brass Housing: DIN form B for dual transmitter | | | | | | | | | | | | | | | | | | | 2520 |
| Electrical connection: M16x1.5 cable gland, nickel plated brass, shielded Housing: DIN form B for dual transmitter | | | | | | | | | | | | | | | | | | | 2620 |
| Electrical connection: M20x1.5 cable gland, nickel plated brass Housing: DIN form B for dual transmitter ⁽¹⁾ | | | | | | | | | | | | | | | | | | | 2720 |
| Electrical connection: M20x1.5 cable gland, Plastic; Housing: DIN form B for dual transmitter | | | | | | | | | | | | | | | | | | | 2710 |
| Electrical connection: M20x1.5 cable gland, stainless steel; Housing: DIN form B for dual transmitter | | | | | | | | | | | | | | | | | | | 2730 |
| Transmitter / socket | | | | | | | | | | | | | | | | | | | |
| Flying leads | | | | | | | | | | | | | | | | | | | 0 |
| Ceramic socket Pt100 | | | | | | | | | | | | | | | | | | | 1 |
| Transmitter 2202 4 ... 20 mA, accuracy ±0,25 °C | | | | | | | | | | | | | | | | | | | 2 |
| Transmitter 2212 4 ... 20 mA, accuracy < ±0.06°C | | | | | | | | | | | | | | | | | | | 6 |
| Transmitter 2222 4 ... 20 mA + HART®, accuracy < ±0.06°C | | | | | | | | | | | | | | | | | | | 7 |
| 2 x Transmitter 2202 4 ... 20 mA, accuracy ±0,25 °C | | | | | | | | | | | | | | | | | | | A |
| 2 x Transmitter 2212 4 ... 20 mA, accuracy < ±0.06°C | | | | | | | | | | | | | | | | | | | D |
| 2 x Transmitter 2222 4 ... 20 mA + HART®, accuracy < ±0.06°C | | | | | | | | | | | | | | | | | | | E |

TCR6

Standard RTD temperature sensor

TCR6-####-##0#-####-####-####

Electrical connection

Ordering key - Configuration possibilities see website

TCR6 - #### . # # # # . # # ## . # # # # . ####

Safety

| | |
|--------------------------------------|---|
| Standard | 0 |
| Ex ia IIC T6/T5...T4 (Gas) | 1 |
| Ex ec IIC T5...T4 (Gas) | 3 |
| Ex ia Simple apparatus, gas and dust | 9 |

Configuration

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

Sensor element

| | |
|------------------------------------|---|
| None | 0 |
| 1 x Pt100, 1/1 B EN 60751 | 1 |
| 2 x Pt100, 1/1 B EN 60751 | 2 |
| 1 x Pt100, 1/3 B EN 60751 | 5 |
| 2 x Pt100, 1/3 B EN 60751 | 6 |
| 1 x Pt100, 1/6 B EN 60751 | 7 |
| 2 x Pt100, 1/6 B EN 60751 | 8 |
| 1 x Pt100, 1/1 A EN 60751 | A |
| 2 x Pt100, 1/1 A EN 60751 | B |
| 1 x Pt100, 1/1 B EN 60751, < 600°C | C |
| 1 x Pt1000, 1/1 B EN 60751 | J |
| 1 x Pt1000, 1/3 B EN 60751 | K |

Sensor insert type

| | |
|---------------------------------------------------|---|
| Sensor tube with embedded sensor element 2-wire | 1 |
| Sensor tube with embedded sensor element 4-wire | 2 |
| Sensor tube with embedded 2x2-wire sensor element | 4 |
| Spring loaded insert, DIN 43762, 2-wire | 5 |
| Spring loaded insert, DIN 43762, 4-wire | 6 |
| Spring loaded insert, DIN 43762, 2x2-wire | 7 |
| Cable sensor Pt100 1/1 B EN 60751 | A |
| Cable sensor Pt100 1/3 B EN 60751 | B |
| Cable sensor Pt100 1/6 B EN 60751 | C |
| Cable sensor Pt100 1/1 A EN 60751 | D |

Cooling neck

| | |
|---------|---|
| Without | 0 |
| 71 mm | 1 |
| 142 mm | 2 |
| 213 mm | 3 |

Process connection

| | |
|----------------------------------------------|----|
| Tube without connection (T65) | 10 |
| G½ A ISO 228-1 (G06) | 12 |
| R 1/2 ISO 7/1 (R01) | 13 |
| M18 × 1.5 ISO 261 / ISO 965 (M07) | 16 |
| M20 × 1.5 ISO 261 / ISO 965 (M08) | 17 |
| 1/2-14 NPT (N02) | 18 |
| G 1/2 A ISO 228-1 female thread (G23) | 23 |
| G 3/4 A ISO 228-1 female thread (G24) | 24 |
| Rotating male nipple G 1/2 A ISO 228-1 (G06) | 33 |
| Rotating male nipple G 3/4 A ISO 228-1 (G10) | 35 |
| Rotating male nipple G 1 A ISO 228-1 (G11) | 36 |

TCR6

Standard RTD temperature sensor

TCR6-####-##0#-####-####-####

Electrical connection

Ordering key - Configuration possibilities see website

TCR6 - #### . # # # # . # # ## . # # # # . ####

Seal

| | |
|---------|---|
| Without | 0 |
| NBR | 1 |

Sensor diameter

| | |
|------------------------------------|---|
| Ø6.0 mm, welded | 5 |
| Ø8.0 mm, welded | 6 |
| Ø10.0 mm, welded | 8 |
| No immersion tube, for insert only | 9 |

Sensor tip

| | |
|---------------------------------------------------------------|---|
| Standard response tip | 1 |
| Fast response tip, Ø 4 mm tip | 2 |
| Insert only, open, no immersion tube below process connection | A |

Approvals

| | |
|--------------------|---|
| Standard approvals | 0 |
| Railway EN 50155 | 4 |

Sensor tube length (mm)

| | |
|-----------|------|
| 20 - 3000 | #### |
|-----------|------|

(1) (not UL-certified)