

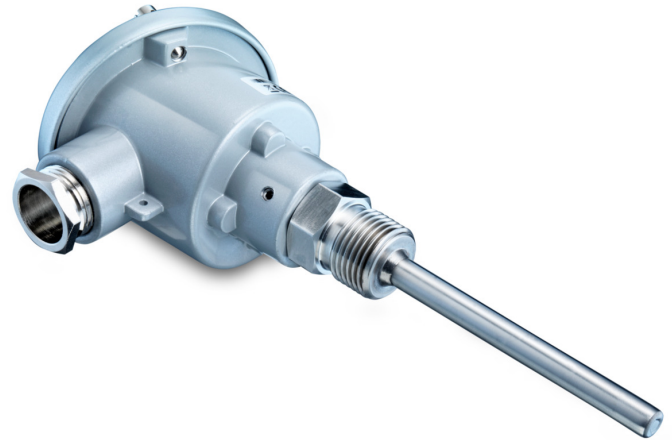
TCR6

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

Insulation resistance > 100 MΩ , 500 V DC (for Rail version)

Insulation voltage 600 V AC , EN 50155 (for Rail version)

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

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Technical data

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

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

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

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

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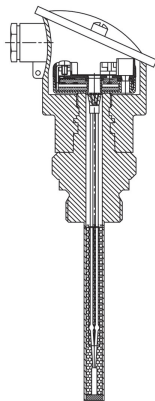
TCR6-####.#0#.####.####.####

Operating conditions

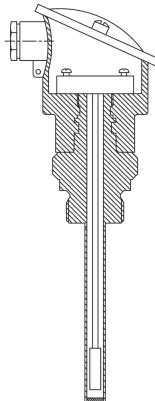
Ordering key	Process connection	BCID	Process pressure (bar)	Process temperature Standard @ Tamb ≤ 45°C (° C)	Continuous	
					Process temperature with cooling neck 71 mm @ Tamb ≤ 70°C (° C)	Process temperature with cooling neck 142 mm / 213 mm @ Tamb ≤ 70°C (° C)
TCR6-####.#10.####.####	Sleeve Ø 6	T65	-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'.

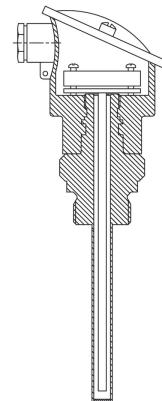
Dimensional drawings (mm)



With embedded sensor



With cable sensor insert



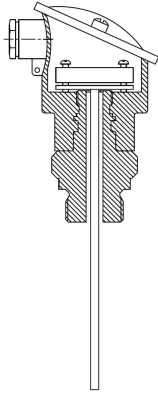
With DIN 43762 insert

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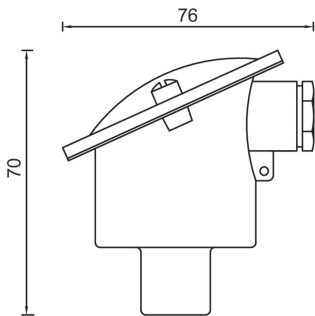
TCR6-####-##0#-####-####-####

Dimensional drawings (mm)

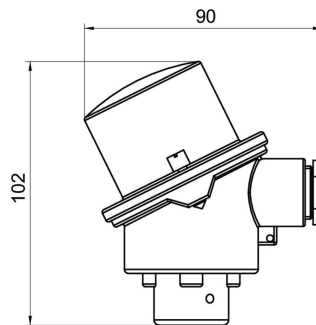


With insert DIN 43762, no immersion tube

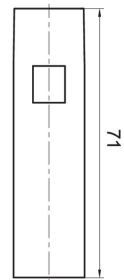
Housing



DIN Form B housing

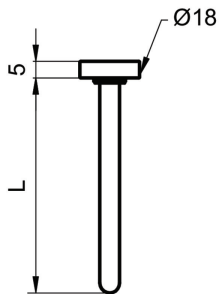


DIN Form B housing, dual transmitter

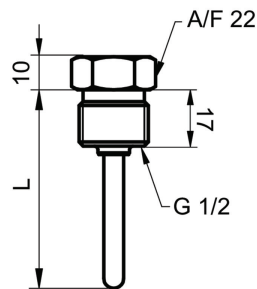


Cooling neck

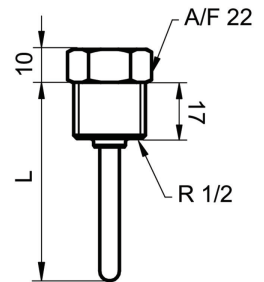
Process connection



Without thread (BCID: T65)



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



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

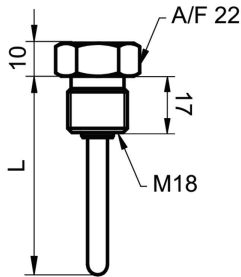
TCR6

Standard RTD temperature sensor

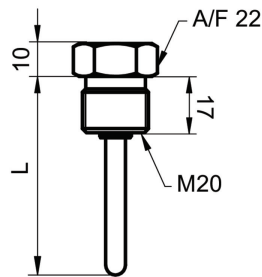
TCR6-####-##0#-####-####-####

Dimensional drawings (mm)

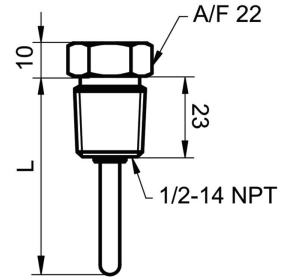
Process connection



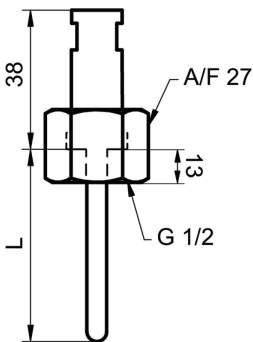
M18 × 1.5 ISO 261 / ISO 965 (BCID: M07)



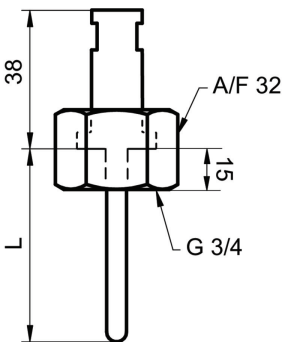
M20 × 1.5 ISO 261 / ISO 965 (BCID: M08)



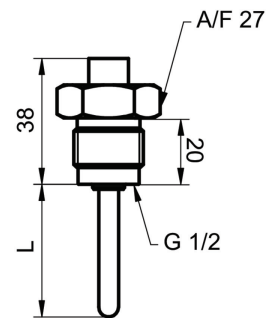
1/2-14 NPT (BCID: N02)



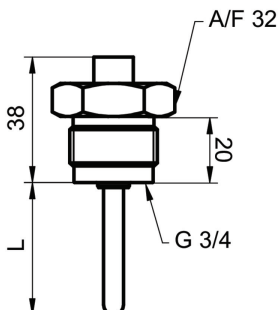
Rotating female union G 1/2 A ISO 228-1 (BCID: G23)



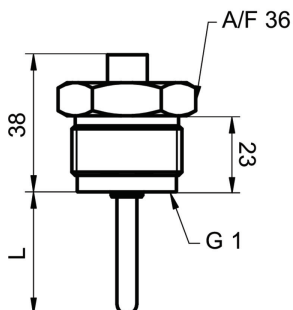
Rotating female union G 3/4 A ISO 228-1 (BCID: G24)



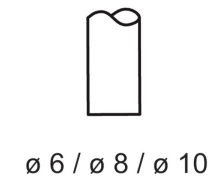
Rotating male nipple G 1/2 A ISO 228-1 (G06)



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



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



Standard response tip

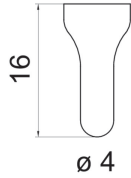
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Dimensional drawings (mm)

Process connection



Fast response tip

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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			
Pt100 11	1			
Pt100 12	2			
Pt100 21	3			
Pt100 22	4			
Frame ground	Plug thread			
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

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Electrical connection

Ordering key - Configuration possibilities see website

Product	TCR6	-	####	.	#	#	#	#	.	#	#	##	.	#	#	#	#	.	####
Electrical connection/Housing	TCR6																		
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

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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 x 1.5 ISO 261 / ISO 965 (M07)	16
M20 x 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

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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	####
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(1) (not UL-certified)