

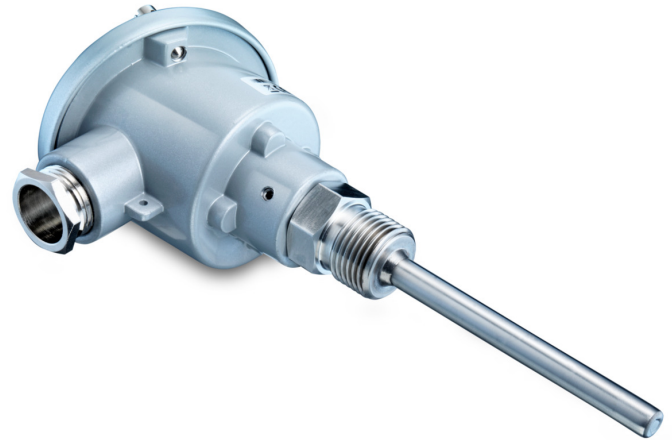
## TCR6

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 $\pm (0.3 + 0.005 \times t)^\circ\text{C}$ 1/1 A $\pm (0.15 + 0.002 \times t)^\circ\text{C}$ 1/3 B $\pm 1/3 \times (0.3 + 0.005 \times t)^\circ\text{C}$ 1/6 B $\pm 1/6 \times (0.3 + 0.005 \times t)^\circ\text{C}$
---------------------------------	---

Pt1000 accuracy class (EN 60751)	1/1 B $\pm (0.3 + 0.005 \times t)^\circ\text{C}$ 1/3 B $\pm 1/3 \times (0.3 + 0.005 \times t)^\circ\text{C}$
----------------------------------	---

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

Thermal response time, T50	$\leq 1.5$ s , $\varnothing 4$ mm $\leq 6.1$ s , $\varnothing 6$ mm $\leq 7.6$ s , $\varnothing 8$ mm $\leq 13.6$ s , $\varnothing 8$ mm with insert $\leq 11.1$ s , $\varnothing 10$ mm $\leq 28.1$ s , $\varnothing 10$ 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	$\varnothing 6$ mm $\varnothing 8$ mm $\varnothing 10$ mm
-------------------------	---

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

Standard response tip	$\varnothing 6$ mm $\varnothing 8$ mm $\varnothing 10$ mm
-----------------------	---

Fast response tip	$\varnothing 4$ mm
-------------------	--------------------

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

Surface roughness wetted parts	$R_a \leq 0.8 \mu\text{m}$
--------------------------------	----------------------------

#### Ambient conditions

Operating temperature range	-40 ... 160 $^\circ\text{C}$ , with Pt100 -40 ... 85 $^\circ\text{C}$ , with transmitter
-----------------------------	---

Storage temperature range	-40 ... 85 $^\circ\text{C}$
---------------------------	-----------------------------

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

Humidity	$\leq 100$ % 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
<b>Compliance and approvals</b>	
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

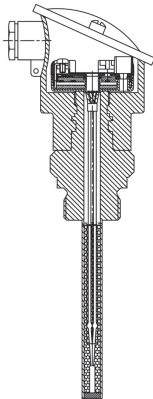
TCR6-####.#0#.#0#.#0#.#0#

## Operating conditions

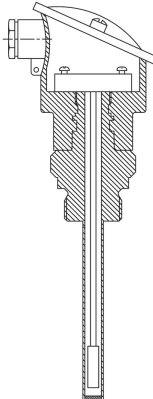
Ordering key	Process connection	BCID	Process pressure	Process temperature Standard @ Tamb ≤ 45°C	Continuous Process temperature with cooling neck 71 mm @ Tamb ≤ 70°C	Process temperature with cooling neck 142 mm / 213 mm @ Tamb ≤ 70°C
			(bar)	(° C)	(° C)	(° C)
TCR6-####.#0#.#10#.#0#.#0#	Sleeve Ø 6	T65	-1 ... 40	-50 ... 400	-50 ... 400	-50 ... 600
TCR6-####.#0#.#12#.#0#.#0#	G 1/2 A ISO 228-1	G06	-1 ... 100	-50 ... 400	-50 ... 400	-50 ... 600
TCR6-####.#0#.#13#.#0#.#0#	R 1/2 ISO 7-1	R06	-1 ... 100	-50 ... 400	-50 ... 400	-50 ... 600
TCR6-####.#0#.#16#.#0#.#0#	M18 × 1.5 ISO 261 / ISO 965	M07	-1 ... 100	-50 ... 400	-50 ... 400	-50 ... 600
TCR6-####.#0#.#17#.#0#.#0#	M20 × 1.5 ISO 261 / ISO 965	M08	-1 ... 100	-50 ... 400	-50 ... 400	-50 ... 600
TCR6-####.#0#.#18#.#0#.#0#	1/2-14 NPT	N02	-1 ... 100	-50 ... 400	-50 ... 400	-50 ... 600
TCR6-####.#0#.#23#.#0#.#0#	G 1/2 A ISO 228-1 female thread	G23	-1 ... 100	-50 ... 400	-50 ... 400	-50 ... 600
TCR6-####.#0#.#24#.#0#.#0#	G 3/4 A ISO 228-1 female thread	G24	-1 ... 100	-50 ... 400	-50 ... 400	-50 ... 600
TCR6-####.#0#.#33#.#0#.#0#	Rotating male nipple G 1/2 A ISO 228-1	G06	-1 ... 100	-50 ... 400	-50 ... 400	-50 ... 600
TCR6-####.#0#.#35#.#0#.#0#	Rotating male nipple G 3/4 A ISO 228-1	G10	-1 ... 100	-50 ... 400	-50 ... 400	-50 ... 600
TCR6-####.#0#.#36#.#0#.#0#	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'.

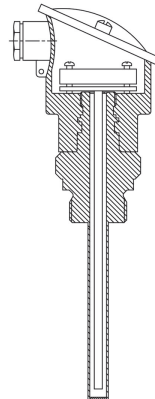
## Dimensional drawings (mm)



With embedded sensor



With cable sensor insert



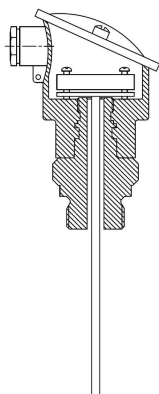
With DIN 43762 insert

## TCR6

Standard RTD temperature sensor

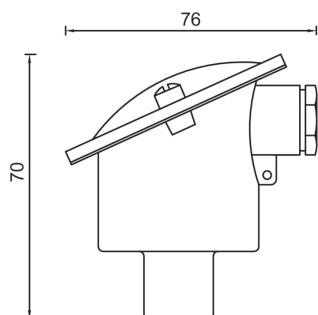
TCR6-####-##0#-####-####-####

### Dimensional drawings (mm)

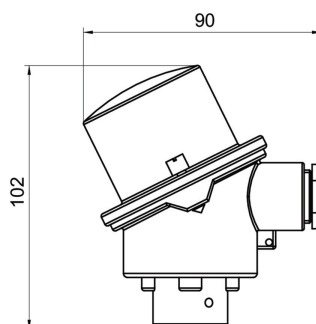


With insert DIN 43762, no immersion tube

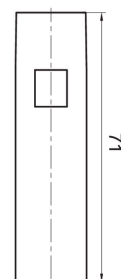
### Housing



DIN Form B housing

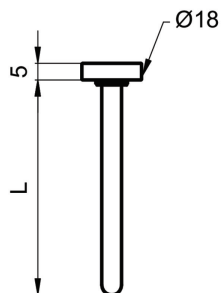


DIN Form B housing, dual transmitter

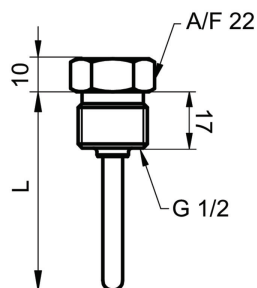


Cooling neck

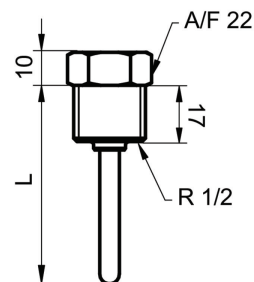
### Process connection



Without thread (BCID: T65)



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



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

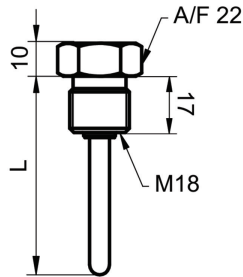
## TCR6

Standard RTD temperature sensor

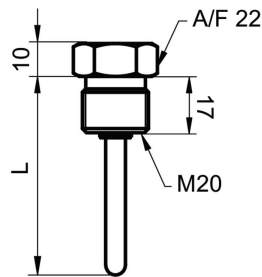
TCR6-####.#0#.####.####.####

### Dimensional drawings (mm)

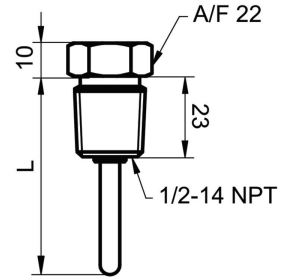
#### Process connection



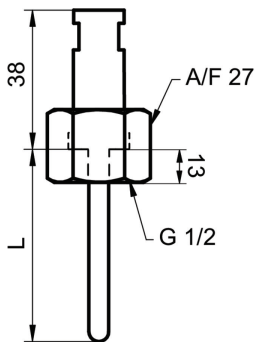
M18 × 1.5 ISO 261 / ISO 965 (BCID: M07)



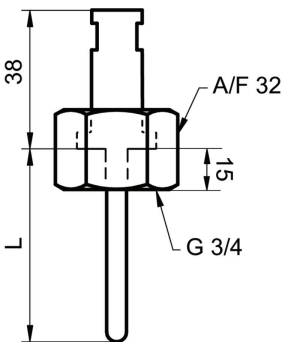
M20 × 1.5 ISO 261 / ISO 965 (BCID: M08)



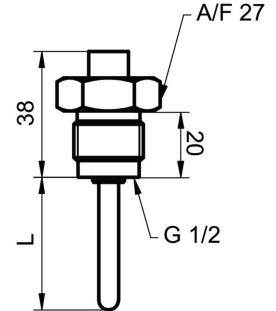
1/2-14 NPT (BCID: N02)



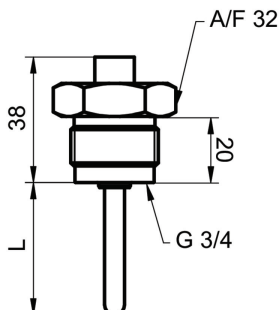
Rotating female union G 1/2 A ISO 228-1  
(BCID: G23)



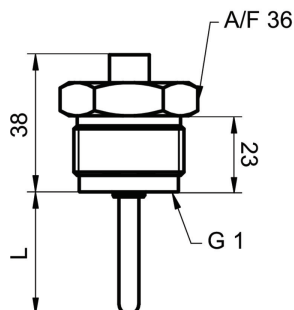
Rotating female union G 3/4 A ISO 228-1  
(BCID: G24)



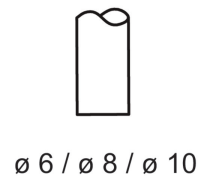
Rotating male nipple G 1/2 A ISO 228-1 (G06)



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



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



Standard response tip

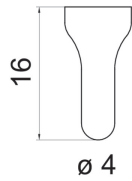
## TCR6

Standard RTD temperature sensor

TCR6-####.#0#.#000#.#000#.#000#

### Dimensional drawings (mm)

#### Process connection



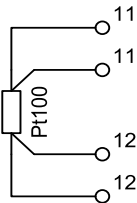
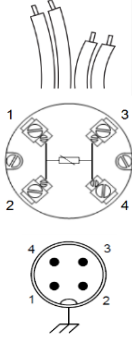
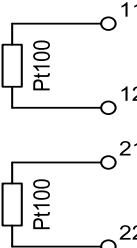
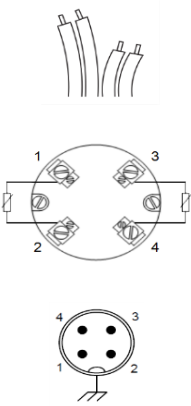
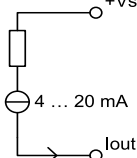
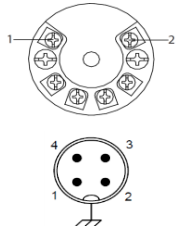
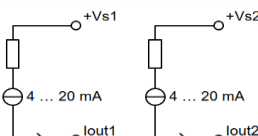
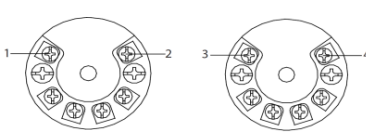
Fast response tip

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
			Pt100 11	1
			Pt100 12	2
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

The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

## TCR6

Standard RTD temperature sensor

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

### Electrical connection

Ordering key - Configuration possibilities see website

Product	TCR6	-	####	.	#	#	#	#	.	#	#	##	.	#	#	#	#	.	####
	TCR6																		
<b>Electrical connection/Housing</b>																			
Electrical connection: M12-A, 4-pin; Housing: DIN form B																			
Electrical connection: M16x1.5 cable gland, nickel plated brass; Housing: DIN form B																			
Electrical connection: M16x1.5 cable gland, nickel plated brass, shielded; Housing: DIN form B																			
Electrical connection: M20x1.5 cable gland, nickel plated brass Housing: DIN form B <sup>(1)</sup>																			
Electrical connection: M20x1.5 cable gland, Plastic; Housing: DIN form B																			
Electrical connection: M20x1.5 cable gland, Stainless steel AISI 304; Housing: DIN form B																			
Electrical connection: M16x1.5 cable gland, nickel plated brass Housing: DIN form B for dual transmitter																			
Electrical connection: M16x1.5 cable gland, nickel plated brass, shielded Housing: DIN form B for dual transmitter																			
Electrical connection: M20x1.5 cable gland, nickel plated brass Housing: DIN form B for dual transmitter <sup>(1)</sup>																			
Electrical connection: M20x1.5 cable gland, Plastic; Housing: DIN form B for dual transmitter																			
Electrical connection: M20x1.5 cable gland, stainless steel; Housing: DIN form B for dual transmitter																			
<b>Transmitter / socket</b>																			
Flying leads																			
Ceramic socket Pt100																			
Transmitter 2202 4 ... 20 mA, accuracy $\pm 0,25$ °C																			
Transmitter 2212 4 ... 20 mA, accuracy $< \pm 0.06$ °C																			
Transmitter 2222 4 ... 20 mA + HART®, accuracy $< \pm 0.06$ °C																			
2 x Transmitter 2202 4 ... 20 mA, accuracy $\pm 0,25$ °C																			
2 x Transmitter 2212 4 ... 20 mA, accuracy $< \pm 0.06$ °C																			
2 x Transmitter 2222 4 ... 20 mA + HART®, accuracy $< \pm 0.06$ °C																			



## 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	-	####	.	#	#	#	#	.	#	#	##	.	#	#	#	#	.	####
<b>Seal</b>																			
Without																		0	
NBR																		1	
<b>Sensor diameter</b>																			
Ø6.0 mm, welded																		5	
Ø8.0 mm, welded																		6	
Ø10.0 mm, welded																		8	
No immersion tube, for insert only																		9	
<b>Sensor tip</b>																			
Standard response tip																		1	
Fast response tip, Ø 4 mm tip																		2	
Insert only, open, no immersion tube below process connection																		A	
<b>Approvals</b>																			
Standard approvals																		0	
Railway EN 50155																		4	
<b>Sensor tube length (mm)</b>																			
20 - 3000																			####

(1) (not UL-certified)