

Fast-response process thermocouple

With exposed MIMS cable

Model TC12-B (FR)

WIKA data sheet TE 65.18



For further approvals,
see page 11



Applications

- Ethylene oxide plants
- Critical flow rates
- Vinyl acetate monomer plants
- Engine test benches

Special features

- Maximum safety thanks to patented double vacuum-brazing
- Short response times, in the seconds range
- Robust, vibration-resistant design



Fig. left: Model TC12-B (FR)

Fig. right: Model TC12-B (FR) in ScrutonWell® design

Description

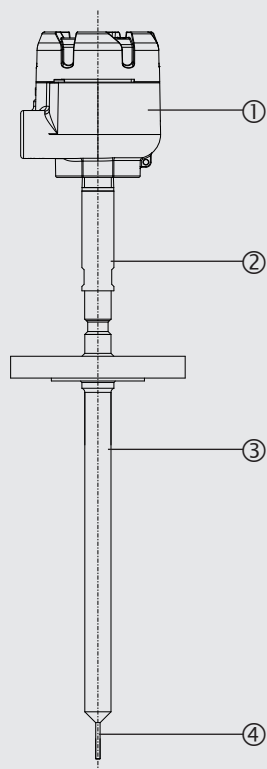
Thermocouples with patented, double vacuum-brazing and exposed mineral-insulated, metal-shielded (MIMS) cables are suitable for demanding applications where the highest level of safety and extremely fast response times (in the order of seconds) are required (Patents, property rights: EP 4 283 268 B1 und US 2023/0375414 A1). It is used without a thermowell, which significantly improves the response time.

The exposed probe tip consists of an outer sheath (Alloy 600 or stainless steel), within which the inner conductors are embedded, insulated, in a highly compacted ceramic compound. This proven, robust design allows for use across a wide temperature range.

For applications involving critical flow rates, the support tube can be manufactured in the ScrutonWell® design.

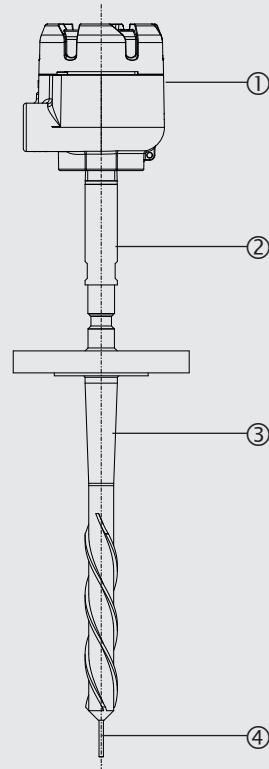
Representation of the components

Support tube in standard version



14710935.01

Support tube in ScrutonWell® design



14710935.01

Legend:

- ① Connection head
- ② Neck tube
- ③ Support tube
- ④ Probe

Overview of approvals for explosion protection

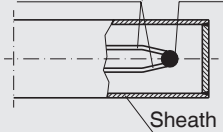
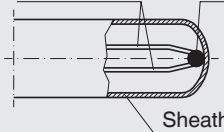
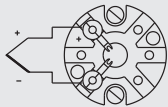
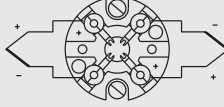
Approval	Explosion protection			
	Ex i (gas) zone 0, 1, 2	Ex i (dust) zone 20, 21, 22	Ex d (Gas) Zone 1, 2	Ex t (dust) zone 21, 22
ATEX	x	x	x	x
IECEX	x	x	x	x
CSA	-	-	x	x
FM	-	-	x	-
EACEx	x	x	x	x
Ex Ukraine	x	x	x	x
INMETRO	x	x	x	x
CCC/NEPSI	x	x	x	-
KCs	x	-	x	x
PESO	x	-	x	-

→ For detailed information, see approvals on page 11

Basic information

Material

Flange	Stainless steel: 1.4571, 316/316L
Support tube	Stainless steel: 1.4571, 316/316L
	→ Other materials on request

Measuring element		
Type of measuring element	Thermocouple per IEC 60584-1 or ASTM E230 Types K, J, E, N, T	
Probe tip design (measuring location)	Ungrounded (measuring location ungrounded welded)	Grounded (measuring location grounded, welded to the bottom)
	Thermocouple Measuring location 	Thermocouple Measuring location 
Marking of the polarity	The colour code at the positive poles of the instrument decides the correlation of polarity and terminal	
Single thermocouple		
Dual thermocouple		
Validity limits of the class accuracy in accordance with IEC 60584-1		
Type K	Class 2	-40 ... +1,200 °C [-40 ... +2,192 °F]
	Class 1	-40 ... +1,000 °C [-40 ... +1,832 °F]
Type J	Class 2	-40 ... +750 °C [-40 ... +1,382 °F]
	Class 1	-40 ... +750 °C [-40 ... +1,382 °F]
Type E	Class 2	-40 ... +900 °C [-40 ... +1,652 °F]
	Class 1	-40 ... +800 °C [-40 ... +1,472 °F]
Type N	Class 2	-40 ... +1,200 °C [-40 ... +2,192 °F]
	Class 1	-40 ... +1,000 °C [-40 ... +1,832 °F]
Type T	Class 2	-40 ... +350 °C [-40 ... +662 °F]
	Class 1	-40 ... +350 °C [-40 ... +662 °F]
Validity limits of the class accuracy in accordance with ASTM E230		
Type K	Standard	0 ... 1,260 °C [32 ... 2,300 °F]
	Special	0 ... 1,260 °C [32 ... 2,300 °F]
Type J	Standard	0 ... 760 °C [32 ... 1,400 °F]
	Special	0 ... 760 °C [32 ... 1,400 °F]
Type E	Standard	0 ... 870 °C [32 ... 1,598 °F]
	Special	0 ... 870 °C [32 ... 1,598 °F]
Type N	Standard	0 ... 1,260 °C [32 ... 2,300 °F]
	Special	0 ... 1,260 °C [32 ... 2,300 °F]
Type T	Standard	0 ... 370 °C [32 ... 698 °F]
	Special	0 ... 370 °C [32 ... 698 °F]

→ For detailed specifications for thermocouples, see IEC 60584-1 or ASTM E230 and technical information IN 00.23 at www.wika.com.

The table shows the temperature ranges listed in the respective standards, in which the tolerance values (class accuracies) are valid.

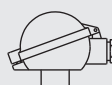
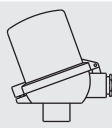
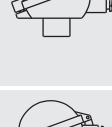
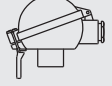
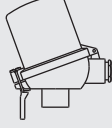
The actual operating temperature of the thermometer is limited both by the maximum permissible operating temperature and the diameter of both the thermocouple and the sheathed cable, as well as by the maximum permissible operating temperature of the support tube material.

For the tolerance value of thermocouples, a cold junction temperature of 0 °C [32 °F] has been taken as the basis.

Response time TC90	
Ø 3 mm [0,12 in], deviation ±15 %	
1 x TC ungrounded	Approx. 2.8 s
2 x TC ungrounded	Approx. 2.1 s
1 x TC grounded	Approx. 1.3 s
2 x TC grounded	Approx. 1.1 s

Connection head

European versions per EN 50446 / DIN 43735 ¹⁾

Model	Material	Thread size of cable inlet	Ingress protection (max.) ¹⁾ IEC/EN 60529	Cap	Surface	Connection to neck tube
 BS	Aluminium	■ M20 x 1.5 ■ ½ NPT	IP65	Flat cover with 2 screws	Blue, painted (RAL 5022)	½ NPT
 BSZ	Aluminium	■ M20 x 1.5 ■ ½ NPT	IP65	Spherical hinged cover with cylinder head screw	Blue, painted (RAL 5022)	½ NPT
 BSZ-H	Aluminium	■ M20 x 1.5 ■ ½ NPT	IP65	Raised hinged cover with cylinder head screw	Blue, painted (RAL 5022)	½ NPT
 BSZ-H / DIH10 ²⁾	Aluminium	■ M20 x 1.5 ■ ½ NPT	IP65	Raised hinged cover with cylinder head screw	Blue, painted (RAL 5022)	½ NPT
 BSS	Aluminium	■ M20 x 1.5 ■ ½ NPT	IP65	Spherical hinged cover with clamping lever	Blue, painted (RAL 5022)	½ NPT
 BSS-H	Aluminium	■ M20 x 1.5 ■ ½ NPT	IP65	Raised hinged cover with clamping lever	Blue, painted (RAL 5022)	½ NPT

1) IP ingress protection of the connection head. The IP ingress protection of the complete instrument does not necessarily have to correspond to the connection head.

2) LED display DIH10 in combination with transmitter with 4 ... 20 mA output (loop)

→ Other thread sizes on request

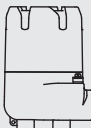
Model	Explosion protection					
	Without	Ex i (gas) zone 0, 1, 2	Ex i (dust) zone 20, 21, 22	Ex e (gas) zone 1, 2	Ex t (dust) zone 21, 22	Ex nA (gas) zone 2
BS	x	x	x	-	-	-
BSZ	x	x	x	x ¹⁾	x ¹⁾	x ²⁾
BSZ-H	x	x	x	x ¹⁾	x ¹⁾	x ²⁾
BSZ-H (2 x cable outlet)	x	x	x	x ¹⁾	x ¹⁾	x ²⁾
BSZ-H / DIH10 ³⁾	x	x	-	-	-	-
BSS	x	x	-	-	-	-
BSS-H	x	x	-	-	-	-
BSZ-K	x	x	-	-	-	-

1) Only ATEX and CCC/NEPSI

2) Only ATEX and EACEx

3) LED display DIH10 in combination with transmitter with 4 ... 20 mA output (loop)

International connection heads

Model		Material	Thread size of cable inlet	Ingress protection (max.) ¹⁾ IEC/EN 60529	Cap	Surface	Connection to neck tube
	1/4000 F	Aluminium	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66 ²⁾	Screw-on lid	Blue, painted (RAL 5022)	½ NPT
	1/4000 S	Stainless steel	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66 ²⁾	Screw-on lid	Unpainted	½ NPT
	7/8000 W	Aluminium	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66 ²⁾	Screw-on lid	Blue, painted (RAL 5022)	½ NPT
	7/8000 S	Stainless steel	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66 ²⁾	Screw-on lid	Unpainted	½ NPT
	7/8000 W / DIH50 ³⁾	Aluminium	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66 ²⁾	Screw-on lid	Blue, painted (RAL 5022)	½ NPT
	7/8000 S / DIH50 ³⁾	Stainless steel	■ ½ NPT ■ ¾ NPT ■ M20 x 1.5	IP66 ²⁾	Screw-on lid	Unpainted	½ NPT
	PIH-L	Aluminium	■ ½ NPT / closed ■ M20 x 1.5 / closed ■ 2 x ½ NPT ■ 2 x M20 x 1.5	IP66 ²⁾	Screw-on lid, flat	Blue upper body, painted (RAL 5022) Grey lower body, painted (RAL 7032)	■ ½ NPT ■ M20 x 1.5
	PIH-H	Aluminium	■ ½ NPT ■ M20 x 1.5 ■ 2 x ½ NPT ■ 2 x M20 x 1.5	IP66 ²⁾	Screw-on lid, high	Blue upper body, painted (RAL 5022) Grey lower body, painted (RAL 7032)	■ ½ NPT ■ M20 x 1.5

1) IP ingress protection of the connection head. The IP ingress protection of the complete instrument does not necessarily have to correspond to the connection head.

2) Suitable sealing / cable gland required

3) LC display DIH50 in combination with transmitter with 4 ... 20 mA output (loop)

Model	Explosion protection				
	Without	Ex i (gas) zone 0, 1, 2	Ex i (dust) zone 20, 21, 22	Ex d (gas) zone 1, 2	Ex t (dust) zone 21, 22
1/4000 F	x	x	x	x	x
1/4000 S	x	x	x	x	x
7/8000 W	x	x	x	x	x
7/8000 S	x	x	x	x	x
7/8000 W / DIH50 ¹⁾	x	x	x	x	x
7/8000 S / DIH50 ¹⁾	x	x	x	x	x
PIH-L / PIH-H	x	x	x	x	x

1) LC display DIH50 in combination with transmitter with 4 ... 20 mA output (loop)

Connection head with digital display



Connection head BSZ-H with model DIH10 LED display
→ see data sheet AC 80.11



Connection head 7/8000 W with model DIH50 LC display
→ see data sheet AC 80.10



PIH-W connection head with T38 and TND
→ see data sheet TE 38.01

To operate the digital displays, a transmitter with a 4 ... 20 mA output is always required.

Cable inlet		Colour	Ingress protection (max.) IEC/EN 60529 ¹⁾	Thread size of cable inlet	Min./Max. ambient temperature
	Standard cable inlet ²⁾	Natural finish	IP65	■ M20 x 1.5 ■ ½ NPT	-40 ... +80 °C [-40 ... +176 °F]
	Plastic cable gland (cable Ø 6 ... 10 mm) ²⁾	■ Black ■ Grey	IP66 ³⁾	■ M20 x 1.5 ■ ½ NPT	-40 ... +80 °C [-40 ... +176 °F]
	Cable gland plastic (cable Ø 6 ... 10 mm), Ex e ²⁾	■ Light blue ■ Black	IP66 ³⁾	■ M20 x 1.5 ■ ½ NPT	■ -20 ... +80 °C [-4 ... +176 °F] ■ -40 ... +70 °C [-40 ... +158 °F]
	Nickel-plated brass cable gland (cable Ø 6 ... 12 mm)	Natural finish	IP66 ³⁾	■ M20 x 1.5 ■ ½ NPT	-60 ⁴⁾ / -40 ... +80 °C [-76 / -40 ... +176 °F]
	Nickel-plated brass cable gland (cable Ø 6 ... 12 mm), Ex e	Natural finish	IP66 ³⁾	■ M20 x 1.5 ■ ½ NPT	-60 ⁴⁾ / -40 ... +80 °C [-76 / -40 ... +176 °F]
	Stainless steel cable gland (cable Ø 7 ... 12 mm)	Natural finish	IP66 ³⁾	■ M20 x 1.5 ■ ½ NPT	-60 ⁴⁾ / -40 ... +80 °C [-76 / -40 ... +176 °F]
	Stainless steel cable gland (cable Ø 7 ... 12 mm), Ex e	Unpainted	IP66 ³⁾	■ M20 x 1.5 ■ ½ NPT	-60 ⁴⁾ / -40 ... +80 °C [-76 / -40 ... +176 °F]
	Plain threaded	-	IP00	■ M20 x 1.5 ■ ½ NPT	-
	2 x plain threaded ⁵⁾	-	IP00	■ 2 x M20 x 1.5 ■ 2 x ½ NPT	-
	Connection socket M12 x 1 (4-pin) ⁶⁾	-	IP65	M20 x 1.5	-40 ... +80 °C [-40 ... +176 °F]
	Sealing plugs for shipping	Transparent	-	■ M20 x 1.5 ■ ½ NPT	-40 ... +80 °C [-40 ... +176 °F]

1) IP ingress protection of the cable gland. The IP ingress protection of the complete instrument does not have to correspond to the cable gland.

2) Not available for BVS connection head

3) Ingress protections IP57, IP58, IP67, IP68, on request

4) Special version on request (explosion-protected versions only available with specific approvals)

5) Only for BSZ-H connection head

6) Not available for ½ NPT thread size of cable inlet

Cable inlet	Explosion protection					
	With-out	Ex i (gas) Zone 0, 1, 2	Ex i (dust) Zone 20, 21, 22	Ex e (gas) Zone 1, 2	Ex t (dust) Zone 21, 22	Ex nA (gas) Zone 2
Standard cable inlet ¹⁾	x	x	-	-	-	-
Plastic cable gland ¹⁾	x	x	-	-	-	-
Plastic cable gland (light blue), Ex e ¹⁾	x	x	x	-	-	-
Plastic cable gland (black), Ex e ¹⁾	x	x	x	x	x	x
Brass cable gland, nickel-plated	x	x	x	-	-	-
Brass cable gland, nickel-plated, Ex e	x	x	x	x	x	x
Stainless steel cable gland	x	x	x	-	-	-
Stainless steel cable gland, Ex e	x	x	x	x	x	x
Plain threaded	x	x	x ⁵⁾	x ⁵⁾	x ⁵⁾	x ⁵⁾
2 x plain threaded ²⁾	x	x	x ⁵⁾	x ⁵⁾	x ⁵⁾	x ⁵⁾
Connection socket M12 x 1 (4-pin) ³⁾	x	x ⁴⁾	x ⁴⁾	-	-	-
Sealing plugs for shipping	Not applicable, transport protection ⁵⁾					

1) Not available for BVS connection head

2) Only for BSZ-H connection head

3) Not available for ½ NPT thread size of cable inlet

4) With appropriate mating connector connected

5) Suitable cable gland required for operation

Process connection				
		AARH in μinch	R_a in μm	R_z in μm
Sealing face roughness				
ASME B16.5	Stock finish	125 ... 250	3.2 ... 6.3	-
	Smooth finish	< 125	< 3.2	-
	RTJ	< 63	< 1.6	-
	Groove/Tongue	< 125	< 3.2	-
EN 1092-1	Form B1	-	3.2 ... 12.5	12.5 ... 50
	Form B2	-	0.8 ... 3.2	3.2 ... 12.5
DIN 2527	Form C	-	-	40 ... 160
	Form E	-	-	< 16

Operating conditions	
Ambient and storage temperature	-60 ¹⁾ / -40 ... +80 °C [-76 ¹⁾ / -40 ... +176 °F]
Vibration resistance	50 g (probe tip)
	The information on vibration resistance refers to the tip of the probe.

1) Special version on request (explosion-protected versions only available with specific approvals)

IP ingress protection per IEC/EN 60529

Standard ingress protection of the model TC12-B (FR) is IP65.

The specified degrees of protection apply under the following conditions:

- Use of a suitable cable gland
- Use a cable cross-section appropriate for the gland or select the appropriate cable gland for the available cable
- Adhere to the tightening torques for all threaded connections

First numeral	Degree of protection / Short description	Test parameters
Degrees of protection against solid foreign bodies (defined by the 1st numeral)		
5	Dust-protected	Per IEC/EN 60529
6	Dust-tight	Per IEC/EN 60529
Degrees of protection against water (defined by the 2nd numeral)		
4	Protected against splash water	Per IEC/EN 60529
5	Protected against water jets	Per IEC/EN 60529
6	Protected against powerful water jets	Per IEC/EN 60529
7 ¹⁾	Protected against the effects of temporary immersion in water	Per IEC/EN 60529
8 ¹⁾	Protected against the effects of permanent immersion in water	As agreed upon

1) Ingress protections describing temporary or permanent immersion, on request

Transmitter models	T16	T38
Transmitter data sheet	TE 16.01	TE 38.01
Figure		
Output		
4 ... 20 mA	x	x
HART® protocol	-	x
Cable inlet		
	■ Type K ■ Type J ■ Type E	■ Type K ■ Type J ■ Type E
Explosion protection	Ex version possible	

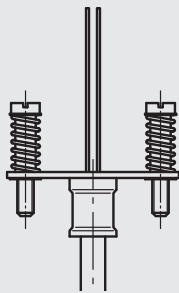
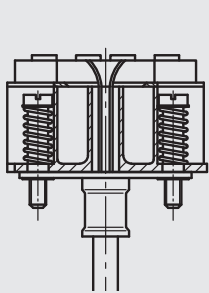
Mounting types

Mounting on the terminal plate

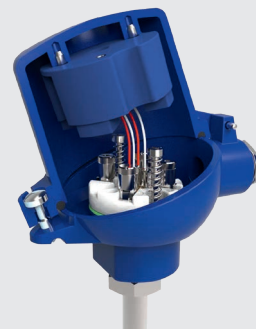


Terminal plate with mounted transmitter

Probe with terminal plate prepared for transmitter mounting



Mounted within the cover of the connection head



When using dual sensors in combination with a single transmitter, sensor 1 is connected to the transmitter. The connection leads of sensor 2 (insulated against short-circuits) protrude loosely into the connection head.

Possible mounting positions for transmitters	Model T16	Model T38
BSZ	○	○
BSZ-H	●	●
BSZ-H (2 x cable outlet)	●	●
BSZ-H / DIH10	○	○
BSZ-H / TND	○	○
BS	○	-
BSS	○	○
BSS-H	●	●
1/4000	○	○
7/8000	○	○
7/8000 / DIH50	○	○
PIH-L / PIH-H	○	○
PIH-W	○	○

Legend:

- Mounted instead of terminal block
- Mounted within the cover of the connection head
- Mounting not possible

The mounting of a transmitter on the terminal plate is possible with all the connection heads listed here. The mounting of a transmitter in the screw cap of a connection head is not possible. Mounting of 2 transmitters on request.

For a correct determination of the overall measuring deviation, the sensor and transmitter measuring deviations must be added.

Functional safety version possible with model T38 temperature transmitter

In safety-critical applications, the entire measuring chain must be taken into consideration in terms of the safety parameters. The SIL classification allows the assessment of the risk reduction achieved by the safety devices.

Selected TC12-B (FR), in conjunction with a suitable temperature transmitter (e.g. model T38, TÜV-certified SIL version for protection systems developed in accordance with IEC 61508), are suitable as sensors for safety functions to SIL 2.

For SIL 3 applications, WIKA recommends the use of two individual TC12-B (FR) with one SIL-certified T38 transmitter connected to each.

→ Functional safety: safety-relevant temperature measurement per IEC 61508 available at www.wika.com.

Approvals

Approvals included in the scope of delivery

Logo	Description	Country
	EU declaration of conformity	European Union
	EMC Directive ¹⁾	
	EN 61326 emission (group 1, class B) and immunity (industrial environment)	
	RoHS directive	

1) Only for built-in transmitter

Optional approvals

Logo	Description	Country																														
	EU declaration of conformity ATEX directive Hazardous areas <table border="0"><tr><td>- Ex i</td><td>Zone 0 gas</td><td>II 1G Ex ia IIC T6 ... T1 Ga</td></tr><tr><td></td><td>Zone 1 mounting to zone 0 gas</td><td>II 1/2G Ex ia IIC T6 ... T1 Ga/Gb</td></tr><tr><td></td><td>Zone 1 gas</td><td>II 2G Ex ia IIC T6 ... T1 Gb</td></tr><tr><td></td><td>Zone 20 dust</td><td>II 1 D Ex ia IIIC T200X °C Da</td></tr><tr><td></td><td>Zone 21 mounting to zone 20 dust</td><td>II 1/2D Ex ia IIIC TX °C Da/Db</td></tr><tr><td></td><td>Zone 21 dust</td><td>II 2D Ex ia IIIC TX °C Db</td></tr><tr><td>- Ex d</td><td>Zone 1 mounting to zone 0 gas</td><td>II 1/2G Ex db IIC T6 ... T1 Ga/Gb</td></tr><tr><td></td><td>Zone 1 gas</td><td>II 2G Ex db IIC T6 ... T1 Gb</td></tr><tr><td>- Ex t</td><td>Zone 21 dust</td><td>II 2D Ex tb IIIC T* Db</td></tr><tr><td></td><td>Zone 21 mounting to zone 20 dust</td><td>II 1/2 D Ex tb IIIC T* Da/Db</td></tr></table>	- Ex i	Zone 0 gas	II 1G Ex ia IIC T6 ... T1 Ga		Zone 1 mounting to zone 0 gas	II 1/2G Ex ia IIC T6 ... T1 Ga/Gb		Zone 1 gas	II 2G Ex ia IIC T6 ... T1 Gb		Zone 20 dust	II 1 D Ex ia IIIC T200X °C Da		Zone 21 mounting to zone 20 dust	II 1/2D Ex ia IIIC TX °C Da/Db		Zone 21 dust	II 2D Ex ia IIIC TX °C Db	- Ex d	Zone 1 mounting to zone 0 gas	II 1/2G Ex db IIC T6 ... T1 Ga/Gb		Zone 1 gas	II 2G Ex db IIC T6 ... T1 Gb	- Ex t	Zone 21 dust	II 2D Ex tb IIIC T* Db		Zone 21 mounting to zone 20 dust	II 1/2 D Ex tb IIIC T* Da/Db	European Union
- Ex i	Zone 0 gas	II 1G Ex ia IIC T6 ... T1 Ga																														
	Zone 1 mounting to zone 0 gas	II 1/2G Ex ia IIC T6 ... T1 Ga/Gb																														
	Zone 1 gas	II 2G Ex ia IIC T6 ... T1 Gb																														
	Zone 20 dust	II 1 D Ex ia IIIC T200X °C Da																														
	Zone 21 mounting to zone 20 dust	II 1/2D Ex ia IIIC TX °C Da/Db																														
	Zone 21 dust	II 2D Ex ia IIIC TX °C Db																														
- Ex d	Zone 1 mounting to zone 0 gas	II 1/2G Ex db IIC T6 ... T1 Ga/Gb																														
	Zone 1 gas	II 2G Ex db IIC T6 ... T1 Gb																														
- Ex t	Zone 21 dust	II 2D Ex tb IIIC T* Db																														
	Zone 21 mounting to zone 20 dust	II 1/2 D Ex tb IIIC T* Da/Db																														
	IECEX Hazardous areas <table border="0"><tr><td>- Ex i</td><td>Zone 0 gas</td><td>Ex ia IIC T6 ... T1 Ga</td></tr><tr><td></td><td>Zone 1 mounting to zone 0 gas</td><td>Ex ia IIC T6 ... T1 Ga/Gb</td></tr><tr><td></td><td>Zone 1 gas</td><td>Ex ia IIC T6 ... T1 Gb</td></tr><tr><td></td><td>Zone 20 dust</td><td>Ex ia IIIC T200X °C Da</td></tr><tr><td></td><td>Zone 21 mounting to zone 20 dust</td><td>Ex ia IIIC TX °C Da/Db</td></tr><tr><td></td><td>Zone 21 dust</td><td>Ex ia IIIC TX °C Db</td></tr><tr><td>- Ex d</td><td>Zone 1 mounting to zone 0 gas</td><td>Ex db IIC T6 ... T1 Ga/Gb</td></tr><tr><td></td><td>Zone 1 gas</td><td>Ex db IIC T6 ... T1 Gb</td></tr><tr><td>- Ex t</td><td>Zone 21 dust</td><td>Ex tb IIIC T* Db</td></tr><tr><td></td><td>Zone 21 mounting to zone 20 dust</td><td>Ex tb IIIC T* Da/Db</td></tr></table>	- Ex i	Zone 0 gas	Ex ia IIC T6 ... T1 Ga		Zone 1 mounting to zone 0 gas	Ex ia IIC T6 ... T1 Ga/Gb		Zone 1 gas	Ex ia IIC T6 ... T1 Gb		Zone 20 dust	Ex ia IIIC T200X °C Da		Zone 21 mounting to zone 20 dust	Ex ia IIIC TX °C Da/Db		Zone 21 dust	Ex ia IIIC TX °C Db	- Ex d	Zone 1 mounting to zone 0 gas	Ex db IIC T6 ... T1 Ga/Gb		Zone 1 gas	Ex db IIC T6 ... T1 Gb	- Ex t	Zone 21 dust	Ex tb IIIC T* Db		Zone 21 mounting to zone 20 dust	Ex tb IIIC T* Da/Db	International
- Ex i	Zone 0 gas	Ex ia IIC T6 ... T1 Ga																														
	Zone 1 mounting to zone 0 gas	Ex ia IIC T6 ... T1 Ga/Gb																														
	Zone 1 gas	Ex ia IIC T6 ... T1 Gb																														
	Zone 20 dust	Ex ia IIIC T200X °C Da																														
	Zone 21 mounting to zone 20 dust	Ex ia IIIC TX °C Da/Db																														
	Zone 21 dust	Ex ia IIIC TX °C Db																														
- Ex d	Zone 1 mounting to zone 0 gas	Ex db IIC T6 ... T1 Ga/Gb																														
	Zone 1 gas	Ex db IIC T6 ... T1 Gb																														
- Ex t	Zone 21 dust	Ex tb IIIC T* Db																														
	Zone 21 mounting to zone 20 dust	Ex tb IIIC T* Da/Db																														
	FM Hazardous areas <table border="0"><tr><td>- Ex d (XP)</td><td>Division 1 gas</td><td>Class I, division 1, groups B, C, D, T6 type 4/4X</td></tr><tr><td></td><td>Division 1 dust</td><td>Class II or III, division 1, groups E, F, G type 4/4X</td></tr></table>	- Ex d (XP)	Division 1 gas	Class I, division 1, groups B, C, D, T6 type 4/4X		Division 1 dust	Class II or III, division 1, groups E, F, G type 4/4X	USA																								
- Ex d (XP)	Division 1 gas	Class I, division 1, groups B, C, D, T6 type 4/4X																														
	Division 1 dust	Class II or III, division 1, groups E, F, G type 4/4X																														
	CSA Safety (e.g. electr. safety, overpressure, ...) Hazardous areas <table border="0"><tr><td>- Ex d (XP)</td><td>Division 1 gas</td><td>Class I, division 1, group B, C, D, T6 type 4/4X</td></tr><tr><td></td><td>Division 1 dust</td><td>Class II or III, division 1, group E, F, G type 4/4X</td></tr><tr><td>- Ex d (FP - CAN)</td><td>Zone 1 gas</td><td>Ex d IIC Gb T6/T5/T4</td></tr><tr><td></td><td>Zone 1 gas</td><td>Ex d IIB + H2 Gb T6/T5/T4</td></tr><tr><td>- Ex d (FP - USA)</td><td>Zone 1 gas</td><td>Class I zone 1, AEx d IIC Gb T6/T5/T4</td></tr><tr><td></td><td>Zone 1 gas</td><td>Class I zone 1, AEx d IIB + H2 Gb T6/T5/T4</td></tr></table>	- Ex d (XP)	Division 1 gas	Class I, division 1, group B, C, D, T6 type 4/4X		Division 1 dust	Class II or III, division 1, group E, F, G type 4/4X	- Ex d (FP - CAN)	Zone 1 gas	Ex d IIC Gb T6/T5/T4		Zone 1 gas	Ex d IIB + H2 Gb T6/T5/T4	- Ex d (FP - USA)	Zone 1 gas	Class I zone 1, AEx d IIC Gb T6/T5/T4		Zone 1 gas	Class I zone 1, AEx d IIB + H2 Gb T6/T5/T4	USA and Canada												
- Ex d (XP)	Division 1 gas	Class I, division 1, group B, C, D, T6 type 4/4X																														
	Division 1 dust	Class II or III, division 1, group E, F, G type 4/4X																														
- Ex d (FP - CAN)	Zone 1 gas	Ex d IIC Gb T6/T5/T4																														
	Zone 1 gas	Ex d IIB + H2 Gb T6/T5/T4																														
- Ex d (FP - USA)	Zone 1 gas	Class I zone 1, AEx d IIC Gb T6/T5/T4																														
	Zone 1 gas	Class I zone 1, AEx d IIB + H2 Gb T6/T5/T4																														
	EAC Hazardous areas <table border="0"><tr><td>- Ex i</td><td>Zone 0 gas</td><td>0 Ex ia IIC T6 ... T1 Ga X</td></tr><tr><td></td><td>Zone 1 gas</td><td>1 Ex ia IIC T6 ... T1 Gb X</td></tr><tr><td></td><td>Zone 20 dust</td><td>Ex ia IIIC T65...T125 °C Da X</td></tr><tr><td>- Ex d</td><td>Zone 1 gas</td><td>1Ex d IIC T6...T1 Gb X</td></tr><tr><td></td><td>Zone 21 dust</td><td>Ex tb IIIC T85°C Db X</td></tr></table>	- Ex i	Zone 0 gas	0 Ex ia IIC T6 ... T1 Ga X		Zone 1 gas	1 Ex ia IIC T6 ... T1 Gb X		Zone 20 dust	Ex ia IIIC T65...T125 °C Da X	- Ex d	Zone 1 gas	1Ex d IIC T6...T1 Gb X		Zone 21 dust	Ex tb IIIC T85°C Db X	Eurasian Economic Community															
- Ex i	Zone 0 gas	0 Ex ia IIC T6 ... T1 Ga X																														
	Zone 1 gas	1 Ex ia IIC T6 ... T1 Gb X																														
	Zone 20 dust	Ex ia IIIC T65...T125 °C Da X																														
- Ex d	Zone 1 gas	1Ex d IIC T6...T1 Gb X																														
	Zone 21 dust	Ex tb IIIC T85°C Db X																														

Logo	Description	Country
	INMETRO Hazardous areas - Ex i Zone 0 gas Ex ia IIC T3 ... T6 Ga Zone 1 mounting to zone 0 gas Ex ia IIC T3 ... T6 Ga/Gb Zone 1 gas Ex ia IIC T3 ... T6 Gb Zone 20 dust Ex ia IIIC T125 ... T65 °C Da Zone 21 mounting to zone 20 dust Ex ia IIIC T125 ... T65 °C Da/Db Zone 21 dust Ex ia IIIC T125 ... T65 °C Db - Ex d Zone 1 mounting to zone 0 gas Ex db IIC T1 ... T6 Ga/Gb Zone 1 gas Ex db IIC T1 ... T6 Gb - Ex t Zone 21 dust Ex tb IIIC T* Db	Brazil
	NEPSI ¹⁾ Hazardous areas - Ex i Zone 0 gas Ex ia IIC T1 ~ T6 Ga Zone 1 mounting to zone 0 gas Ex ia IIC T1 ~ T6 Ga/Gb Zone 1 gas Ex ia IIC T1 ~ T6 Gb Zone 20 dust Ex iaD 20 T65/T95/T125 Zone 20 dust Ex iaD 20/21 T65/T95/T125 Zone 21 dust Ex iaD 21 T65/T95/T125 - Ex d Zone 1 gas Ex db IIC T1 ... T6 Gb Zone 1 mounting to zone 0 Ex db IIC T1 ... T6 Ga/Gb	China
	CCC ²⁾ Hazardous areas - Ex i Zone 0 gas Ex ia IIC T1 ... T6 Ga Zone 1 mounting to zone 0 gas Ex ia IIC T1 ... T6 Ga/Gb Zone 1 gas Ex ia IIC T1 ... T6 Gb Zone 20 dust Ex ia IIIC T ₂₀₀ 65°C/T200 95°C/T200 125°C Da Zone 20 mounting to zone 21 dust Ex ia IIIC T ₂₀₀ 65°C/T200 95°C/T200 125°C Da/Db Zone 21 dust Ex ia IIIC T65°C/T95°C/T125°C - Ex d Zone 1 gas Ex db T1...T6 Gb Zone 1 mounting to zone 0 Ex db IIC T1 ... T6 Ga/Gb	China
	KCs Hazardous areas - Ex i Zone 0 gas Ex ia IIC T4 ... T6 Zone 1 gas Ex ib IIC T4 ... T6 - Ex d Zone 1 gas Ex db IIC T6 ... T1 Gb Zone 1 mounting to zone 0 gas Ex db IIC T6 ... T1 Ga/Gb - Ex t Zone 21 dust Ex tb IIIC T*°C Db	South Korea
-	PESO Hazardous areas - Ex i Zone 0 gas Ex ia IIC T1 ... T6 Ga Zone 1 mounting to zone 0 gas Ex ia IIC T1...T6 Ga/Gb Zone 1 gas Ex ia IIC T1...T6 Gb - Ex d Zone 1 gas Ex db IIC T1...T5 Gb	India
	PAC Kazakhstan Metrology, measurement technology	Kazakhstan

1) Only for built-in transmitter

2) Only without built-in transmitter

Instruments marked with “ia” may also be used in areas only requiring instruments marked with “ib” or “ic”. If an instrument with “ia” marking has been used in an area with requirements in accordance with “ib” or “ic”, it can no longer be operated in areas with requirements in accordance with “ia” afterwards.

Explosion protection (selectable)

The permissible power, P_{max} , as well as the permissible ambient temperature, for the respective category can be seen on the Ex certificate or the operating instructions.

The transmitters have their own certificates for hazardous areas. The permissible ambient temperature ranges of the built-in transmitters can be taken from the corresponding transmitter operating instructions and approvals.

Manufacturer's information and certificates

Logo	Description
	For SIL 2, SIL 3, see page 10 Functional safety
	NAMUR NE 024 Hazardous areas (Ex i)

Patents, property rights

Number	Description
EP 4 283 268 B1 US 2023/0375414 A1	Temperature sensing device

→ For approvals and certificates, see website

Certificates (option)

Certificate type	Measurement accuracy	Material certificate ¹⁾
2.2 test report	x	x
3.1 inspection certificate	x	x
DAkkS calibration certificate	x	-

1) For selected components, support tubes have their own material certificates

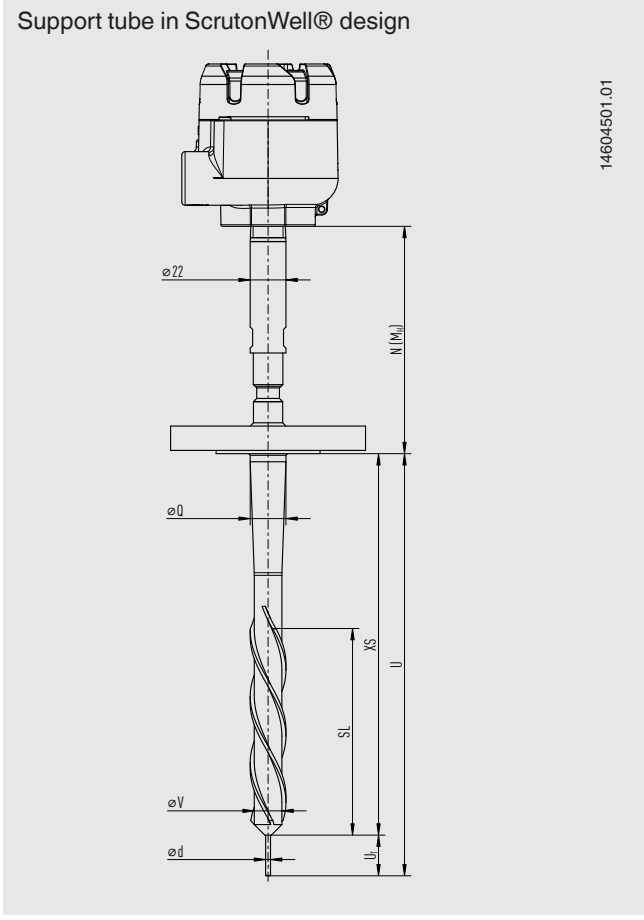
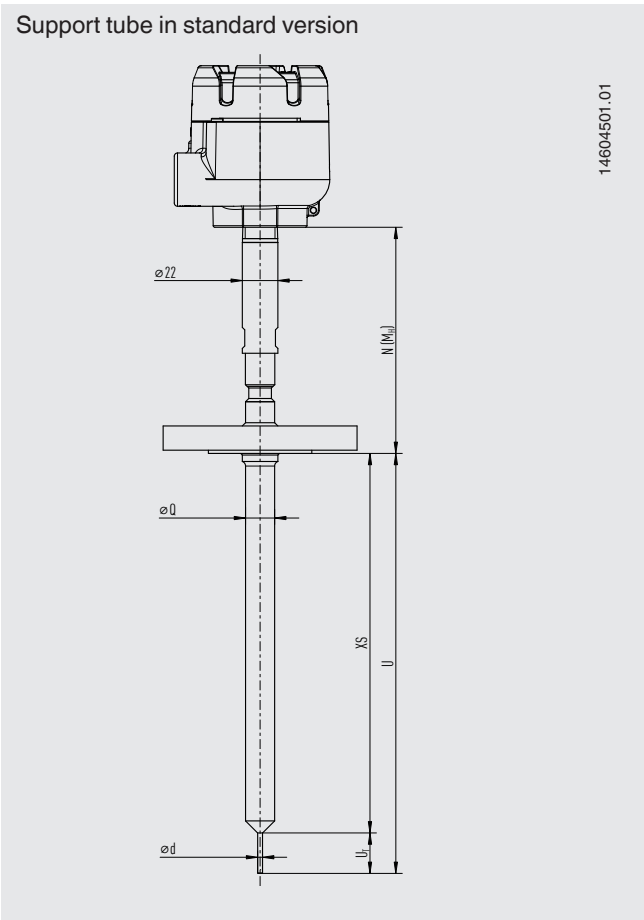
The minimum length (metal part of the probe) for carrying out a 3.1 measurement accuracy test or DAkkS is 100 mm [~ 4 in].

→ Calibration of shorter lengths on request.

The different certificates can be combined with each other.

→ For approvals and certificates, see website

Dimensions in mm [in]



- Legend:
- N (MH) Neck tube length
 - U_T Probe length
 - U Insertion length
 - XS Support tube length
 - $\varnothing d$ Probe diameter

Probe diameter $\varnothing d$ in mm [in]		Code number per DIN 43735	Tolerance in mm	Sheath material
3 [0.118]	Standard	30	3 ± 0.05	■ Alloy 600
				■ 316L

Dimensions in mm [in]	
Neck tube length N	
Standard version	■ Min. 135 [5.31] ■ Max. 500 [19.69]
Safety version	■ Min. 160 [6.30] ■ Max. 500 [19.69]
Support tube length XS	■ Min. 150 [5.91] ■ Max. 1,000 [39.37]
Exposed probe length U_T	
Minimum	■ 15 [0.59], $\varnothing 3$ [0.12] ■ 20 [0.79], $\varnothing 6$ [0.24]
Maximum	100 [3.94]
Welded joint	Double fillet weld with weld seam thickness 3 mm [0.12 in]

Dimensions in mm [in]	
Root diameter Q	22 [0.87]
Tip diameter V	18 [0.71]
	→ Other dimensions on request

Support tube in standard version

DN	PN	Weight ¹⁾ in kg [lb]		
		XS = 100 mm [4 in]	XS = 325 mm [13 in]	XS = 550 mm [22 in]
1 ½	150 lb	3.2 [7.04]	3.8 [8.36]	4.4 [9.68]
	300 lb	4.7 [10.34]	5.3 [11.66]	5.9 [12.98]
	600 lb	5.4 [11.88]	6.1 [13.42]	6.7 [14.74]
	1,500 lb	7.8 [17.16]	8.5 [18.7]	9.1 [20.02]
	2,500 lb	13.4 [29.48]	14 [30.8]	14.7 [32.34]
2	150 lb	3.9 [8.58]	4.5 [9.9]	5.1 [11.22]
	300 lb	5.1 [11.22]	5.7 [12.54]	6.3 [13.86]
	600 lb	5.6 [12.32]	6.3 [13.86]	6.9 [15.18]
	1,500 lb	12.4 [27.28]	13 [28.6]	13.7 [30.14]
	2,500 lb	18.4 [40.48]	19 [41.8]	19.7 [43.34]
40	40 bar	4.4 [9.68]	4.9 [10.78]	5.4 [11.88]
	63/64 bar	6.1 [13.42]	6.6 [14.52]	7.1 [15.62]
	100 bar	6.1 [13.42]	6.6 [14.52]	7.1 [15.62]
50	40 bar	5.2 [11.44]	5.7 [12.54]	6.2 [13.64]
	63/64 bar	6.5 [14.3]	7 [15.4]	7.5 [16.5]
	100 bar	7.9 [17.38]	8.4 [18.48]	8.9 [19.58]

1) Based on the PIH-H head with a neck tube length of 160 mm [6.3 in] and the minimum probe length.

Support tube in ScrutonWell® design with one-piece helix

DN	PN	Weight ¹⁾ in kg [lb]		
		XS = 100 mm [4 in]	XS = 325 mm [13 in]	XS = 550 mm [22 in]
1 ½	150 lb	3.4 [7.48]	4 [8.8]	4.6 [10.12]
	300 lb	4.9 [10.78]	5.6 [12.32]	6.2 [13.64]
	600 lb	5.7 [12.54]	6.4 [14.08]	7 [15.4]
	1,500 lb	8.2 [18.04]	8.9 [19.58]	9.6 [21.12]
	2,500 lb	14.1 [31.02]	14.7 [32.34]	15.4 [33.88]
2	150 lb	4.1 [9.02]	4.7 [10.34]	5.4 [11.88]
	300 lb	5.4 [11.88]	6 [13.2]	6.6 [14.52]
	600 lb	5.9 [12.98]	6.6 [14.52]	7.2 [15.84]
	1,500 lb	13 [28.6]	13.7 [30.14]	14.4 [31.68]
	2,500 lb	19.3 [42.46]	20 [44]	20.7 [45.54]
40	40 bar	4.6 [10.12]	5.1 [11.22]	5.7 [12.54]
	63/64 bar	6.4 [14.08]	6.9 [15.18]	7.5 [16.5]
	100 bar	6.4 [14.08]	6.8 [15.18]	7.5 [16.5]
50	40 bar	5.5 [12.1]	6 [13.2]	6.5 [14.3]
	63/64 bar	6.8 [14.96]	7.4 [16.28]	7.9 [17.38]
	100 bar	8.3 [18.26]	8.8 [19.36]	9.3 [20.46]

1) Based on the PIH-H head with a neck tube length of 160 mm [6.3 in] and the minimum probe length.

→ Further flanges and dimensions on request

ScrutonWell® is a registered trademark of WIKA Alexander Wiegand SE & Co. KG
HART® is a registered trademark of FieldComm Group, Inc.

Ordering information

Model / Explosion protection / Further approvals, certificates / Sensor / Accuracy class,
range of use of the sensor / Connection housing / Cable inlet / Transmitter / Connection
to neck tube / Neck tube / Thread size / Neck length N (MH) / Insertion length U / Probe
length U_T / Support tube length XS / Probe diameter $\varnothing d$ / Sheath material of probe /
Certificates / Options

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We reserve the right to make modifications to the specifications and materials.



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