

Intrinsically Safe Thermocouples for the Installation into Thermowells

With neck tube, replaceable measuring insert

TTeHrXiA
TTeHrXiAT



Application

The thermocouple models TTeHrXiA and TTeHrXiAT are designed for the installation into solid drilled or fabricated thermometer thermowells (e.g. according to DIN 43 772). Without thermowell, this version must not be applied in pressurised media.

They have an EU Type Examination Certificate for the ignition protection type "intrinsic safety" and meet the requirements of the directive 2014/34/EU for the application in potentially explosive atmospheres due to gases and dusts.

For both models, we offer various thermocouple materials according to DIN EN 60 584. In addition, model TTeHrXiAT is available with several fitted transmitters with analogue or digital output.

Standard Versions

Measuring Element

Thermocouple types K, N, J and S according to DIN EN 60 584 as single or dual element

Operating Temperature Ranges

Type K (NiCr-Ni): -40 °C to +1175 °C (-40 °F to +2147 °F)¹⁾
Type N (NiCrSi-NiSi): -40 °C to +1175 °C (-40 °F to +2147 °F)¹⁾
Type J (Fe-CuNi): -40 °C to +750 °C (-40 °F to +1382 °F)
Type S (Pt10Rh-Pt): 0 °C to +1175 °C (+32 °F to +2147 °F)¹⁾

Ambient Temperature Ranges²⁾

-40 °C to +85 °C (-40 °F to +185 °F)

Please refer to operating instruction B71 for the precise conditions.

Accuracy

Class 1 according to DIN EN 60 584

Tolerance value³⁾ J, K, N: +1.5 °C or 0.004 · |t|

for type J in the range: -40 °C to +750 °C (-40 °F to +1382 °F)

for type K, N in the range: -40 °C to +1000 °C (-40 °F to +1832 °F)

Tolerance value³⁾ S: +1.0 °C or (1+(t-1100)·0.003) °C

in the entire operating temperature range

Measuring Insert

According to DIN 43 735

The measuring insert shall only be replaced by an original spare part.

Spring-loaded in the connection head

Insertion tube made of sheathed, mineral insulated cable

Sheath material: Inconel 600 (2.4816) for type K, N, S
1.4401 for type J

Insulation: MgO

Diameter (dF): 3±0.05 or 6±0.06 mm (0.12±0.002 or 0.24±0.0024 ")

Spring travel: approximately 7 mm (0.28")

Neck Tube

Material: stainless steel 316Ti (1.4571)

Standard length h: 120 mm (4.7")

Process Connection

Various thread spigots (E4.1) or union nuts (E3)

Connection Heads

Types XE-BUZ, XE-BUZ-H, XI-BUZ or XI-BUZ-H



Degree of Protection (DIN EN 60 529)

IP67 when mounted in a thermowell and corresponding screwed cable gland (PAN, PAR, MAN or MAR)

Approvals

II 1G Ex ia IIC T6...T1 Ga

II 1/2G Ex ia IIC T6...T1 Ga/Gb⁴⁾

II 2G Ex ia IIC T6...T1 Gb

II 1D Ex ia IIIC T80 °C...T440 °C Da

II 1/2D Ex ia IIIC T80 °C...T440 °C Da/Db⁴⁾

II 2D Ex ia IIIC T80 °C...T440 °C Db

Application in Explosion Hazardous Areas

Zones 0, 1, 2, 20, 21, 22

Output Signal

Model TTeHrXiA: thermoelectric voltage according to DIN EN 60 584

Model TTeHrXiAT: 4...20 mA, HART® or PROFIBUS® PA/ FOUNDATION™ Fieldbus

Electrical Connection Values

For the electrical connection values, please refer to operating instruction B71.

Ordering Information

See page 4

¹⁾ application range limited due to the sheath material Inconel 600

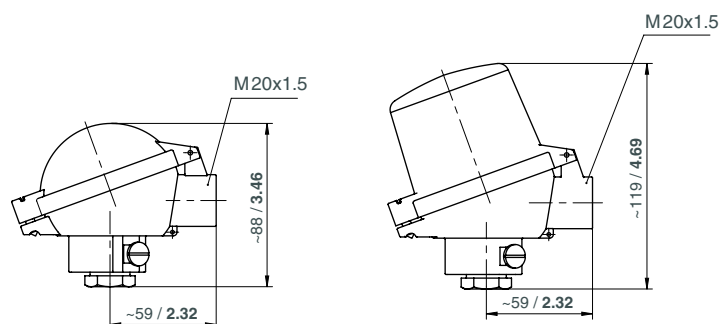
²⁾ permissible storage temperature at the connection head

³⁾ whichever value is higher

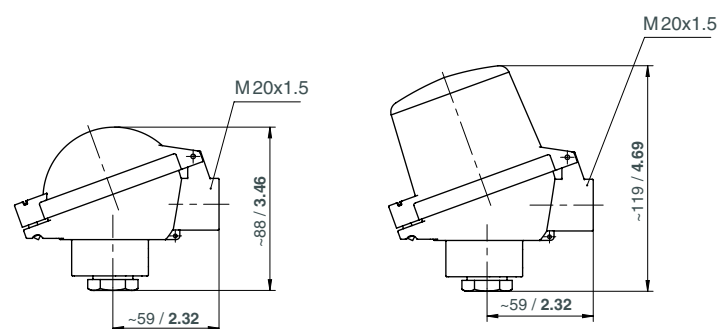
⁴⁾ only with thermowell suitable for zone separation – see operating instructions B71

Connection Heads, Dimensional Data (mm/inches)

Connection Heads		
	Head XE-BUZ	Head XE-BUZ-H ¹⁾
Material:	die-cast aluminum	die-cast aluminum
Lid:	hinged lid	high lid, hinged
Degree of protection:	IP67 ²⁾	IP67 ²⁾
No. of transmitters:	1	2
Max. installation dimensions:	Ø 45 x 40 mm (1.77 x 1.57")	lid Ø 60 x 40 mm (2.36 x 1.57") base Ø 45 x 16 mm (1.77 x 0.63")



	Head XI-BUZ	Head XI-BUZ-H ¹⁾
Material:	polyamide PA12	polyamide PA12
Lid:	hinged lid	high lid, hinged
Degree of protection:	IP67 ²⁾	IP67 ²⁾
No. of transmitters:	1	2
Max. installation dimensions:	Ø 45 x 40 mm (1.77 x 1.57")	lid Ø 60 x 40 mm (2.36 x 1.57") base Ø 45 x 16 mm (1.77 x 0.63")



Options Screwed Cable Gland			
Type code	Type	Material	Clamping range
PAN	screwed cable gland	polyamide, blue	5 – 10 mm (0.2 – 0.39")
PAR	screwed cable gland	polyamide, blue	7 – 13 mm (0.28 – 0.51")
MAN	screwed cable gland	brass, nickelplated	5 – 10 mm (0.2 – 0.39")
MAR	screwed cable gland	brass, nickelplated	7 – 13 mm (0.28 – 0.51")
GWO	open thread ³⁾	–	–

¹⁾ For connection heads XE-BUZ-H and XI-BUZ-H, the transmitter is fitted in the lid and the measuring insert is assembled with ceramic terminal block. Moreover, the heads XE-BUZ-H and XI-BUZ-H offer the possibility of installing two transmitters.

²⁾ depending on the screwed cable gland used

³⁾ For mounting of the cable gland by the customer. Operation without suitable screwed cable gland is not permissible.

Process Connections, Dimensional Data (mm/inches)

Dimensional Data

Process connections: Thread spigot (E4.1)

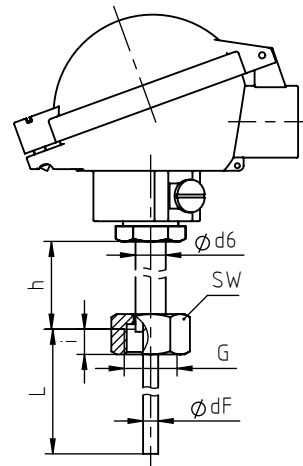
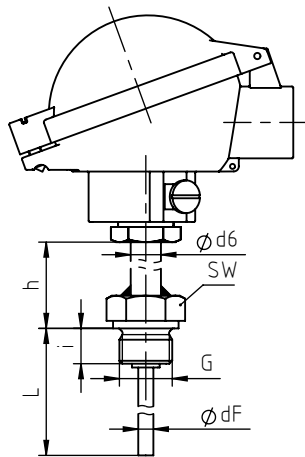
Measuring insert \varnothing dF: 3 or 6 mm (0.12 or 0.24")
Installation length L: 30 – 2000 mm (1.18 – 78.74")¹⁾
Neck tube length h: 120 mm (4.72")²⁾
Measuring insert length: L + h + 35 mm (1.38")³⁾
Connection thread:

G	SW	i	d6
G ½B (½" BSP)	27 1.06	14 0.55	12 0.47
M14x1.5	19 0.75	12 0.47	12 0.47
M18x1.5	24 0.94	14 0.55	12 0.47
M20x1.5	27 1.06	14 0.55	12 0.47

Union nut (E3)

Measuring insert \varnothing dF: 3 or 6 mm (0.12 or 0.24")
Installation length L: 30 – 2000 mm (1.18 – 78.74")¹⁾
Neck tube length h: 120 mm (4.72")²⁾
Measuring insert length: L + h + 35 mm (1.38")³⁾

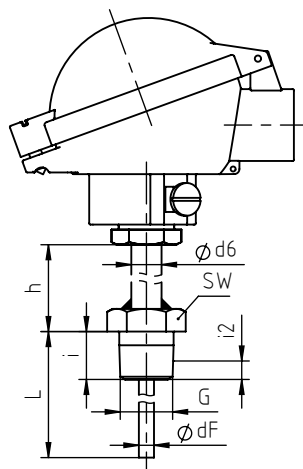
G	SW	i	d6
G ½B (½" BSP)	27 1.06	10 0.39	12 0.47
G ¾B (¾" BSP)	32 1.26	12 0.47	12 0.47
M18x1.5	27 1.06	10 0.39	12 0.47
M20x1.5	32 1.26	12 0.47	12 0.47
M27x2	32 1.26	12 0.47	12 0.47



Process connection: Thread spigot conical (E4.1)

Measuring insert \varnothing dF: 3 or 6 mm (0.12 or 0.24")
Installation length L: 30 – 2000 mm (1.18 – 78.74")¹⁾
Neck tube length h: 120 mm (4.72")²⁾
Measuring insert length: L + h + 35 mm (1.38")⁴⁾
Connection thread:

G	SW	i	d6	i2
½" NPT	27 1.06	19 0.75	12 0.47	8.13 0.32



¹⁾ For lengths exceeding 2000 mm, the measuring insert is supplied as coil.

²⁾ Other lengths are available upon request. The minimum length is 20 mm.

³⁾ The measuring insert length should be selected according to DIN 43 735 so that the installation dimension (L) is 3 ± 1 mm longer than the drilling depth of the thermowell.

⁴⁾ The measuring insert length should be selected according to DIN 43 735 so that the installation dimension (L - i + i2) is 3 ± 1 mm longer than the drilling depth of the thermowell. Please also note our technical information sheet T08-000-032.

Ordering Information

Basic Model:		Intrinsically Safe Thermocouple for the Installation into Thermowells	TTeHrXiA
Transmitter:	without		without code letter
	with fitted transmitter		T
Thermocouple:	type K, NiCr-Ni		K
	type N, NiCrSi-NiSi		N
	type J, Fe-CuNi		J
	type S, Pt10Rh-Pt		S
No. of thermocouples:	1		1
	2		2
Measuring insert Ø dF:	3 mm (0.12")		dF = 3 mm
	6 mm (0.24")		dF = 6 mm
Connection head:	type XE-BUZ, aluminum, hinged lid		XE-BUZ
	type XE-BUZ-H, aluminum, high lid		XE-BUZ-H
	type XI-BUZ, polyamide, hinged lid		XI-BUZ
	type XI-BUZ-H, polyamide, high lid		XI-BUZ-H
Screwed cable gland:	polyamide, blue	5 – 10 mm (0.2 – 0.39")	PAN
	polyamide, blue	7 – 13 mm (0.28 – 0.51")	PAR
	brass, nickelplated	5 – 10 mm (0.2 – 0.39")	MAN
	brass, nickelplated	7 – 13 mm (0.28 – 0.51")	MAR
	open thread		GWO
Process connection:	thread spigot		E4.1
	union nut		E3
Connection thread:	see page 3	e.g.	G ½ B
Installation length:	U1 in mm	e.g.	U1 = 250 mm
With fitted transmitter:	TT5334: 4...20 mA		5334-B
	TT5337: 4...20 mA + HART 7		5337-D
	TT5350: PROFIBUS® PA/FOUNDATION™ Fieldbus		5350-B
Measuring range:	scaling of the 4...20 mA signal to the temperature range	e.g.	0 °C to +250 °C
Options:	neck tube length h	other lengths, min. 20 mm (0.79")	
	instrument tag	stainless steel plate 12 x 55 mm (0.47 x 2.17") sticker on the case	

Example: TTeHrXiAT, K, 1, dF = 6 mm, XE-BUZ, PAN, E4.1, G ½ B, U1 = 500 mm, 5334-B, 0 °C to +600 °C

Special Versions: Please describe your requirements in cleartext!