

Intrinsically Safe Thermocouples with Fabricated Thermowell

According to DIN 43 772, replaceable measuring insert

TTeSrXiA
TTeSrXiAT



Application

The thermocouple models TTeSrXiA and TTeSrXiAT with fabricated thermowells form 2, 2G and 2F according to DIN 43 772 have an EU Type Examination Certificate for the ignition protection type "intrinsic safety". Both models meet the requirements of the directive 2014/34/EU for the application in potentially explosive atmospheres due to gases and dusts. The thermocouples can be mounted directly into the process. The measuring insert can be replaced as separate component.

For both models, we offer various thermocouple materials according to DIN EN 60 584. In addition, model TTeSrXiAT 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 +800 °C (-40 °F to +1472 °F)¹⁾

Type N (NiCrSi-NiSi): -40 °C to +800 °C (-40 °F to +1472 °F)¹⁾

Type J (Fe-CuNi): -40 °C to +750 °C (-40 °F to +1382 °F)

Type S (Pt10Rh-Pt): 0 °C to +800 °C (+32 °F to +1472 °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")

Thermowell

Form 2, 2F or 2G according to DIN 43 772

Material stainless steel 316Ti (1.4571)

Connection Heads

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



Degree of Protection (DIN EN 60 529)

IP67 with 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/Gb

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/Db

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 TTeSrXiA: thermoelectric voltage according to
DIN EN 60 584

Model TTeSrXiAT: 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

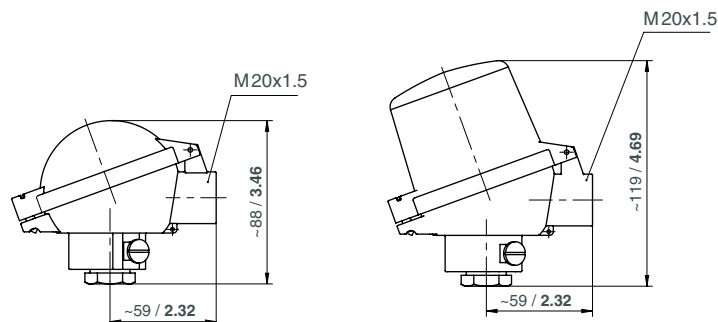
¹⁾ application range limited due to the thermowell material 316Ti (1.4571)

²⁾ permissible storage temperature above the sealing face

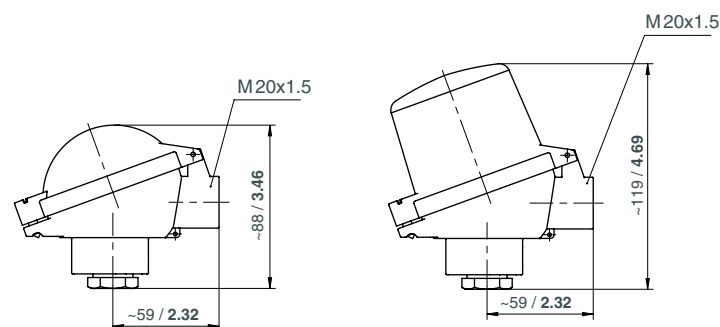
³⁾ whichever value is higher

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: Without thread

Form acc. to DIN 43 772: form 2

Installation length U1¹⁾: 280, 370, 520 mm (11.02, 14.57, 20.47")

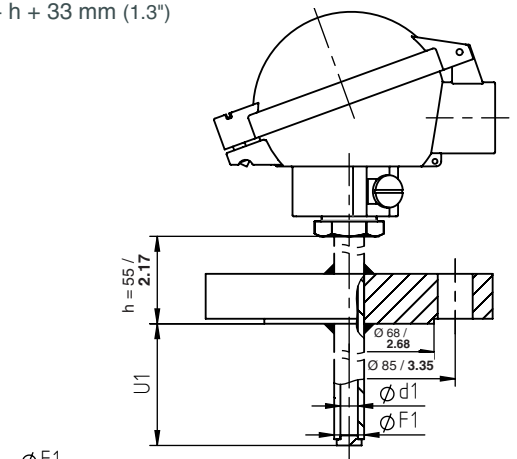
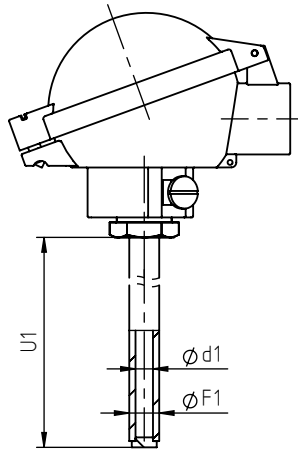
Measuring insert length: U1 + 33 mm (1.3")

Blind flange acc. to DIN 2527, DN 25 PN 40, form C form 2F

225, 315, 465 mm (8.86, 12.4, 18.31")

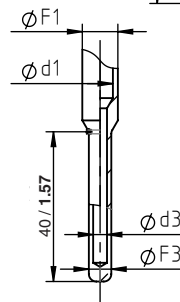
U1 + h + 33 mm (1.3")

F1	d1	Measuring insert Ø
6 / 0.24 ²⁾	4 / 0.16 ²⁾	3 / 0.12
9 / 0.35	7 / 0.28	6 / 0.24
11 / 0.43	7 / 0.28	6 / 0.24
12 / 0.47	7 / 0.28	6 / 0.24
14 / 0.55	9 / 0.35	6 / 0.24 ³⁾



Tapered measuring tip²⁾

F1	d1	F3	d3	Measuring insert Ø
9 / 0.35	7 / 0.28	6 / 0.24	3.5 / 0.14	3 / 0.12
11 / 0.43	7 / 0.28	6 / 0.24	3.5 / 0.14	3 / 0.12
12 / 0.47	7 / 0.28	6 / 0.24	3.5 / 0.14	3 / 0.12
14 / 0.55	9 / 0.35	9 / 0.35	6.5 / 0.26	6 / 0.24



Process connection: Thread spigot

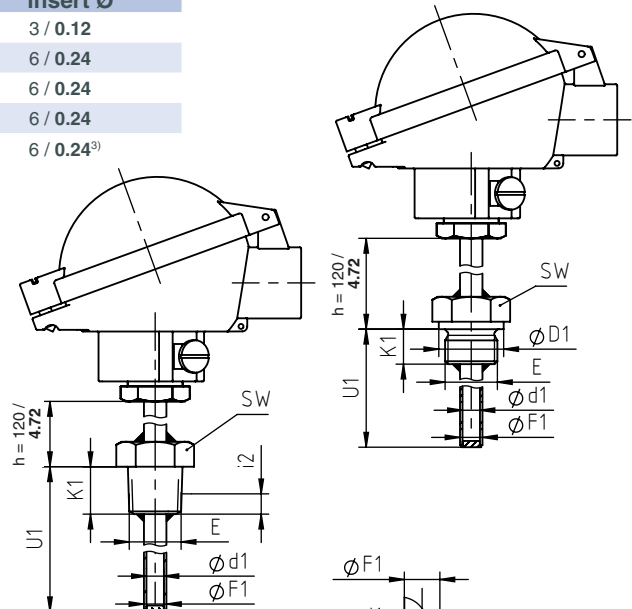
Form acc. to DIN 43 772: form 2G

Installation length U1¹⁾: 160, 250, 400 mm (6.3, 9.84, 15.75")

Measuring insert length: U1 + h + 33 mm (1.3")

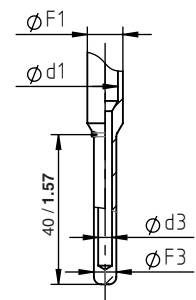
E		F1	d1	Measuring insert Ø
G ½ B (½" BSP) ½" NPT ²⁾ M20x1.5 ²⁾	G ¼ B (¼" BSP) ²⁾	6 / 0.24 ²⁾	4 / 0.16 ²⁾	3 / 0.12
	¼" NPT ²⁾	9 / 0.35	7 / 0.28	6 / 0.24
	M14x1.5 ²⁾	11 / 0.43	7 / 0.28	6 / 0.24
	–	12 / 0.47	7 / 0.28	6 / 0.24
	G ¾ B (¾" BSP) ²⁾ G 1 B (1" BSP)	14 / 0.55	9 / 0.35	6 / 0.24 ³⁾

E	K1	i2	D1	SW
G ¼ B (¼" BSP)	12 / 0.47	–	18 / 0.71	19 / 0.75
¼" NPT	13 / 0.51	5.79 / 0.23	–	19 / 0.75
M14x1.5	12 / 0.47	–	19 / 0.75	19 / 0.75
G ½ B (½" BSP)	15 / 0.59	–	26 / 1.02	27 / 1.06
½" NPT	19 / 0.75	8.13 / 0.32	–	27 / 1.06
M20x1.5	14 / 0.55	–	25 / 0.98	27 / 1.06
G ¾ B (¾" BSP)	16 / 0.63	–	27 / 1.06	32 / 1.26
G 1 B (1" BSP)	30 / 1.18	–	39 / 1.54	41 / 1.61



Tapered measuring tip²⁾

F1	d1	F3	d3	Measuring insert Ø
9 / 0.35	7 / 0.28	6 / 0.24	3.5 / 0.14	3 / 0.12
11 / 0.43	7 / 0.28	6 / 0.24	3.5 / 0.14	3 / 0.12
12 / 0.47	7 / 0.28	6 / 0.24	3.5 / 0.14	3 / 0.12
14 / 0.55	9 / 0.35	9 / 0.35	6.5 / 0.26	6 / 0.24



¹⁾ Deviating lengths available – please specify when ordering.

²⁾ No version according to DIN 43 772.

³⁾ With crimped-on sleeve Ø 8 x 50 mm (0.31 x 1.97") in the sensor range. Measuring insert with a consistent diameter of 8 mm (0.31") upon request.

Ordering Information

Basic Model:		Intrinsically Safe Thermocouple with Fabricated Thermowell	TTeSrXiA
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
Thermowell Ø F1:	6 x 1 mm (0.24 x 0.04")		F1 = 6 mm
	9 x 1 mm (0.35 x 0.04")		F1 = 9 mm
	11 x 2 mm (0.43 x 0.08")		F1 = 11 mm
	12 x 2.5 mm (0.47 x 0.1")		F1 = 12 mm
	14 x 2.5 mm (0.55 x 0.1")		F1 = 14 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:	form 2, without thread (plain)		2
	form 2F, blind flange according to DIN 2527, DN 25 PN 40		2F
	form 2G, thread spigot		2G
Tapered measuring tip:	without		without code letter
	with tapered measuring tip		S
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: TTeSrXiAT, K, 1, F1 = 9 mm, XE-BUZ, PAN, 2G, G ½ B, U1 = 400 mm, 5337-D, 0 °C to +600 °C

Special Versions: Please describe your requirements in cleartext!