

Thermocouple with Process Display for the Installation into Thermowells

TTePAXd



Application

The thermocouple model TTePAXd is 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.

TTePAXd is equipped with a rugged die-cast aluminum case with an integrated backlit LC-graphic display, which communicates digitally with the fitted transmitter type 5337-D via HART interface. Both digital display and transmitter can be parameterised via optical keyboard through the window of the instrument without having to remove the screw-on lid.

TTePAXd has an EU Type Examination Certificate for the ignition protection types "flameproof enclosure" and "intrinsic safety" and meets the requirements of the directive 2014/34/EU for the application in potentially explosive atmospheres due to gases and dusts.

Standard Versions

Measuring Element

Thermocouple types K, N, J and S class 1 according to DIN EN 60 584

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 Range²⁾

-40 °C to +85 °C (-40 °F to +185 °F)

Please refer to operating instruction B71 for the precise conditions.

Accuracy

Input	Accuracy	Temperature coefficient	Sensor tolerance ³⁾
all	≤ ±0.05 % FS ⁴⁾	≤ ±0.005 % FS ^{4)/°C}	-
K, N, J	≤ ±0.5 °C	≤ ±0.025 °C/°C	±1.5 °C or 0.004 · t ⁵⁾
S	≤ ±1 °C	≤ ±0.1 °C/°C	±1.0 °C or (1+(t-1100)·0.003) °C

Measuring Insert

Special measuring insert with sleeve, which forms, in combination with a socket, a flame arrester in the connection head. 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)
 Neck tube length h: 80 mm (3.15")

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⁾ this refers to the full scale value or the span of the programmed range

⁵⁾ for type K and N in the range -40 / +1000 °C (-40 °F / +1832 °F), for type J in the range -40 / +750 °C (-40 °F / +1382 °F)

⁶⁾ depending on the screwed cable gland used

⁷⁾ only with thermowell suitable for zone separation – see operating instructions B71



Process Connection

Various thread spigots (E4.1)

Case

With screw-on lid and two cable inlets

Material	Dimensional data (H x W x D)
die-cast aluminum	109.3 x 145 x 126 mm (4.3 x 5.71 x 4.96")
stainless steel 1.4401	107.4 x 145 x 124 mm (4.23 x 5.71 x 4.88")

Degree of Protection (DIN EN 60 529)

IP66 – 68⁶⁾ (when mounted in a thermowell)

Approvals

II 1G Ex ia db IIC T6...T1 Ga
 II 1/2G Ex db IIC T6...T1 Ga/Gb⁷⁾
 II 1/2G Ex ia/db IIC T6...T1 Ga/Gb⁷⁾
 II 2G Ex db IIC T6...T1 Gb
 II 1D Ex ia tb IIIC T80 °C...T440 °C Da
 II 1/2D Ex ia/tb IIIC T80 °C...T440 °C Da/Db⁷⁾
 II 2D Ex tb IIIC T80 °C...T440 °C Db

Application in Explosion Hazardous Areas

Zones 1, 2, 21, 22

Zones 0, 20: applicable with measuring insert with ignition protection type Ex ia

Error Monitoring

Sensor break and short circuit monitoring according to Namur NE89
 Error signals according to NAMUR NE43
 Visual signalling: shift of the background lighting from white to red (flashing)

Functional Safety

SIL2

Output Signal

4...20 mA, HART®

Electrical Connection Values

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

Ordering Information

See page 3

www.armano-messtechnik.com

ARMANO

ARMANO Messtechnik GmbH

Location Beierfeld

Am Gewerbepark 9 • 08344 Grünhain-Beierfeld
 Tel.: +49 3774 58 – 0 • Fax: +49 3774 58 – 545
 mail@armano-beierfeld.com

Location Wesel

Manometerstraße 5 • 46487 Wesel-Ginderich
 Tel.: +49 2803 9130 – 0 • Fax: +49 2803 1035
 mail@armano-wesel.com

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Process Connections, Dimensional Data (mm/inches)

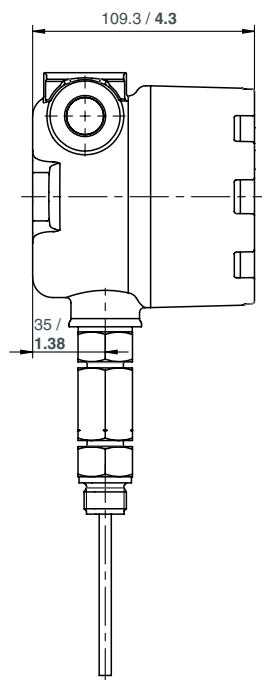
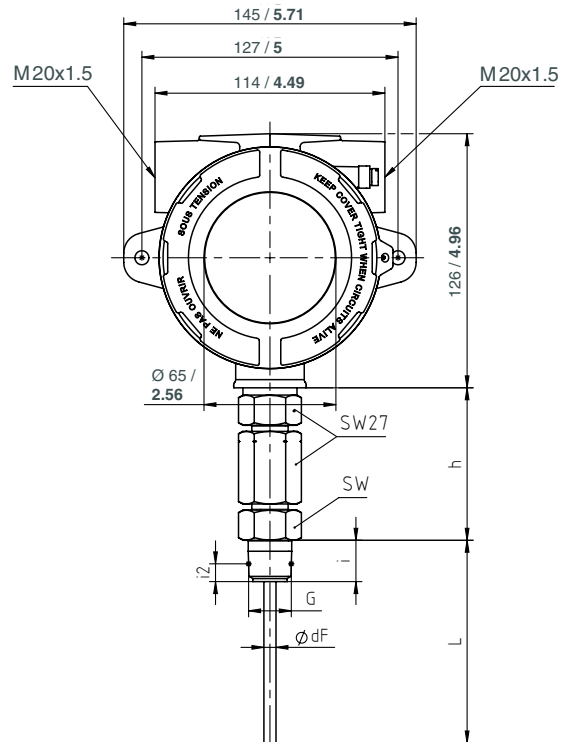
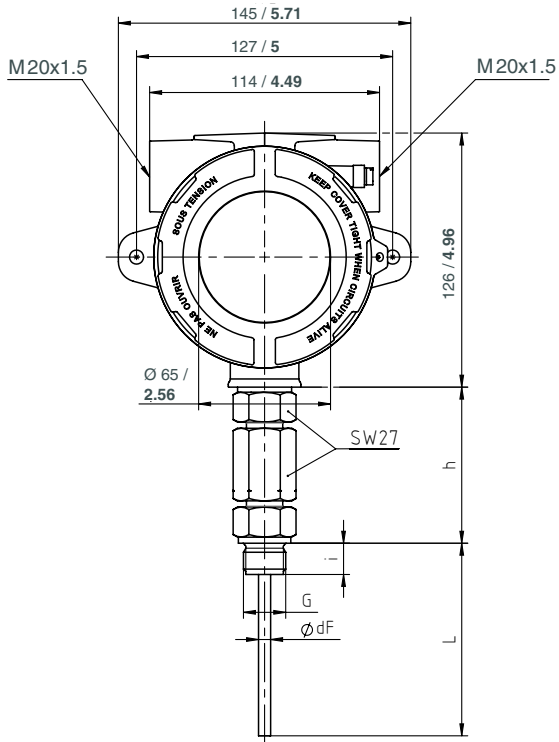
Dimensional Data

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: 80 mm (3.15")
Measuring insert length: L + h + 27 mm (1.06")²⁾

Connection thread:	G	SW	i
G 1/2 B (1/2" BSP)	27	1.06	14
G 3/4 B (3/4" BSP)	32	1.26	16
M20x1.5	27	1.06	14

Thread spigot conical (E4.1)
3 or 6 mm (0.12 or 0.24")
30 – 2000 mm (1.18 – 78.74")¹⁾
80 mm (3.15")
L + h + 27 mm (1.06")³⁾

G	SW	i	i2
1/2" NPT	27	19	8.13
	1.06	0.75	0.32
3/4" NPT	27	19	8.61
	1.06	0.75	0.34



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

²⁾ 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.

³⁾ 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: Thermocouple with Process Display		TTePAXd
Thermocouple:	type K, NiCr-Ni	K
	type N, NiCrSi-NiSi	N
	type J, Fe-CuNi	J
	type S, Pt10Rh-Pt	S
Measuring insert Ø dF:	3 mm (0.12")	dF = 3 mm
	6 mm (0.24")	dF = 6 mm
Case material:	die-cast aluminum	AL
	stainless steel	1.4401
Cable input:	single right ¹⁾	1R
	single left ¹⁾	1L
	double	2X
Connection thread:	see page 2	e.g. G ½ B
Installation length:	L in mm	e.g. L = 200 mm
Measuring range:	scaling of the 4...20 mA signal to the temperature range	e.g. 0 °C to +250 °C
Options:	crimped-on tube sleeve 50 mm Ø 8 mm (0.31") (1.97") for alignment to the internal thermowell diameter	

Example: TTePAXd, K, dF = 6 mm, AL, 1L, G ½ B, L = 500 mm, 0 °C to +600 °C

Special Versions: Please describe your requirements in cleartext!

¹⁾ if only one cable input is selected, the threaded hole for the second screwed cable gland is equipped with a screw plug