

# TSTW (SensyTemp TW T)

Thermocouples  
with drilled thermowell  
and measuring inset

10/10-3.26 EN



## ■ Essential components

- Standardised components can be combined to form company-standard designs
- Measuring insets can be replaced during operation
- No welding seams coming into contact with media

## ■ Technical features

- Thermowell materials and designs adapted to operating conditions
- Installation of a transmitter in the connection head makes an compensating cable unnecessary
- Interfaces to all current process control systems

## ■ Applications

- Power generation and heat distribution
- Chemical process engineering
- Oil/gas conveyance
- Food and beverage industry
- Machine and system construction

## Description

Thermocouples with welded protection tube are used primarily to measure temperatures in process plants with corrosive media in the operating range from 400 to approximately 650 °C or 660 bar.

They are composed of a thermowell made from bar stock material, with an extension tube and a connection head, into which an exchangeable measuring inset is fitted. The design of the thermowell allows it to be optimised to meet the measurement and mechanical requirements, thus enabling it to withstand high levels of stress caused by pressure, flow and vibration.

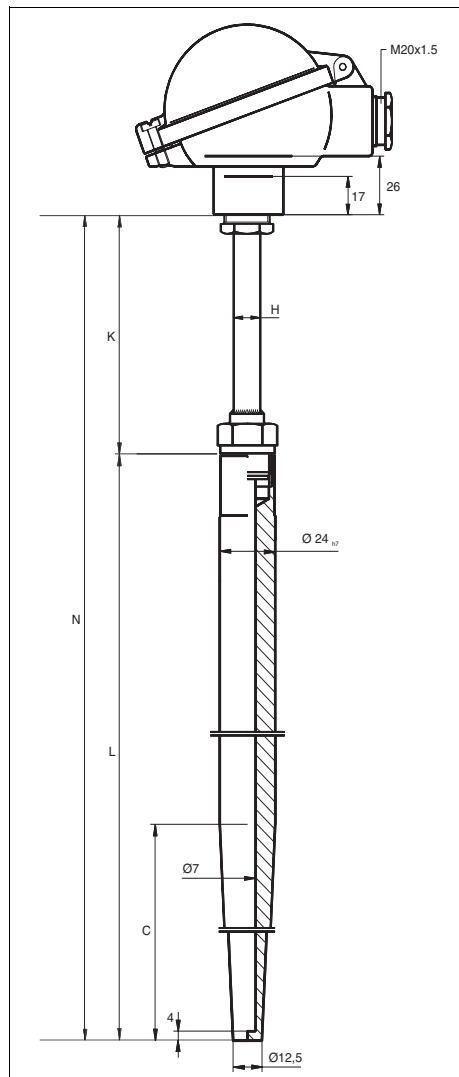
This design considerably facilitates the operational checks mandated, since the measuring inset

- can be removed while the plant is running without dismantling the entire sensor,
- can be calibrated in standard test facilities
- can be stocked as a universal standard component in order to assure availability of the system during replacement.

**ABB**

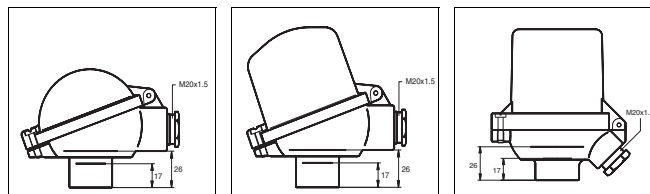
**Sensor design**

Example



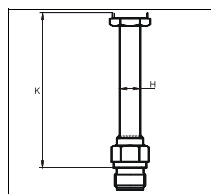
**Connection heads**

Type **BUZ** aluminium    Type **BUZH** aluminium for install. of transmitter    Type **BUKH** polyamide for install. of transmitter



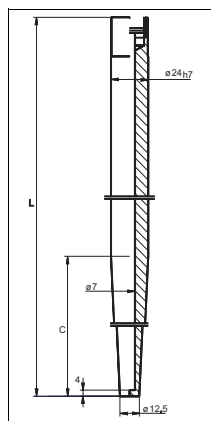
**Extension tube**

Welded mounting thread  
 M18 x 1.5



**Thermowell**

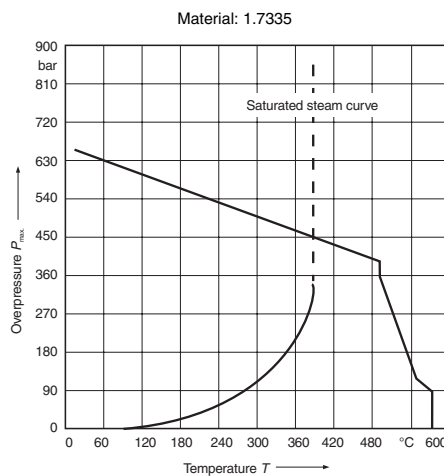
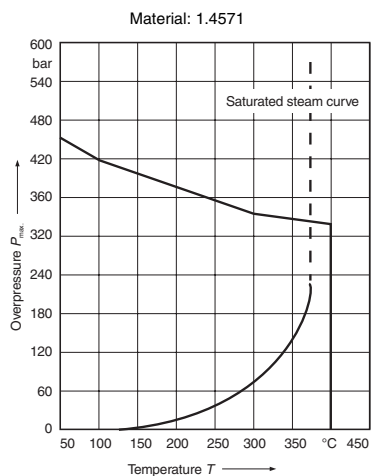
Type 4, DIN 43772 (replacement for type D, DIN 43763)



**Captions**

- N = Nominal length
- L = Thermowell length
- K = Extension tube length
- H = Extension tube diameter
- C = Cone length

**Stress capacity of the thermowells Type 4 conforming to DIN 43772 (replacement for Type D conforming to DIN 43763)**



Type 4 (D2, D5)  
 Thermowells c = 125 mm;  
 Bend, stream length = 125 mm  
 Thermowell diameter = 24 mm  
 Thermowell inside diameter = 7 mm  
 Flow velocity  
 Water = 5 m/s  
 Steam = 60 m/s  
 Air = 60 m/s

**TSTW (SensyTemp TW T)**  
**Thermocouples with drilled thermowell and measuring inset**

10/10-3.26 EN

Ordering information					Catalog No.				Code		
<b>Thermocouple TSTW (SensyTemp TW T)</b>					<b>V10514-</b>	<b>0</b>					
<b>Thermowell</b>											
Type	L	C	Material								
4 (D1)	140 mm	65 mm	1.4571 (AISI 316-Ti)		A						
	140 mm	65 mm	1.7335 (AISI A 182-F11)		C						
4 (D2)	200 mm	125 mm	1.4571 (AISI 316-Ti)		E						
	200 mm	125 mm	1.7335 (AISI A 182-F11)		G						
4 (D4)	200 mm	65 mm	1.4571 (AISI 316-Ti)		I						
	200 mm	65 mm	1.7335 (AISI A 182-F11)		L						
	200 mm	65 mm	1.5415 (AISI A 204-Gr. A)		K						
4 (D5)	260 mm	125 mm	1.4571 (AISI 316-Ti)		N						
	260 mm	125 mm	1.7335 (AISI A 182-F11)		Q						
<b>Extension tube</b>											
Thread	Diameter	Length	Material								
M18 x 1,5	H = 11 mm	K = 150 mm	1.4571 (AISI 316-Ti)		Y						
M18 x 1,5	H = 14 mm	K = 150 mm	1.4571 (AISI 316-Ti)		D						
<b>Connection head</b>											
Type	Material	Cable entry	Surface	prot. degr./-class							
BUZ	aluminium	M20 x 1.5	painted	IP 66 / NEMA 4 X	1						
BUZH	aluminium	M20 x 1.5	painted	IP 66 / NEMA 4 X	5						
BUKH	polyamide	M20 x 1.5	black	IP 66 / NEMA 4 X	F						
<b>Measuring inset</b>											
1 x Type K (NiCr-Ni)		Non-explosion protected			H						
2 x Type K (NiCr-Ni)		Non-explosion protected			J						
<b>Error limit</b>											
Class 2		EN 60584 (IEC 60584)			G						
Class 1		EN 60584 (IEC 60584)			H						
<b>Head mounted transmitter</b> 1)											
without									0		
TS02		programmable							6		
TH02		programmable, HART protocol							9		
TF12		PROFIBUS-PA							K		
<b>Options</b>											
Measuring range = (start value...final value °C)									680		
TAG-No. on stainless steel label									490		

1) Transmitter TS02, TH02, TF12 incl. parameterization  
 Measuring range (clear text)  
 as standard in connection head BUZH and BUKH only

- Other options:**
- Ex i-design
  - other thermowell material
  - other thermowell type
  - other thermowell fastening
  - other cable entry
  - other head painting
  - Tests (see Data Sheet 10/10-3.81 EN)

Other versions on request

<b>Basic values, deviations of thermocouples acc. to EN 60584 (IEC 60584)</b>							
Temperature		200 °C	350 °C	500 °C	700 °C	900 °C	1100 °C
Thermoelectric voltage (mV) Type K		8.14	14.29	20.64	29.13	37.33	45.12
Tolerance (K)	Class 2	2.5	2.6	3.8	5.3	6.8	8.3
	Class 1	1.5	1.5	2.0	2.8	3.6	–

**Accessories, components**

Many of the components of the models listed in the catalog may be ordered as separate components or as modules. In this respect you should refer to Data Sheet 10-3.45 EN (Exchangeable thermocouple measuring insets) and 10-3.91 EN (Components for temperature sensors with exchangeable measuring insets).

**Other models**

This Data Sheet contains only a small selection of our range of thermocouples with drilled thermowell and measuring inset. See Data Sheet 10-3.03 EN for technical data. Other models can be supplied on request.



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