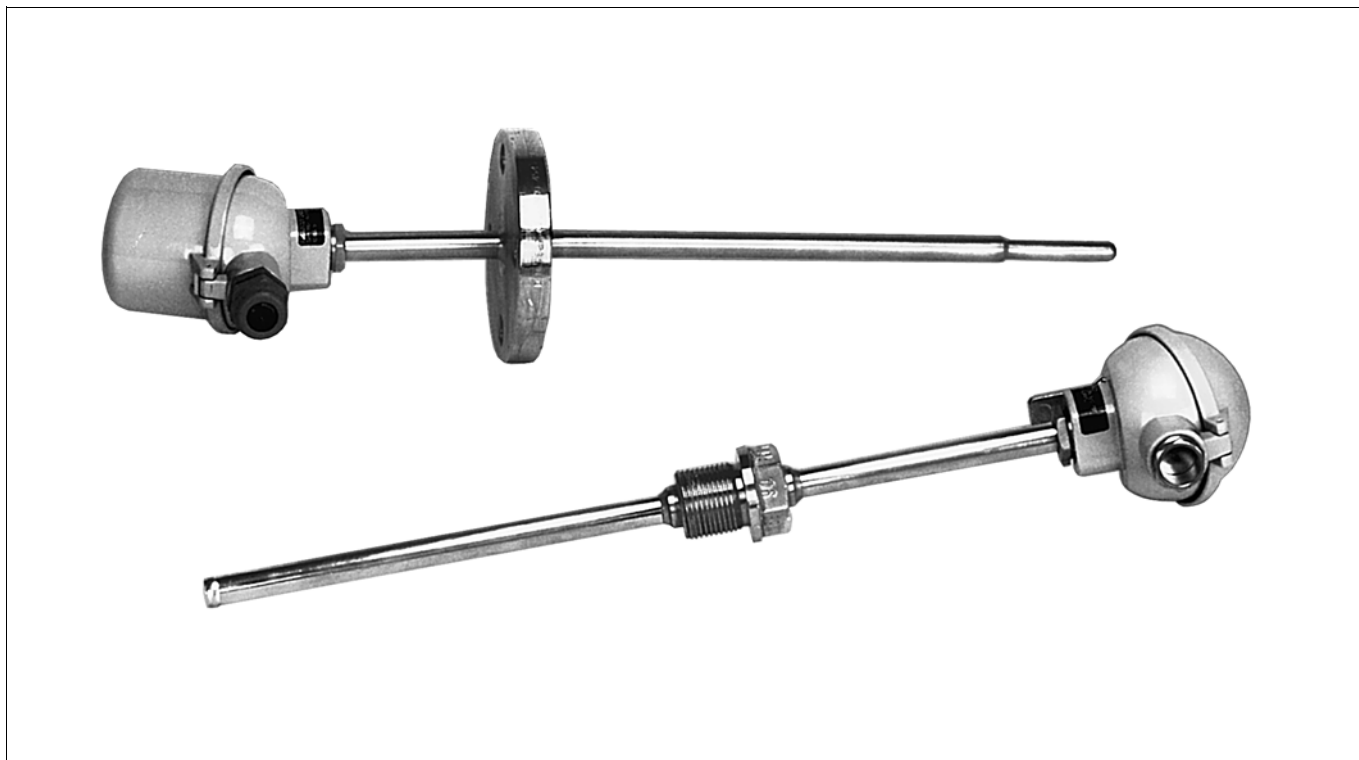


TSWT (SensyTemp WT T)

Thermocouples
with welded protection tube
and measuring inset

10/10-3.25 EN



■ Essential components

- Can be combined from standardised components
- Standard lengths mean that few spare parts need to be kept in stock
- Insertion lengths can be selected individually
- Measuring insets can be replaced during operation

■ Technical features

- Protection tube 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

- Chemical process engineering
- Petroleum/natural gas supply and processing
- Power generation and heat distribution
- Food and beverages industries
- General machinery and apparatus engineering

Description

Thermocouples with welded protection tube are used primarily to measure temperatures in the operating range from 400 °C to maximum each 800 °C, 40 bar, 20 m/s, in vessels and pipelines.

They consist of a welded thermowell, with a connection head, into which an exchangeable measuring inset is fitted, and are used chiefly in liquid and gaseous media where there is moderate mechanical stress and low chemical aggressiveness.

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

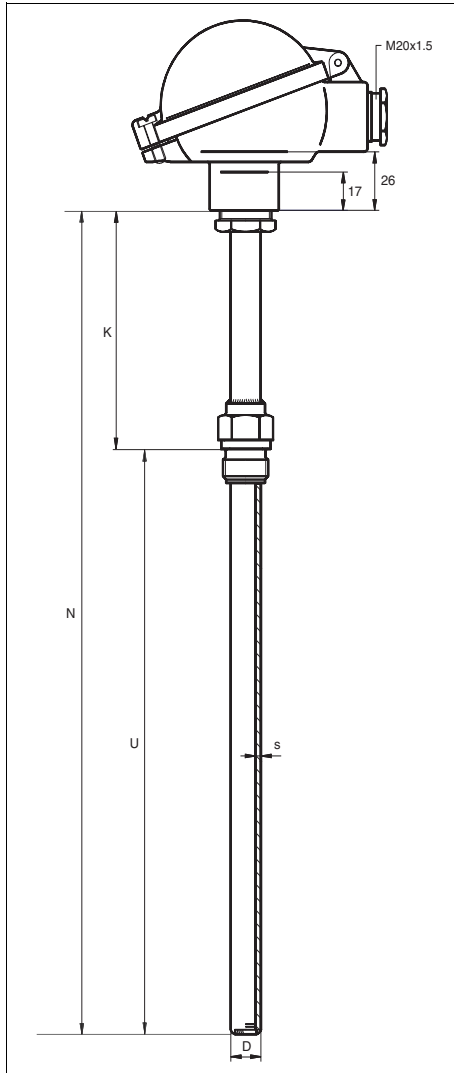
- can be removed while the plant is running without dismantling the entire sensor
- can be calibrated in standard test facilities
- can be stocked as a universal standard component to guarantee the operability of the plant when it is replaced.

In most cases, however, replacement by a new measuring inset is more reliable and less expensive than recalibration.

ABB

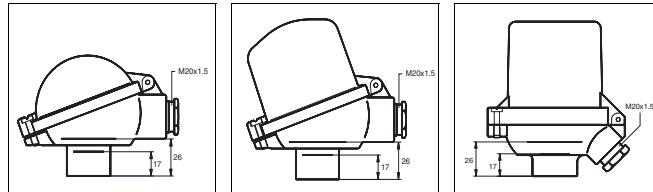
Sensor design

Example



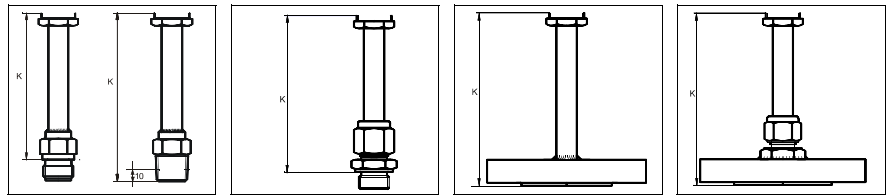
Connection heads

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



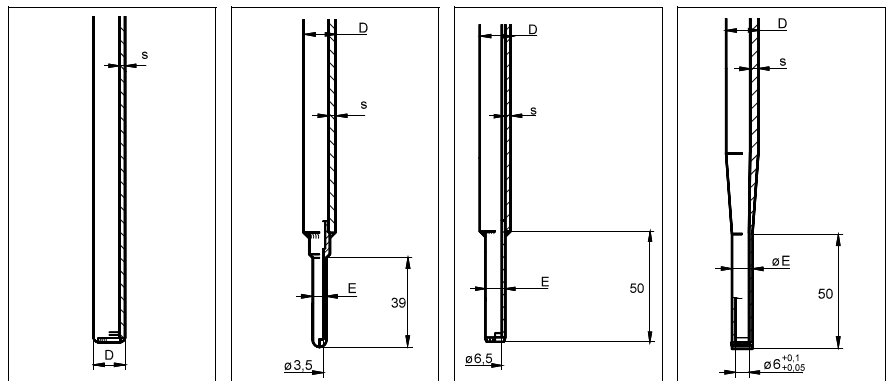
Process connection

Welded mounting thread cylindrical (G) conical (NPT) Compression fitting adjustable Welded flange Adjustable flange



Protection tubes

Type C2, K2, K3, B3 Type C2S, K2S Type K3S Type E1



Captions

- N = Nominal length
- K = Extension tube length
- U = Insertion length
- D = Thermowell diameter
- E = Diameter of the thermowell tip
- S = Wall thickness

TSWT (SensyTemp WT T)
Thermocouples with welded protection tube and measuring inset

10/10-3.25 EN

Ordering information										
						Catalog No.		Code		
Thermocouple TSWT (SensyTemp WT T)						V10513-				
Protection tube										
Type	D x S	Material	E							
C2	11 x 2 mm	1.4571 (AISI 316-Ti)	-		D					
K2	12 x 2.5 mm	1.4571 (AISI 316-Ti)	-		J					
K3	14 x 2.5 mm	1.4571 (AISI 316-Ti)	-		K					
K3S	14 x 2.5 mm	1.4571 (AISI 316-Ti)	9 mm		T					
B3	9 x 1 mm	1.4571 (AISI 316-Ti)	-		C					
E1	12 x 2.5 mm	1.4571 (AISI 316-Ti)	9 mm		G					
Nominal length										
N = 290 mm					1					
N = 380 mm					2					
N = 530 mm					3					
Connection head										
Type	Material	Cable entry	Surface	prot. degr./-class						
BUZ	aluminium	M20 x 1.5	painting	IP 66 / NEMA 4 X		1				
BUZH	aluminium	M20 x 1.5	painting	IP 66 / NEMA 4 X		5				
BUKH	polyamide	M20 x 1.5	black	IP 66 / NEMA 4 X		F				
Measuring inset										
1 x Type K (NiCr-Ni)		Non-explosion protected				H				
2 x Type K (NiCr-Ni)		Non-explosion protected				J				
Error limit										
Class 2		EN 60584 (IEC 60584)				G				
Class 1		EN 60584 (IEC 60584)				H				
Head mounted transmitter										
without						1)		0		
TS02	programmable							6		
TH02	programmable, HART protocol							9		
TF12	PROFIBUS-PA							K		
Process connection										
Mounting thread	G½", welded-on	Mat. 1.4571 (AISI 316-Ti)	Type A DIN 3852	2)				RB1		
Mounting thread	G¾", welded-on	Mat. 1.4571 (AISI 316-Ti)	Type A DIN 3852	2)				RB2		
Mounting thread	G1", welded-on	Mat. 1.4571 (AISI 316-Ti)	Type A DIN 3852	2)				RB3		
Mounting thread	½" NPT, welded-on	Mat. 1.4571 (AISI 316-Ti)		2)				RB4		
Mounting thread	¾" NPT, welded-on	Mat. 1.4571 (AISI 316-Ti)		2)				RB5		
Compression fitting	G½", adjustable	Mat. 1.4571 (AISI 316-Ti)		3)				SB1		
Welded flange	DN 25, PN 40, Type B1	Mat. 1.4571 (AISI 316-Ti)	DIN EN 1092-1	2)				F06		
Welded flange	DN 50, PN 40, Type B1	Mat. 1.4571 (AISI 316-Ti)	DIN EN 1092-1	2)				F11		
Welded flange	1" 300 lbs. RF	Mat. 1.4571 (AISI 316-Ti)		2)				F18		
Adjustable flange	DN 25, PN 40, Type B1	Mat. 1.4571 (AISI 316-Ti)	DIN EN 1092-1	3)				F42		
Options										
Measuring range = (start value...final value °C)								680		
Insertion length U = ...mm								2)	468	
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
- 2) Specify insertion length U. Standard U = 160 for N = 290,
 U = 250 for N = 380, U = 400 for N = 530
- 3) not for protection tube Type C2, C2S and B3

Other versions on request

Other options:

- other nominal length
- Ex i-design
- other process connection
- other protection tube material
- other protection tube
- other cable entry
- other head painting
- Tests (see Data Sheet 10/10-3.81 EN)

TSWT (SensyTemp WT T) Thermocouples with welded protection tube and measuring inset

10/10-3.25 EN

Basic values, deviations of thermocouples acc. to EN 60584 (IEC 60584)							
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 resistance thermometers with welded thermowell measuring inset. See Data Sheet 10-3.03 EN for technical data. Other models can be supplied on request.



ABB Ltd.

Salterbeck Trading Estate
Workington, Cumbria
CA14 5DS
UK

Tel: +44 (0)1946 830 611
Fax: +44 (0)1946 832 661

ABB Inc.

125 E. County Line Road
Warminster, PA 18974
USA

Tel: +1 215 674 6000
Fax: +1 215 674 7183

ABB Automation Products GmbH

Borsigstr. 2
63755 Alzenau
Germany

Tel: +49 551 905-534
Fax: +49 551 905-555

Subject to technical changes.
Printed in the Fed. Rep. of Germany
10/10-3.25 EN 05.04