TSST (SensyTemp ST P)

Straight thermocouples with ceramic insulated precious metal thermocouples and ceramic protection tube

10/10-3.59 EN

Main components
- Thermocouple wires insulated in ceramic capillary
- Protection tube of ceramic/optional ceramic inner tube
- Adjustable gas-tight flange or threaded bushing
- Connection head
- Optional integrated head-mounted transmitter

Technical features
- A wide variety of standard designs adapted to various operating and installation conditions
- Head-mounted transmitter compensating cable and reference junction unnecessary
- Interfaces to all current process control systems

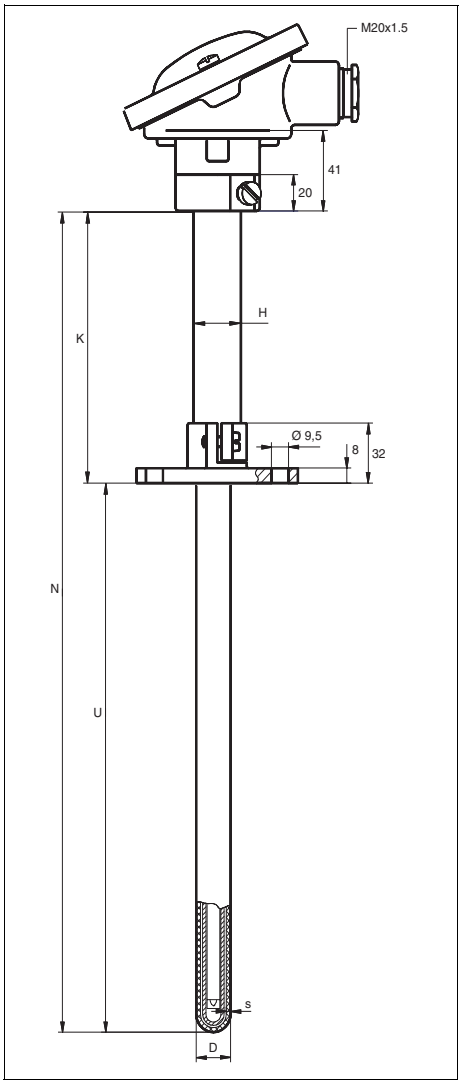
Applications
- Blast furnaces, blast heating apparatus
- Cement kilns, rotary tubular kilns
- Glass tempering furnaces, ceramic kilns
- Manufacture of bricks and porcelain
- Annealing processes, heat treatment processes
- Incineration of waste and special waste
- Large-scale heating plants, heat generation

Straight thermocouples are used for technical temperature measurements in combustion processes and in hot gas atmospheres, mainly in furnaces and kilns of all kinds, at temperatures up to 1800 °C and pressures of approximately 1 bar.

TSST (SensyTemp ST P) – Straight thermocouples with ceramic insulated precious metal thermocouples and ceramic protection tube

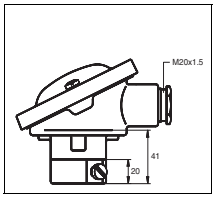
Sensor design

Example

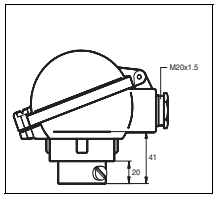


Connection heads

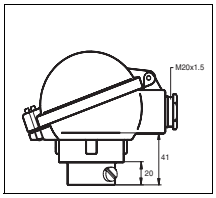
Type **A** Aluminium



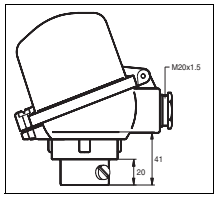
Type **AUZ** Aluminium



Type **AUG**
Grey cast iron

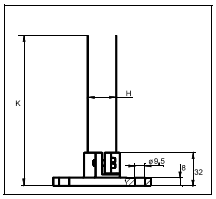


Type **AUZH** Aluminium for install. of transmitter

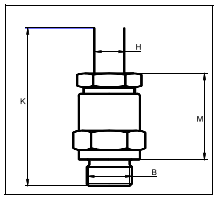


Process connection

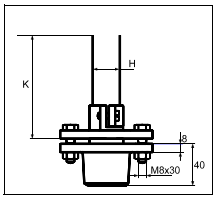
Adjustable flange



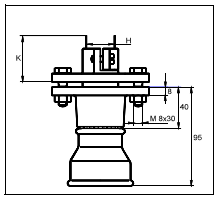
Threaded bushing



Adjustable and mating flange for welding on

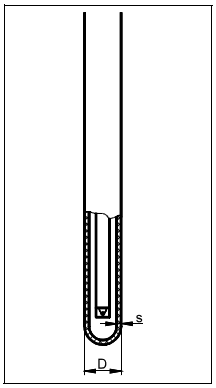


Adjustable and mating flange for screwing on with G 1½" bushing

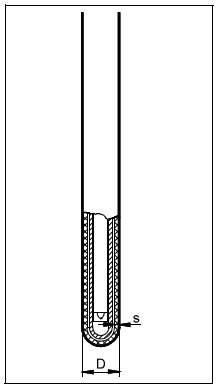


Protection tubes

Type ST P-AK Ceramic protection tube without ceramic inner tube



Type ST P-AKK Ceramic protection tube with ceramic inner tube



Captions:

N = Nominal length
K = Support tube length
H = Support tube diameter
U = Insertion length
D = Protection tube diameter
S = Wall thickness

Thermocouple type and tolerance						
Type	Material	Standard	Standard tolerance Class / Deviation	Reduced tolerance Class / Deviation	Max. temperature	Wire ∅ mm
Precious metal thermocouple combinations						
S	Pt10Rh-Pt	EN 60584 (IEC 60584)	2 1.5 °C or 0.0025 t	1 1 °C or 1 + 0.003 (t-1100 °C)	1600 °C	0.5
B	Pt30Rh-Pt6Rh	EN 60584 (IEC 60584)	3 4 °C or 0.005 t	2 1.5 °C or 0..025 t	1800 °C	0.5

Please note:
Type B thermocouples generate an assessable thermoelectric voltage at no lower than 200 °C, depending on physical conditions.

Ordering information

				Catalog No.									Code		
Straight thermocouple TSST (SensyTemp ST P)				**V10521-**			**1**						**410**		
Protection tube				1)											
Type	Nom. Length	Material	Dimensions	Inner tube											
ST P-AK	N = 500 mm	Cer. C610	Ø 16 x 2 mm	without	2	Q									
ST P-AK	N = 500 mm	Cer. C799	Ø 15 x 2.5 mm	without	2	U									
ST P-AKK	N = 500 mm	Cer. C610	Ø 24 x 2.5 mm	C799	2	T									
ST P-AKK	N = 500 mm	Cer. C530	Ø 26 x 4 mm	C610	2	N									
ST P-AKK	N = 500 mm	Cer. C799	Ø 24 x 3 mm	C799	2	X									
ST P-AK	N = 710 mm	Cer. C610	Ø 16 x 2 mm	without	3	Q									
ST P-AK	N = 710 mm	Cer. C799	Ø 15 x 2.5 mm	without	3	U									
ST P-AKK	N = 710 mm	Cer. C610	Ø 24 x 2.5 mm	C799	3	T									
ST P-AKK	N = 710 mm	Cer. C530	Ø 26 x 4 mm	C610	3	N									
ST P-AKK	N = 710 mm	Cer. C799	Ø 24 x 3 mm	C799	3	X									
ST P-AK	N = 1000 mm	Cer. C610	Ø 16 x 2 mm	without	4	Q									
ST P-AK	N = 1000 mm	Cer. C799	Ø 15 x 2.5 mm	without	4	U									
ST P-AKK	N = 1000 mm	Cer. C610	Ø 24 x 2.5 mm	C799	4	T									
ST P-AKK	N = 1000 mm	Cer. C530	Ø 26 x 4 mm	C610	4	N									
ST P-AKK	N = 1000 mm	Cer. C799	Ø 24 x 3 mm	C799	4	X									
ST P-AK	N = 1400 mm	Cer. C610	Ø 16 x 2 mm	without	5	Q									
ST P-AK	N = 1400 mm	Cer. C799	Ø 15 x 2.5 mm	without	5	U									
ST P-AKK	N = 1400 mm	Cer. C610	Ø 24 x 2.5 mm	C799	5	T									
ST P-AKK	N = 1400 mm	Cer. C530	Ø 26 x 4 mm	C610	5	N									
ST P-AKK	N = 1400 mm	Cer. C799	Ø 24 x 3 mm	C799	5	X									
Process connection															
Without connection								A							
Adjustable flange, 1.0402 (AISI (M) 1020)				2)				B							
Adjustable threaded bushing, 1.0718 (AISI 12L13), can be shifted				3)				C							
Adjustable and mating flange for welded on, 1.0402 (AISI (M) 1020)				2)				D							
Adjustable and mating flange with G 1½" bushing, 1.0402 (AISI (M) 1020)				2)				E							
Connection head															
Type	Material	Cable entry	Surface	Degr. of protection											
A	Aluminium	M20 x 1.5	painted	IP 54	4)				1						
AUZ	Aluminium	M20 x 1.5	painted	IP 54	4)				2						
AUG	Grey cast iron	M20 x 1.5	painted	IP 54	4)				4						
AUZH	Aluminium	M20 x 1.5	painted	IP 54					6						
Thermocouple															
1 x type S (Pt10Rh-Pt)		EN 60584 (IEC 60584) class 2		Ø 0.5 mm						N	2				
1 x type B (Pt30Rh-Pt6Rh)		EN 60584 (IEC 60584) class 3		Ø 0.5 mm						S	3				
1 x type S (Pt10Rh-Pt)		EN 60584 (IEC 60584) class 1		Ø 0.5 mm						N	1				
1 x type B (Pt30Rh-Pt6Rh)		EN 60584 (IEC 60584) class 2		Ø 0.5 mm						S	2				

Continued on next page

1) With support tube Ø 32 mm, length K = 200 mm, for prot. tube Ø 24 mm or Ø 26 mm or with support tube Ø 22 mm, length K = 150 mm, for protection tube Ø 15 mm or Ø 16 mm
2) The mounting is located at the end of the support tube
3) For protection tube Ø 15 mm or Ø 16 mm G 1" or for protection tube Ø 24 mm or Ø 26 mm G 1¼"
4) Not suitable for the installation of head mounted transmitters

Other options:
- other nominal length
- other protection tube material
- other cable entry
- other head painting
- Tests (see Data Sheet 10/10-3.81 EN)

Other versions on request

Prices may change due to fluctuations in exchange rates of precious metal.

Ordering information (continued)					
	Catalog No.			Code	
Straight thermocouple TSST (SensyTemp ST P)	**V10521-**	**1**		**410**	
Head mounted transmitter	1)				
Without		0			
TS02 programmable		6			
TH02 programmable, HART protocol		9			
TF12 PROFIBUS-PA		K			
Options					
Measuring range = (start value...end value °C)			680		
TAG-No. on stainless steel label			490		

1) Transmitter incl. parameterization
(Measuring range in clear text)

Other versions on request

Other options:
- other nominal length
- other protection tube material
- other cable entry
- other head painting
- Tests (see Data Sheet 10/10-3.81 EN)

Thermowell material operation conditions			
Material	Max. temperature	Advantages	Disadvantages
C530 (Al_2O_3 > 80 %)	1400 °C	Resistant to temperature changes	Finely porous, not gas-tight, sensitive to impacts
C610 (Al_2O_3 > 60 %)	1500 °C	Gas-tight, high fire-resistance, medium resistance to temperature changes	Low Al_2O_3 purity, sensitive to impacts
C799 (Al_2O_3 > 99 %)	1800 °C	Very gas-tight, maximum fire-resistance	Low resistance to temperature changes, sensitive to impacts

Support tube materials for ceramic protection tubes

As the temperature above the process connection is mostly low, unalloyed steel is used as standard for support tubes. If the support tube extends into the furnace, heat-resistant steel should be used.

Accessories, components

Many 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 10-3.92 EN (Components for straight thermocouples).

Other models

This Data Sheet contains only a small selection of our range of sheathed resistance thermometers. 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
10/10-3.59 EN 05.04