

TSST (SensyTemp ST B)

Straight thermocouples with ceramic insulated base-metal thermocouples and metal-protection tube

10/10-3.58 EN



■ Main components

- Thermocouple wires insulated in ceramic capillary
- Protection tube of heat-resistant steel
- 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

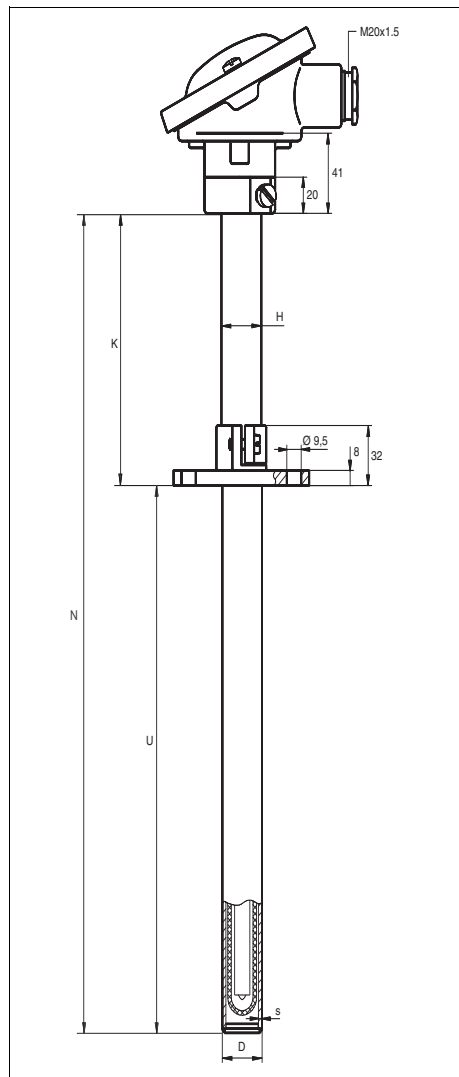
■ Applications

- Blast furnaces, blast heating apparatus
- Cement kilns, rotary tubular kilns
- 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 1200 °C and pressures of approximately 1 bar.

Sensor design

Example



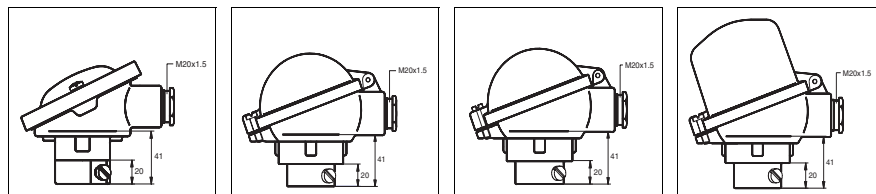
Connection heads

Type A Aluminium

Type AUZ Aluminium

Type AUG
Grey cast iron

Type AUZH Aluminium
for install. of transmitter



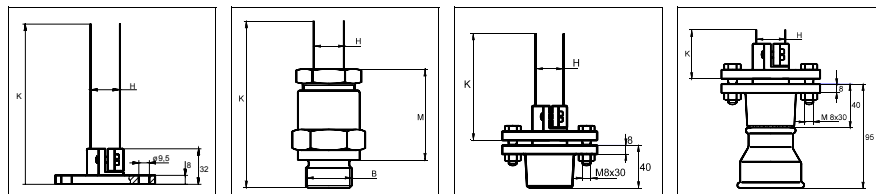
Process connection

Adjustable flange

Threaded bushing

Adjustable and mating flange
for welding on

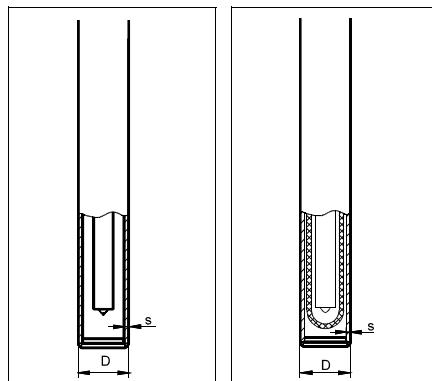
Adjustable and mating flange for screwing on
with G 1/2" bushing



Protection tubes

Type ST B-AM
Metal prot. tube without
ceramic inner tube

Type ST B-AMK
Metal prot. 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
- H = D for metal protection tubes

Thermocouple type and tolerance

Type	Material	Standard	Standard tolerance		Reduced tolerance		Max. Temperature	Wire Ø mm
			Class	Deviation	Class	Deviation		
Base-metal thermocouple combination								
K	NiCr-Ni	EN 60584 (IEC 60584)	2	2.5 °C or 0.0075 t	1	1.5 °C or 0.004 t	1200 °C	2.5

Ordering information										
					Catalog No.					Code
Straight thermocouple TSST (SensyTemp ST B)					V10521-			1		
Protection tube					Inner tube					
Type	Nom. Length	Material	Dimensions							
ST B-AM	N = 500 mm	1.4762 (A 446)	Ø 22 x 2 mm	without	2	E				
ST B-AMK	N = 500 mm	1.4762 (A 446)	Ø 22 x 2 mm	C610	2	F				
ST B-AMK	N = 500 mm	1.4841 (A 314)	Ø 22 x 2 mm	C610	2	I				
ST B-AM	N = 710 mm	1.4762 (A 446)	Ø 22 x 2 mm	without	3	E				
ST B-AMK	N = 710 mm	1.4762 (A 446)	Ø 22 x 2 mm	C610	3	F				
ST B-AMK	N = 710 mm	1.4841 (A 314)	Ø 22 x 2 mm	C610	3	I				
ST B-AM	N = 1000 mm	1.4762 (A 446)	Ø 22 x 2 mm	without	4	E				
ST B-AMK	N = 1000 mm	1.4762 (A 446)	Ø 22 x 2 mm	C610	4	F				
ST B-AMK	N = 1000 mm	1.4841 (A 314)	Ø 22 x 2 mm	C610	4	I				
ST B-AM	N = 1400 mm	1.4762 (A 446)	Ø 22 x 2 mm	without	5	E				
ST B-AMK	N = 1400 mm	1.4762 (A 446)	Ø 22 x 2 mm	C610	5	F				
ST B-AMK	N = 1400 mm	1.4841 (A 314)	Ø 22 x 2 mm	C610	5	I				
Process connection										
Without connection										
Adjustable flange, 1.0402 (AISI (M) 1020)										
Adjustable threaded bushing G1", 1.0718 (AISI 12L13), can be shifted										
Adjustable and mating flange for welded on, 1.0402 (AISI (M) 1020)										
Adjustable and mating flange with G 1½" bushing, 1.0402 (AISI (M) 1020)										
Connection head										
Type	Material	Cable entry	Surface	Degr. of protection						
A	Aluminium	M20 x 1.5	painted	IP 54	1)		1			
AUZ	Aluminium	M20 x 1.5	painted	IP 54	1)		2			
AUG	Grey cast iron	M20 x 1.5	painted	IP 54	1)		4			
AUZH	Aluminium	M20 x 1.5	painted	IP 54			6			
Thermocouple										
1 x type K (NiCr-Ni)	EN 60584 (IEC 60584) class 2		Ø 2.5 mm					A	2	
2 x type K (NiCr-Ni)	EN 60584 (IEC 60584) class 2		Ø 2.5 mm					E	2	
1 x type K (NiCr-Ni)	EN 60584 (IEC 60584) class 1		Ø 2.5 mm					A	1	
2 x type K (NiCr-Ni)	EN 60584 (IEC 60584) class 1		Ø 2.5 mm					E	1	
Head mounted transmitter										
Without										
TS02	programmable								0	
TH02	programmable, HART protocol								6	
TF12	PROFIBUS-PA								9	
									K	
Options										
Measuring range = (start value...end value °C)										680
TAG-No. on stainless steel label										490

1) not suitable for the installation of head mounted transmitters

2) 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)

Sensor operating conditions		
<p>At high temperatures, metal protection tube materials may become porous thus making the penetration of aggressive gases from the environment possible.</p> <p>These pollution gases change the characteristic of the thermocouple. In order to prevent this, a gas-tight ceramic inner tube can be inserted in to the protection tube to screen the thermocouple.</p>	<p>The stress features can be optimized by appropriate choices of materials for the protection tube and inner tube, for example:</p>	
	<p>Protection tube Heat-resistant steel Impact-resistant and resistant to temperature changes</p>	<p>Inner tube C 610 Relatively pure, gas-tight</p>

Protection tube material operating conditions			
Material	Max. temperature	Advantages	Disadvantages
1.0308 enamelled (St 35 enamelled)	550 °C	Corrosive applications in the dew point range of flue gases	Sensitive to impacts and bending
1.4762 (X10CrAl 24) (AISI 446)	1200 °C	High level of resistance to gases containing sulphurs	Low level of resistance to gases containing nitrogen
1.4841 (X15CrNiSi 25 20) (AISI 446)	1150 °C	High level of resistance to gases containing nitrogen and with a low oxygen content	Low level of resistance to gases containing sulphur

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 straight thermocouples. See Data Sheet 10-3.03 EN for technical data. Other models can be supplied on request.



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