Data Sheet
DS/TSP1X1-EN

Temperature sensors
SensyTemp TSP111, TSP121, TSP131

for light and medium duty applications

Modular system
- Measuring inset, thermowell, extension tube, connection head, transmitter
- Supports numerous configurations

Exchangeable measuring inset
- Measuring elements can be exchanged during operation
- Secure base contact via pressure springs

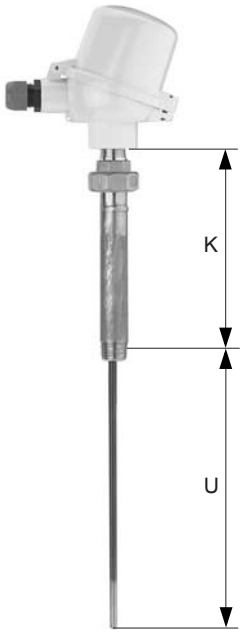
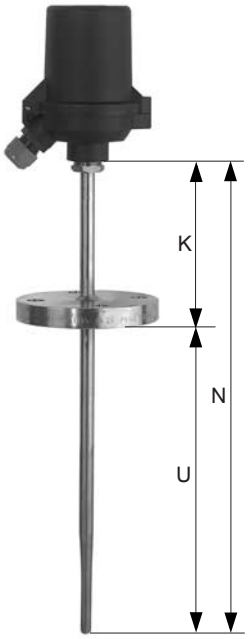
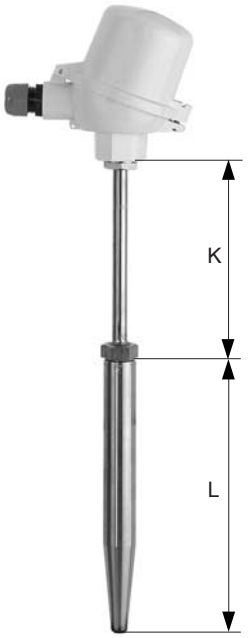
Approvals
- ATEX Ex i
- ATEX Dust ignition proof
- GOST Russia
- GOST Kazakhstan
- GOST Ukraina

Transmitter in connection head
- Less wiring expense
- High accuracy
- High interference resistance
- Interface to all state-of-the-art process management systems
- Process safety via SIL2 classification

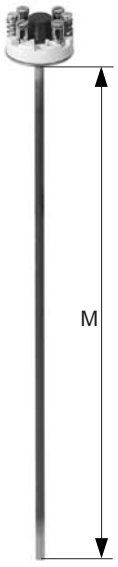
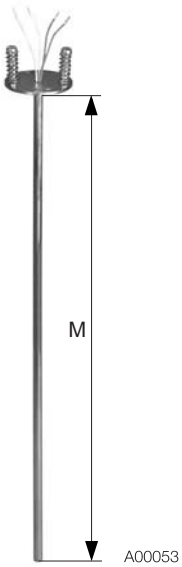
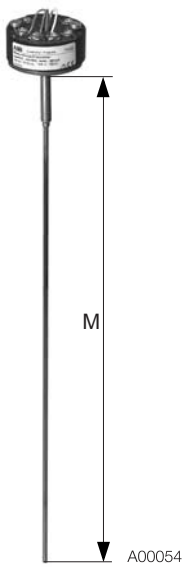
Areas of application
- Chemical industry
- Energy industry
- General process engineering
- Tank and pipeline construction
- Manufacturing systems and plant engineering
- Food and drink industry

Modular design
Versatile, easy to use
No maintenance required

1 Overview of temperature sensors with an exchangeable measuring inset

Type	TSP111	TSP121	TSP131
			
Thermowell properties	No thermowell, for installation in existing thermowell	Tube, tube base and welded process connection	Drilled bar stock material
Components	Measuring inset, extension tube with thermowell interface, connection head, transmitter, display	Measuring inset, thermowell with process interface, connection head, transmitter, display	Measuring inset, thermowell with process interface, extension tube, connection head, transmitter, display
Standard process interface	Installation by customer in existing thermowell	Screw-in thread, flange, compression fitting	Welded connections, screw-in thread, flange
Thermowell Ø (shaft/tip) [mm]	At installation site	9; 11; 12; 14; 11/6; 12/6; 12/9; 13,7; 13,7/6	18/9; 24/12.5; 32/13.5; 20/13.5; 23/13.5; 25/16; 17/13.5
Standard thermowell material	-	1.4404 (SS 316L) 1.4571 (SS 316Ti) 2.4819 (Hastelloy C276)	1.4571 (SS 316Ti), 1.4404 (SS 316L), 1.7335 (AISI F12), 1.5415 (AISI F1), 2.4819 (Hastelloy C276)
Standard ext. tube material	Stainless steel	One-piece thermowell	Stainless steel
Connection heads	BUZ, BUZH, BUZHD: Aluminum BUKH: Polyamide BEG: Stainless steel		
Output signal	Sensor signal, 4 ... 20 mA, HART, PROFIBUS PA, FOUNDATION Fieldbus		
Measuring insets	Compliant with DIN 43735, exchangeable		
Explosion protection class	ATEX II 1 G EEx ia IIC T6 ... T1 – zone 0, 1, 2 / connection head zone 1 ATEX II 1 D T133 ... T400 – zone 20, 21, 22 Note: Requirements for NAMUR NE24 recommendation are fulfilled by ATEX EEx i.		
Application	Comply with temperature limit for thermowell when measuring temperatures in tanks and pipelines in liquid and gaseous media.		
Temperature	Resistance thermometer < 600 °C, thermocouples < 1000 °C		
Pressure (depends on material, connection and stress data)	-	approx. 40 ... 100 bar	approx. 700 bar
Weight for standard designs	0.5 ... 2.5 kg	1.0 ... 4.0 kg	1.0 ... 6.0 kg

2 Overview of measuring insets

Type	Sheathed thermocouples and sheathed resistance thermometers		
			
Electrical connection	Terminal block	Flying leads	Installed ABB transmitter
Design	Mineral insulated cable: flexible, bendable, vibration resistant		
Measuring inset diameter	TSP111: Ø = 1 mm less than inside diameter of the thermowell	TSP121 / TSP131: Ø is adapted in factory to inside diameter of thermowell	
Measuring inset length (M)	TSP111: Insertion length U + ext. tube length K + 25 mm TSP121: Nominal length N + 25 mm TSP131: Thermowell length L + ext. tube length K + 25 mm		
Standard sheath material	Resistance thermometers: 1.4571 (SS 316Ti) Thermocouples: 2.4816 (Inconel 600)		
Standard measuring elements	Resistance thermometers: (EN 60751) Pt100 basic application (-50 ... 400 °C), single/dual, 3-/4-wire connection Pt100 extended measuring range (-200 ... 600 °C), single/dual, 3-/4-wire connection Thermocouples: (EN 60584) Type K, J and N, single/dual		
Explosion protection class	ATEX II 1 G EEx ia IIC T6 ... T1 ATEX II 1 D T133 … T400 Note: Requirements for NAMUR NE24 recommendation are fulfilled by ATEX EEx i.		
Application	Installation in TSP temperature sensors		
Spring travel	Approx. 10 mm		
Temperature	Resistance thermometers: Basic application: -50 ... 400 °C Extended vibration resistance: -50 ... 400 °C Extended measuring range: -200 ... 600 °C Thermocouples Type K, J and N: Approx. -40 ... 1000 °C		

Note
For higher resistance to vibrations, resistance measuring insets or thermocouples with higher resistance to vibrations are recommended.
For information on additional sensor models, sheath materials and diameters, contact your ABB sales representative.