

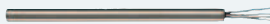




Type	TSinsert	TS100	TS200
<b>Description</b>	Measuring insert	Temperature sensors in cable version	Temperature sensors in compact version
<b>Application</b>	Replaceable	Universal use	Universal use
<b>Version</b>	Mineral-insulated version	Mineral-insulated version	Mineral-insulated version
<b>Type</b>	in European or American type	For unfavorable space conditions	For unfavorable space conditions
<b>Image</b>			
<b>Catalog page</b>	2/101	2/42	2/45
<b>Article No.</b>	Nr. 7MC70*	7MC711*	7MC72*
<b>Wetted material</b>	Cr-Ni-Mo (RTD); 2.4816 (TC) (Cr-Ni-Mo; Inconel600)	Cr-Ni-Mo (RTD); 2.4816 (TC) (Cr-Ni-Mo; Inconel600)	Cr-Ni-Mo (RTD); 2.4816 (TC) (Cr-Ni-Mo; Inconel600)
<b>Thermowell types</b>	To order separately	Without/with separate thermowell	Without/with separate thermowell
<b>Process connections</b>	-	<ul style="list-style-type: none"> <li>Compression fittings</li> <li>Soldering nipple: <ul style="list-style-type: none"> <li>- G 1/4, G 1/2</li> <li>- 1/2 NPT</li> <li>- M 8x1, M18x1.5</li> </ul> </li> <li>Surface connection piece for installation on surfaces/tubes</li> </ul>	<ul style="list-style-type: none"> <li>Compression fittings</li> <li>Soldering nipple: <ul style="list-style-type: none"> <li>- G 1/4, G 1/2</li> <li>- 1/2 NPT</li> <li>- M 8x1, M18x1.5</li> </ul> </li> <li>Surface connection piece for installation on surfaces/tubes</li> </ul>
<b>Sensor elements</b>	Pt100 + thermocouples	Pt100 + thermocouples	Pt100 + thermocouples
<b>Sensor connection</b>	<ul style="list-style-type: none"> <li>• 1 x 4 wire</li> <li>• 2 x 3 wire</li> </ul>	<ul style="list-style-type: none"> <li>• 1 x 4 wire</li> <li>• 2 x 3 wire</li> </ul>	<ul style="list-style-type: none"> <li>• 1 x 4 wire</li> <li>• 2 x 3 wire</li> </ul>
<b>Sensor accuracy</b>	<ul style="list-style-type: none"> <li>• Class AA</li> <li>• Class A</li> <li>• Class B</li> <li>• Class 1</li> <li>• Class 2</li> </ul>	<ul style="list-style-type: none"> <li>• Class AA</li> <li>• Class A</li> <li>• Class B</li> <li>• Class 1</li> <li>• Class 2</li> </ul>	<ul style="list-style-type: none"> <li>• Class AA</li> <li>• Class A</li> <li>• Class B</li> <li>• Class 1</li> <li>• Class 2</li> </ul>
<b>Connection heads</b>	Type B (Type A flameproof)	Cable, optional with misc. plugs	<ul style="list-style-type: none"> <li>• Flying leads</li> <li>• Misc. plugs</li> </ul>
<b>Explosion protection (EU, CN, EAC, AU, NZ, US, CA)</b>	Intrinsic safety "i"/"IS"	Intrinsic safety "i"/"IS"	Intrinsic safety "i"/"IS"
<b>Output signal</b>	Sensor signal: <ul style="list-style-type: none"> <li>• 4 ... 20 mA (TH100/TH200)</li> <li>• HART (TH300)</li> <li>• PA (TH400)</li> <li>• FF (TH400)</li> </ul>	Sensor signal	Sensor signal
<b>Application</b>	Spare parts	<ul style="list-style-type: none"> <li>• Machinery and equipment</li> <li>• Bearing temperature</li> <li>• Surfaces</li> </ul>	<ul style="list-style-type: none"> <li>• Machinery and equipment</li> <li>• Bearing temperature</li> <li>• Surfaces</li> </ul>
<b>Limit temperat.<sup>1)</sup> [°C (°F)]</b>	<ul style="list-style-type: none"> <li>• Pt100 basis: -50 ... +400 (-58 ... +752)</li> <li>• Pt100 extended measuring range: -196 ... +600 (-321 ... +1112)</li> <li>• Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)</li> </ul>	<ul style="list-style-type: none"> <li>• Pt100 basis: -50 ... +400 (-58 ... +752)</li> <li>• Pt100 extended measuring range: -196 ... +600 (-321 ... +1112)</li> <li>• Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)</li> </ul>	<ul style="list-style-type: none"> <li>• Pt100 basis: -50 ... +400 (-58 ... +752)</li> <li>• Pt100 extended measuring range: -196 ... +600 (-321 ... +1112)</li> <li>• Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)</li> </ul>
<b>Max. nominal pressure<sup>1)</sup> (static pressure at 20°C)</b>	-	Compression fitting max. 5 bar (145 psi) Compression fitting: Gasket made of PTFE, temperature min./max. -20 ... 150°C	Compression fitting max. 5 bar (145 psi) Compression fitting: Gasket made of PTFE, temperature min./max. -20 ... 150°C
<b>Min. response time t<sub>0,5</sub></b>	2 ... 6 s	2 ... 6 s	2 ... 6 s
<b>Degree of protection</b>	IP54	See drawing page 2/8	See drawing page 2/8

<sup>1)</sup> Load combinations (temperature, flow, vibration, pressure) can at times significantly restrict these values. Other temperature limits result from e.g. thermowell materials with lower limit values [e.g. 1.4571 pressure resilient, 450 ... 550 °C (842 ... 1022 °F), limit temperature 800 °C (1472 °F)].


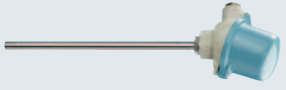
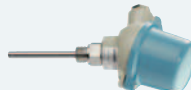
## Temperature Measurement

### SITRANS TS

#### Detailed product overview

Type	TS300 Modular	TS300 Clamp-on
<b>Description</b>	Temperature sensors for food, pharmaceuticals and biotechnology	Temperature sensors for food, pharmaceuticals and biotechnology
<b>Application</b>	Measurements submersed in medium (pipelines and vessels)	Clamp-on measurement of pipe surface temperature
<b>Version</b>	Protective pipe similar to DIN 43772, Type 2F and tapered design	Protective pipe similar to DIN 43772, Type 2F and tapered design
<b>Type</b>		For unfavorable space conditions
<b>Image</b>		
<b>Catalog page</b>	2/48	2/52
<b>Article No.</b>	7MC8005*	7MC8016
<b>Wetted material</b>	1.4404 or 1.4435 (316L)	1.4404 or 1.4435 (316L)
<b>Thermowell types</b>	Similar to 2F	Similar to 2F
<b>Process connections</b>	DIN 11851, clamp connection (Triclamp/ISO 2852/DIN 32676), Varivent, Ingold connection (Fermenter connection), Neumo Biocontrol, ball weld sleeve, (gaskets are not included in scope of delivery)	Clamp-on connections suitable for the following pipe diameters: <ul style="list-style-type: none"> <li>• Collar 4 ... 57 mm (0.16 ... 2.24 inch)</li> <li>• Tensioning 6 ... 50,8 mm (0.24 ... 2.00 inch)</li> <li>• Tensioning 50 ... 200 mm (1.97 ... 7.87 inch)</li> </ul>
<b>Sensor elements</b>	Pt100	Pt100
<b>Sensor connection</b>	<ul style="list-style-type: none"> <li>• 1x4 wire</li> <li>• 2x3 wire</li> </ul>	<ul style="list-style-type: none"> <li>• 1x3 wire</li> </ul>
<b>Sensor accuracy</b>	<ul style="list-style-type: none"> <li>• Class A</li> </ul>	<ul style="list-style-type: none"> <li>• Class A</li> <li>• Process-optimized design</li> </ul>
<b>Connection heads</b>	Typ B	<ul style="list-style-type: none"> <li>• Typ B</li> </ul>
<b>Explosion protection (EU, CN, EAC, AU, NZ, US, CA)</b>	-	-
<b>Output signal</b>	Sensor signal: <ul style="list-style-type: none"> <li>• 4 ... 20 mA (TH100/TH200)</li> <li>• HART (TH300)</li> <li>• PA (TH400)</li> <li>• FF (TH400)</li> </ul>	Sensor signal: <ul style="list-style-type: none"> <li>• 4 ... 20 mA TH100slim</li> <li>• HART (TH300)</li> <li>• PA (TH400)</li> <li>• FF (TH400)</li> </ul>
<b>Application</b>	Surface roughness: Standard applications Ra < 1.5 µm (5.9 10 <sup>-5</sup> inch)	Surface roughness: Standard applications Ra < 1.5 µm (5.9 10 <sup>-5</sup> inch)
<b>Limit temperat. <sup>1)</sup> [°C (°F)]</b>	-20 ... +400 °C (-4 ... +752 °F)	-40 ... +150 °C (-40 ... +302 °F)
<b>Max. nominal pressure<sup>1)</sup> (static pressure at 20°C)</b>	0 ... 150 (0 ... 5.91)      50 bar 150 ... 300 (5.91 ... 11.81)      40 bar	No pressure load due to clamp-on principle
<b>Min. response time t<sub>0.5</sub></b>	20 ... 34 s	4 s (See "Reference conditions SITRANS TS300 Clamp-on" page 2/19)
<b>Degree of protection</b>	IP54 ... IP68 dep. to connection head, see page 2/15	IP65 for pipe collar, IP67 for electrical connection

<sup>1)</sup> Load combinations (temperature, flow, vibration, pressure) can at times significantly restrict these values. Other temperature limits result from e.g. thermowell materials with lower limit values [e.g. 1.4571 pressure resilient, 450 ... 550 °C (842 ... 1022 °F), limit temperature 800 °C (1472 °F)].



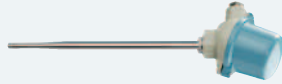
Type	TS500 for installation	TS500 Type 2	TS500 Type 2N
<b>Description</b>	Temperature sensors for the process industry (vessels and pipings)	Temperature sensors for the process industry (vessels and pipings)	Temperature sensors for the process industry (vessels and pipings)
<b>Application</b>	Temperature sensors for the installation of existing thermowells	Tubular version for minimal to medium stress	Tubular version for minimal to medium stress
<b>Version</b>	Suitable for thermowells as per DIN 43772 as well as ASME B40.9-2001	Thermowell as per DIN 43772, Type 2 without process connection	Thermowell Type 2N similar to DIN 43772, screwed in
<b>Type</b>	With extension <ul style="list-style-type: none"> <li>• European type</li> <li>• American type</li> </ul>	<ul style="list-style-type: none"> <li>• Without extension, plug-in</li> <li>• Use with moveable compression fittings</li> </ul>	Without extension
<b>Image</b>			
<b>Catalog page</b>	2/95	2/56	2/61
<b>Article No.</b>	Nr. 7MC750*	7MC751*-0*(A/B)**-0***	7MC751*-1****-0***
<b>Wetted material</b>	None: Measuring insert made of 1.4571, 1.4404 or 1.4435 (RTD); 2.4816 (TC) (316L; Inconel600)	1.4404 or 1.4435; 1.4571 (316L; 316TI)	1.4404 or 1.4435; 1.4571 (316L; 316TI)
<b>Thermowell types</b>	To order separately	Form 2	Form 2N (similar to form 2)
<b>Process connections</b>	Connection to thermowell: <ul style="list-style-type: none"> <li>• M14x1.5</li> <li>• M18x1.5</li> <li>• G 1/2</li> <li>• 1/2 NPT</li> </ul>	Compression fittings <ul style="list-style-type: none"> <li>• G 1/2</li> <li>• 1/2 NPT</li> </ul> For welding	<ul style="list-style-type: none"> <li>• G 1/2</li> <li>• 1/2 NPT</li> </ul>
<b>Insertion length</b>	<ul style="list-style-type: none"> <li>• 110 mm (4.33 inch)</li> <li>• 140 mm (5.51 inch)</li> <li>• 200 mm (7.87 inch)</li> <li>• 260 mm (10.24 inch)</li> <li>• 410 mm (16.14 inch)</li> </ul>	Variable	<ul style="list-style-type: none"> <li>• 100 mm (3.94 inch)</li> <li>• 160 mm (6.30 inch)</li> <li>• 230 mm (9.06 inch)</li> <li>• 360 mm (14.17 inch)</li> <li>• 510 mm (20.08 inch)</li> </ul>
<b>Extension length</b>	as per DIN 43772	as per DIN 43772	not adjustable X=20 mm (0.79 inch)
<b>Sensor elem.</b>	Pt100 + thermocouples	Pt100 + thermocouples	Pt100 + thermocouples
<b>Sensor connection</b>	<ul style="list-style-type: none"> <li>• 1 x 4 wire</li> <li>• 2 x 3 wire</li> </ul>	<ul style="list-style-type: none"> <li>• 1 x 4 wire</li> <li>• 2 x 3 wire</li> </ul>	<ul style="list-style-type: none"> <li>• 1 x 4 wire</li> <li>• 2 x 3 wire</li> </ul>
<b>Sensor accuracy</b>	<ul style="list-style-type: none"> <li>• Class AA</li> <li>• Class A</li> <li>• Class B</li> <li>• Class 1</li> <li>• Class 2</li> </ul>	<ul style="list-style-type: none"> <li>• Class AA</li> <li>• Class A</li> <li>• Class B</li> <li>• Class 1</li> <li>• Class 2</li> </ul>	<ul style="list-style-type: none"> <li>• Class AA</li> <li>• Class A</li> <li>• Class B</li> <li>• Class 1</li> <li>• Class 2</li> </ul>
<b>Conn. heads</b>	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)
<b>Explosion protection (EU, CN, EAC, AU, NZ, US, CA)</b>	<ul style="list-style-type: none"> <li>• Intrinsic safety "i"/"IS"</li> <li>• Flameproof enclosure "d"/"XP"</li> <li>• Non-sparking "nA"/"NI"</li> </ul>	<ul style="list-style-type: none"> <li>• Intrinsic safety "i"/"IS"</li> <li>• Flameproof enclosure "d"/"XP"</li> <li>• Non-sparking "nA"/"NI"</li> </ul>	<ul style="list-style-type: none"> <li>• Intrinsic safety "i"/"IS"</li> <li>• Flameproof enclosure "d"/"XP"</li> <li>• Non-sparking "nA"/"NI"</li> </ul>
<b>Output signal</b>	Sensor signal: <ul style="list-style-type: none"> <li>• 4 ... 20 mA (TH100/TH200)</li> <li>• HART (TH300)</li> <li>• PA (TH400)</li> <li>• FF (TH400)</li> </ul>	Sensor signal: <ul style="list-style-type: none"> <li>• 4 ... 20 mA (TH100/TH200)</li> <li>• HART (TH300)</li> <li>• PA (TH400)</li> <li>• FF (TH400)</li> </ul>	Sensor signal: <ul style="list-style-type: none"> <li>• 4 ... 20 mA (TH100/TH200)</li> <li>• HART (TH300)</li> <li>• PA (TH400)</li> <li>• FF (TH400)</li> </ul>
<b>Application</b>	Pressure vessel and piping	Pressure vessel and piping	Pressure vessel and piping
<b>Limit temperature<sup>1)</sup> [°C (°F)]</b>	<ul style="list-style-type: none"> <li>• Pt100 Basis: -50 ... +400 (-58 ... +752)</li> <li>• Pt100 extended measuring range: -196 ... +600 (-321 ... +1112)</li> <li>• Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)</li> </ul>	<ul style="list-style-type: none"> <li>• Pt100 Basis: -50 ... +400 (-58 ... +752)</li> <li>• Pt100 extended measuring range: -196 ... +600 (-321 ... +1112)</li> <li>• Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)</li> </ul>	<ul style="list-style-type: none"> <li>• Pt100 Basis: -50 ... +400 (-58 ... +752)</li> <li>• Pt100 extended measuring range: -196 ... +600 (-321 ... +1112)</li> <li>• Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)</li> </ul>
<b>Max. nominal pressure<sup>1)</sup> (static pressure at 20°C), dimensions in mm (inch)</b>	s. thermowell	Tube Ø9 (0.35): <ul style="list-style-type: none"> <li>• 0 ... 150 (0 ... 5.91) 50 bar</li> <li>• 150 ... 300 (5.91 ... 11.81) 40 bar</li> </ul> Compression fitting           Tube Ø12 (0.47): <ul style="list-style-type: none"> <li>• 0 ... 150 (0 ... 5.91) 75 bar</li> <li>• 150 ... 300 (5.91 ... 11.81) 60 bar</li> </ul> Compression fitting           Compression fitting: Gasket made of PTFE, temperature min./max. -20 ... 150°C	Tube Ø9 (0.35): <ul style="list-style-type: none"> <li>• 0 ... 150 (0 ... 5.91) 50 bar</li> <li>• 150 ... 300 (5.91 ... 11.81) 40 bar</li> </ul>
<b>Min. response time t<sub>0.5</sub></b>	s. thermowell	20 ... 45 s	20 ... 34 s
<b>Degree of prot.</b>	IP54 ... IP68 dep. on connection head see page 2/15	IP54 ... IP68 dep. on connection head see page 2/15	IP54 ... IP68 dep. on connection head see page 2/15

<sup>1)</sup> Load combinations (temperature, flow, vibration, pressure) can at times significantly restrict these values. Other temperature limits result from e.g. thermowell materials with lower limit values [e.g. 1.4571 pressure resilient, 450 ... 550 °C (842 ... 1022 °F), limit temperature 800 °C (1472 °F)].



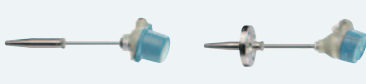
# Temperature Measurement

## SITRANS TS

### Detailed product overview

Type	TS500 Type 2G	TS500 Type 2F	TS500 Type 3
<b>Description</b>	Temperature sensors for the process industry (vessels and pipings)	Temperature sensors for the process industry (vessels and pipings)	Temperature sensors for the process industry (vessels and pipings) <b>Quicker than form 2</b>
<b>Application</b>	Pipe version for minimal to medium stress	Pipe version for minimal to medium stress	Pipe version for minimal to medium stress
<b>Version</b>	Thermowell as per DIN 43722, Type 2G, screwed in	Thermowell as per DIN 43722, Type 2F with flange	Thermowell as per DIN 43722, Type 3 without process connection, improved response time
<b>Type</b>	With extension	With extension	<ul style="list-style-type: none"> <li>Without extension, plug-in</li> <li>Use with moveable compression fittings</li> </ul>
<b>Image</b>			
<b>Catalog page</b>	2/66	2/71	2/76
<b>Article No.</b>	7MC751*-1*(A/B)**-1***	7MC751*-2*(A/B)**-1***	7MC751*-0*K**-0***
<b>Wetted mater.</b>	1.4404 or 1.4435; 1.4571 (316L; 316TI)	1.4404 or 1.4435; 1.4571 (316L; 316TI)	1.4404 or 1.4435; 1.4571 (316L; 316TI)
<b>Therm. types</b>	Form 2G	Form 2F	Form 3
<b>Process connections</b>	Welded threads: <ul style="list-style-type: none"> <li>G 1</li> <li>G 1/2</li> <li>1/2 NPT</li> </ul>	Welded flange <ul style="list-style-type: none"> <li>DN 25, PN10 ... 40</li> <li>1RF150</li> <li>1.5RF150</li> <li>1.5RF300</li> </ul>	Compression fittings <ul style="list-style-type: none"> <li>G 1/2</li> <li>1/2 NPT</li> </ul> For welding
<b>Insertion length</b>	<ul style="list-style-type: none"> <li>160 mm (6.30 inch)</li> <li>250 mm (9.84 inch)</li> <li>400 mm (15.75 inch)</li> </ul>	<ul style="list-style-type: none"> <li>225 mm (8.86 inch)</li> <li>315 mm (12.40 inch)</li> <li>465 mm (18.31 inch)</li> </ul>	<ul style="list-style-type: none"> <li>225 mm (8.86 inch)</li> <li>315 mm (12.40 inch)</li> <li>465 mm (18.31 inch)</li> </ul>
<b>Extension length</b>	As per DIN 43772	As per DIN 43772	As per DIN 43772
<b>Sensor elements</b>	Pt100 + thermocouples	Pt100 + thermocouples	Pt100 + thermocouples
<b>Sensor connection</b>	<ul style="list-style-type: none"> <li>1 x 4 wire</li> <li>2 x 3 wire</li> </ul>	<ul style="list-style-type: none"> <li>1 x 4 wire</li> <li>2 x 3 wire</li> </ul>	<ul style="list-style-type: none"> <li>1 x 4 wire</li> <li>2 x 3 wire</li> </ul>
<b>Sensor accuracy</b>	<ul style="list-style-type: none"> <li>Class AA</li> <li>Class A</li> <li>Class B</li> <li>Class 1</li> <li>Class 2</li> </ul>	<ul style="list-style-type: none"> <li>Class AA</li> <li>Class A</li> <li>Class B</li> <li>Class 1</li> <li>Class 2</li> </ul>	<ul style="list-style-type: none"> <li>Class AA</li> <li>Class A</li> <li>Class B</li> <li>Class 1</li> <li>Class 2</li> </ul>
<b>Connection heads</b>	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)
<b>Explosion protection (EU, CN, EAC, AU, NZ, US, CA)</b>	<ul style="list-style-type: none"> <li>Intrinsic safety "i"/"IS"</li> <li>Flameproof enclosure "d"/"XP"</li> <li>Non-sparking "nA"/"NI"</li> </ul>	<ul style="list-style-type: none"> <li>Intrinsic safety "i"/"IS"</li> <li>Flameproof enclosure "d"/"XP"</li> <li>Non-sparking "nA"/"NI"</li> </ul>	<ul style="list-style-type: none"> <li>Intrinsic safety "i"/"IS"</li> <li>Flameproof enclosure "d"/"XP"</li> <li>Non-sparking "nA"/"NI"</li> </ul>
<b>Output signal</b>	Sensor signal: <ul style="list-style-type: none"> <li>4 ... 20 mA (TH100/TH200)</li> <li>HART (TH300)</li> <li>PA (TH400)</li> <li>FF (TH400)</li> </ul>	Sensor signal: <ul style="list-style-type: none"> <li>4 ... 20 mA (TH100/TH200)</li> <li>HART (TH300)</li> <li>PA (TH400)</li> <li>FF (TH400)</li> </ul>	Sensor signal: <ul style="list-style-type: none"> <li>4 ... 20 mA (TH100/TH200)</li> <li>HART (TH300)</li> <li>PA (TH400)</li> <li>FF (TH400)</li> </ul>
<b>Application</b>	Pressure vessel and piping	Pressure vessel and piping	Pressure vessel and piping
<b>Limit temperat.<sup>1)</sup> [°C (°F)]</b>	<ul style="list-style-type: none"> <li>Pt100 Basis: -50 ... +400 (-58 ... +752)</li> <li>Pt100 extended measuring range: -196 ... +600 (-321 ... +1112)</li> <li>Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)</li> </ul>	<ul style="list-style-type: none"> <li>Pt100 Basis: -50 ... +400 (-58 ... +752)</li> <li>Pt100 extended measuring range: -196 ... +600 (-321 ... +1112)</li> <li>Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)</li> </ul>	<ul style="list-style-type: none"> <li>Pt100 Basis: -50 ... +400 (-58 ... +752)</li> <li>Pt100 extended measuring range: -196 ... +600 (-321 ... +1112)</li> <li>Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)</li> </ul>
<b>Max. nominal pressure<sup>1)</sup> (static pressure at 20°C), dimensions in mm (inch)</b>	<ul style="list-style-type: none"> <li>Tube Ø9 (0.35): <ul style="list-style-type: none"> <li>0 ... 150 mm (0 ... 5.91 inch) 50 bar</li> <li>150 ... 300 (5.91 ... 11.81) 40 bar</li> </ul> </li> <li>Compression fitting <ul style="list-style-type: none"> <li>Tube Ø12 (0.47): <ul style="list-style-type: none"> <li>0 ... 150 (0 ... 5.91) 75 bar</li> <li>150 ... 300 (5.91 ... 11.81) 60 bar</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Tube Ø9 (0.35): <ul style="list-style-type: none"> <li>0 ... 150 mm (0 ... 5.91 inch) 50 bar</li> <li>150 ... 300 (5.91 ... 11.81) 40 bar</li> </ul> </li> <li>Tube Ø12 (0.47): <ul style="list-style-type: none"> <li>0 ... 150 (0 ... 5.91) 75 bar</li> <li>150 ... 300 (5.91 ... 11.81) 60 bar</li> </ul> </li> <li>Note restriction imposed by PN of the flange</li> </ul>	<ul style="list-style-type: none"> <li>Tube Ø12 (0.47): <ul style="list-style-type: none"> <li>0 ... 200 (0 ... 7.87) 75 bar</li> <li>200 ... 300 mm (7.87 ... 11.81) 60 bar</li> </ul> </li> <li>Compression fitting <ul style="list-style-type: none"> <li>Compression fitting: Gasket made of PTFE, temperature min./max. -20 ... 150°C</li> <li>5 bar</li> </ul> </li> </ul>
<b>Min. response time t<sub>0.5</sub></b>	20 ... 34 s	20 ... 34 s	7 ... 15 s
<b>Degr. of protec.</b>	IP54 ... IP68 dep. on connection head see page 2/15	IP54 ... IP68 dep. on connection head see page 2/15	IP54 ... IP68 dep. on connection head see page 2/15

<sup>1)</sup> Load combinations (temperature, flow, vibration, pressure) can at times significantly restrict these values. Other temperature limits result from e.g. thermowell materials with lower limit values [e.g. 1.4571 pressure resilient, 450 ... 550 °C (842 ... 1022 °F), limit temperature 800 °C (1472 °F)].

Type	TS500 Type 3G	TS500 Type 3F	TS500 Type 4/4F
<b>Description</b>	Temperature sensors for the process industry (vessels and pipings) <b>Faster as form 2</b>	Temperature sensors for the process industry (vessels and pipings) <b>Faster as form 2</b>	Temperature sensors for the process industry (vessels and pipings) <b>Quick-response version available</b>
<b>Applic. area</b>	Tubular version for minimal to medium stress	Tubular version for minimal to medium stress	Barstock version for medium to highest stress
<b>Version</b>	Thermowell as per DIN 43722, Type 3G, screwed in	Thermowell as per DIN 43722, Type 3F with flange	Thermowell to DIN 43722: • Type 4 for weld-in • Type 4F with flange
<b>Type</b>	With extension	With extension	With extension
<b>Image</b>			
<b>Catalog page</b>	2/81	2/86	2/91
<b>Article No.</b>	7MC751*-1*K**-1***	7MC751*-2*K**-1***	7MC752*
<b>Wetted material</b>	1.4404 or 1.4435; 1.4571 (316L; 316Ti)	1.4404 or 1.4435; 1.4571 (316L; 316Ti)	Form 4F: 1.4404 or 1.4435; 1.4571 (316L; 316Ti) Additional Form 4: 1.7335; 1.5415(A 182 F11; A 204 Size A)
<b>Thermowell types</b>	Form 3G	Form 3F	• Form 4 • Form 4F
<b>Process connections</b>	Welded threads: • G 1 • G 1/2 • 1/2 NPT	Welded flange • DN 25, PN10 ... 40 • 1RF150 • 1.5RF150 • 1.5RF300	For 4 for welding in, Form 4F with flange: • DN 25, PN10 ... 40 • 1RF150 • 1RF300 • 1.5RF150 • 1.5RF300
<b>Insertion length</b>	• 160 mm (6.30 inch) • 220 mm (8.66 inch) • 280 mm (11.02 inch)	• 225 mm (8.86 inch) • 285 mm (11.22 inch) • 345 mm (13.58 inch)	Form 4F: as per customer-specification Form 4: • 110 mm (4.33 inch) fast • 140 mm (5.51 inch) fast/normal • 200 mm (7.87 inch) fast/normal • 260 mm (10.23 inch) normal
<b>Extension length</b>	As per DIN 43772	As per DIN 43772	As per DIN 43772
<b>Sensor elem.</b>	Pt100 + thermocouples	Pt100 + thermocouples	Pt100 + thermocouples
<b>Sensor connection</b>	• 1 x 4 wire • 2 x 3 wire	• 1 x 4 wire • 2 x 3 wire	• 1 x 4 wire • 2 x 3 wire
<b>Sensor accuracy</b>	• Class AA • Class A • Class B • Class 1 • Class 2	• Class AA • Class A • Class B • Class 1 • Class 2	• Class AA • Class A • Class B • Class 1 • Class 2
<b>Conn. heads</b>	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)
<b>Explosion protection (EU, CN, EAC, AU, NZ, US, CA)</b>	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Dust protection by enclosure "t"/"DIP" • Non-sparking "nA"/"NI"	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Non-sparking "nA"/"NI"	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • Non-sparking "nA"/"NI"
<b>Output signal</b>	Sensor signal: • 4 ... 20 mA (TH100/TH200) • HART (TH300) • PA (TH400) • FF (TH400)	Sensor signal: • 4 ... 20 mA (TH100/TH200) • HART (TH300) • PA (TH400) • FF (TH400)	Sensor signal: • 4 ... 20 mA (TH100/TH200) • HART (TH300) • PA (TH400) • FF (TH400)
<b>Application</b>	Vessels and pipings	Vessels and pipings	Vessels and pipings
<b>Limit temperat.<sup>1)</sup> [°C (°F)]</b>	• Pt100 Basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 °C (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)	• Pt100 Basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 °C (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)	• Pt100 Basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 °C (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)
<b>Max. nominal pressure<sup>1)</sup> (static pressure at 20°C), dimensions in mm (inch)</b>	Pipe Ø12 (0.47): • 0 ... 200 • 200 ... 300 75 bar 60 bar	Pipe Ø12 (0.47): • 0 ... 200 • 200 ... 300 75 bar 60 bar Note restriction imposed by PN of the flange	Mat. (1.4404; 1.4571) : • 65 • 125 450 bar 350 bar Mat. (1.7335; 1.5415) : • 65 • 125 500 bar 400 bar Form 4F: Note restriction imposed by PN of the flange
<b>Min. response time t<sub>0,5</sub></b>	7 ... 15 s	7 ... 15 s	Ø24 mm (0.95 inch): 20 ... 45 s
<b>Deg. of protect.</b>	IP54 ... IP68 dep. on connection head, see page 2/15	IP54 ... IP68 dep. on connection head, see page 2/15	IP54 ... IP68 dep. on connection head, see page 2/15

<sup>1)</sup> Load combinations (temperature, flow, vibration, pressure) can at times significantly restrict these values. Other temperature limits result from e.g. thermowell materials with lower limit values [e.g. 1.4571 pressure resilient, 450 ... 550 °C (842 ... 1022 °F), limit temperature 800 °C (1472 °F)].

## Temperature Measurement

### SITRANS TS

#### Detailed product overview

Type	TS Thermowells 7MT14..	TS Thermowells 7MT2..	TS Thermowells 7MT3..	TS Thermowells 7MT4..	TS Thermowells 7MT5..
<b>Description</b>	Thermometer thermowells for the process industry				
<b>Application</b>	Barstock version for medium to extreme stress				
<b>Version</b>	Thermowell according to DIN 43772		Thermowell according to ASME B40.9		
<b>Type</b>	With flange connection or for welding	For screwing in	For welding	With flange connection	Van Stone version
<b>Catalog page</b>	2/105	2/108	2/108	2/109	2/109
<b>Article No.</b>	7MT14..	7MT21.. (straight) 7MT22.. (reduced) 7MT23.. (tapered)	7MT31.. (straight) 7MT32.. (reduced) 7MT33.. (tapered)	7MT41.. (straight) 7MT42.. (reduced) 7MT43.. (tapered)	7MT51.. (straight) 7MT52.. (reduced) 7MT53.. (tapered)
<b>Material, in contact with media</b>	<ul style="list-style-type: none"> <li>• 316Ti/1.4571</li> <li>• 316L/1.4404</li> <li>• Hastelloy C276/2.4819</li> <li>• 1.5415 Heat-resistant</li> <li>• 1.7335 Heat-resistant</li> <li>• PTFE coating (thermowell made of 316/Ti/L)</li> <li>• ECTFE (HALAR) thermowell made of 316/Ti/L)</li> <li>• Stellite coating (thermowell made of 316/Ti/L)</li> </ul>	<ul style="list-style-type: none"> <li>• 316L/1.4404</li> <li>• Carbon steel</li> <li>• 304L/1.4306</li> <li>• 321/1.4541</li> </ul>	<ul style="list-style-type: none"> <li>• 316L/1.4404</li> <li>• Carbon steel</li> <li>• 304L/1.4306</li> <li>• 321/1.4541</li> </ul>	<ul style="list-style-type: none"> <li>• 316L/1.4404</li> <li>• Carbon steel</li> <li>• Hastelloy C276/2.4819</li> <li>• Hastelloy C22/2.4602</li> <li>• 304L / 1.4306</li> <li>• 321 / 1.4541</li> <li>• Monel alloy 400/2.4360</li> <li>• Duplex/1.4462</li> <li>• Superduplex</li> <li>• Tantalum coating on 316</li> <li>• PTFE coating thermowell made of 316/Ti/L)</li> <li>• ECTFE (HALAR) thermowell made of 316/Ti/L)</li> <li>• Stellite coating thermowell made of 316/Ti/L)</li> </ul>	<ul style="list-style-type: none"> <li>• 316L/1.4404</li> <li>• Hastelloy C276/2.4819</li> <li>• Hastelloy C22/2.4602</li> <li>• 304L / 1.4306</li> <li>• 321 / 1.4541</li> <li>• Monel alloy 400/2.4360</li> <li>• Duplex/1.4462</li> <li>• Superduplex</li> <li>• Tantalum coating on 316</li> <li>• PTFE coating thermowell made of 316/Ti/L)</li> <li>• ECTFE (HALAR) thermowell made of 316/Ti/L)</li> <li>• Stellite coating thermowell made of 316/Ti/L)</li> </ul>
<b>Thermowell forms</b>	• Straight/tapered	<ul style="list-style-type: none"> <li>• straight</li> <li>• reduced (staggered)</li> <li>• tapered</li> </ul>			
<b>Process connections</b>	<ul style="list-style-type: none"> <li>• Without (for direct welding)</li> <li>• Flange connection</li> <li>• EN 1092-1: DN 40, 50/ PN 10-16, 25-40</li> <li>• ASME B16.5: 1,5" 2"/ Class 150, 300, 600</li> </ul>	<ul style="list-style-type: none"> <li>• M20x1.5</li> <li>• M27x2.0</li> <li>• M33x2.0</li> <li>• 1/2-14 NPT</li> <li>• 3/4 NPT</li> <li>• 1 NPT</li> <li>• G1/2</li> <li>• G3/4</li> <li>• G1</li> <li>• R1/2</li> <li>• R3/4</li> <li>• R1</li> </ul>	<ul style="list-style-type: none"> <li>• 26.7 mm</li> <li>• 33.4 mm</li> <li>• 48.3 mm</li> </ul>	<ul style="list-style-type: none"> <li>• EN 1092-1: DN 25, 40, 50/ PN 10-16, 25-40</li> <li>• ASME B16.5: 1", 1.5, "2", 3", 4"/ Class 150, 300, 600</li> </ul>	<ul style="list-style-type: none"> <li>• 33,4 mm/51 mm</li> <li>• 48,3 mm/73 mm</li> <li>• 60,3 mm/92 mm + collar flanges</li> <li>• ASME B16.5: 1", 1,5" 2"/ Class 150, 300, 600</li> </ul>
<b>Installation length</b>	Standard length and free configuration				
<b>Extension length</b>	Standard length and free configuration				
<b>Explosion protection</b>	Not Ex-relevant, but offers zone separation when wall thickness of 1 mm for anti-corrosive materials, or otherwise 3 mm is observed. Not for coated versions.				
<b>Application</b>	Pipelines and containers				
<b>Limit temperatures</b>	Material-dependent				
<b>Max. static pressure</b>	Material-dependent				
<b>Min. response time</b>	20 s... several minutes				
<b>Degree of protection</b>	but offers zone separation when wall thickness of 1 mm for anti-corrosive materials, or otherwise 3 mm is observed				