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Overview

	Type	Description	Page	Software for parameterization
Temperature sensors				
	TS100	• Cable connection • Universal use • For unfavorable space conditions • Mineral-insulated	2/40	-
	TS200	• Compact version • Universal use • Mineral-insulated • For unfavorable space conditions	2/43	-
	TS300	Resistance thermometer for food, pharmaceiticals and biotechnology • Modular design, for installation in pipe-lines and tanks	2/46	
		• Clamp-on design, for attachment on the pipe primarily for sterilization processes	2/50	
	TS500, Type 2	• For the process industry (piping and tanks) • Tubular thermowell for minimal to medium stress • Thermowell as per DIN 43772, Type 2 without process connection • Without extension, plug-in or use with moveable compression fittings	2/54	-
	TS500, Type 2N	• For the process industry (vessels and pipings) • Tubular thermowell for minimal to medium stress • Thermowell Type 2N similar to DIN 43772, screwed in • Without extension, connection head not adjustable	2/59	-
	TS500, Type 2G	• For the process industry (vessels and pipings) • Tubular version for minimal to medium stress • Thermowell as per DIN 43722, Type 2G, screwed in • With extension	2/64	-
	TS500, Type 2F	• For the process industry (vessels and pipings) • Tubular version for minimal to medium stress • Thermowell as per DIN 43722, Type 2F with flange • With extension	2/69	-

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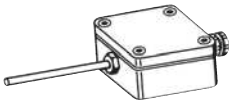
	Type	Description	Page	Software for parameterization
	TS500, Type 3	• For the process industry (vessels and pipings) • Tubular thermowell for minimal to medium stress • Thermowell as per DIN 43722, Type 3 without process connection, improved response time • Without extension, plug-in or use with moveable compression fittings	2/74	-
	TS500, Type 3G	• For the process industry (vessels and pipings) • Tubular version for minimal to medium stress • Thermowell as per DIN 43722, Type 3G, screwed in, improved response time • With extension	2/79	-
	TS500, Type 3F	• For the process industry (vessels and pipings) • Tubular thermowell for minimal to medium stress • Thermowell as per DIN 43722, Type 3F with flange, improved response time • With extension X	2/84	-
 	TS500, Type 4 TS500, Type 4F	• For the process industry (vessels and pipings) • Barstock thermowell for medium to highest stress • Thermowell as per DIN 43722 • Type 4 for weld-in • Type 4F with flange	2/89	-
	TS500, installation	• For the process industry (vessels and pipings) • For the installation of existing thermowells • Suitable for thermowells as per DIN 43772 as well as ASME B40.9-2001 • With European or American type extension	2/93	-
Measuring inserts for temperature sensors				
	European type	• Replaceable • Mineral-insulated	2/98	-
	American type		2/101	-
Temperature sensors for combustion processes and damp rooms				
	Flue gas resistance thermometers	Largest measuring range: -50 ... +600 °C (-58 ... +1112 °F)	2/103	
	Resistance thermometers for damp rooms	Largest measuring range: -30 ... +60 °C (-22 ... +140 °F)	2/104	
	Straight thermocouples	Largest measuring range: 0 ... 1250 °C (32 ... 2282 °F)	2/108	

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	Application	Mounting of transmitter with Ex protection		Page	Software for parameterization
		Transmitter	Sensor		
Temperature transmitter in a compact design					
	**SITRANS TH100 Slim** For temperature measurement in combination with Pt100 compact resistance thermometers	-	-	2/111	SIPROM T
Temperature transmitter for head mounting					
	**SITRANS TH100** Transmitters for Pt100	Zone 2, zone 1	Zone 2, zone 1, zone 0	2/114	SIPROM T
	**SITRANS TH200** Transmitters for connection to resistance thermometers, resistance-based sensors, thermocouples and DC voltages up to 1.1 V • Two-wire system • Universal	Zone 2, zone 1	Zone 2, zone 1, zone 0	2/118	SIPROM T
	**SITRANS TH300** Transmitters for connection to resistance thermometers, resistance-based sensors, thermocouples and DC voltages up to 1.1 V • Two-wire system • Universal • HART	Zone 2, zone 1	Zone 2, zone 1, zone 0	2/125	SIMATIC PDM
	**SITRANS TH400** Transmitters for connection to resistance thermometers, resistance-based sensors, thermocouples and DC voltages • Fieldbus transmitters • PROFIBUS PA • FOUNDATION fieldbus	Zone 2, zone 1, zone 21	Zone 2, zone 1, zone 0, zone 21, zone 20	2/132	SIMATIC PDM for TH 400 with PROFIBUS PA

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	Application	Mounting of transmitter with Ex protection		Page	Software for parameterization
		Transmitter	Sensor		
Temperature transmitters for rail mounting					
	**SITRANS TR200** • Two-wire system • Universal	Zone 2, zone 1, zone 21	Zone 2, zone 1, zone 0, zone 21, zone 20	2/138	SIPROM T
	**SITRANS TR300** • Two-wire system • Universal • HART	Zone 2, zone 1, zone 21	Zone 2, zone 1, zone 0, zone 21, zone 20	2/145	SIMATIC PDM
	**SITRANS TW** • Four-wire system • Universal • HART	Safe area	Zone 1, zone 0, zone 21, zone 20	2/152	SIMATIC PDM
Temperature transmitters for field mounting					
	**SITRANS TF280** Transmitter for connection to resistance-based sensor • In field enclosure for heavy industrial use • battery-operated • WirelessHART	-	-	2/164	Local operation via buttons SIMATIC PDM local with HART modem and wireless via WirelessHART
	**SITRANS TF** Transmitters for connection to resistance thermometers, resistance-based sensors, thermocouples and DC voltages up to 1.1 V • In field enclosure for heavy industrial use • HART, Universal	Zone 2, zone 1	Zone 2, zone 1, zone 0	2/169	Depending on the installed TH200/TH300 transmitter
	**SITRANS TF** Fieldbus transmitters for connection to resistance thermometers, resistance-based sensors, thermocouples and DC voltages up to 0.8 V • In field enclosure for heavy industrial use • PROFIBUS PA • FOUNDATION fieldbus	Zone 2, zone 1	Zone 2 zone 1, zone 0	2/178	SIMATIC PDM for PROFIBUS PA
Field indicator for 4 to 20 mA signals					
	**SITRANS TF** Field indicator for 4 to 20 mA signals Display of units can be user-defined	Zone 2, zone 1	-	2/169	--

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	Application	Mounting of transmitter with Ex protection		Page	Software for parameterization
		Transmitter	Sensor		
Multipoint temperature transmitter					
	**SITRANS TO500** NEW Multipoint temperature transmitter for measuring temperatures and temperature profiles using fiber optic Multipoint temperature measurement lances.	Zone 2, Zone 22	Zone 0, Zone 20	2/185	Via Ethernet with the supplied parameter assignment software

Product documentation on DVD and Safety Note

Siemens products for process instrumentation will be delivered with a multi-language **Safety note** and a **Mini DVD - Process Instrumentation and Weighing Systems.**

On the DVD, customers can find many important operating instructions and certificates of our Siemens portfolio for process instrumentation and weighing systems.
Additionally, product or order-specific print material might be part of the delivery.

For further information see appendix page 10/11.

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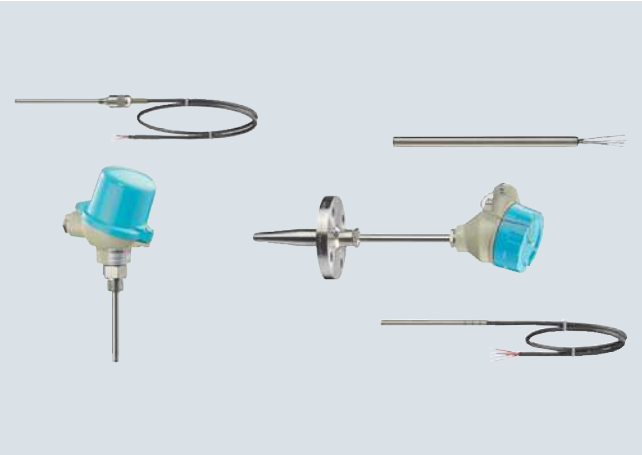
Overview



Temperature sensors of the SITRANS TS product family are used to measure temperatures in industrial equipment.

Siemens offers the following temperature sensors:

- SITRANS TS100
  - General use
  - Compact design with connection cable
- SITRANS TS200
  - General use
  - Compact design with plug/wire ends
- SITRANS TS300
  - Use in food, pharmaceuticals and biotechnology
  - Modular or clamp-on design
- SITRANS TS500
  - General use
  - Modular design with connection head and thermowell

Benefits

The modular design makes it possible to customize the temperature sensor for most applications, while still being able to use many standardized individual components.

Application

Depending on the specification, sensors can be combined with different connection heads, neck tubes and process connections. As a result, the sensors can be used in a large number of technical applications in the following industries:

- Chemical industry
- Petrochemical industry
- Power engineering
- Primary industry
- Pharmaceutical industry
- Biotechnology
- Food manufacturing

SITRANS TS100 and SITRANS TS200

Temperature sensors of the SITRANS TS100 series are cable thermometers with different electrical connection options (e.g. plug, soldered connections, connection cables)

The SITRANS TS200 series of compact thermometers is charcterized by a compact design. Both temperature sensor series are suitable for the following:

- Measurements of temperatures of solids, where additional thermowells are not required for replacements done during ongoing operations, e.g. bearing block temperature.
- Measurements which are particularly critical with regard to response times. The advantages offered by an additional thermowell are purposely omitted.
- Measuring points which must be easy to convert or relocate.
- Surface temperature measurements: The temperature sensor is used in conjunction with a surface connection piece.
- Cost-effective transport: The mineral-insulated design allows for economically feasible transport even at large lengths. From a length of 0.8 m (2.63 ft), the sensors can be delivered rolled up or bended.

SITRANS TS300 temperature sensors for food, pharmaceuticals and biotechnology

The temperature sensors of the SITRANS TS300 series are thermometers especially designed for measurements with high hygienic demands, such as in the food, pharmaceutical and biotechnology industries. The basic versions are:

- Thermometers in modular design with replaceable measuring insert and process connections usual in the industry
- Clamp-on thermometers for measurement of the pipe surface temperature without interrupting the process

SITRANS TS500 Temperature sensors as a module system

Due to their modular design, temperature sensors of the SITRANS TS500 series are well suited to a large number of applications.

The replaceable measuring insert makes it possible to conduct maintenance work even during ongoing operations. These devices are used particularly frequently in vessels and pipelines of the following industries:

- Power stations
- Chemical industry
- Petrochemical industry
- General process engineering
- Water, waste water

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2

Design

SITRANS TS100 7MC711xx

The following image illustrates the available designs for SITRANS TS100 temperature sensors:

SITRANS TS100, mineral-insulated (MIC)
IP54 at the transition sensor/cable, plug see table

Version	Degree of protection
Flying leads	IP00
LEMO coupling 1S	IP50
M12 plugs	IP54
Thermocouple coupling	IP20

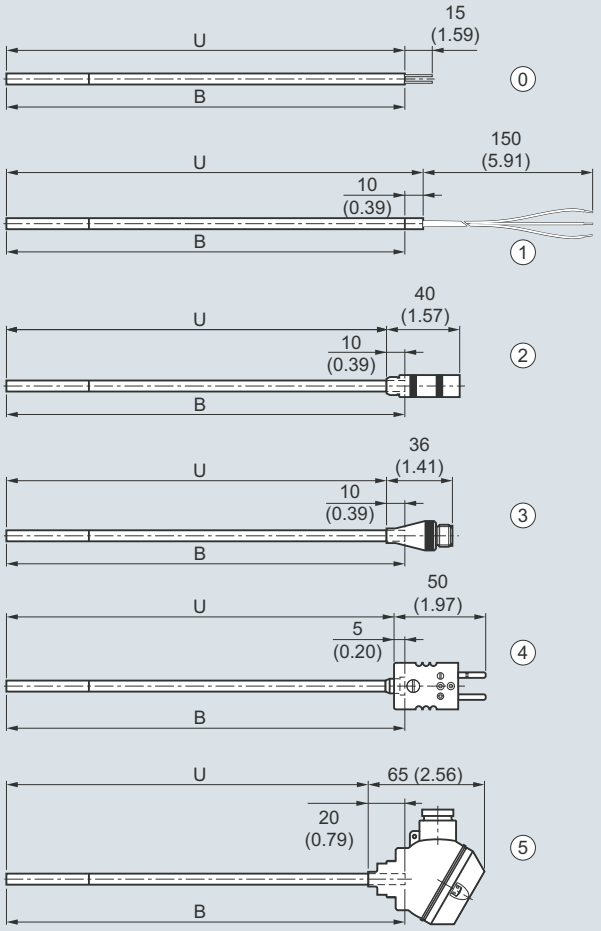
SITRANS TS100

The following types of process connections can be implemented:

- Compression fitting
- Spring-loaded compression fitting
- Soldering nipple
- Direct soldering/welding in

SITRANS TS200 7MC712xx

The following image illustrates the available designs for SITRANS TS200 temperature sensors:



B Measuring insert length
H Head height
U Insertion length

0	Basic sensor	**U = B**	IP00
1	Flying leads	**U = B + 10 (0.39)**	IP00
2	LEMO coupling 1S	**U = B - 10 (0.39)**	IP50
3	M12 plugs	U = B - 10 (0.39)	IP54
4	Thermocouple coupling	**U = B - 5 (0.20)**	IP20
5	Mini connection head	U = B - 20 (0.79)	IP54

SITRANS TS 200, dimensions in mm (inch)

The following types of process connections can be implemented:

- Compression fitting
- Spring-loaded compression fitting
- Soldering nipple
- Direct soldering/welding in

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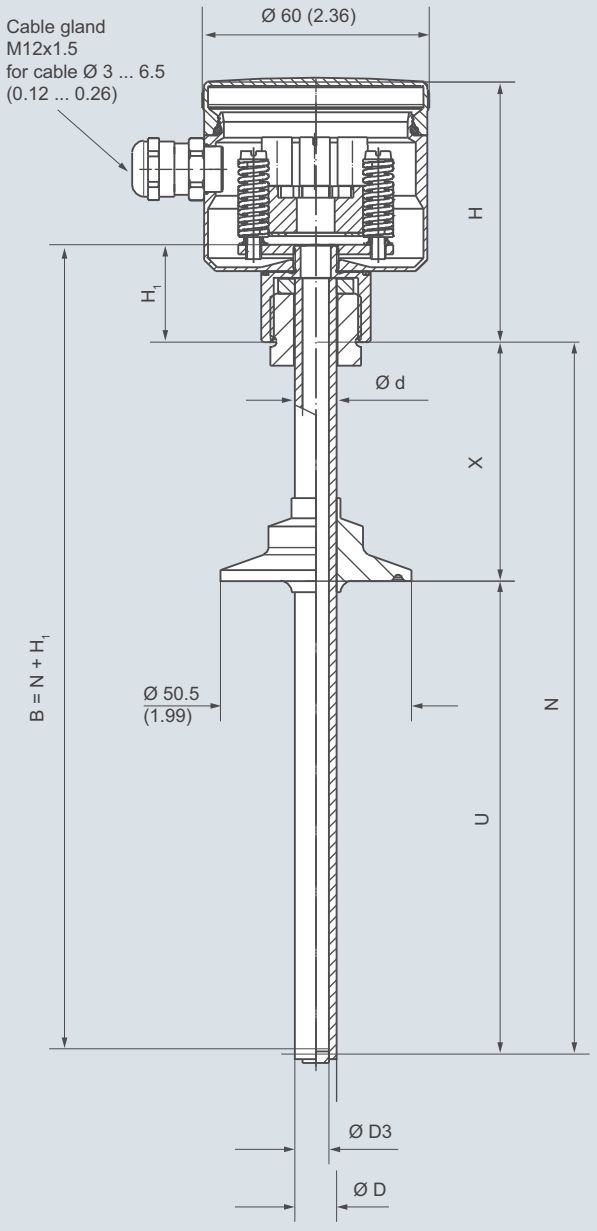
SITRANS TS300

SITRANS TS300 modular design

The following figure shows the available versions and components of the SITRANS TS300 temperature sensors in modular design.



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD3	Protective pipe inner diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
N	Nominal length
U	Insertion length
X	Extension length

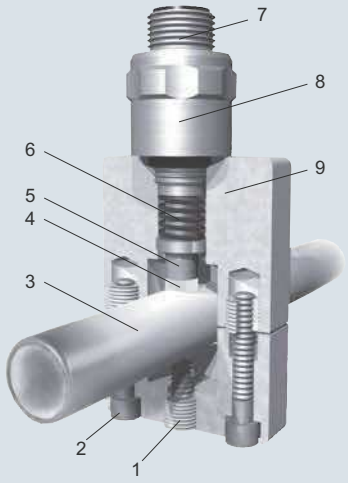
SITRANS TS modular design, dimensions in mm (inch)

SITRANS TS300 Clamp-on

Temperature measurement is carried out over a modified and quick-response Pt100 measuring element, which is positioned and insulated over a pipe collar made of heat-resistant plastic.

The measuring insert contains a special temperature sensor tip made of silver, which is pressed evenly onto the pipeline by means of a spring.

The compulsory guide of the replaceable measuring insert ensures even pressure contact on the pipeline, which ensures a reproducible measuring result.



Design	
Measuring insert	• Special measuring insert made of stainless steel; hygienic design • Measuring element made of silver, thermal decoupling through plastic insert Measuring insert screwed into collar with spring load. Use heat-conductive-compound (see accessories) prior to mounting the device.
Pipe collar	
• Material	Temperature resistant high-performance plastic with integrated insulating system in the hygienic design
• Ambient temperature influence	Approx. 0.2 %/10 K

The pipe diameter of the measuring tube is required for correct device selection. For special sizes, you start by selecting the matching collar size and entering the required size in plain text. Space-saving designs are available (latch fastener version) for installation in a limited space (e.g., tube bundles).

For correct assignment after recalibration, the collar as well as the measuring insert are identified with serial number and pipe diameter. This information can also be engraved.

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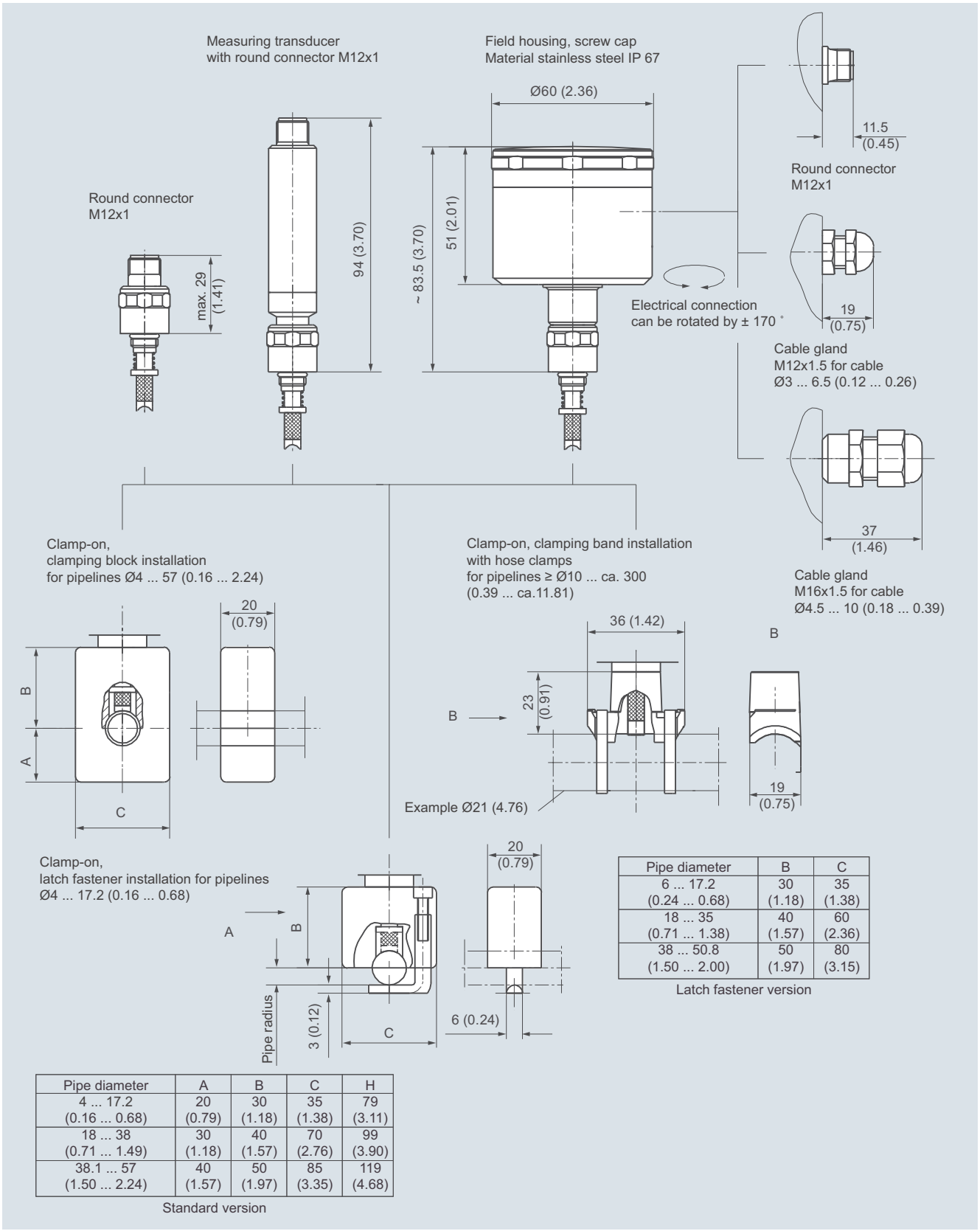
Technical description

The following figure illustrates the available designs and components for SITRANS TS300 temperature sensors in clamp-on design:



Pipe diameter	B	C
6 ... 17.2 (0.24 ... 0.68)	30 (1.18)	35 (1.38)
18 ... 35 (0.71 ... 1.38)	40 (1.57)	60 (2.36)
38 ... 50.8 (1.50 ... 2.00)	50 (1.97)	80 (3.15)

Latch fastener version

Pipe diameter	A	B	C	H
4 ... 17.2 (0.16 ... 0.68)	20 (0.79)	30 (1.18)	35 (1.38)	79 (3.11)
18 ... 38 (0.71 ... 1.49)	30 (1.18)	40 (1.57)	70 (2.76)	99 (3.90)
38.1 ... 57 (1.50 ... 2.24)	40 (1.57)	50 (1.97)	85 (3.35)	119 (4.68)

Standard version

SITRANS TS300 clamp-on design, round connector, field enclosure, cable gland, versions, dimensions in mm (inch)

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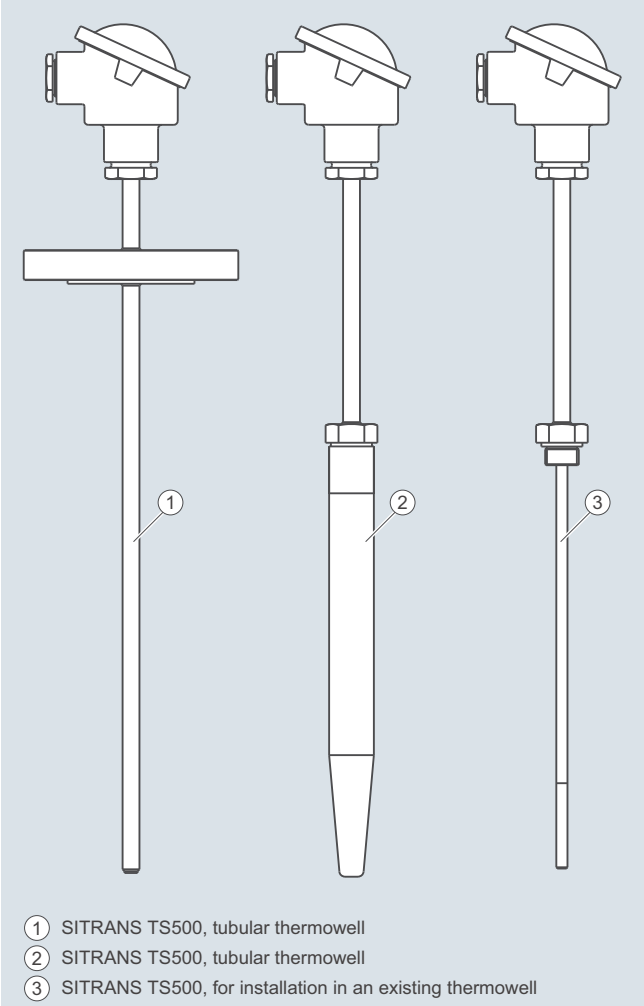
SITRANS TS500 7MC75xx

The following image illustrates the available designs for SITRANS TS500 temperature sensors:



1 SITRANS TS500, tubular thermowell
2 SITRANS TS500, tubular thermowell
3 SITRANS TS500, for installation in an existing thermowell

SITRANS TS500 temperature sensors; the IP degree of protection depends on the connection head (see page 2/84)

The temperature sensors of the SITRANS TS500 series are available in three different designs:

Version	Description	Application	Process connection
1	• Tubular thermowell • Tubular thermowell and extension made of one pipe; closed at the tip with a welded bottom cap	Minimal to medium process load	• Welded connection with thread or flange • connection with compression fitting
2	• Barstock thermowell • Barstock thermowell, tubular extension, extension screwed into thermowell	Medium to highest process load	• Directly welded into pipeline • With welded flange • With male thread
3	• For installation into existing thermowells. • Tubular extension	Process load depends on thermowell design	Screwed into existing thermowell

Function

A complete measuring point consists of a measuring insert which contains the basic sensors, the protective fitting and an optional measurement value processor (transmitter).

The basic sensors are:

- Resistance thermometers:
  Temperature measurement is based on the temperature dependency of the installed measuring resistor.
- Thermocouples:
  Temperature measurement is based on the Seebeck effect. A thermocouple which subjected to a temperature drop produces thermoelectric voltage that can be measured.

Transmitters:

The optional Siemens transmitters assume the following functions:

- Optimum measurement processing
- Strengthening of weak sensor signals directly on site
- Transmits standardized signals
- Protects against electromagnetic interfrences
- Support enhanced diagnosis options

The resistance thermometer is intended for installation in containers and pipelines for hygienic requirements.

- Modular design consisting of protective pipe, measuring insert, connection head and optional transmitter for replacement during operation.
- Hygienic version, design according to recommendations of the EHEDG
- Transmitter can be integrated (4 to 20 mA, PROFIBUS PA or FOUNDATION Fieldbus)

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2

Configuration

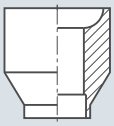
Components: Process connections

This catalog is limited to the standard versions. Special versions are available on request. The technical data is designed to assist the user. It is the responsibility of the ordering party to make the correct selection of suitable devices.

Welding

A welded thermowell provides a permanent, secure and highly resilient process connection. This advantage requires an adequate weld-in quality.

It is not possible to accidentally open the process conneciton. Additional gaskets are not required. If the tube is not thick enough to ensure a secure welding connection, the appropriate weldable sockets are used. With weldable sockets of matching length it is also possible to largely stadardize a plant's measuring points. Stocks of spare parts can therefore be reduced to a minimum

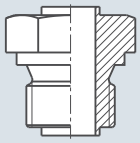


Weldable sockets

Thread

Type of installation: Welded threads

Welded threads of different thread types and sizes are firmly welded to the thermowell.



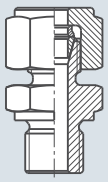
Welded threads

Type of installation: Compression fittings

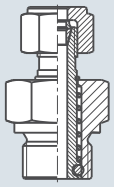
Compression fittings are available as accessories. They fit with the diameter of the thermowell and provide for flexible installation. The mounting length can be selected on site. When installed correctly, compression fittings are well suited for low and medium pressure.

The difference between a normal and spring-loaded design is as follows:

In the case of spring-loaded compression fitting, the sensor is pressed against the measured object or the tip of the thermowell, thus achieving outstanding heat contact.



Compression fitting

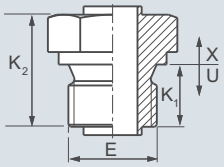


Spring-loaded compression fitting

Thread form

Cylindrical thread

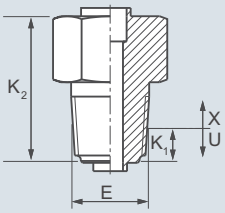
Cylindrical threads do not seal in the thread but due to an additional sealing face or seal. For example, threads with the short form "G" (as per ISO 228) feature a threat type with a defined screw gauge.



Cylindrical thread

Tapered thread

By contrast, tapered threads, such as the American "NPT" thread, seal metallically in the thread. The relevant length information in the catalog refers to the "fully-tightened point" of the thread, which cannot be defined exactly due to standard-related tolerances. However, the spring unit of the measuring insert compensates for the differences in length.



NPT thread

	Thread form	E / E_1	K_1	K_2
Protective tube shape 2G + 3G	Cylindrical	G 1/2"	15	27
		G 1"	30	46
	Tapered	NPT 1/2"	9	30
Extensions 7MC7500	Cylindrical	M14 x 1.5	12	23
		M18 x 1.5	12	25
		G 1/2"	12	27
	Tapered	NPT 1/2"	9	33

X = extension length
U = installation length
E_1 = neck tube / process connection
K_1 = penetration depth
K_2 = length of the process connection

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Flanges

The different properties of the flanges are as follows:

- Standard series EN 1092, ASME 16.5,..
- Nominal pressure
- Nominal diameter
- Sealing face

This information is stamped into the flange, as well as the material code and batch number for "3.1 Material".

Industry-specific process connections

Special process connections have become popular in different industries. For example, hygiene technology: clamp connections, milk pipe unions and others.

Components: Thermowell

Thermowells fulfill two basic functions:

- They protect the measuring insert from aggressive media
- They make it possible to replace units during ongoing operations

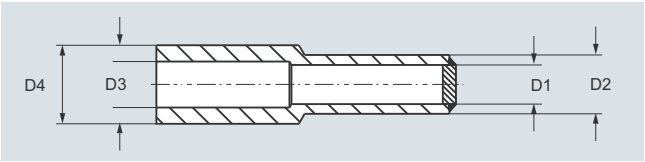
This catalog is limited to the standard versions. Special versions are available on request. The large number of available types can be classified as follows:

- Tubular thermowells
  Tubular thermowells are also described as "welded" or "multi-part" thermowells (not to be confused with "multi-part protective armatures"). They are suitable for low to medium process loads and can be manufactured on a cost-effective basis.
  Versions :
  - Form 2N similar to DIN 43772
    with straight tip and shortest possible extension length
    not adjustable connection head
  - Form 2 as per DIN 43772
    with straight tip and extension
    adjustable connection head
  - Form 2: with process connection
    Form 2G: Threaded connection
    Form 2F: Flange connection
  - Form 3 as per DIN 43772
    Design with tapered tip and extension
    adjustable connection head
    For these thermowells, thermowell tip is tapered by rotary swaging. This results in an excellent fit with the measuring insert and very good response times.
    Analogous to forms 2, versions 3/3G/3F are also available for form 3
- Barstock thermowells
  Where process loads are too high, or where thermowells with welded seams are not allowed, deep hole drilled barstock thermowells are used. Form 4 thermowells (as per DIN 43772) are very popular in this area. This thermowell type replaces the D1-D5 types of the predecessor standard DIN 43763:

DIN 43763 design invalid	**DIN 43772 design 4 current**	
	L in mm	**U in mm**
D1	140	65
D2	200	125
D4	200	65
D5	260	125

The following table shows the dimensions of the different thermowells.

	Tip		**Process connection**	
	Ø Inner [mm (inch)]	**Ø Outer [mm (inch)]**	**Ø Inner [mm (inch)]**	**Ø Outer [mm (inch)]**
Thermowell type, design	**D_1**	**D_2**	**D_3**	**D_4**
2N/2/2G/2F, tubular	7 (0.28)	9 (0.35)	7 (0.28)	9 (0.35)
2/2G/2F, tubular	7 (0.28)	12 (0.47)	7 (0.28)	12 (0.47)
3/3G/3F, tubular	6 (0.24) tolerance acc. to DIN 43772	9 (0.35)	7 (0.28)	12 (0.47)
4/4F, barstock	7 (0.28)	12,5 (0.49)	7 (0.28)	24 (0.94)
4/4F, fast response, barstock	3.5 (0.14)	9 (0.35)	3.5 (0.14)	18 (0.71)



Sizing of thermowells

Components: Extension (neck tube)

The extension is the section from the lower edge of the connection head to the fixed point of the process connection or thermowell. There is a variety of terms for this components, e.g. neck tube. For this reason the term extension has been selected as a standardized term for the different designs. Function is the deciding factor:

- Thermal decoupling of connection head from process temperature see image page 2/91
- Installation of connection head over existing insulation
- Simple standardization of measuring inserts: In general, the length of the extension may be freely selected. However, when using standardized insertion lengths, the option "Extension as per DIN 43 772" is recommended. This ensures that measuring inserts which are quickly available can be used. In case of special lengths, it is possible to standardize the measuring insert length through a clever combination with the respective special extension length. This allows customers to optimize their costs in purchasing and logistics.
- In the case of American-designed sensors, the extension also takes the spring load of the measuring unit.
- Depending on the design, the extension can also be used to achieve an alignment of the connection head.
- The form of the extension depends on the form of the thermowell:
  - Tubular thermowell
    The extension and thermowell usually consist of one continuous tube. The process connection is welded on. (= one-piece protective armature).
  - Barstock thermowells
    Extension and thermowell of two components which are welded together. The process connection is attached to the thermowell (= multi-piece protective armature).

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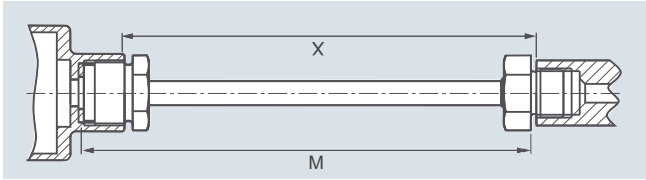
Technical description

Thermowell type	X [mm (inch)]	M [mm (inch)]	Divisible
2G	129 (5.08)	145 (5.71)	No
2F	64 (2.52)	80 (3.15)	No
3G	131 (5.19)	147 (5.79)	No
3F	66 (2.60)	82 (3.23)	No
4 (only L=110)	139 (5.47)	155 (6.10)	Yes
4 (others)	149 (5.87)	165 (6.50)	Yes

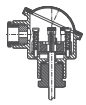
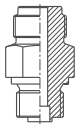
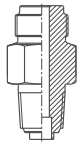


Extensions as per DIN 43772

Versions

With regard to their function, extensions can be classified into two types:

- Ajustable/not ajustable:
  Function on the neck tube to align the connection head to the desired direction
- Integrated measuring insert spring load:
  In the case of American-type sensors, the spring load of the measuring insert is integrated into the extension. Measuring insert and extension form one unit.

European type ajustable, cylindrical	European type ajustable, tapered	wihtout extension wihtout thread (optional gland)
		
European type not ajustable, cylindrical	**European type not ajustable, tapered**	**European type not ajustable, nipple**
		
European type ajustable nipple-union-nipple	**American type ajustable, nipple-union-nipple spring load**	**American type not ajustable nipple-union-nipple spring load**
		

Versions: particularly with heavy stainless steel connection heads in combination with vibration, a short extension length should be selected or external support should be provided.

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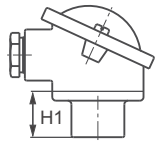
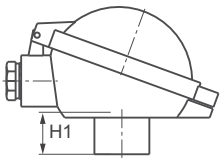
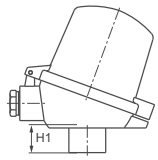
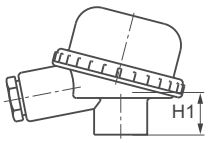
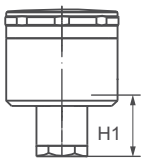
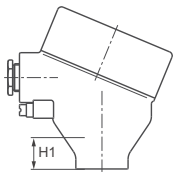
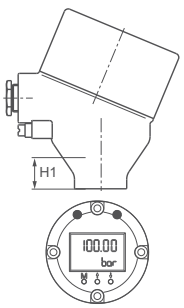
Components: Connection head

Connection head

The connection head protects the connection department.

The connection head features sufficient room for mounting a clamping base or transmitter.

Different connection heads are used depending on the application and preference:

Connection head	Type Material	Designation	Cable gland	Degree of protection	Transmitter installation	Connection height H1 [mm (inch)]	Explosion protection optional
	BA0 Aluminum	Flange lid	M20 x 1,5 brass	IP54	Measuring insert	26 (1.02)	Ex i
	BB0 Aluminum	Hinged cover low	M20 x 1,5 brass	IP65	Measuring insert	26 (1.02)	Ex i
	BC0 Aluminum BP0 Plastic	Hinged cover high	M20 x 1,5 BC0: brass BP0: polyamide	IP65	Measuring insert and/or hinged cover (tandard)	26 (1.02)	Ex i
	BM0 Plastic	Screw cover	M20 x 1,5 polyamide	IP65	Measuring insert	26 (1.02)	Ex i
	BS0 Stainless steel	Screw cover	M12 x 1,5 polyamide	IP67	Measuring insert	26 (1.02)	Ex i
	AG0 Aluminum AU0 Stainless steel AISI 316 (1.4401)	Screw cover, heavy-duty	M20 x 1,5 not Ex: plastic Ex i/Ex n: brass Ex d: without cable gland	IP66/68 (IP68: 1.5 m; 2 h)	Measuring insert	41 (1.61)	Ex i, Ex d
	AH0 Aluminum AV0 Stainless steel AISI 316 (1.4401)	Screw cover, sight glass, heavy-duty, with 4 ... 20 mA display	M20 x 1,5 not Ex: plastic Ex i/Ex n: brass Ex d: without cable gland	IP66/68 (IP68: 1.5 m; 2 h)	Measuring insert	41 (1.61)	Ex i, Ex d

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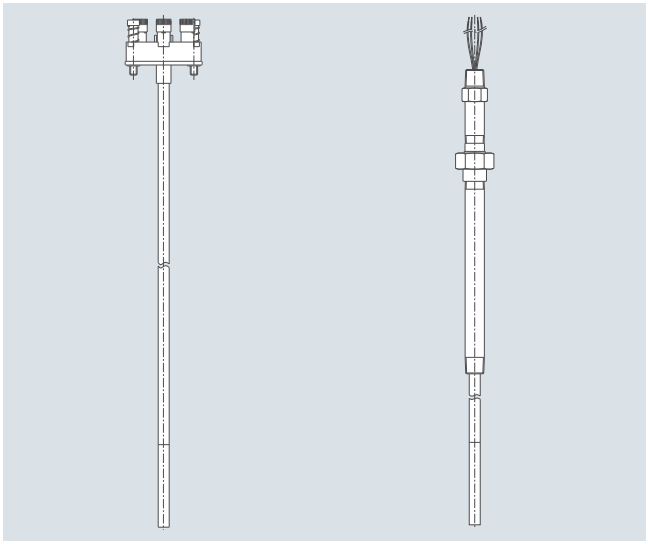
Technical description

Components: Measuring insert

Measuring insert

The measuring insert of the temperature sensor is built into the protective armature (thermowell, extension and connection head). The sensor element is protected in the measuring insert. The spring load of the Siemens measuring inserts provide good thermal contact with the bottom of the thermowell, and vibration resistance is significantly increased. Only highly resistant mineral-insulated cables (so-called MIC) are used for the electrical connection between the sensor element and connection head. The highly compacted insulation of magnesium oxide achieves excellent level of vibration resistance. The following measuring insert designs are the most widely used on the world market:



European type American type

European type

European type measuring inserts can be replaced without having to dismantle the connection head. The springs are located either on the transmitter or the terminal block. This makes it possible to achieve a 8 to 10 mm spring range. If no transmitter is mounted, there is a ceramic base in its place. However, with the order option G01, a version with free wire ends instead of a ceramic base can be selected for mounting head-mounted transmitters.

American type

American-type measuring inserts feature a large spring range. These measuring inserts are ideal for use with NPT threads with the typical loose tolerances. In this configuration, the extension function is partially or fully integrated (nipple-union-nipple). Moreover it is also possible to directly attach field devices, e.g. SITRANS TF.

Components: Transmitters

SITRANS TH head transmitters process the weak non-linear sensor signals and transmit a stable and temperature-linear standard signal, thereby minimizing sensor signal disruptions.

The transmitters permanently monitor the temperature sensors and transmit diagnostic data to superordinate systems.

Because of the low energy feed of the SITRANS TH head transmitters, self-heating of the temperature sensors can be maintained at minimal levels.

The electrical isolation and integrated cold junction ensure that temperature sensors with thermocouples provide reliable measurements at a low cost.

SITRANS TH product family

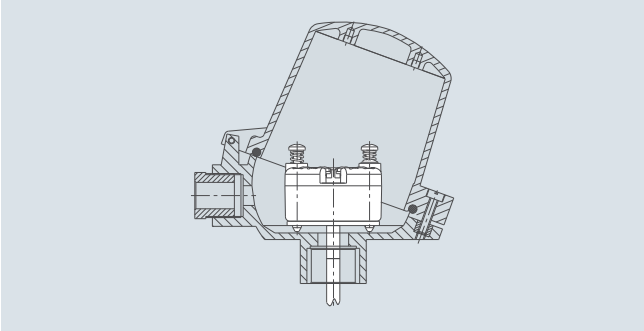
For detailed technical data on the SITRANS TH transmitters, please refer to the catalog FI 01.

- TH100 - the basic device
  - Output 4 to 20mA
  - for Pt100
  - can be configured using simple software
- TH200 - the universal device
  - Output 4 to 20mA
  - Resistance thermometer, thermocouples
  - can be configured using simple software
- TH300 - HART universal
  - Output 4 to 20 mA/HART
  - Resistance thermometer, thermocouples
  - HART conforming
  - Diagnostic functions
- TH400 - Fieldbus PA and FF
  - Output PROFIBUS PA or FOUNDATION Fieldbus
  - Resistance thermometer, thermocouples
  - Diagnostic functions; for detailed technical description of the SITRANS TH transmitter please refer to the related chapter of this catalog.

Installation types

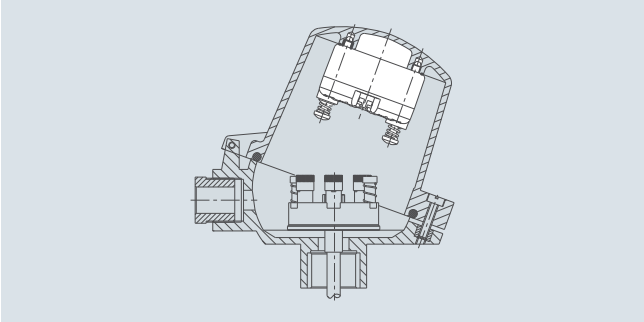
All SITRANS TH transmitters can be installed in type B connection heads. The following installation forms are used:

- Measuring insert installation
  Our standard version offers the following advantages
  - Small vibrating masses and compact design
  - Insert-transmitter unit can be replaced quickly



Installation of measuring insert

- Hinged cover installation
  - Standard for head type BC0 and BP0
  - Advantage: Measuring insert and transmitter can be repaired/maintained separately (recalibration).



Hinged cover installation

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Measuring technology: Sensor elements

The diverse application spectrum for industrial temperature measuring technology requires different sensor technologies.

Resistance thermometer

Sensor elements made of other basic materials with different nominal resistances or different underlying standards are available on request. Resistance thermometers can be classified as follows:

- Basic design:
  The sensor element is built with thin layer technology. The resistance material is applied in the form of a thin layer on a ceramic carrier material.
- Versions featuring increased vibration-resistance:
  In addition to the basic design, the vibration resistance is improved through extra measures.
- Versions with expanded measuring range:
  Elements in wire-wound design. The wire winding is embedded in a ceramic body.

Thermocouples

Other thermocouples based on other thermo couples or underlying standards are available upon request.

The most common base metal thermocouples include:

- Type N (NiCrSi-NiSi) high degree of stability even in upper temperature range.
- Type K (NiCr-Ni) more stable than type J, but drifts in upper range.
- Type J (Fe-CuNi) narrow application band

Measuring technology: Measuring range

The measuring range describes the temperature limits within which the thermometer can be used in a way that is meaningful for measurement purposes. Depending on the loads present, the thermowell materials and the desired accuracy levels, the actual application range for the thermometer may be smaller.

Resistance thermometer [°C (°F)]	
Basic version and increased vibration resistance	-50 ... +400 (-58 ... +752)
Expanded measuring range	-196 ... +600 (-320.8 ... +1112)

Thermocouple [°C (°F)]	
Type N	-40 ... +1100 (-40 ... +2112)
Type K	-40 ... +1000 (-40 ... +1132)
Type J	-40 ... +750 (-40 ... +1382)

Measuring technology: Measuring accuracy

Resistance thermometer

The tolerance classes of the resistance thermometers correspond with IEC 751/EN 60751:

Tolerance	**Δt**
Basic accuracy, Class B	±(0.30 °C +0.0050|t[°C]|) ±(0.54 °F +0.0050|t [°F]-32|)
Increased accuracy, Class A	±(0.15 °C +0.0020|t[°C]|) (±(0.27 °F +0.0020|t [°F]-32|))
High degree of accuracy, Class AA (1/3 B)	±(0.10 °C +0.0017|t[°C]|) (±(0.18 °F +0.0017|t [°F]-32|))

The following tables provide an overview of the scope of these tolerances. If you exceed the specified limits with a resistance thermometer, the values of the next lower accuracy class apply:

Resistance thermometer Basic version [°C (°F)]	
Tolerance	**Range**
Basic accuracy, Class B	-50 ... +400 (-58 ... +752)
Increased accuracy, Class A	-30 ... +300 (-22 ... +572)
High degree of accuracy Class AA (1/3 B)	0 ... 150 (32 ... 302)

Resistance thermometer Increased vibration-resistance [°C (°F)]	
Tolerance	**Range**
Basic accuracy, Class B	-50 ... +400 (-58 ... +752)
Increased accuracy, Class A	-30 ... +300 (-22 ... +572)
High degree of accuracy Class AA (1/3 B)	0 ... 150 (32 ... 302)

Resistance thermometer Expanded measuring range [°C (°F)]	
Tolerance	**Range**
Basic accuracy, Class B	-196 ... +600 (-321 ... +1112)
Increased accuracy, Class A	-100 ... +450 (-148 ... +842)
High degree of accuracy Class AA	-50 ... +250 (-58 ... +482)

Thermocouples

The tolerance classes of the thermocouples correspond with IEC 584/EN 60584:

Catalog versions

Type	**Basic accuracy, Class 2**	**Increased accuracy, Class 1**
N	-40 °C ... +333 °C ±2.5 °C (-40 °F ... +631 °F ±4.5 °F) 333 °C ... 1100 °C ±0.0075x|t[°C]| (631 °F ... 2012 °F ±0.0075x|t[°F]-32|)	-40 °C ... +375 °C ±1.5 °C (-40 °F ... +707 °F ±2.7 °F) 375 °C ... 1000 °C ±0.004x|t[°C]| (707 °F ... 1832 °F ±0.004x|t[°F]-32|)
K	-40 °C ... +333 °C ±2.5 °C (-40 °F ... +631 °F ±4.5 °F) 333 °C ... 1000 °C ±0.0075x|t[°C]| (631 °F ... 1832 °F ±0.0075x|t[°F]-32|)	-40 °C ... +375 °C ±1.5 °C (-40 °F ... +707 °F ±2.7 °F) 375 °C ... 1000 °C ±0.004x|t[°C]| (707 °F ... 1832 °F ±0.004x|t[°F]-32|)
J	-40 °C ... +333 °C ±2.5 °C (-40 °F ... +631 °F ±4.5 °F) 333 °C ... 750 °C ±0.0075x|t[°C]| (631 °F ... 1382 °F ±0.0075x|t[°F]-32|)	-40 °C ... +375 °C ±1.5 °C (-40 °F ... +707 °F ±2.7 °F) 375 °C ... 750 °C ±0.004x|t[°C]| (707 °F ... 1382 °F ±0.004x|t[°F]-32|)

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Other thermocouples, ignoble

Type	Basic accuracy, Class 2	Increased accuracy, Class 1
T	-40 °C ... 133 °C ±1 °C (-40 °F ... +271 °F ±1.8 °F) 133 °C ... 350 °C ±0.0075x|t[°C]| (271 °F ... 662 °F ±0.0075x|t[°F]-32|)	-40 °C ... +125 °C ±0.5 °C (-40 °F ... +257 °F ±0.9 °F) 125 °C ... 350 °C ±0.004x|t[°C]| (257 °F ... 662 °F ±0.004x|t[°F]-32|)
E	-40 °C ... +333 °C ±2.5 °C (-40 °F ... +631 °F ±4.5 °F) 333 °C ... 900 °C ±0.0075x|t[°C]| (631 °F ... 1652 °F ±0.0075x|t[°F]-32|)	-40 °C ... +375 °C ±1.5 °C (-40 °F ... +707 °F ±2.7 °F) 375 °C ... 800 °C ±0.004x|t[°C]| (707 °F ... 1472 °F ±0.004x|t[°F]-32|)

Other thermocouples. noble

Type	Basic accuracy, Class 2	Increased accuracy. Class 1
R and S	0 °C ... 600 °C±1.5 °C (32 °F ... 1112 °F±2.7 °F) 600 °C ... 1600 °C±0.0025 x |t| (1112 °F ... 2912 °F±0.0025 x |t|)	0 °C ... 1100 °C±1 °C (32 °F ... 2012 °F±1.8 °F) 1100 °C ... 1600 °C±[1 + 0.003 (t - 1100)] °C (2112 °F ... 2912 °F±[1.8 + 0.003 (t - 212)] °F)
B	600 °C ... 1700 °C±0.0025 x |t| (1112 °F ... 3092 °F±0.0025 x |t|)	

SITRANS TS300 Clamp-on

Measuring accuracy	
Reference conditions	
• Pipeline	13 x 1.5 mm (0.51 x 0.06 inch) made of stainless steel using using thermal paste
• Ambient temperature	20 °C (68 °F)
• Medium	Water, 120 °C (248 °F)
• Flow speed	3 m/s (9.84 ft/s)
Measuring accuracy using thermal paste (The accuracy depends on the geometry of the pipeline, the medium and the ambient conditions. T_M = process temperature; T_A = ambient temperature)	Process-optimized for steam sterilization
• Application, process-optimized for steam sterilization	for 100 ... 150 °C (212 ... 302 °F) $(T_A-T_M) \times 0.01$
• Application, alternative class A as per IEC 60751	-40 ... +150 °C (-40 ... 302 °F) $(T_A-T_M) \times 0.02$

Measuring technology: Response times

Response time describes the speed of the measurement system in the case of a temperature change, and is typically indicated as T0.5 or T0.9. The values indicate the time in which a measured value has increased to 50% or 90% of the actual temperature increase.

The main variables which affect response time are as follows:

- Ideal thermowell geometry includes:
  - smallest possible material at the tip
  - use of conductive material
- Thermal connection of measuring insert to thermowell:
  Due to the optimized design of the Siemens inserts (small gap width, spring system), they feature very good response behavior. Because of the good fit, additional contact materials are not usually required except in certain applications e.g. attachment of a surface sensor.
- Size of temperature increase
- Medium and flow rate

Resistance thermometer

Typical values as per EN 60751 in water at 0.4m/s can be found in the following table.

Thermowell form	Diameter [mm (inch)]	T0.5	T0.9
None	6 (0.24)	6	15
Straight (2)	9 (0.35)	34	90
	12 (0.47)	45	143
Tapered (3)	12 (0.47)	15	31
Barstock (4) U/C = 65	24 (0.95)	40	100
Barstock (4)] U/C = 65	24 (0.95)	45	110

Thermocouples

Typical values as per EN 60751 in water at 0.4m/s can be found in the following table.

Thermowell form	Diameter [mm (inch)]	T0.5	T0.9
None	6 (0.24)	2	4
Straight (2)	9 (0.35)	20	63
	12 (0.47)	19	66
Tapered (3)	12 (0.47)	7	22
Barstock (4) U/C = 65	24 (0.95)	22	73
Barstock (4)] U/C = 65	24 (0.95)	20	53

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Measuring technology: Mounting depth

Measuring insert

Type	Temperature-sensitive length (TSL [mm (inch)]	Non-bendable length [mm (inch)]
Basic	50 (1.97)	30 (1.82)
Increased vibration resistance	50 (1.97)	30 (1.82)
Expanded measuring range	50 (1.97)	60 (2.36)
Thermocouple	20 (0.79)	5 (0.20)

Immersion depth/contact with media

Ambient conditions (temperature/climate/insulation) and the design of the thermowell, process connection and piping result in so-called "heat transmission errors".

To prevent such an error, the submersion depth and diameter of the thermowell tip will be defined. The temperature-sensitive length (TSL) of the thermowell must also be taken into account. The following rule of thumb can be used:

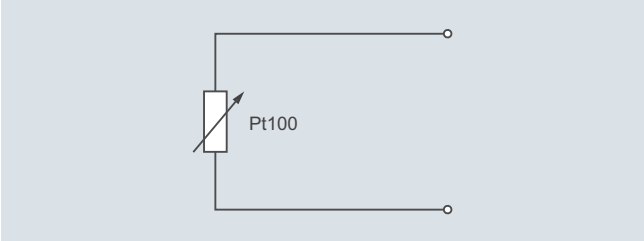
- Water
  Submersion depth ≥ TSL + 5 x Ø of thermowell
- Air
  Submersion depth ≥ TSL + 10 ... 15 x Ø of thermowell
- Recommendations
  - Select largest possible submersion depth
  - Select measuring location with higher flow velocity
  - Thermal insulation for outer thermometer components
  - Smallest possible surface for outer components
  - Insertion in pipe bends
  - Direct measurements without additional thermowell if no suitable solution can be found using other measures.

Measuring technology: Connection types

In the case of resistance thermometers, the type of sensor connection directly affects the level of accuracy:

Two-wire system

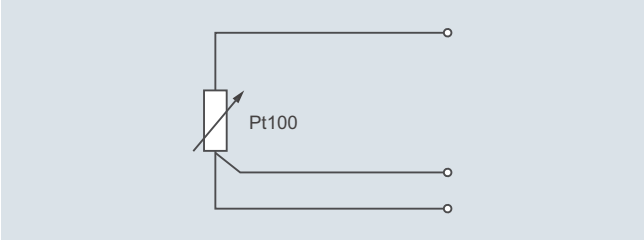
The resistance of sensor lines are included in the measurement result as an error. Adjustments are recommended in this case.



Pt100 Two-wire system

Three-wire system

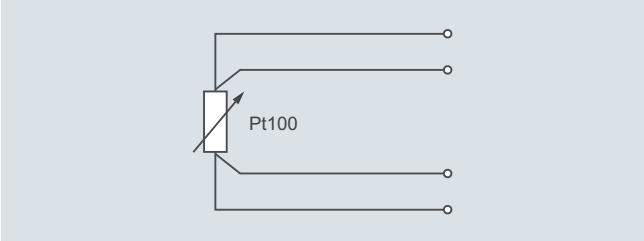
Line resistance is not included in the measurement result. Requirements: all terminal and line resistances (corrosion) are at the same level, and terminals are at the same temperature level.



Pt100 Three-wire system

Four-wire system

Line resistance is not included in the measurement result. This type of connection is the most secure and most accurate.



Pt100 Four-wire system

Siemens measuring inserts can be used to implement all types of connections for 1 x Pt100 devices. In the case of 2 x Pt100 versions, two- and three-wire systems are also possible. For measurement-related reasons, we always recommend a 1 x four-wire or 2 x 3-wire connection.

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Temperature influence

At the connection head TS500[1)]

	Without transmitter [°C (°F)]	With transmitter [°C (°F)]
Aluminum or stainless steel	-40 ... +100 (-40 ... +212)	-40 ... +85 (-40 ... +185)
Plastic	-40 ... +85 (-40 ... +185)	-40 ... +85 (-40 ... +185)

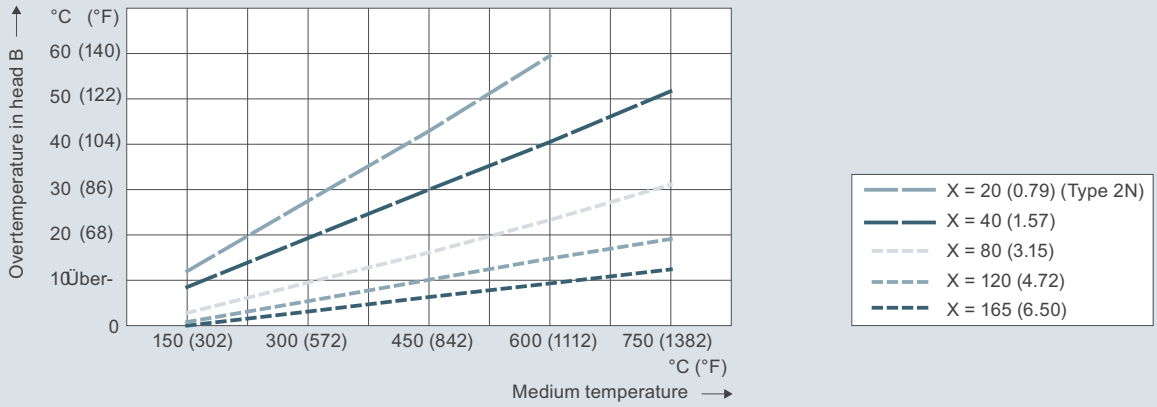
1) Notice manual at Ex-applications, please

At the TS100/200 connector/cable connection point:

The specified measuring range is valid for the hot end of the sensor. At the cold end, the maximum permitted temperature depends on the cables and plugs used. < 80 °C (176 °F) is uncritical for all types

Influence of extension

The illustration below assists you in selecting the right length for the neck tube. In this case, the following applies: Connection head temperature = Ambient temperature + Overtemperature. The temperature in the connection head can thus be assessed as follows:



Extension length X, effect on temperature, dimensions in mm (inch)

Please note that guidance values may change due to local conditions. Please consider these potential changes particularly with respect to explosion protection.

Also note that the accuracy of the transmitter also depends on the temperature in the connection head.

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SITRANS TS300 Clamp-on

Design	
Measuring insert	• Special measuring insert made of stainless steel; hygienic design • Measuring element made of silver, thermal decoupling through plastic insert Measuring insert screwed into collar with spring load. Use heat-conductive-compound (see accessories) prior to mounting the device.
Pipe collar	
• Material	Temperature resistant high-performance plastic with integrated insulating system in the hygienic design
• Ambient temperature influence	Approx. 0.2 %/10 K

Process connection/Thermowell

When selecting a process connection, the process parameters sometimes only allow a specific technology. In addition, regional standard-related and customer-specific requirements must be observed. The range of products therefore includes a broad selection of standard connections.

In the case of redesigned or newly designed facilities, it is possible to achieve cost savings by implementing various measures:

- Use of standard lengths through clever selection of screw, weld or flange sockets
- Moveable compression fittings

The temperature resistance of a material for process connections and thermowells also limits the application area of the temperature sensor. The temperature range indicated on the type plate always refers to the measuring insert, not the material which comes into contact with media. Two aspects must be considered when assessing temperature stability:

- What maximum temperature may the material reach without a load?
- What is the behavior under load?

Process load

Because of the large variety of possible applications and variables, it is not possible to make general binding statements regarding the resilience of components which comes into contact with media. The load diagrams below can be used for common applications. However, where operating conditions vary significantly, please contact our technical support team.

Load on the thermowell and remedies:

The process itself	**Correction options**
Temperature	Material selection
Pressure	Thermowell type
Flow velocity	Insertion length, thermowell type
Viscosity	Insertion length, thermowell type
Vibration	Support against vibration
Corrosiveness	Material selection, coating
Abrasion (e.g. carbon dust)	Sensing rod, coating

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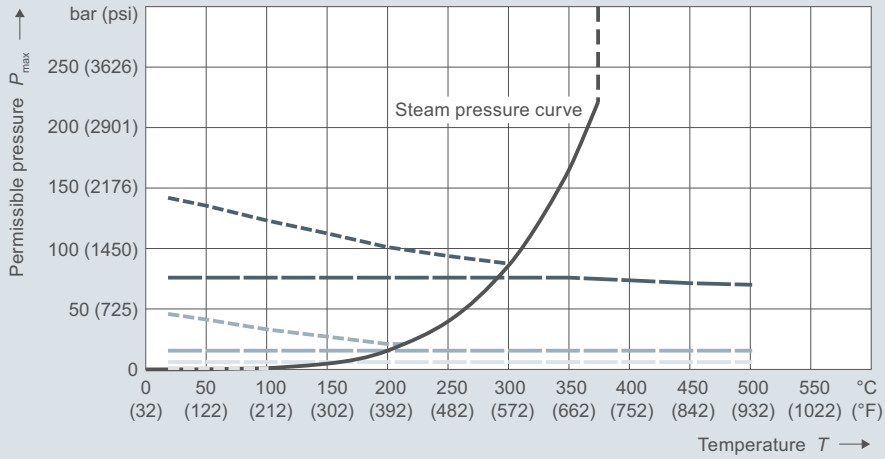
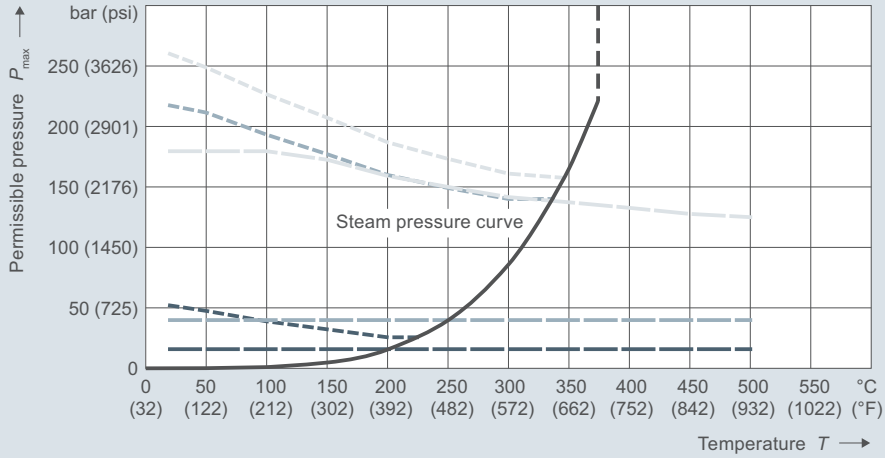
Load diagrams



Form 2/2G/2N/2F Ø9x1 (0.35x0.04)
Material No. 1.4571

	U	Speed v
– – –	140 (5.51)	v_W = 3 m/s (9.84 ft/s)
– – –	315 (12.40)	
– – –	510 (20.08)	
———	140 (5.51)	v_L = 25 m/s (82.02 ft/s)
———	315 (12.40)	
———	510 (20.08)	

Thermowells with Ø 9 x 1 mm (0.35 x 0.04 inch), dimensions in mm (inch)



Form 2/2G/2N/2F Ø12x2.5 (0.47x0.10)
Material No. 1.4571

	U	Speed v
– – –	140 (5.51)	v_W = 3 m/s (9.84 ft/s)
– – –	315 (12.40)	
– – –	510 (20.08)	
———	140 (5.51)	v_L = 25 m/s (82.02 ft/s)
———	315 (12.40)	
———	510 (20.08)	

Thermowells with Ø 12 x 2.5 mm (0.47 x 0.10 inch), dimensions in mm (inch)

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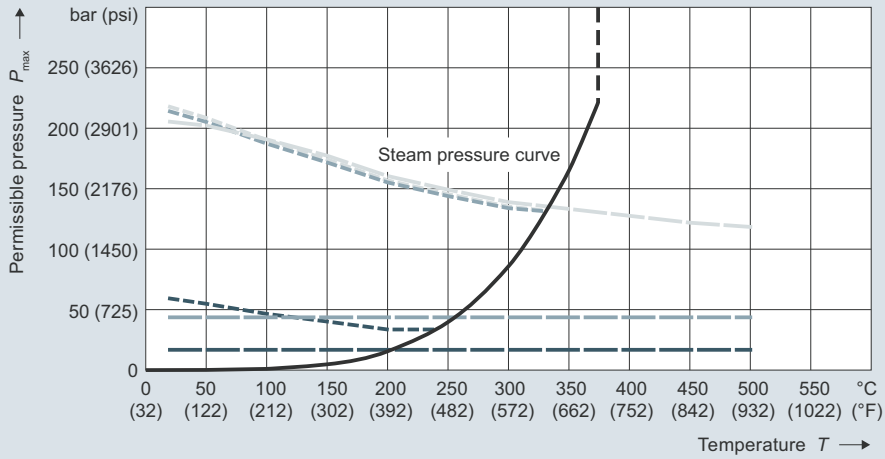
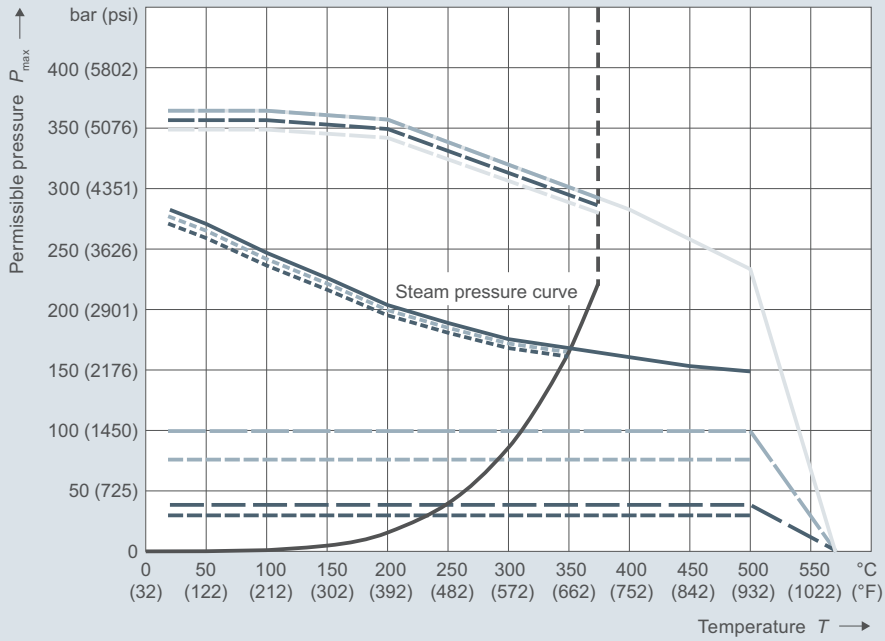


Form 3/3G/3F Ø12x2.5 (0.47x0.10)
Material No. 1.4571

	U	Speed v
	140 (5.51) 315 (12.40) 510 (20.08)	v_W = 3 m/s (9.84 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 25 m/s (82.02 ft/s)

Thermowells with Ø 12 x 2.5 mm (0.47 x 0.10 inch), Ø 14 x 2.5 mm (0.55 x 0.10 inch), dimensions in mm (inch)



Form 4/4F Ø24 (0.94); C=65 (2.56)
Material No. 1.4571

	U	Speed v
	140/510 (5.51/20.08) 315 (12.40)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

Form 4/4F Ø24 (0.94); C=65 (2.56)
Material No. 1.7335

	U	Speed v
	140 (5.51) 315 (12.40) 510 (20.08)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

Thermowells with Ø 24 mm (0.95 inch), C= 65 mm (2.60 inch), dimensions in mm (inch)

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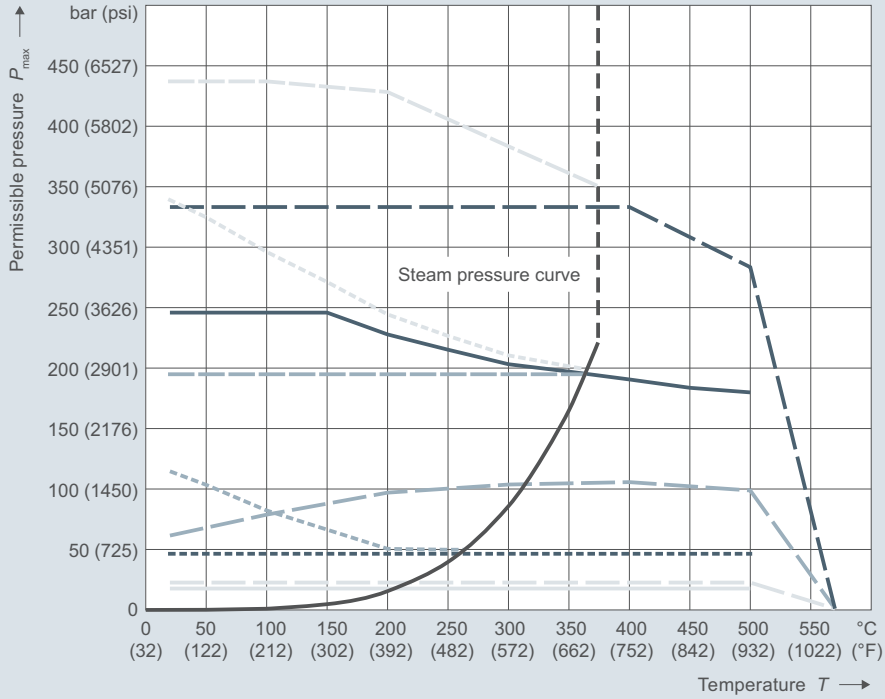


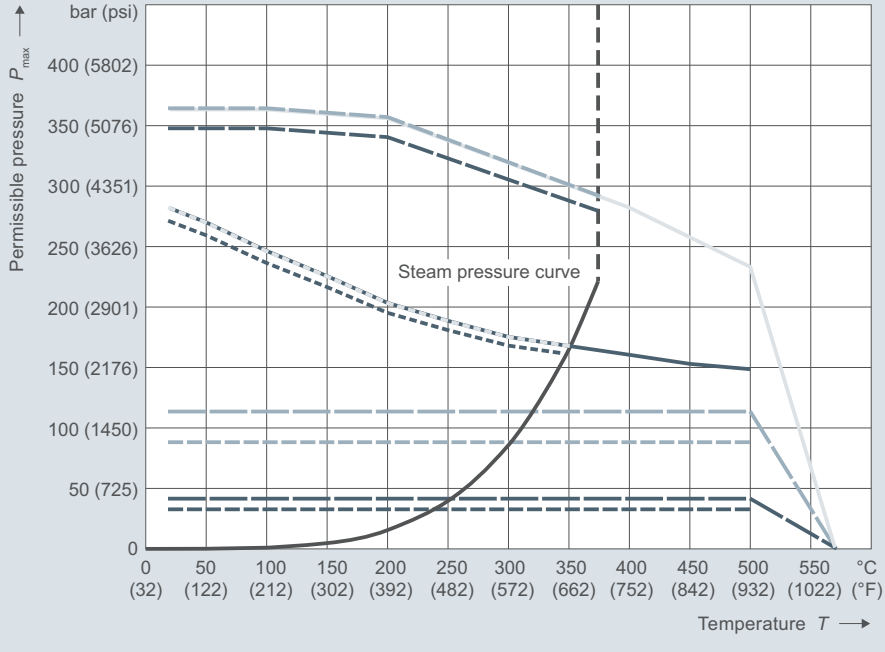
Form 4/4F Ø18 (0.71); C=65 (2.56)
Material No. 1.4571

	U	Speed v
	140/315 (5.51/12.40) 510 (20.08)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

Form 4/4F Ø18 (0.71); C=65 (2.56)
Material No. 1.7335

	U	Speed v
	140/315 (5.51/12.40) 510 (20.08)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

Thermowells with Ø 18 mm (0.71 in), C= 65 mm (2.60 inch), dimensions in mm (inch)



Form 4/4F Ø24 (0.94); C=125 (4.92)
Material No. 1.4571

	U	Speed v
	140/315 (5.51/12.40) 510 (20.08)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

Form 4/4F Ø24 (0.94); C=125 (4.92)
Material No. 1.7335

	U	Speed v
	140/315 (5.51/12.40) 510 (20.08)	v_W = 5 m/s (16.40 ft/s)
	140 (5.51) 315 (12.40) 510 (20.08)	v_L = 40 m/s (131.20 ft/s)

Thermowells with Ø 24 mm (0.95 inch), C= 125 in (4.92 in), dimensions in mm (inch)

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Thermowell calculation

Properly applied load diagrams will provide a sufficient degree of safety for the most common thermowell configurations.

However, there are cases in which operating conditions deviate too greatly from standard parameters. In this case, a customized thermowell calculation may be required.

Another reason for doing this calculation is the fact that flowing media can create turbulence at the tip of the thermowell under certain conditions. The thermowell will then vibrate and may even be destroyed if not configured correctly. This is the most frequent cause of thermowell bailure.

SIEMENS offers the two recognized methods for calculating the thermowell:

- DIN/Dittrich method
- ASME/Murdock method
  This method also takes into account turbulence formation on a mathematical level.

Both methods provide a high degree of safety with regard to thermowell configuration, however, they do not provide a guarantee against breakdowns.

Materials

Material descriptions/Standards comparison				**Max. temperature [°C (°F)] (unloaded)**	**Properties**	**Applications**
Mat. No.:	AISI/Trade name:	EN 10028-2:	Description			
1.4404 or 1.4435	AISI 316 L	X2CrNiMo17-12-2	Austenitic stainless steel	600 (1112)	Good acid resistance, resistant against grain boundary corrosion	Chemical industry, waste treatment, paper and cellulose industry, food industry
1.4571	AISI 316 Ti	X6CrNiMoTi 17 12-2	Austenitic stainless steel	800 (1472)	Good acid resistance, resistant against grain boundary corrosion (supported by Ti portion)	Chemical industry, textile industry, paper and cellulose industry, water supply, food and pharmaceuticals
1.5415	A 204 size A	16Mo3	Carbon steel, high-alloy	500 (932)	Resistant at higher temperatures, well suited for welding	Steam turbines, steam lines, water pipes
1.7335	A 182 F11	13CrMo4-5	Carbon steel, high-alloy	540 (1004)	Resistant at higher temperatures, well suited for welding	Steam turbines, steam lines, water pipes
1.4841	SS 314	X15CrNiSi25-20	Austenitic heat-resistant stainless steel	1150 (2102)	Resistant at high temperatures, also resistant against low-O_2 and nitrogen-containing gases.	Flue gas, petrochemical industry, chemicals industry, power plants
1.4762	446	X10CrAl24	Ferritic heat-resistant steel	1150 (2102)	Resistant at high temperatures, in oxidizing and reducing sulphur-containing atmosphere	Chemical industry, power plants, steel industry, waste gas treatment
2.4816	Inconel 600	NiCr15Fe	Nickel-Chrome alloy	1150 (2102)	Resistant at high temperatures, resistant against chlorine-induced cold crack corrosion	Chemical industry, petrochemical industry, food industry
1.4876	Incoloy 800	X10NiCrAlTi32-21	Austenitic heat-resistant stainless steel	1100 (2012)	Excellent resistance against oxidation and carbonization at high temperatures, good corrosion resistance	O&G industry, waste gas treatment, power plants (steam boiler, heat exchanger), applications using aggressive fluids
2.4819	Hastelloy C 276	NiMo16Cr15W	Nickel-Chrome-Molybdenum alloy	1100 (2012)	Resistant at high temperatures, in oxidizing and reducing atmosphere, resistant against pitting and crevice corrosion, good corrosion resistance after welding	Chemicals industry, paper and cellulose industry, waste treatment, waste incinerators, emissions controls, shipbuilding and offshore industry
2.4360	Monel 400	NiCu30Fe	Nickel-Copper alloy	500 (932)	Excellent corrosion resistance, particularly against chlorine-induced cold crack corrosion	Chemical industry, offshore industry, nuclear technology, petrochemical industry

Where cost-intensive materials are used with flange thermowells, cost savings can be achieved by using a so-called flanged wheel. A thin disc of the material which comes into contact with media is applied prior to the flange (ordinary stainless steel).

Materials sensor tube/measuring inserts:

- SITRANS TSinsert, TS100, TS200
  - Resistance thermometer Cr-Ni-Mo
  - Thermocouples 2.4816/Inconel600

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Vibration resistance of measuring insert, cable sensor

Similar to the thermowell, inner (Karman vortices) and outer (plant) vibrations also affect the measuring insert. For this reason, a special assembly of measurement elements is required. Other than a few exceptions for cable and compact thermometers, Siemens only produces sensors based on a mineral-insulated cable. Together with precautions taken when installing the measuring element, the Siemens basic version already exceeds EN 60751 by more than a factor of 3. Pursuant to the measurement methods of this standard, the following values are obtained (tip-tip):

- 10 g: Basic version and expanded measuring range
- 60 g: Increased vibration-resistance and thermocouple

Bending ability of measuring insert/cable sensor

All Siemens measuring inserts SITRANS TSinsert are made with a mineral-insulated cable (MIC). The same applies to a portion of the cable and compact thermometer. In addition to the properties already described, another advantage of the MIC is its bending ability. This makes it possible to install these thermometers even in difficult to access areas. Please ensure that you are not below the following bending radius:

Ø MIC [mm (inch)]	R_{min} = 4x Ø MIC [mm (inch)]
3 (0.12)	12 (0.48)
6 (0.24)	24 (0.95)

Where a smaller bending radius is required due to installation conditions, subsequent testing of the insulation resistance is recommended.

Electrical stability

Insulation resistance

The insulation resistance between each measuring circuit and the fitting is tested at a voltage of 500 V DC at room temperature.

$R_{iso} \geq 100$ MΩ

Due to the property of the mineral-insulated cable, the insulation resistance decreases as temperature increases. Because of the special production method, it is, however, possible to achieve very good values even at high temperatures.

Line resistance

When connected to two-wire systems, the line resistance is included in the measurement result. The following rule of thumb can be used:

- ∅ Measuring insert 3 mm (0.12 inch) 5 Ω/m or 12.8 °C (55.04 °F)
- ∅ Measuring insert 6 mm (0.24 in) 2.8 Ω/m or 44.78 (44.78)

For this reason a connection to three- or four-wire systems is highly recommended.

Pressure equipment directive:

This device is not included in the pressure device guideline; classification according to pressure device guideline (PED 2014/68/EU), Directive 1/40; article 1, paragraph 2.1.4

In addition, statutory, standards-based or operating specifications also require additional testing. The results are certified in certificates as per EN 10204:

- As per EN 10204-2.1, order conformity (C35)
  Certificate in which Siemens confirms that the delivered products correspond with the requirements of the order, without indicating test results. The testing does not have to be carried out on the delivered devices.
- As per EN 10 204-3.1
  Certificate in which Siemens confirms that the delivered products meet the requirements set out in the order, with indication of the specific test results. Testing is carried out by an organization which is independent of production. The inspection certificate 3.1 replaces 3.1.B of the previous edition.
- Material certificate for parts which come into contact with media (C12)
  This certificate confirms the properties of the material and warrants traceability up to the melting batch.
- Pressure-resistant (C31)
  Hydrostatic pressure test on thermowell as per customer specifications. Where operating pressure is not specified, testing is carried out using the nominal pressure of the process connection.
- Helium leak test (C32)
  This test can be used to detect even the smallest leaks in thermowells and welded seams.
- Dye penetration test (C33)
  The dye penetration method can detect cracks and other surface defects.
- Comparative test (calibration) (Y33)
  The test object is measured in at an equalized temperature level against a highly precise thermometer, and the measured values of test object and normal values are documented. However, calibration requires the measuring insert to be of a certain minimum length.
  Measuring inserts can be calibrated together with the associated transmitter. Calibration values can be stored in the transmitter in order to increase the accuracy of the system.
- As per EN 10204-3.2
  This acceptance certificate can be prepared on request, together with an acceptance representative of the ordering party or a representative indicated as per official requirements (e.g. TÜV) It confirms that the delivered products meet the requirements set out in the order; it also contains the test results.

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Approvals

Explosion protection

Due to the variety of requirements, all flameproof versions, as well as those complying with CSA and FM are supplied without cable glands.

Designator	Additional information	Region	Standard	Type of protection	For Zone	For Division
TSinsert	E00	EU/AU/NZ	CE/RCM	Without Ex protection		-
TS100	E17	US/CA	cCSAus			-
TS200	E54	CN				-
	E80	EAC	TR			-
	E01	EU/AU/NZ	ATEX, IECEx	Intrinsic safety "i"/"IS"	0…2/20…22	-
	E18	US/CA	cCSAus		0…2/20…22	1/2
	E55	CN	NEPSI		0…2/20…22	-
	E81	EAC	EACEx		0…2/20…22	-
TS500	E00	EU/AU/NZ	CE/RCM	Without Ex protection		-
	E17	US/CA	cCSAus			-
	E54	CN				-
	E80	EAC	TR			-
	E01	EU/AU/NZ	ATEX, IECEx	Intrinsic safety "i"/"IS"	0*…2/20*…22	-
	E18	US/CA	cCSAus		0*…2/20*…22	1/2
	E55	CN	NEPSI		0*…2/20*…22	-
	E81	EAC	EACEx		0*…2/20*…22	-
	E03	EU/AU/NZ	ATEX, IECEx	Flameproof enclosure "d"/"XP" dust protection through housing "t"/"DIP" only with connection heads code AG0, AH0, AU0, AV0	0*…2/20*…22	-
	E20 (NPT)	US/CA	cCSAus		0*…2/20*…22	1/2
	E21 (metric)	US	CSAus		0*…2/20*…22	-
	E56	CN	NEPSI		0*…2/20*…22	-
	E82	EAC	EACEx		0*…2/20*…22	-
	E04	EU/AU/NZ	ATEX, IECEx	Non-sparking "nA"/"NI"	2	-
	E23	US/CA	cCSAus		2	2
	E57	CN	NEPSI		2	-
	E83	EAC	EACEx		2	-

AU = Australia; CA = Canada; CN = China; EAC = Eurasian Customs Union; EU = Europe; US = USA

* Zone 0 to process connection, outside Zone 1

Marine approvals

Designator	Additional information	Approval
TS Insert	D01	Det Norske Veritas Germanischer Lloyd (DNV GL)
TS100	D02	Bureau Veritas (BV)
TS200	D04	Lloyd's Register of Shipping (LR)
TS500	D05	American Bureau of Shipping (ABS)

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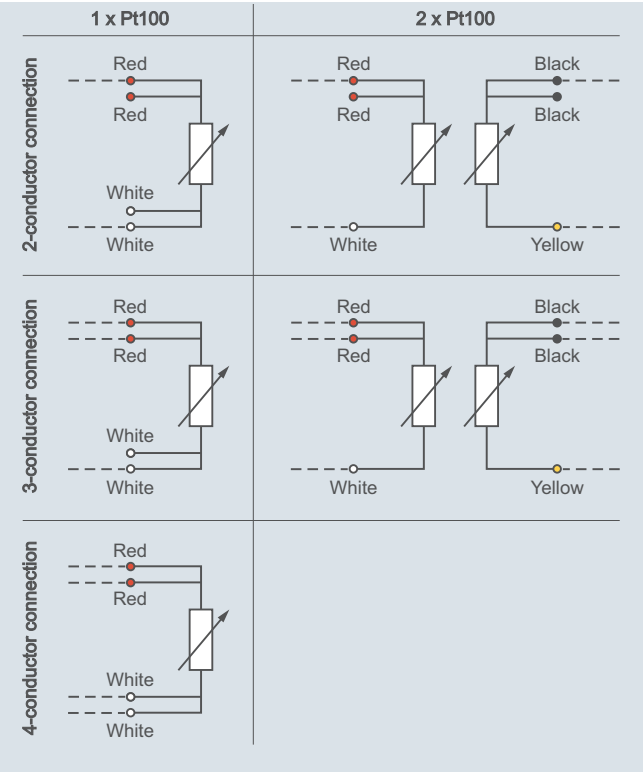
2

Schematics

Resistance thermometer connection

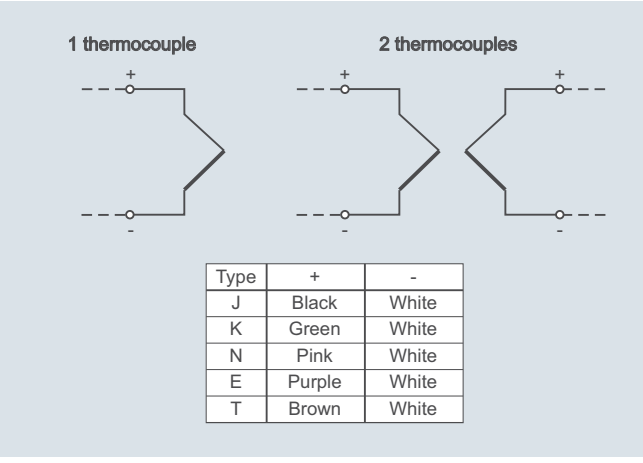
SITRANS TSinsert measuring inserts are designed as a four-wire system for single Pt100 if not mentioned differently. This makes it possible to implement all of the aforementioned connection types.

Double Pt100 measuring inserts (for 6 mm OD only) are designed as a three-wire system.



Schematics 1 x Pt100-2W up to 2 x Pt100-4W

Thermocouple connection



Type	+	-
J	Black	White
K	Green	White
N	Pink	White
E	Purple	White
T	Brown	White

Circuit diagram for thermocouple

Where thermocouples are used, the use of head transmitters offers particular advantages: The cold junction is already integrated into the universal transmitter. There is no need for expensive thermo or extension cable. This also removes a number of possible error sources. The weak millivolt signal of the thermocouple is already converted into a stable and temperature-linear DC or bus signal on site. This drastically reduces the effects of electromagnetic factors on the measurement result.

If a head transmitter is not installed, the sensor feed line consists either of the appropriate thermo or extension leads. The thermo line is made from the thermo material of the relevant thermocouple, while the extension lead uses a cost-effective substitute material. The extension cable behaves similar to a thermo line at an electrical level, within a limited temperature range of up to 200°C.

A wide spectrum of color coding is available for thermocouples on an international level. This must be taken into account during the electrical connecting.

Country	**International/ Germany**			**North America**			**UK/ Czech Republic**		
Standard	Not intrinsically safe[1]			Extension lead[2]			BS 1843		
	Jacket	+	-	Jacket	+	-	Jacket	+	-
N	PN	PN	WH	OG	OG	RD	OG	OG	BU
K	GN	GN	WH	YE	YE	RD	RD	BR	BU
J	BK	BK	WH	BK	WH	RD	BK	YE	BU
T	BR	BR	WH	BU	BU	RD	BU	WH	BU
E	VT	VT	WH	VT	VT	RD	BR	BR	BU
R+S	OG	OG	WH		BK	RD	GN	WH	BU
B	GY	GY	WH	GY	GY	RD	-	-	-

[1] With an intrinsically safe line as per IEC 584-3, the sheath is always blue.

[2] For thermo lines as per ANSI MC96, the sheath is always blue.

Country	**Netherlands**			**Japan**			**France**		
Standard	DIN 43714			ISC 1610-198			NF C42-323		
	Jacket	+	-	Jacket	+	-	Jacket	+	-
N	GN	RD	GN	BU	RD	WH	VT	VT	YE
K	BU	RD	BU	YE	RD	WH	BK	BK	YE
J	BR	RD	BR	BR	RD	WH	BU	BU	YE
T	BK	RD	BK	VT	RD	WH	OG	OG	YE
E	WH	RD	WH	BK	RD	WH	GN	GN	YE
R+S	GY	RD	GY	GY	RD	WH	-	-	-
B	GN	RD	GN	BU	RD	WH	VT	VT	YE

Abbreviation for colors				
BK: black	BR: brown	BU: blue	GD: gold	GN: green
GY: gray	OG: orange	PN: pink	RD: red	SR: silver
TQ: turquoise	VT: violet	WH: white	YE: yellow	

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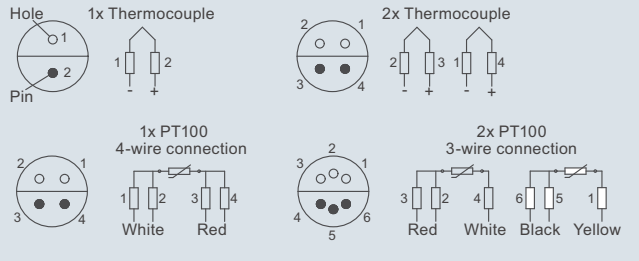
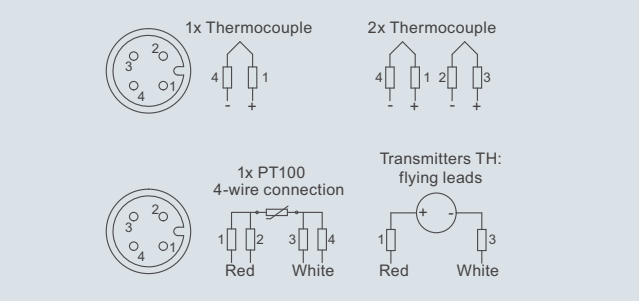
Plug connectors

In some cases, sensors are not connected directly but with plug connectors. The connection is made according to the figures below.

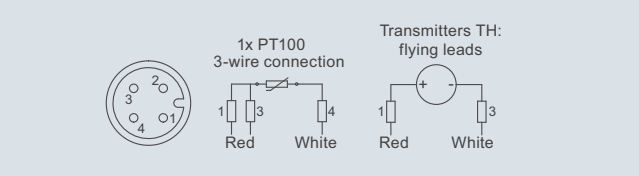
Lemo 1S coupling (SITRANS TS100/TS200)



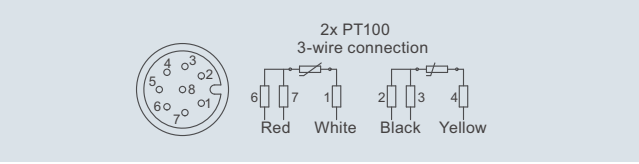
M12 connector for single sensors (SITRANS TS100/TS200/TS500)



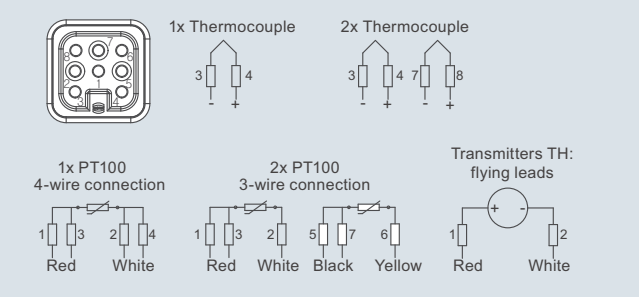
M1 connector for single sensors (SITRANS TS300)



M12 connector for dual sensors (SITRANS TS100)



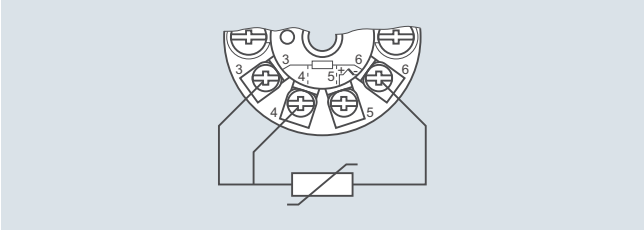
HAN7 D connector (SITRANS TS500)



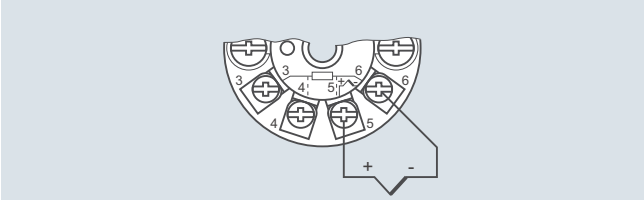
Transmitter connection

Where SITRANS TH transmitters are used in the connection head of the temperature sensor, connection takes place according to the following pattern:

SITRANS TH100/TH200/TH300

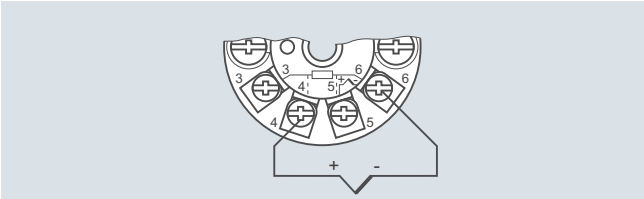


Resistance thermometer

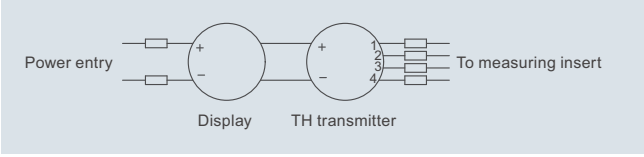


Thermocouples

SITRANS TH400



SITRANS TS500 TH transmitter display



In addition, our transmitters also allow for a large number of other possible connections (e.g. difference, average, two sensors). More information can be obtained at:
http://www.siemens.com/temperature

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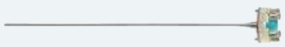
Detailed product overview

Type	TSinsert	TS100	TS200
Description	Measuring insert	Temperature sensors in cable version	Temperature sensors in compact version
Application	Replaceable	Universal use	Universal use
Version	Mineral-insulated version	Mineral-insulated version	Mineral-insulated version
Type	in European or American type	For unfavorable space conditions	For unfavorable space conditions
Image			
Catalog page	2/98	2/40	2/43
Order	Nr. 7MC70*	7MC711*	7MC72*
Wetted material	Cr-Ni-Mo (RTD): 2.4816 (TC) (Cr-Ni-Mo; Inconnel600)	Cr-Ni-Mo (RTD); 2.4816 (TC) (Cr-Ni-Mo; Inconnel600)	Cr-Ni-Mo (RTD); 2.4816 (TC) (Cr-Ni-Mo; Inconnel600)
Thermowell types	To order separately	Without/with separate thermowell	Without/with separate thermowell
Process connections	-	Compression fittings • Soldering nipple: - G ¼, G ½ - ½ NPT - M 8x1, M18x1.5 • Surface connection piece for installation on surfaces/tubes	Compression fittings • Soldering nipple: - G ¼, G ½ - ½ NPT - M 8x1, M18x1.5 • Surface connection piece for installation on surfaces/tubes
Sensor elements	Pt100 + thermocouples	Pt100 + thermocouples	Pt100 + thermocouples
Sensor connection	• 1 x 4 wire • 2 x 3 wire	• 1 x 4 wire • 2 x 3 wire	• 1 x 4 wire • 2 x 3 wire
Sensor accuracy	• 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
Connection heads	Type B (Type A flameproof)	Cable, optional with misc. plugs	• Flying leads • Misc. plugs
Explosion protection (EU, CN, EAC, AU, NZ, US, CA)	Intrinsic safety "i"/"IS"	Intrinsic safety "i"/"IS"	Intrinsic safety "i"/"IS"
Output signal	Sensor signal: • 4 ... 20 mA (TH100/TH200) • HART (TH300) • PA (TH400) • FF (TH400)	Sensor signal	Sensor signal
Application	Spare parts	• Machinery and equipment • Bearing temperature • Surfaces	• Machinery and equipment • Bearing temperature • Surfaces
Limit temperat.[1] **[°C (°F)]**	• Pt100 basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)	• Pt100 basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)	• Pt100 basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)
Max. nominal pressure[1] **(static pressure at 20°C)**	-	Compression fitting max. 5 bar (145 psi)	Compression fitting max. 5 bar (145 psi)
Min. response time $t_{0.5}$	2 … 6 s	2 … 6 s	2 … 6 s
Degree of protection	IP54	See drawing page 2/8	See drawing page 2/8

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

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Type	TS300 Modular	TS300 Clamp-on
Description	Temperature sensors for food, pharmaceuticals and biotechnology	Temperature sensors for food, pharmaceuticals and biotechnology
Application	Measurements submersed in medium (pipelines and vessels)	Clamp-on measurement of pipe surface temperature
Version	Protective pipe similar to DIN 43772, Type 2F and tapered design	Protective pipe similar to DIN 43772, Type 2F and tapered design
Type		For unfavorable space conditions
Image		
Catalog page	2/46	2/50
Order	7MC8005*	7MC8016
Wetted material	1.4404 or1.4435 (316L)	1.4404 or 1.4435 (316L)
Thermowell types	Similar to 2F	Similar to 2F
Process connections	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: • Collar 4 ... 57 mm (0.16 ... 2.24 inch) • Tensioning 6 ... 50,8 mm (0.24 ... 2.00 inch) • Tensioning 50 ... 200 mm (1.97 ... 7.87 inch)
Sensor elements	Pt100	Pt100
Sensor connection	• 1x4 wire • 2x3 wire	• 1x3 wire
Sensor accuracy	• Class A	• Class A • Process-optimized design
Connection heads	Typ B	• Typ B
Explosion protection (EU, CN, EAC, AU, NZ, US, CA)	-	-
Output signal	Sensor signal: • 4 ... 20 mA (TH100/TH200) • HART (TH300) • PA (TH400) • FF (TH400)	Sensor signal: • 4 ... 20 mA TH100slim • HART (TH300) • PA (TH400) • FF (TH400)
Application	Surface roughness: Standard applications Ra < 1.5 µm (5.9 10^{-5} inch)	Surface roughness: Standard applications Ra < 1.5 µm (5.9 10^{-5} inch)
Limit temperat. [1] [°C (°F)]	-20 ... +400 °C (-4 ... +752 °F)	-40 ... +150 °C (-40 ... +302 °F)
Max. nominal pressure[1] (static pressure at 20°C)	0 ... 150 (0 ... 5.91) 50 bar 150 ... 300 (5.91 ... 11.81) 40 bar	No pressure load due to clamp-on principle
Min. response time $t_{0.5}$	20 ... 34 s	4 s (See "Reference conditions SITRANS TS300 Clamp-on" page 2/18)
Degree of protection	IP54 ... IP68 dep. to connection head, see page 2/15	IP65 for pipe collar, IP67 for elektrical connection

[1] 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)].

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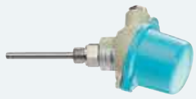
Detailed product overview

Type	TS500 for installation	TS500 Type 2	TS500 Type 2N
Description	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)
Application	Temperature sensors for the installation of existing thermowells	Tubular version for minimal to medium stress	Tubular version for minimal to medium stress
Version	Suitable for thermowells as per DIN 43772 as well as ASME B40.9-2001	Thermowell as per DIN 43722, Type 2 without process connection	Thermowell Type 2N similar to DIN 43772, screwed in
Type	With extension • European type • American type	• Without extension, plug-in • Use with moveable compression fittings	Without extension
Image			
Catalog page	2/93	2/54	2/59
Article No.	Nr. 7MC750*	7MC751*-0*(A/B)**-0***	7MC751*-1****-0***
Wetted material	None: Measuring insert made of 1.4571, 1.4404 or 1.4435 (RTD); 2.4816 (TC) (316L; Inconnel600)	1.4404 or 1.4435; 1.4571 (316L; 316TI)	1.4404 or 1.4435; 1.4571 (316L; 316TI)
Thermowell types	To order separately	Form 2	Form 2N (similar to form 2)
Process connections	Connection to thermowell: • M14x1.5 • M18x1.5 • G ½ • ½ NPT	Compression fittings • G ½ • ½ NPT For welding	• G ½ • ½ NPT
Insertion length	• 110 mm (4.33 inch) • 140 mm (5.51 inch) • 200 mm (7.87 inch) • 260 mm (10.24 inch) • 410 mm (16.14 inch)	Variable	• 100 mm (3.94 inch) • 160 mm (6.30 inch) • 230 mm (9.06 inch) • 360 mm (14.17 inch) • 510 mm (20.08 inch)
Neck tube length	as per DIN 43772	as per DIN 43772	not adjustable X=20 mm (0.79 inch)
Sensor elem.	Pt100 + thermocouples	Pt100 + thermocouples	Pt100 + thermocouples
Sensor connection	• 1 x 4 wire • 2 x 3 wire	• 1 x 4 wire • 2 x 3 wire	• 1 x 4 wire • 2 x 3 wire
Sensor accuracy	• 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
Conn. heads	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)
Explosion protection (EU, CN, EAC, AU, NZ, US, CA)	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • 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"
Output signal	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)
Application	Pressure vessel and piping	Pressure vessel and piping	Pressure vessel and piping
Limit temperature[1] **[°C (°F)]**	• Pt100 Basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)	• Pt100 Basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)	• Pt100 Basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)
Max. nominal pressure[1] **(static pressure at 20°C),** dimensions in mm (inch)	s. thermowell	Tube Ø9 (0.35): • 0 ... 150 (0 ... 5.91) 50 bar • 150 ... 300 (5.91 ... 11.81) 40 bar • Compression fitting 5 bar Tube Ø12 (0.47): • 0 ... 150 (0 ... 5.91) 75 bar • 150 ... 300 (5.91 ... 11.81) 60 bar • Compression fitting 5 bar	Tube Ø9 (0.35): • 0 ... 150 (0 ... 5.91) 50 bar • 150 ... 300 (5.91 ... 11.81) 40 bar
Min. response time $t_{0.5}$	s. thermowell	20 … 45 s	20 … 34 s
Degree of prot.	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

[1] 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)].

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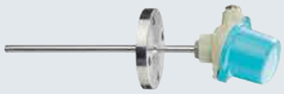
Type	**TS500 Type 2G**	**TS500 Type 2F**	**TS500 Type 3**
Description	Temperature sensors for the process industry (vessels and pipings)	Temperature sensors for the process industry (vessels and pipings)	Temperature sensors for the process industry (vessels and pipings) **Quicker than form 2**
Application	Pipe version for minimal to medium stress	Pipe version for minimal to medium stress	Pipe version for minimal to medium stress
Version	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
Type	With extension	With extension	• Without extension, plug-in • Use with moveable compression fittings
Image			
Catalog page	2/64	2/69	2/74
Article No.	7MC751*-1*(A/B)**-1***	7MC751*-2*(A/B)**-1***	7MC751*-0*K**-0***
Wetted mater.	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)
Therm. types	Form 2G	Form 2F	Form 3
Process connections	Welded threads: • G 1 • G ½ • ½ NPT	Welded flange • DN 25, PN10 ... 40 • 1RF150 • 1.5RF150 • 1.5RF300	Compression fittings • G ½ • ½ NPT For welding
Insertion length	• 160 mm (6.30 inch) • 250 mm (9.84 inch) • 400 mm (15.75 inch)	• 225 mm (8.86 inch) • 315 mm (12.40 inch) • 465 mm (18.31 inch)	• 225 mm (8.86 inch) • 315 mm (12.40 inch) • 465 mm (18.31 inch)
Neck tube length	As per DIN 43772	As per DIN 43772	As per DIN 43772
Sensor elements	Pt100 + thermocouples	Pt100 + thermocouples	Pt100 + thermocouples
Sensor connection	• 1 x 4 wire • 2 x 3 wire	• 1 x 4 wire • 2 x 3 wire	• 1 x 4 wire • 2 x 3 wire
Sensor accuracy	• 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
Connection heads	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)
Explosion protection (EU, CN, EAC, AU, NZ, US, CA)	• Intrinsic safety "i"/"IS" • Flameproof enclosure "d"/"XP" • 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"
Output signal	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)
Application	Pressure vessel and piping	Pressure vessel and piping	Pressure vessel and piping
Limit temperat.[1] **[°C (°F)]**	• Pt100 Basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)	• Pt100 Basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)	• Pt100 Basis: -50 ... +400 (-58 ... +752) • Pt100 extended measuring range: -196 ... +600 (-321 ... +1112) • Thermocouple: -40 ... +1100 (-40 ... +2012) (depends on type)
Max. nominal pressure[1] **(static pressure at 20°C),** dimensions in mm (inch)	Tube Ø9 (0.35): • 0 ... 150 mm (0 ... 5.91 inch) 50 bar • 150 ... 300 (5.91 ... 11.81) 40 bar • Compression fitting 5 bar Tube Ø12 (0.47): • 0 ... 150 (0 ... 5.91) 75 bar • 150 ... 300 (5.91 ... 11.81) 60 bar	Tube Ø9 (0.35): • 0 ... 150 mm (0 ... 5.91 inch) 50 bar • 150 ... 300 (5.91 ... 11.81) 40 bar Tube Ø12 (0.47): • 0 ... 150 (0 ... 5.91) 75 bar • 150 ... 300 (5.91 ... 11.81) 60 bar Note restriction imposed by PN of the flange	Tube Ø12 (0.47): • 0 ... 200 (0 ... 7.87) 75 bar • 200 ... 300 mm (7.87 ... 11.81) 60 bar • Compression fitting 5 bar
Min. response time $t_{0.5}$	20 … 34 s	20 … 34 s	7 … 15 s
Degr. of protec.	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

[1)] 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)].

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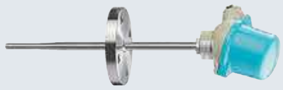
2

Detailed product overview

Type	TS500 Type 3G	TS500 Type 3F	TS500 Type 4/4F
Description	Temperature sensors for the process industry (vessels and pipings) **Faster as form 2**	Temperature sensors for the process industry (vessels and pipings) **Faster as form 2**	Temperature sensors for the process industry (vessels and pipings) **Quick-respone version available**
Applic. area	Tubular version for minimal to medium stress	Tubular version for minimal to medium stress	Tubular version for medium to highest stress
Version	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
Type	With extension	With extension	With extension
Image			 
Catalog page	2/79	2/84	2/89
Article No.	7MC751*-1*K**-1***	7MC751*-2*K**-1***	7MC752*
Wetted material	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)
Thermowell types	Form 3G	Form 3F	• Form 4 • Form 4F
Process connections	Welded threads: • G 1 • G ½ • ½ 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
Insertion length	• 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
Neck tube length	As per DIN 43772	As per DIN 43772	As per DIN 43772
Sensor elem.	Pt100 + thermocouples	Pt100 + thermocouples	Pt100 + thermocouples
Sensor connection	• 1 x 4 wire • 2 x 3 wire	• 1 x 4 wire • 2 x 3 wire	• 1 x 4 wire • 2 x 3 wire
Sensor accuracy	• 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
Conn. heads	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)	Type B (Type A for Ex d versions)
Explosion protection (EU, CN, EAC, AU, NZ, US, CA)	• 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"
Output signal	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)
Application	Vessels and pipings	Vessels and pipings	Vessels and pipings
Limit temperat.[1] **[°C (°F)]**	• 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)
Max. nominal pressure[1] **(static pressure at 20°C),** dimensions in mm (inch)	Pipe Ø12 (0.47): • 0 ... 200 75 bar • 200 ... 300 60 bar	Pipe Ø12 (0.47): • 0 ... 200 75 bar • 200 ... 300 60 bar Note restriction imposed by PN of the flange	Mat. (1.4404; 1.4571) : • 65 450 bar • 125 350 bar Mat. (1.7335; 1.5415) : • 65 500 bar • 125 400 bar Form 4F: Note restriction imposed by PN of the flange
Min. response time $t_{0.5}$	7 … 15 s	7 … 15 s	∅24 mm (0.95 inch): 20 … 45 s
Deg. of protect.	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

[1] 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)].

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Old	Length	Material	Number of sensors + Ex		Connection head		New	Material		PA weights	PA characteristic	Thermowell form	Length of 1st digit	Length of 2nd digit	-	Neck tube	Connection side	Sensor type	Number of sensors			Ex protection
7MC1006-	■	D	■	1	■		**7MC751**	1	-	1	C	A	■	■	-	0	■	A	■			
	1												0	1								
	2												0	4								
	3												1	0								
	4												2	0								
	5												3	1								
			A																1		-Z	E01
			B																5		-Z	E01
			E																1		-Z	E01
			F																5		-Z	E01
					1												A					
					4												B					
					6												C					
					7												-					
7MC1007-	■	D	■	1	■		**7MC751**	1	-	1	C	A	■	■	-	1	■	C	■			
	5												0	4								
	6												1	2								
	7												2	2								
			A																1		-Z	E01
			B																5		-Z	E01
			E																1		-Z	E01
			F																5		-Z	E01
					1												A					
					4												B					
					6												C					
					7												-					
7MC1008-	■	D	■	1	■		**7MC751**	1	-	1	E	B	■	■	-	1	■	C	■		-Z	E01
	6												0	4								
	7												1	2								
			A																1			
			B																5			
					1												A					
					4												B					
					6												C					
					7												-					

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Conversion assistance old appliance

Old	Length	Material	Number of sensors + Ex		Connection head		New	Material		PA weights	PA characteristic	Thermowell form	Length of 1st digit	Length of 2nd digit	-	Neck tube	Connection side	Sensor type	Number of sensors			Ex protection
7MC1010-	■	■	■	2	*		**7MC752**	■	-	0	N	■	■	0	-	■	■	C	■			
	1											A	0			1						
	2											A	0			9						N2D: X45 {Y45:209 mm}
	3											A	0			9						N2D: X45 {Y45:179 mm}
	4											B	0			1						
	5											B	0			9						N2D: X45 {Y45:179 mm}
	6											D	0			1						
	7											D	0			9						N2D: X45 {Y45:179 mm}
	8											E	0			9						N1D: X45 {Y45:119 mm}
		G						3														
		F						1														
			A																1		-Z	E01
			B																5		-Z	E01
			E																1		-Z	E01
			F																5		-Z	E01
					1												A					
					4												B					
					6												C					
					7												-					
7MC1017-	■	F	■	1	■		**7MC751**	1	-	2	A	B	■	■	-	9	■	C	■			N2D: X45 {Y45:129 mm}
	1												0	4								
	2												1	2								
			A																1		-Z	E01
			B																5		-Z	E01
			E																1		-Z	E01
			F																5		-Z	E01
					1												A					
					4												B					
					6												C					
					7												-					
7MC1041-	■	F	■	0	■		**7MC751**	1	-	2	A	K	■	■	-	1	■	C	■			
	1												1	1								
	2												1	4								
	3												1	7								
		A	A																1		-Z	E01
		A	B																5		-Z	E01
		E	A																1		-Z	E01
		E	B																5		-Z	E01
					1												A					
					4												B					
					6												C					
					7												-					

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Old	Length		Number of sensors		Connection head		New	Diameter		Measuring insert type	Sensor	Number of sensors	Length of 1st digit	Length of 2nd digit								Ex protection
7MC1900-	■	E	A				7MC701	8	-	1	C	A	■	■							-Z	E01
	1												3	3								
	2												4	1								
	3												4	7							-Z	Y44: B=1025 mm
	4												4	7							-Z	Y44: B=1425 mm
7MC1910-	■	J	■				7MC701	6	-	1	C	■	■	■								
	1												1	3								
	2												1	7								
	3												2	1								
	4												2	3								
	5												2	5								
	6												2	7								
	7												3	5								
	8												2	0								
			A									A										
			B									D										
7MC1913-	■	A	■	■	2		7MC701	6	-	1	C	■	■	■							-Z	E01
	1												1	3								
	2												1	7								
	3												2	1								
	4												2	3								
	5												2	5								
	6												2	7								
	7												2	0								
	8												3	5								
			A	2								A										
			B	1								D										

Old	Length	Type of cable		External diameter of sheath			New			External diameter of sheath	Nominal length	Sensor	Number of sensors	Connection side								Ex-protection
7MC2027-	■	■	A	■	0		7MC711	1	-	■	■	K	1	1	-	0	A	A	0		-Z	E01
	1										B											
	2										D										-Z	Y44: U=300 mm
	3										D											
		A																			-Z	J03
		B																			-Z	S03
		C																			-Z	L03
				1						-												
				2						-												
				3						-												
				4						-												

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Conversion assistance old appliance

Old	External diameter of sheath	Material of sheath	Type + number of sensor		Length		New			External diameter of sheath	Length	Sensor type	Number									Ex-protection
7MC2021-	■	■	■	-Z			**7MC721**	2	-	■	■	■	■	5	-	0	A	A	0		-Z	E01
	2									3												
	4									6												
		C																				
		L																				
			E									J	1									
			F									J	4									
			A									-	-									
			B									-	-									
			C									K	1									
			D									K	4									
					A01					C										-Z		Y44: U=250 mm
					A02					F												
					A03					M												
					A04					T												

Old	Length		Number of sensors	External diameter of sheath	Material of sheath		New			External diameter of sheath	Length	Sensor type	Number									Ex-protection
7MC2028-	■	A	■	■	■		**7MC721**	2	-	■	■	K	■	4	-	0	A	A	0		-Z	E01
	1										D										-Z	Y44: U=300 mm
	2										D											
			C										1									
			D										4									
				1						-												
				2						-												
				3						3												
				4						6												
					1																	
					2																	

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Connection head, Form B	Old	New
• Made of cast light alloy, with 1 cable bushing and		
- Screw cover	1	A
- Standard hinged cover	4	B
- Hinged cover high	6	C
• Made of stainless steel, with 1 cable bushing and screw cover	7	-
Measuring insert, single	A	1
Measuring insert, single, explosion protection	E	1 and additional E01
Measuring insert, double	B	5
Measuring insert, double, explosion protection	F	5 and additional E01

More information

Ordering examples for SITRANS TS100/200

Desired features	Article No.
SITRANS TS100	**7MC7111**
Sensor diameter	**6**
Standard length 200 mm (scope of sensor length 101 ... 250 mm)	**C**
Sensor	**A1**
Flying leads	**1**
Enclosed compression fitting	**A41**
Connection cable PVC, 10 m	**J10**
TAG plate	**Y15: TTSA5458**
Non-Ex requirements	**-Z E00**

Full article no.:

7MC7111-6CA11-Z A41+J10+Y15
Y15: TTSA5458

Desired features	Article No.
SITRANS TS100	**7MC7111**
Sensor diameter	**6**
Standard length 200 mm (scope of sensor length 101 ... 250 mm)	**C**
Sensor	**A1**
Flying leads	**1**
Enclosed compression fitting	**A41**
Connection cable PVC, 10 m	**J10**
TAG plate	**Y15: TTSA5458**
Customer-specific length 211 mm	**Y44: 211 mm**
Non-Ex requirements	**-Z E00**

Full article no.:

7MC7111-6CA11-Z A41+J10+Y15+Y44
Y15: TTSA5458
Y44: 211 mm

Ordering example for SITRANS TS500

Desired features	Article No.
SITRANS TS500	**7MC751**
Material	**1**
Process connection	**1E**
Thermowell form	**A**
Insertion length U Standard 250 mm (insertion length customer-specific 220 mm)	**12**
Extension X customer-specific	**9**
Head	**C**
Sensor	**A**
Sensor number/Accuracy	**1**
Extension X customer-specific	**N2D**
Insertion length U customer-specific	**Y44: 220 mm**
Extension length X customer-specific	**Y45: 200 mm**
Plant calibration per 3-point	**Y33: 0°C** **Y33: 50°C** **Y33: 150°C**
Non-Ex requirements	**-Z E00**

Full article no.:

7MC7511-1EA12-9CA1-Z N2D+Y44+Y45 +Y33+Y33+Y33
Y44: 220 mm
Y45: 200 mm
Y33: 0°C
Y33: 50°C
Y33: 150°C

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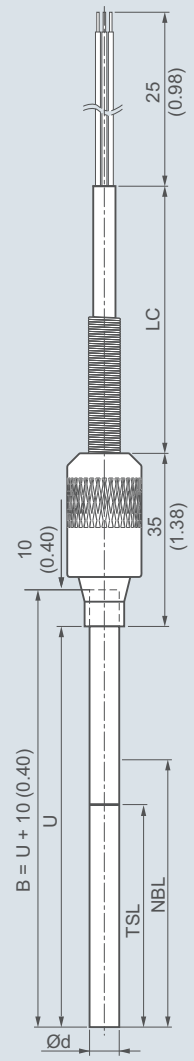
2

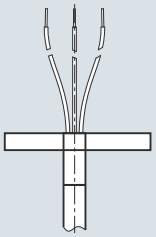
Dimensional drawings



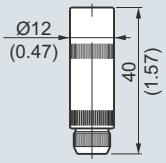
B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
LC	Cable length
NBL	Non-bending length
TSL	Temperature-sensitive length
U	Insertion length

SITRANS TS100, temperature sensors in cable version, universal use, mineral-insulated version, for unfavorable space conditions, IP54 at sensor/cable transition, dimensions in mm (inch)

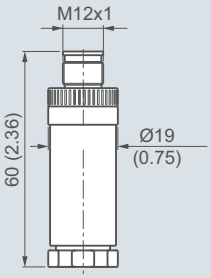
Design of connection side



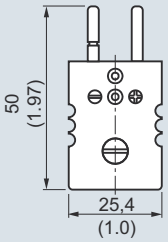
Flying leads, IP00, dimensions in mm (inch)



Coupling LEMO 1S, IP50, dimensions in mm (inch)



M12 plug, IP54, dimensions in +mm (inch)



Thermocouple plug, IP20, dimensions in mm (inch)

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Selection and Ordering data	Article No.
SITRANS TS100 ↗	**7MC7111-**
Temperature sensors in cable version, universal use, mineral-insulated version, for unfavorable space conditions	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Sensor diameter	
6 mm (0.24 inch)	**6**
Length of sensor element B, effective length U = B-10; see dimensional drawings page 2/40	
200 mm (7.87 inch)	**C**
500 mm (19.68 inch)	**D**
750 mm (29.53 inch)	**E**
Customer-specific length of sensor element B, effective length U = B-10; see dimensional drawings page 2/40	
enter customer specific length with Y44, see Order codes below	
70 ... 100 mm (2.76 ... 3.94 inch) Initial: 100 mm (3.94 inch)	**B**
101 ... 250 mm (3.98 ... 9.84 inch) Initial: 200 mm (7.87 inch)	**C**
251 ... 500 mm (9.88 ... 19.68 inch) Initial: 500 mm (19.68 inch)	**D**
501 ... 750 mm (19.72 ... 29.53 inch) Initial: 750 mm (29.53 inch)	**E**
751 ... 1 000 mm (19.72 ... 39.37 inch) Initial: 1 000 mm (39.37 inch)	**F**
1 001 ... 1500 mm (39.4 ... 59.00 inch) Initial: 1 500 mm (59.00 inch)	**G**
Sensor[1]	
Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17	
Pt100, basis, -50 ... +400 °C (-58 ... +752 °F)	**A**
Pt100, vibration-resitant, -50 ... +400 °C (-58 ... +752 °F)	**B**
Pt100, expanded range, -196 ... +600 °C (-320.8 ... +1 112 °F)	**C**
Thermocouple Type K, -40 ... +1 000 °C (-40 .... +1 832 °F)	**K**
Thermocouple Type J, only class 2, -40 ... +750 °C (-40 ... +1 382 °F)	**J**
Sensor number/Accuracy	
Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19	
Single, basic accuracy (Class 2/Class B)	**1**
Single, increased accuracy (Class 1/Class A)	**2**
Single, highest accuracy (Class AA)	**3**
Double, basic accuracy (Class 2/Class B)	**4**
Double, increased accuracy (Class 1/Class A)	**5**
Double, highest accuracy (Class AA)	**6**
Design of connection side	
Flying leads	**1**
LEMO coupling 1S	**2**
M12 connector, not for double Pt100	**3**
Thermocouple coupling, from TC-material (2xTC on request)	**4**

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Customer-specific length of sensor element B, effective length U = B-10 Select range, enter desired length in plain text (No entry = standard length)	**Y44**
Options	
Add "**-Z**" to Article No., add options, separate extensions with "+".	
Connection cable, type and length Cable type = 1st letter, Length 1 ... 99 m (3.28 ... 324.80 ft) = 2nd + 3rd place e.g.: 34 m (111.55 ft) connection cable PVC (PVC code is J34)	
with X meters connection cable (JJ) PVC/PVC, Operating temperature (-10...+105°C) (14 ... 221 °F)	**J01 ... J99**
with X meters connection cable (SLFP) Silicone/Fluorpolymer, operating temperature -50 ... +180 °C (-58 ... +356 °F)	**S01 ... S99**
with X meters connection cable (TGLV) PTFE/glass fiber/reinforced with stainless steel), Operating temperature (-100...+205°C (148 ... 401°F))	**L01 ... L99**

[1] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Additional configurations on page after next page!

You find ordering examples on page 2/39.

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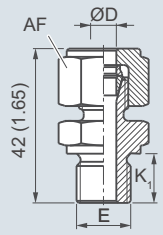
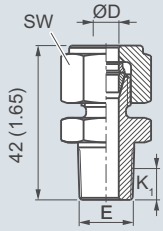
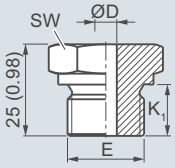


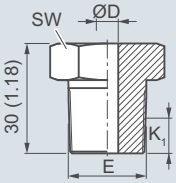
Compression fitting, metric (A30, A31), dimensions in mm (inch)



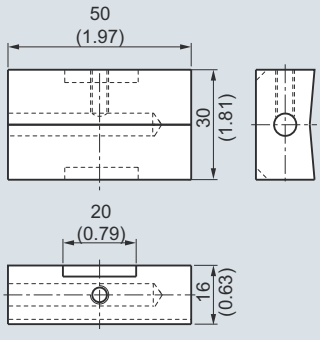
Compression fitting NPT (A32), dimensions in mm (inch)



Soldering nipple, metric (A20, A21, A23), dimensions in mm (inch)



Soldering nipple NPT (A22), dimensions in mm (inch)



Surface connection piece (A50), dimensions in mm (inch)

Selection and Ordering data	Order code
Options	
Add "**-Z**" to Article No., add options, separate extensions with "+".	
Process connection	
Soldering nipple G¼", enclosed	**A20**
Soldering nipple G½", enclosed	**A21**
Soldering nipple NPT½", enclosed	**A22**
Soldering nipple M18x1.5, enclosed	**A23**
Compression fitting G¼", enclosed	**A30**
Compression fitting G½", enclosed	**A31**
Compression fitting NPT ½", enclosed	**A32**
Surface connection piece, enclosed (non Ex)	**A50**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS1) according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"[1)] according to cCSAus (USA, Canada)	**E18**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1)] according to NEPSI (China)	**E55**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1)] according to EACEx (EAC)	**E81**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**
Certificates and approvals	
EN 10204-3.1 Inspection certificate for materials coming into contact with media	**C12**
EN 10204-3.1 Inspection certificate visual: measurement and functional inspection	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
ISO 9001 grease-free (cleaned for e.g. oxygen applications)	**C51**
Further options	
Stainless steel TAG plate , Enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text, Attention: For devices with built-in head transmitters, select test points within the set measurement range	**Y33**

1) Please select Ex i version of the optional transmitter.

You find ordering examples on page 2/39.

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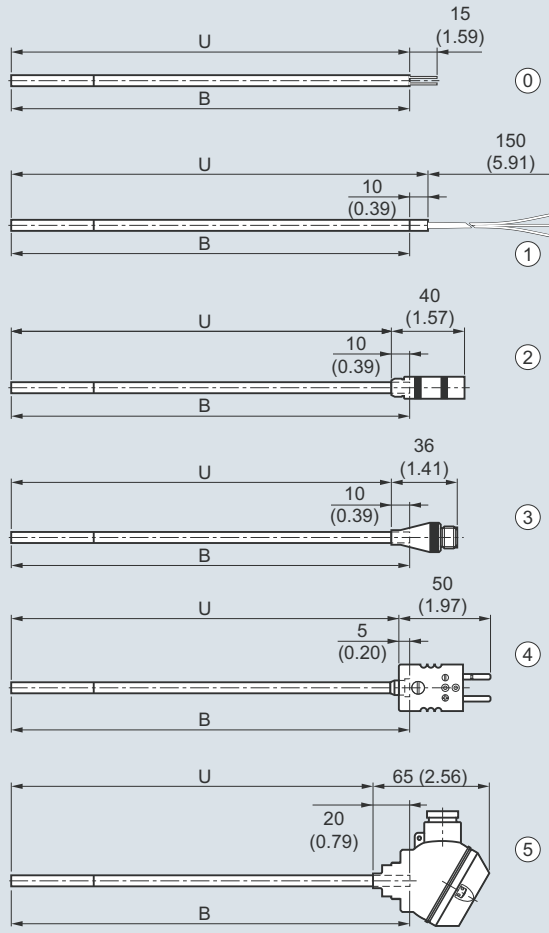
Dimensional drawings



B Measuring insert length
H Head height
U Insertion length

0	Basic sensor	**U = B**	IP00
1	Flying leads	**U = B + 10 (0.39)**	IP00
2	LEMO coupling 1S	**U = B - 10 (0.39)**	IP50
3	M12 plugs	U = B - 10 (0.39)	IP54
4	Thermocouple coupling	**U = B - 5 (0.20)**	IP20
5	Mini connection head	U = B - 20 (0.79)	IP54

SITRANS TS200, temperature sensors in cable version, universal use, mineral-insulated version, for unfavorable space conditions, dimensions in mm (inch)

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Compact, mineral-insulated

Selection and Ordering data	Article No.
SITRANS TS200 ↗	**7MC7212-**
Temperature sensors in compact version, universal use, mineral-insulated version, for unfavorable space conditions	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Sensor diameter	
6 mm (0.24 inch)	6
Length of sensor element B, effective length U see dimensional drawing on page 2/43	
200 mm (7.87 inch)	C
500 mm (19.68 inch)	D
750 mm (29.53 inch)	E
Customer-specific length of sensor element B, effective length U see dimensional drawing on page 2/43	
enter customer specific length with Y44, see Order codes below	
70 ...100 mm (2.76 ... 3.94 inch) Initial: 100 mm (3.94 inch)	B
101 ... 250 mm (3.98 ... 9.84 inch) Initial: 200 mm (7.87 inch)	C
251 ... 500 mm (9.88 ... 19.68 inch) Initial: 500 mm (19.68 inch)	D
501 ... 750 mm (19.72 ... 29.53 inch) Initial: 750 mm (29.53 inch)	E
751 ... 1 000 mm (29.57 ... 39.37 inch) Initial: 1 000 mm (39.37 inch)	F
1 001 ... 1 500 mm (39.4 ... 59.00 inch) Initial: 1 500 mm (59.00 inch)	G
Sensor[1)]	
Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17	
Pt100, basis, -50 ... +400 °C (-58 ... +752 °F)	A
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)	B
Pt100, expanded range, -196 ... +600 °C (-320.8 ... +1 112 °F)	C
Thermocouple Type K, -40 ... +1 000 °C (-40 ... +1 832 °F)	K
Thermocouple Type J, only class 2, -40 ... +750 °C (-40 ... +1 382 °F)	J
Number/Accuracy	
Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19	
Single, basic accuracy (Class 2/Class B)	1
Single, increased accuracy (Class 1/Class A)	2
Single, highest accuracy (Class AA)	3
Double, basic accuracy (Class 2/Class B)	4
Double, increased accuracy (Class 1/Class A)	5
Double, highest accuracy (Class AA)	6
Design of connection side	
Solid wire ends (sensor element)	0
Flying leads	1
LEMO coupling 1S	2
M12 connector, not for double Pt100	3
Thermocouple coupling, from TC-material (2xTC on request)	4
Mini connection head, aluminum, not for double Pt100	5

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Customer-specific length of sensor element B, effective length, U see dimensional drawing on page 2/43 Select range, enter desired length in plain text (No entry = standard length)	**Y44**

[1)] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Additional configurations on page after next page!

You find ordering examples on page 2/39.

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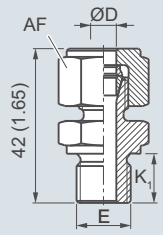
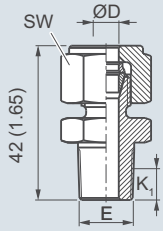
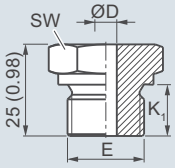


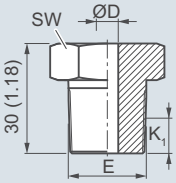
Compression fitting, metric (A30, A31), dimensions in mm (inch)



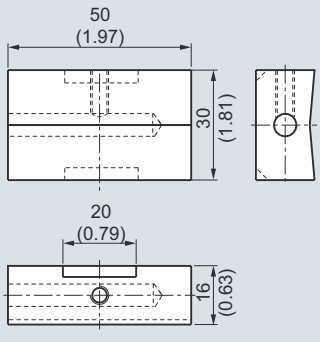
Compression fitting NPT (A32), dimensions in mm (inch)



Soldering nipple, metric (A20, A21, A23), dimensions in mm (inch)



Soldering nipple NPT (A22), dimensions in mm (inch)



Surface connection piece (A50), dimensions in mm (inch)

Selection and Ordering data	Order code
Options	
Add "**-Z**" to Article No., add options, separate extensions with "+".	
Process connection	
Soldering nipple G¼", enclosed	**A20**
Soldering nipple G½", enclosed	**A21**
Soldering nipple NPT½", enclosed	**A22**
Soldering nipple M18x1.5, enclosed	**A23**
Compression fitting G¼", enclosed	**A30**
Compression fitting G½", enclosed	**A31**
Compression fitting NPT½", enclosed	**A32**
Surface connection piece, enclosed (non Ex)	**A50**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS1) according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"[1)] according to cCSAus (USA, Canada)	**E18**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1)] according to NEPSI (China)	**E55**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1)] according to EACEx (EAC)	**E81**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**
Certificates and approvals	
EN 10204-3.1 Inspection certificate for materials coming into contact with media	**C12**
EN 10204-3.1 Inspection certificate visual, measurement and functional inspection	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
ISO 9001 grease-free (cleaned for e.g. oxygen applications)	**C51**
Setting, designation, calibration	
Stainless steel TAG plate , Enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text. Attention: For devices with built-in head transmitters, select test points within the set measurement range	**Y33**

1) Please select Ex i version of the optional transmitter.

You find ordering examples on page 2/39.
Accessories, see page 2/188.

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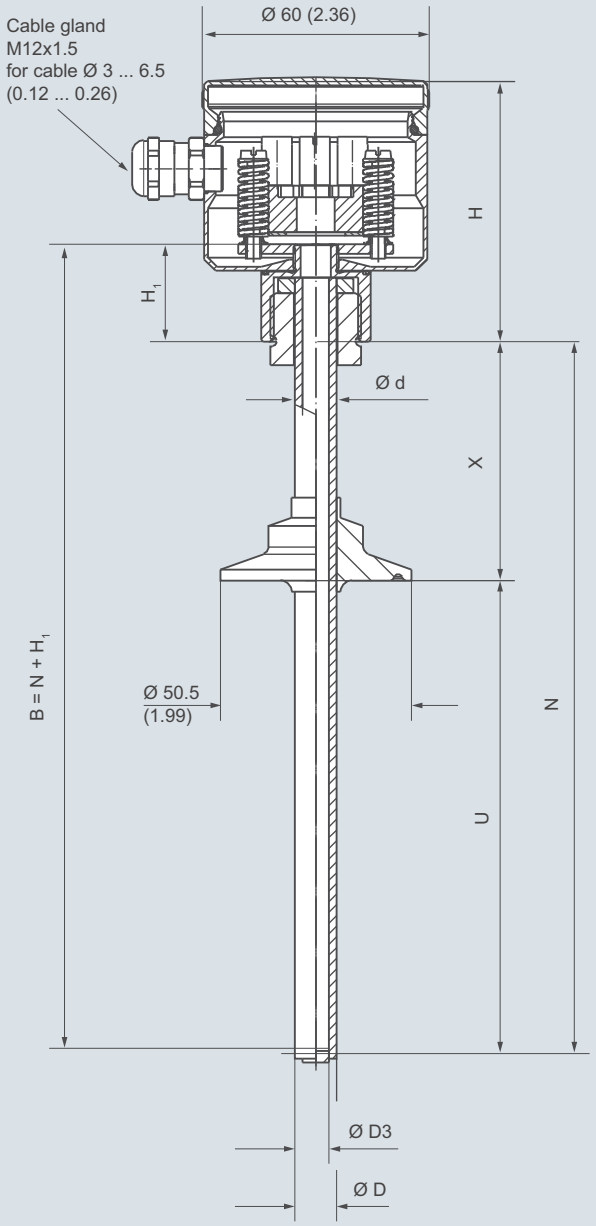
2

Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD3	Protective pipe inner diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
N	Nominal length
U	Insertion length
X	Extension length

SITRANS TS300 modular design, dimensions in mm (inch)

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Selection and Ordering data

Article No. 7MC8005- 0 - 0

Order code

SITRANS TS300 for food, pharmaceuticals and biotechnology, modular design for installation in pipelines and vessels

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Head

Stainless steel head, BS0, screw cover (Standard version)	5
Aluminum head, BA0, flange cover standard	1
Plastic cover, BM0, srew cover	2
Aluminum head, BB0, hinged cover low	3
Aluminum head, BC0, hinged cover high	4
Special version: (add Order code and plain text)	9 H1Y

Process connection, material 1.4404 or 1.4435/316L

Milk pipe union to DIN 11851 with slotted union nut and nominal diameter/pressure

DN 25/PN 40	AA
DN 32/PN 40	AB
DN 40/PN 40	AC
DN 50/PN 25	AD

Clamp connection:

ISO 2852	DIN 32676	Tri-Clamp	Outer diameter D	
–	–	½"/ ¾"	25.0 mm	CA
DN 25/ 33.7/38	DN 25/32/40	1", 1½"	50.5 mm	CB
DN 40/51	DN 50	2"	64.0 mm	CC
DN 63.5	–	2½"	77.5 mm	CD
DN 88.9	DN 80	–	106.0 mm	CE

Varivent connection (Tuchenhagen)

Ø D_6 = 50 mm (1.97 inch), for Varivent housing DN 25 and DN 1"	KU
Ø D_6 = 68 mm (2.68 inch), for Varivent housing DN 40 ... 125 and 1½" ... 6"	KV

NEUMO/BioControl

Size 25	BA
Size 50	BB
Size 65	BC

Ingold flange

DN 25 with hexagon union nut G 1¼", mounting length 40 mm (1.57"), diameter 24.8 mm (0.98") incl. O-ring	JA
Welding piece (sphere diameter 30 x 40 mm (1.2 x 1.6 inch) long)	LA
Special version: Type of screwed gland and nominal diameter (add Order code and plain text)	ZA J1Y

Protective tube	Measuring insert	
Ø D = 6 mm (0.24 inch)	Ø 3/3.2 mm, (0.12/0.13 inch) miner. insul.	1
Ø D =9 mm (0.35 inch)	Ø 6 mm (0.24 inch)	2
Ø D =9 mm (0.35 inch)	Ø 6 mm (0.24 inch) miner. insul.	3
Ø D =9 mm (0.35 inch) tapered tip D_2 =5 Ø x 20 mm (0.2 x 0.79 inch)	Ø 3/3.2 mm, (0.12/0.12 inch) miner. insul.	4
Special version: (add Order code and plain text)		9 L1Y

Selection and Ordering data

Article No. 7MC8005- 0 - 0

Order code

SITRANS TS300 for food, pharmaceuticals and biotechnology, modular design for installation in pipelines and vessels

Neck tube length X

65 mm (2.56 inch) [M = 80 mm (3.15 inch)]	1
130 mm (5.12 inch) [M = 145 mm (5.71 inch)]	2
Special version: (add Order code and plain text)	9 N1Y

Insertion length

Enter customer specific length with Y44, see Order codes below

15 mm (0.59 inch)	B
16 ... 35 mm (0.63 ...1.38 inch) Initial: 35 mm (1.38 inch)	C
36 ... 50 mm (1.42 ... 1.97 inch) Initial: 50 mm (1.97 inch)	D
51 ... 100 mm (2.01 ... 3.94 inch) Initial: 100 mm (3.94 inch)	E
101 ... 160 mm (3.98 ... 6.30 inch) Initial: 160 mm (6.30 inch)	F
161 ... 250 mm (6.34 ... 9.84 inch) Initial: 250 mm (9.84 inch)	G
251 ... 400 mm (9.88 ... 15.75 inch) Initial: 400 mm (15.75 inch)	H
1 ... 4 inch, Initial: 4 inch	J
4 ... 6 inch, Initial: 6 inch	K
6 ... 9 inch, Initial: 9 inch	L
Special version: (add Order code and plain text)	Z P1Y

Sensor

Thin-film technology: measuring range -50 ... +400 °C (-58 ... +752 °F)	
2 x Pt100, class A, three-wire	G
1 x Pt100, class A, four-wire	H
Special version: (add Order code and plain text)	Z Q1Y

Further designs Add "**-Z**" to Article No. and add Order code	Order code
Process connection completely electropolished	P01
Hygiene version (R_a < 0.8 µm (3.1 x 10^{-5} inch))	H01
Certificates	
• Roughness depth measurement R_a certified by factory certificate to EN 10204-3.1	C18
• Material certificate to EN 10204-3.1	C12
TAG plate made of stainless steel specify TAG No. in plain text	Y15
Test report (at 0, 50 and 100%) specify measuring range in plain text If optional head transmitters are integrated, please note that all calibration points are located in the set measuring range. If the points are located outside the standard measuring range, a Y01 addition is always required.	Y33
Insertion length customer-specific Select range, enter desired length in plain text (No entry = standard length)	Y44

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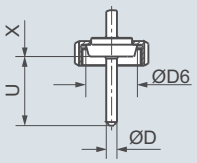
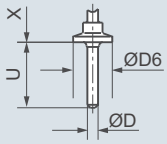
2

Dimensional drawings

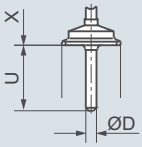
Conical connection with union nut according acc. to DIN 11851



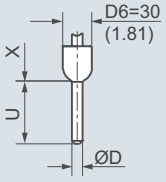
Tri-Clamp-connection



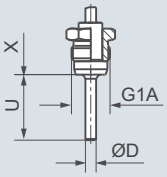
Clamp- connection acc. to DIN 32676 or ISO 2852



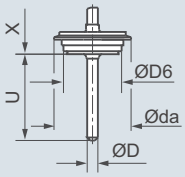
Ball weld sleeve Ball 30 x 40 (1.18 x 1.58)



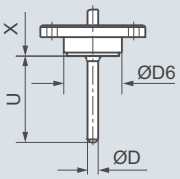
G1A without dead space due to conical metal cone



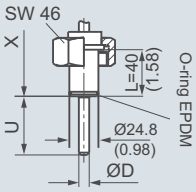
Varivent connection



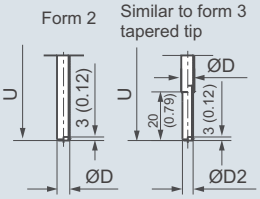
NEUMO BioControl



Ingold connection DN 25 with union nut



Protective pipe design based on DIN 43772



Process connections, dimensions in mm (inch)

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Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Built-in head transmitter Measuring range to be set must be specified with plain text data "Y11".	
SITRANS TH100, 4 ... 20 mA, Pt100	**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100	**T11**
SITRANS TH200, 4 ... 20 mA, universal	**T20**
SITRANS TH200 Ex i(ATEX), 4 ... 20 mA, universal	**T21**
SITRANS TH300, HART, universal	**T30**
SITRANS TH300 Ex i (ATEX), HART, universal	**T31**
SITRANS TH400 PA, universal	**T40**
SITRANS TH400 PA Ex i, universal	**T41**
SITRANS TH400 FF, universal	**T45**
SITRANS TH400 FF Ex i, universal	**T46**
Transmitter options	
Transmitter, enter complete setting in plain text (Y11:+/-NNNN ... +/-NNNN C,F)	**Y11**
Enter measuring point (max. 8 characters) in plain text	**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text	**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text	**Y24**
Transmitter, enter bus address in plain text	**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)	**U36**
Transmitter with a SIL 2 conformity	**C20**
Transmitter with a SIL 2/3 conformity	**C23**
Transmitter test protocol (5 points)	**C11**
Further options	
Connection form, flying leads (for the direct transmitter assembly, delivery without screws and springs)	**G01**
M12 plug (in combination with 1x Pt100 and/or transmitter, Non-Ex)	**G12**
Option not found?	
Specify special version in plain text	**Y98**
Process number for the special version	**Y99**

Accessories, see page 2/188.

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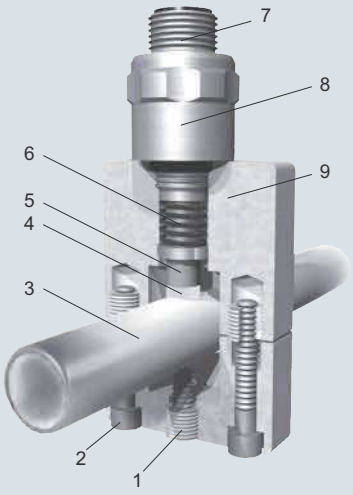
2

Dimensional drawings



1 Vibration-locking-screw
2 Mounting screws
3 Process pipeline
4 Temperature sensor
5 Thermal decoupling
6 Spring load
7 Electrical connection M12
8 Replaceable measuring insert
9 Heat insulated pipe collar

Resitance thermometer with protection pipe in Clamp-on design

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Selection and Ordering data

	Article No.	Ord. code
SITRANS TS300 ↗	**7MC8016-**	**0**
for food, pharmaceuticals and biotechnology **Clamp-on design for the measuring of the pipe surface temperature**		
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Design		
Acc. to IEC 60751, class A [-40 ... +150 °C (-40 ... +302 °F)]		**1**
Type of connection		
Round connector M12 x 1		**A**
connection head form B, stainless steel		**B**
4 ... 20 mA compact transmitter SITRANS TH100slim (standard measuring range 0 ... 100 °C (32 ... 212 °F))		**C**
Mounting with pipe collar		
Pipe outer-Ø mm (inch) / **Collar size mm (inch)**		
4 (0.16)		**A 1**
6 (0.24)		**B 1**
6.35 (0.25)		**C 1**
8 (0.31)		**D 1**
9.35 (0.37)		**E 1**
10 (0.39)		**F 1**
10.2 (0.40) / 50 x 35 x 20 (1.97 x 1.38 x 0.79)		**G 1**
10.3 (0.41)		**H 1**
12 (0.47)		**J 1**
12.7 (0.50)		**K 1**
13 (0.51)		**L 1**
13.5 (0.53)		**M 1**
13.7 (0.54)		**N 1**
14 (0.55)		**P 1**
15.88 (0.62)		**Q 1**
16 (0.63)		**R 1**
17.2 (0.68)		**S 1**
18.0 (0.71)		**A 2**
19.0 (0.74)		**B 2**
19.05 (0.75)		**C 2**
20.0 (0.79)		**D 2**
21.3 (0.84)		**E 2**
22.0 (0.87)		**F 2**
23.0 (0.90)		**G 2**
24.0 (0.94)		**H 2**
25.0 (0.98)		**J 2**
25.4 (1.00)		**K 2**
26.7 (1.05)		**L 2**
26.9 (1.06)		**M 2**
28.0 (1.10) / 70 x 70 x 20 (2.76 x 2.76 x 0.79)		**N 2**
29.0 (1.14)		**P 2**
30.0 (1.18)		**Q 2**
31.8 (1.25)		**R 2**
32.0 (1.26)		**S 2**
33.4 (1.31)		**T 2**
33.7 (1.33)		**U 2**
34.0 (1.34)		**V 2**
35.0 (1.38)		**W 2**
36.0 (1.42)		**X 2**
38.0 (1.49)		**Y 2**

Selection and Ordering data

	Article No.	Ord. code
SITRANS TS300	**7MC8016-**	**0**
for food, pharmaceuticals and biotechnology **Clamp-on design for the measuring of the pipe surface temperature**		
38.1 (1.50)		**A 3**
41.0 (1.61)		**B 3**
42.4 (1.67)		**C 3**
44.5 (1.75)		**D 3**
48.3 (1.90) / 90 x 85 x 20 (3.54 x 3.35 x 0.79)		**E 3**
50.8 (2.00)		**F 3**
53.0 (2.09)		**G 3**
54.0 (2.13)		**H 3**
57.0 (2.24)		**J 3**
Always indicate external tube diameter for[1]: • Installation with tube collar and deviating external tube diameter (S11-S19) • Securing with clamps (S21-S23) • Clamping band installation (S31-S35)		**Z 0** **K 1 Y**

[1] Special sizes for pipe outer diameters: In order to process "Z0" special sizes, the following two additional items of information are essential:
- the required diameter specified in plain text under "K1Y"
- Selection of the corresponding pipe collar, clamping band or clamping bracket size (Order codes "S11" to "S35")

Recommended for all versions: Heat-conductive-compound, silicone-free, syringe 3 g, Order code: L15 (see page 2/53)

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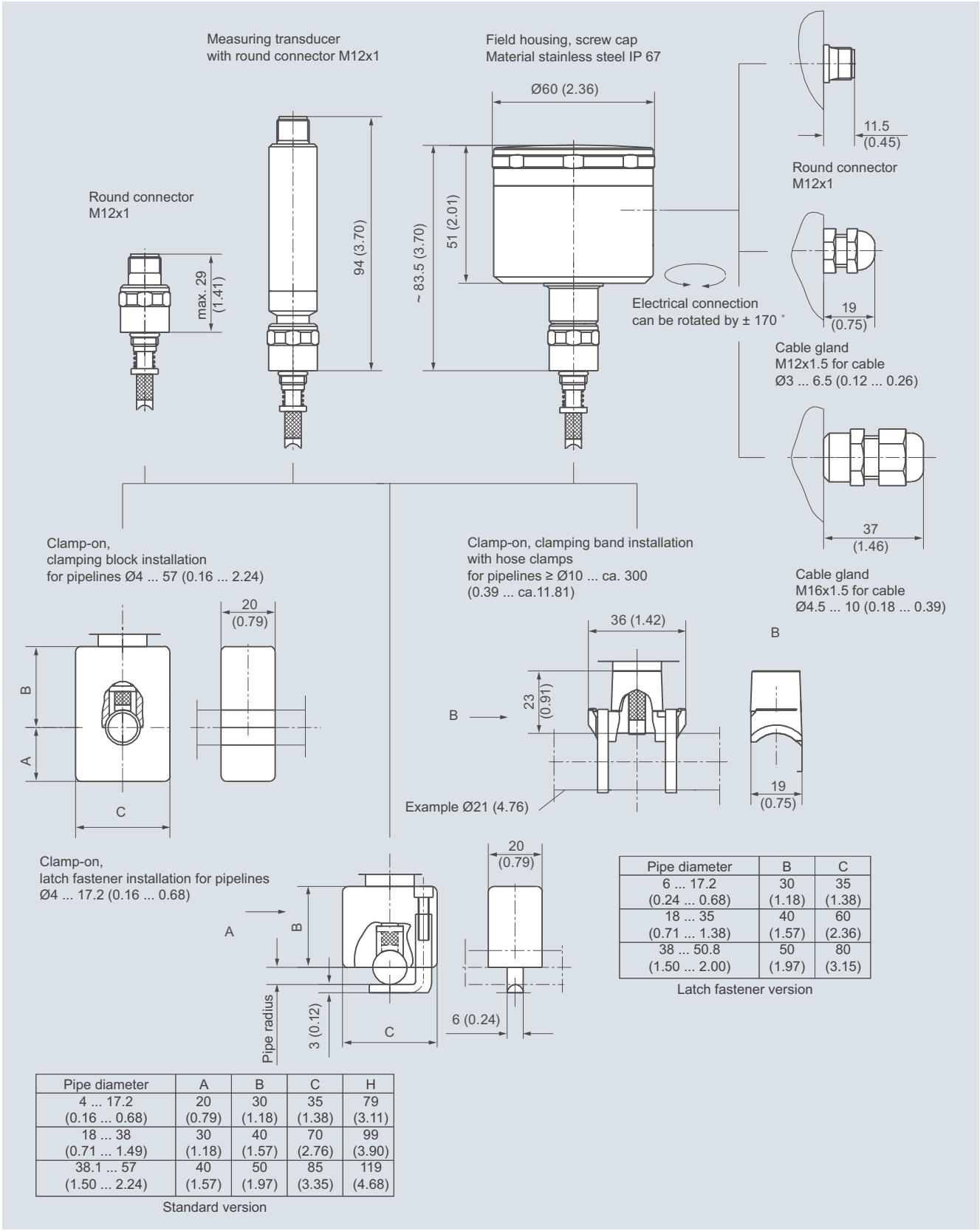
2

Dimensional drawings



Pipe diameter	B	C
6 ... 17.2 (0.24 ... 0.68)	30 (1.18)	35 (1.38)
18 ... 35 (0.71 ... 1.38)	40 (1.57)	60 (2.36)
38 ... 50.8 (1.50 ... 2.00)	50 (1.97)	80 (3.15)

Latch fastener version

Pipe diameter	A	B	C	H
4 ... 17.2 (0.16 ... 0.68)	20 (0.79)	30 (1.18)	35 (1.38)	79 (3.11)
18 ... 38 (0.71 ... 1.49)	30 (1.18)	40 (1.57)	70 (2.76)	99 (3.90)
38.1 ... 57 (1.50 ... 2.24)	40 (1.57)	50 (1.97)	85 (3.35)	119 (4.68)

Standard version

SITRANS TS300 Clamp-on design, round connector, field housing, cable gland, variants, dimensions in mm (inch)

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Selection and Ordering data		Order code
Further designs		
Add "**-Z**" to Article No. and specify Order code.		
Built in head transmitter		
Measuring range to be set must be specified with plain text data "Y11".		
SITRANS TH100, 4 ... 20 mA, Pt100		**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100		**T11**
SITRANS TH200, 4 ... 20 mA, universal		**T20**
SITRANS TH200 Ex i (ATEX), 4 ... 20 mA, universal		**T21**
SITRANS TH300, HART, universal		**T30**
SITRANS TH300 Ex i (ATEX), HART, universal		**T31**
SITRANS TH400 PA, universal		**T40**
SITRANS TH400 PA Ex i, universal		**T41**
SITRANS TH400 FF, universal		**T45**
SITRANS TH400 FF Ex i, universal		**T46**
Transmitter options		
Transmitter, enter complete setting in plain text (Y11:+/-NNNN ... +/-NNNN C,F)		**Y11**
Enter measuring point (max. 8 characters) in plain text		**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text		**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text		**Y24**
Transmitter, enter bus address in plain text		**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)		**U36**
Transmitter with a SIL 2 conformity		**C20**
Transmitter with a SIL 2/3 conformity		**C23**
Transmitter test protocol (5 points)		**C11**
Other cable gland (only for connection head)		
Polyamide for cable diameter 4.5 … 10 mm (0.18 … 0.39 inch)		**K02**
Stainless steel for cable diameter 3 … 6,5 mm (0.12 … 0.25 inch)		**K03**
Round connector M12 x 1		**K11**
Deviating pipe; mm (inch)	**Collar size; mm (inch)**	
4 … 17.2 (0.16 … 0.68)	50 x 35 (1.97 x 1.38)	**S11**
18 … 38 (0.71 … 1.49)	70 x 70 (2.76 x 2.76)	**S12**
38.1 … 57 (1.5 … 2.24)	90 x 85 (3.54 x 3.35)	**S13**
Larger nominal diameters on request		**S19**
Space-saving mounting (latch fastening)		
Outer pipe; mm (inch):		
4 … 17.2 (0.16 … 0.68)		**S21**
18 … 35 (0.71 … 1.38) (Clamping band version recommended, see below)		**S22**
38 … 50.8 (1.45 … 2.00) (Clamping band version recommended, see below)		**S23**
Clamping band installation		
Outer pipe; mm (inch):		
10 ... 57 (0.39 ... 2.24)		**S31**
58 ... 220 (2.28 ... 8.66)		**S32**
Without clamping band		**S35**

Selection and Ordering data	Order code
Further Options	
Assignment marking, engraving instead of adhesive label (Serial number and pipe diameter on plug and plastic block)	**L11**
2 mm drain hole	**L12**
Sensor 4-wire connection	**L14**
Heat-conductive-compound, silicone-free, syringe 3 g	**L15**
Suffixes	
Add "**-Z**" to Article No. and specify Order code and plain text.	
TAG plate made of stainless steel (specify TAG No. in plain text)	**Y15**
Test report at 50 % and 100 % (specify the measuring range in plain text) If optional head transmitters are integrated, please note that all calibration points are located in the set measuring range. If the points are located outside the standard measuring range, a Y01 addition is always required.	**Y33**
Special version, specify in plain text	**Y98**
Process number for special version	**Y99**

Accessories, see page 2/188.

Ordering examples:

Deviating tube diameter 28.5 mm:
7MC8016-1AZ00-Z K1Y+S12 {K1Y: 28.5 mm}

Space-saving mounting, tube diameter 38 mm:
7MC8016-1AZ00-Z K1Y + S23 {K1Y: 38 mm};
as of diameter ≥ 18 mm, we recommend using the clamping band installation.

Clamping band installation, tube diameter 111 mm:
7MC8016-1AZ00-Z K1Y+S32 {K1Y: 111 mm}

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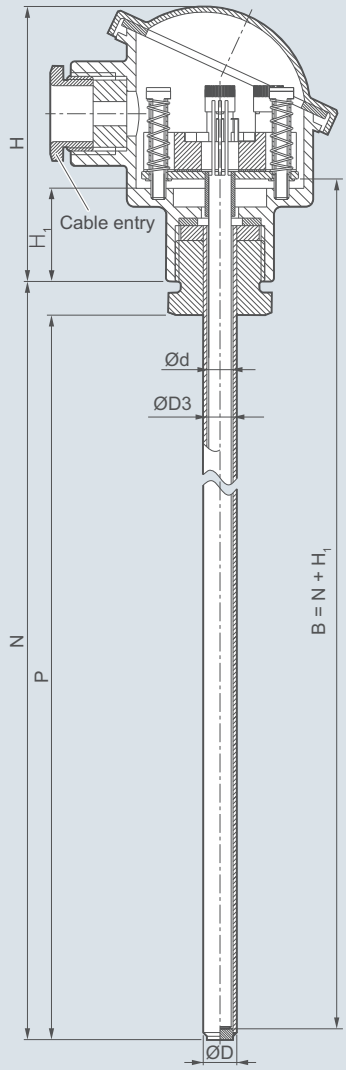
Type 2, tubular version without process connection

Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD3	Thermowell internal diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
N	Nominal length
P	Space for process connection P ~ N - 9 (0.35)

SITRANS TS500, temperature sensors for vessels and pipings, tubular version for minimal to medium stress, without process connection, without extension, plug-in or use with moveable compression fittings, dimensions in mm (inch)

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Selection and Ordering data	Article No.
SITRANS TS500 **Pipe version for minimal to medium stress, as per thermowell DIN 43722, Type 2, without process connection, without extension, plug-in or use with moveable compression fittings**	**7MC751-**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Material, in contact with media	
316Ti (1.4571)	1
316L (1.4404 or 1.4435)	2
Process connection	
Without process connection (for compression fitting) N=U	0 N
Thermowell form	
2; 9 mm (0.35 inch)	A
2; 12 mm (0.47 inch)	B
Insertion length U (=N), Standard	
160 mm (6.3 inch)	0 4
250 mm (9.84 inch)	1 2
400 mm (15.75 inch)	2 2
Insertion length U (=N), customer-specific	
enter customer specific length with Y44, see Order codes on page 2/57	
80 ... 100 mm (3.15 ... 3.94 inch) Initial: 100 mm (3.94 inch)	0 1
101 ... 120 mm (3.98 ... 4.72 inch) Initial: 120 mm (4.72 inch)	0 2
121 ... 140 mm (4.76 ... 5.51 inch) Initial: 140 mm (5.51 inch)	0 3
141 ... 160 mm (5.55 ... 6.30 inch) Initial: 160 mm (6.3 inch)	0 4
161 ... 180 mm (6.34 ... 7.09 inch) Initial: 180 mm (7.09 inch)	0 5
181 ... 200 mm (7.13 ... 7.87 inch) Initial: 200 mm (7.87 inch)	0 6
201 ... 220 mm (7.91 ... 8.66 inch) Initial: 220 mm (8.66 inch)	0 7
221 ... 240 mm (8.7 ... 9.45 inch) Initial: 225 mm (8.86 inch)	1 1
241 ... 260 mm (9.48 ... 10.24 inch) Initial: 250 mm (9.84 inch)	1 2
261 ... 280 mm (10.28 ... 11.02 inch) Initial: 280 mm (11.02 inch)	1 3
281 ... 300 mm (11.02 ... 11.81 inch) Initial: 285 mm (11.22 inch)	1 4
301 ... 320 mm (11.85 ... 12.6 inch) Initial: 315 mm (12.4 inch)	1 5
321 ... 340 mm (12.64 ... 13.39 inch) Initial: 340 mm (13.39 inch)	1 6
341 ... 360 mm (13.43 ... 14.17 inch) Initial: 360 mm (14.17 inch)	2 0
361 ... 380 mm (14.21 ... 14.96 inch) Initial: 380 mm (14.96 inch)	2 1
381 ... 400 mm (15 ... 15.75 inch) Initial: 400 mm (15.75 inch)	2 2
401 ... 420 mm (15.79 ... 16.54 inch) Initial: 420 mm (16.54 inch)	2 3
421 ... 440 mm (16.57 ... 17.32 inch) Initial: 440 mm (17.32 inch)	2 4
441 ... 460 mm (17.36 ... 18.11 inch) Initial: 460 mm (18.11 inch)	2 5
461 ... 480 mm (18.15 ... 18.90 inch) Initial: 465 mm (18.30 inch)	2 6
481 ... 500 mm (18.94 ... 19.68 inch) Initial: 500 mm (19.68 inch)	2 7
501 ... 550 mm (19.72 ... 21.65 inch) Initial: 510 mm (20.08 inch)	3 1
551 ... 600 mm (21.69 ... 23.62 inch) Initial: 600 mm (23.62 inch)	3 2
601 ... 650 mm (23.66 ... 25.59 inch) Initial: 650 mm (25.59 inch)	3 3

Selection and Ordering data	Article No.
SITRANS TS500 **Pipe version for minimal to medium stress, as per thermowell DIN 43722, Type 2, without process connection, without extension, plug-in or use with moveable compression fittings**	**7MC751-**
651 ... 700 mm (25.63 ... 27.56 inch) Initial: 700 mm (27.56 inch)	3 4
701 ... 750 mm (27.6 ... 29.53 inch) Initial: 750 mm (29.53 inch)	3 5
751 ... 800 mm (29.57 ... 31.50 inch) Initial: 800 mm (31.50 inch)	3 6
801 ... 850 mm (31.5 ... 33.47 inch) Initial: 850 mm (33.47 inch)	3 7
851 ... 900 mm (33.5 ... 35.43 inch) Initial: 900 mm (35.43 inch)	4 1
901 ... 950 mm (35.47 ... 37.4 inch) Initial: 950 mm (37.4 inch)	4 2
951 ... 1 000 mm (37.44 ... 39.37 inch) Initial: 1 000 mm (39.37 inch)	4 3
1001 ... 1 100 mm (39.4 ... 43.30 inch) Initial: 1 100 mm (43.30 inch)	4 4
1 101 ... 1 200 mm (43.35 ... 47.24 inch) Initial: 1 200 mm (47.24 inch)	4 5
1 201 ... 1 300 mm (47.28 ... 51.18 inch) Initial: 1 300 mm (51.18 inch)	4 6
1 301 ... 1 400 mm (51.22 ... 55.11 inch) Initial: 1400 mm (55.11 inch)	4 7
1 401 ... 1 500 mm (55.15 ... 59.05 inch) Initial: 1 500 mm (59.05 inch)	5 1
Extension X	
Standard length for Type 2 as per DIN 43722 (without extension N=U)	0

Additional configurations on page after next page!

You find ordering examples on page 2/39!

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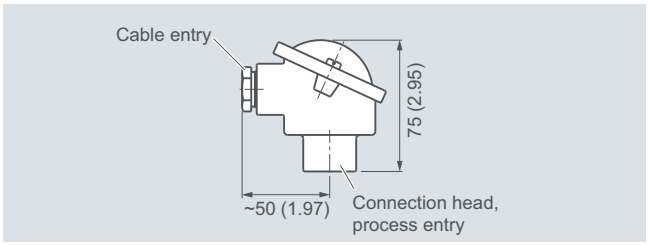
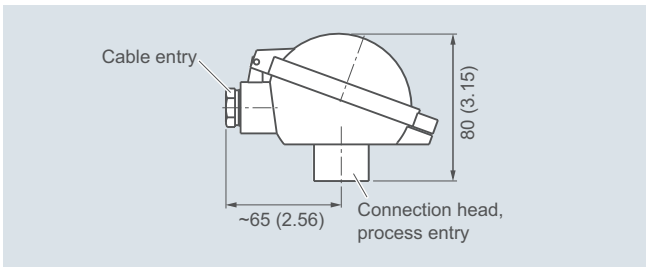
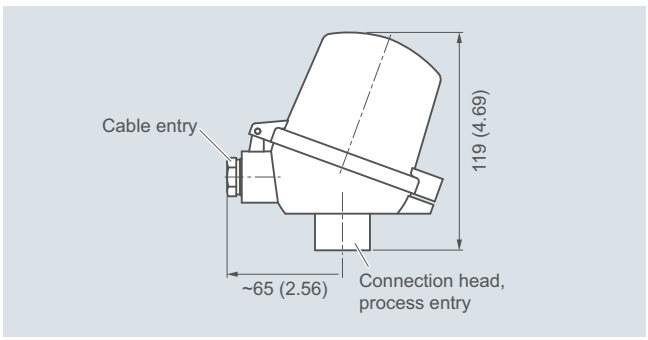
Type 2, tubular version without process connection



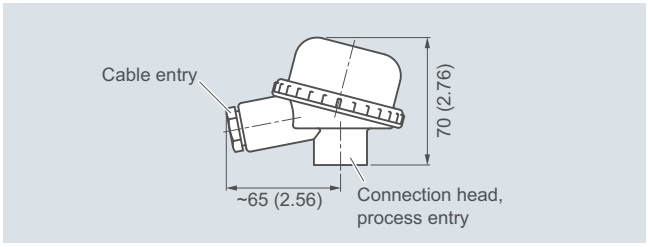
Connection head, aluminum, Type BA0, dimensions in mm (inch)



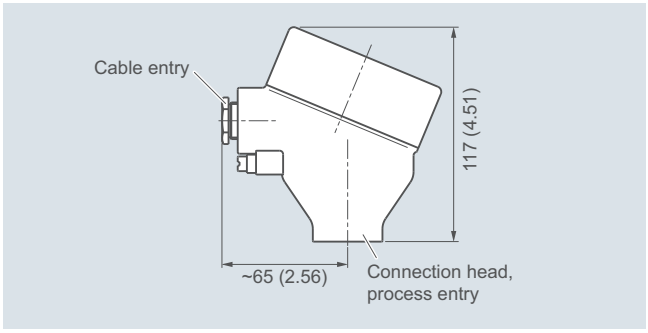
Connection head, aluminum, Type BB0, dimensions in mm (inch)



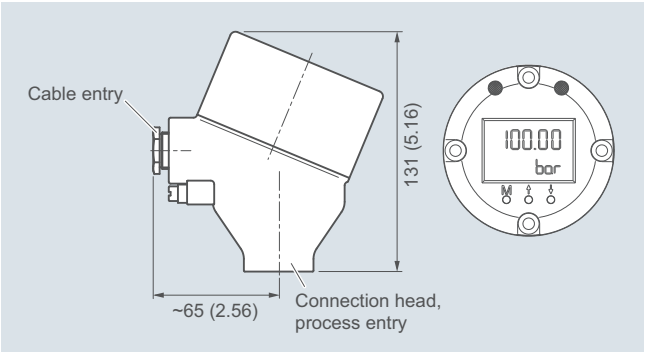
Connection head, aluminum, Type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, plastic, Type BM0, dimensions in mm (inch)



Connection head, aluminum, Type AG0, stainless steel, Type AU0, dimensions in mm (inch)



Connection head with 4-20 mA display, aluminum, Type AH0, stainless steel, Type AV0, dimensions in mm (inch)

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Selection and Ordering data	Article No.
SITRANS TS500 **Tubular version for minimal to medium stress, as per thermowell DIN 43722, Type 2, without process connection, without extension, plug-in or use with moveable compression fittings**	**7MC751-** ■ - ■■■■■ - ■■■
Head	
Aluminum head, BA0, flange cover, Standard	**A**
Aluminum head, BB0, low hinged cover, screw connection	**B**
Aluminum head, BC0, high hinged cover, screw connection	**C**
Aluminum head, AG0, screw cover, suitable for suitable for Ex d[1]	**G**
Aluminum head, AH0, screw cover, suitable for Ex d, display[1]	**H**
Plastic head, BM0, screw cover	**M**
Plastic head, BP0, high hinged cover, screw connection	**P**
Stainless steel head, AU0, screw cover, suitable for Ex d[1]	**U**
Stainless steel head, AV0, screw cover, suitable for Ex d, display[1]	**V**
Sensor[2] Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17	
Pt100, basis, -50 ... +400 °C (-58 ... +752 °F)	**A**
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)	**B**
Pt100, expanded range, -196 ... +600 °C (-321 ... +1 112 °F)	**C**
Thermocouple Type K, -40 ... +1 000 °C (-40 ... +1 832 °F)	**K**
Thermocouple Type J, -40 ... +750 °C (-40 ... +1 382 °F)	**J**
Thermocouple Type N, -40 ... +1 000 °C (-40 ... +1 832 °F)	**N**
Sensor number/Accuracy Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19	
Single, basic accuracy (Class 2/Class B)	**1**
Single, increased accuracy (Class 1/Class A)	**2**
Single, highest accuracy (Class AA)	**3**
Double, basic accuracy (Class 2/Class B)	**5**
Double, increased accuracy (Class 1/Class A)	**6**
Double, highest accuracy (Class AA)	**7**

[1] Ex d in connection with Order code E03

[2] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Article No. and specify Order code.	
Insertion length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y44**

Selection and Ordering data	Order code
Options Add "**-Z**" to Article No. and add options, separate extensions with "+".	
Built-in head transmitter Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, 4 ... 20 mA, Pt100	**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100	**T11**
SITRANS TH200, 4 ... 20 mA, Universal	**T20**
SITRANS TH200 Ex i (ATEX), 4 ... 20 mA, Universal	**T21**
SITRANS TH300, HART, Universal	**T30**
SITRANS TH300 Ex i (ATEX), HART, Universal	**T31**
SITRANS TH400 PA, Universal	**T40**
SITRANS TH400 PA Ex i, Universal	**T41**
SITRANS TH400 FF, Universal	**T45**
SITRANS TH400 FF Ex i, Universal	**T46**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"2) according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "nA"/"NI" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"1) according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to cCSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through housing "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**
Certificates and approvals	
EN 10204-3.1 Inspection certificate for materials coming into contact with media	**C12**
EN 10204-3.1 Inspection certificate for hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate for helium leak test	**C32**
EN 10204-3.1 Inspection certificate for surface tear test	**C33**
EN 10204-3.1Inspection certificate: visual, measurement and functional inspection	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
ISO 9001 grease-free (cleaned for e.g. oxygen applications)	**C51**

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Type 2, tubular version without process connection

Selection and Ordering data	Order code
Designation, calibration	
Stainless steel TAG plate , enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text	**Y33**
Transmitter options	
Transmitter, enter complete setting in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when Order code "Y15" is selected	**Y01**
Enter measuring point (max. 8 characters) in plain text	**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text	**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text	**Y24**
Transmitter, enter bus address in plain text	**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)	**U36**
Transmitter with a SIL 2 conformity	**C20**
Transmitter with a SIL 2/3 conformity	**C23**
Transmitter test protocol (5 points)	**C11**
Further options	
Connection form, flying leads (for the direct transmitter assembly, delivery without screws and springs)	**G01**
M12 plug (in combination with 1x Pt100 and/or transmitter, Non-Ex max. IP65/67)	**G12**
Harting plug Han 7 D (Non Ex, without mating connector max. IP65/67)	**G13**
Connection head with ½" NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
with outer earth screw for heads AG0, AH0, AU0 and AV0	**A02**
with inner earth screw for heads BC0, AG0, AH0, AU0 and AV0	**A03**
Compression fitting G½", enclosed	**A31**
Compression fitting NPT½", enclosed	**A32**

[1]) Please select Ex i version of the optional transmitter.
[2]) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (please select non-Ex version of the optional transmitter).

You find ordering examples on page 2/39.
Accessories, see page 2/188.

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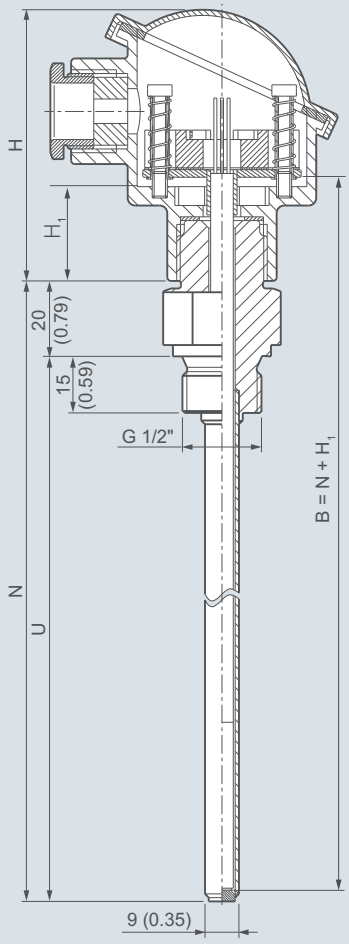
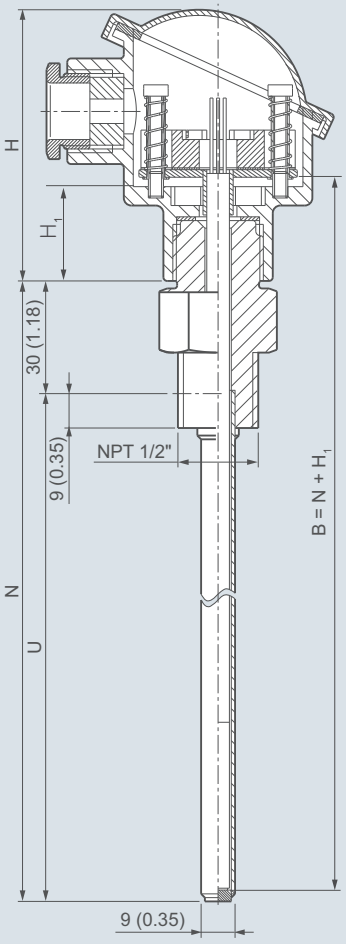
Dimensional drawings

SITRANS TS500, temperature sensors for vessels and pipelines, tubular version for minimal to medium stress, thermowell Type 2N similar to DIN 43722, screwed in, without extension, non-alignable connection head.
For Ex-versions the maximum process temperature is 100 °C.



H Head height
N Nominal length
U Insertion length
H_1 Type Axx = 41 (1.61)
Type Bxx = 26 (1.02)

Connection type "G", dimensions in mm (inch)



H Head height
N Nominal length
U Insertion length

Connection type "NPT", dimensions in mm (inch)

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Type 2N, tubular version, with screw socket

2

Selection and Ordering data	Article No.
SITRANS TS500 ↗	**7MC751-**
Tubular thermowell, minimal to medium stress, Type 2N similar to DIN 43722, screwed in, without extension	- - -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Material, in contact with media	
316Ti (1.4571)	1
316L (1.4404 or 1.4435)	2
Process connection	
G ½" (½"BSPF)	1 C
½" NPT	1 J
Thermowell form	
2N, 9 mm (0.35 inch)	A
Standard insertion length	
100 mm (3.97 inch)	0 1
160 mm (6.30 inch)	0 4
230 mm (9.06 inch)	1 0
360 mm (14.17 inch)	2 0
510 mm (20.08 inch)	3 1
Customer-specific insertion length enter customer specific length with Y44, see page 2/62 Order codes	
80 ... 100 mm (3.15 ... 3.94 inch) Initial: 100 mm (3.94 inch)	0 1
101 ... 120 mm (3.98 ... 4.72 inch) Initial: 120 mm (4.72 inch)	0 2
121 ... 140 mm (4.76 ... 5.51 inch) Initial: 140 mm (5.51 inch)	0 3
141 ... 160 mm (5.55 ... 6.30 inch) Initial: 160 mm (6.30 inch)	0 4
161 ... 180 mm (6.34 ... 7.09 inch) Initial: 180 mm (7.09 inch)	0 5
181 ... 200 mm (7.13 ... 7.87 inch) Initial: 200 mm (7.87 inch)	0 6
201 ... 220 mm (7.91 ... 8.66 inch) Initial: 220 mm (8.66 inch)	0 7
221…240 mm (8.70 ... 9.45 inch) Initial: 230 mm (9.06 inch)	1 0
241…260 mm (9.49 ... 10.24 inch) Initial: 250 mm (9.84 inch)	1 2
261…280 mm (10.28 ...11.02 inch) Initial: 280 mm (11.02 inch)	1 3
281…300 mm (11.06 ... 11.81 inch) Initial: 285 mm 11.22 inch)	1 4
301…320 mm (11.85 ... 13.00 inch) Initial: 315 mm (12.40 inch)	1 5
321…340 mm (12.64 ... 13.39 inch) Initial: 340 mm (13.39 inch)	1 6
341…360 mm (13.43 ... 14.17 inch) Initial: 360 mm (14.17 inch)	2 0
361…380 mm (14.21 ... 14.96 inch) Initial: 380 mm (14.96 inch)	2 1
381…400 mm (14.99 ... 15.75 inch) Initial: 400 mm (15.75 inch)	2 2
401…420 mm (15.79 ... 16.54 inch) Initial: 420 mm (16.54 inch)	2 3
421…440 mm (16.57 ... 17.32 inch) Initial: 440 mm (17.32 inch)	2 4
441…460 mm (17.36 ... 18.11 inch) Initial: 460 mm (18.11 inch)	2 5
461…480 mm (18.15 ... 18.90 inch) Initial: 465 mm (18.30 inch)	2 6
481…500 mm (18.94 ... 19.69 inch) Initial: 500 mm (19.69 inch)	2 7

Selection and Ordering data	Article No.
SITRANS TS500	**7MC751-**
Tubular thermowell, minimal to medium stress, Type 2N similar to DIN 43722, screwed in, without extension	- - -
501…550 mm (19.72 ... 21.65 inch) Initial: 510 mm (20.08 inch)	3 1
551…600 mm (21.69 ... 23.62 inch) Initial: 600 mm (23.62 inch)	3 2
601…650 mm (23.66 ... 25.59 inch) Initial: 650 mm (25.59 inch)	3 3
651…700 mm (25.63 ... 27.56 inch) Initial: 700 mm (27.56 inch)	3 4
701…750 mm (27.60 ... 29.53 inch) Initial: 750 mm (29.53 inch)	3 5
751…800 mm (29.57 ... 31.50 inch) Initial: 800 mm (31.50 inch)	3 6
801…850 mm (31.54 ... 33.46 inch) Initial: 850 mm (33.46 inch)	3 7
851…900 mm (33.50 ... 35.43 inch) Initial: 900 mm (35.43 inch)	4 1
901…950 mm (35.47 ... 37.40 inch) Initial: 950 mm (37.40 inch)	4 2
951…1 000 mm (37.44 ... 39.37 inch) Initial: 1 000 mm (39.37 inch)	4 3
1 001…1 100 mm (39.41 ... 43.31 inch) Initial: 1 100 mm (43.31 inch)	4 4
1 101…1 200 mm (43.35 ... 47.24 inch) Initial: 1 200 mm (47.24 inch)	4 5
1 201…1 300 mm (47.28 ... 51.18 inch) Initial: 1 300 mm (51.18 inch)	4 6
1 301…1 400 mm (51.22 ... 55.12 inch) Initial: 1400 mm (55.12 inch)	4 7
1 401…1 500 mm (55.16 ... 59.05 inch) Initial: 1 500 mm (59.05 inch)	5 1
Extension X	
without neck tube, (not adjustable)	0

Additional configurations on page after next page!

You find ordering examples on page 2/39!

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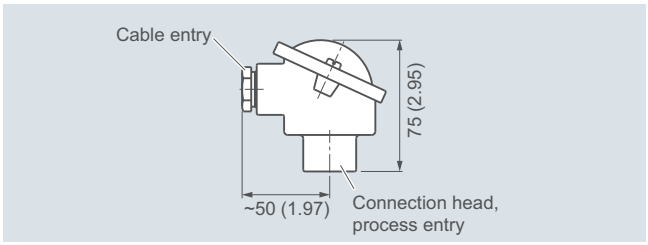
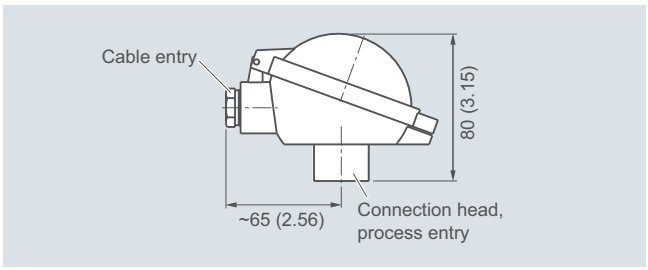
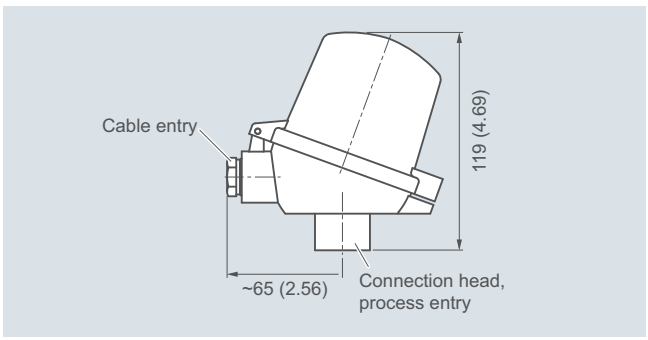


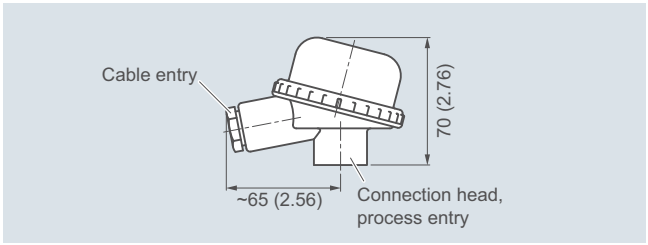
Connection head, aluminum, Type BA0, dimensions in mm (inch)



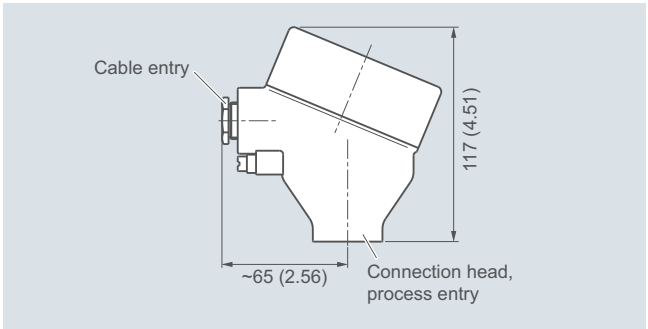
Connection head, aluminum, Type BB0, dimensions in mm (inch)



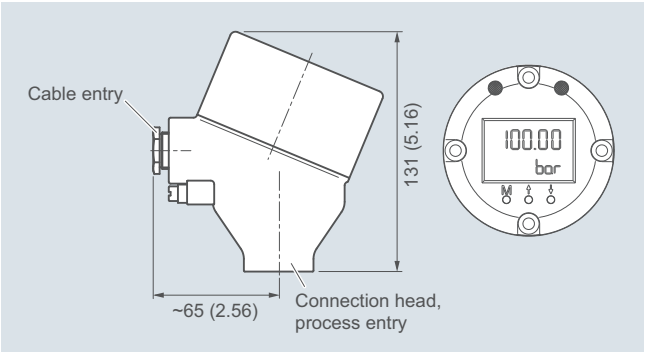
Connection head, aluminum, Type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, plastic, Type BM0, dimensions in mm (inch)



Connection head, aluminum, Type AG0, stainless steel, Type AU0, dimensions in mm (inch)



Connection head with 4-20 mA display, aluminum, Type AH0, stainless steel, Type AV0, dimensions in mm (inch)

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Type 2N, tubular version, with screw socket

Selection and Ordering data	Article No.
SITRANS TS500 **Tubular thermowell, minimal to medium stress, Type 2N similar to DIN 43722, screwed in, without extension, for maximum process temperatures of 100 °C**	**7MC751-** ■ - ■■■■■ - ■■■
Head	
Aluminum head, BA0, flange cover, Standard	**A**
Aluminum head, BB0, low hinged cover, screw connection	**B**
Aluminum head, BC0, high hinged cover, screw connection	**C**
Aluminum head, AG0, screw cover, suitable for Ex d[1]	**G**
Aluminum head, AH0, screw cover, suitable for Ex d, display[1]	**H**
Plastic head, BM0, screw cover	**M**
Plastic head, BP0high hinged cover, screw connection	**P**
Stainless steel head, AU0, screw cover, suitable for Ex d[1]	**U**
Stainless steel head, AV0, screw cover, suitable for Ex d, display[1]	**V**
Sensor[2] Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17	
Pt100, basis, -50 ... +400 °C (-58 ... +752 °F)	**A**
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)	**B**
Pt100, expanded range, -196 ... +600 °C (-321 ... +1 112 °F)	**C**
Thermocouple Type K, -40 ... +1 000 °C (-40 ... +1 832 °F)	**K**
Thermocouple Type J, -40 ... +750 °C (-40 ... +1 382 °F)	**J**
Thermocouple Type N, -40 ... +1 000 °C (-40 ... +1 832 °F)	**N**
Sensor number/Accuracy Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19	
Single, basic accuracy (Class 2/Class B)	**1**
Single, increased accuracy (Class 1/Class A)	**2**
Single, highest accuracy (Class AA)	**3**
Double, basic accuracy (Class 2/Class B)	**5**
Double, increased accuracy (Class 1/Class A)	**6**
Double, highest accuracy (Class AA)	**7**

[1] Ex d in connection with Order code E03

[2] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Article No. and specify Order code.	
Insertion length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y44**

Selection and Ordering data	Order code
Options Add "**-Z**" to Article No. and add options, separate extensions with "+".	
Built-in head transmitter Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, 4 ... 20 mA, Pt100	**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100	**T11**
SITRANS TH200, 4 ... 20 mA, Universal	**T20**
SITRANS TH200 Ex i (ATEX), 4 ... 20 mA,Universal	**T21**
SITRANS TH300, HART, Universal	**T30**
SITRANS TH300 Ex i (ATEX), HART, Universal	**T31**
SITRANS TH400 PA, Universal	**T40**
SITRANS TH400 PA Ex i, Universal	**T41**
SITRANS TH400 FF, Universal	**T45**
SITRANS TH400 FF Ex i, Universal	**T46**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"2) according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "nA"/"NI" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"1) according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to cCSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through housing "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**
Certificates and approvals	
EN 10204-3.1 Inspection certificate for materials coming into contact with media	**C12**
EN 10204-3.1 Inspection certificate for hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate for helium leak test	**C32**
EN 10204-3.1 Inspection certificate for surface tear test	**C33**
EN 10204-3.1 Inspection certificate: visual, measurement and functional inspection	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
ISO 9001 grease-free (cleaned for e.g. oxygen applications)	**C51**

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Selection and Ordering data	Order code
Designation, calibration	
Stainless steel TAG plate , enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text	**Y33**
Transmitter options	
Transmitter, enter complete setting in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when Order code "Y15" is selected	**Y01**
Enter measuring point (max. 8 characters) in plain text	**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text	**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text	**Y24**
Transmitter, enter bus address in plain text	**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)	**U36**
Transmitter with a SIL 2 conformity	**C20**
Transmitter with a SIL 2/3 conformity	**C23**
Transmitter test protocol (5 points)	**C11**
Further options	
Connection form, flying leads (for the direct transmitter assembly, delivery without screws and springs)	**G01**
M12 plug (in combination with 1x Pt100 and/or transmitter, Non-Ex max. IP65/67)	**G12**
Harting plug Han 7 D (Non Ex, without mating connector max. IP65/67)	**G13**
Connection head with ½" NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
with outer earth screw for heads AG0, AH0, AU0 and AV0	**A02**
with inner earth screw for heads BC0, AG0, AH0, AU0 and AV0	**A03**

[1]) Please select Ex i version of the optional transmitter.
[2]) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (please select non-Ex version of the optional transmitter).

You find ordering examples on page 2/39.
Accessories, see page 2/188.

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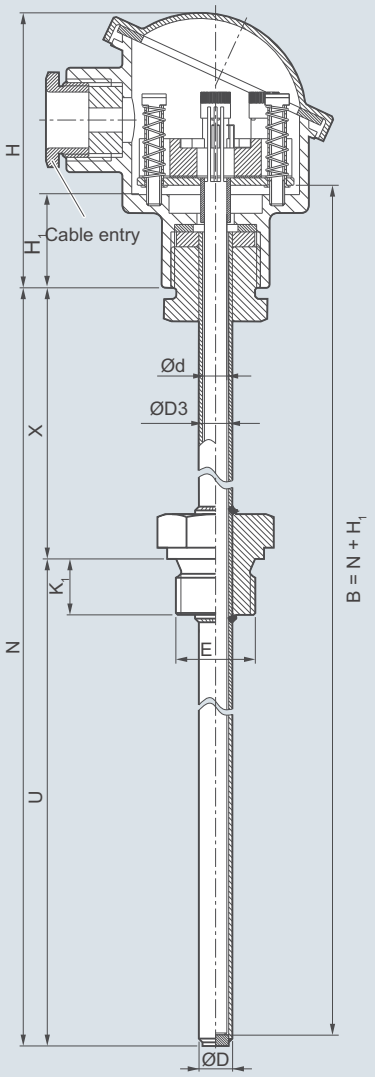
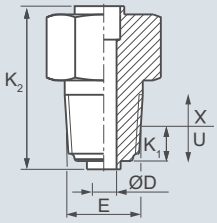
Type 2G, tubular version, with screw socket and extension

Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer, diameter (6 (0.24))
ØD	Process connection, outer diameter
ØD3	Thermowell internal diameter
E	Process connection, thread size
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
K_1	Screw depth
N	Nominal length
U	Insertion length
X	Extension length

SITRANS TS500, temperature sensors for vessels and pipelines, tubular version for minimal to medium stress, thermowell as per DIN 43722, Type 2G, screwed in, with extension.
For dimensions for the screw depth see page 2/12, dimensions in mm (inch)



Tapered process connection, dimensions in mm (inch)

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Selection and Ordering data	Article No.	Ord. Code
SITRANS TS500 ↗	**7MC751-**	
Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 2G, screwed in, with extension	-	-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Material, in contact with media		
316Ti (1.4571)	1	
316L (1.4404 or 1.4435)	2	
Process connection		
Cylindrical: G½ " (½ "BSPF)	1 C	
Cylindrical: G1 " (1 "BSPF)	1 E	
Tapered: NPT½ "	1 J	
Thermowell form		
2G, 9 mm (0.35 inch)	A	
2G, 12 mm (0.47 inch)	B	
Insertion length U standard		
160 mm (6.30 inch)	0 4	
250 mm (9.84 inch)	1 2	
400 mm (15.75 inch)	2 2	
Insertion length U customer-specific		
enter customer specific length with Y44, see page 2/67 Order codes		
80 ... 100 mm (3.15 ... 3.94 inch) Initial: 100 mm (3.94 inch)	0 1	
101 ... 120 mm (3.98 ... 4.72 inch) Initial: 120 mm (4.72 inch)	0 2	
121 ... 140 mm (4.76 ... 5.51 inch) Initial: 140 mm (5.51 inch)	0 3	
141 ... 160 mm (5.55 ... 6.30 inch) Initial: 160 mm (6.30 inch)	0 4	
161 ... 180 mm (6.34 ... 7.09 inch) Initial: 180 mm (7.09 inch)	0 5	
181 ... 200 mm (7.13 ... 7.87 inch) Initial: 200 mm (7.87 inch)	0 6	
201 ... 220 mm (7.91 ... 8.66 inch) Initial: 220 mm (8.66 inch)	0 7	
221…240 mm (8.70 ... 9.45 inch) Initial: 225 mm (8.86 inch)	1 1	
241…260 mm (9.49 ... 10.24 inch) Initial: 250 mm (9.84 inch)	1 2	
261…280 mm (10.28 ...11.02 inch) Initial: 280 mm (11.02 inch)	1 3	
281…300 mm (11.06 ... 11.81 inch) Initial: 285 mm 11.22 inch)	1 4	
301…320 mm (11.85 ... 13.00 inch) Initial: 315 mm (12.40 inch)	1 5	
321…340 mm (12.64 ... 13.39 inch) Initial: 340 mm (13.39 inch)	1 6	
341…360 mm (13.43 ... 14.17 inch) Initial: 360 mm (14.17 inch)	2 0	
361…380 mm (14.21 ... 14.96 inch) Initial: 380 mm (14.96 inch)	2 1	
381…400 mm (14.99 ... 15.75 inch) Initial: 400 mm (15.75 inch)	2 2	
401…420 mm (15.79 ... 16.54 inch) Initial: 420 mm (16.54 inch)	2 3	
421…440 mm (16.57 ... 17.32 inch) Initial: 440 mm (17.32 inch)	2 4	
441…460 mm (17.36 ... 18.11 inch) Initial: 460 mm (18.11 inch)	2 5	
461…480 mm (18.15 ... 18.90 inch) Initial: 465 mm (18.30 inch)	2 6	
481…500 mm (18.94 ... 19.69 inch) Initial: 500 mm (19.69 inch)	2 7	

Selection and Ordering data	Article No.	Ord. Code
SITRANS TS500	**7MC751-**	
Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 2G, screwed in, with extension	-	-
501…550 mm (19.72 ... 21.65 inch) Initial: 510 mm (20.08 inch)	3 1	
551…600 mm (21.69 ... 23.62 inch) Initial: 600 mm (23.62 inch)	3 2	
601…650 mm (23.66 ... 25.59 inch) Initial: 650 mm (25.59 inch)	3 3	
651…700 mm (25.63 ... 27.56 inch) Initial: 700 mm (27.56 inch)	3 4	
701…750 mm (27.60 ... 29.53 inch) Initial: 750 mm (29.53 inch)	3 5	
751…800 mm (29.57 ... 31.50 inch) Initial: 800 mm (31.50 inch)	3 6	
801…850 mm (31.54 ... 33.46 inch) Initial: 850 mm (33.46 inch)	3 7	
851…900 mm (33.50 ... 35.43 inch) Initial: 900 mm (35.43 inch)	4 1	
901…950 mm (35.47 ... 37.40 inch) Initial: 950 mm (37.40 inch)	4 2	
951…1 000 mm (37.44 ... 39.37 inch) Initial: 1 000 mm (39.37 inch)	4 3	
1 001…1 100 mm (39.41 ... 43.31 inch) Initial: 1 100 mm (43.31 inch)	4 4	
1 101…1 200 mm (43.35 ... 47.24 inch) Initial: 1 200 mm (47.24 inch)	4 5	
1 201…1 300 mm (47.28 ... 51.18 inch) Initial: 1 300 mm (51.18 inch)	4 6	
1 301…1 400 mm (51.22 ... 55.12 inch) Initial: 1 400 mm (55.12 inch)	4 7	
1 401…1 500 mm (55.16 ... 59.05 inch) Initial: 1 500 mm (59.05 inch)	5 1	
Extension X		
Standard length for Type 2G DIN 43772 (X=129 mm (5.08 inch))	1	
Extension length X - customer specific		
enter customer specific length with Y45, see page 2/67 Order codes		
45 ...150 mm (1.77 ... 5.91 inch) Initial: 150 mm (5.91 inch)	9	N 1 D
151 ... 300 mm (5.95 ... 11.81 inch) Initial: 300 mm (11.81 inch)	9	N 2 D
301 ... 450 mm (11.85 ... 17.72 inch) Initial: 450 mm (17.72 inch)	9	N 3 D

Additional configurations on page after next page!

You find ordering examples on page 2/39!

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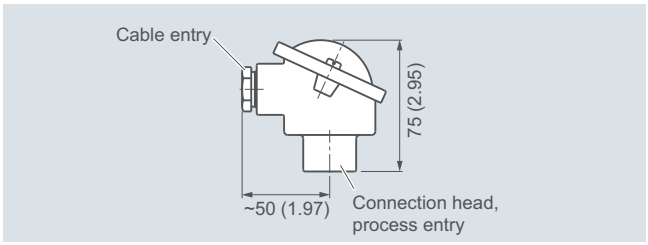
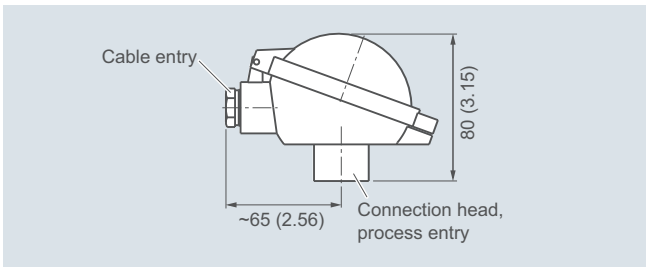
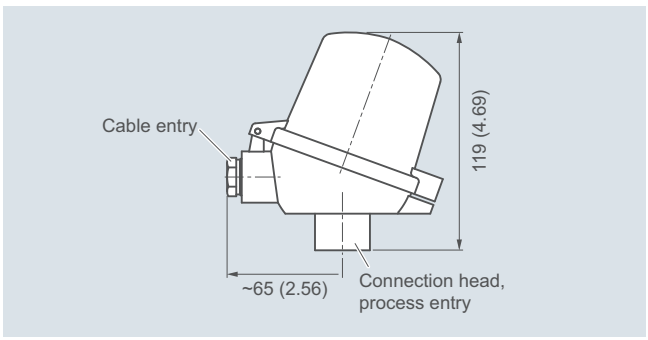
Type 2G, tubular version, with screw socket and extension



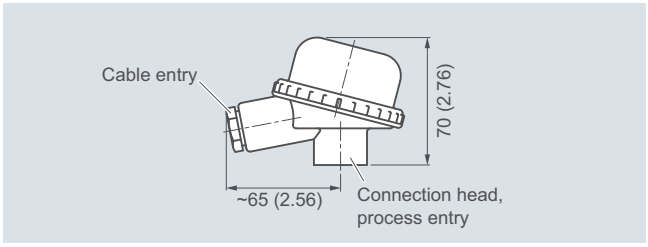
Connection head, aluminum, Type BA0, dimensions in mm (inch)



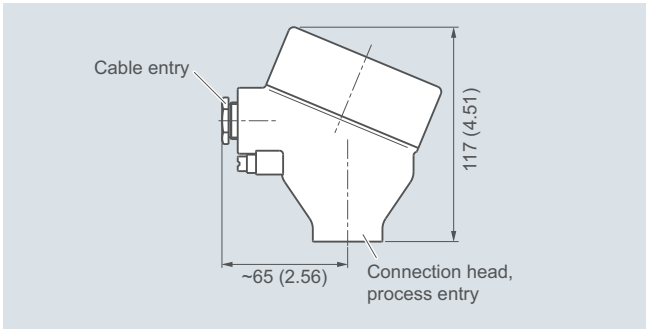
Connection head, aluminum, Type BB0, dimensions in mm (inch)



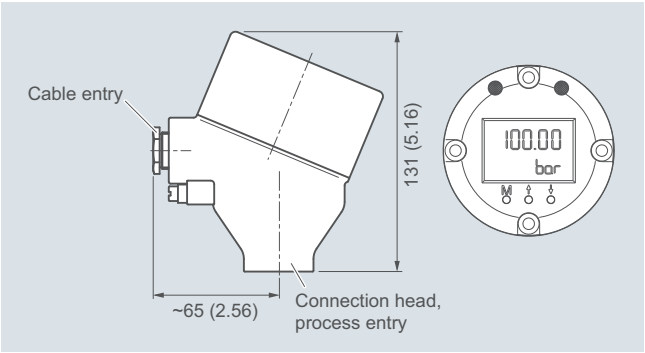
Connection head, aluminum, Type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, plastic, Type BM0, dimensions in mm (inch)



Connection head, aluminum, Type AG0, stainless steel, Type AU0, dimensions in mm (inch)



Connection head with 4-20 mA display, aluminum, Type AH0, stainless steel, Type AV0, dimensions in mm (inch)

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Type 2G, tubular version, with screw socket and extension

Selection and Ordering data	Article No.	Ord. Code
SITRANS TS500 **Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 2G, screwed in, with extension**	**7MC751-**	- -
Head		
Aluminum head, BA0, flange cover, Standard		**A**
Aluminum head, BB0, low hinged cover, screw connection		**B**
Aluminum head, BC0, high hinged cover, screw connection		**C**
Aluminum head, AG0, screw cover, suitable for Ex d[1]		**G**
Aluminum head, AH0, screw cover, suitable for Ex d, display[1]		**H**
Plastic head, BM0, screw cover		**M**
Plastic head, BP0high hinged cover, screw connection		**P**
Stainless steel head, AU0, screw cover, suitable for Ex d[1]		**U**
Stainless steel head, AV0, screw cover, suitable for Ex d, display[1]		**V**
Sensor[2]		
Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17		
Pt100, Basis, -50 ... +400 °C (-58 ... +752 °F)		**A**
Pt100, vibration resistant, -50 ... +400 °C (-58 ... +752 °F)		**B**
Pt100, expanded range, -196 ... +600 °C (-321 ... +1 112 °F)		**C**
Thermocouple Type K, -40 ... +1 000 °C (-40 ... +1 832 °F)		**K**
Thermocouple Type J, -40 ... +750 °C (-40 ... +1 382 °F)		**J**
Thermocouple Type N, -40 ... +1 000 °C (-40 ... +1 832 °F)		**N**
Sensor number/Accuracy		
Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19		
Single, basic accuracy (Class 2/Class B)		**1**
Single, increased accuracy (Class 1/Class A)		**2**
Single, highest accuracy (Class AA)		**3**
Double, basic accuracy (Class 2/Class B)		**5**
Double, increased accuracy (Class 1/Class A)		**6**
Double, highest accuracy (Class AA)		**7**

[1] Ex d in connection with Order code E03

[2] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Article No. and specify Order code.	
Insertion length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y44**
Extension X length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y45**

Selection and Ordering data	Order code
Options Add "**-Z**" to Article No. and add options, separate extensions with "+".	
Built-in head transmitter Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, 4 ... 20 mA, Pt100	**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100	**T11**
SITRANS TH200, 4 ... 20 mA, Universal	**T20**
SITRANS TH200 Ex i (ATEX), 4 ... 20 mA, Universal	**T21**
SITRANS TH300, HART, Universal	**T30**
SITRANS TH300 Ex i (ATEX), HART, Universal	**T31**
SITRANS TH400 PA, Universal	**T40**
SITRANS TH400 PA Ex i, Universal	**T41**
SITRANS TH400 FF, Universal	**T45**
SITRANS TH400 FF Ex i, Universal	**T46**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"2) according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "nA"/"NI" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"1) according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to cCSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through housing "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**
Certificates and approvals	
EN 10204-3.1 Inspection certificate for materials coming into contact with media	**C12**
EN 10204-3.1 Inspection certificate for hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate for helium leak test	**C32**
EN 10204-3.1 Inspection certificate for surface tear test	**C33**
EN 10204-3.1 Inspection certificate: visual, measurement and functional inspection	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
ISO 9001 grease-free (cleaned for e.g. oxygen applications)	**C51**

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Type 2G, tubular version, with screw socket and extension

Selection and Ordering data	Order code
Designation, calibration	
Stainless steel TAG plate , enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text	**Y33**
Transmitter options	
Transmitter, enter complete setting in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when Order code "Y15" is selected	**Y01**
Enter measuring point (max. 8 characters) in plain text	**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text	**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text	**Y24**
Transmitter, enter bus address in plain text	**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)	**U36**
Transmitter with a SIL 2 conformity	**C20**
Transmitter with a SIL 2/3 conformity	**C23**
Transmitter test protocol (5 points)	**C11**
Further options	
Connection form, flying leads (for the direct transmitter assembly, delivery without screws and springs)	**G01**
M12 plug (in combination with 1x Pt100 and/or transmitter, Non-Ex max. IP65/67)	**G12**
Harting plug Han 7 D (Non Ex, without mating connector max. IP65/67)	**G13**
Connection head with ½" NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
with outer earth screw for heads AG0, AH0, AU0 and AV0	**A02**
with inner earth screw for heads BC0, AG0, AH0, AU0 and AV0	**A03**

[1]) Please select Ex i version of the optional transmitter.
[2]) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (please select non-Ex version of the optional transmitter).

You find ordering examples on page 2/39.
Accessories, see page 2/188.

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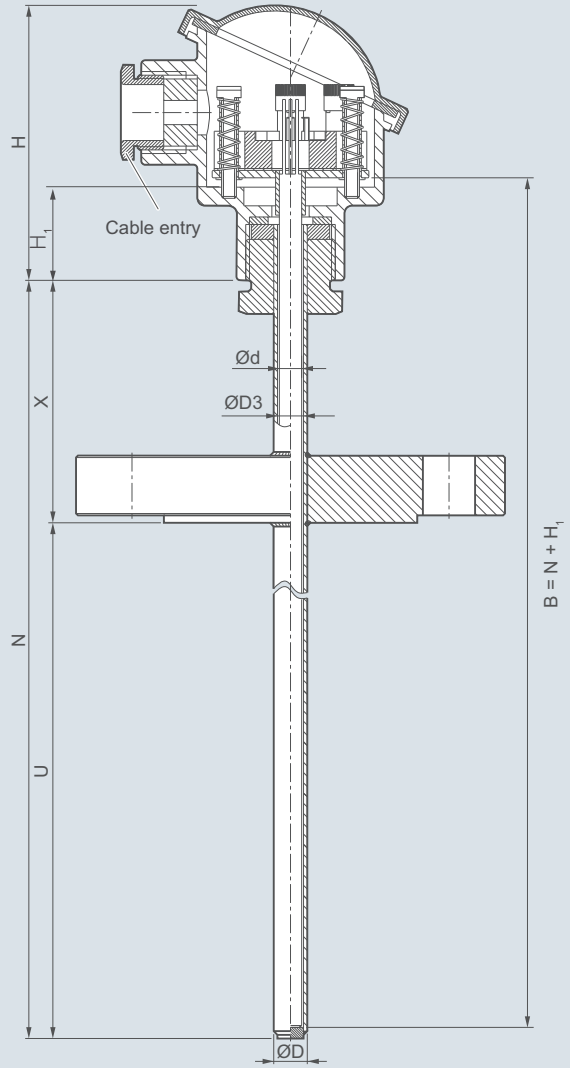
Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD3	Thermowell internal diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
N	Nominal length
U	Insertion length
X	Extension length

SITRANS TS500, temperature sensors for vessels and pipelines, tubular version for minimal to medium stress, thermowell as per DIN 43722, Type 2F, with flange, with extension, dimensions in mm (inch)

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Type 2F, tubular version, with flange and extension

2

Selection and Ordering data	Article No.	Ord. Code
SITRANS TS500 ↗	**7MC751-**	
Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 2F, with flange, with extension	-	-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Material, in contact with media		
316Ti (1.4571)	1	
316L (1.4404 or 1.4435)	2	
Process connection		
Flange EN, DN25 PN10 ... 40 B1	2 A	
Flange ASME, 1"RF150	2 E	
Flange ASME, 1"RF300	2 F	
Flange ASME, 1.5"RF150	2 G	
Flange ASME, 1.5"RF300	2 H	
Thermowell form		
2F, 9 mm (0.35 inch)	A	
2F, 12 mm (0.47 inch)	B	
Insertion U standard		
225 mm (8.86 inch)	1 1	
315 mm (12.40 inch)	1 5	
465 mm (18.31 inch)	2 6	
Insertion length U customer-specific enter customer specific length with Y44, see page 2/72 Order codes		
80 ... 100 mm (3.15 ... 3.94 inch) Initial: 100 mm (3.94 inch)	0 1	
101 ... 120 mm (3.98 ... 4.72 inch) Initial: 120 mm (4.72 inch)	0 2	
121 ... 140 mm (4.76 ... 5.51 inch) Initial: 140 mm (5.51 inch)	0 3	
141 ... 160 mm (5.55 ... 6.30 inch) Initial: 160 mm (6.30 inch)	0 4	
161 ... 180 mm (6.34 ... 7.09 inch) Initial: 180 mm (7.09 inch)	0 5	
181 ... 200 mm (7.13 ... 7.87 inch) Initial: 200 mm (7.87 inch)	0 6	
201 ... 220 mm (7.91 ... 8.66 inch) Initial: 220 mm (8.66 inch)	0 7	
221…240 mm (8.70 ... 9.45 inch) Initial: 225 mm (8.86 inch)	1 1	
241…260 mm (9.49 ... 10.24 inch) Initial: 250 mm (9.84 inch)	1 2	
261…280 mm (10.28 ...11.02 inch) Initial: 280 mm (11.02 inch)	1 3	
281…300 mm (11.06 ... 11.81 inch) Initial: 285 mm 11.22 inch)	1 4	
301…320 mm (11.85 ... 13.00 inch) Initial: 315 mm (12.40 inch)	1 5	
321…340 mm (12.64 ... 13.39 inch) Initial: 340 mm (13.39 inch)	1 6	
341…360 mm (13.43 ... 14.17 inch) Initial: 360 mm (14.17 inch)	2 0	
361…380 mm (14.21 ... 14.96 inch) Initial: 380 mm (14.96 inch)	2 1	
381…400 mm (14.99 ... 15.75 inch) Initial: 400 mm (15.75 inch)	2 2	
401…420 mm (15.79 ... 16.54 inch) Initial: 420 mm (16.54 inch)	2 3	
421…440 mm (16.57 ... 17.32 inch) Initial: 440 mm (17.32 inch)	2 4	
441…460 mm (17.36 ... 18.11 inch) Initial: 460 mm (18.11 inch)	2 5	
461…480 mm (18.15 ... 18.90 inch) Initial: 465 mm (18.30 inch)	2 6	
481…500 mm (18.94 ... 19.69 inch) Initial: 500 mm (19.69 inch)	2 7	

Selection and Ordering data	Article No.	Ord. Code
SITRANS TS500	**7MC751-**	
Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 2F, with flange, with extension	-	-
501…550 mm (19.72 ... 21.65 inch) Initial: 510 mm (20.08 inch)	3 1	
551…600 mm (21.69 ... 23.62 inch) Initial: 600 mm (23.62 inch)	3 2	
601…650 mm (23.66 ... 25.59 inch) Initial: 650 mm (25.59 inch)	3 3	
651…700 mm (25.63 ... 27.56 inch) Initial: 700 mm (27.56 inch)	3 4	
701…750 mm (27.60 ... 29.53 inch) Initial: 750 mm (29.53 inch)	3 5	
751…800 mm (29.57 ... 31.50 inch) Initial: 800 mm (31.50 inch)	3 6	
801…850 mm (31.54 ... 33.46 inch) Initial: 850 mm (33.46 inch)	3 7	
851…900 mm (33.50 ... 35.43 inch) Initial: 900 mm (35.43 inch)	4 1	
901…950 mm (35.47 ... 37.40 inch) Initial: 950 mm (37.40 inch)	4 2	
951…1 000 mm (37.44 ... 39.37 inch) Initial: 1 000 mm (39.37 inch)	4 3	
1 001…1 100 mm (39.41 ... 43.31 inch) Initial: 1 100 mm (43.31 inch)	4 4	
1 101…1 200 mm (43.35 ... 47.24 inch) Initial: 1 200 mm (47.24 inch)	4 5	
1 201…1 300 mm (47.28 ... 51.18 inch) Initial: 1 300 mm (51.18 inch)	4 6	
1 301…1 400 mm (51.22 ... 55.12 inch) Initial: 1 400 mm (55.12 inch)	4 7	
1 401…1 500 mm (55.16 ... 59.05 inch) Initial: 1 500 mm (59.05 inch)	5 1	
Extension X		
Standard length for Type 2F DIN 43772 (X=64 mm (2.52 inch))		1
Extension length X - customer specific enter customer specific length with Y45, see page 2/72 Order codes		
45 ...150 mm (1.77 ... 5.91 inch) Initial: 150 mm (5.91 inch)		9 N 1 D
151 ... 300 mm (5.95 ... 11.81 inch) Initial: 300 mm (11.81 inch)		9 N 2 D
301 ... 450 mm (11.85 ... 17.72 inch) Initial: 450 mm (17.72 inch)		9 N 3 D

Additional configurations on page after next page!

You find ordering examples on page 2/39!

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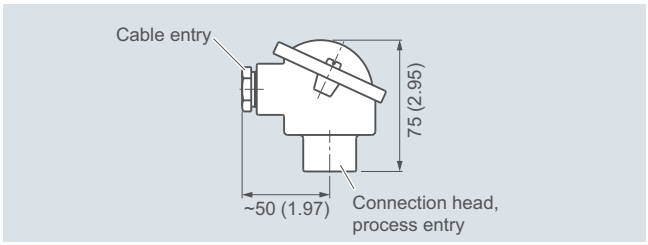
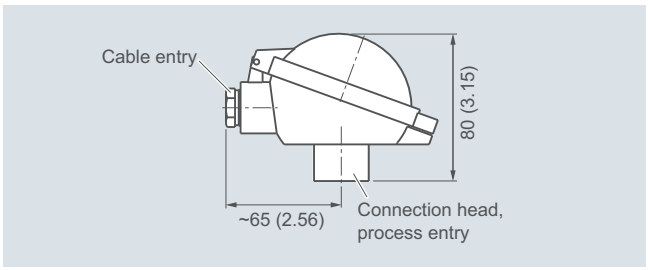
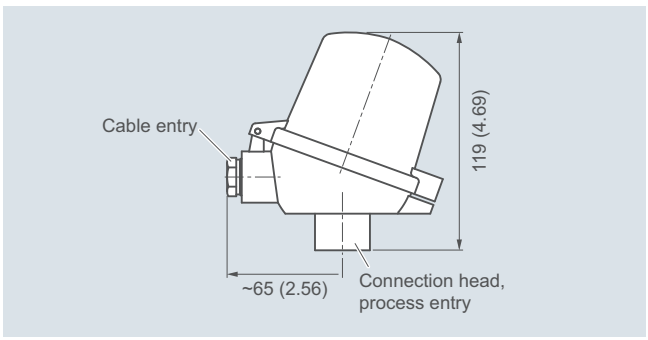


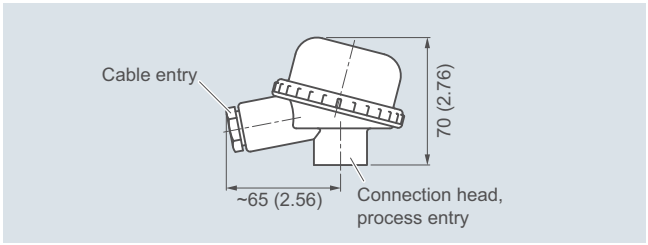
Connection head, aluminum, Type BA0, dimensions in mm (inch)



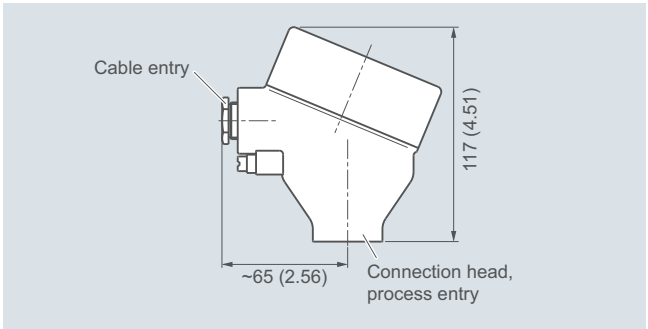
Connection head, aluminum, Type BB0, dimensions in mm (inch)



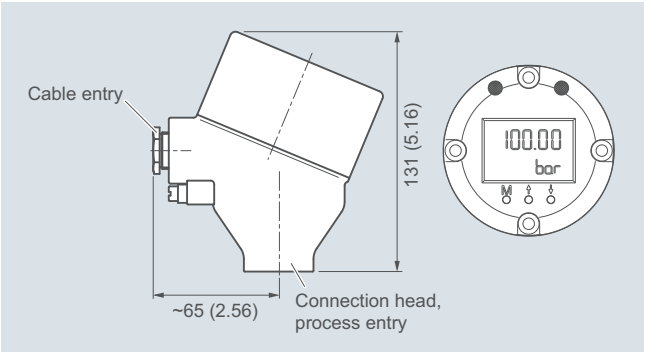
Connection head, aluminum, Type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, plastic, Type BM0, dimensions in mm (inch)



Connection head, aluminum, Type AG0, stainless steel, Type AU0, dimensions in mm (inch)



Connection head with 4-20 mA display, aluminum, Type AH0, stainless steel, Type AV0, dimensions in mm (inch)

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Type 2F, tubular version, with flange and extension

2

Selection and Ordering data	Article No.
SITRANS TS500	**7MC751-**
Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 2F, with flange, with extension	- -
Head	
Aluminum head, BA0, flange cover, Standard	A
Aluminum head, BB0, low hinged cover, screw connection	B
Aluminum head, BC0, high hinged cover, screw connection	C
Aluminum head, AG0, screw cover, suitable for Ex d[1]	G
Aluminum head, AH0, screw cover, suitable for Ex d, display[1]	H
Plastic head, BM0, screw cover	M
Plastic head, BP0high hinged cover, screw connection	P
Stainless steel head, AU0, screw cover, suitable for Ex d[1]	U
Stainless steel head, AV0, screw cover, suitable for Ex d, display[1]	V
Sensor[2]	
Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17	
Pt100, Basis, -50 ... +400 °C (-58 ... +752 °F)	A
Pt100, vibration resistant, -50 ... +400 °C (-58 ... +752 °F)	B
Pt100, expanded range, -196 ... +600 °C (-321 ... +1 112 °F)	C
Thermocouple Type K, -40 ... +1 000 °C (-40 ... +1 832 °F)	K
Thermocouple Type J, -40 ... +750 °C (-40 ... +1 382 °F)	J
Thermocouple Type N, -40 ... +1 000 °C (-40 ... +1 832 °F)	N
Sensor number/Accuracy	
Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19	
Single, basic accuracy (Class 2/Class B)	1
Single, increased accuracy (Class 1/Class A)	2
Single, highest accuracy (Class AA)	3
Double, basic accuracy (Class 2/Class B)	5
Double, increased accuracy (Class 1/Class A)	6
Double, highest accuracy (Class AA)	7

[1] Ex d in connection with Order code E03

[2] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Insertionlength customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y44**
Extension X length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y45**

Selection and Ordering data	Order code
Options Add "**-Z**" to Article No. and add options, separate extensions with "+".	
Built-in head transmitter Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, 4 ... 20 mA, Pt100	**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100	**T11**
SITRANS TH200, 4 ... 20 mA, Universal	**T20**
SITRANS TH200 Ex i (ATEX), 4 ... 20 mA, Universal	**T21**
SITRANS TH300, HART, Universal	**T30**
SITRANS TH300 Ex i (ATEX), HART, Universal	**T31**
SITRANS TH400 PA, Universal	**T40**
SITRANS TH400 PA Ex i, Universal	**T41**
SITRANS TH400 FF, Universal	**T45**
SITRANS TH400 FF Ex i, Universal	**T46**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"2) according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "nA"/"NI" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"1) according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to cCSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through housing "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**
Certificates and approvals	
EN 10204-3.1 Inspection certificate for materials coming into contact with media	**C12**
EN 10204-3.1 Inspection certificate for hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate for helium leak test	**C32**
EN 10204-3.1 Inspection certificate for surface tear test	**C33**
EN 10204-3.1 Inspection certificate: visual, measurement and functional inspection	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
ISO 9001 grease-free (cleaned for e.g. oxygen applications)	**C51**

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Selection and Ordering data	Order code
Designation, calibration	
Stainless steel TAG plate , enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text	**Y33**
Transmitter options	
Transmitter, enter complete setting in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when Order code "Y15" is selected	**Y01**
Enter measuring point (max. 8 characters) in plain text	**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text	**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text	**Y24**
Transmitter, enter bus address in plain text	**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)	**U36**
Transmitter with a SIL 2 conformity	**C20**
Transmitter with a SIL 2/3 conformity	**C23**
Transmitter test protocol (5 points)	**C11**
Further options	
Connection form, flying leads (for the direct transmitter assembly, delivery without screws and springs)	**G01**
M12 plug (in combination with 1x Pt100 and/or transmitter, Non-Ex max. IP65/67)	**G12**
Harting plug Han 7 D (Non Ex, without mating connector max. IP65/67)	**G13**
Connection head with ½" NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
with outer earth screw for heads AG0, AH0, AU0 and AV0	**A02**
with inner earth screw for heads BC0, AG0, AH0, AU0 and AV0	**A03**

[1]) Please select Ex i version of the optional transmitter.
[2]) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (please select non-Ex version of the optional transmitter).

You find ordering examples on page 2/39.
Accessories, see page 2/188.

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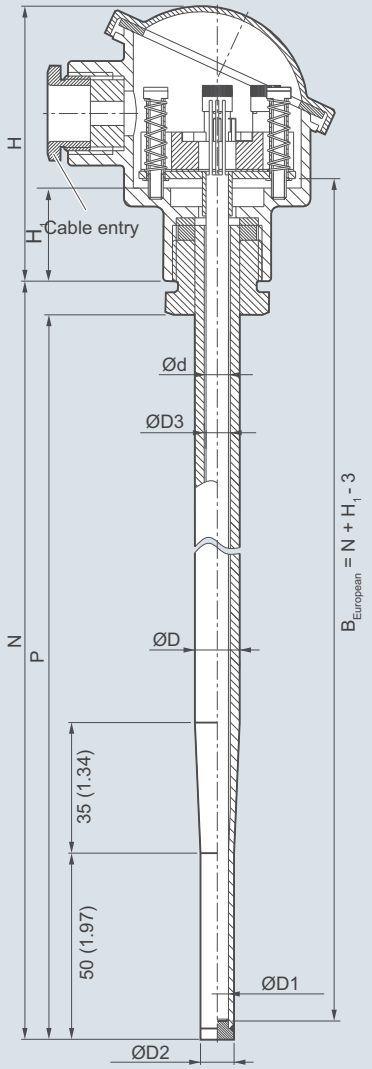
Type 3, tubular quick, without process connection

Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD1	Tip internal diameter
ØD2	Tip outer diameter
ØD3	Thermowell diameter
H	Head height
H_1	Type Axx> 41 (1.61) Type Bxx> 26 (1.02)
N	Nominal length
P	Space for process connection

SITRANS TS500, temperature sensors for vessel and pipings, tubular version for minimum to medium stress, without process connection, without extension, plug-in or use with moveable compression fitting, dimension in mm (inch)

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Selection and Ordering data	Article No.
SITRANS TS500 ↗	**7MC751-**
Tubular version for minimal to medium stress, thermowell per DIN 43722, Type 3, without process connection, improved response time, plug-in or use with moveable compression fittings	-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Material, in contact with media	
316Ti (1.4571)	1
316L (1.4404 or 1.4435)	2
Process connection	
Without process connection (for compression joints) N=U	0 N
Thermowell form	
3, 12/9 mm (0.47/0.35 inch)	K
Insertion length U (=N), Standard	
160 mm (6.3 inch)	0 4
220 mm (8.66 inch)	0 7
280 mm (11.02 inch)	1 3
Insertion length U (=N), customer-specific enter customer specific length with Y44, see page 2/77 Order codes	
121 ... 140 mm (4.76 ... 5.51 inch) Initial: 140 mm (5.51 inch)	0 3
141 ... 160 mm (5.55 ... 6.30 inch) Initial: 160 mm (6.3 inch)	0 4
161 ... 180 mm (6.34 ... 7.09 inch) Initial: 180 mm (7.09 inch)	0 5
181 ... 200 mm (7.13 ... 7.87 inch) Initial: 200 mm (7.87 inch)	0 6
201 ... 220 mm (7.91 ... 8.66 inch) Initial: 220 mm (8.66 inch)	0 7
221 ... 240 mm (8.7 ... 9.45 inch) Initial: 225 mm (8.86 inch)	1 1
241 ... 260 mm (9.48 ... 10.24 inch) Initial: 250 mm (9.84 inch)	1 2
261 ... 280 mm (10.28 ... 11.02 inch) Initial: 280 mm (11.02 inch)	1 3
281 ... 300 mm (11.02 ... 11.81 inch) Initial: 285 mm (11.22 inch)	1 4
301 ... 320 mm (11.85 ... 12.6 inch) Initial: 315 mm (12.4 inch)	1 5
321 ... 340 mm (12.64 ... 13.39 inch) Initial: 340 mm (13.39 inch)	1 6
341 ... 360 mm (13.43 ... 14.17 inch) Initial: 360 mm (14.17 inch)	2 0
361 ... 380 mm (14.21 ... 14.96 inch) Initial: 380 mm (14.96 inch)	2 1

Selection and Ordering data	Article No.
SITRANS TS500	**7MC751-**
Tubular version for minimal to medium stress, thermowell per DIN 43722, Type 3, without process connection, improved response time, plug-in or use with moveable compression fittings	-
381 ... 400 mm (15 ... 15.75 inch) Initial: 400 mm (15.75 inch)	2 2
401 ... 420 mm (15.79 ... 16.54 inch) Initial: 420 mm (16.54 inch)	2 3
421 ... 440 mm (16.57 ... 17.32 inch) Initial: 440 mm (17.32 inch)	2 4
441 ... 460 mm (17.36 ... 18.11 inch) Initial: 460 mm (18.11 inch)	2 5
461 ... 480 mm (18.15 ... 18.90 inch) Initial: 465 mm (18.30 inch)	2 6
481 ... 500 mm (18.94 ... 19.68 inch) Initial: 500 mm (19.68 inch)	2 7
501 ... 550 mm (19.72 ... 21.65 inch) Initial: 510 mm (20.08 inch)	3 1
551 ... 600 mm (21.69 ... 23.62 inch) Initial: 600 mm (23.62 inch)	3 2
601 ... 650 mm (23.66 ... 25.59 inch) Initial: 650 mm (25.59 inch)	3 3
651 ... 700 mm (25.63 ... 27.56 inch) Initial: 700 mm (27.56 inch)	3 4
701 ... 750 mm (27.6 ... 29.53 inch) Initial: 750 mm (29.53 inch)	3 5
751 ... 800 mm (29.57 ... 31.50 inch) Initial: 800 mm (31.50 inch)	3 6
801 ... 850 mm (31.53 ... 33.46 inch) Initial: 850 mm (33.46 inch)	3 7
851 ... 900 mm (33.50 ... 35.43 inch) Initial: 900 mm (35.43 inch)	4 1
901 ... 950 mm (35.47 ... 37.40 inch) Initial: 950 mm (37.40 inch)	4 2
951 ... 1 000 mm (37.44 ... 39.37 inch) Initial: 1 000 mm (39.37 inch)	4 3
1 001 ... 1 100 mm (39.41 ... 43.31 inch) Initial: 1 100 mm (43.31 inch)	4 4
Extension	
Standard length for Type 2 as per DIN 43722 (without extension N=U)	0

Additional configurations on page after next page!

You find ordering examples on page 2/39!

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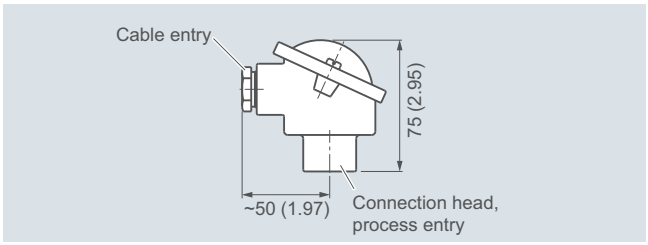
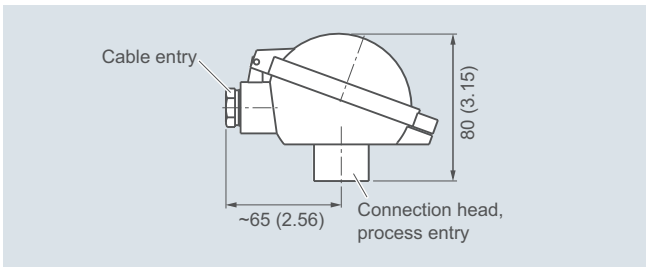
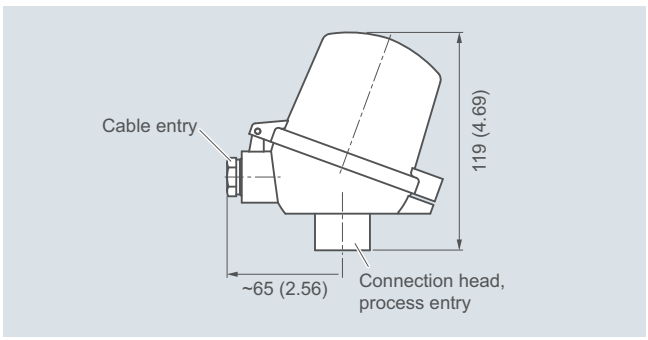
Type 3, tubular quick, without process connection



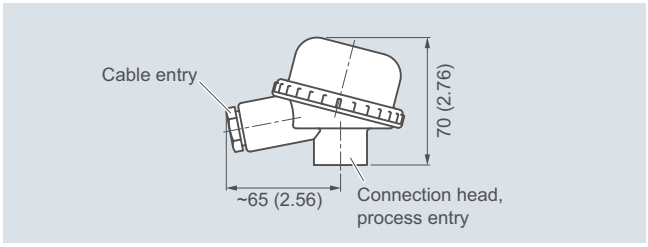
Connection head, aluminum, Type BA0, dimensions in mm (inch)



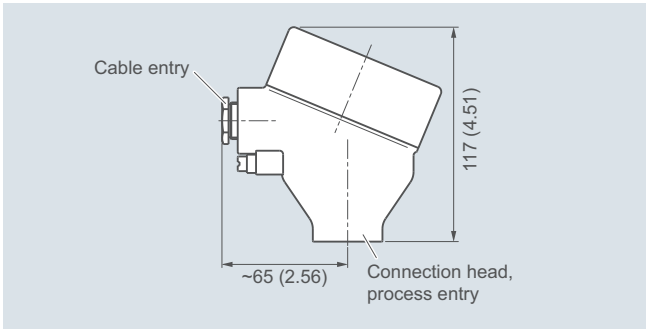
Connection head, aluminum, Type BB0, dimensions in mm (inch)



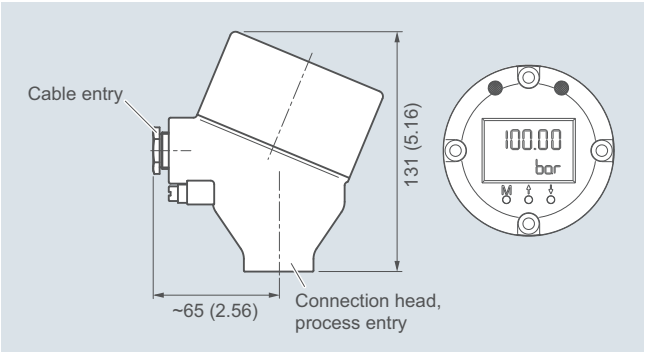
Connection head, aluminum, Type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, plastic, Type BM0, dimensions in mm (inch)



Connection head, aluminum, Type AG0, stainless steel, Type AU0, dimensions in mm (inch)



Connection head with 4-20 mA display, aluminum, Type AH0, stainless steel, Type AV0, dimensions in mm (inch)

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Selection and Ordering data	Article No.
SITRANS TS500	**7MC751-**
Tubular version for minimal to medium stress, thermowell as per DIN 43722, Type 3, without process connection, improved response time, plug-in or use with moveable compression fittings	- -
Head	
Aluminum head, BA0, flange cover, Standard	A
Aluminum head, BB0, low hinged cover, screw connection	B
Aluminum head, BC0, high hinged cover, screw connection	C
Aluminum head, AG0, screw cover, suitable for Ex d[1]	G
Aluminum head, AH0, screw cover, suitable for Ex d, display[1]	H
Plastic head, BM0, screw cover	M
Plastic head, BP0high hinged cover, screw connection	P
Stainless steel head, AU0, screw cover, Ex d[1]	U
Stainless steel head, AV0, screw cover, suitable for Ex d, display[1]	V
Sensor[2]	
Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17	
Pt100, basis, -50 ... +400 °C (-58 ... +752 °F)	A
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)	B
Pt100, expanded range, -196 ... +600 °C (-321 ... +1 112 °F)	C
Thermocouple Type J, only class 2, -40 ... +750 °C (-40 ... +1 382 °F)	J
Thermocouple Type K, -40 .. . +1 000 °C (-40 ... +1 832 °F)	K
Thermocouple Type N, -40 ... +1 000 °C (-40 ... +1 832 °F)	N
Sensor number/Accuracy	
Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19	
Single, basic accuracy (Class 2/Class B)	1
Single, increased accuracy (Class 1/Class A)	2
Single, highest accuracy (Class AA)	3
Double, basic accuracy (Class 2/Class B)	5
Double, increased accuracy (Class 1/Class A)	6
Double, highest accuracy (Class AA)	7

[1] Ex d in connection with Order code E03

[2] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Insertion length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y44**

Selection and Ordering data	Order code
Options	
Add "**-Z**" to Article No. and add options, separate extensions with "+".	
Built-in head transmitter Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, 4 ... 20 mA, Pt100	**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100	**T11**
SITRANS TH200, 4 ... 20 mA, Universal	**T20**
SITRANS TH200 Ex i (ATEX), 4 ... 20 mA, Universal	**T21**
SITRANS TH300, HART, Universal	**T30**
SITRANS TH300 Ex i (ATEX), HART, Universal	**T31**
SITRANS TH400 PA, Universal	**T40**
SITRANS TH400 PA Ex i, Universal	**T41**
SITRANS TH400 FF, Universal	**T45**
SITRANS TH400 FF Ex i, Universal	**T46**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"2) according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "nA"/"NI" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"1) according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to cCSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through housing "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**
Certificates and approvals	
EN 10204-3.1 Inspection certificate for materials coming into contact with media	**C12**
EN 10204-3.1 Inspection certificate for hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate for helium leak test	**C32**
EN 10204-3.1 Inspection certificate for surface tear test	**C33**
EN 10204-3.1 Inspection certificate: visual, measurement and functional inspection	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
ISO 9001 grease-free (cleaned for e.g. oxygen applications)	**C51**

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Type 3, tubular quick, without process connection

Selection and Ordering data	Order code
Designation, calibration	
Stainless steel TAG plate , enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text	**Y33**
Transmitter options	
Transmitter, enter complete setting in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when Order code "Y15" is selected	**Y01**
Enter measuring point (max. 8 characters) in plain text	**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text	**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text	**Y24**
Transmitter, enter bus address in plain text	**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)	**U36**
Transmitter with a SIL 2 conformity	**C20**
Transmitter with a SIL 2/3 conformity	**C23**
Transmitter test protocol (5 points)	**C11**
Further options	
Connection form, flying leads (for the direct transmitter assembly, delivery without screws and springs)	**G01**
M12 plug (in combination with 1x Pt100 and/or transmitter, Non-Ex max. IP65/67)	**G12**
Harting plug Han 7 D (Non Ex, without mating connector max. IP65/67)	**G13**
Connection head with ½" NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
with outer earth screw for heads AG0, AH0, AU0 and AV0	**A02**
with inner earth screw for heads BC0, AG0, AH0, AU0 and AV0	**A03**
Compression joint G½", enclosed	**A31**
Compression joint NPT½", enclosed	**A32**

1) Please select Ex i version of the optional transmitter.
2) Nur mit Anschlussköpfen Code AG0, AH0, AU0, AV0, ohne Kabelverschraubung (bitte Nicht-Ex-Ausführung des optionalen Messumformers wählen)

You find ordering examples on page 2/39.
Accessories, see page 2/188.

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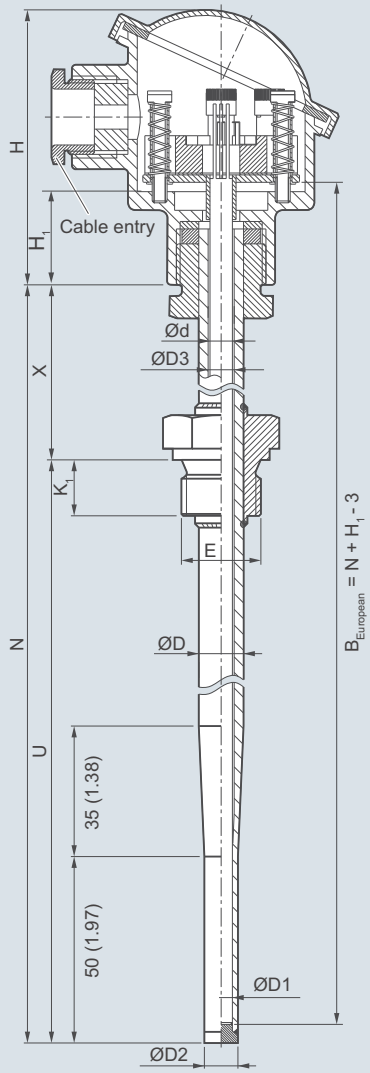
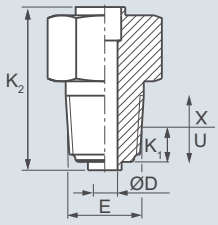
Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD1	Tip internal diameter
ØD2	Tip outer diameter
ØD3	Thermowell internal diameter
E	Process connection, thread size
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
K_1	Screw depth
N	Nominal length
U	Insertion length
X	Extension length

SITRANS TS500, temperature sensors for vessels and pipelines, tubular version for minimal to medium stress, thermowell as per DIN 43722, Type 3G, screwed in, with extension.
For dimensions for the screw depth see page 2/12, dimensions in mm (inch).



Tapered process connection, dimensions in mm (inch)

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Type 3G, tubular quick, with screw socket and extension

Selection and Ordering data	Article No.	Ord. Code
SITRANS TS500 ↗	**7MC751-**	
Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 3G, screwed in, with extension	-	-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Material, in contact with media		
316Ti (1.4571)	1	
316L (1.4404 or 1.4435)	2	
Process connection		
Cylindrical: G½" inch (½" BSPF)	1 C	
Cylindrical: G1" inch (1" BSPF)	1 E	
Tapered: NPT½"	1 J	
Thermowell form		
3G, 12/9 mm (0.47/0.35 inch)	K	
Insertion length U standard		
160 mm (6.30 inch)	0 4	
220 mm (8.66 inch)	0 7	
280 mm (11.02 inch)	1 3	
Insertion length U customer-specific		
enter customer specific length with Y44, see page 2/82 Order codes		
121 ... 140 mm (4.76 ... 5.51 inch) Initial: 140 mm (5.51 inch)	0 3	
141 ... 160 mm (5.55 ... 6.30 inch) Initial: 160 mm (6.30 inch)	0 4	
161 ... 180 mm (6.34 ... 7.09 inch) Initial: 180 mm (7.09 inch)	0 5	
181 ... 200 mm (7.13 ... 7.87 inch) Initial: 200 mm (7.87 inch)	0 6	
201 ... 220 mm (7.91 ... 8.66 inch) Initial: 220 mm (8.66 inch)	0 7	
221…240 mm (8.70 ... 9.45 inch) Initial: 225 mm (8.86 inch)	1 1	
241…260 mm (9.49 ... 10.24 inch) Initial: 250 mm (9.84 inch)	1 2	
261…280 mm (10.28 ...11.02 inch) Initial: 280 mm (11.02 inch)	1 3	
281…300 mm (11.06 ... 11.81 inch) Initial: 285 mm 11.22 inch)	1 4	
301…320 mm (11.85 ... 13.00 inch) Initial: 315 mm (12.40 inch)	1 5	
321…340 mm (12.64 ... 13.39 inch) Initial: 340 mm (13.39 inch)	1 6	
341…360 mm (13.43 ... 14.17 inch) Initial: 360 mm (14.17 inch)	2 0	
361…380 mm (14.21 ... 14.96 inch) Initial: 380 mm (14.96 inch)	2 1	
381…400 mm (14.99 ... 15.75 inch) Initial: 400 mm (15.75 inch)	2 2	
401…420 mm (15.79 ... 16.54 inch) Initial: 420 mm (16.54 inch)	2 3	
421…440 mm (16.57 ... 17.32 inch) Initial: 440 mm (17.32 inch)	2 4	
441…460 mm (17.36 ... 18.11 inch) Initial: 460 mm (18.11 inch)	2 5	
461…480 mm (18.15 ... 18.90 inch) Initial: 465 mm (18.30 inch)	2 6	
481…500 mm (18.94 ... 19.69 inch) Initial: 500 mm (19.69 inch)	2 7	

Selection and Ordering data	Article No.	Ord. Code
SITRANS TS500	**7MC751-**	
Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 3G, screwed in, with extension	-	-
501 ... 550 mm (19.72 ... 21.65 inch) Initial: 510 mm (20.08 inch)	3 1	
551 ... 600 mm (21.69 ... 23.62 inch) Initial: 600 mm (23.62 inch)	3 2	
601 ... 650 mm (23.66 ... 25.59 inch) Initial: 650 mm (25.59 inch)	3 3	
651 ... 700 mm (25.63 ... 27.56 inch) Initial: 700 mm (27.56 inch)	3 4	
701 ... 750 mm (27.6 ... 29.53 inch) Initial: 750 mm (29.53 inch)	3 5	
751 ... 800 mm (29.57 ... 31.50 inch) Initial: 800 mm (31.50 inch)	3 6	
801 ... 850 mm (31.53 ... 33.46 inch) Initial: 850 mm (33.46 inch)	3 7	
851 ... 900 mm (33.50 ... 35.43 inch) Initial: 900 mm (35.43 inch)	4 1	
901 ... 950 mm (35.47 ... 37.40 inch) Initial: 950 mm (37.40 inch)	4 2	
951 ... 1 000 mm (37.44 ... 39.37 inch) Initial: 1 000 mm (39.37 inch)	4 3	
Extension X		
Standard length for Type 2G DIN 43772 (X=131 mm (5.08 inch))	1	
Extension length - customer specific		
enter customer specific length with Y45, see page 2/82 Order codes		
55 ...150 mm (2.17 ... 5.91 inch) Initial: 150 mm (5.91 inch)	9	N 1 D
151 ... 300 mm (5.95 ... 11.81 inch) Initial: 300 mm (11.81 inch)	9	N 2 D

Additional configurations on page after next page!

You find ordering examples on page 2/39!

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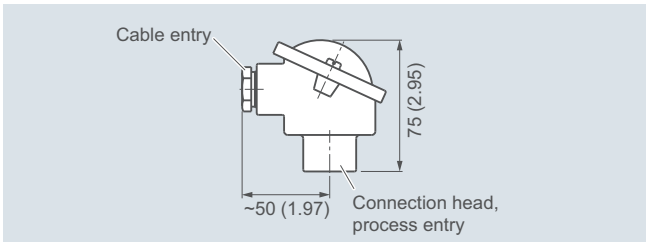
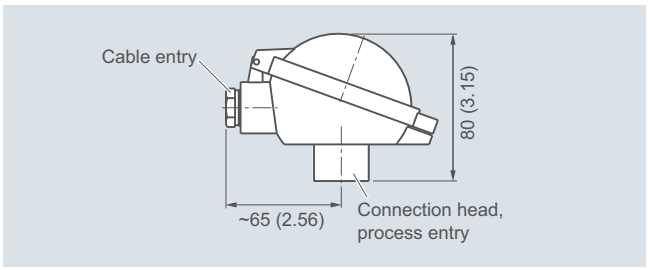
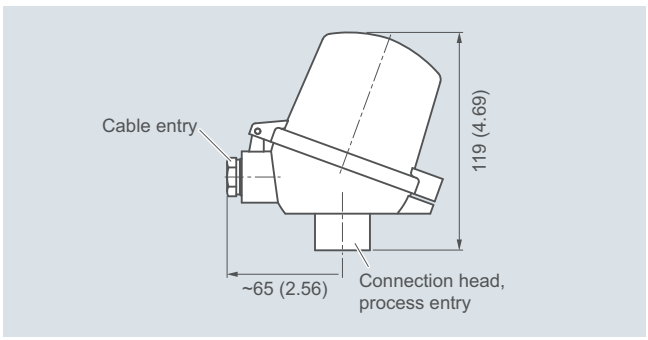


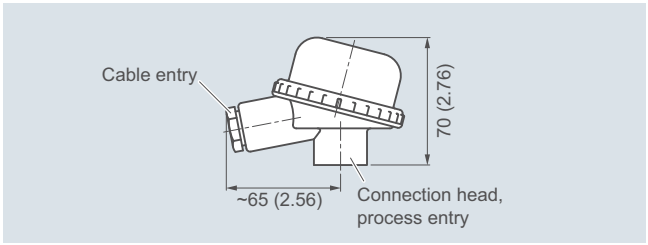
Connection head, aluminum, Type BA0, dimensions in mm (inch)



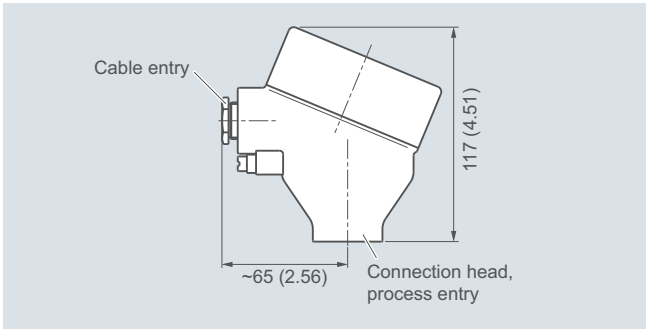
Connection head, aluminum, Type BB0, dimensions in mm (inch)



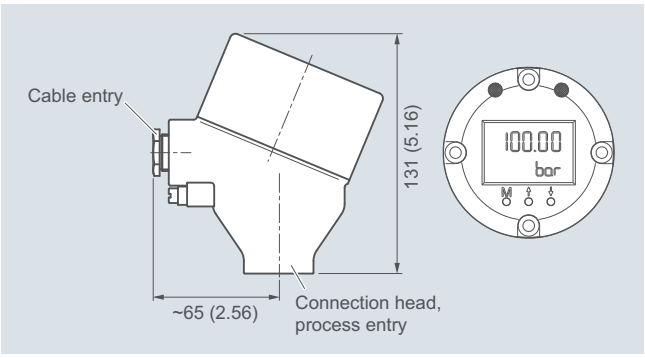
Connection head, aluminum, Type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, plastic, Type BM0, dimensions in mm (inch)



Connection head, aluminum, Type AG0, stainless steel, Type AU0, dimensions in mm (inch)



Connection head with 4-20 mA display, aluminum, Type AH0, stainless steel, Type AV0, dimensions in mm (inch)

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Type 3G, tubular quick, with screw socket and extension

Selection and Ordering data	Article No.
SITRANS TS500 **Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 3G, screwed in, with extension**	**7MC751-** ■ - ■■■■■■ - ■■■■
Head	
Aluminum head, BA0, flange cover, Standard	A
Aluminum head, BB0, low hinged cover, screw connection	B
Aluminum head, BC0, high hinged cover, screw connection	C
Aluminum head, AG0, screw cover, suitable for Ex d[1]	G
Aluminum head, AH0, screw cover, suitable for Ex d, display[1]	H
Plastic head, BM0, screw cover	M
Plastic head, BP0high hinged cover, screw connection	P
Stainless steel head, AU0, screw cover, Ex d[1]	U
Stainless steel head, screw cover, Ex d, display[1]	V
Sensor[2] Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17	
Pt100, basis, -50 ... +400 °C (-58 ... +752 °F)	A
Pt100, vibration resistant, -50 ... +400 °C (-58 ... +752 °F)	B
Pt100, expanded range, -196 ... +600 °C (-321 ... +1 112 °F)	C
Thermocouple Type J, only class 2, -40 ... +750 °C (-40 ... +1 382 °F)	J
Thermocouple Type K, -40 .. . +1 000 °C (-40 ... +1 832 °F)	K
Thermocouple Type N, -40 ... + 1000 °C (-40 ... +1 832 °F)	N
Sensor number/Accuracy Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19	
Single, basic accuracy (Class 2/Class B)	1
Single, increased accuracy (Class 1/Class A)	2
Single, highest accuracy (Class AA)	3
Double, basic accuracy (Class 2/Class B)	5
Double, increased accuracy (Class 1/Class A)	6
Double, highest accuracy (Class AA)	7

[1] Ex d in connection with Order code E03

[2] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Article No. and specify Order code.	
Insertion length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y44**
Extension length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y45**

Selection and Ordering data	Order code
Options Add "**-Z**" to Article No. and add options, separate extensions with "+".	
Built-in head transmitter Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, 4 ... 20 mA, Pt100	**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100	**T11**
SITRANS TH200, 4 ... 20 mA, Universal	**T20**
SITRANS TH200 Ex i (ATEX), 4 ... 20 mA, Universal	**T21**
SITRANS TH300, HART, Universal	**T30**
SITRANS TH300 Ex i (ATEX), HART, Universal	**T31**
SITRANS TH400 PA, Universal	**T40**
SITRANS TH400 PA Ex i, Universal	**T41**
SITRANS TH400 FF, Universal	**T45**
SITRANS TH400 FF Ex i, Universal	**T46**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"2) according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "nA"/"NI" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"1) according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to cCSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through housing "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**
Certificates and approvals	
EN 10204-3.1 Inspeciton certificate for materials coming into contact with media	**C12**
EN 10204-3.1 Inspection certificate for hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate for helium leak test	**C32**
EN 10204-3.1 Inspection certificate for surface tear test	**C33**
EN 10204-3.1 Inspectiont certificate: visual, measurement and functional inspection	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
ISO 9001 grease-free (cleaned for e.g. oxygen applications)	**C51**

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Selection and Ordering data	Order code
Designation, calibration	
Stainless steel TAG plate , enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text	**Y33**
Transmitter options	
Transmitter, enter complete setting in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when Order code "Y15" is selected	**Y01**
Enter measuring point (max. 8 characters) in plain text	**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text	**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text	**Y24**
Transmitter, enter bus address in plain text	**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)	**U36**
Transmitter with a SIL 2 conformity	**C20**
Transmitter with a SIL 2/3 conformity	**C23**
Transmitter test protocol (5 points)	**C11**
Further options	
Connection form, flying leads (for the direct transmitter assembly, delivery without screws and springs)	**G01**
M12 plug (in combination with 1x Pt100 and/or transmitter, Non-Ex max. IP65/67)	**G12**
Harting plug Han 7 D (Non Ex, without mating connector max. IP65/67)	**G13**
Connection head with ½" NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
with outer earth screw for heads AG0, AH0, AU0 and AV0	**A02**
with inner earth screw for heads BC0, AG0, AH0, AU0 and AV0	**A03**

[1]) Please select Ex i version of the optional transmitter.
[2]) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (please select non-Ex version of the optional transmitter).

You find ordering examples on page 2/39.
Accessories, see page 2/188.

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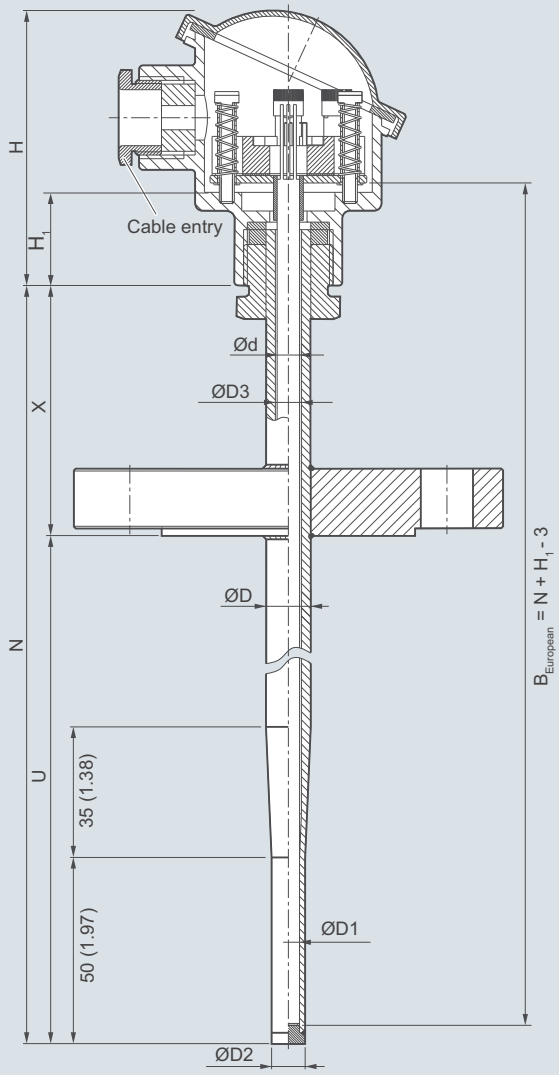
Type 3F, tubular quick, with flange and extension

Dimensional drawings



B	Measuring insert length
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD1	Tip internal diameter
ØD2	Tip outer diameter
ØD3	Thermowell internal diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
N	Nominal length
U	Insertion length
X	Extension length

SITRANS TS500, temperature sensors for vessels and pipelines, tubular version for minimal to medium stress, thermowell as per DIN 43722, Type 3F, with flange, with extension, dimensions in mm (inch)

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Selection and Ordering data	Article No.	Ord. Code
SITRANS TS500 ↗	**7MC751-**	
Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 3F, with flange, with extension	-	-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Material, in contact with media		
316Ti (1.4571)	1	
316L (1.4404 or 1.4435)	2	
Process connection		
Flange EN; DN25 PN10 ... 40 B1	2 A	
Flange ASME; 1"RF150	2 E	
Flange ASME; 1"RF300	2 F	
Flange ASME; 1.5"RF150	2 G	
Flange ASME; 1.5"RF300	2 H	
Thermowell form		
3F; 12/9 mm (0.47/0.35 inch)	K	
Insertion length U standard		
225 mm (8.86 inch)	1 1	
285 mm (11.22 inch)	1 4	
345 mm (13.58 inch)	1 7	
Insertion length U customer-specific enter customer specific length with Y44, see page 2/87 Order codes		
121 ... 140 mm (4.76 ... 5.51 inch) Initial: 140 mm (5.51 inch)	0 3	
141 ... 160 mm (5.55 ... 6.30 inch) Initial: 160 mm (6.3 inch)	0 4	
161 ... 180 mm (6.34 ... 7.09 inch) Initial: 180 mm (7.09 inch)	0 5	
181 ... 200 mm (7.13 ... 7.87 inch) Initial: 200 mm (7.87 inch)	0 6	
201 ... 220 mm (7.91 ... 8.66 inch) Initial: 220 mm (8.66 inch)	0 7	
221 ... 240 mm (8.7 ... 9.45 inch) Initial: 225 mm (8.86 inch)	1 1	
241 ... 260 mm (9.48 ... 10.24 inch) Initial: 250 mm (9.84 inch)	1 2	
261 ... 280 mm (10.28 ... 11.02 inch) Initial: 280 mm (11.02 inch)	1 3	
281 ... 300 mm (11.02 ... 11.81 inch) Initial: 285 mm (11.22 inch)	1 4	
301 ... 320 mm (11.85 ... 12.6 inch) Initial: 315 mm (12.4 inch)	1 5	
321 ... 340 mm (12.64 ... 13.39 inch) Initial: 340 mm (13.39 inch)	1 6	
341 ... 360 mm (13.43 ... 14.17 inch) Initial: 345 mm (13.58 inch)	1 7	
361 ... 380 mm (14.21 ... 14.96 inch) Initial: 380 mm (14.96 inch)	2 1	
381 ... 400 mm (15 ... 15.75 inch) Initial: 400 mm (15.75 inch)	2 2	
401 ... 420 mm (15.79 ... 16.54 inch) Initial: 420 mm (16.54 inch)	2 3	
421 ... 440 mm (16.57 ... 17.32 inch) Initial: 440 mm (17.32 inch)	2 4	
441 ... 460 mm (17.36 ... 18.11 inch) Initial: 460 mm (18.11 inch)	2 5	
461 ... 480 mm (18.15 ... 18.90 inch) Initial: 465 mm (18.30 inch)	2 6	
481 ... 500 mm (18.94 ... 19.68 inch) Initial: 500 mm (19.68 inch)	2 7	

Selection and Ordering data	Article No.	Ord. Code
SITRANS TS500	**7MC751-**	
Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 3F, with flange, with extension	-	-
501 ... 550 mm (19.72 ... 21.65 inch) Initial: 510 mm (20.08 inch)	3 1	
551 ... 600 mm (21.69 ... 23.62 inch) Initial: 600 mm (23.62 inch)	3 2	
601 ... 650 mm (23.66 ... 25.59 inch) Initial: 650 mm (25.59 inch)	3 3	
651 ... 700 mm (25.63 ... 27.56 inch) Initial: 700 mm (27.56 inch)	3 4	
701 ... 750 mm (27.6 ... 29.53 inch) Initial: 750 mm (29.53 inch)	3 5	
751 ... 800 mm (29.57 ... 31.50 inch) Initial: 800 mm (31.50 inch)	3 6	
801 ... 850 mm (31.53 ... 33.46 inch) Initial: 850 mm (33.46 inch)	3 7	
851 ... 900 mm (33.50 ... 35.43 inch) Initial: 900 mm (35.43 inch)	4 1	
901 ... 950 mm (35.47 ... 37.40 inch) Initial: 950 mm (37.40 inch)	4 2	
951 ... 1 000 mm (37.44 ... 39.37 inch) Initial: 1 000 mm (39.37 inch)	4 3	
1 001 ... 1 100 mm (39.41 ... 43.31 inch) Initial: 1 100 mm (43.31 inch)	4 4	
Extension		
Standard length for Type 2G DIN 43772 (X=66 mm (2.60 inch))	1	
Extension length - customer specific enter customer specific length with Y45, see page 2/87 Order codes		
55 ...150 mm (2.17 ... 5.91 inch) Initial: 150 mm (5.91 inch)	9	N 1 D
151 ... 300 mm (5.95 ... 11.81 inch) Initial: 300 mm (11.81 inch)	9	N 2 D

Additional configurations on page after next page!

You find ordering examples on page 2/39!

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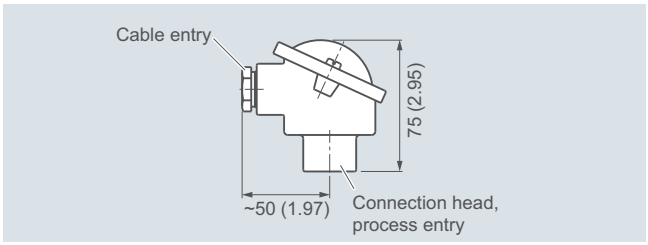
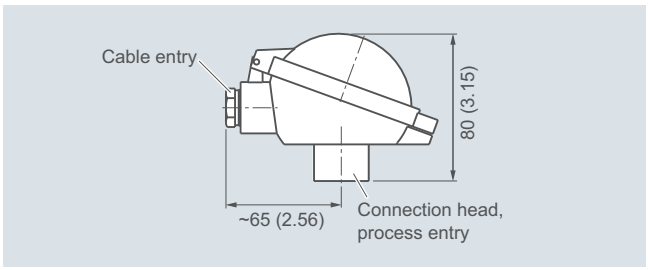
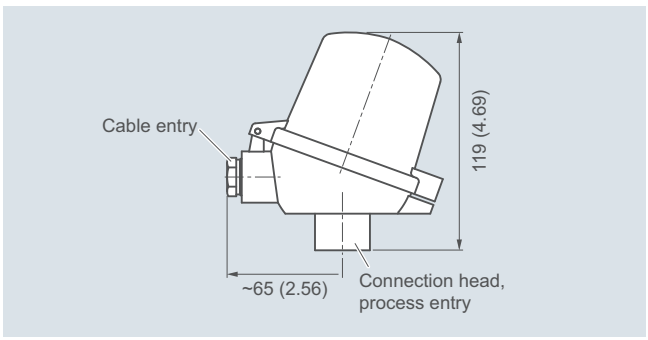
Type 3F, tubular quick, with flange and extension



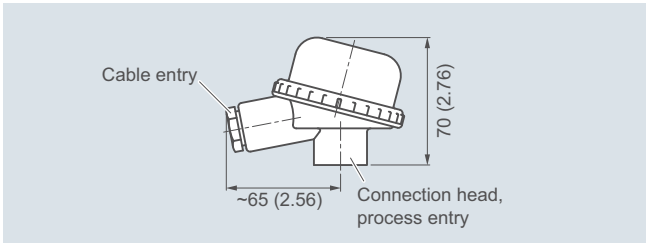
Connection head, aluminum, Type BA0, dimensions in mm (inch)



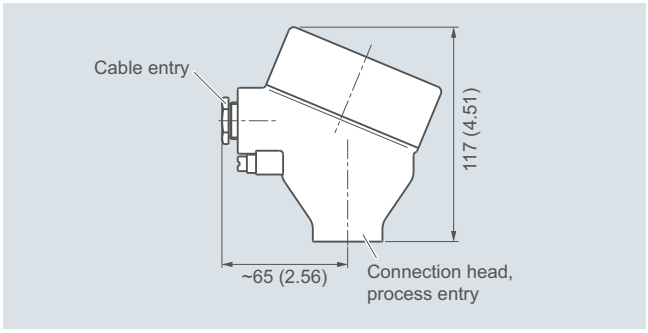
Connection head, aluminum, Type BB0, dimensions in mm (inch)



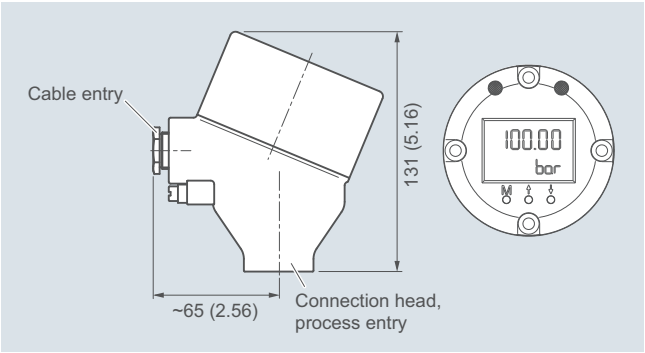
Connection head, aluminum, Type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, plastic, Type BM0, dimensions in mm (inch)



Connection head, aluminum, Type AG0, stainless steel, Type AU0, dimensions in mm (inch)



Connection head with 4-20 mA display, aluminum, Type AH0, stainless steel, Type AV0, dimensions in mm (inch)

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Selection and Ordering data	Article No.	Ord. Code
SITRANS TS500 **Tubular thermowell, minimal to medium stress, thermowell as per DIN 43722, Type 3F, with flange, with extension**	**7MC751-**	- -
Head		
Aluminum head, BA0, flange cover, Standard		**A**
Aluminum head, BB0, low hinged cover, screw connection		**B**
Aluminum head, BC0, high hinged cover, screw connection		**C**
Aluminum head, AG0, screw cover, suitable for Ex d[1]		**G**
Aluminum head, AH0, screw cover, suitable for Ex d, display[1]		**H**
Plastic head, BM0, screw cover		**M**
Plastic head, BP0high hinged cover, screw connection		**P**
Stainless steel head, AU0, screw cover, Ex d[1]		**U**
Stainless steel head, screw cover, Ex d, display[1]		**V**
Sensor[2] Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17		
Pt100, basis, -50 ... +400 °C (-58 ... +752 °F)		**A**
Pt100, vibration.resistant, -50 ... +400 °C (-58 ... +752 °F)		**B**
Pt100, expanded range, -196 ... +600 °C (-321 ... +1 112 °F)		**C**
Thermocouple Type J, only class 2, -40 ... +750 °C (-40 ... +1 382 °F)		**J**
Thermocouple Type K, -40 .. . +1 000 °C (-40 ... +1 832 °F)		**K**
Thermocouple Type N, -40 ... +1 000 °C (-40 ... 1 832 °F)		**N**
Sensor number/Accuracy Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19		
Single, basic accuracy (Class 2/Class B)		**1**
Single, increased accuracy (Class 1/Class A)		**2**
Single, highest accuracy (Class AA)		**3**
Double, basic accuracy (Class 2/Class B)		**5**
Double, increased accuracy (Class 1/Class A)		**6**
Double, highest accuracy (Class AA)		**7**

[1] Ex d in connection with Order code E03

[2] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Article No. and specify Order code.	
Insertion length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y44**
Extension length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y45**

Selection and Ordering data	Order code
Options Add "**-Z**" to Article No. and add options, separate extensions with "+".	
Built-in head transmitter Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, 4 ... 20 mA, Pt100	**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100	**T11**
SITRANS TH200, 4 ... 20 mA, Universal	**T20**
SITRANS TH200 Ex i (ATEX), 4 ... 20 mA, Universal	**T21**
SITRANS TH300, HART, Universal	**T30**
SITRANS TH300 Ex i (ATEX), HART, Universal	**T31**
SITRANS TH400 PA, Universal	**T40**
SITRANS TH400 PA Ex i, Universal	**T41**
SITRANS TH400 FF, Universal	**T45**
SITRANS TH400 FF Ex i, Universal	**T46**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"2) according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "nA"/"NI" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"1) according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to cCSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through housing "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**
Certificates and approvals	
EN 10204-3.1 Inspection certificate for materials coming into contact with media	**C12**
EN 10204-3.1 Inspection certificate for hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate for helium leak test	**C32**
EN 10204-3.1 Inspection certificate for surface tear test	**C33**
EN 10204-3.1 Inspection certificate: visual, measurement and functional inspection	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
ISO 9001 grease-free (cleaned for e.g. oxygen applications)	**C51**

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Type 3F, tubular quick, with flange and extension

Selection and Ordering data	Order code
Designation, calibration	
Stainless steel TAG plate , enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text	**Y33**
Transmitter options	
Transmitter, enter complete setting in plain text (Y01:+/-NNNN ... +/-NNNN C,F)	**Y01**
Enter measuring point (max. 8 characters) in plain text	**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text	**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text	**Y24**
Transmitter, enter bus address in plain text	**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)	**U36**
Transmitter with a SIL 2 conformity	**C20**
Transmitter with a SIL 2/3 conformity	**C23**
Transmitter test protocol (5 points)	**C11**
Further options	
Connection form, flying leads (for the direct transmitter assembly, delivery without screws and springs)	**G01**
M12 plug (in combination with 1x Pt100 and/or transmitter, Non-Ex max. IP65/67)	**G12**
Harting plug Han 7 D (Non Ex, without mating connector max. IP65/67)	**G13**
Connection head with ½" NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
with outer earth screw for heads AG0, AH0, AU0 and AV0	**A02**
with inner earth screw for heads BC0, AG0, AH0, AU0 and AV0	**A03**
Surface treatment: pickled and passivated	**W01**
Surface treatment: electropolished RA 1.3	**W02**

1) Please select Ex i version of the optional transmitter.

2) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (please select non-Ex version of the optional transmitter).

You find ordering examples on page 2/39.
Accessories, see page 2/188.

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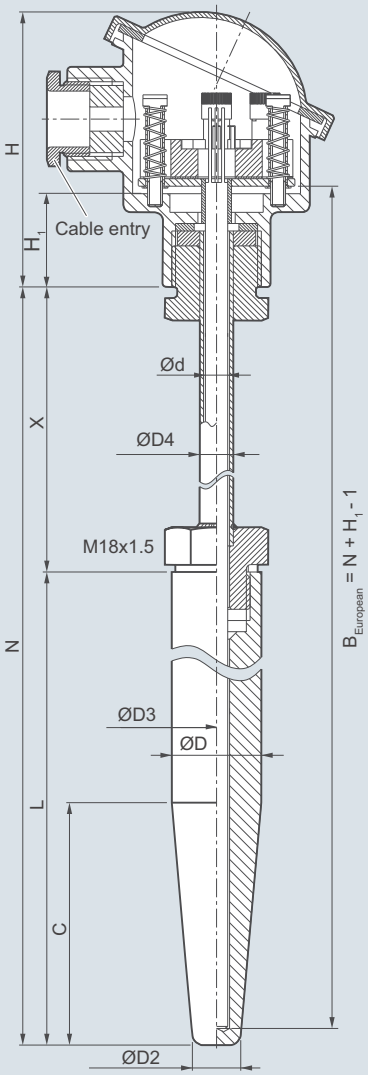
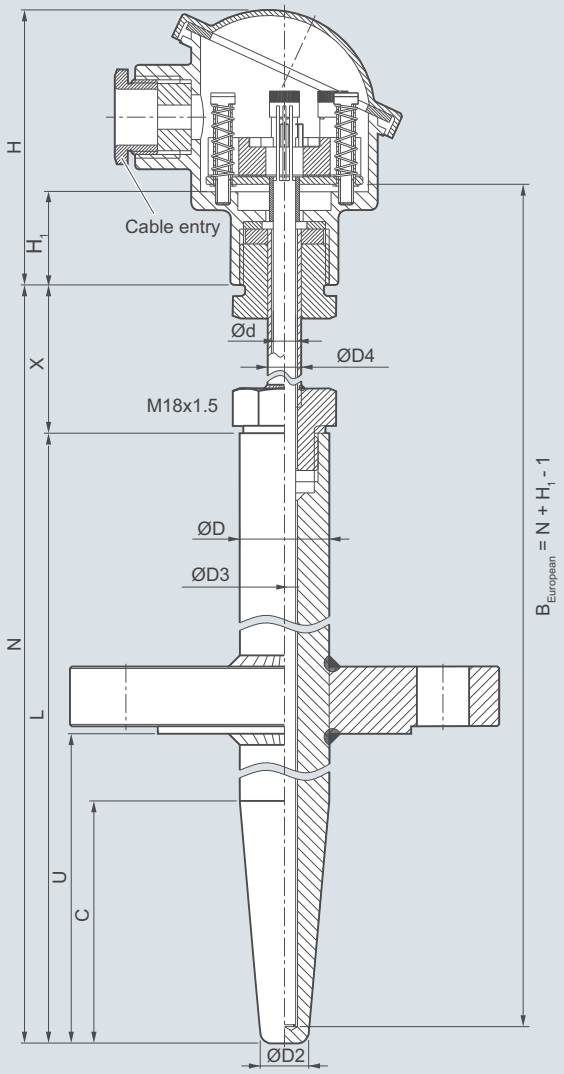
Dimensional drawings

SITRANS TS500, temperature sensors for vessels and pipelines, barstock version for minimal to medium stress, thermowell as per DIN 43722.



B	Measuring insert length
C	Cone length = U_{min}
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD2	Tip outer diameter
ØD3	Thermowell internal diameter
ØD4	Extension outer diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
L	Length of thermowell
N	Nominal length
X	Extension length

Thermowell type 4, for welding in, with extension, dimensions in mm (inch)



B	Measuring insert length
C	Cone length = U_{min}
Ød	Measuring insert outer diameter (6 (0.24))
ØD	Process connection outer diameter
ØD2	Tip outer diameter
ØD3	Thermowell internal diameter
ØD4	Extension outer diameter
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
L	Length of thermowell
N	Nominal length
U	Insertion length (Standard: U = L - 70 (2.76))
X	Extension length

Thermowell type 4F, with flange, with extension, dimensions in mm (inch)

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Type 4+4F barstock thermowell, with extension

2

Selection and Ordering data	Article No. / Ord. Code
SITRANS TS500 ↗	**7MC752-**
Barstock thermowell for medium to highest stress, thermowell as per DIN 43722, Type 4, for welding in, Type 4F with flange, with extension	- - -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Material, in contact with media	
316Ti (1.4571)	1
316L (1.4404 or 1.4435)	2
1.7335 heat resistant, only for versions without flange	3
1.5415 heat resistant, only for versions without flange	4
Process connection	
Without (for welding in)	0 N
Flange DN25 PN10 ... 40 B1	2 A
Flange 1"RF150	2 E
Flange 1"RF300	2 F
Flange 1.5"RF150	2 G
Flange 1.5"RF300	2 H
Thermowell form	
For flanged types only: specify with Y44 in plain text if insertion length "U" deviates from standard (U=L-70 mm (2.76 inch)). (Min: U = C; Max; U= L-50 mm (1.97 inch))	
Type 4/4F, L=140 mm (5.51 inch), C=65 mm (3.74 inch), ØD=24 mm (0.95 inch), Ød=6 mm (0.24 inch)	A 0 0
Type 4/4F, L=200 mm (7.87 inch), C=65 mm (3.74 inch), ØD=24 mm (0.95 inch), Ød=6 mm (0.24 inch)	B 0 0
Type 4/4F, L=200 mm (7.87 inch), C=125 mm (4.92 inch), ØD=24 mm (0.95 inch), Ød=6 mm (0.24 inch)	D 0 0
Type 4/4F, L=260 mm (10.24 inch), C=125 mm (4.92 inch), ØD=24 mm (0.95 inch), Ød=6 mm (0.24 inch)	E 0 0
Extension X	
as per DIN 43772 (X=149 mm (5.87 inch))	1
Extension X, customer-specific	
enter customer specific length with Y45, see page 2/92 Order codes	
55 ...150 mm (2.17 ... 5.91 inch) Initial: 150 mm (5.91 inch)	9 N 1 D
151 ... 300 mm (5.95 ... 11.81 inch) Initial: 300 mm (11.81 inch)	9 N 2 D
301 ... 450 mm (11.85 ... 17.72 inch) Initial: 450 mm (17.72 inch)	9 N 3 D
451 ... 600 mm (17.86 ... 23.62 inch) Initial: 600 mm (23.62 inch)	9 N 4 D
601 ... 750 mm (23.66 ... 29.53 inch) Initial: 750 mm (29.53 inch)	9 N 5 D
751 ... 900 mm (29.57 ... 45.43 inch) Initial: 900 mm (45.43 inch)	9 N 6 D
901 ... 1 050 mm (45.47 ... 41.34 inch) Initial: 1 050 mm (41.34 inch)	9 N 7 D

Selection and Ordering data	Article No. / Ord. Code
SITRANS TS500	**7MC752-**
Barstock thermowell for medium to highest stress, thermowell as per DIN 43722, Type 4, for welding in, Type 4F with flange, with extension	- - -
Head	
Aluminum head, BA0, flange cover, Standard	A
Aluminum head, BB0, low hinged cover, screw connection	B
Aluminum head, BC0, high hinged cover, screw connection	C
Aluminum head, AG0, screw cover, suitable for Ex d[1]	G
Aluminum head, AH0, screw cover, suitable for Ex d, display[1]	H
Plastic head, BM0, screw cover	M
Plastic head, BP0high hinged cover, screw connection	P
Stainless steel head, AU0, screw cover, Ex d[1]	U
Stainless steel head, AV0, screw cover, Ex d, display[1]	V
Sensor[2]	
Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17	
Pt100, basis, -50 ... +400 °C (-58 ... +752)	A
Pt100, vibration resistant, -50 ... +400 °C (-58 ... +752)	B
Pt100, expanded range, -196 ... +600 °C (-321 ... +1 112)	C
Thermocouple Type K, -40 ... +1 000 °C (-40 ... +1 832)	K
Thermocouple Type J, only class 2, -40 ... +750 °C (-40 ... +1 382)	J
Thermocouple Type N, -40 ... +1 000 °C (-40 ... +1 832)	N
Sensor number/Accuracy	
Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19	
Single, basic accuracy (Class 2/Class B)	1
Single, increased accuracy (Class 1/Class A)	2
Single, highest accuracy (Class AA)	3
Double, basic accuracy (Class 2/Class B)	5
Double, increased accuracy (Class 1/Class A)	6
Double, highest accuracy (Class AA)	7

[1] Ex d in connection with Order code E03

[2] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Additional configurations on page after next page!

You find ordering examples on page 2/39!

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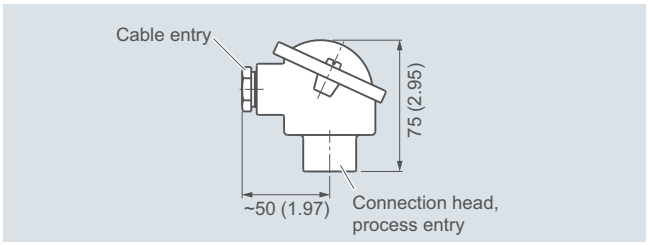
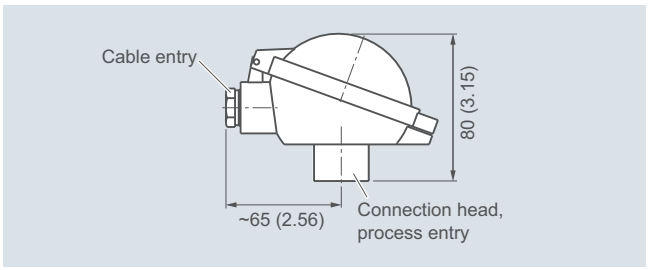
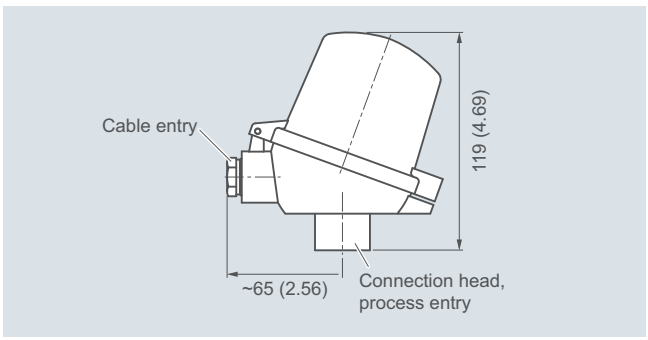


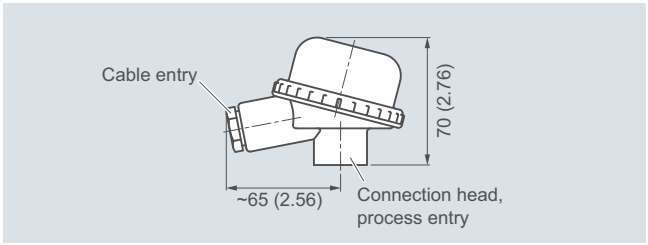
Connection head, aluminum, Type BA0, dimensions in mm (inch)



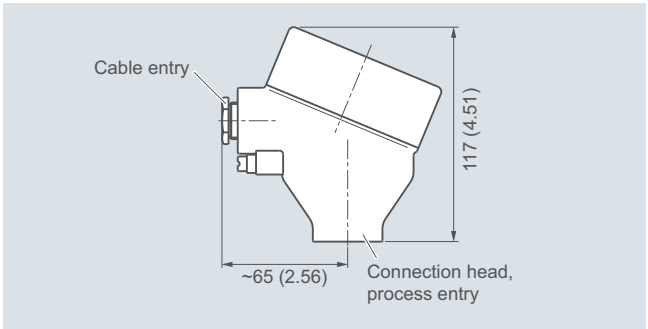
Connection head, aluminum, Type BB0, dimensions in mm (inch)



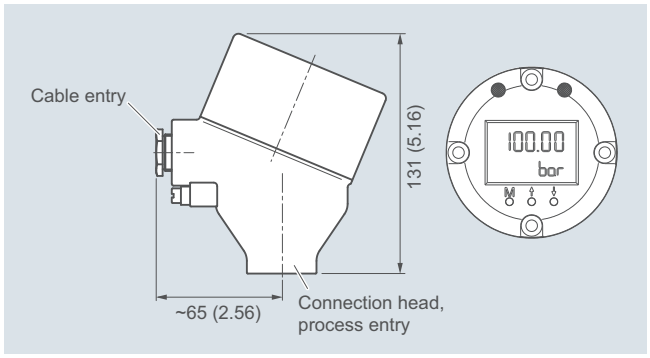
Connection head, aluminum, Type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, plastic, Type BM0, dimensions in mm (inch)



Connection head, aluminum, Type AG0, stainless steel, Type AU0, dimensions in mm (inch)



Connection head with 4-20 mA display, aluminum, Type AH0, stainless steel, Type AV0, dimensions in mm (inch)

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Type 4+4F barstock thermowell, with extension

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Insertion length customer-specific	**Y44**
Select range, enter desired length in plain text Insertion length U deviating from standard; (Min: U = C; Max; U= L-50 mm (1.97 inch)), no entry = standard length (U=L-70 mm (2.76 inch))	
Extension length customer-specific	**Y45**
Select range, enter desired length in plain text (No entry = standard length)	
Options	
Add "**-Z**" to Article No. and add options, separate extensions with "+".	
Built-in head transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, 4 ... 20 mA, Pt100	**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100	**T11**
SITRANS TH200, 4 ... 20 mA, Universal	**T20**
SITRANS TH200 Ex i (ATEX), 4 ... 20 mA, Universal	**T21**
SITRANS TH300, HART, Universal	**T30**
SITRANS TH300 Ex i (ATEX), HART, Universal	**T31**
SITRANS TH400 PA, Universal	**T40**
SITRANS TH400 PA Ex i, Universal	**T41**
SITRANS TH400 FF, Universal	**T45**
SITRANS TH400 FF Ex i, Universal	**T46**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"2) according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "nA"/"NI" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"1) according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to cCSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through housing "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**

Selection and Ordering data	Order code
Certificates and approvals	
EN 10204-3.1 Inspection certificate for materials coming into contact with media	**C12**
EN 10204-3.1 Inspection certificate for hydrostatic pressure test	**C31**
EN 10204-3.1 Inspection certificate for helium leak test	**C32**
EN 10204-3.1 Inspection certificate for surface tear test	**C33**
EN 10204-3.1 Inspection certificate: visual, measurement and functional inspection	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
NACE Standard MR-01-75 compliance	**C50**
ISO 9001 grease-free (cleaned for e.g. oxygen applications)	**C51**
Designation, calibration	
Stainless steel TAG plate , enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text	**Y33**
Transmitter options	
Transmitter, enter complete setting in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when Order code "Y15" is selected	**Y01**
Enter measuring point (max. 8 characters) in plain text	**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text	**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text	**Y24**
Transmitter, enter bus address in plain text	**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)	**U36**
Transmitter with a SIL 2 conformity	**C20**
Transmitter with a SIL 2/3 conformity	**C23**
Transmitter test protocol (5 points)	**C11**
Further options	
Connection form, flying leads (for the direct transmitter assembly, delivery without screws and springs)	**G01**
Full penetration process connection for 316L/316TI	**G02**
M12 plug (in combination with 1x Pt100 and/or transmitter, Non-Ex max. IP65/67)	**G12**
Harting plug Han 7 D (Non Ex, without mating connector max. IP65/67)	**G13**
Connection head with ½ NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
with outer earth screw for heads AG0, AH0, AU0 and AV0	**A02**
with inner earth screw for heads BC0, AG0, AH0, AU0 and AV0	**A03**

1) Please select Ex i version of the optional transmitter.
2) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (please select non-Ex version of the optional transmitter).

You find ordering examples on page 2/39.
Accessories, see page 2/188.

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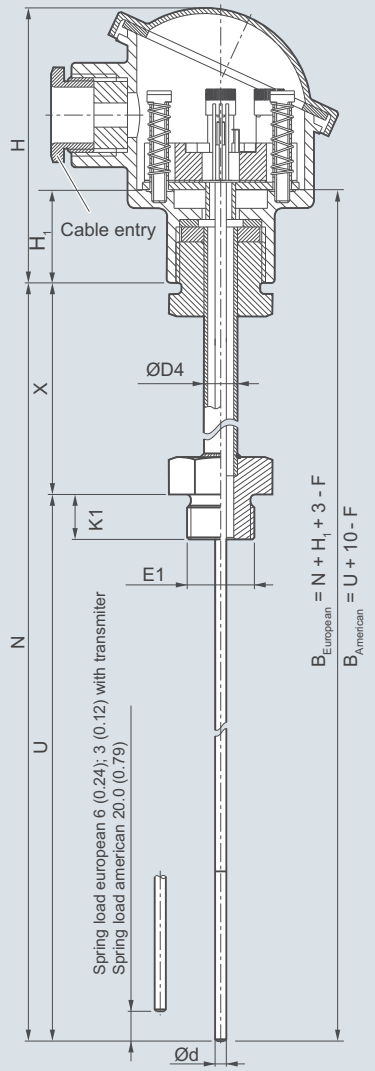
Dimensional drawings



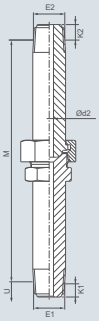
B	Measuring insert length
Ød	Measuring insert outer diameter
ØD4	Extension outer diameter
E1	Process connection, thread size
H	Head height
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)
K1	Screw depth
N	Nominal length
U	Insertion length
X	Extension length

Recommended rebound:
European versions = inside length of the protective tube + 3 (0.12)
American versions = inside length of the protective tube + 10 (0.39)

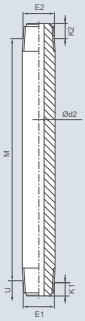
SITRANS TS500, temperature sensors for vessels and pipings, temperature sensors for installation in existing thermowells, suitable for thermowells as per DIN 43772 as well as ASME B40.9-2001 with extension European or American types, dimensions in mm (inch)

Neck tube (1, 2, 3), ajustable, european, cylindrical, dimensions in mm (inch)

Neck tube NPT (1, 2, 3), ajustable, european, conical, dimensions in mm (inch)



Neck tube NUN, ajustable, conical, european (5), american (8), dimensions in mm (inch)



Neck tube, nipple, non ajustable, conical, european (4), american (6), dimensions in mm (inch)

[1] Numerics 1 ... 8: s. Selection and Ordering data option extension page 2/94

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For installation in existing protective tubes

2

Selection and Ordering data	Article No. / Ord. Code
SITRANS TS500 ↗	**7MC7500-**
Temperature sensors for installation in existing thermowells, suitable for thermowells as per DIN 43772 as well as ASME B40.9-2001 with extension European or American types	-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Model	
existing thermowells	1
Thread type	
G½" (½"BSPF) (not for American type)	C
NPT½"	J
M14x1.5 (not for American type)	T
M18x1.5 (not for American type)	U
Without thread	N
Insertion ength U free length, standard lengths	
110 mm (4.33 inch)	B 1
140 mm (5.51 inch)	B 2
200 mm (7.87 inch)	C 1
260 mm (10.24 inch)	C 2
410 mm (16.14 inch)	E 1
Insertion U free length, customer-specific	
enter customer specific length with Y44, see page 2/96 Order codes	
30 ... 100 mm (1.18 ... 3.94 inch) Initial: 100 mm (3.94 inch)	A 0
101 ... 200 mm (3.98 ... 7.87 inch) Initial: 200 mm (7.87 inch)	B 0
201 ... 300 mm (7.91 ... 11.81 inch) Initial: 300 mm (11.81 inch)	C 0
301 ... 400 mm (11.85 ... 15.75 inch) Initial: 400 mm (15.75 inch)	D 0
401 ... 500 mm (15.79 ... 19.68 inch) Initial: 500 mm (19.68 inch)	E 0
501 ... 600 mm (19.72 ... 23.62 inch) Initial: 600 mm (23.62 inch)	F 0
601 ... 800 mm (23.66 ... 31.50 inch) Initial: 800 mm (31.50 inch)	G 0
801 ... 1 000 mm (31.54 ... 39.37 inch) Initial: 1 000 mm (39.37 inch)	H 0
1 001 ... 1 250 mm (39.41 ... 49.21 inch) Initial: 1 250 mm (49.21 inch)	J 0
1 251 ... 1 500 mm (49.25... 59.05 inch) Initial: 1 500 mm (59.05 inch)	K 0
Measurement tip diameter	
6 mm (0.24 inch)	6
8 mm (0.31 inch) (with sleeve) (with sleeve = not replaceable)	8
10 mm (0.39 inch) (with sleeve) (with sleeve = not replaceable)	0

Selection and Ordering data	Article No. / Ord. Code
SITRANS TS500	**7MC7500-**
Temperature sensors for installation in existing thermowells, suitable for thermowells as per DIN 43772 as well as ASME B40.9-2001 with extension European or American types	-
Extension X	
Without extension	0
European type: X=65 (M=80 mm) (3.15 inch) adjustable	1
European type: X=139 mm (5.47 inch) (M=155 mm (6.10 inch)) adjustable (DIN standard length for L=110)	2
European type: X=149 mm (5.87 inch) (M=165 mm (6.50 inch)) adjustable	3
European type:NIP, =150 mm (5.91 inch) not adjustable (NPT½")	4
European type: X=150 mm (5.91 inch) NUN adjustable (NPT½")	5
American type: X=74 mm (2.91 inch) integrated sensor spring, NIP, not adjustable (NPT½"), Umin = 100 mm	6
American type: X=150 mm (5.91 inch) integrated sensor spring NUN adjustable (NPT½")	8
Extension X, customer-specific	
enter customer specific length with Y45, see page 2/96 Order codes	
55 ...150 mm (2.17 ... 5.91 inch) Standard: 150 mm (5.91 inch)	9 N 1
151 ... 300 mm (5.95 ... 11.81 inch) Standard: 300 mm (11.81 inch)	9 N 2
301 ... 450 mm (11.85 ... 17.72 inch) Standard: 450 mm (17.72 inch)	9 N 3
Model	
European type (M24 adjustable)	D

Additional configurations on page after next page!

You find ordering examples on page 2/39!

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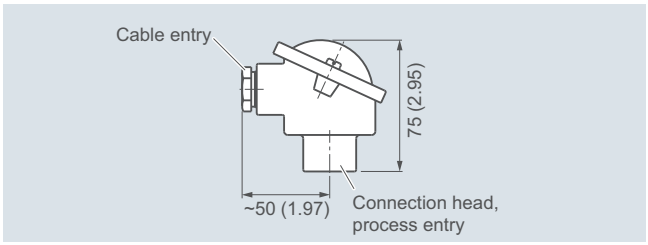
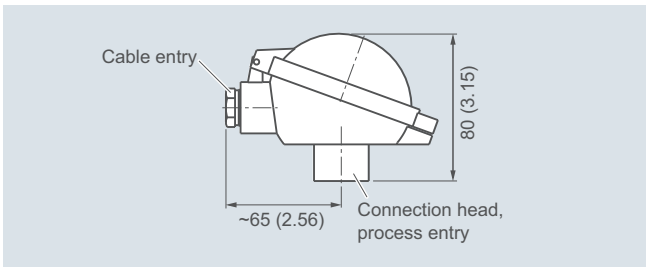
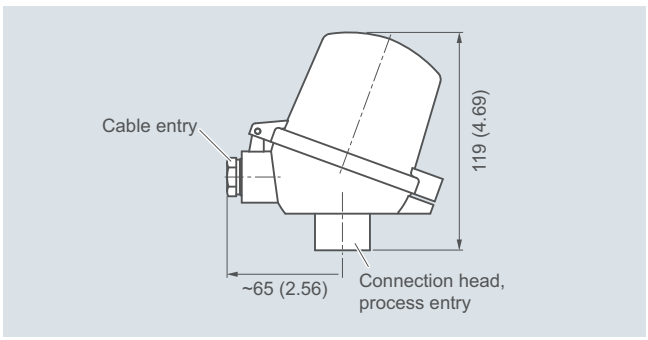


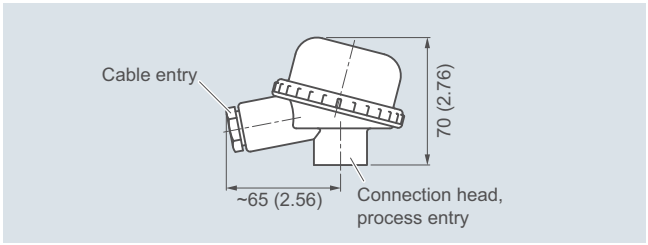
Connection head, aluminum, Type BA0, dimensions in mm (inch)



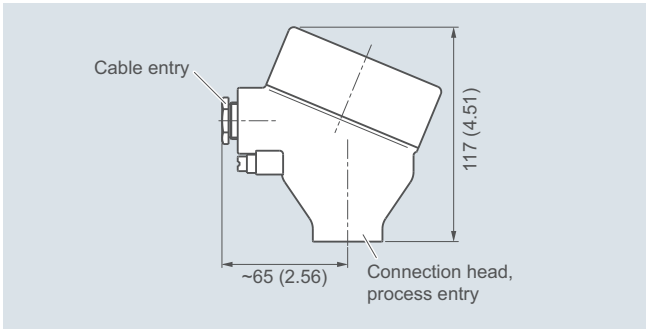
Connection head, aluminum, Type BB0, dimensions in mm (inch)



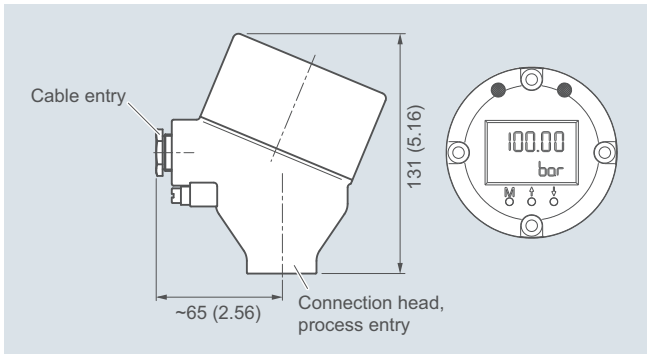
Connection head, aluminum, Type BC0, plastic, type BP0, dimensions in mm (inch)



Connection head, plastic, Type BM0, dimensions in mm (inch)



Connection head, aluminum, Type AG0, stainless steel, Type AU0, dimensions in mm (inch)



Connection head with 4-20 mA display, aluminum, Type AH0, stainless steel, Type AV0, dimensions in mm (inch)

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For installation in existing protective tubes

2

Selection and Ordering data	Article No.	Ord. Code
SITRANS TS500 **Temperature sensors for installation in existing thermowells, suitable for thermowells as per DIN 43772 as well as ASME B40.9-2001 with extension European or American types**	**7MC7500-**	-
Head		
Aluminum head, BA0, flange cover, Standard		A
Aluminum head, BB0, low hinged cover, screw connection		B
Aluminum head, BC0, high hinged cover, screw connection		C
Aluminum head, AG0, screw cover, suitable for Ex d[1]		G
Aluminum head, AH0, screw cover, suitable for Ex d, display[1]		H
Plastic head, BM0, screw cover		M
Plastic head, BP0high hinged cover, screw connection		P
Stainless steel head, AU0, screw cover, Ex d[1]		U
Stainless steel head, AV0, screw cover, Ex d, display[1]		V
Sensor[2] Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17		
Pt100, Basis, -50 ... +400 °C (-58 ... +752 °F)		A
Pt100, vibration resistant, -50 ... +400 °C (-58 ... +752 °F)		B
Pt100, expanded range, Umin = 100 mm -196 ... +600 °C (-321 ... +1 112 °F)		C
Thermocouple Type J, only class 2, -40 ... +750 °C (-40 ... +1 382 °F)		J
Thermocouple Type K, -40 .. . +1 000 °C (-40 ... +1 832 °F)		K
Thermocouple Type N, -40 ... +1 000 °C (-40 ... +1 832 °F)		N
Sensor number/Accuracy Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19		
Single, basic accuracy (Class 2/Class B)		1
Single, increased accuracy (Class 1/Class A)		2
Single, highest accuracy (Class AA)		3
Double, basic accuracy (Class 2/Class B)		5
Double, increased accuracy (Class 1/Class A)		6
Double, highest accuracy (Class AA)		7

[1] Ex d in connection with Order code E03

[2] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Article No. and specify Order code.	
Insertion length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y44**
Extension length customer-specific Select range, enter desired length in plain text (No entry = standard length)	**Y45**

Selection and Ordering data	Order code
Options Add "**-Z**" to Article No. and add options, separate extensions with "+".	
Built-in head transmitter Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, 4 ... 20 mA, Pt100	**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100	**T11**
SITRANS TH200, 4 ... 20 mA, Universal	**T20**
SITRANS TH200 Ex i (ATEX), 4 ... 20 mA, Universal	**T21**
SITRANS TH300, HART, Universal	**T30**
SITRANS TH300 Ex i (ATEX), HART, Universal	**T31**
SITRANS TH400 PA, Universal	**T40**
SITRANS TH400 PA Ex i, Universal	**T41**
SITRANS TH400 FF, Universal	**T45**
SITRANS TH400 FF Ex i, Universal	**T46**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"2) according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
Non-sparking "nA"/"NI" according to ATEX and IECEx (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"1) according to cCSAus (USA, Canada)	**E18**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"2) according to cCSAus (USA, Canada); NPT connections **at the enclosure** are mandatory	**E20**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to cCSAus (USA); other connections (M, G, R)	**E21**
Non-sparking "nA"/"NI" according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
Flameproof enclosure "d"; dust protection through housing "t"[2] according to NEPSI (China)	**E56**
Non-sparking "nA"/"NI" according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
Flameproof enclosure "d"/"XP; dust protection through housing "t"/"DIP"[2] according to EACEx (EAC)	**E82**
Non-sparking "nA"/"NI" according to EACEx (EAC)	**E83**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**
Certificates and approvals	
EN 10204-3.1 Factory certificate: visual, measurement and functional inspection	**C34**
EN 10204-2.1: Declaration of compliance with the order	**C35**
Designation, calibration	
Stainless steel TAG plate , enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text	**Y33**

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Selection and Ordering data	Order code
Transmitter options	
Transmitter, enter complete setting in plain text (Y01:+/-NNNN ... +/-NNNN C,F), marking on the device when Order code "Y15" is selected	**Y01**
Enter measuring point (max. 8 characters) in plain text	**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text	**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text	**Y24**
Transmitter, enter bus address in plain text	**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)	**U36**
Transmitter with a SIL 2 conformity	**C20**
Transmitter with a SIL 2/3 conformity	**C23**
Transmitter test protocol (5 points)	**C11**
Further options	
Connection form, flying leads (for the direct transmitter assembly, delivery without screws and springs)	**G01**
M12 plug (in combination with 1x Pt100 and/or transmitter, Non-Ex max. IP65/67)	**G12**
Harting plug Han 7 D (Non Ex, without mating connector max. IP65/67)	**G13**
Connection head with ½" NPT thread without cable gland, for AU0 and AH0 only IP66	**G20**
Input of the connection head: M24x1.5, with sealing screw, Umin = 50 mm	**G50**
Input of the connection head: 1/2"NPT, with sealing screw, Umin = 50 mm	**G51**
Input of the connection head: M24x1.5, open, Umin = 50 mm	**G52**
Input of the connection head: 1/2"NP, open, Umin = 50 mm	**G53**
with outer earth screw for heads AG0, AH0, AU0 and AV0	**A02**
with inner earth screw for heads BC0, AG0, AH0, AU0 and AV0	**A03**

1) Please select Ex i version of the optional transmitter.
2) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (please select non-Ex version of the optional transmitter).

You find ordering examples on page 2/39.
Accessories, see page 2/188.

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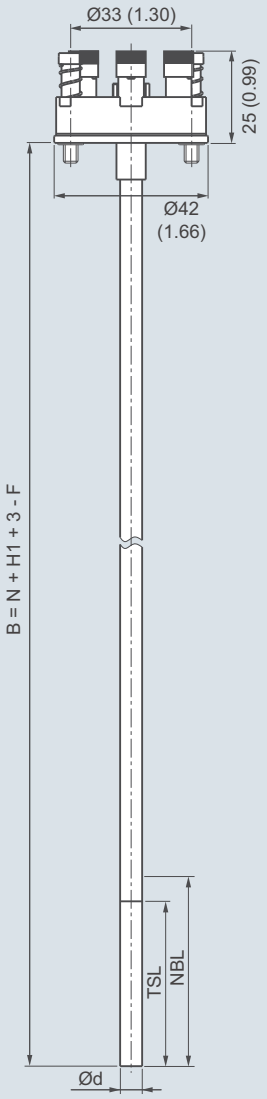
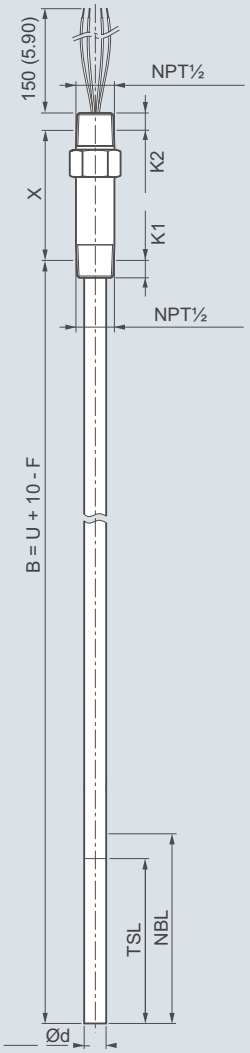
Measuring inserts for retrofits and upgrades European and American type

Dimensional drawings

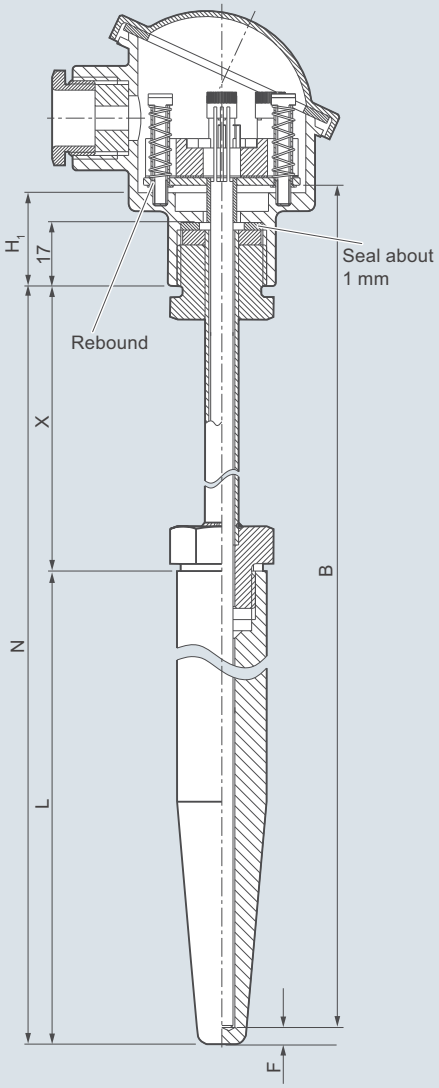
European type



American type



Determination of the measuring insert length



B	Measuring insert length
Ød	Measuring insert outer diameter
N	Nominal length
NBL	Non-bending length
TSL	Temperature-sensitive length
F	Floor strength Type 2: 3 Type 3: 6 Type 4: 4
X	Extension length
K1	Screw depth
K2	Screw depth
L/U	Thermowell length U for Form 2*/ 3*/ 4F L for Form 4
H_1	Type Axx = 41 (1.61) Type Bxx = 26 (1.02)

Recommended rebound:
European versions = 3 (0.12)
American versions = 10 (0.39)

Example calculations

European measuring insert
Connection head BC0, Thermowell Form 2F, U = 225 mm, X = 64
B = U + X + H1 + 3 – F
B = 225 + 64 + 26 + 3 – 3 = 315

American measuring insert
Connection head AG0, Thermowell Form 4, L = 200 mm
B = L + 10 - F
B = 200 + 10 – 4 = 206

SITRANS TSinsert measuring inserts for temperature sensors, replaceable, mineral-insulated design
European type (DIN ceramic base), spring load approx. 6 mm (0.24 inch)/3 mm (0.12 inch) with transmitter
American type, spring load approx. 21 mm (0.83 inch); determination of measuring insert length, dimensions in mm (inch);
Cold End types: see drawings on page 2/100

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Selection and Ordering data	Article No.
SITRANS TSinsert for temperature sensors, replaceable, mineral-insulated design, European or American type ↗	**7MC701** ▢ - ▢▢▢▢▢▢
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Measurement tip diameter	
6 mm (0.24 inch)	6
8 mm (0.31 inch) (with sleeve)	8
10 mm (0.39 inch) (with sleeve)	0
Type	
European type - DIN ceramic base	1
European type - DIN flying leads, absolutely necessary with built-on transmitter	2
American type - ANSI (nipple spring)	5
Sensor[1]	
Please note: The accuracy class range can be lower than the measuring range. For more information, see page 2/17	
Pt100, basis, -50 ... +400 °C (-58 ... +752 °F)	A
Pt100, vibration-resistant, -50 ... +400 °C (-58 ... +752 °F)	B
Pt100, expanded range, Umin = 100 mm -196 ... +600 °C (-321 ... +1 112 °F)	C
Thermocouple Type J, -40 ... +750 °C (-40 ... +1 382 °F)	J
Thermocouple Type K, -40 .. . +1 000 °C (-40 ... +1 832 °F)	K
Thermocouple Type N, -40 ... +1 000 °C (-40 ... +1 832 °F)	N
Sensor number/Accuracy	
Circuit Pt 100: 1 x 4-wire circuit or 2 x 3-wire circuit, see "Measuring technique: Connection types", page 2/19	
Single, basic accuracy (Class 2/Class B)	A
Single, increased accuracy (Class 1/Class A)	B
Single, highest accuracy (Class AA)	C
Double, basic accuracy (Class 2/Class B)	D
Double, increased accuracy (Class 1/Class A)	E
Double, highest accuracy (Class AA)	F
Measuring insert length B, standard	
145 mm (6.89 inch)	1 3
205 mm (8.07 inch)	1 7
275 mm (10.83 inch)	2 1
315 mm (12.40 inch)	2 3
345 mm (13.58 inch)	2 4
375 mm (14.76 inch)	2 5
405 mm (15.94 inch)	2 7
435 mm (17.13 inch)	2 0
555 mm (21.85 inch)	3 5
585 mm (23.03 inch)	3 6

Selection and Ordering data	Article No.
SITRANS TSinsert for temperature sensors, replaceable, mineral-insulated design, European or American type	**7MC701** ▢ - ▢▢▢▢▢
Measuring insert length B, customer-specific	
specify length with Y44, s. page 2/93	
85 ... 100 mm (3.37 ... 3.94 inch) Initial: 100 mm (3.94 inch)	1 1
101 ... 150 mm (3.98 ... 5.91 inch) Initial: 145 mm (5.71 inch)	1 3
151 ... 200 mm (5.95 ... 7.87 inch) Initial: 200 mm (7.87 inch)	1 5
201 ... 250 mm (7.91 ... 9.84 inch) Initial: 205 mm (8.07 inch)	1 7
251 ... 300 mm (9.88 ... 11.81 inch) Initial: 275 mm (10.83 inch)	2 1
301 ... 350 mm (11.85 ... 13.78 inch) Initial: 315 mm (12.40 inch)	2 3
351 ... 400 mm (13.82 ... 15.75 inch) Initial: 375 mm (14.76 inch)	2 5
401 ... 450 mm (15.79 ... 17.72 inch) Initial: 405 mm (15.94 inch)	2 7
451 ... 500 mm (17.76 ... 19.68 inch) Initial: 500 mm (19.68 inch)	3 1
501 ... 550 mm (19.72 ... 21.65 inch) Initial: 525 mm (20.67 inch)	3 3
551 ... 600 mm (21.69 ... 23.92 inch) Initial: 555 mm (21.85 inch)	3 5
601 ... 700 mm (23.66 ... 27.56 inch) Initial: 655 mm (25.79 inch)	3 7
701 ... 800 mm (27.60 ... 31.50 inch) Initial: 735 mm (28.94 inch)	4 1
801 ... 900 mm (31.54 ... 35.43 inch) Initial: 825 mm (32.48 inch)	4 3
901 ... 1 000 mm (35.47 ... 39.37 inch) Initial: 950 mm (37.40 inch)	4 5
1 001 ... 1 500 mm (39.41 ... 59.05 inch) Initial: 1 250 mm (49.21 inch)	4 7
1 501 ... 1 700 mm (59.09 ... 66.93 inch) Initial: 1 700 mm (66.93 inch)	4 8

[1] Pt1000 versions are also available. To find these, please switch to Online Configuration in the PIA Life Cycle Portal: www.siemens.com/pia-portal

Additional configurations on page after next page!

You find ordering examples on page 2/39!

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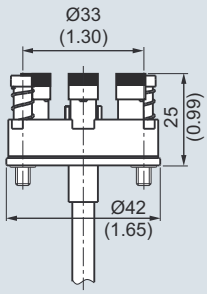
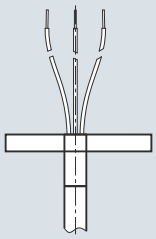
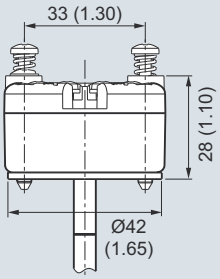
Measuring inserts for retrofits and upgrades European and American type



Cold end type, ceramic base, dimensions in mm (inch)



Cold end type, free wire ends, dimensions in mm (inch)



European type:
cold end type, built-on transmitter, dimensions in mm (inch)

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Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Measuring insert length B	**Y44**
Select range, enter desired length in plain text (No entry = standard length)	
Options	
Add "**-Z**" to Article No. and add options, separate extensions with "+".	
Built-in head transmitter	
Measuring range to be set must be specified with plain text data "Y01".	
SITRANS TH100, 4 ... 20 mA, Pt100	**T10**
SITRANS TH100 Ex i (ATEX), 4 ... 20 mA, Pt100	**T11**
SITRANS TH200, 4 ... 20 mA, Universal	**T20**
SITRANS TH200 Ex i(ATEX), 4 ... 20 mA, Universal	**T21**
SITRANS TH300, HART, Universal	**T30**
SITRANS TH300 Ex i (ATEX), HART, Universal	**T31**
SITRANS TH400 PA, Universal	**T40**
SITRANS TH400 PA Ex i, Universal	**T41**
SITRANS TH400 FF, Universal	**T45**
SITRANS TH400 FF Ex i, Universal	**T46**
Explosion protection	
Without explosion protection requirements (Europe, Australia, New Zealand)	**E00**
Intrinsic safety "i"/"IS"[1] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E01**
For SITRANS TS500 in flameproof enclosure "d"/"XP type of protection; dust protection through housing "t"/"DIP"[2] according to ATEX and IECEx (Europe, Australia, New Zealand)	**E03**
For SITRANS TS500 in non-sparking "nA"/"NI" according to ATEX and IECEx type of protection (Europe, Australia, New Zealand)	**E04**
Without explosion protection requirements (USA, Canada)	**E17**
Intrinsic safety "i"/"IS"[1] according to cCSAus (USA, Canada)	**E18**
For SITRANS TS500 in flameproof enclosure "d"/"XP type of protection; dust protection through housing "t"/"DIP"[2] according to cCSAus (USA, Canada); NPT connections **at the enclosure** are mandatory	**E20**
For SITRANS TS500 in flameproof enclosure "d"/"XP type of protection; dust protection through housing "t"/"DIP"[2] according to cCSAus (USA); other connections (M, G, R)	**E21**
For SITRANS TS500 in non-sparking "nA"/"NI" type of protection according to cCSAus (USA, Canada)	**E23**
Without explosion protection requirements (China)	**E54**
Intrinsic safety "i"/"IS"[1] according to NEPSI (China)	**E55**
For SITRANS TS500 in flameproof enclosure "d" type of protection; dust protection through housing "t"[2] according to NEPSI (China)	**E56**
For SITRANS TS500 in non-sparking "nA"/"NI" type of protection according to NEPSI (China)	**E57**
Without explosion protection requirements (EAC)	**E80**
Intrinsic safety "i"/"IS"[1] according to EACEx (EAC)	**E81**
For SITRANS TS500 in flameproof enclosure "d"/"XP type of protection; dust protection through housing "t"/"DIP"[2] according to EACEx (EAC)	**E82**
For SITRANS TS500 in non-sparking "nA"/"NI" type of protection according to EACEx (EAC)	**E83**
Marine approvals	
Det Norske Veritas Germanischer Lloyd (DNV GL)	**D01**
Bureau Veritas (BV)	**D02**
Lloyd's Register of Shipping (LR)	**D04**
American Bureau of Shipping (ABS)	**D05**

Selection and Ordering data	Order code
Designation, calibration	
Stainless steel TAG plate , enter lettering in plain text	**Y15**
Plant calibration per 1 point, enter temperature in plain text	**Y33**
Transmitter options	
Transmitter, enter complete setting in plain text (Y01:+/-NNNN ... +/-NNNN C,F)	**Y01**
Enter measuring point (max. 8 characters) in plain text	**Y17**
Transmitter, enter measuring point description (max. 16 characters) in plain text	**Y23**
Transmitter, enter measuring point text (max. 32 characters) in plain text	**Y24**
Transmitter, enter bus address in plain text	**Y25**
Transmitter, fail-safe value 3.6 mA (instead of 22.8 mA)	**U36**
Transmitter with a SIL 2 conformity	**C20**
Transmitter with a SIL 2/3 conformity	**C23**
Transmitter test protocol (5 points)	**C11**

1) Please select Ex i version of the optional transmitter.
2) Only with connection heads code AG0, AH0, AU0, AV0, without cable gland (please select non-Ex version of the optional transmitter).

You find ordering examples on page 2/39.
Accessories, see page 2/188.