

Technical Information

Omnigrad

TA570, TA571, TA572

Industrial thermowell



Heavy duty - general purpose thermowell made of drilled barstock material for weld-in

Application

The thermowell is designed for use with resistance and thermocouple thermometers mainly in heavy duty applications.

Your benefits

- TA570, TA571 and TA572 are industry standard thermowells manufactured from round barstock.
- The process connection is welded.
- The thermowell stem shape can be straight, conical or conical tapered.
- The extension, the immersion and the tapering lengths can be chosen according to process requirements.
- Wide choice of standard materials. Additional versions can be ordered according to specification.
- Different grades of surface finishing available.

Technical data

Thermowell	TA570	TA571	TA572
Standard reference	Dow Chemical G6D-7001-00	-	Du Pont SR21T/SR22T
Outer diameter extension	35 to 49 mm (1.38 to 1.9 in)	30 to 35 mm (1.18 to 1.37 in)	25 to 29 mm (0.98 to 1.14 in)
Outer diameter immersion length	< Ø extension		
Standard extension	75 mm (2.96 in)	45 mm (1.77 in) 80 mm (3.15 in)	43 mm (1.69 in) 45 mm (1.77 in) 68 mm (2.67 in) 70 mm (2.75 in) 145 mm (5.71 in) 146 mm (5.75 in) 221 mm (8.70 in) 222 mm (8.74 in)
Standard bore diameter	7 mm (0.28 in)		7 mm (0.28 in) or 8 mm (0.31 in)

Process

Process temperature range

For the maximum operating temperatures, see the 'Material' section.

Process pressure

The maximum process pressure depends on the process temperatures and the maximum permitted flow velocity.

Permitted flow velocity depending on the immersion length

The maximum flow velocity tolerated by the thermowell diminishes with increasing thermowell immersion length exposed to the stream of the fluid. In addition, it depends on the shape and size of the thermowell, the medium type, process temperature and process pressure.



Thermowell sizing tool

It is possible to check the mechanical loading capacity as a function of the installation and process conditions online in the TW Sizing Module for thermowells in the Endress+Hauser Applicator software. See <https://wapps.endress.com/applicator>

Connection to thermometer

Thermowell	Thread	Standard
TA570	½" NPT	ASME B 1.20.1
	½" NPSM	
	G½"	ISO 228-1
TA571	½" NPT	ASME B 1.20.1
	½" NPSM	
	G½"	ISO 228-1
TA572	½" NPT	ASME B 1.20.1
	½" NPSC	

Process connection

The cylindrical extension can be welded directly or by using a welding socket.

Tip

	TA570	TA571	TA572
Bottom shape	conical or conical tapered		
Bottom thickness (D)	6 mm (¼ in)	4 mm (0.16 in), 6 mm (¼ in), 6.35 mm (0.25 in)	5 mm (0.20 in) or 6 mm (¼ in)

Surface roughness

Finishings: 0.8 µm (0.32 µin) or 1.6 µm (0.63 µin)

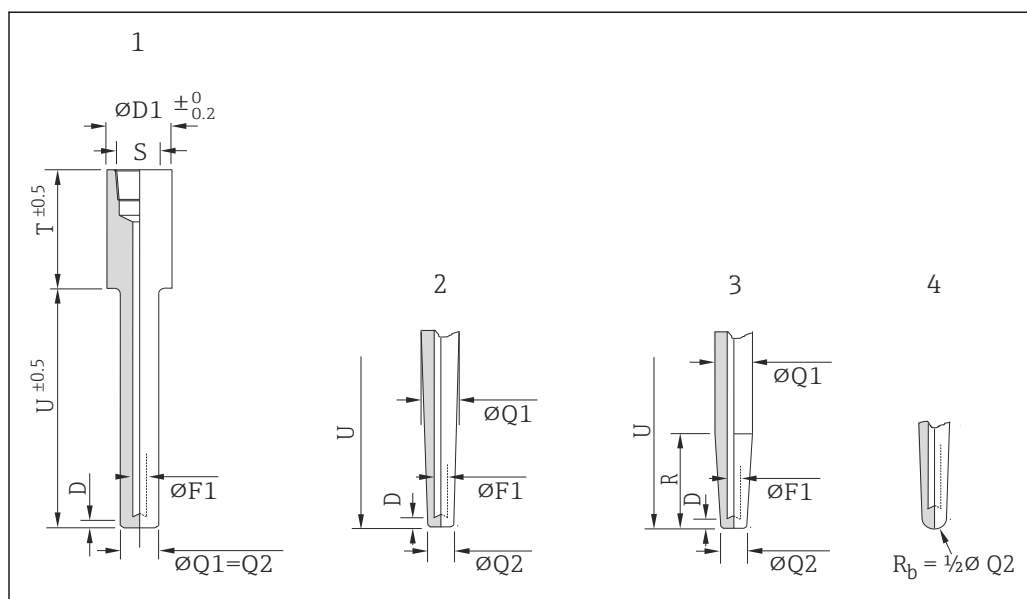
Material

Thermowell, process connection

The temperatures for continuous operation specified in the following table are only intended as reference values for use of the various materials in air and without any significant compressive load. The maximum operation temperatures are reduced considerably in some cases where abnormal conditions such as high mechanical load occur or in aggressive media.

Material name	Short form	Recommended max. temp. for continuous use in air	Properties
AISI 316/1.4401	X5CrNiMo 17-12-2	650 °C (1 202 °F)	■ Austenitic, stainless steel ■ High corrosion resistance in general ■ Particularly high corrosion resistance in chlorine-based and acidic, non-oxidizing atmospheres through the addition of molybdenum (e.g. phosphoric and sulfuric acids, acetic and tartaric acids with a low concentration)
AISI 316L/ 1.4404 1.4435	X2CrNiMo17-12-2 X2CrNiMo18-14-3	650 °C (1 202 °F)	■ Austenitic, stainless steel ■ High corrosion resistance in general ■ Particularly high corrosion resistance in chlorine-based and acidic, non-oxidizing atmospheres through the addition of molybdenum (e.g. phosphoric and sulfuric acids, acetic and tartaric acids with a low concentration) ■ Increased resistance to intergranular corrosion and pitting ■ Compared to 1.4404, 1.4435 has even higher corrosion resistance and a lower delta ferrite content
AISI 316Ti/ 1.4571	X6CrNiMoTi17-12-2	700 °C (1 292 °F)	■ Properties comparable to AISI316L ■ Addition of titanium means increased resistance to intergranular corrosion even after welding ■ Broad range of uses in the chemical, petrochemical and oil industries as well as in coal chemistry ■ Can only be polished to a limited extent, titanium streaks can form
AISI 321/1.4541	X6CrNiTi18 10	650 °C (1 202 °F)	■ Insensitive to intergranular corrosion if the material is heated within the carbon precipitation range of 482 °C to 800 °C ■ corrosion resistance similar to 304SS

Mechanical construction



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1 Thermowell dimensions in mm (in)

- 1 Continuous straight shape, flat bottom shape
- 2 Conical tip shape, flat bottom shape
- 3 Conical tapered tip shape, flat bottom shape
- 4 Round bottom shape

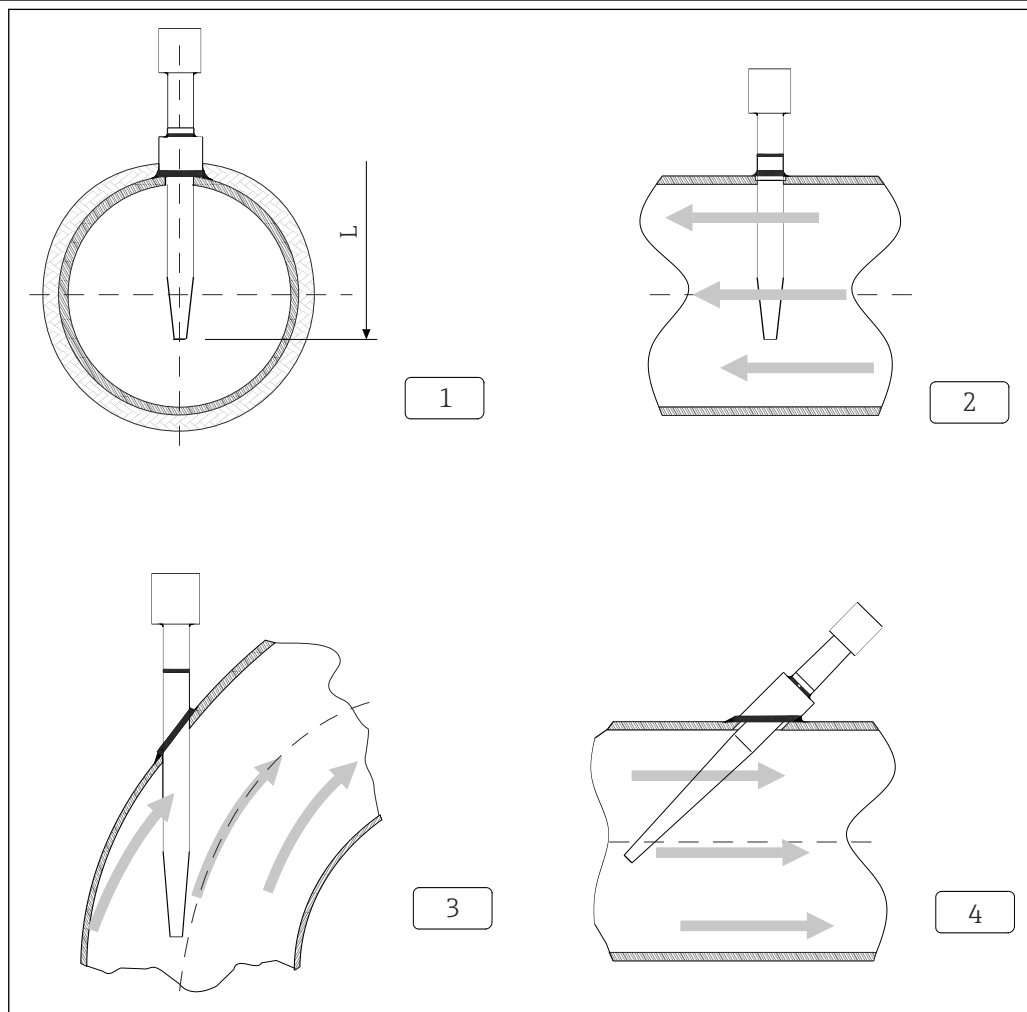
Pos. no.	Description	TA570	TA571	TA572
U	Immersion length	150 mm (5.9 in), 225 mm (8.9 in) customer-specific	150 mm (5.9 in), 270 mm (10.6 in), 400 mm (15.7 in) customer-specific	100 mm (3.94 in) customer-specific
T	Extension			
D	Bottom thickness			
ØQ1 ØQ2	Diameter thermowell tip, specification see ordering information Min. wall thickness 3 mm (0.12 in), (Q2-F1)/2≥3 mm (0.12 in)			
ØF1	Bore diameter	7 mm (0.28 in)		7 mm (0.28 in) or 8 mm (0.31 in)
R	Tapered tip length, specification see ordering information			
S	Thermometer connection thread, specification see ordering information			
ØD1	Diameter (extension)	35 to 49 mm (1.38 to 1.9 in)	30 to 35 mm (1.18 to 1.37 in)	25 to 29 mm (0.98 to 1.14 in)

Installation conditions

Orientation

No restrictions.

Installation instructions



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2 Installation examples

1-2 In pipes with a small cross section the sensor tip should reach or extend slightly past the center line of the pipe ($= L$)

3-4 Tilted installation

The immersion length of the thermometer influences the accuracy. If the immersion length is too small then errors in the measurement are caused by heat conduction via the process connection and the container wall. If installing into a pipe then the immersion length should be half of the pipe diameter, if possible (see 1 and 2). A further solution could be an angled (tilted) installation (see 3 and 4). When determining the immersion length all thermometer parameters and the process to be measured must be taken into account (e.g. flow velocity, process pressure).

- Installation possibilities: Pipes, tanks or other plant components
- Recommended minimum immersion length = 80 to 100 mm (3.15 to 3.94 in)
The immersion length should correspond to at least 8 times of the thermowell diameter.
- ATEX certification: Always take note of the installation regulations.

Certificates and approvals

PED approval

The thermowell complies with paragraph 3.3 of the Pressure Equipment Directive (97/23/EC) and is not marked separately.

Test on thermowell

Thermowell pressure tests are carried out in accordance with the specifications in the DIN 43772 standard. With regards to thermowells with tapered or reduced tips that do not comply with this standard these are tested using the pressure of corresponding straight thermowells. Tests according to other specifications can be carried out on request. Dye penetration tests verify the absence of cracks on the thermowell welding.

Ordering information

Detailed ordering information is available from the following sources:

- In the Product Configurator on the Endress+Hauser website: www.endress.com → Select country → Instruments → Select device → Product page function: Configure this product
- From your Endress+Hauser Sales Center: www.endress.com/worldwide



Product Configurator - the tool for individual product configuration

- Up-to-the-minute configuration data
- Depending on the device: Direct input of measuring point-specific information such as measuring range or operating language
- Automatic verification of exclusion criteria
- Automatic creation of the order code and its breakdown in PDF or Excel output format
- Ability to order directly in the Endress+Hauser Online Shop

Accessories

Service-specific accessories

Accessories	Description
Applicator	Software for selecting and sizing Endress+Hauser measuring devices: ■ Calculation of all the necessary data for identifying the optimum measuring device: e.g. pressure loss, accuracy or process connections. ■ Graphic illustration of the calculation results Administration, documentation and access to all project-related data and parameters over the entire life cycle of a project. Applicator is available: ■ Via the Internet: https://wapps.endress.com/applicator ■ On CD-ROM for local PC installation.
Konfigurator ^{+temperature}	Software for selecting and configuring the product depending on the measuring task, supported by graphics. Includes a comprehensive knowledge database and calculation tools: ■ For temperature competence ■ Quick and easy design and sizing of temperature measuring points ■ Ideal measuring point design and sizing to suit the processes and needs of a wide range of industries The Konfigurator is available: On request from your Endress+Hauser sales office on a CD-ROM for local PC installation.
W@M	Life cycle management for your plant W@M supports you with a wide range of software applications over the entire process: from planning and procurement, to the installation, commissioning and operation of the measuring devices. All the relevant device information, such as the device status, spare parts and device-specific documentation, is available for every device over the entire life cycle. The application already contains the data of your Endress+Hauser device. Endress+Hauser also takes care of maintaining and updating the data records. W@M is available: ■ Via the Internet: www.endress.com/lifecyclemanagement ■ On CD-ROM for local PC installation.

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