Technical Information
Omnigrad TA575, TA576

Industrial thermowell

Heavy duty - general purpose thermowell made of drilled barstock material with flanged weld type

Application

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

Your benefits

- TA575 and TA576 are industry standard thermowells manufactured from round barstock.
- The process connection is flanged with double sided standard or full penetration weld.
- The thermowell stem shape can be straight, conical or conical tapered.
- The extension, the immersion and the tapering lengths as well as the bar dimensions can be chosen according to process requirements.
- A wide choice of standard materials is available.
- Special versions can be manufactured according to specifications.

Endress+Hauser
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Technical data

Thermowell

	TA575	TA576
Standard reference	Dow Chemical G6D-7002-00 (1995)	Du Pont SR6T/SR7T
Extension, outer diameter	30 to 34 mm (1.18 to 1.34 in)	25 to 29 mm (0.98 to 1.14 in)
Immersion length, outer diameter	≤ outer diameter of extension	
Standard extension length	75 mm (2.95 in)	56 mm (2.20 in) 58 mm (2.28 in)
Standard bore diameter	7 mm (0.28 in)	6.5 mm (0.25 in) 7 mm (0.28 in) 9.5 mm (0.37 in) 10 mm (0.4 in)
Surface finishing	< 0.8 µm (31.5 µin) < 1.6 µm (63.0 µin)	

Process

Process temperature range

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

Process pressure (static)

Process connection	Standard	Max. process pressure
Flange	EN1092-1	Depending on the flange pressure rating PNxx: 16 bar or 40 bar
	ASME B16.5	Depending on the flange pressure rating: 150 psi, 300 psi or 600 psi

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

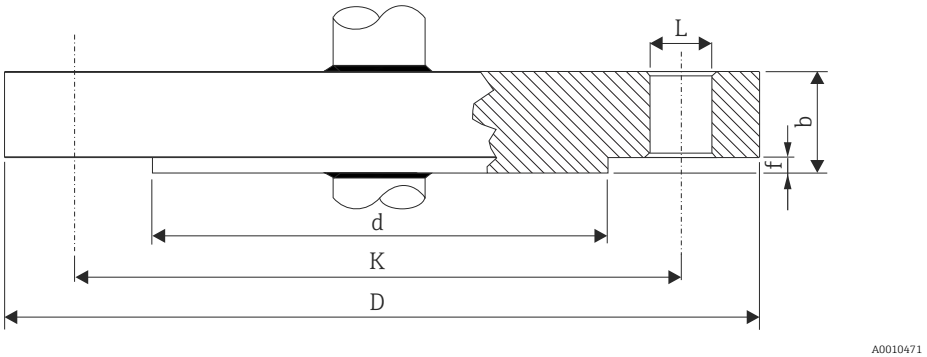
Connection to thermometer

Thermowell	Thread	Standard
TA575	½" NPT, ½" NPSM	ASME B 1.20.1
TA576	½" NPT, ½" NPSC	

Process connection

The process connection is flanged with a double sided standard weld or a full penetration weld.

Flange



For detailed information on the flange dimensions refer to the following flange standards:

- ANSI/ASME B16.5
- EN 1092-1

Thermowell tip shape

- Tip shape: straight, conical or conical tapered
- Bottom thickness: 5 mm (0.2 in) or 6 mm (0.25 in)

Material

Thermowell, process connection

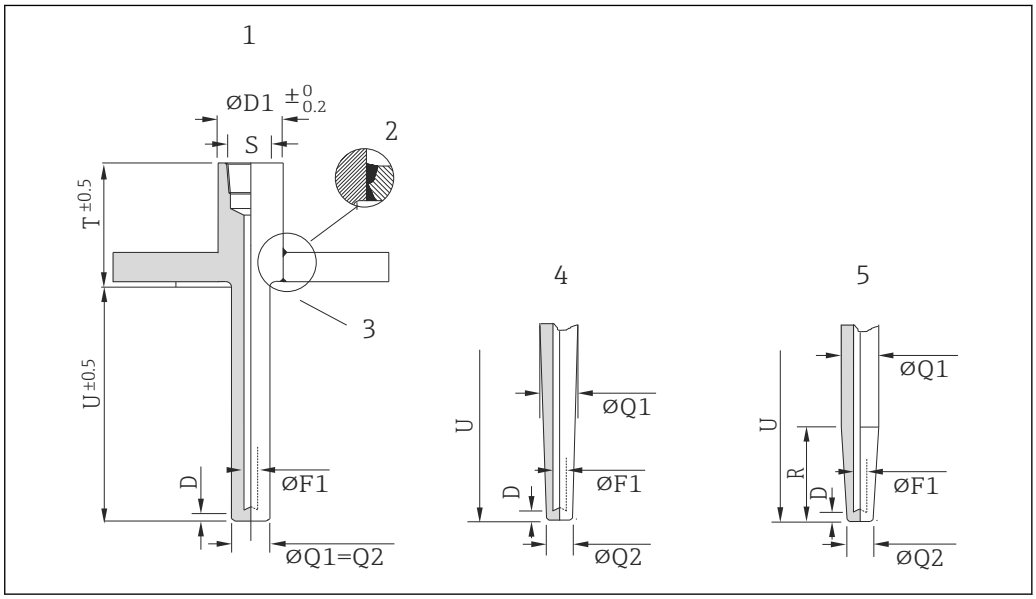
The temperatures for continuous operation specified in the following table are only intended as reference values for use of the various materials in air and without any significant compressive load. The maximum operation temperatures are reduced considerably in some cases where abnormal conditions such 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 (1202 °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 (1202 °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 (1292 °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 A105/ 1.0460	C22.8	450 °C (842 °F)	▪ Heat-resistant steel ▪ Resistant in nitrogen-containing atmospheres and atmospheres that are low in oxygen; not suitable for acids or other aggressive media ▪ Often used in steam generators, water and steam pipes, pressure vessels

Mechanical construction

Design, dimensions

All dimensions in mm (in).



1 Dimensions of the thermowell

1 Continuous straight shape, flat bottom shape
2 Full penetration welding
3 Standard welding
4 Conical tip shape, flat bottom shape
5 Conical tapered tip shape, flat bottom shape
D Bottom thickness
F1 Bore diameter
Q1 Outer diameter
Q2 Root tip diameter
R Tapering length, if R = 0 tip shape is straight or completely conical
S Connection to thermometer
T Extension
U Immersion length

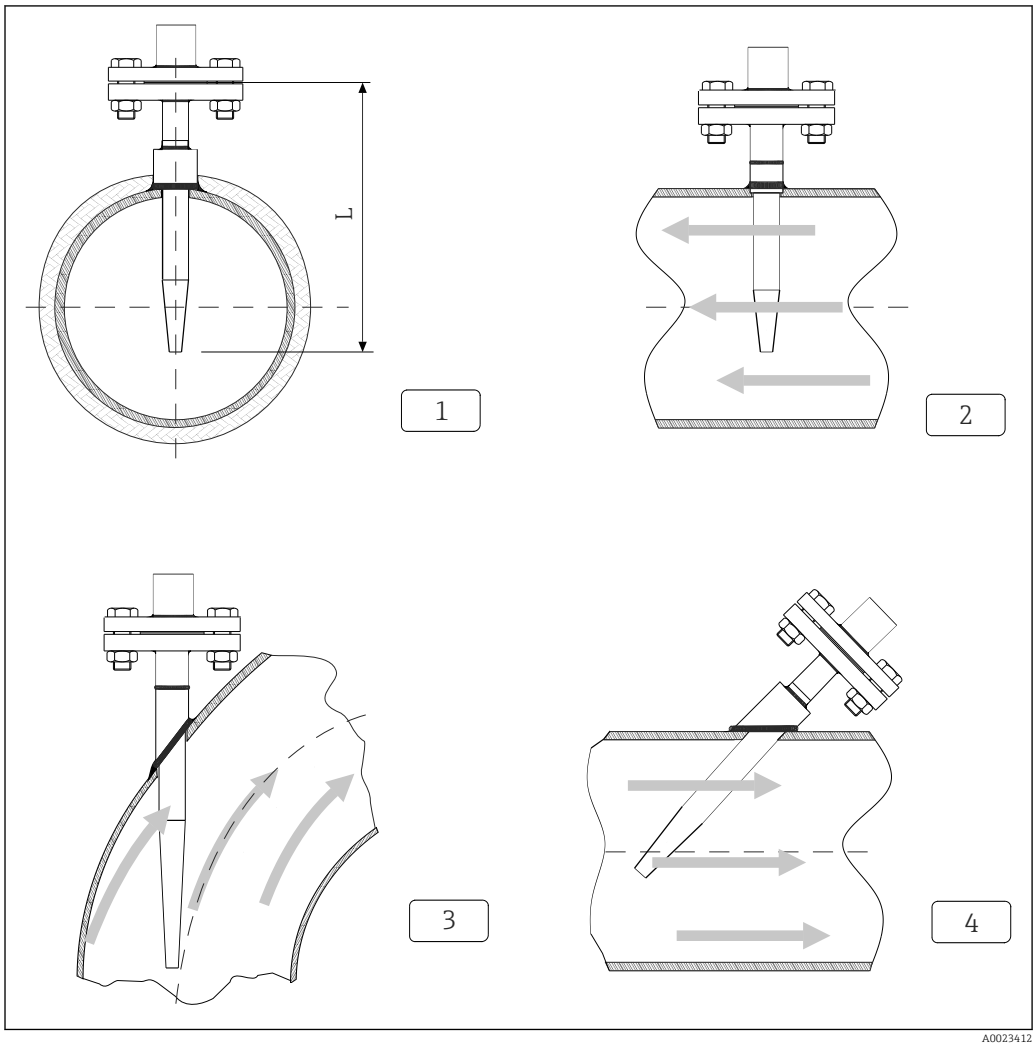
Thread thermometer connection	
½" NPT	Engagement length 8 mm (0.31 in)
½" NPSM ½" NPSC	Thread length 22 mm (0.87 in)

Installation conditions

Orientation

No restrictions.

Installation instructions



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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