

# Technical Information

## Thermowell TA535

For general industrial applications and processes generating medium to high stress



Thermowell for temperature inserts  
Welded version with hexagonal extension and threaded process connection

### Application

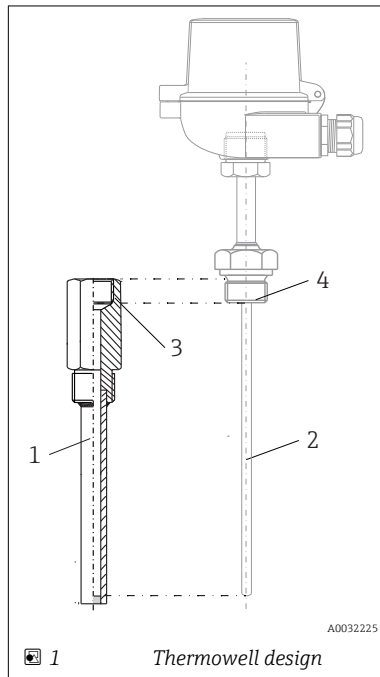
The thermowell with a hexagonal extension is employed in industrial applications which generate medium to high stress. For pipes or tanks that have threaded process connections. It can accommodate sensors with a diameter of 6 mm (0.24 in) and can also be used in combination with thermometers without a thermowell. It is available with NPT, gas and M20 connections (on thermometer and process sides).

### Your benefits

- Several types of process connection can be selected as standard
- Also large choice of outer diameters as standard
- Thermometer connection: ½" NPT, G ½" or M20x1.5 thread
- Thermowell made of SS 316L / 1.4404
- The immersion length can be selected to suit the process requirements, maximum standard length 10 m (32.8 ft).

## Function and system design

### Equipment architecture



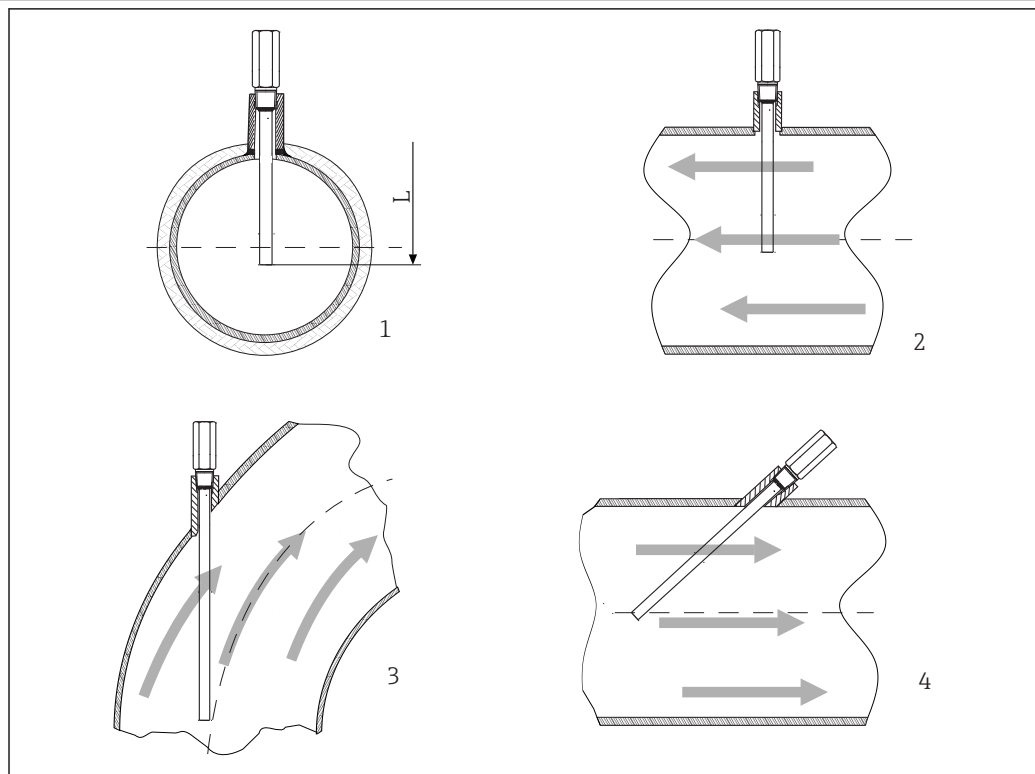
The TA535 is a straight thermowell (1) made from a welded tube. It is perfect to accommodate temperature inserts (2) with a customary diameter of 6 mm (0.25 in). The hexagonal extension is available in several lengths and ends with a female thread (3), enabling the thermowell to be connected to temperature inserts with an adjustable compression fitting, for example, or thermometers with a matching extension neck male thread (4).

## Installation

### Orientation

No restrictions.

### Installation instructions



2 Mounting examples

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The immersion length of the thermometer influences the accuracy. If the immersion length is too small, errors in the measurement are caused by heat conduction via the process connection and the container wall. For installation in a pipe, therefore, the recommended installation depth ideally corresponds to half of the pipe diameter (see 1 and 2). Installation at an angle (see 3 and 4) could be another solution. When determining the immersion length or installation depth all the parameters of the thermometer and of 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 depth = 80 to 100 mm (3.15 to 3.94 in)  
The immersion depth should be at least 8 times the diameter of the thermowell.

## Process

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**Process temperature range**     -200 to +650 °C (-328 to +1 202 °F)

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**Process pressure (static)**     Max. 100 bar (1 450 psi)

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### 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.



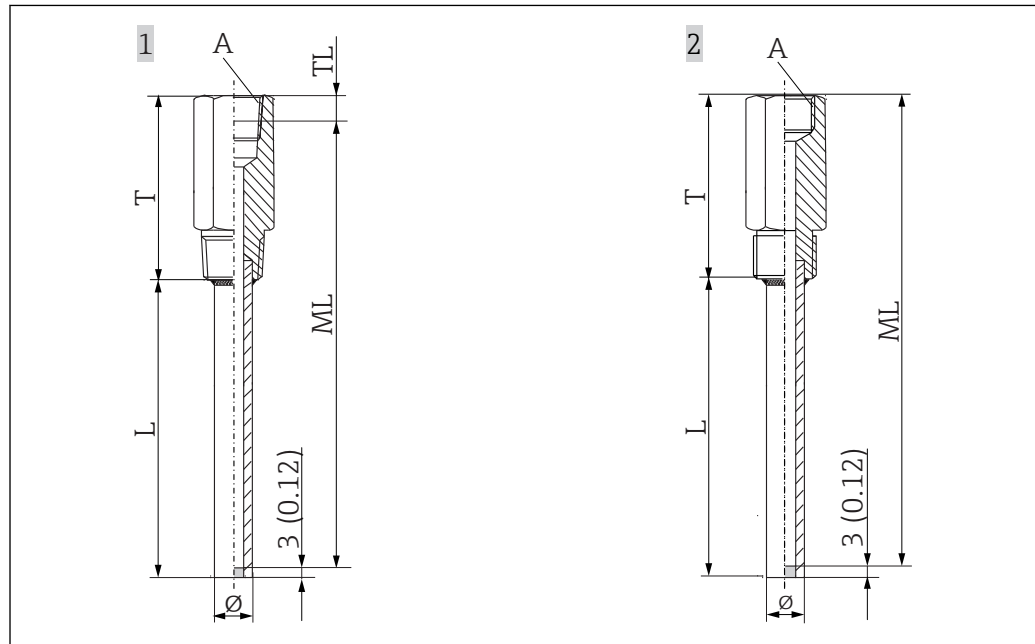
### Thermowell sizing tool

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 protection tubes in the Endress+Hauser Applicator software. See <https://wapps.endress.com/applicator>

## Mechanical construction

### Design, dimensions

All dimensions in mm (in). Surface roughness Ra ≤ 1.6 µm (63 µin)



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- 1 Version with NPT connection thread
- 2 Version with G or M20 connection thread
- A Thermometer connection
- L Immersion length
- ML Insertion length of insert
- T Extension
- TL Screw-in length 8 mm (0.32 in)
- Ø Thermowell outer diameter

Thermometer connection A	Extension T	Immersion length L	Thermowell outer diameter Ø
Thread M20X1.5 Thread NPT ½" Thread G ½"	50 mm (1.97 in) 70 mm (2.76 in) 90 mm (3.54 in) 110 mm (4.33 in) Other values up to a maximum of 500 mm (19.7 in) can be specified separately.	50 to 5000 mm (1.97 to 197 in) 10 to 10000 mm (0.39 to 393.7 in)	<ul style="list-style-type: none"> <li>■ 9 mm (0.35 in) Internal diameter: 6.5 mm (0.26 in)</li> <li>■ 10 mm (0.39 in) Internal diameter: 7 mm (0.28 in)</li> <li>■ 12 mm (0.47 in) Internal diameter: 8 mm (0.32 in)</li> </ul>



For correct temperature measurement, ensure that the tip of the insert touches the bottom of the thermowell. To accurately determine the insertion length of the insert (ML), factor in the type of connection on the thermometer used.

When using Endress+Hauser thermometers, the following lengths apply:

- Omnigrad S TMT162R, TMT162C, TR62, TC62: ML = (L+T) - 8 mm (0.32 in)
- Omnigrad S TR88, TC88: ML = (L+T)

### Weight

Typical values, around 0.2 to 1 kg (0.44 to 2.2 lb) depending on the version and standard length.

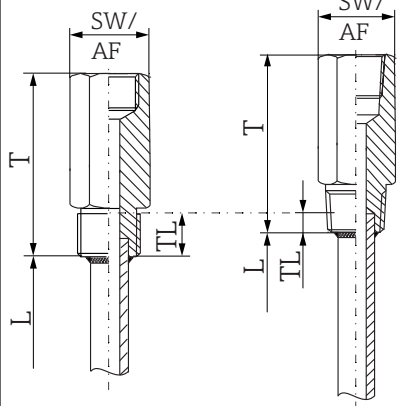
### Material

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 operating temperatures are reduced considerably in some cases where abnormal conditions such as high mechanical load occur or in aggressive media.

Description	Short form	Recommended max. temperature for continuous use in air	Properties
AISI 316L/ 1.4404	X2CrNiMo17-12-2	650 °C (1202 °F)	<ul style="list-style-type: none"> <li>■ Austenitic, stainless steel</li> <li>■ High corrosion resistance in general</li> <li>■ 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)</li> <li>■ Increased resistance to intergranular corrosion and pitting</li> </ul>

**Process connection**

Threaded connection		Version		Screw-in length TL in mm (in)	Width across flats (SW/AF)
Parallel (version M, G)	Conical (version NPT)	M	M20x1.5	20 (0.79)	27
		G	G 1/2"		30
			G 3/4"		
		NPT	NPT 1/2"	8 (0.32)	27
			NPT 3/4"	8.5 (0.33)	

**Seal**

A process connection seal must be used for parallel threads (M20x1.5, G 1/2", G 3/4").

Possible seal sizes:

- M20x1.5: seal 24x20.3x1.5 (copper)
- G 1/2": seal 26x21.3x1.5 (copper)
- G 3/4": seal 32x27.3x2 (copper)

The material of the seal must be resistant to the process medium. The seal is not included in the scope of supply.

## Certificates and approvals

**Material certification**

The material certificate 3.1 (according to standard EN 10204) can be selected directly in the order code. Other material-specific certificates can be requested separately. The "short form" certificate includes a simplified declaration and has no enclosures of documents related to the materials used, but guarantees the traceability of the materials through the identification number of the thermowell. The data related to the origin of the materials can subsequently be requested by the client if necessary.

## Ordering information

Detailed ordering information is available from the following sources:


- In the Product Configurator on the Endress+Hauser website: [www.endress.com](http://www.endress.com) -> Click "Corporate" -> Select your country -> Click "Products" -> Select the product using the filters and search field -> Open product page -> The "Configure" button to the right of the product image opens the Product Configurator.
- From your Endress+Hauser Sales Center: [www.addresses.endress.com](http://www.addresses.endress.com)

### 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	<p>Software for selecting and sizing Endress+Hauser measuring devices:</p> <ul style="list-style-type: none"> <li>▪ Calculation of all the necessary data for identifying the optimum measuring device: e.g. pressure loss, accuracy or process connections.</li> <li>▪ Graphic illustration of the calculation results</li> </ul> <p>Administration, documentation and access to all project-related data and parameters over the entire life cycle of a project.</p> <p>Applicator is available:</p> <ul style="list-style-type: none"> <li>▪ Via the Internet: <a href="https://wapps.endress.com/applicator">https://wapps.endress.com/applicator</a></li> <li>▪ On CD-ROM for local PC installation.</li> </ul>
Konfigurator <sup>+temperature</sup>	<p>Software for selecting and configuring the product depending on the measuring task, supported by graphics. Includes a comprehensive knowledge database and calculation tools:</p> <ul style="list-style-type: none"> <li>▪ For temperature competence</li> <li>▪ Quick and easy design and sizing of temperature measuring points</li> <li>▪ Ideal measuring point design and sizing to suit the processes and needs of a wide range of industries</li> </ul> <p>The Konfigurator is available: On request from your Endress+Hauser sales office on a CD-ROM for local PC installation.</p>
W@M	<p>Life cycle management for your plant</p> <p>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.</p> <p>The application already contains the data of your Endress+Hauser device. Endress+Hauser also takes care of maintaining and updating the data records.</p> <p>W@M is available:</p> <ul style="list-style-type: none"> <li>▪ Via the Internet: <a href="http://www.endress.com/lifecyclemanagement">www.endress.com/lifecyclemanagement</a></li> <li>▪ On CD-ROM for local PC installation.</li> </ul>
FieldCare	<p>FDT-based plant asset management tool from Endress+Hauser.</p> <p>It can configure all smart field units in your system and helps you manage them. By using the status information, it is also a simple but effective way of checking their status and condition.</p> <p> For details, see Operating Instructions BA00027S and BA00059S</p>

## Supplementary documentation

Technical Information:

- RTD thermometer, Omnigrad S field transmitter TMT162R (TI00266T/02)
- TC thermometer, Omnigrad S field transmitter TMT162C (TI00267T/02)
- Omnigrad S: TR62 modular thermometer with resistance insert (RTD), TC62 modular thermometer with thermocouple insert (TC) (TI01024T/09)
- Omnigrad S: TR88 with resistance insert (RTD), TC88 with thermocouple insert (TC) - Extension neck and threaded connection for installation in an existing thermowell (TI01098T/09)

[www.addresses.endress.com](http://www.addresses.endress.com)

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