

# Weld-in thermowell

## For welding sockets

### Model TW20

WIKA data sheet TW 95.20

#### Applications

- Petrochemical industry, on-/offshore, plant construction
- For high process loads

#### Special features

- Different dimensions for standardised welding sockets
- International standard
- Possible thermowell designs:
  - Design TW20-A: Tapered
  - Design TW20-B: Straight
  - Design TW20-C: Stepped



Weld-in thermowell, design TW20-A

#### Description

Each thermowell/protection tube is an important component of any temperature measuring location. It is used to separate the process from the surrounding area, thus protecting the environment and operating personnel and keeps aggressive media, high pressures and flow rates from the temperature probe itself and thereby enables the thermometer to be exchanged during operation.

Based on the almost limitless application possibilities, there are a large number of variants, such as thermowell designs or materials. The type of process connection and the basic method of manufacture are important design differentiation criteria. A basic differentiation can be made between threaded and weld-in thermowells/protection tubes, and those with flange connections.

Furthermore, one can differentiate between protection tubes and thermowells. Protection tubes are constructed from a tube, that is closed at the tip by a welded solid tip. Thermowells are manufactured from solid bar stock.

The TW20 series of weld-in thermowells are suitable for use with numerous electrical and mechanical thermometers from WIKA.

Due to the heavy-duty design, these international design thermowells are the first choice for use in the chemical and petrochemical industries and in plant construction.

# Specifications

Basic information	
<b>Thermowell form</b>	
Design TW20-A	Tapered
Design TW20-B	Straight
Design TW20-C	Stepped
<b>Material (wetted)</b>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Stainless steel 316/316L</li> <li><input checked="" type="checkbox"/> Stainless steel 304/304L</li> <li><input checked="" type="checkbox"/> A105</li> <li><input checked="" type="checkbox"/> Stainless steel 1.4571</li> <li><input checked="" type="checkbox"/> Special materials</li> </ul> <p>→ Other materials on request</p>

Process connection	
<b>Type of process connection</b>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Ø 26.7 mm [3/4 in]</li> <li><input checked="" type="checkbox"/> Ø 33.4 mm [1 in]</li> <li><input checked="" type="checkbox"/> Ø 48.3 mm [1.5 in]</li> </ul> <p>→ Other diameters on request</p>
<b>Connection to thermometer</b>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> 1/2 NPT female thread</li> <li><input checked="" type="checkbox"/> G 1/2 female thread</li> </ul> <p>→ Other threads on request</p>
<b>Bore size</b>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Ø 6.6 mm [0.260 in]</li> <li><input checked="" type="checkbox"/> Ø 8.5 mm [0.355 in]</li> </ul>
<b>Insertion length U</b>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> 100 mm [2.5 in]</li> <li><input checked="" type="checkbox"/> 150 mm [5.9 in]</li> <li><input checked="" type="checkbox"/> 200 mm [7.87 in]</li> <li><input checked="" type="checkbox"/> 250 mm [9.84 in]</li> <li><input checked="" type="checkbox"/> 300 mm [11.81 in]</li> <li><input checked="" type="checkbox"/> 350 mm [13.78 in]</li> <li><input checked="" type="checkbox"/> 400 mm [15.75 in]</li> </ul> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> 6 in [152 mm]</li> <li><input checked="" type="checkbox"/> 7 in [178 mm]</li> <li><input checked="" type="checkbox"/> 10 in [254 mm]</li> <li><input checked="" type="checkbox"/> 13 in [330 mm]</li> <li><input checked="" type="checkbox"/> 16 in [406 mm]</li> </ul> <p>→ Other insertion lengths on request</p>
Min. insertion length	Depending on the selected version
Max. insertion length <sup>1)</sup>	800 mm [31.5 in]
<b>Connection length H</b>	45 mm [1.75 in]
Min. Connection length	Depending on the selected version
Max. Connection length	250 mm [10 in]
<b>Tip thickness</b>	<ul style="list-style-type: none"> <li>6.4 mm [0.25 in]</li> </ul> <p>→ Other tip thicknesses on request</p>
<b>Suitable stem lengths <math>l_1</math> (dial thermometer) with tip thickness 6.4 mm [0.25 in]</b>	
Connection design S, 4, 4.1, 5, 6.1, 6.2, 6.3 and 7	<ul style="list-style-type: none"> <li>Parallel thread</li> </ul> $l_1 = U + H - 10 \text{ mm [0.4 in]}$
	<ul style="list-style-type: none"> <li>Tapered thread</li> </ul> $l_1 = U + H - 2 \text{ mm [0.08 in]}$
Connection design 2	$l_1 = U + H - 30 \text{ mm [1.2 in]}$

1) Longer insertion lengths in one-piece design are dependent on the geometry and material, and are possible up to 1575 mm (62 in) on request. Basically, from an insertion length of 800 mm (31.5 in), a multi-part assembly in accordance with IN 00.16 is carried out, unless otherwise requested. A wake frequency calculation in accordance with ASME PTC 19.3 TW-2016 requires compliance with the requirements of the above-mentioned standard.

Operating conditions	
<b>Max. process temperature, process pressure</b>	<p>Depending on:</p> <ul style="list-style-type: none"> <li>■ Thermowell design <ul style="list-style-type: none"> <li>- Dimensions</li> <li>- Material</li> </ul> </li> <li>■ Process conditions <ul style="list-style-type: none"> <li>- Flow rate</li> <li>- Medium density</li> </ul> </li> </ul>
<b>Wake frequency calculation (option)</b>	<p>The calculation in accordance with ASME PTC 19.3 TW-2016 of individual thermowells minimises the risk of dynamic damage that can be caused by the vortex shedding of a Kármán vortex street (Vortex Induced Vibration; VIV). In addition, the static loads due to lateral flow and the process pressure are calculated depending on the temperature.</p> <p>The calculation can be carried out independently using an online tool or as a WIKA engineered service (subject to charges).</p> <p>→ For further information, see Technical information IN 00.15 "Wake frequency calculation".</p>

## Certificates (option)

### Certificates

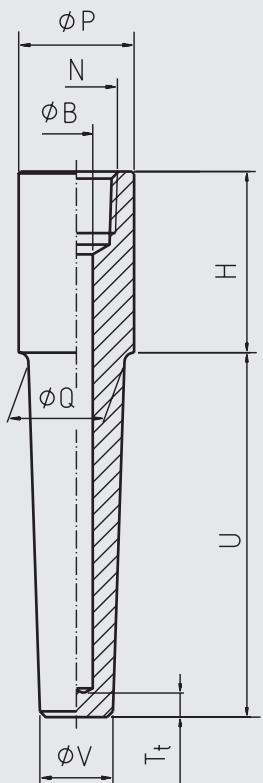
#### Certificates

- 2.2 test report
- 3.1 inspection certificate

Approvals and certificates, see website

## Dimensions in mm [in]

### Design TW20-A



3109962.02

#### Legend:

Ø P	Welding diameter
N	Connection to thermometer
U	Insertion length
H	Connection length
Ø B	Bore size
Ø Q	Root diameter
Ø V	Tip diameter
T <sub>t</sub>	Tip thickness (6.4 mm [0.25 in])

## Tapered thermowell form

Dimensions in mm [in]					Weight in kg [lbs] (for H = 45 mm [1.771 in])	
Ø P	N	Ø Q	Ø V	Ø B	U = 100 mm [3.937 in]	U = 560 mm [22.047 in]
26.7 [3/4]	■ 1/2 NPT ■ G 1/2	19 [0.750]	16 [0.625]	■ 6.6 [0.260] ■ 8.5 [0.355]	0.4 [0.882]	1.1 [2.425]
33.4 [1]	■ 1/2 NPT ■ G 1/2	25 [1.000]	19 [0.750]	■ 6.6 [0.260] ■ 8.5 [0.355]	0.6 [1.322]	1.9 [4.188]
48.3 [1.5]	■ 1/2 NPT ■ G 1/2	38 [1.496]	19 [0.750]	■ 6.6 [0.260] ■ 8.5 [0.355]	1.2 [2.646]	3.5 [7.716]

## Ordering information

Model / Thermowell form / Welding diameter Ø P / Connection to thermometer / Insertion length U / Connection length H / Thermowell material / Bore size Ø B / Root diameter Ø Q / Tip diameter Ø V / Assembly with thermometer / Certificates / Options

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