

# Thermowell with flange Model TW10

WIKA data sheet TW 95.10

## Applications

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

## Special features

- Heavy-duty design
- Coating for corrosive or abrasive process loads
- Possible thermowell forms: tapered, straight, stepped
- Design TW10-F: Full penetration weld version  
Design TW10-P, TW10-R: With double weld seam  
Design TW10-S, TW10-B: Screw-welded design



Thermowell with flange, model TW10

## Description

Each thermowell/protection tube is an important component of any temperature measuring point. 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 sensor 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/protection tube 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 barstock.

The TW10 series of thermowells with flange connection 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>	<ul style="list-style-type: none"> <li>■ Tapered</li> <li>■ Straight</li> <li>■ Stepped</li> </ul>
<b>Versions</b>	
Design TW10-F	Full penetration weld version
Design TW10-P	With double weld seam (weld seam strength 3 mm)
Design TW10-R	With double weld seam (weld seam strength 6 mm)
Design TW10-S	Screw-welded design, weld seam does not come into direct contact with the medium
Design TW10-B	Screw-welded design, additional weld seam on the process side (sealing joint)
<b>Material (wetted)</b>	<ul style="list-style-type: none"> <li>■ Stainless steel 304/304L</li> <li>■ Stainless steel 316/316L</li> <li>■ Stainless steel 1.4571</li> <li>■ Stainless steel 1.4404</li> <li>■ A105</li> <li>■ Alloy C4</li> <li>■ Alloy C276</li> <li>■ Alloy 400</li> <li>■ Titanium grade 2 <sup>1)</sup></li> <li>■ Tantalum sheet for wetted parts</li> </ul> <p>Other materials on request</p>
<b>Coating</b>	
Hardfacing for abrasive process loads with Stellite® 6	<ul style="list-style-type: none"> <li>■ Laser cladding Layer thickness 1.6 mm [0.062 in] (standard) Higher layer thickness on request</li> <li>■ Plasma Transfer Arc (PTA) Layer thickness 1.6 mm [0.062 in] (standard) up to 3.2 mm [0.125 in]</li> <li>■ Air Plasma Spraying (APS) Layer thickness max. 1.6 mm [0.062 in]</li> <li>■ High Velocity Oxide Fuel (HVOF) Layer thickness 0.5 mm [0.02 in]</li> </ul>
Corrosion protection for high chemical loads	<ul style="list-style-type: none"> <li>■ PFA Layer thickness min. 0.4 mm [0.015 in] (standard) or min. 0.6 mm [0.024 in] (special design)</li> <li>■ ECTFE (Halar®) Layer thickness min. 0.6 mm [0.024 in]</li> </ul> <p>Other resistant coatings on request</p>

1) For titanium grade 2 material in a washer disc construction, the blind flange is designed to be removable.

Stellite® is a registered trademark of the company Kennametal Stellite.  
Halar® ECTFE is a registered trademark of the company Solvay Solexis.

## Examples for coatings

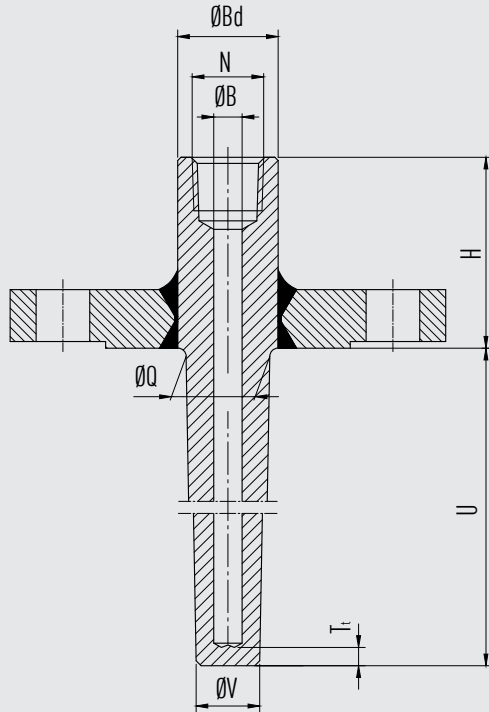


Process connection					
<b>Type of process connection</b>	<ul style="list-style-type: none"> <li>■ Flange per ASME B16.5</li> <li>■ Flange per EN 1092-1</li> <li>■ Flange per DIN 2527</li> </ul>				
	Other flanges on request				
<b>Connection to thermometer</b>	<ul style="list-style-type: none"> <li>■ ½ NPT female thread</li> <li>■ G ½ female thread</li> <li>■ M20 x 1.5</li> </ul>				
	Other dimensions on request				
<b>Bore size B</b>	<ul style="list-style-type: none"> <li>■ 6.2 mm [0.244 in]</li> <li>■ 6.6 mm [0.260 in]</li> <li>■ 7.0 mm [0.276 in]</li> <li>■ 8.2 mm [0.323 in]</li> <li>■ 8.5 mm [0.355 in]</li> <li>■ 9.0 mm [0.354 in]</li> <li>■ 9.8 mm [0.385 in]</li> <li>■ 10.2 mm [0.402 in]</li> <li>■ 12.2 mm [0.480 in]</li> </ul>				
	Other dimensions on request				
<b>Insertion length U</b>	13 ... 1,575 mm [0.5 ... 62 in]				
<b>Connection length H</b>	<ul style="list-style-type: none"> <li>■ 57 mm [2.25 in]</li> <li>■ 83 mm [3.25 in]</li> </ul>				
	Other connection lengths on request				
<b>Tip thickness</b>	6.4 mm [0.25 in]				
	Other tip thicknesses on request				
<b>Suitable stem lengths <math>l_1</math> (dial thermometer) with tip thickness 6.4 mm [0.25 in]</b>					
Connection design S, 4 or 5	$l_1 = U + H - 10 \text{ mm [0.4 in]}$				
Connection design 2	$l_1 = U + H - 30 \text{ mm [1.2 in]}$				
<b>Sealing face roughness</b>	<b>Version</b>	<b>AARRH in <math>\mu\text{inch}</math></b>	<b>Ra in <math>\mu\text{m}</math></b>	<b>Rz in <math>\mu\text{m}</math></b>	
	ASME B16.5	Stock finish	125 ... 250	3.2 ... 6.3	-
		Smooth finish	< 125	< 3.2	-
		RTJ	< 63	< 1.6	-
		Tongue/groove	< 125	< 3.2	-
EN 1092-1	Form B1	-	3.2 ... 12.5	12.5 ... 50	
	Form B2	-	0.8 ... 3.2	3.2 ... 12.5	
DIN 2527	Form C	-	-	40 ... 160	
	Form E	-	-	< 16	

Operating conditions	
<b>Max. process temperature, process pressure</b>	Depending on: <ul style="list-style-type: none"> <li>■ Thermowell design               <ul style="list-style-type: none"> <li>- Dimensions</li> <li>- Material</li> <li>- Coating</li> <li>- Flange pressure rating</li> </ul> </li> <li>■ Process conditions               <ul style="list-style-type: none"> <li>- Flow rate</li> <li>- Density of medium</li> </ul> </li> </ul>
<b>Wake frequency calculation (option)</b>	Per ASME PTC 19.3 TW-2016 recommended in critical applications as a WIKA engineering service
	→ For further information see Technical information IN 00.15 "Wake frequency calculation".

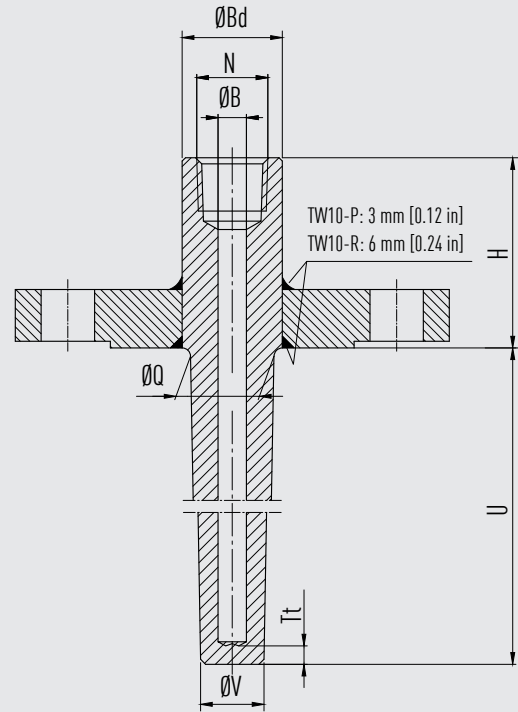
# Dimensions in mm [in]

**Design TW10-F**



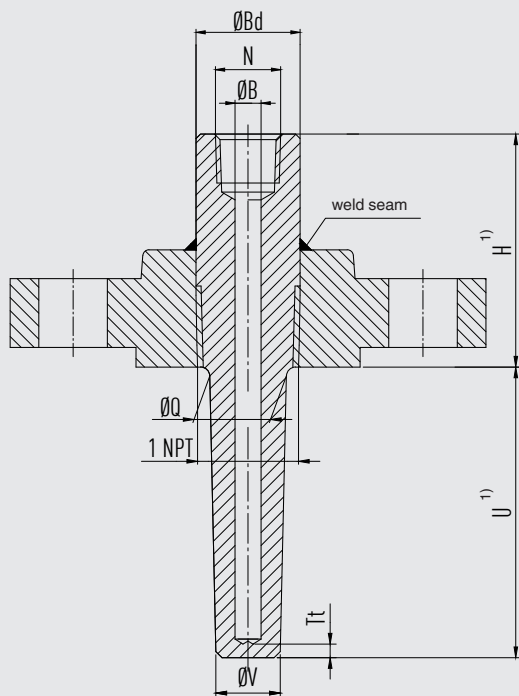
3111923.01

**Design TW10-P, TW10-R**



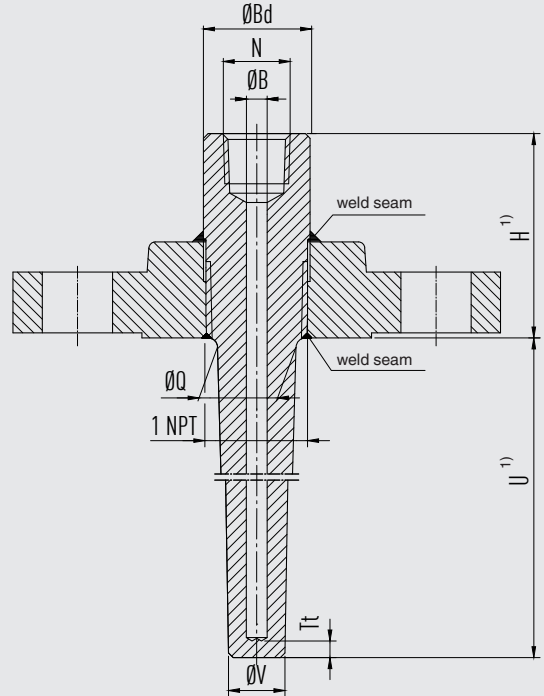
14364895.01

**Design TW10-S**



14366057.01

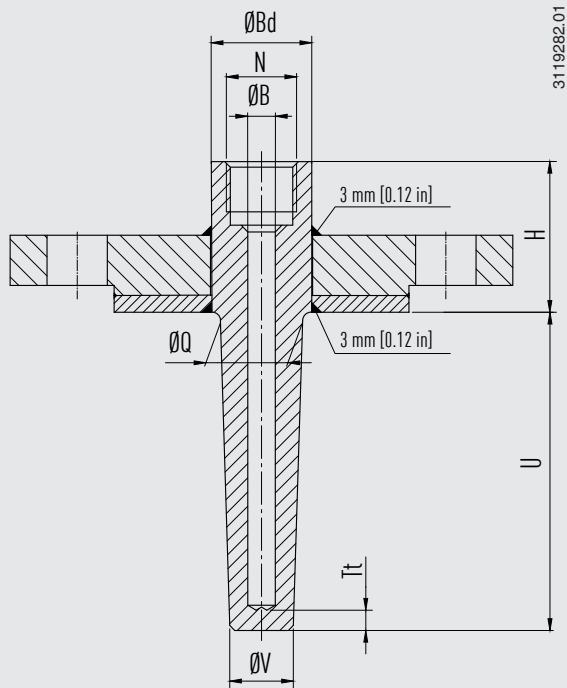
**Design TW10-B**



14365203.01

1) For technical reasons around the 1 NPT thread, the connection length, H, and also the insertion length, U, can move with a tolerance of  $\pm 5$  mm [ $\pm 0.02$  in] to the specified nominal dimension.  
A flush connection of the thread with the flange sealing face can therefore not be guaranteed.

### Design TW10-P in washer disc construction



**Legend:**

- H Connection length
- U Insertion length
- N Connection to thermometer
- Ø B Bore size
- Ø Q Root diameter
- Ø V Tip diameter
- Ø Bd Bar diameter (depending on selected root diameter or customer specification)
- Tt Tip thickness (6.4 mm [0.25 in])

### ASME flanges, tapered thermowell form

DN	PN in lbs	Dimensions in mm [in]			Weight in kg [lbs] (approx.)		
		H	Ø Q	Ø V	U = 4"	U = 13"	U = 22"
1"	150	approx. 57 [2 ¼]	22 [0.875]	16 [0.625]	1.4 [3.086]	1.9 [4.188]	2.3 [5.070]
	300	approx. 57 [2 ¼]	22 [0.875]	16 [0.625]	2.1 [4.629]	2.6 [5.732]	3.0 [6.613]
	600	approx. 57 [2 ¼]	22 [0.875]	16 [0.625]	2.3 [5.070]	2.8 [6.172]	3.2 [7.054]
	1,500	approx. 83 [3 ¼]	22 [0.875]	16 [0.625]	4.3 [9.479]	4.8 [10.582]	5.2 [11.464]
	2,500	approx. 83 [3 ¼]	22 [0.875]	16 [0.625]	5.6 [12.345]	6.1 [13.448]	6.5 [14.330]
1 ½"	150	approx. 57 [2 ¼]	25 [1.000]	19 [0.750]	1.8 [3.968]	2.4 [5.291]	3.0 [6.613]
	300	approx. 57 [2 ¼]	25 [1.000]	19 [0.750]	3.3 [7.275]	3.9 [8.598]	4.5 [9.920]
	600	approx. 57 [2 ¼]	25 [1.000]	19 [0.750]	4.0 [8.818]	4.7 [10.361]	5.3 [11.684]
	1,500	approx. 83 [3 ¼]	25 [1.000]	19 [0.750]	6.4 [14.109]	7.1 [15.652]	7.7 [16.975]
	2,500	approx. 83 [3 ¼]	25 [1.000]	19 [0.750]	12.0 [26.455]	12.6 [27.778]	13.3 [29.321]
2"	150	approx. 57 [2 ¼]	25 [1.000]	19 [0.750]	2.5 [5.511]	3.1 [6.834]	3.7 [8.157]
	300	approx. 57 [2 ¼]	25 [1.000]	19 [0.750]	3.7 [8.157]	4.3 [9.479]	4.9 [10.802]
	600	approx. 57 [2 ¼]	25 [1.000]	19 [0.750]	4.2 [9.259]	4.9 [10.802]	5.5 [12.125]
	1,500	approx. 83 [3 ¼]	25 [1.000]	19 [0.750]	11.0 [24.250]	11.6 [25.573]	12.3 [27.116]
	2,500	approx. 108 [4 ¼]	25 [1.000]	19 [0.750]	17.0 [37.478]	17.6 [38.801]	18.3 [40.344]

## EN and DIN flanges, tapered thermowell form - only for design TW10-P and TW10-R

(only for welding version with weld seam, 3 mm [0.12"] or 6 mm [0.24"] on both sides)

DN	PN in bar	Dimensions in mm [in]			Weight in kg [lbs] (approx.)	
		H	Ø Q	Ø V	U = 160 mm	U = 500 mm
25	40	45 [1.771]	22 [0.875]	16 [0.625]	1.9 [4.188]	2.6 [5.732]
	63/64	45 [1.771]	22 [0.875]	16 [0.625]	3.2 [7.054]	3.9 [8.598]
	100	45 [1.771]	22 [0.875]	16 [0.625]	3.2 [7.054]	3.9 [8.598]
40	40	45 [1.771]	25 [1.000]	19 [0.750]	3.1 [6.834]	4.0 [8.818]
	63/64	45 [1.771]	25 [1.000]	19 [0.750]	4.8 [10.582]	5.7 [12.566]
	100	45 [1.771]	25 [1.000]	19 [0.750]	4.8 [10.582]	5.7 [12.566]
50	40	45 [1.771]	25 [1.000]	19 [0.750]	3.9 [8.598]	4.8 [10.582]
	63/64	45 [1.771]	25 [1.000]	19 [0.750]	5.2 [11.464]	6.1 [13.448]
	100	45 [1.771]	25 [1.000]	19 [0.750]	6.6 [14.550]	7.5 [16.534]
80	40	60 [2.362]	25 [1.000]	19 [0.750]	6.6 [14.550]	7.5 [16.534]
	63/64	60 [2.362]	25 [1.000]	19 [0.750]	7.6 [16.755]	8.5 [18.739]
	100	60 [2.362]	25 [1.000]	19 [0.750]	10.2 [22.487]	11.1 [24.471]
100	40	60 [2.362]	25 [1.000]	19 [0.750]	8.3 [18.298]	9.2 [20.282]
	63/64	60 [2.362]	25 [1.000]	19 [0.750]	10.9 [24.030]	11.8 [26.014]
	100	60 [2.362]	25 [1.000]	19 [0.750]	15.0 [33.069]	15.9 [35.053]

### Ordering information

Model / Thermowell form / Thermowell material / Flange material / Head diameter / Connection to the thermometer / Bore Ø B / Nominal diameter DN / Pressure rating PN / Sealing face / Wall thickness of flange nozzle / Insertion length U / Connection length H / Coating / Assembly with thermometer / Certificates / Options

© 04/2008 WIKA Alexander Wiegand SE & Co. KG, all rights reserved.  
The specifications given in this document represent the state of engineering at the time of publishing.  
We reserve the right to make modifications to the specifications and materials.

