

# Thermowell with threaded flange (solid-machined)

## Screwed and welded design

### Models TW10-S, TW10-B

WIKA data sheet TW 95.11

#### Applications

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

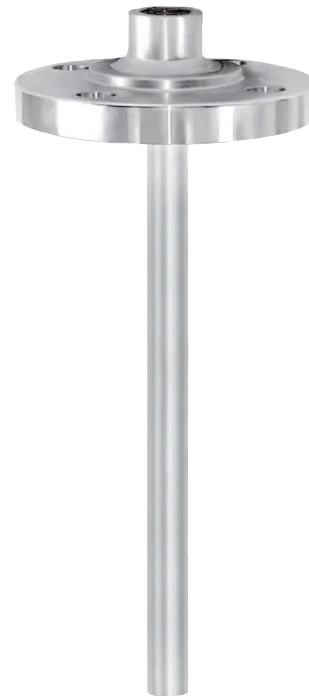
#### Special features

- Connection between flange and thermowell in thread-welded design
- Model TW10-S: No directly wetted welded joints (standard)
- Model TW10-B: Additional weld seam on the process side (sealing joint)
- Coating for corrosive or abrasive process loads
- Possible thermowell forms:
  - tapered, straight or stepped
  - "Quill Tip" version (with open tip)

#### Description

Each thermowell is an important component of any temperature measurement 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 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, and those with flange connections.



Thermowell with threaded flange, model TW10-S

Furthermore, one can differentiate between fabricated and solid-machined thermowells. Fabricated thermowells are constructed from a tube, that is closed at the tip by a welded solid tip. Solid-machined thermowells are manufactured from barstock.

The TW10 series of solid-machined 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 the chemical and petrochemical industries and in plant construction.

## Standard version

### Thermowell material

Stainless steel 304/304L, 316/316L, 1.4571  
A105, special materials

### Flange

Threaded flange to ASME B16.5

### Connection to thermometer

½ NPT, G ½ female  
"Quill Tip" version with weld-in connection ½" and ¾"

### Bore size

Ø 6.6 mm, Ø 8.5 mm

### Insertion length U

To customer specification

### Connection length H

57, 83, 102 mm (standard)  
Others on request

### Coating

Hardfacing for abrasive process loads with Stellite® 6:

- High Velocity Oxide Fuel (HVOF)  
Thickness 0.5 mm
- Plasma Transfer Arc (PTA)  
Thickness 1.6 mm (standard) up to 3.2 mm
- Laser cladding  
Thickness 1.6 mm (standard)  
higher thickness on request
- Air Plasma Spraying (APS)  
Thickness max. 1.6 mm

Corrosion protection for high chemical loads:

- PFA  
Thickness min. 0.4 mm (standard) or  
min. 0.6 mm (special design)
- ECTFE (Halar®)  
Thickness min. 0.6 mm

Other resistant coatings on request

### Max. process temperature, process pressure

Depending on

- Thermowell design
  - Dimensions
  - Material
  - Coating
  - Flange pressure rating
- Process conditions
  - Flow rate
  - Density of medium

## Options

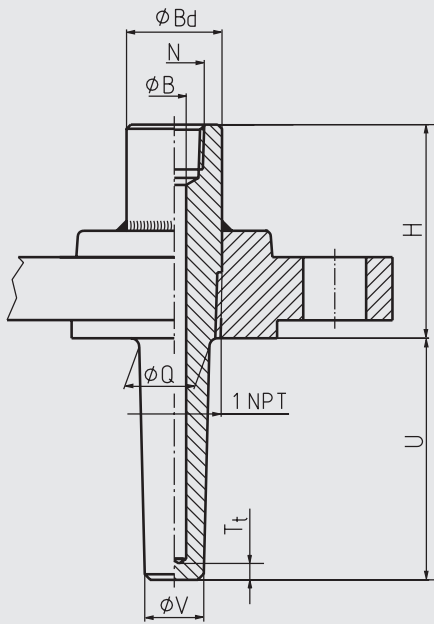
- Other flanges, dimensions and materials
- "Quill Tip" version
- Tantalum coating for wetted parts (insertion length U + max. 3 mm)
- Quality certificates
- Wake frequency calculation to ASME PTC 19.3 TW-2016 is recommended in critical applications as a WIKA engineering service

For further information see Technical information IN 00.15 "Wake frequency calculation".

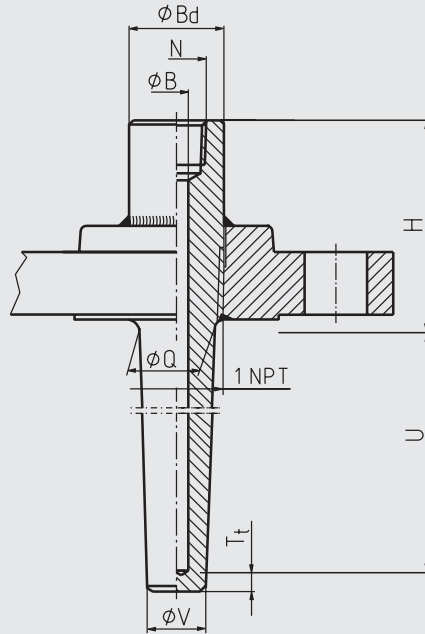
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# Dimensions in mm

**Model TW10-S-A**



**Model TW10-B-A**



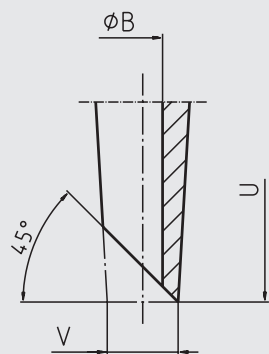
- Legend:
- H Connection length <sup>1)</sup>
  - U Insertion length <sup>1)</sup>
  - N Connection to thermometer
  - Ø B Bore size
  - Ø Q Root diameter
  - Ø V Tip diameter
  - Ø Bd Head diameter
  - T<sub>t</sub> Tip thickness (6.5 mm)

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 ±5 mm to the specified nominal dimension. A flush connection of the thread with the flange sealing face can therefore not be guaranteed.

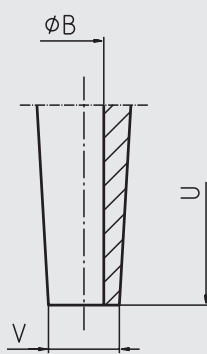
DN	PN in lbs	Dimensions in mm					Weight in kg		
		H	Ø Q	Ø V	Ø B	Ø Bd	U = 4"	U = 13"	U = 22"
1"	150	2 ¼" (approx. 57 mm)	22	16	6.6 or 8.5	34	1.4	1.9	2.3
	300	2 ¼" (approx. 57 mm)	22	16	6.6 or 8.5	34	2.1	2.6	3.0
	600	2 ¼" (approx. 57 mm)	22	16	6.6 or 8.5	34	2.3	2.8	3.2
	1,500	3 ¼" (approx. 83 mm)	22	16	6.6 or 8.5	34	4.3	4.8	5.2
	2,500	3 ¼" (approx. 83 mm)	22	16	6.6 or 8.5	34	5.6	6.1	6.5
1 ½"	150	2 ¼" (approx. 57 mm)	25	19	6.6 or 8.5	34	2.0	2.6	3.2
	300	2 ¼" (approx. 57 mm)	25	19	6.6 or 8.5	34	3.3	3.9	4.5
	600	3 ¼" (approx. 83 mm)	25	19	6.6 or 8.5	34	4.0	4.7	5.3
	1,500	3 ¼" (approx. 83 mm)	25	19	6.6 or 8.5	34	6.4	7.1	7.7
	2,500	4" (approx. 102 mm)	25	19	6.6 or 8.5	34	12.0	12.6	13.3
2"	150	2 ¼" (approx. 57 mm)	25	19	6.6 or 8.5	34	2.8	3.4	4.0
	300	2 ¼" (approx. 57 mm)	25	19	6.6 or 8.5	34	3.7	4.3	4.9
	600	3 ¼" (approx. 83 mm)	25	19	6.6 or 8.5	34	4.6	5.3	5.9
	1,500	4" (approx. 102 mm)	25	19	6.6 or 8.5	34	11.0	11.6	12.3
	2,500	4 ¼" (approx. 108 mm)	25	19	6.6 or 8.5	34	17.0	17.6	18.3
2 ½"	150	2 ¼" (approx. 57 mm)	25	19	6.6 or 8.5	34	4.0	4.6	5.2
	300	3 ¼" (approx. 83 mm)	25	19	6.6 or 8.5	34	5.2	5.9	6.5
	600	3 ¼" (approx. 83 mm)	25	19	6.6 or 8.5	34	6.3	7.0	7.6
	1,500	4" (approx. 102 mm)	25	19	6.6 or 8.5	34	15.0	15.6	16.3
	2,500	4 ¼" (approx. 108 mm)	25	19	6.6 or 8.5	34	23.1	23.7	24.4

## “Quill Tip” version

Standard



Option: straight



11536128.01

## Suitable stem lengths (dial thermometers)

Connection type	Stem length $l_1$
S, 4, 5	$l_1 = U + H - 10 \text{ mm}$
2	$l_1 = U + H - 30 \text{ mm}$

## Sealing face roughness

Flange standard		AARH in $\mu\text{inch}$	Ra in $\mu\text{m}$	Rz in $\mu\text{m}$
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

## Examples for coatings

**Hardfacing:**  
Laser cladding (thermowell stem)



**Hardfacing:**  
Air Plasma Spraying (APS)  
(thermowell stem)



**Corrosion protection:**  
PFA (wetted parts)



### Ordering information

Model / Thermowell form / Nominal diameter DN / Pressure rating PN / Sealing face / Connection to thermometer / Wall thickness of flange nozzle / Insertion length U / Connection length H / Flange material / Thermowell material / Head diameter / Bore diameter  $\varnothing$  B / Root diameter  $\varnothing$  Q / Tip diameter  $\varnothing$  V / Assembly with thermometer / Certificates / Options

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