

# Thermowell with flange (solid-machined) Model TW10-F, full penetration weld design Models TW10-P and TW10-R, with double fillet weld

WIKA data sheet TW 95.10

## Applications

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

## Special features

- Heavy-duty design
- Model TW10-F: Full penetration weld version  
Model TW10-P: With double fillet weld  
weld seam strength  $a = 3 \text{ mm}$   
Model TW10-R: With double fillet weld  
weld seam strength  $a = 6 \text{ mm}$
- Coating for corrosive or abrasive process loads
- Possible thermowell forms:
  - tapered, straight or stepped
  - "Quill Tip" version (with open tip)
- Welding process test to ASME Sec. IX



Thermowell with flange, model TW10

## 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.

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 in the chemical and petrochemical industries and in plant construction.

## Standard version

### Thermowell material

Stainless steel 304/304L, 316/316L, A105, 1.4571, 1.4404, special materials

### Flange

Blind flange per ASME, EN 1092-1, DIN 2527

### 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 and 83 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

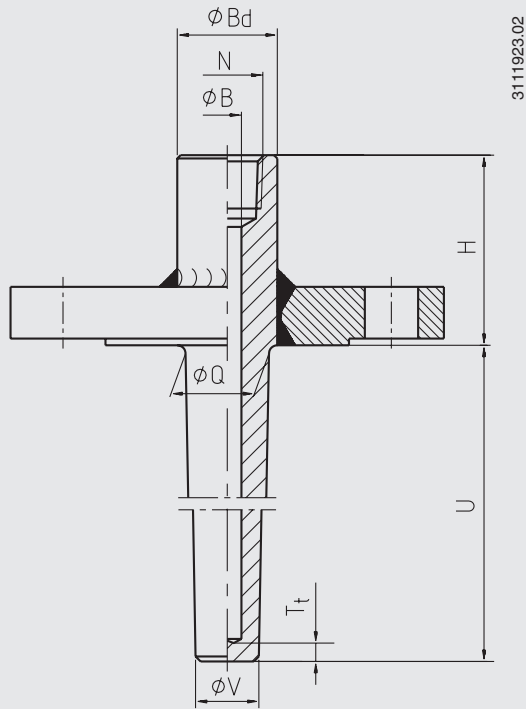
- Other flanges, dimensions and materials
- “Quill Tip” version
- Tantalum coating for wetted parts (insertion length U + max. 3 mm)
- Quality certificates
- Wake frequency calculation to ASME PTC 19.3 TW-2016 is recommended in critical applications as a WIKA engineering service

For further information see Technical information IN 00.15 “Wake frequency calculation”.

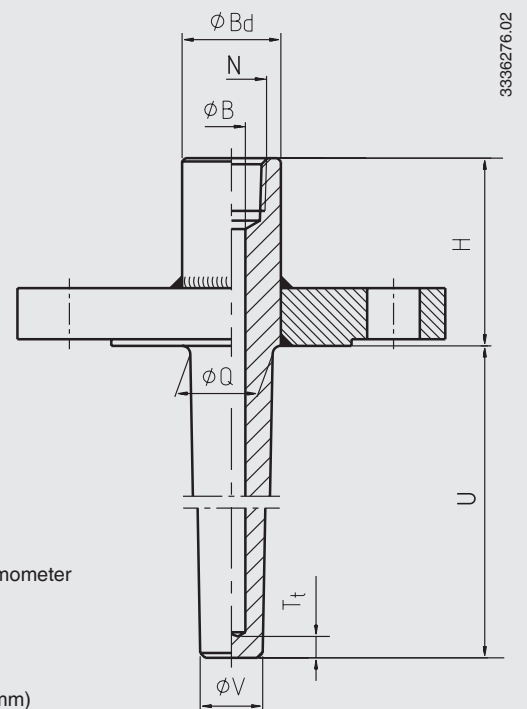
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# Dimensions in mm

**Model TW10-F**



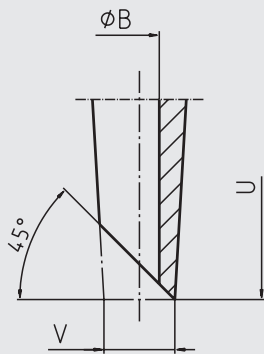
**Models TW10-P, TW10-R**



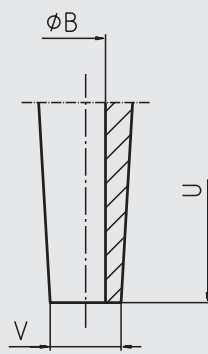
- Legend:
- H Connection length
  - U Insertion length
  - N Connection to thermometer
  - $\phi B$  Bore size
  - $\phi Q$  Root diameter
  - $\phi V$  Tip diameter
  - $\phi B_d$  Head diameter:
  - $T_t$  Tip thickness (6.5 mm)

**“Quill Tip” version**

Standard



Option: straight



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### ASME flanges, tapered thermowell form

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	30	1.4	1.9	2.3
	300	2 ¼" (approx. 57 mm)	22	16	6.6 or 8.5	30	2.1	2.6	3.0
	600	2 ¼" (approx. 57 mm)	22	16	6.6 or 8.5	30	2.3	2.8	3.2
	1,500	3 ¼" (approx. 83 mm)	22	16	6.6 or 8.5	30	4.3	4.8	5.2
1 ½"	150	2 ¼" (approx. 57 mm)	25	19	6.6 or 8.5	30	1.8	2.4	3.0
	300	2 ¼" (approx. 57 mm)	25	19	6.6 or 8.5	30	3.3	3.9	4.5
	600	2 ¼" (approx. 57 mm)	25	19	6.6 or 8.5	30	4.0	4.7	5.3
	1,500	3 ¼" (approx. 83 mm)	25	19	6.6 or 8.5	30	6.4	7.1	7.7
2"	150	2 ¼" (approx. 57 mm)	25	19	6.6 or 8.5	30	2.5	3.1	3.7
	300	2 ¼" (approx. 57 mm)	25	19	6.6 or 8.5	30	3.7	4.3	4.9
	600	2 ¼" (approx. 57 mm)	25	19	6.6 or 8.5	30	4.2	4.9	5.5
	1,500	3 ¼" (approx. 83 mm)	25	19	6.6 or 8.5	30	11.0	11.6	12.3

### EN and DIN flanges, tapered thermowell form

(only for welding version with fillet weld, a = 3 or 6 mm on both sides)

DN	PN in bar	Dimensions in mm					Weight in kg	
		H	Ø Q	Ø V	Ø B	Ø Bd	U = 160 mm	U = 500 mm
25	40	45	22	16	6.2 ... 10.2	30	1.9	2.6
	63/64	45	22	16	6.2 ... 10.2	30	3.2	3.9
	100	45	22	16	6.2 ... 10.2	30	3.2	3.9
40	40	45	25	19	6.2 ... 10.2	30	3.1	4.0
	63/64	45	25	19	6.2 ... 10.2	30	4.8	5.7
	100	45	25	19	6.2 ... 10.2	30	4.8	5.7
50	40	45	25	19	6.2 ... 10.2	30	3.9	4.8
	63/64	45	25	19	6.2 ... 10.2	30	5.2	6.1
	100	45	25	19	6.2 ... 10.2	30	6.6	7.5
80	40	60	25	19	6.2 ... 10.2	30	6.6	7.5
	63/64	60	25	19	6.2 ... 10.2	30	7.6	8.5
	100	60	25	19	6.2 ... 10.2	30	10.2	11.1
100	40	60	25	19	6.2 ... 10.2	30	8.3	9.2
	63/64	60	25	19	6.2 ... 10.2	30	10.9	11.8
	100	60	25	19	6.2 ... 10.2	30	15.0	15.9

### 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 µinch	Ra in µm	Rz in µm
<b>ASME B16.5</b>	Stock finish	125 ... 250	3.2 ... 6.3	-
	Smooth finish	< 125	< 3.2	-
	RTJ	< 63	< 1.6	-
	Tongue/groove	< 125	< 3.2	-
<b>EN 1092-1</b>	Form B1	-	3.2 ... 12.5	12.5 ... 50
	Form B2	-	0.8 ... 3.2	3.2 ... 12.5
<b>DIN 2527</b>	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 / Thermowell material / Flange material / Head diameter / Connection to the thermometer / Bore ØB / 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

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