THERMOWELLS
CONSTRUCTION FROM BARSTOCK OR FABRICATED

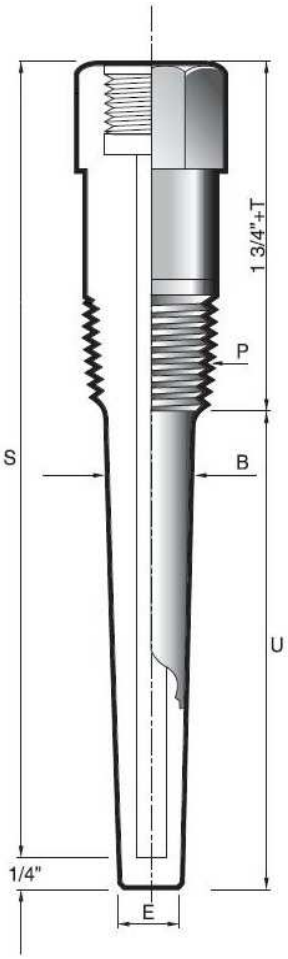
A thermowell is a thermally conductive socket recommended to:

- **Protect the delicate instrument sensing elements against corrosive effects.**
- **Permit instrument interchange or calibration check without disturbing or closing down the process.**

Thermowells are available for high pressures, high temperatures and high velocity applications. Selected on the basis of pressure, temperature, flow, vibration and corrosion service parameters.

ATEX approvals available under our PCI TEMA brand.

DESCRIPTION



F - THE INSTRUMENT CONNECTION
It is usually a female thread axially aligned with the bore into which the instrument mounting threads or capillary bushing is screwed but other connections can also be supplied.

BORE
It is the inside cylindrical diameter of a thermowell. The 1/4", 3/8" and 1/2" nominal bore are thermowell standard.

S - THE INSTRUMENT INSERTION LENGTH
Commonly called the «S» or the «L» dimension, it is the length from the top oft the mounting threads of a thermometer to the end of its stem or from the threads of a union bushing on a fixed extension or a capillary, to the end of the extension.

E - SHANK CONFIGURATION
It is the shape of that portion of a thermowell that is inserted into the process. The tapered shank is recommended as opposed to a stepped or straight shank due to the superior strength and vibration resistance.

T - LAGGING EXTENSION
Show as «T», it is used when the vessel or pipe into which the thermowell is inserted, is insulated. This is the extra length between the process connection and the instrument connection of a thermowell, which is determined by the insulation thickness. The standard lagging extension is 3" except it is 2" for the thermowells with 2-½" «U» dimensions. Other are available on request

P - THE PROCESS CONNECTION
It is that portion of the thermowell which provides the mechanical connection with the vessel or pipe. These connections can be integral male thread, prepared surface for welding flanges for mechanical pressure seals, or combinations thereof . Thermowell standard process threads are ½", ¾" and 1" NPT. Standard flanges are raised face or ring joint types, dimensioned to ASA B 16.5; standard flange sizes are 1", 1- ½" and 2" with rating from 150 lbs to 900 lbs. Standard weld in sizes are for ¾" and 1" nominal pipe. Other size process connections can be provided on request.

U - THE THERMOWELL INSERTION LENGTH
It is commonly called the «U» dimension, it is that portion of the shank from the process connection to the tip of the shank which is inserted into the process area.

MATERIAL AND IDENTIFICATION

Standard material: AISI 316

Every thermowell is supplied clearly identified with:

- Tag – Material and «U» dimension – Flange size – Rating and material etc.
- Standard materials: AISI 316 / 316-Ti / 304 / 321
- Special materials such as: Duplex / Monel / Titanium / Nickel / Hastelloy C276 / Hastelloy C4 / Inconel 600 / etc.
- Special materials (sheets) for coating wetted parts: Tantalum / PFTE / Hastelloy C276 / Hastelloy C4 / Zirconium.

OPTIONAL DOCUMENTATION

- Construction drawing
- Hydrostatic test pressure
- Dye penetrating test
- Inspection and material certificate according to EN10204 3.1.B, 3.1.C
- Heat number stamped on well and flange
- Certificate according to NACE
- Heat treatment certificate
- HUEY test to ASTM A 262-C
- Performance test to ASME PTC 19.3-1974
- Welding Procedure Specification (W.P.S.)
- Procedure Qualification Record (P.Q.R.)

STANDARD THERMOWELL TYPES

TWF1: Fabricated - threaded - straight

TWB1: Bar stock - threaded - stepped
TWB3: Bar stock - threaded - straight
TWB4: Bar stock - threaded - tapered

TWB5: Bar stock - weld in - stepped
TWB6: Bar stock - weld in - tapered

TWF1-F: Fabricated - flange connection - straight
TWB1-F: Bar stock - flange connection - stepped
TWB4-F: Bar stock - flange connection - tapered

TWB3-F: Bar stock – flange connection - straight - wetted parts protected

Nominal Pressures

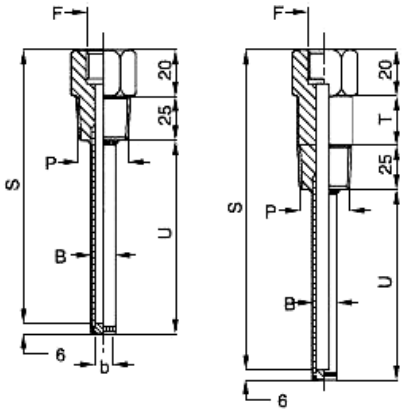
Fabricated = PN25
Bar stock stepped shank = PN100
Bar stock tapered shank = PN250

OPTIONS

To reduce the price for special material straight shank flanged thermowell wetted parts can be supplied protected by special materials such as PTFE, NICKEL, ZIRCONIUM, TITANIUM, TANTALUM and HALAR
Plug and chain – U dimension polished – Degreased for oxygen service extension nipples

MOUNTING STYLES AND DIMENSIONS

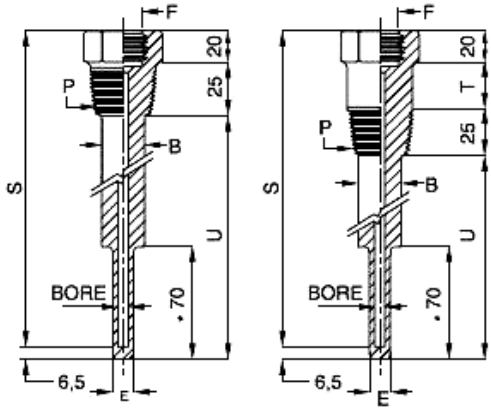
TWF1



Fabricated - threaded - straight

STANDARD DIMENSIONS		
Process connection P	Tube dimensions b x B	Hex

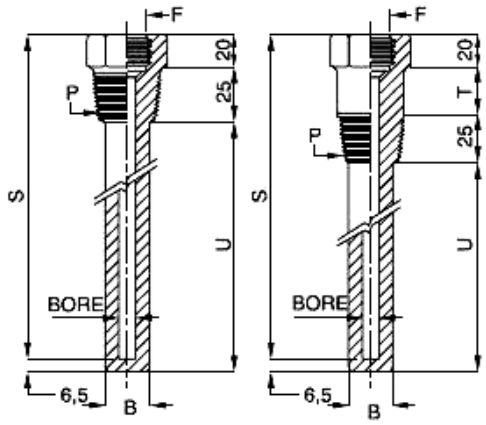
TWB1



Bar stock - threaded - stepped

STANDARD DIMENSIONS				
Process connection P	Ø Bore Sizes b	Diameter B	Diameter E	Hex
½“ NPT / BSP	6.5	16	12.7	27
¾“ NPT / BSP	6.5	19	12.7	27
	9	19	15	
1“ NPT / BSP	6.5	22	12.7	36
	9	22	15	

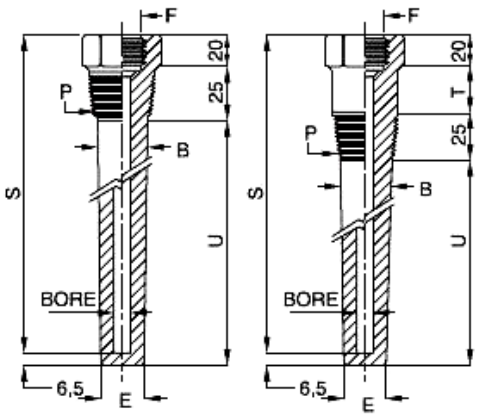
TWB3



Bar stock - threaded - straight

STANDARD DIMENSIONS			
Process connection P	Ø Bore Sizes b	Diameter B	Hex
½“ NPT / BSP	6.5	16	27
¾“ NPT / BSP	6.5	19	27
	10.5		
1“ NPT / BSP	6.5	19	36
	10.5		

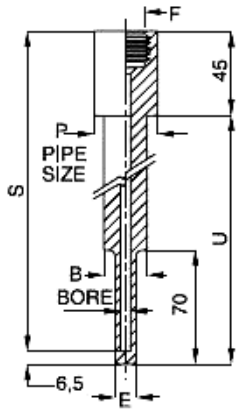
TWB4



Bar stock - threaded - tapered

STANDARD DIMENSIONS				
Process connection P	Ø Bore Sizes b	Diameter B	Diameter E	Hex
½”, ¾“ NPT / BSP	6.5	22	16	27
	10.5	22	19	
1“ NPT / BSP	6.5	27	16	36
	10.5	27	19	

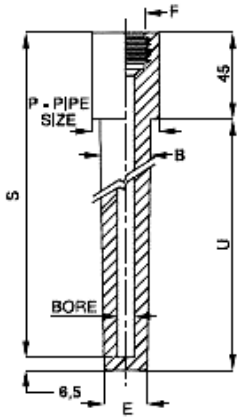
TWB5



Bar stock - weld in - stepped

STANDARD DIMENSIONS			
Process connection P	Ø Bore Sizes b	Diameter B	Diameter E
¾“ PIPE (Ø 27)	6.5	19	12.7
	9	19	15
1“ PIPE (Ø 33)	6.5	22	12.7
	9	22	15

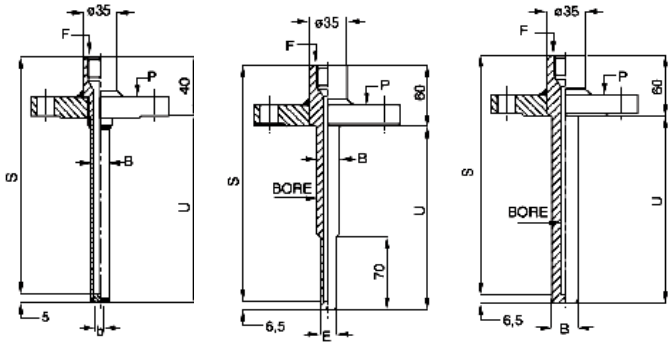
TWB6



Bar stock - weld in - tapered

STANDARD DIMENSIONS			
Process connection P	Ø Bore Sizes b	Diameter B	Diameter E
¾“ PIPE (Ø 27)	6.5	20	16
	10.5	20	19
1“ PIPE (Ø 33)	6.5	25	16
	10.5	25	19

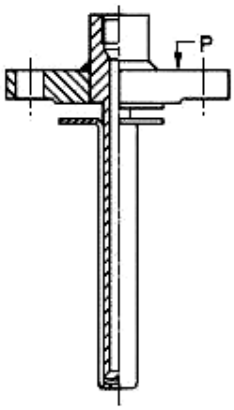
TWF1-F TWB1-F TWB4-F



TWF1-F: Fabricated - flange connection - straight
TWB1-F: Bar stock - flange connection - stepped
TWB4-F: Bar stock - flange connection - tapered

STANDARD FLANGES		THERMOWELL DIMENSIONS		
Sizes	Ratings	b	B	E
1“ - 1 ½“ - 2“	from 150 to 900lbs	Same as threaded thermowells TWF1 TWB1 TWB4		

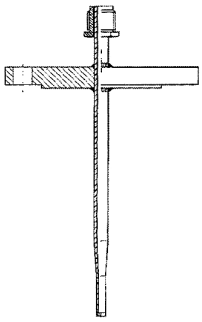
TWB3-F



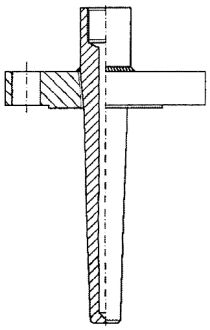
Bar stock – flange connection - straight - wetted parts protected

OPTIONAL EXTRA
Wetted part covered by special material

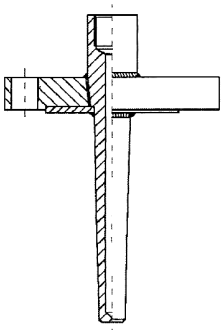
THERMOWELLS FLANGED



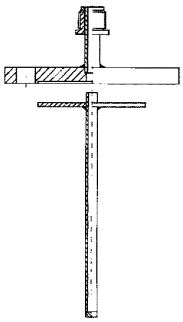
Fabricated



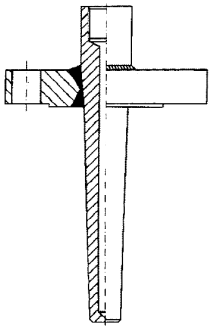
Barstock standard type



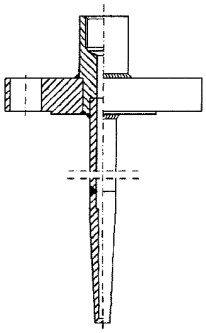
Barstock with rotating or welded flange. Wetted parts in: Hastelloy C276,C4, Nickel, Titanium



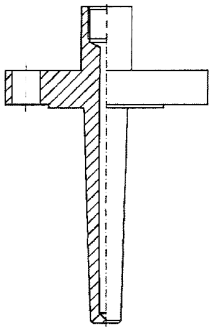
Two pieces for flange mounting. Wetted parts in: Stainless steel 316, Hastelloy C276,C4, Nickel, Tantalum, Zirconium, Titanium



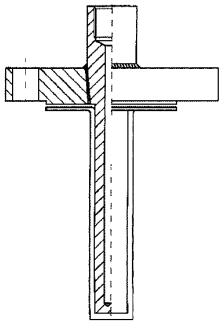
Full penetration
Partial full penetration



For extremely long immersion length with ip from barstock



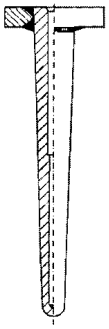
Forged type one piece without welding



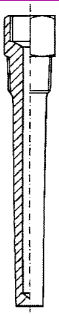
Barstock Wetted parts covered by: Hastelloy C276,C4, Tantalum, Zirconium, Nickel, Halar, PFTE

THERMOWELLS THREADED, WELD IN, SANITARY, CUSTOMER DRAWING

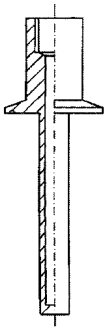
Weld-in type according to DIN43729 standard



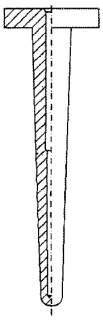
Barstock type full penetration execution



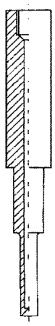
Barstock standard type with or without lagging extension



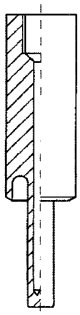
Sanitary connection



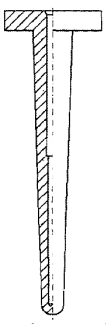
Barstock type without welding



Weld in type



Customer drawing



Electro forged execution