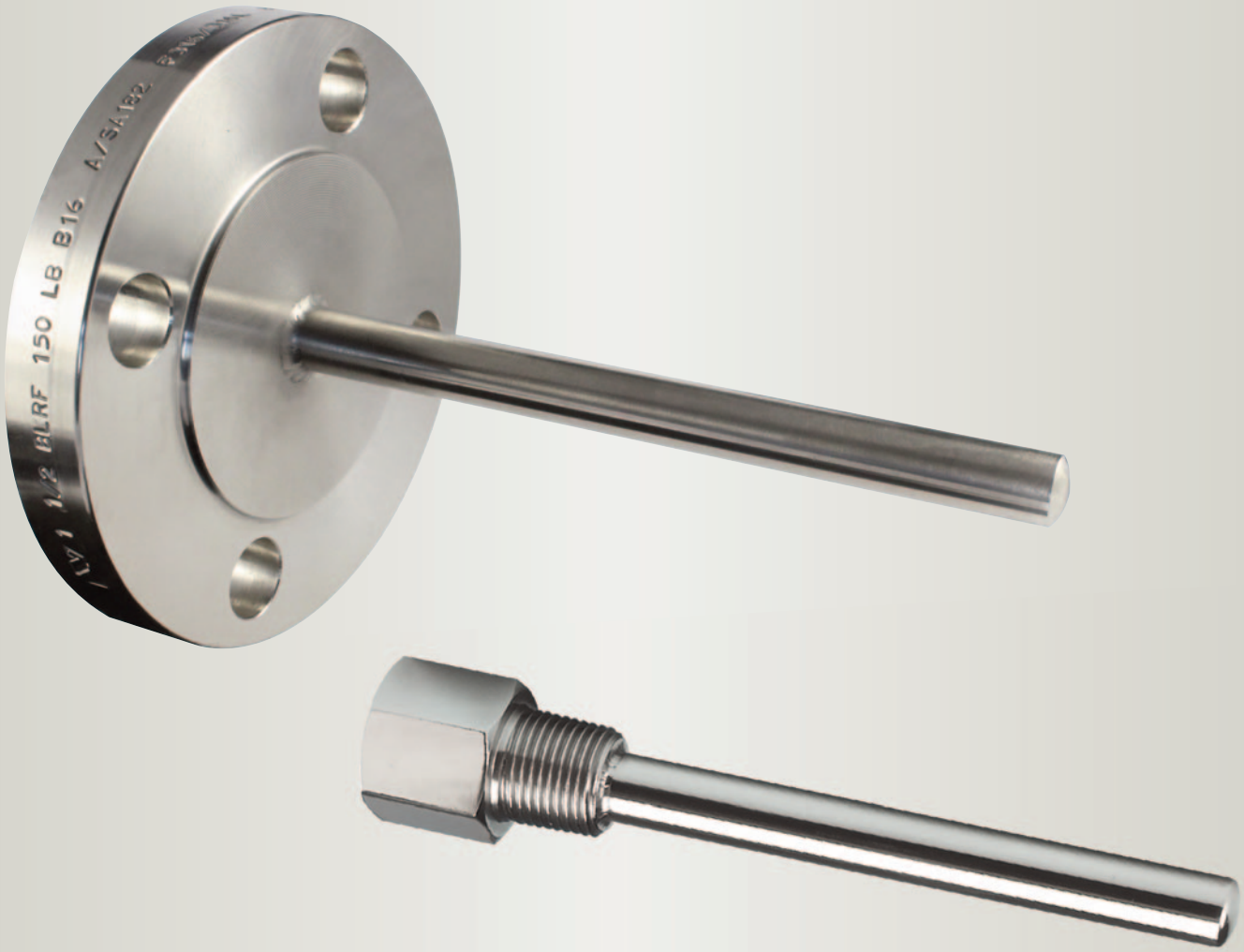
Thermowells - Type 20



A range of flanged and threaded thermowells to help protect or insulate thermocouples or platinum resistance thermometers in industrial applications.

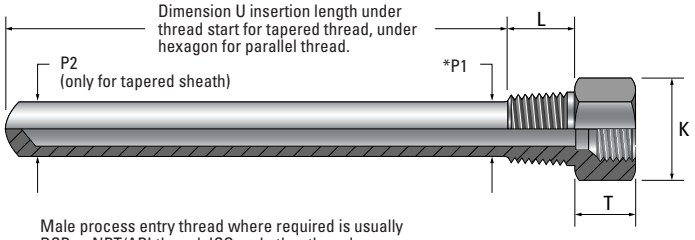
A wide choice of sheath materials, including PTFE for chemical resistance is available, in a variety of styles.

Type 20 Threaded Thermowells

Threaded Thermowells for Thermocouple and RTD Sensors

Our range of thermowell pockets can be supplied in a wide choice of lengths, diameters and sheath materials with different process connections to suit almost any application. Thermowells are useful for processes which require the sensing device to be inserted and removed regularly, without the need for disrupting the process itself. Thermowells are also excellent for protecting sensors against attack from chemicals or harmful atmospheres. The units can be custom built to suit virtually any application, in either a welded construction or made from solid bar, dependant on the requirement.

- **Ideal for when an application demands the removal of a sensor without interrupting the process**
- **Our thermowells can either be of welded construction with a parallel sheath or machined from solid with a parallel or tapered sheath**
- **Available in a variety of constructions with either screwed BSP or NPT male process entry. Other threads are available upon request**
- **Custom built with a wide choice of sheath materials to meet customer requirements on a prompt delivery**
- **Testing and Certification Services include:**
  ASME PTC 19.3 TW-2010 (wake frequency calculation), pressure testing, MTC's, X-Ray, dye penetration, full penetration weld and NACE MR0175 (hardness test)



Male process entry thread where required is usually BSP or NPT/API thread. ISO and other threads are available on request.

Female thermowell entry thread where required is usually BSP or NPT/API. ISO and other threads are available on request.

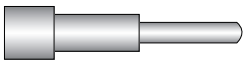
If no lagging extension is required dimension T is typically 0.984". If a lagging extension is required, please specify dimension T.

Dimensions K and L are as recommended in BS EN 61152

Notes:
* P1 = Outside diameter of thermowell immediately below thread start.
  P2 = Dimension at tip of thermowell (required for tapered sheath).

Bore/ID of thermowell is usually such that the sensor can be easily inserted but no larger in order to minimise air gap and thus maximise thermal response.

SECTION 1 — Thermowell Design Styles

	Description	Sketch
WH	Welded fabrication thermowell with male and female threaded connections. Parallel sheath.	
SH	Machined from solid thermowell with male and female threaded connections. Tapered or parallel sheath available.	
SW	Socket Weld style. Machined from solid thermowell, designed to work with socket weld fittings. Tapered, parallel or stepped sheath.	

SECTION 3 — Standard Process Connections

	Process Entry Thread	Female (Sensor) Entry Thread
Standard Sizes	1/2in NPT/BSPT/BSPP	1/4in NPT/BSPT/BSPP
	3/4in NPT/BSPT/BSPP	1/2in NPT/BSPT/BSPP
	1in NPT/BSPT/BSPP	3/4in NPT/BSPT/BSPP

As standard, welded construction sensor entry threads are NPT. Machined from solid entry threads can be BSPT or BSPP. Other threads are available upon request.

SECTION 4 — Bore and Outer Dimensions

	Outer Diameter	Bore Diameter	Minimum Thread Size
Standard Sizes	0.500"	0.334"	1/2"
	0.626"	0.465"	1/2"
	0.839"	0.626"	3/4"
	1.051"	0.823"	1"

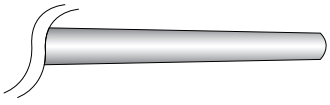
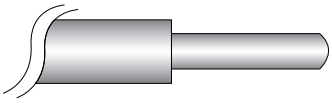
The above are suggested bore and outer diameters for 20WH thermowells.
For machined from solid 20SH thermowells the bore size is custom built to your requirements but is typically 0.276" to suit a 0.236" diameter temperature sensor.

SECTION 2 — Sheath Materials

		Sheath Specifications	Operational Properties	Max. Temp.
Standard	**316L**	**Grade 316L Stainless Steel** 18/8/1 Ni/Cr/Molybdenum Stabilised To BS EN 10088, Werkstoff No : 1.4404	Very good corrosion resistance throughout the operating temperature range. Suited to a wide range of industrial applications. Enjoys high ductility.	1470°F
	310	**Grade 310 Stainless Steel** 25/20 Nickel/Chromium To BS EN 10088, Werkstoff No : 1.4845	Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. 310 stainless steel has high oxidation resistance.	2010°F
	600	**Inconel 600*** Nickel/Chromium/Iron alloy To BS EN 10095, Werkstoff No : 2.4816	Used in severely corrosive atmospheres to elevated temperatures. Has good resistance to oxidation. Do not use in sulphur bearing atmospheres above 1020°F.	2010°F
	800	**Incoloy 800*** Iron/Nickel/Chromium alloy To BS EN 10095, Werkstoff No : 1.4876	Used in severely corrosive atmospheres to elevated temperatures. Enjoys a good resistance to oxidation and carburisation. Resistant to sulphur bearing atmospheres.	2010°F
	825	**Incoloy 825*** Iron/Nickel/Chromium alloy To BS EN 10204, Werkstoff No : 2.4858	Highly resistant to corrosion and oxidising conditions. Particularly useful when used in acidic environments.	2280°F
Specialized	**276**	**Hastelloy 276*** Nickel/Chromium/Iron/Molybdenum To ASTM B574, Werkstoff No : 2.4819	Excellent general corrosion resistance and good fabricability. Highly popular for chemical and petrochemical processing applications.	2280°F
	400	**Monel 400** Nickel 30% Copper/Iron To BS 3076, Werkstoff No : 2.4360	Monel is particularly resistant to corrosion by seawater and has high strength and toughness over a wide temperature range.	2280°F
	PTFE	**PTFE** Polytetrafluoroethylene	A fluorocarbon based polymer, PTFE offers high chemical resistance, low friction and electrical and thermal insulation over a wider temperature range than most plastics. Perfect for protecting metals against acid attack.	480°F

Other sheath materials are available upon request. * Trade Names

SECTION 5 — Sheath Options

Parallel	Tapered	Stepped
		

Order Code - Example

Type No.	Style No.	Sheath Material (see section 2)	Process Entry Thread (if required, see section 3)	Sensor Entry Thread (see section 3)	Insertion Length 'U' * (in inches)	Thermowell Bore (see section 4)	OD of Thermowell ('P1', see section 4)	Sheath Options (see section 5)	Taper Details ('P2')
20	WH	316L	1/2" NPT	1/4" NPT	4"	0.334"	0.500"	PARALLEL	—

** Insertion length is under thread start for tapered threads, under hex/flats for parallel threads.*

Flanged Thermowells Type 20

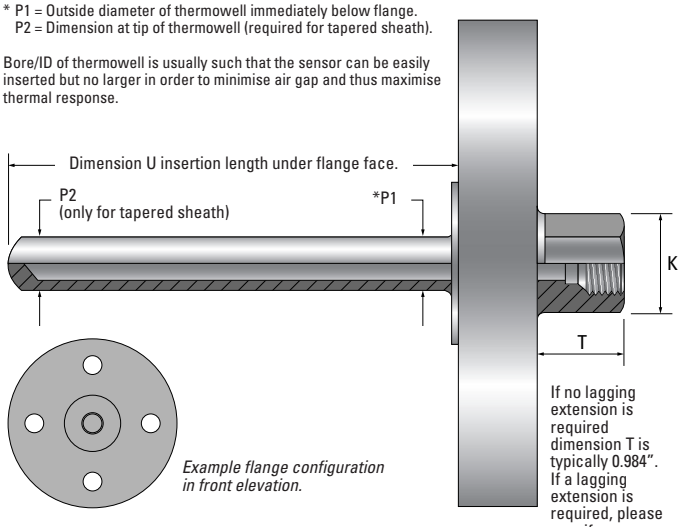
Flanged Thermowells for Thermocouple and RTD Sensors

Our range of thermowell pockets can be supplied in a wide choice of lengths, diameters and sheath materials with different flange types to suit almost any application. Thermowells are useful for processes which require the sensing device to be inserted and removed regularly, without the need for disrupting the process itself. Thermowells are also excellent for protecting sensors against attack from chemicals or harmful atmospheres. The units can be custom built to suit virtually any application, in either a welded construction or made from solid bar, dependant on the requirement.

- **Ideal for when an application demands the removal of a sensor without interrupting the process**
- **Our thermowells can either be of welded construction with a parallel sheath or machined from solid with a parallel or tapered sheath**
- **Available in a variety of constructions with plain or drilled flanges. Other flanges are available upon request**
- **Custom built with a wide choice of sheath materials to meet customer requirements on a prompt delivery**
- **Testing and Certification Services include:**
  ASME PTC 19.3 TW-2010 (wake frequency calculation), pressure testing, MTC's, X-Ray, dye penetration, full penetration weld and NACE MR0175 (hardness test)

Notes:
* P1 = Outside diameter of thermowell immediately below flange.
P2 = Dimension at tip of thermowell (required for tapered sheath).

Bore/ID of thermowell is usually such that the sensor can be easily inserted but no larger in order to minimise air gap and thus maximise thermal response.

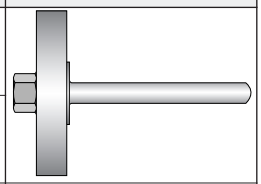
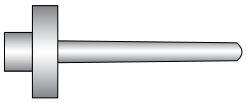


Example flange configuration in front elevation.

If no lagging extension is required dimension T is typically 0.984". If a lagging extension is required, please specify dimension T.

Various flanges are available, see section 3 for more information, or contact TC Ltd to discuss your requirement.

SECTION 1 — Thermowell Design Styles

	Description	Sketch
WF	Welded flange onto a welded end fabricated Thermowell with a female threaded connection. Parallel sheath.	
WFS	Welded flange onto a machined from solid Thermowell with a female threaded connection. Tapered or Parallel sheath.	
VS	Vanstone Style. Machined from solid, designed to be mounted between two mating flanges. Dimensions should correspond to mating raised face of process flange. Tapered or stepped.	

SECTION 3 — Common Flanges - Examples

	Dia.	Rating / Nominal Pressure	Face Type	Notes
FL05	1/2"	Class 150 to 2500 (lb) PN 10 to 250 (bar) 5K and 10K (Kg/cm³)	**FF** (Flat Face) **RF** (Raised Face) **RTJ** (Ring Type Joint) **TRI** (Tri Clamp)	Flanges are manufactured in accordance with internationally recognised standards such as ANSI, DIN or JIS.
FL15	1+1/2"			
FL20	2"			

Generally, flanges are supplied in 304 or 316 stainless steel, however other materials are available to match exotic sheathings. Other types of flange are available, please contact us for details.

SECTION 4 — Bore and Outer Dimensions

	Outer Diameter	Bore Diameter
Standard Sizes	0.500"	0.334"
	0.626"	0.465"
	0.839"	0.626"
	1.051"	0.823"

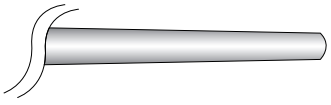
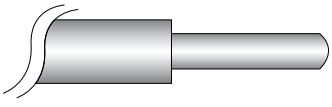
The above are suggested bore and outer diameters for 20WF thermowells. For 20WFS or 20VS thermowells the bore size is to your requirements (typically 0.276" to suit a 0.236" diameter temperature sensor).

SECTION 2 — Sheath Materials

		Sheath Specifications	Operational Properties	Max. Temp.
Standard	**316L**	**Grade 316L Stainless Steel** 18/8/1 Ni/Cr/Molybdenum Stabilised To BS EN 10088, Werkstoff No : 1.4404	Very good corrosion resistance throughout the operating temperature range. Suited to a wide range of industrial applications. Enjoys high ductility.	**1470°F**
	310	**Grade 310 Stainless Steel** 25/20 Nickel/Chromium To BS EN 10088, Werkstoff No : 1.4845	Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. 310 stainless steel has high oxidation resistance.	**2010°F**
	600	**Inconel 600*** Nickel/Chromium/Iron alloy To BS EN 10095, Werkstoff No : 2.4816	Used in severely corrosive atmospheres to elevated temperatures. Has good resistance to oxidation. Do not use in sulphur bearing atmospheres above 550°C.	**2010°F**
	800	**Incoloy 800*** Iron/Nickel/Chromium alloy To BS EN 10095, Werkstoff No : 1.4876	Used in severely corrosive atmospheres to elevated temperatures. Enjoys a good resistance to oxidation and carburisation. Resistant to sulphur bearing atmospheres.	**2010°F**
	825	**Incoloy 825*** Iron/Nickel/Chromium alloy To BS EN 10204, Werkstoff No : 2.4858	Highly resistant to corrosion and oxidising conditions. Particularly useful when used in acidic environments.	**2280°F**
Specialized	**276**	**Hastelloy 276*** Nickel/Chromium/Iron/Molybdenum To ASTM B574, Werkstoff No : 2.4819	Excellent general corrosion resistance and good fabricability. Highly popular for chemical and petrochemical processing applications.	**2280°F**
	400	**Monel 400** Nickel 30% Copper/Iron To BS 3076, Werkstoff No : 2.4360	Monel is particularly resistant to corrosion by seawater and has high strength and toughness over a wide temperature range.	**2280°F**

Other sheath materials are available upon request. * Trade Names

SECTION 5 — Sheath Options

Parallel	Tapered	Stepped
		

Order Code - Example

Type No.	Style No.	Sheath Material (see section 2)	Sensor Entry Thread (see section 3)	Insertion Length 'U' * (in inches)	Thermowell Bore (see section 4)	OD of Thermowell ('P1', see section 4)	Flange Details ** (see section 3)	Sheath Options (see section 5)	Taper Details ('P2')
20	**WF**	**316L**	**1/2" NPT**	**6"**	**0.465"**	**0.626"**	**FL15/150RF**	**PARALLEL**	—

** Insertion length starts from under flange.*
*** Flange details to be: size, rating facing, PCD and hole size if required.*

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