



## Features & Options

- Three Lengths: 2", 4" and 8"  
(Fit standard Immersion Unit lengths)
- Stainless Steel (304 or 316) or Brass
- Two Part (Welded) or Machined Construction
- Other Lengths Available Upon Request
- Limited Lifetime Warranty

Standard Thermowells available from BAPI include 304 stainless steel (machined), 316 stainless steel (machined), brass (machined), and two part\* (welded) 304 stainless steel. These wells are offered in 2", 4" and 8" lengths with 1/2" NPT external and 1/2" NPSM internal. Other lengths and thread diameters are available upon request.

The Thermowell chosen for an installation is governed mainly by the corrosion conditions the well will face. The machined stainless steel wells all come with a mirror polish to provide maximum corrosion resistance.

Occasionally, the material consideration is one of strength rather than corrosion. For example, a machined stainless steel well may be required for high pressure water service where otherwise a brass or two part stainless steel well would be satisfactory from a corrosion standpoint.

Note: The two part welded stainless steel thermowells are not intended for service in moving water. They may be used in catch basins, sumps or large storage tanks with small inlet and outlet pipes. Do not mount the two part welded stainless steel thermowells close to the inlet or outlet pipe of the tank.

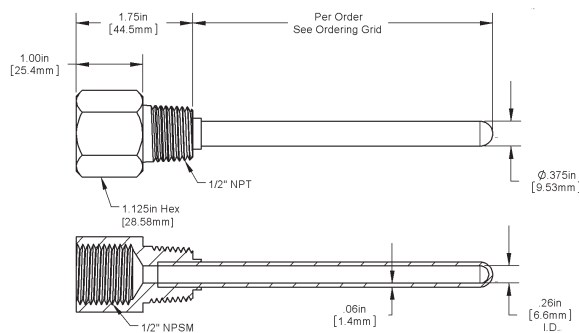


**Machined  
Thermowell**

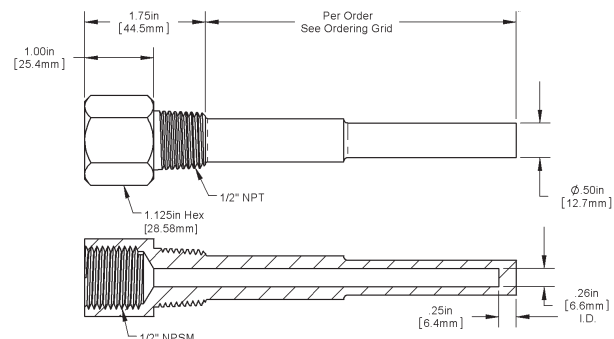


**Two Part (welded)  
Thermowell**

## Specifications



**Two Part (Welded) Thermowell  
304 Stainless Steel**



**Machined Thermowell  
304 or 316 Stainless Steel or Brass**

**NPT= National Pipe Taper  
NPSM=National Pipe Straight Mechanical (not tapered)**





Ordering Information		Thermowells
BA/		
	<b>Unit Type</b>	
	2"	Two Part (Welded) 304 Stainless Steel - 2"
	4"	Two Part (Welded) 304 Stainless Steel - 4"
	8"	Two Part (Welded) 304 Stainless Steel - 8"
	2" <b>M304</b>	Machined 304 Stainless Steel - 2"
	4" <b>M304</b>	Machined 304 Stainless Steel - 4"
	8" <b>M304</b>	Machined 304 Stainless Steel - 8"
	2" <b>M316</b>	Machined 316 Stainless Steel - 2"
	4" <b>M316</b>	Machined 316 Stainless Steel - 4"
	8" <b>M316</b>	Machined 316 Stainless Steel - 8"
	2" <b>MB</b>	Machined Brass - 2"
	4" <b>MB</b>	Machined Brass - 4"
	8" <b>MB</b>	Machined Brass - 8"
<b>EXAMPLE</b>		
BA/	4" <b>M304</b>	
Example Part Number: BA/4"M304 4" Machined 304 Stainless Steel Thermowell		
<b>Your Part Number:</b>		

Note: Standard thread size is 1/2" NPT external, and 1/2" NPSM internal.  
 2" wells have an insertion length of 2.5" (11.43 cm).  
 4" wells have an insertion length of 4.5" (11.43 cm).  
 8" wells have an insertion length of 7.5" (19.05 cm).

Gray shaded items follow the Buy and Resale Multiplier.

## Comparing the Wake Frequency and the Resonant Frequency

Well failures, in most cases, are not due to the effects of pressure or temperature on the well. The calculations necessary to provide adequate strength, under given conditions, are familiar enough to permit proper choice of wall thickness and material. The values shown in Table 1 are conservative, and intended primarily as a guide. Less familiar, and more dangerous, are the **vibration effects** to which wells are subjected. Fluid, flowing by the well, forms a turbulent wake (called the Von Karman Trail) which has a definite frequency, based on the diameter of the well and the velocity of the fluid. It is important that the well have sufficient stiffness so that the wake frequency will never equal the resonant (natural) frequency of the well itself. If the resonant frequency of the well coincided with the wake frequency, the well would vibrate to destruction and break off in the piping. Wells are also safe if the resonant frequency is well **below** the wake frequency or if the fluid velocity is constantly fluctuating through the critical velocity point. Nevertheless, if the installation is not hampered by the use of a sufficiently stiff well, we recommend the values given in Table 2 not be exceeded.

**Table 1: Pressure Rating versus Temperature**

Thermowell Material	Temperature in Degrees Fahrenheit						
	70°F	200°F	400°F	600°F	800°F	1000°F	1200°F
	Pressure Rating (Pounds per Square Inch)						
Brass	5000	4200	1000	-	-	-	-
Welded 304 S.S.	982	820	675	604	550	510	299
304 S.S.	7000	6200	5600	5400	5200	4500	1650
316 S.S.	7000	7000	6400	6200	6100	5100	2500

**Table 2:  
Maximum Fluid Velocity versus Insertion Length**

Thermowell Material	Fluid Type	Insertion Length (inches)		
		1-2"	1-4"	1-8"
		Maximum Fluid Velocity (Feet per Second)		
Brass	Air/Steam	207	75.5	27.3
	Water	59.3	32.2	19.7
Welded 304 S.S.	Air/Steam	169	61	20
	Water	88	20	10
304 S.S.	Air/Steam	300	109	39.5
	316 S.S.	Water	148	82.2

The values shown in Table Two are based on operating temperatures of 350°F for brass and 1,000°F for stainless steel (S.S.). Slightly higher velocities are possible at lower temperatures.