

Thermowells and Bosses

TW, TS, TF, TJ and BS Series



FITOK Group

FITOK GmbH (Headquarter)

Sprendlinger Landstr. 115, 63069 Offenbach, Germany
Tel.: +49 69 8900 4498
Fax: +49 69 8900 4495

FITOK INC

13000 Murphy Road, Suite 116, Stafford, TX 77477, USA
Tel.: +1 281 888 0077
Fax: +1 281 247 1806

FITOK INCORPORATED

Yingtailong Industrial Park, Shenzhen, 518109, China
Tel.: +86 755 2803 2500
Fax: +86 755 2803 2619

info@fitokgroup.com
www.fitokgroup.com

FI22040813

FITOK
Valves and Fittings

www.fitokgroup.com

Thermowells

TW, TS, TF and TJ Series

Features

- FITOK thermowells provide reliable heat-transmission performance under high temperature, high pressure, and corrosive conditions.
- Rugged mechanical construction ensures resistance to distortion under sharp temperature fluctuation conditions.
- Straight, stepped, and tapered shank designs are available.
- Standard instrument connection is 1/2 NPT, other connections are available on request.
- Materials include 316 SS, 304 SS, 321 SS, F91, F92, 316H SS, carbon steel, brass, titanium, alloy C-276 and alloy 400/R-405.

Velocity Ratings

When selecting a thermowell, take maximum fluid velocity rating into consideration to avoid failure due to resonance vibration, as well as connection type, insertion length, bore diameter.

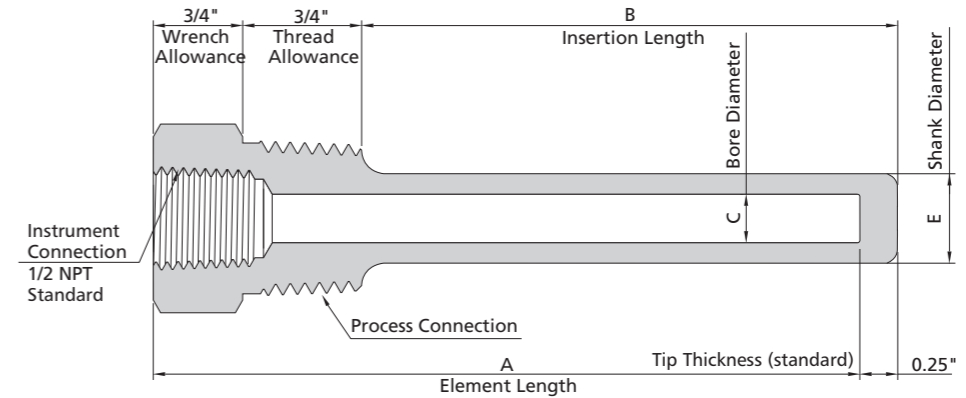
Please refer to the table below for the maximum fluid velocities:

Maximum Fluid Velocities (ft/sec)

| Shank Style | Root Dia. in. | Material | Process Fluid | Immersion Length | | | | | | | |
|-------------|---------------|----------------|---------------|------------------|-------------|-----------|-------|-------|-------|-------|-------|
| | | | | 2.5" | 4.5" | 7.5" | 10.5" | 13.5" | 16.5" | 19.5" | 22.5" |
| Stepped | 3/4 | Brass | Liquid/Gas | 59.3/207.0 | 39.8/89.1 | 23.9/32.3 | 16.4 | 9.9 | 6.6 | 4.8 | 3.6 |
| | | Carbon Steel | Liquid/Gas | 106.0/290.0 | 71.2/123.0 | 42.7/44.9 | 22.8 | 13.8 | 9.3 | 6.7 | 4.9 |
| | | 304 SS, 316 SS | Liquid/Gas | 148.0/300.0 | 99.3/128.0 | 46.4 | 23.6 | 14.3 | 9.6 | 6.9 | 5.1 |
| | 7/8 | Monel | Liquid/Gas | 118.0/261.0 | 79.8/112.0 | 40.6 | 20.7 | 12.4 | 8.3 | 6.1 | 4.5 |
| | | Brass | Liquid/Gas | 59.3/207.0 | 47.6/102.0 | 37.0/28.0 | 18.8 | 11.4 | 7.6 | 5.5 | 4.1 |
| | | Carbon Steel | Liquid/Gas | 106.0/290.0 | 84.3/143.0 | 51.6/50.6 | 26.2 | 15.9 | 10.6 | 7.6 | 5.7 |
| Straight | Any | 304 SS, 316 SS | Liquid/Gas | 148.0/300.0 | 117.0/148.0 | 53.5 | 27.2 | 16.5 | 11.0 | 7.9 | 5.9 |
| | | Monel | Liquid/Gas | 118.0/261.0 | 93.3/128.0 | 46.7 | 23.7 | 14.4 | 9.5 | 6.9 | 5.1 |
| | | Brass | Liquid/Gas | 145.0/290.0 | 80.0/150.0 | 48.0/54.1 | 27.6 | 16.7 | 11.1 | 8.0 | 6.0 |
| | | Carbon Steel | Liquid/Gas | 260.0/326.0 | 144.0/192.0 | 69.5 | 35.4 | 20.5 | 14.3 | 10.3 | 7.7 |
| Tapered | Any | 304 SS, 316 SS | Liquid/Gas | 360.0/349.0 | 199.0 | 71.9 | 36.6 | 21.2 | 14.8 | 10.7 | 8.0 |
| | | Monel | Liquid/Gas | 316.0/320.0 | 178.0/189.0 | 68.1 | 34.8 | 20.8 | 14.0 | 10.0 | 7.5 |
| | | Carbon Steel | Liquid/Gas | 270.0/410.0 | 150.0/249.0 | 90.3 | 45.6 | 27.8 | 18.5 | 13.2 | 9.8 |

TW series

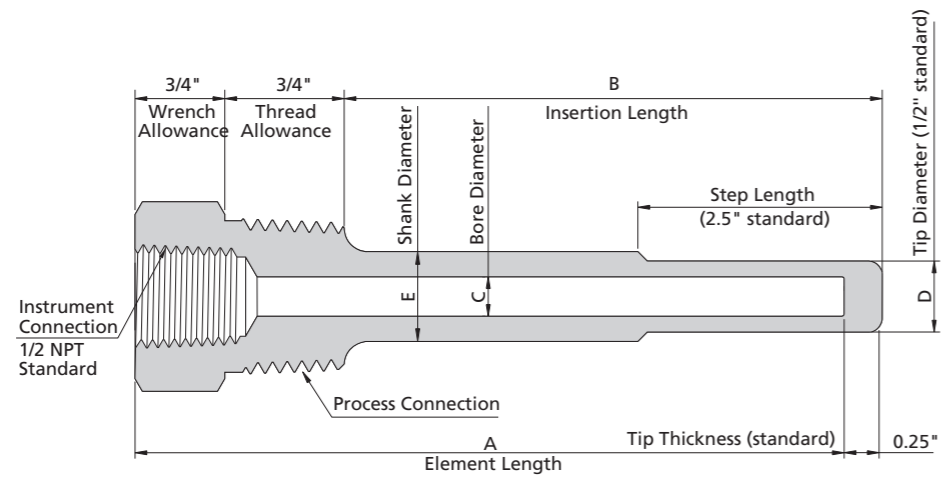
Straight



Standard Sizes

| Instrument Connection | Process Connection | Dimension, in. (mm) | | | | | |
|-----------------------|--------------------|---------------------|--------------|-------------|--------------|------------|-----------|
| | | C | E | B | A | | |
| 1/2 NPT Standard | 3/4 NPT | 0.413 (10.5) | 0.750 (19.0) | 4.5 (114.3) | 6 (152.4) | | |
| | 1 NPT | | | 7.5 (190.5) | 9 (228.6) | | |
| | 3/4 NPT | | | | | | |
| | 1 NPT | 0.656 (16.6) | 1.060 (27.0) | 0.385 (9.8) | 0.750 (19.0) | 2.5 (63.5) | 4 (101.6) |
| | 3/4 NPT | 4.5 (114.3) | 6 (152.4) | | | | |
| | | 7.5 (190.5) | 9 (228.6) | | | | |
| | | 10.5 (266.7) | 12 (304.8) | | | | |
| | | 13.5 (342.9) | 15 (381.0) | | | | |
| | | 16.5 (419.1) | 18 (457.2) | | | | |
| | 1 NPT | 22.5 (571.5) | 24 (609.6) | | | | |
| | | 2.5 (63.5) | 4 (101.6) | | | | |
| | | 4.5 (114.3) | 6 (152.4) | | | | |
| 7.5 (190.5) | | 9 (228.6) | | | | | |
| 10.5 (266.7) | | 12 (304.8) | | | | | |
| 13.5 (342.9) | | 15 (381.0) | | | | | |
| 16.5 (419.1) | 18 (457.2) | | | | | | |
| 22.5 (571.5) | 24 (609.6) | | | | | | |

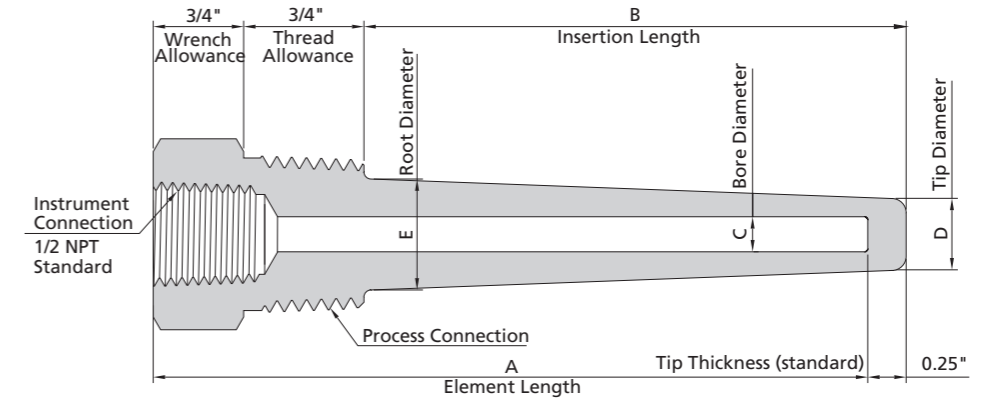
Stepped



Standard Sizes

| Instrument Connection | Process Connection | Dimension, in. (mm) | | | |
|-----------------------|--------------------|---------------------|--------------|--------------|------------|
| | | C | E | B | A |
| 1/2 NPT Standard | 1/2 NPT | 0.260 (6.6) | 0.625 (16.0) | 2.5 (63.5) | 4 (101.6) |
| | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | 22.5 (571.5) | 24 (609.6) |
| | 3/4 NPT | 0.260 (6.6) | 0.750 (19.0) | 2.5 (63.5) | 4 (101.6) |
| | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | 22.5 (571.5) | 24 (609.6) |
| | 1 NPT | 0.260 (6.6) | 0.875 (22.3) | 2.5 (63.5) | 4 (101.6) |
| | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | 22.5 (571.5) | 24 (609.6) |

Tapered

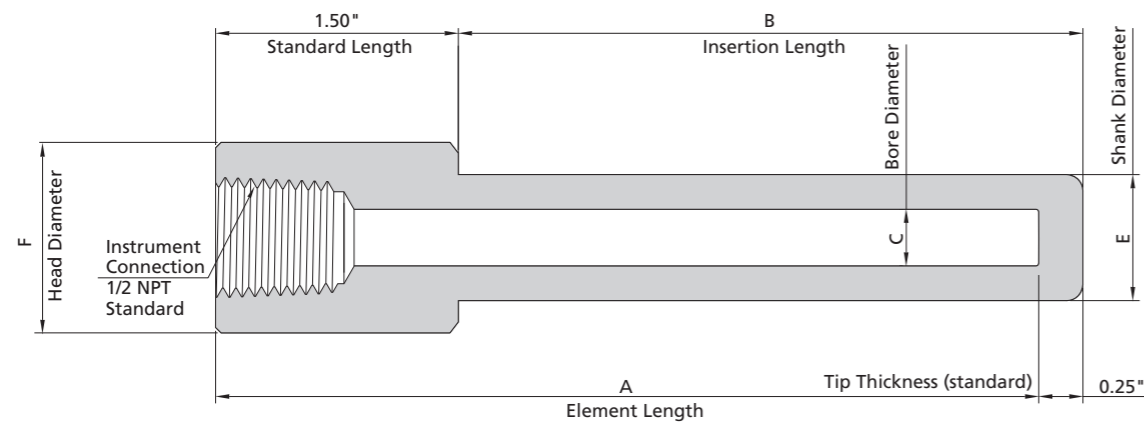


Standard Sizes

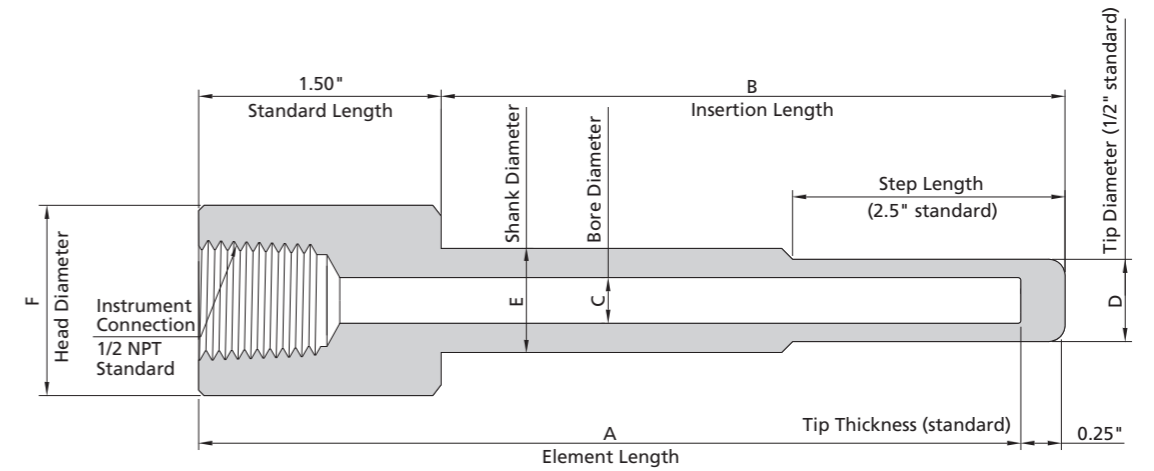
| Instrument Connection | Process Connection | Dimension, in. (mm) | | | | |
|-----------------------|--------------------|---------------------|--------------|--------------|--------------|------------|
| | | C | E | D | B | A |
| 1/2 NPT Standard | 3/4 NPT | 0.260 (6.6) | 0.875 (22.3) | 0.625 (16.0) | 2.5 (63.5) | 4 (101.6) |
| | | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | | 22.5 (571.5) | 24 (609.6) |
| | 1 NPT | 0.260 (6.6) | 1.060 (27.0) | 0.625 (16.0) | 2.5 (63.5) | 4 (101.6) |
| | | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | | 22.5 (571.5) | 24 (609.6) |
| | 3/4 NPT | 0.385 (9.8) | 0.875 (22.3) | 0.750 (19.0) | 2.5 (63.5) | 4 (101.6) |
| | | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | | 22.5 (571.5) | 24 (609.6) |
| | 1 NPT | 0.385 (9.8) | 1.060 (27.0) | 0.750 (19.0) | 2.5 (63.5) | 4 (101.6) |
| | | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | | 7.5 (190.5) | 9 (228.6) |
| 10.5 (266.7) | | | | | 12 (304.8) | |
| 13.5 (342.9) | | | | | 15 (381.0) | |
| 16.5 (419.1) | | | | | 18 (457.2) | |
| 22.5 (571.5) | | | | | 24 (609.6) | |

TS series

Straight



Stepped



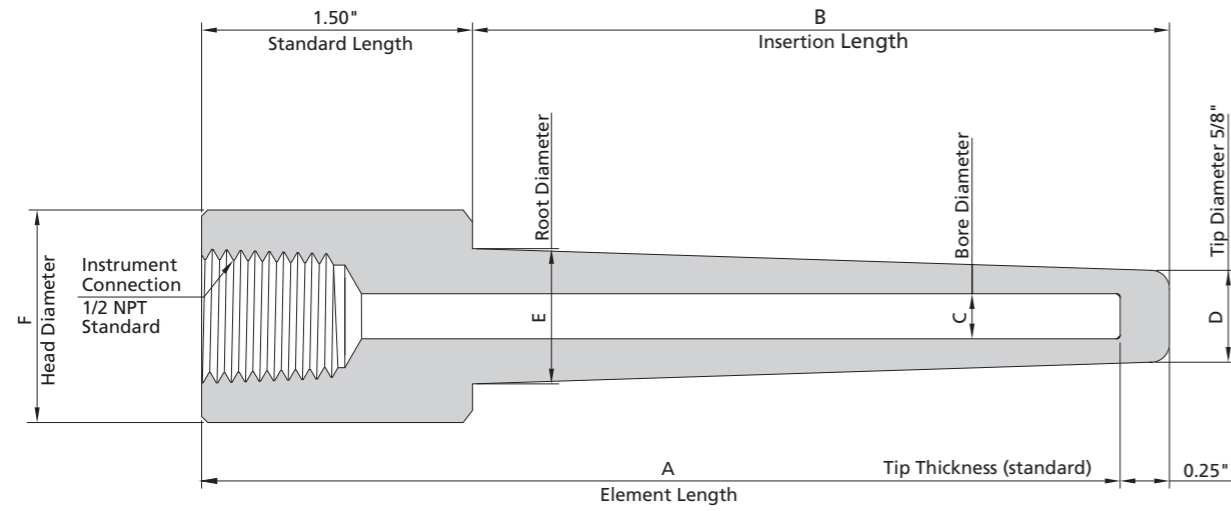
Standard Sizes

| Instrument Connection | Dimension, in. (mm) | | | | |
|-----------------------|---------------------|--------------|--------------|--------------|------------|
| | C | E | F | B | A |
| 1/2 NPT Standard | 0.260 (6.6) | 0.750 (19.0) | 1.060 (27.0) | 2.5 (63.5) | 4 (101.6) |
| | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | 22.5 (571.5) | 24 (609.6) |
| | 0.260 (6.6) | 0.875 (22.3) | 1.315 (33.5) | 2.5 (63.5) | 4 (101.6) |
| | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | 22.5 (571.5) | 24 (609.6) |

Standard Sizes

| Instrument Connection | Dimension, in. (mm) | | | | |
|-----------------------|---------------------|--------------|--------------|--------------|------------|
| | C | E | F | B | A |
| 1/2 NPT Standard | 0.260 (6.6) | 0.750 (19.0) | 1.060 (27.0) | 2.5 (63.5) | 4 (101.6) |
| | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | 22.5 (571.5) | 24 (609.6) |
| | 0.260 (6.6) | 0.875 (22.3) | 1.315 (33.5) | 2.5 (63.5) | 4 (101.6) |
| | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | 22.5 (571.5) | 24 (609.6) |

Tapered

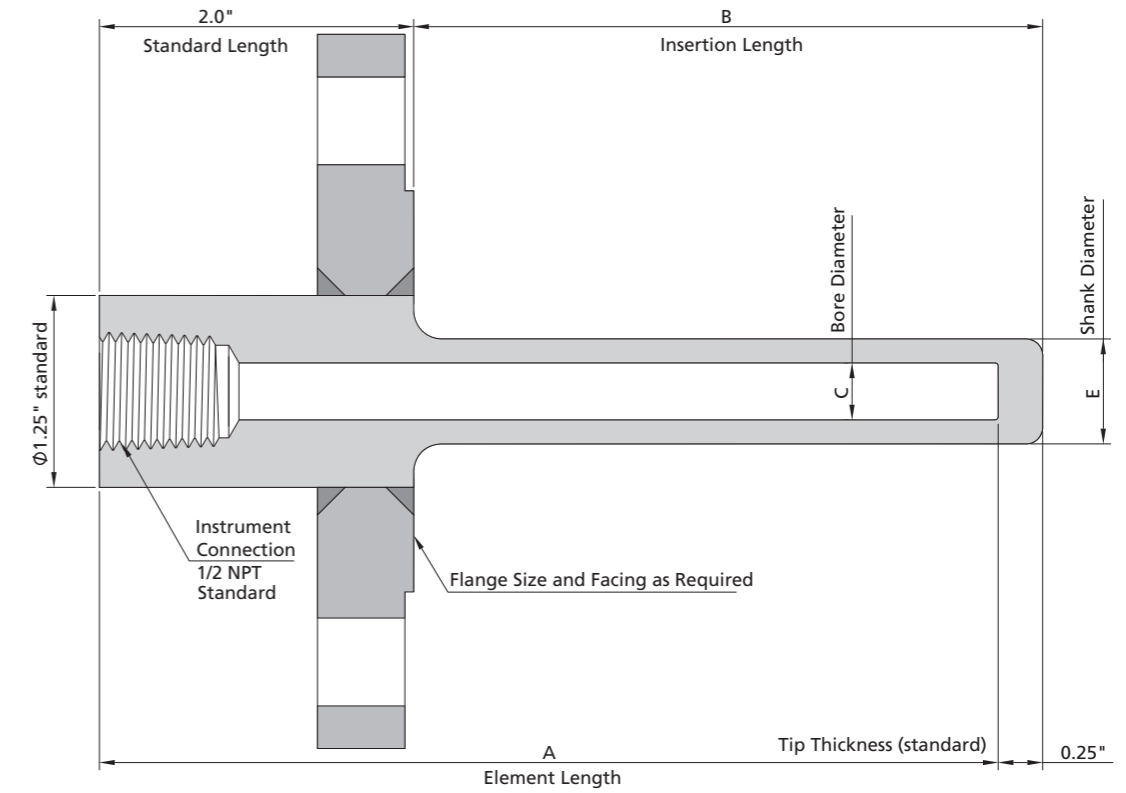


Standard Sizes

| Instrument Connection | Dimension, in. (mm) | | | | |
|-----------------------|---------------------|--------------|--------------|--------------|------------|
| | C | E | F | B | A |
| 1/2 NPT Standard | 0.260 (6.6) | 0.750 (19.0) | 1.060 (27.0) | 2.5 (63.5) | 4 (101.6) |
| | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | 22.5 (571.5) | 24 (609.6) |
| | 0.260 (6.6) | 1.060 (27.0) | 1.315 (33.5) | 2.5 (63.5) | 4 (101.6) |
| | | | | 4.5 (114.3) | 6 (152.4) |
| | | | | 7.5 (190.5) | 9 (228.6) |
| | | | | 10.5 (266.7) | 12 (304.8) |
| | | | | 13.5 (342.9) | 15 (381.0) |
| | | | | 16.5 (419.1) | 18 (457.2) |
| | | | | 22.5 (571.5) | 24 (609.6) |

TF series

Straight

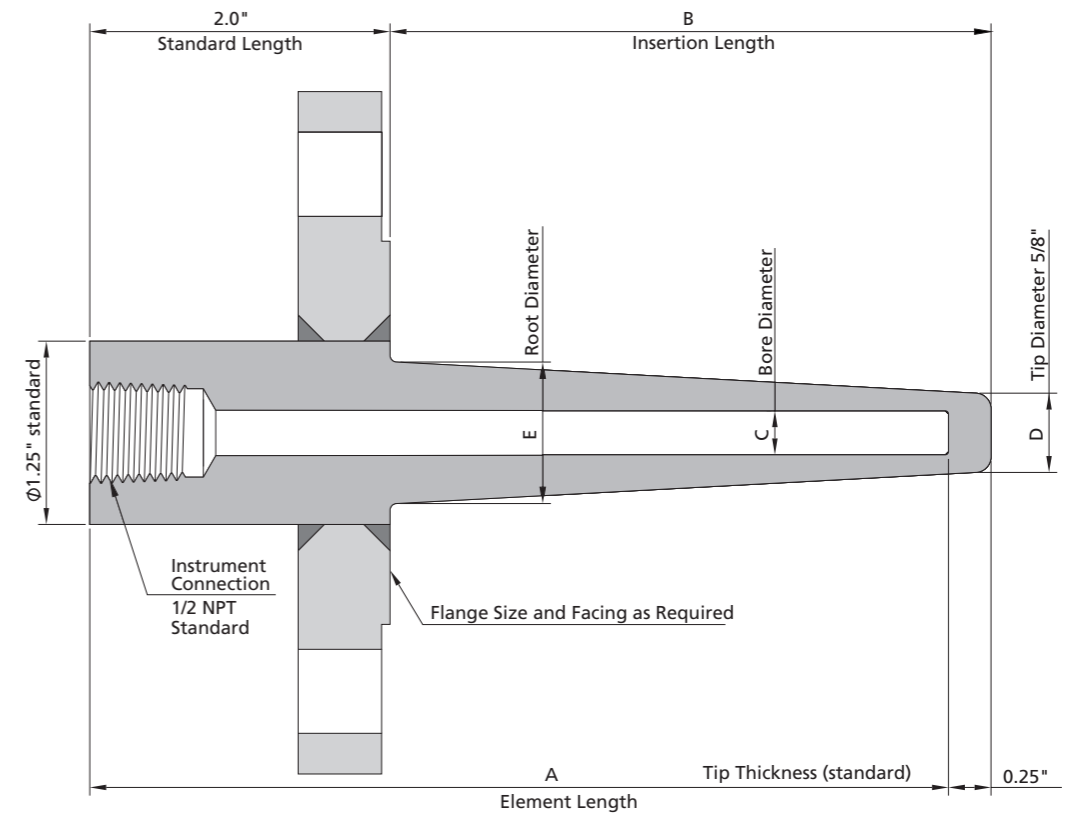
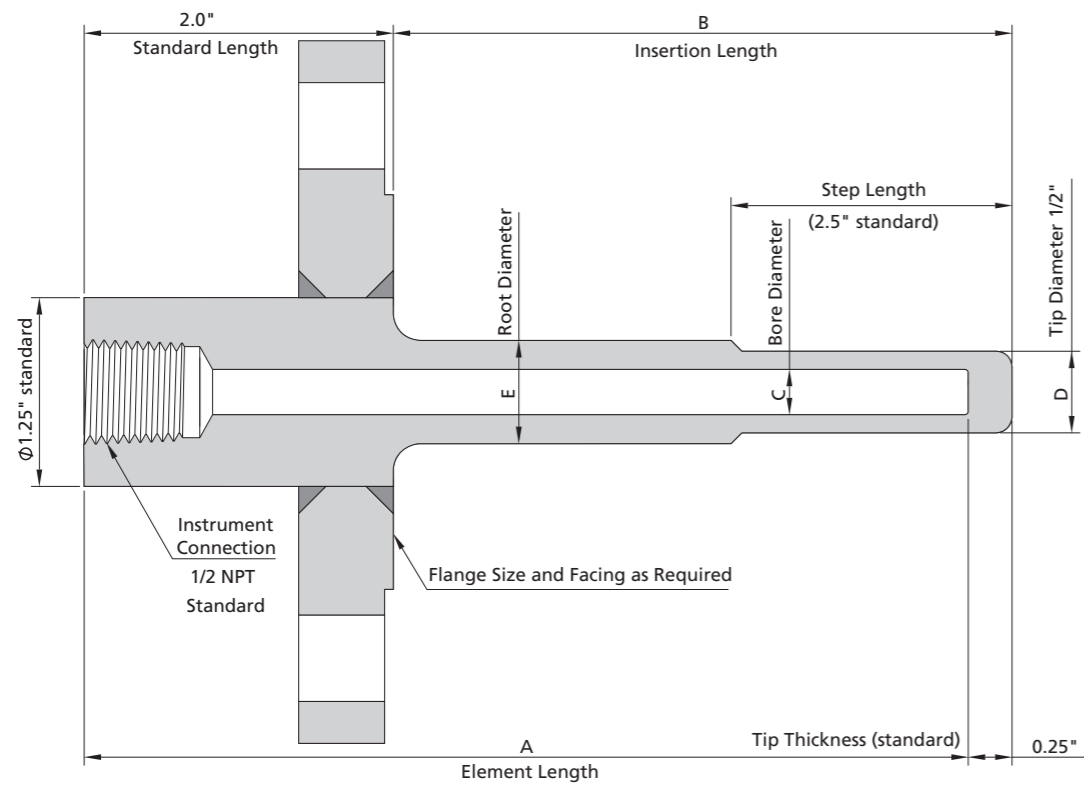


Standard Sizes

| Instrument Connection | Process Connection | Dimension, in. (mm) | | | |
|-----------------------|-------------------------------------|---------------------|--------------|------------|------------|
| | | C | E | B | A |
| 1/2 NPT Standard | 1 Flange Raised Face ANSI Class 150 | 0.260 (6.6) | 0.750 (19.0) | 2 (50.8) | 4 (101.6) |
| | | | | 4 (101.6) | 6 (152.4) |
| | | | | 7 (177.8) | 9 (228.6) |
| | | | | 10 (254.0) | 12 (304.8) |
| | | | | 13 (330.2) | 15 (381.0) |
| | | | | 16 (406.4) | 18 (457.2) |
| | | | | 22 (558.8) | 24 (609.6) |
| | 0.385 (9.8) | 0.875 (22.3) | 2 (50.8) | 4 (101.6) | |
| | | | 4 (101.6) | 6 (152.4) | |
| | | | 7 (177.8) | 9 (228.6) | |
| | | | 10 (254.0) | 12 (304.8) | |
| | | | 13 (330.2) | 15 (381.0) | |
| | | | 16 (406.4) | 18 (457.2) | |
| | | | 22 (558.8) | 24 (609.6) | |

Stepped

Tapered



Standard Sizes

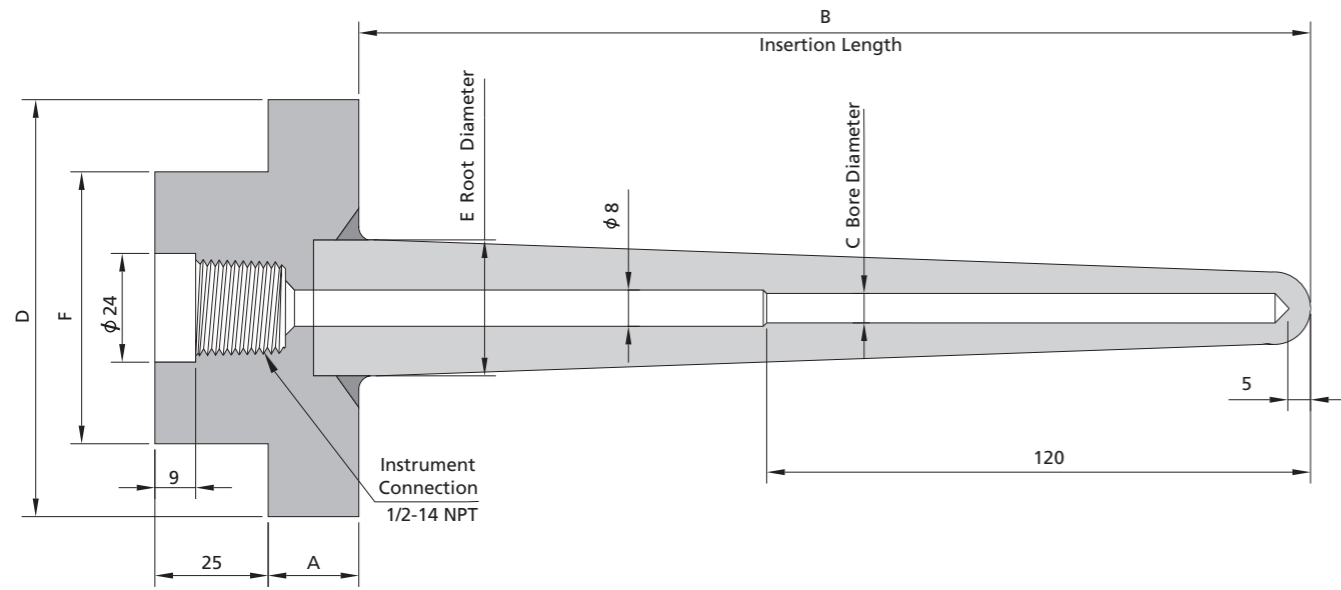
Standard Sizes

| Instrument Connection | Process Connection | Dimension, in. (mm) | | | |
|-----------------------|---|---------------------|--------------|------------|------------|
| | | C | E | B | A |
| 1/2 NPT Standard | 1 Flange Raised Face ANSI Class 150 | 0.260 (6.6) | 0.750 (19.0) | 2 (50.8) | 4 (101.6) |
| | | | | 4 (101.6) | 6 (152.4) |
| | | | | 7 (177.8) | 9 (228.6) |
| | | | | 10 (254.0) | 12 (304.8) |
| | | | | 13 (330.2) | 15 (381.0) |
| | | | | 16 (406.4) | 18 (457.2) |
| | | | | 22 (558.8) | 24 (609.6) |
| | 1 1/2 Flange Raised Face ANSI Class 150 | | | 2 (50.8) | 4 (101.6) |
| | | | | 4 (101.6) | 6 (152.4) |
| | | | | 7 (177.8) | 9 (228.6) |
| | | | | 10 (254.0) | 12 (304.8) |
| | | | | 13 (330.2) | 15 (381.0) |
| | | | | 16 (406.4) | 18 (457.2) |
| | | | | 22 (558.8) | 24 (609.6) |

| Instrument Connection | Process Connection | Dimension, in. (mm) | | | |
|-----------------------|---|---------------------|--------------|------------|------------|
| | | C | E | B | A |
| 1/2 NPT Standard | 1 Flange Raised Face ANSI Class 150 | 0.260 (6.6) | 1.060 (27.0) | 2 (50.8) | 4 (101.6) |
| | | | | 4 (101.6) | 6 (152.4) |
| | | | | 7 (177.8) | 9 (228.6) |
| | | | | 10 (254.0) | 12 (304.8) |
| | | | | 13 (330.2) | 15 (381.0) |
| | | | | 16 (406.4) | 18 (457.2) |
| | | | | 22 (558.8) | 24 (609.6) |
| | 1 1/2 Flange Raised Face ANSI Class 150 | | | 2 (50.8) | 4 (101.6) |
| | | | | 4 (101.6) | 6 (152.4) |
| | | | | 7 (177.8) | 9 (228.6) |
| | | | | 10 (254.0) | 12 (304.8) |
| | | | | 13 (330.2) | 15 (381.0) |
| | | | | 16 (406.4) | 18 (457.2) |
| | | | | 22 (558.8) | 24 (609.6) |

TJ series

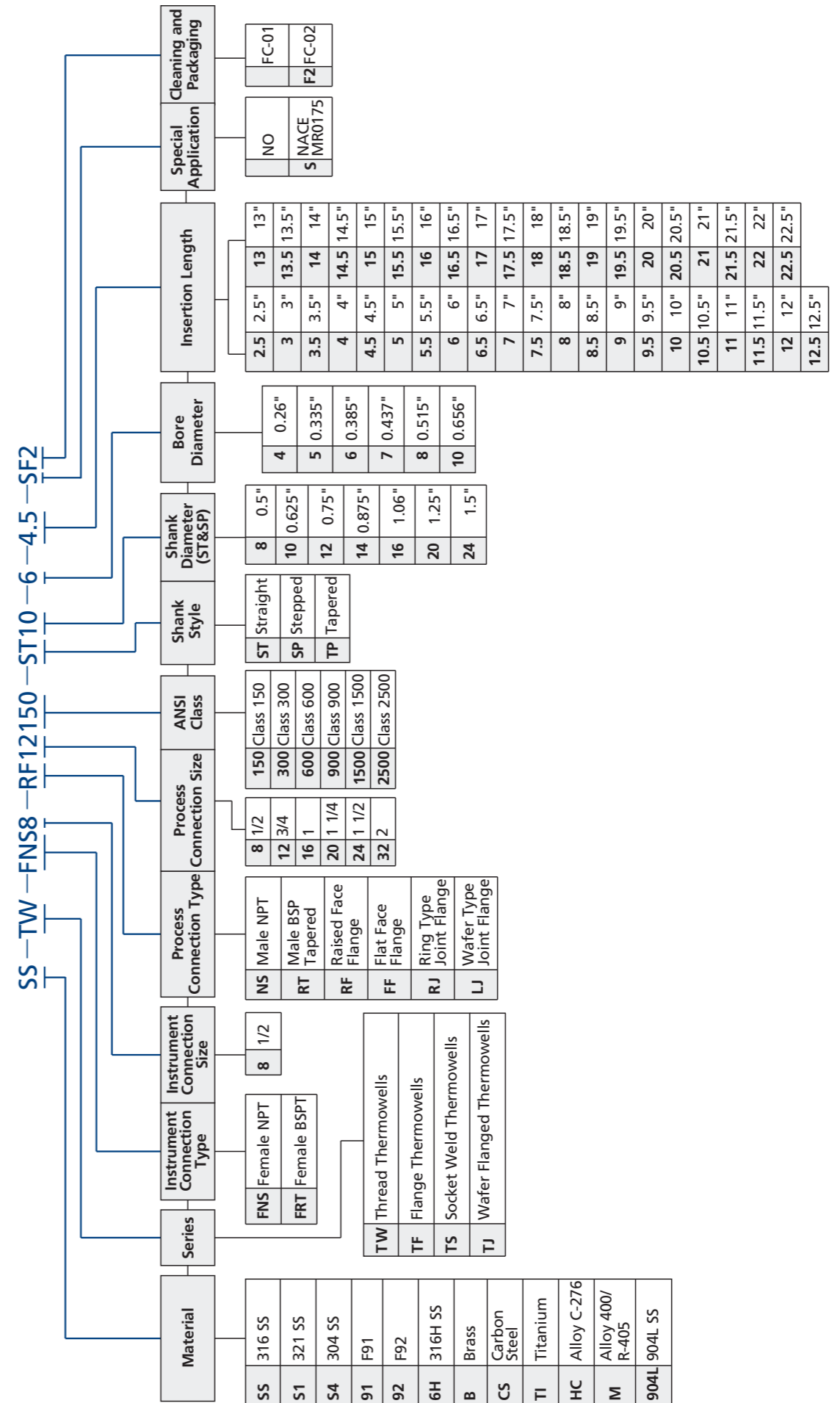
Tapered



Standard Sizes

| Instrument Connection | Process Connection | Dimension, mm | | | | | Application Liquid flow rate is less than 8m/s; Gas flow rate is less than 40m/s | |
|-----------------------|---|----------------|----|-----|----|----|--|--|
| | | C | E | B | A | D | | F |
| 1/2 NPT Normative | NPS 1 1/2 Flange Raised Face ANSI Class 300 | 6.5 | 30 | 215 | 15 | 73 | 48 | Only apply to installation of pipeline |
| | | | | 240 | | | | |
| | | | | 290 | | | | |
| | | | | 340 | | | | |
| | | | | 390 | | | | |
| | NPS 2 Flange Raised Face ANSI Class 300 | Base on Design | 20 | 92 | 60 | 60 | Only apply to installation of equipment and vessel | |
| | | | | | | | | 160 |

Ordering Information



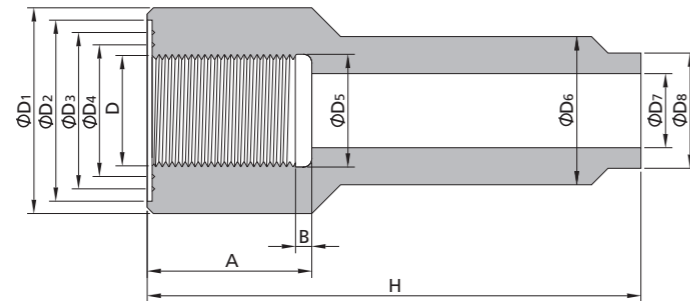
Bosses

BS Series

Features

- Maximum working pressure: 1500 psig (104 bar)
- Solid bar stock boss
- Variety of end connections

Dimensions



| End Connection | Dimensions (mm) | | | | | | | | | | Basic Ordering Number | |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|-----------------------|---------------------|
| | D | ØD ₁ | ØD ₂ | ØD ₃ | ØD ₄ | ØD ₅ | ØD ₆ | ØD ₇ | ØD ₈ | A | | B |
| M12 x 1.5 | 32 | 28 | 23 | 17 | 12.3 | 18 | 7 | 12 | 27 | 3 | 60 | -BS-FMS12-7-27-60 |
| | | | | | | | | | | | 120 | -BS-FMS12-7-27-120 |
| M16 x 1.5 | 36 | 32 | 27 | 21 | 16.3 | 18 | 9 | 14 | 27 | 3 | 60 | -BS-FMS16-9-27-60 |
| | | | | | | | | | | | 120 | -BS-FMS16-9-27-120 |
| M27 x 2.0 | 47 | 43 | 38 | 32 | 27.4 | 28 | 17 | 22 | 40 | 4 | 60 | -BS-FMS27-17-40-60 |
| | | | | | | | | | | | 120 | -BS-FMS27-17-40-120 |
| M33 x 2.0 | 55 | 51 | 44 | 38 | 33.4 | 36 | 24 | 30 | 40 | 5 | 60 | -BS-FMS33-24-40-60 |
| | | | | | | | | | | | 120 | -BS-FMS33-24-40-120 |
| 1/2 Female BSPP | 39 | 35 | 31 | 25 | 21.5 | 27 | 16 | 21 | 35 | 4 | 60 | -BS-FRP8-16-35-60 |
| | | | | | | | | | | | 120 | -BS-FRP8-16-35-120 |
| 3/4 Female BSPP | 47 | 43 | 38 | 32 | 27.0 | 31 | 20 | 25 | 40 | 4 | 60 | -BS-FRP12-20-40-60 |
| | | | | | | | | | | | 120 | -BS-FRP12-20-40-120 |
| 1 Female BSPP | 55 | 51 | 44 | 38 | 34.0 | 41 | 30 | 35 | 45 | 6 | 60 | -BS-FRP16-30-45-60 |
| | | | | | | | | | | | 120 | -BS-FRP16-30-45-120 |
| M27 x 2.0 | 47 | 43 | | | 27.4 | 28 | 14 | 22 | 20 | 4 | (80) | -BS-FMS27-14-20-80 |
| | | | | | | | | | | | (140) | -BS-FMS27-14-20-140 |

- The boss with H in brackets shall be used for the thermometer with movable male thread (such as bimetal therm).
- When the boss is used for bimetal therm, the sealing slot at D₃ and D₄ shall not be processed.
- The boss of M27 x 2 shall be used for TIC or RTD when a=40, used for bimetal therm when a=20.
- The boss with H=120 or 140 shall be used for thermo-insulation objects.
- Dimensions are for reference only and are subject to change.
- Sizes and types listed are standard. Other sizes and types are available on request.
- Materials same as TW series, add the material designator as a prefix to the basic ordering number to get the complete ordering number.

Ordering Information

