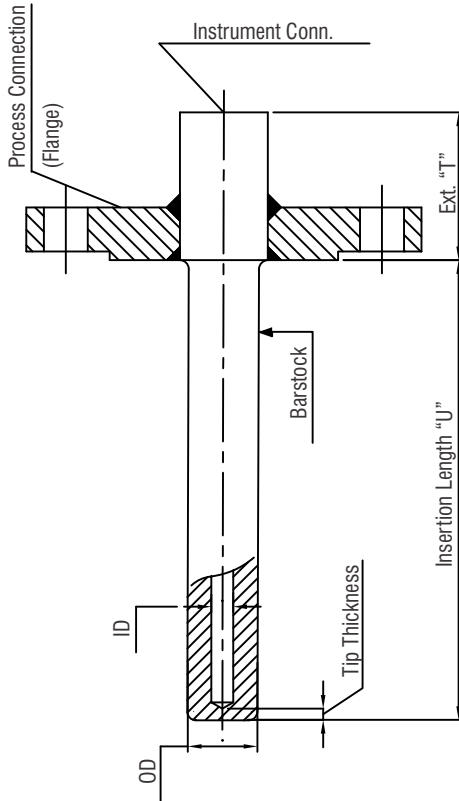


TW BF 01 - Barstock Flanged Type Thermowell (Straight)



| | Other Options |
|----|----------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 2 | IBR |
| 3 | Radiography Test (RT) for Bore Concentricity |
| 4 | Ultrasonic Test (UT) for Bore Concentricity |
| 5 | NACE to MR-01-75-/MR-01-03 |
| 6 | Radiography Test (RT) for weld joints |
| 7 | Full penetration weld |
| 8 | PWHT |
| 9 | H2 Service |
| 10 | 1 mm Ti sleeve |
| 11 | 1 mm Ni sleeve |
| 12 | 1 mm Hac sleeve |
| 13 | 0.4 mm Ta sleeve |
| 14 | 1 mm PTFE coating |
| 15 | 1 mm zirconium oxide coating |
| 16 | 0.5 mm Tungsten carbide coating |
| 17 | 1 mm Tungsten carbide coating |
| 18 | 1 mm stellite coating |

TWBF - 01

Thermowell Material

| | | | |
|------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | TI2 | Ti-II |
| N20 | Nickel 200 | | |

**Special material on Request

Thermowell Head Dia Pl. Specify in mm

Thermowell OD Pl. Specify in mm

Bore ID Pl. Specify in mm

Instrument Connection

| THREADED - T | | | | | |
|--------------|------------|-----------|-----------|-------|----------|
| Size | Code | Type | Code | M / F | Code |
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | Gas | GS | | |
| M20 | M20 | Pitch 1.5 | C | | |

Process Connection

| FLANGED - F | | | | | |
|-------------|-----------|--------|----------|--------|-----------|
| Size | Code | Rating | Code | Facing | Code |
| 1/2" | 15 | 150 | A | RF | RF |
| 3/4" | 20 | 300 | B | FF | FF |
| 1" | 25 | 600 | C | RTJ | RJ |
| 1-1/2" | 40 | 900 | D | ST | ST |
| 2" | 50 | 1500 | E | SG | SG |
| 3" | 80 | 2500 | F | LT | LT |
| | | | | LG | LG |

Flange Material

| | | | |
|------------|--------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | S6L | SS316L |
| CST | CS | HCC | Hastelloy® C-276 |
| 410 | SS410 | HCB | Hastelloy® B |
| S7S | SS317 | MN4 | Monel® 400 |
| S7L | SS317L | MN5 | Monel® 500 |
| TI2 | Ti-II | N20 | Nickel 200 |

**Special material on Request

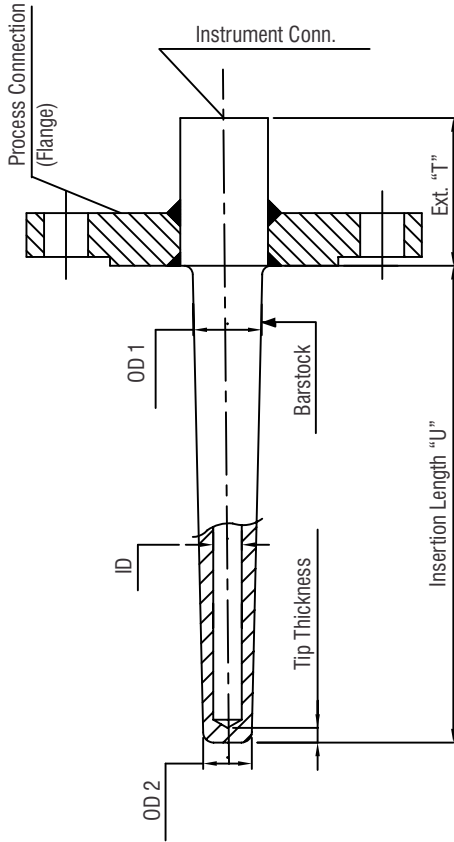
Insertion Length ("U") Pl. Specify in mm

Extension Length ("T") Pl. Specify in mm

Tip Thickness Pl. Specify in mm

Ordering Example:- TWBF01-S6S-32-16-7-T15NTF-F25ARF-S6S-280-60-5-1

TW BF 02 - Barstock Flanged Type Thermowell (Taper)



| Other Options | |
|---------------|----------------------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 2 | IBR |
| 3 | Radiography Test (RT) for Bore Concentricity |
| 4 | Ultrasonic Test (UT) for Bore Concentricity |
| 5 | NACE to MR-01-75-/MR-01-03 |
| 6 | Radiography Test (RT) for weld joints |
| 7 | Full penetration weld |
| 8 | PWHT |
| 9 | H2 Service |
| 14 | 1 mm PTFE coating |
| 15 | 1 mm zirconium oxide coating |
| 16 | 0.5 mm Tungsten carbide coating |
| 17 | 1 mm Tungsten carbide coating |
| 18 | 1 mm stellite coating |
| 19 | Tapered for tail portion only (Pl. Specify length in mm) |

TWBF - 02

Thermowell Material

| | | | |
|------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | TI2 | Ti-II |
| N20 | Nickel 200 | | |

**Special material on Request

Head Dia

Pl. Specify in mm

OD 1 (Cold End)

Pl. Specify in mm

OD 2 (Hot End)

Pl. Specify in mm

Bore ID

Pl. Specify in mm

Instrument Connection

| THREADED - T | | | | | |
|--------------|------------|-----------|-----------|-------|----------|
| Size | Code | Type | Code | M / F | Code |
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | Gas | GS | | |
| M20 | M20 | Pitch 1.5 | C | | |

Process Connection

| FLANGED - F | | | | | |
|-------------|-----------|--------|----------|--------|-----------|
| Size | Code | Rating | Code | Facing | Code |
| 1/2" | 15 | 150 | A | RF | RF |
| 3/4" | 20 | 300 | B | FF | FF |
| 1" | 25 | 600 | C | RTJ | RJ |
| 1-1/2" | 40 | 900 | D | ST | ST |
| 2" | 50 | 1500 | E | SG | SG |
| 3" | 80 | 2500 | F | LT | LT |
| | | | | LG | LG |

Flange Material

| | | | |
|------------|--------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | S6L | SS316L |
| CST | CS | HCC | Hastelloy® C-276 |
| 410 | SS410 | HCB | Hastelloy® B |
| S7S | SS317 | MN4 | Monel® 400 |
| S7L | SS317L | MN5 | Monel® 500 |
| TI2 | Ti-II | N20 | Nickel 200 |

**Special material on Request

Insertion Length ("U")

Pl. Specify in mm

Extension Length ("T")

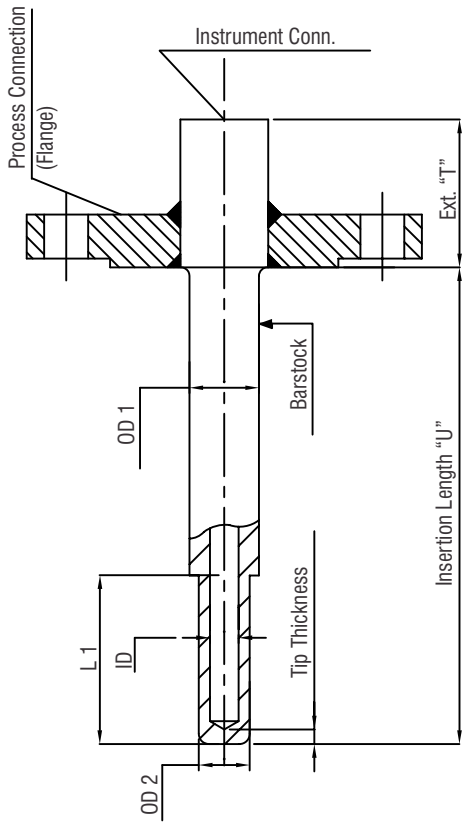
Pl. Specify in mm

Tip Thickness

Pl. Specify in mm

Ordering Example:- TWBF02-S6L-34-22-18-11-T15NTF-F40BRF-S6L-320-65.6-4-19(150)

TW BF 03 - Barstock Flanged Type Thermowell (Stepped)



| Other Options | |
|---------------|----------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 2 | IBR |
| 3 | Radiography Test (RT) for Bore Concentricity |
| 4 | Ultrasonic Test (UT) for Bore Concentricity |
| 5 | NACE to MR-01-75/-MR-01-03 |
| 6 | Radiography Test (RT) for weld joints |
| 7 | Full penetration weld |
| 8 | PWHT |
| 9 | H2 Service |
| 14 | 1 mm PTFE coating |
| 16 | 0.5 mm Tungsten carbide coating |
| 17 | 1 mm Tungsten carbide coating |
| 18 | 1 mm stellite coating |

TWBF - 03

Thermowell Material

| | | | |
|------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | TI2 | Ti-II |
| N20 | Nickel 200 | | |

**Special material on Request

Head Dia

Pl. Specify in mm

OD 1 (Cold End)

Pl. Specify in mm

OD 2 (Hot End)

Pl. Specify in mm

Bore ID

Pl. Specify in mm

Instrument Connection

| THREADED - T | | | | | |
|--------------|------------|-----------|-----------|-------|----------|
| Size | Code | Type | Code | M / F | Code |
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | Gas | GS | | |
| M20 | M20 | Pitch 1.5 | C | | |

Process Connection

| FLANGED - F | | | | | |
|-------------|-----------|--------|----------|--------|-----------|
| Size | Code | Rating | Code | Facing | Code |
| 1/2" | 15 | 150 | A | RF | RF |
| 3/4" | 20 | 300 | B | FF | FF |
| 1" | 25 | 600 | C | RTJ | RJ |
| 1-1/2" | 40 | 900 | D | ST | ST |
| 2" | 50 | 1500 | E | SG | SG |
| 3" | 80 | 2500 | F | LT | LT |
| | | | | LG | LG |

Flange Material

| | | | |
|------------|--------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | S6L | SS316L |
| CST | CS | HCC | Hastelloy® C-276 |
| 410 | SS410 | HCB | Hastelloy® B |
| S7S | SS317 | MN4 | Monel® 400 |
| S7L | SS317L | MN5 | Monel® 500 |
| TI2 | Ti-II | N20 | Nickel 200 |

**Special material on Request

Insertion Length ("U")

Pl. Specify in mm

Stepped Length ("L1")

Pl. Specify in mm

Extension Length ("T")

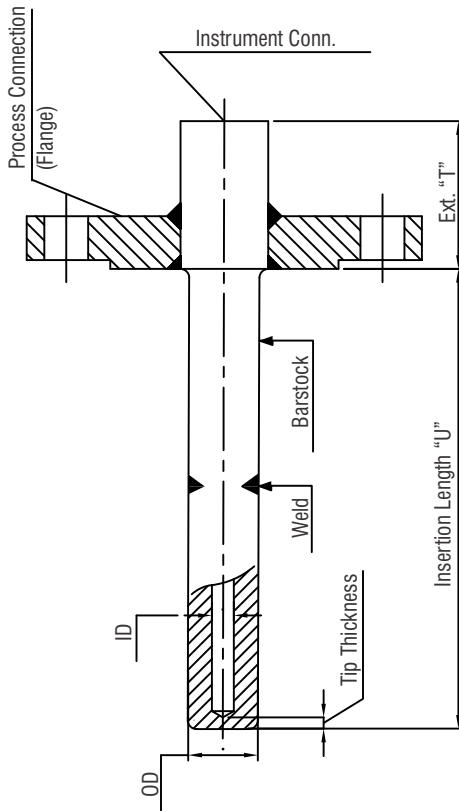
Pl. Specify in mm

Tip Thickness

Pl. Specify in mm

Ordering Example:- TWBF03-MN4-32-24-18-11-T15NTF-F40CRF-MN4-280-75-70-5-0

TW BF 04 - Multiple Barstock Flanged Type Thermowell



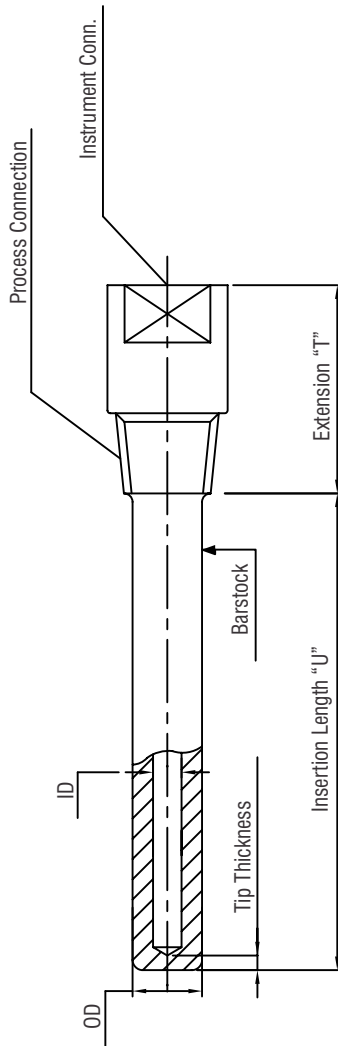
| Other Options | |
|---------------|----------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 2 | IBR |
| 3 | Radiography Test (RT) for Bore Concentricity |
| 4 | Ultrasonic Test (UT) for Bore Concentricity |
| 5 | NACE to MR-01-75-/-MR-01-03 |
| 6 | Radiography Test (RT) for weld joints |
| 7 | Full penetration weld |
| 8 | PWHT |
| 9 | H2 Service |
| 10 | 1 mm Ti sleeve |
| 11 | 1 mm Ni sleeve |
| 12 | 1 mm Hac sleeve |
| 13 | 0.4 mm Ta sleeve |
| 14 | 1 mm PTFE coating |
| 15 | 1 mm zirconium oxide coating |
| 16 | 0.5 mm Tungsten carbide coating |
| 17 | 1 mm Tungsten carbide coating |
| 18 | 1 mm stellite coating |

TWBF - 04

| Thermowell Material | | <table border="1"> <tbody> <tr><td>S4S</td><td>SS304</td><td>825</td><td>Incoloy® 825</td></tr> <tr><td>S6S</td><td>SS316</td><td>600</td><td>Inconel® 600</td></tr> <tr><td>310</td><td>SS310</td><td>800</td><td>Incoloy® 800</td></tr> <tr><td>446</td><td>SS446</td><td>321</td><td>SS321</td></tr> <tr><td>S4L</td><td>SS304L</td><td>KAN</td><td>Kanthal</td></tr> <tr><td>S6L</td><td>SS316L</td><td>HCC</td><td>Hastelloy® C-276</td></tr> <tr><td>CST</td><td>CS</td><td>HCB</td><td>Hastelloy® B</td></tr> <tr><td>410</td><td>SS410</td><td>MN4</td><td>Monel® 400</td></tr> <tr><td>S7S</td><td>SS317</td><td>MN5</td><td>Monel® 500</td></tr> <tr><td>S7L</td><td>SS317L</td><td>TI2</td><td>Ti-II</td></tr> <tr><td>N20</td><td colspan="3">Nickel 200</td></tr> <tr><td colspan="4" style="text-align: center;">**Special material on Request</td></tr> </tbody> </table> | S4S | SS304 | 825 | Incoloy® 825 | S6S | SS316 | 600 | Inconel® 600 | 310 | SS310 | 800 | Incoloy® 800 | 446 | SS446 | 321 | SS321 | S4L | SS304L | KAN | Kanthal | S6L | SS316L | HCC | Hastelloy® C-276 | CST | CS | HCB | Hastelloy® B | 410 | SS410 | MN4 | Monel® 400 | S7S | SS317 | MN5 | Monel® 500 | S7L | SS317L | TI2 | Ti-II | N20 | Nickel 200 | | | **Special material on Request | | | | | | | | | |
|-------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------|------------|--------------|------------|-------|------------|--------------|------------|-------|------------|--------------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|------------------|------------|-----------|------------|--------------|------------|-----------|------------|------------|------------|-----------|------------|------------|------------|-----------|------------|------------|-------------------------------|------------|-----|------------|-------------------------------|----------|----|-----------|--|--|--|--|----|-----------|
| S4S | SS304 | 825 | Incoloy® 825 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S6S | SS316 | 600 | Inconel® 600 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 310 | SS310 | 800 | Incoloy® 800 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 446 | SS446 | 321 | SS321 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S4L | SS304L | KAN | Kanthal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S6L | SS316L | HCC | Hastelloy® C-276 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CST | CS | HCB | Hastelloy® B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 410 | SS410 | MN4 | Monel® 400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S7S | SS317 | MN5 | Monel® 500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S7L | SS317L | TI2 | Ti-II | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N20 | Nickel 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Special material on Request | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thermowell Head Dia | | Pl. Specify in mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thermowell OD | | Pl. Specify in mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bore ID | | Pl. Specify in mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Instrument Connection | | <table border="1"> <thead> <tr><th colspan="6">THREADED - T</th></tr> <tr><th>Size</th><th>Code</th><th>Type</th><th>Code</th><th>M / F</th><th>Code</th></tr> </thead> <tbody> <tr><td>1/4"</td><td>06</td><td>NPS</td><td>NS</td><td>M</td><td>M</td></tr> <tr><td>3/8"</td><td>10</td><td>NPT</td><td>NT</td><td>F</td><td>F</td></tr> <tr><td>1/2"</td><td>15</td><td>BSP</td><td>BP</td><td></td><td></td></tr> <tr><td>3/4"</td><td>20</td><td>BSPT</td><td>BT</td><td></td><td></td></tr> <tr><td>1"</td><td>25</td><td>Gas</td><td>GS</td><td></td><td></td></tr> <tr><td>M20</td><td>M20</td><td>Pitch 1.5</td><td>C</td><td></td><td></td></tr> </tbody> </table> | THREADED - T | | | | | | Size | Code | Type | Code | M / F | Code | 1/4" | 06 | NPS | NS | M | M | 3/8" | 10 | NPT | NT | F | F | 1/2" | 15 | BSP | BP | | | 3/4" | 20 | BSPT | BT | | | 1" | 25 | Gas | GS | | | M20 | M20 | Pitch 1.5 | C | | | | | | | | |
| THREADED - T | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Size | Code | Type | Code | M / F | Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1/4" | 06 | NPS | NS | M | M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3/8" | 10 | NPT | NT | F | F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1/2" | 15 | BSP | BP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3/4" | 20 | BSPT | BT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1" | 25 | Gas | GS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M20 | M20 | Pitch 1.5 | C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Process Connection | | <table border="1"> <thead> <tr><th colspan="6">FLANGED - F</th></tr> <tr><th>Size</th><th>Code</th><th>Rating</th><th>Code</th><th>Facing</th><th>Code</th></tr> </thead> <tbody> <tr><td>1/2"</td><td>15</td><td>150</td><td>A</td><td>RF</td><td>RF</td></tr> <tr><td>3/4"</td><td>20</td><td>300</td><td>B</td><td>FF</td><td>FF</td></tr> <tr><td>1"</td><td>25</td><td>600</td><td>C</td><td>RTJ</td><td>RJ</td></tr> <tr><td>1-1/2"</td><td>40</td><td>900</td><td>D</td><td>ST</td><td>ST</td></tr> <tr><td>2"</td><td>50</td><td>1500</td><td>E</td><td>SG</td><td>SG</td></tr> <tr><td>3"</td><td>80</td><td>2500</td><td>F</td><td>LT</td><td>LT</td></tr> <tr><td></td><td></td><td></td><td></td><td>LG</td><td>LG</td></tr> </tbody> </table> | FLANGED - F | | | | | | Size | Code | Rating | Code | Facing | Code | 1/2" | 15 | 150 | A | RF | RF | 3/4" | 20 | 300 | B | FF | FF | 1" | 25 | 600 | C | RTJ | RJ | 1-1/2" | 40 | 900 | D | ST | ST | 2" | 50 | 1500 | E | SG | SG | 3" | 80 | 2500 | F | LT | LT | | | | | LG | LG |
| FLANGED - F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Size | Code | Rating | Code | Facing | Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1/2" | 15 | 150 | A | RF | RF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3/4" | 20 | 300 | B | FF | FF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1" | 25 | 600 | C | RTJ | RJ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-1/2" | 40 | 900 | D | ST | ST | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2" | 50 | 1500 | E | SG | SG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3" | 80 | 2500 | F | LT | LT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | LG | LG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flange Material | | <table border="1"> <tbody> <tr><td>S4S</td><td>SS304</td><td>825</td><td>Incoloy® 825</td></tr> <tr><td>S6S</td><td>SS316</td><td>600</td><td>Inconel® 600</td></tr> <tr><td>310</td><td>SS310</td><td>800</td><td>Incoloy® 800</td></tr> <tr><td>446</td><td>SS446</td><td>321</td><td>SS321</td></tr> <tr><td>S4L</td><td>SS304L</td><td>S6L</td><td>SS316L</td></tr> <tr><td>CST</td><td>CS</td><td>HCC</td><td>Hastelloy® C-276</td></tr> <tr><td>410</td><td>SS410</td><td>HCB</td><td>Hastelloy® B</td></tr> <tr><td>S7S</td><td>SS317</td><td>MN4</td><td>Monel® 400</td></tr> <tr><td>S7L</td><td>SS317L</td><td>MN5</td><td>Monel® 500</td></tr> <tr><td>TI2</td><td>Ti-II</td><td>N20</td><td>Nickel 200</td></tr> <tr><td colspan="4" style="text-align: center;">**Special material on Request</td></tr> </tbody> </table> | S4S | SS304 | 825 | Incoloy® 825 | S6S | SS316 | 600 | Inconel® 600 | 310 | SS310 | 800 | Incoloy® 800 | 446 | SS446 | 321 | SS321 | S4L | SS304L | S6L | SS316L | CST | CS | HCC | Hastelloy® C-276 | 410 | SS410 | HCB | Hastelloy® B | S7S | SS317 | MN4 | Monel® 400 | S7L | SS317L | MN5 | Monel® 500 | TI2 | Ti-II | N20 | Nickel 200 | **Special material on Request | | | | | | | | | | | | | |
| S4S | SS304 | 825 | Incoloy® 825 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S6S | SS316 | 600 | Inconel® 600 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 310 | SS310 | 800 | Incoloy® 800 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 446 | SS446 | 321 | SS321 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S4L | SS304L | S6L | SS316L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CST | CS | HCC | Hastelloy® C-276 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 410 | SS410 | HCB | Hastelloy® B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S7S | SS317 | MN4 | Monel® 400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S7L | SS317L | MN5 | Monel® 500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TI2 | Ti-II | N20 | Nickel 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Special material on Request | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Insertion Length ("U") | | Pl. Specify in mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extension Length ("T") | | Pl. Specify in mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tip Thickness | | Pl. Specify in mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Ordering Example:- TWBF04-S6S-32-16-7-T15NTF-F25ARF-S6S-800-50-5-0

TW BT 01 - Barstock Threaded Type Thermowell (Straight)



| | Other Options |
|---|----------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 2 | IBR |
| 3 | Radiography Test (RT) for Bore Concentricity |
| 4 | Ultrasonic Test (UT) for Bore Concentricity |
| 5 | NACE to MR-01-75/-MR-01-03 |

TWBT - 01

| | | | |
|-------------------------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | Ti2 | Ti-II |
| N20 | Nickel 200 | | |
| **Special material on Request | | | |

Thermowell Material

Thermowell Head Dia

Thermowell OD

Bore ID

Instrument Connection

Process Connection

Insertion Length ("U")

Extension Length ("T")

Tip Thickness

Pl. Specify in mm*

Pl. Specify in mm

Pl. Specify in mm

| THREADED - T | | | | | |
|--------------|------------|-----------|-----------|-------|----------|
| Size | Code | Type | Code | M / F | Code |
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | JIS-PF | PF | | |
| 1-1/2" | 40 | JIS-PT | PT | | |
| 2" | 50 | Gas | GS | | |
| M20 | M20 | R | RR | | |
| M24 | M24 | Rp | RP | | |
| M27 | M27 | Pitch 1.5 | C | | |
| M33 | M33 | Pitch 2 | D | | |

Pl. Specify in mm

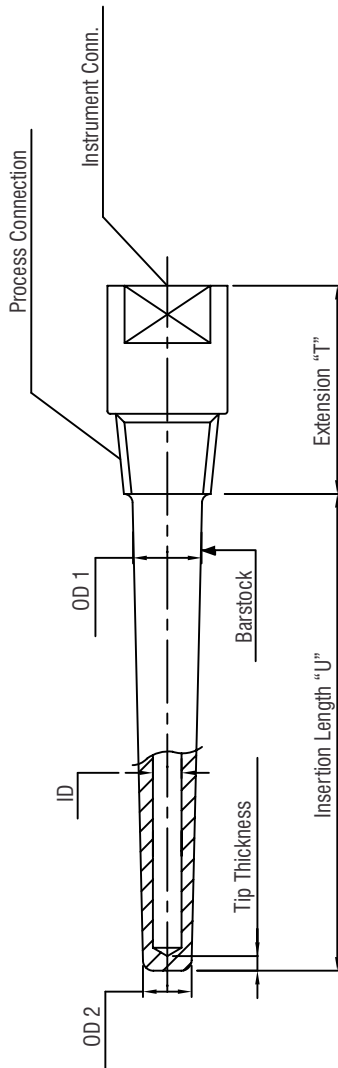
Pl. Specify in mm

Pl. Specify in mm

* for Hexagonal Head, please specify the AF size in mm e.g. code: HEX36AF

Ordering Example:- TWBT01-S6S-32-18-11-T15NTF-T20BPM-250-50-5-2

TW BT 02 - Barstock Threaded Type Thermowell (Taper)



| Other Options | |
|---------------|----------------------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 2 | IBR |
| 3 | Radiography Test (RT) for Bore Concentricity |
| 4 | Ultrasonic Test (UT) for Bore Concentricity |
| 5 | NACE to MR-01-75/-MR-01-03 |
| 19 | Tapered for tail portion only (Pl. Specify length in mm) |

TWBT - 02

| | | | |
|-------------------------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | TI2 | Ti-II |
| N20 | Nickel 200 | | |
| **Special material on Request | | | |

Thermowell Material

Thermowell Head Dia

Thermowell OD 1 (Cold End)

Thermowell OD 2 (Hot End)

Bore ID

Instrument Connection

Process Connection

Insertion Length ("U")

Extension Length ("T")

Tip Thickness

Pl. Specify in mm*

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

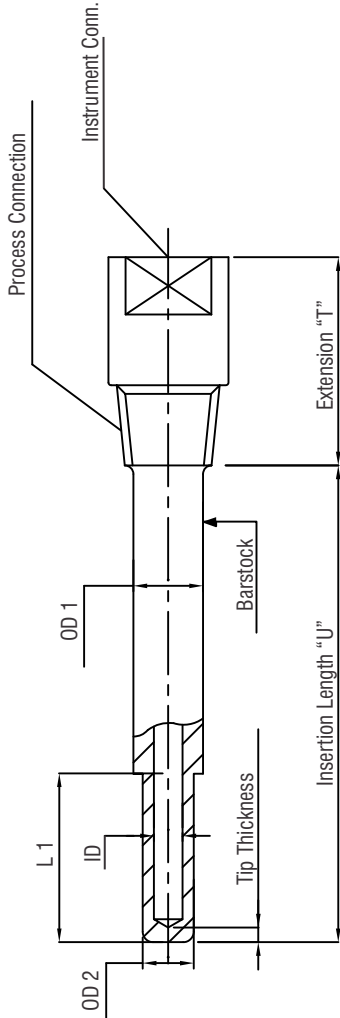
Pl. Specify in mm

| THREADED - T | | | | | |
|--------------|------------|-----------|-----------|-------|----------|
| Size | Code | Type | Code | M / F | Code |
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | JIS-PF | PF | | |
| 1-1/2" | 40 | JIS-PT | PT | | |
| 2" | 50 | Gas | GS | | |
| M20 | M20 | R | RR | | |
| M24 | M24 | Rp | RP | | |
| M27 | M27 | Pitch 1.5 | C | | |
| M33 | M33 | Pitch 2 | D | | |

* for Hexagonal Head, please specify the AF size in mm e.g. code: HEX36AF

Ordering Example:- TWBT02-S6S-HEX36AF-24-20-11-T15NTF-TM33DM-280-60-5-0

TW BT 03 - Barstock Threaded Type Thermowell (Stepped)



| Other Options | |
|---------------|----------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 2 | IBR |
| 3 | Radiography Test (RT) for Bore Concentricity |
| 4 | Ultrasonic Test (UT) for Bore Concentricity |
| 5 | NACE to MR-01-75/-MR-01-03 |

TWBT - 03

| | | | |
|-------------------------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | Ti2 | Ti-II |
| N20 | Nickel 200 | | |
| **Special material on Request | | | |

Thermowell Material

Thermowell Head Dia

Thermowell OD 1 (Cold End)

Thermowell OD 2 (Hot End)

Bore ID

Instrument Connection

Process Connection

Insertion Length ("U")

Stepped Length ("L1")

Extension Length ("T")

Tip Thickness

Pl. Specify in mm*

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

THREADED - T

| Size | Code | Type | Code | M / F | Code |
|--------|------------|-----------|-----------|-------|----------|
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | JIS-PF | PF | | |
| 1-1/2" | 40 | JIS-PT | PT | | |
| 2" | 50 | Gas | GS | | |
| M20 | M20 | R | RR | | |
| M24 | M24 | Rp | RP | | |
| M27 | M27 | Pitch 1.5 | C | | |
| M33 | M33 | Pitch 2 | D | | |

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

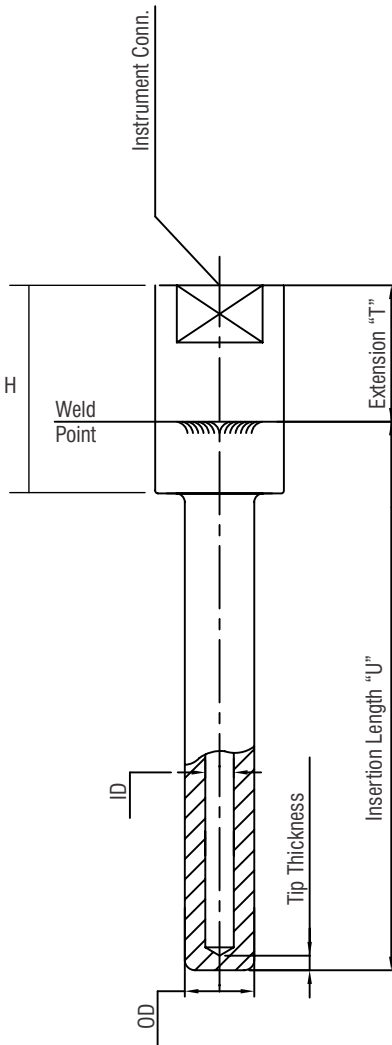
* for Hexagonal Head, please specify the AF size in mm e.g. code: HEX36AF

Ordering Example:- TWBT03-S6S-36-24-18-11-T15NTF-T25NTM-300-100-60-5-1

TW BW 01 - Barstock Weld in Thermowell (Straight)



TWBW - 01



| | Other Options |
|---|-------------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 2 | IBR |
| 3 | Radiography Test (RT) for Bore Concentricity |
| 4 | Ultrasonic Test (UT) for Bore Concentricity |
| 5 | NACE to MR-01-75/-MR-01-03 |

| | | | |
|-------------------------------|------------|------------|------------------------------|
| S4S | SS304 | 825 | Incoloy [®] 825 |
| S6S | SS316 | 600 | Inconel [®] 600 |
| 310 | SS310 | 800 | Incoloy [®] 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy [®] C-276 |
| CST | CS | HCB | Hastelloy [®] B |
| 410 | SS410 | MN4 | Monel [®] 400 |
| S7S | SS317 | MN5 | Monel [®] 500 |
| S7L | SS317L | Ti2 | Ti-II |
| N20 | Nickel 200 | | |
| **Special material on Request | | | |

Thermowell
Material

Thermowell
Head Dia

Thermowell OD

Bore ID

Instrument
Connection

Process
Connection

Insertion
Length ("U")

Extension
Length ("T")

Head
Length (H)

Tip Thickness

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

THREADED - T

| Size | Code | Type | Code | M / F | Code |
|------|------------|-----------|-----------|-------|----------|
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | JIS-PF | PF | | |
| M20 | M20 | JIS-PT | PT | | |
| | | Gas | GS | | |
| | | R | RR | | |
| | | Rp | RP | | |
| | | Pitch 1.5 | C | | |

Weld in

Pl. Specify in mm

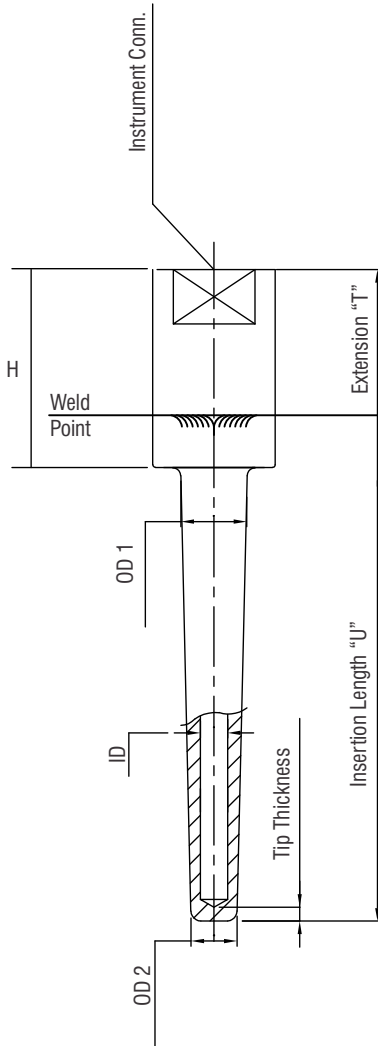
Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Ordering Example:- TWBW01-S6S-32-24-11-T15NTF-Weld in-250-50-75-6.5-0

TW BW 02 - Barstock Weld in Thermowell (Taper)



| Other Options | |
|---------------|----------------------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 2 | IBR |
| 3 | Radiography Test (RT) for Bore Concentricity |
| 4 | Ultrasonic Test (UT) for Bore Concentricity |
| 5 | NACE to MR-01-75/-MR-01-03 |
| 19 | Tapered for tail portion only (Pl. Specify length in mm) |

TWBW - 02

| | | | |
|-------------------------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | TI2 | Ti-II |
| N20 | Nickel 200 | | |
| **Special material on Request | | | |

Thermowell Material

Thermowell Head Dia

Thermowell OD 1 (Cold End)

Thermowell OD 2 (Hot End)

Bore ID

Instrument Connection

Process Connection

Insertion Length ("U")

Extension Length ("T")

Head Length (H)

Tip Thickness

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

THREADED - T

| Size | Code | Type | Code | M / F | Code |
|------|------------|-----------|-----------|-------|----------|
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | JIS-PF | PF | | |
| M20 | M20 | JIS-PT | PT | | |
| | | Gas | GS | | |
| | | R | RR | | |
| | | Rp | RP | | |
| | | Pitch 1.5 | C | | |

Weld in

Pl. Specify in mm

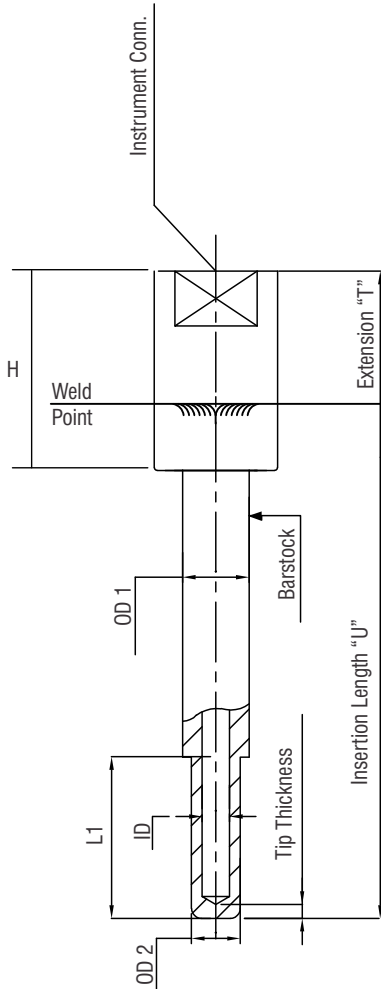
Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Ordering Example:- TWBW02-S6S-34-26-20-11-T15NTF-Weld in-300-45-75-6-2

TW BW 03 - Barstock Weld in Thermowell (Stepped)



| | Other Options |
|---|-------------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 2 | IBR |
| 3 | Radiography Test (RT) for Bore Concentricity |
| 4 | Ultrasonic Test (UT) for Bore Concentricity |
| 5 | NACE to MR-01-75/-MR-01-03 |

TWBW - 03

| | | | |
|------------|------------|------------|------------------------------|
| S4S | SS304 | 825 | Incoloy [®] 825 |
| S6S | SS316 | 600 | Inconel [®] 600 |
| 310 | SS310 | 800 | Incoloy [®] 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy [®] C-276 |
| CST | CS | HCB | Hastelloy [®] B |
| 410 | SS410 | MN4 | Monel [®] 400 |
| S7S | SS317 | MN5 | Monel [®] 500 |
| S7L | SS317L | TI2 | Ti-II |
| N20 | Nickel 200 | | |

**Special material on Request

Thermowell
Material

Thermowell
Head Dia

Thermowell
OD 1 (Cold End)

Thermowell
OD 2 (Hot End)

Bore ID

Instrument
Connection

Process
Connection

Insertion
Length ("U")

Stepped
Length ("L1")

Extension
Length ("T")

Head
Length (H)

Tip Thickness

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

THREADED - T

| Size | Code | Type | Code | M / F | Code |
|------|------|-----------|------|-------|------|
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | JIS-PF | PF | | |
| M20 | M20 | JIS-PT | PT | | |
| | | Gas | GS | | |
| | | R | RR | | |
| | | Rp | RP | | |
| | | Pitch 1.5 | C | | |

WELD IN

Pl. Specify in mm

Pl. Specify in mm

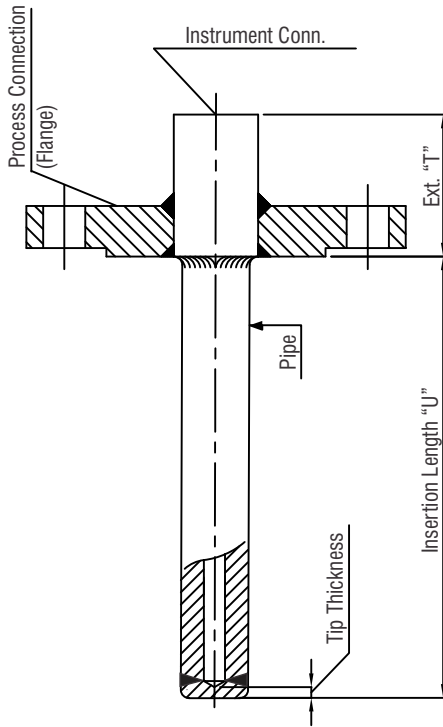
Pl. Specify in mm

Pl. Specify in mm

Pl. Specify in mm

Ordering Example:- TWBW03-S6S-34-26-20-11-T15NTF-Weld in-250-100-50-80-5-0

TW FF 01 - Fabricated Flanged Type Thermowell



| Other Options | |
|---------------|------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 5 | NACE to MR-01-75/-MR-01-03 |
| 6 | Radiography Test (RT) for weld joints |
| 7 | Full penetration weld |
| 8 | PWHT |
| 9 | H2 Service |
| 10 | 1 mm Ti sleeve |
| 11 | 1 mm Ni sleeve |
| 12 | 1 mm Hac sleeve |
| 13 | 0.4 mm Ta sleeve |
| 14 | 1 mm PTFE coating |
| 15 | 1 mm zirconium oxide coating |
| 16 | 0.5 mm Tungsten carbide coating |
| 17 | 1 mm Tungsten carbide coating |
| 18 | 1 mm stellite coating |

TWFF - 01

Thermowell Material

| | | | |
|-------------------------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | TI2 | Ti-II |
| N20 | Nickel 200 | | |
| **Special material on Request | | | |

Pipe Size & schedule

| | | | |
|--------------|-----------------|------------|------------|
| 15A | ½" Sch 40 | 15B | ½" Sch 80 |
| 15C | ½" Sch 160 | 20A | ¾" Sch 40 |
| 20B | ¾" Sch 80 | 25A | 1" Sch 40 |
| 25B | 1" Sch 80 | 25C | 1" Sch 160 |
| 10x7 | 10 mm x 7 mm | | |
| 14x9 | 14 mm x 9 mm | | |
| Other | Consult Factory | | |

Instrument Connection

| THREADED - T | | | | | |
|--------------|------------|-----------|-----------|-------|----------|
| Size | Code | Type | Code | M / F | Code |
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | Gas | GS | | |
| M20 | M20 | Pitch 1.5 | C | | |

Process Connection

| FLANGED - F | | | | | |
|-------------|-----------|--------|----------|--------|-----------|
| Size | Code | Rating | Code | Facing | Code |
| 1/2" | 15 | 150 | A | RF | RF |
| 3/4" | 20 | 300 | B | FF | FF |
| 1" | 25 | 600 | C | RTJ | RJ |
| 1-1/2" | 40 | 900 | D | ST | ST |
| 2" | 50 | 1500 | E | SG | SG |
| 3" | 80 | 2500 | F | LT | LT |
| | | | | LG | LG |

Flange Material

| | | | |
|-------------------------------|--------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | S6L | SS316L |
| CST | CS | HCC | Hastelloy® C-276 |
| 410 | SS410 | HCB | Hastelloy® B |
| S7S | SS317 | MN4 | Monel® 400 |
| S7L | SS317L | MN5 | Monel® 500 |
| TI2 | Ti-II | N20 | Nickel 200 |
| **Special material on Request | | | |

Insertion Length ("U")

Pl. Specify in mm

Extension Length ("T")

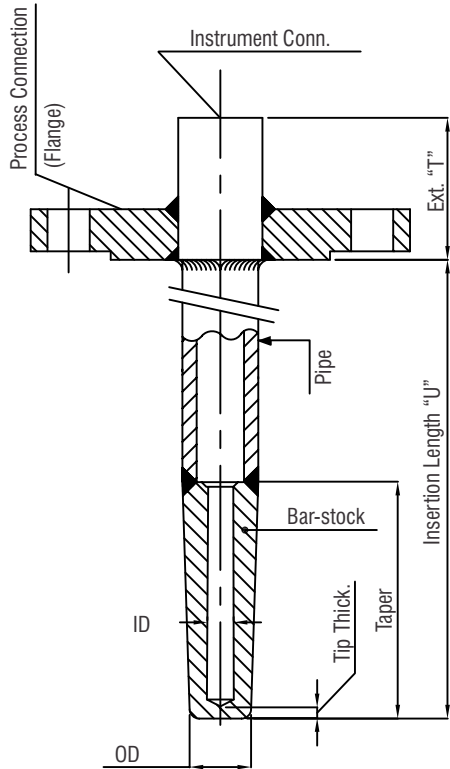
Pl. Specify in mm

Tip Thickness

Pl. Specify in mm

Ordering Example:- TWFF01-S6S-(14x9)-T15NTF-F25ARF-S6S-600-50-4-0

TW FF 02 - Fabricated Flanged Type Thermowell (Pipe + Barstock)



TWFF - 02

Thermowell Material

| | | | |
|-------------------------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | TI2 | Ti-II |
| N20 | Nickel 200 | | |
| **Special material on Request | | | |

Pipe Size & schedule

| | | | |
|--------------|-----------------|------------|------------|
| 15A | ½" Sch 40 | 15B | ½" Sch 80 |
| 15C | ½" Sch 160 | 20A | ¾" Sch 40 |
| 20B | ¾" Sch 80 | 25A | 1" Sch 40 |
| 25B | 1" Sch 80 | 25C | 1" Sch 160 |
| 10x7 | 10 mm x 7 mm | | |
| 14x9 | 14 mm x 9 mm | | |
| Other | Consult Factory | | |

Barstock OD at Tip

Pl. Specify in mm

Barstock ID

Pl. Specify in mm

Taper Length

Pl. Specify in mm

Instrument Connection

FLANGED - F

| Size | Code | Rating | Code | Facing | Code |
|--------|-----------|--------|----------|--------|-----------|
| 1/2" | 15 | 150 | A | RF | RF |
| 3/4" | 20 | 300 | B | FF | FF |
| 1" | 25 | 600 | C | RTJ | RJ |
| 1-1/2" | 40 | 900 | D | ST | ST |
| 2" | 50 | 1500 | E | SG | SG |
| 3" | 80 | 2500 | F | LT | LT |
| | | | | LG | LG |

Process Connection

Flange Material

| | | | |
|-------------------------------|--------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | S6L | SS316L |
| CST | CS | HCC | Hastelloy® C-276 |
| 410 | SS410 | HCB | Hastelloy® B |
| S7S | SS317 | MN4 | Monel® 400 |
| S7L | SS317L | MN5 | Monel® 500 |
| TI2 | Ti-II | N20 | Nickel 200 |
| **Special material on Request | | | |

Insertion Length ("U")

Pl. Specify in mm

Extension Length ("T")

Pl. Specify in mm

Tip Thickness

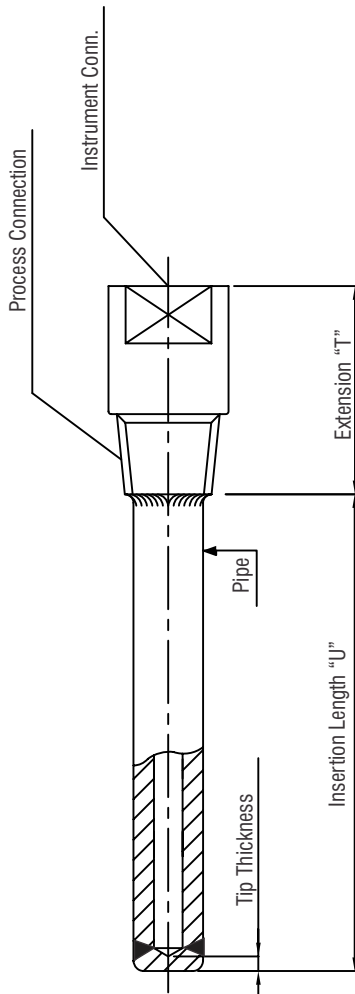
Pl. Specify in mm

| Other Options | |
|---------------|---------------------------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 5 | NACE to MR-01-75-/MR-01-03 |
| 6 | Radiography Test (RT) for weld joints |
| 7 | Full penetration weld |
| 8 | PWHT |
| 9 | H2 Service |
| 14 | 1 mm PTFE coating |
| 15 | 1 mm zirconium oxide coating |
| 16 | 0.5 mm Tungsten carbide coating |
| 17 | 1 mm Tungsten carbide coating |
| 18 | 1 mm stellite coating |
| 19 | Tapered for tail portion of 150 mm (Pl. Specify length in mm) |

| THREADED - T | | | | | |
|--------------|------------|-----------|-----------|-------|----------|
| Size | Code | Type | Code | M / F | Code |
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | Gas | GS | | |
| M20 | M20 | Pitch 1.5 | C | | |

Ordering Example:- TWFF02-S6S-25B-18-11-150-T15NTF-F50BRF-S6S-1500-65.6-4-0

TW FT 01 - Fabricated Threaded Type Thermowell



| Other Options | |
|---------------|-----------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 5 | NACE to MR-01-75-/-MR-01-03 |

TWFT - 01

Thermowell Material

| | | | |
|-------------------------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | TI2 | Ti-2 |
| N20 | Nickel 200 | | |
| **Special material on Request | | | |

Pipe Size & schedule

| | |
|--------------|-----------------|
| 15A | 1/2 " Sch 40 |
| 15B | 1/2 " Sch 80 |
| 15C | 1/2 " Sch 160 |
| 20A | 3/4 " Sch 40 |
| 20B | 3/4 " Sch 80 |
| 25A | 1" Sch 40 |
| 25B | 1" Sch 80 |
| 25C | 1" Sch 160 |
| 10x7 | 10 mm x 7 mm |
| 14x9 | 14 mm x 9 mm |
| Other | Consult Factory |

Instrument Connection

| THREADED - T | | | | | |
|--------------|------------|-----------|-----------|-------|----------|
| Size | Code | Type | Code | M / F | Code |
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | JIS-PF | PF | | |
| 1-1/2" | 40 | JIS-PT | PT | | |
| 2" | 50 | Gas | GS | | |
| M20 | M20 | R | RR | | |
| M24 | M24 | Rp | RP | | |
| M27 | M27 | Pitch 1.5 | C | | |
| M33 | M33 | Pitch 2 | D | | |

Process Connection

Insertion Length ("U")

Pl. Specify in mm

Extension Length ("T")

Pl. Specify in mm

Tip Thickness

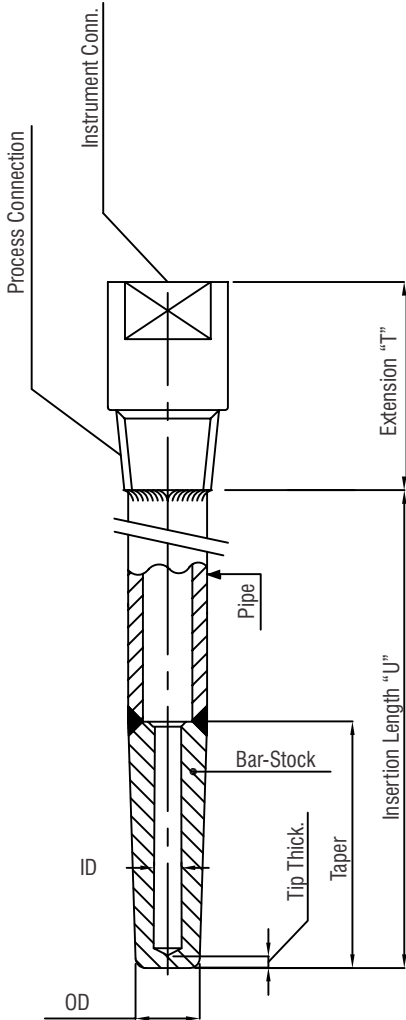
Pl. Specify in mm

Ordering Example:- TWFT01-S6S-(10x7)-T15NTF-T20BPM-1500-50-5-0

TW FT 02 - Fabricated Threaded Type Thermowell (Pipe + Barstock)



TWFT - 02



| Other Options | |
|---------------|----------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 5 | NACE to MR-01-75-/MR-01-03 |

Thermowell Material

| | | | |
|-------------------------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | TI2 | Ti-II |
| N20 | Nickel 200 | | |
| **Special material on Request | | | |

Pipe Size & schedule

| | |
|--------------|-----------------|
| 15A | 1/2 " Sch 40 |
| 15B | 1/2 " Sch 80 |
| 15C | 1/2 " Sch 160 |
| 20A | 3/4 " Sch 40 |
| 20B | 3/4 " Sch 80 |
| 25A | 1" Sch 40 |
| 25B | 1" Sch 80 |
| 25C | 1" Sch 160 |
| 10x7 | 10 mm x 7 mm |
| 14x9 | 14 mm x 9 mm |
| Other | Consult Factory |

Barstock OD at Tip

Pl. Specify in mm

Barstock ID

Pl. Specify in mm

Taper Length

Pl. Specify in mm

Instrument Connection

| THREADED - T | | | | | |
|--------------|------------|-----------|-----------|-------|----------|
| Size | Code | Type | Code | M / F | Code |
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | JIS-PF | PF | | |
| 1-1/2" | 40 | JIS-PT | PT | | |
| 2" | 50 | Gas | GS | | |
| M20 | M20 | R | RR | | |
| M24 | M24 | Rp | RP | | |
| M27 | M27 | Pitch 1.5 | C | | |
| M33 | M33 | Pitch 2 | D | | |

Process Connection

Insertion Length ("U")

Pl. Specify in mm

Extension Length ("T")

Pl. Specify in mm

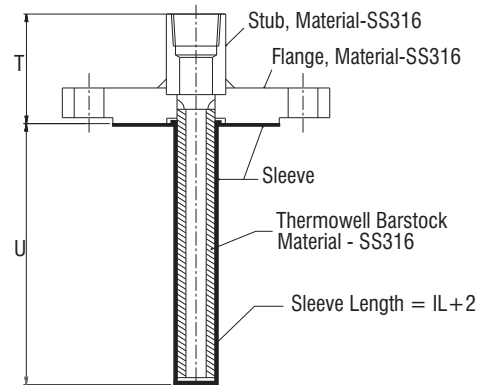
Tip Thickness

Pl. Specify in mm

Ordering Example:- TWFT02-S6S-15A-16-7-150-T15NTF-T20BPM-1500-50-5-0

Sleeved (Lined) Thermowell

One of the most economical solutions to protect the thermowells from chemically aggressive fluids is to provide a bar-stock flanged thermowell made out of conventional stainless steel (SS316) with loose lining in the form of a sleeve on the entire wetted portion. This will provide strength from stainless steel & corrosion resistance from the lining.

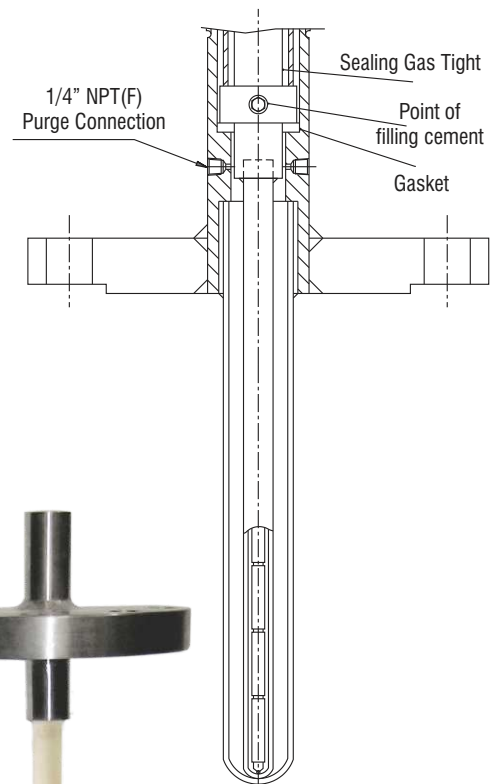


Thermowells for use in high temperature applications

For high temperature applications, generally, Ceramic protecting tubes are used in different industries such as Iron & Steel, glass, cement etc. It has high resistance to thermal shocks. It is inert to most chemicals and has a high dielectric strength. These are primarily used to protect noble metal thermocouples (like R, S & B type) They are available in variety of sizes. Normally it is cemented (by high temperature withstanding cement) to metal tubes (which are termed as holding tubes). The process connection slides or is welded to this metallic portion of the tube. For double protection, inner ceramic tube is also used. Mainly two grades of ceramic are used. Ceramic 610 (also termed as Mullite) & Ceramic 710 (recrystallised Alumina-99.5% purity) can withstand up to 1500°C & 1800°C respectively. It should be remembered that it has poor mechanical shock resistance. It is impervious to gases at high temperatures.

Silicon Carbide protecting tubes are also used generally as a secondary protection for applications such as Kilns, Furnaces, Stove Dome etc. Recrystallised silicon carbide has a very high abrasion resistance. Also used for flue gas application or incinerators in waste management system. It can withstand 1600°C & direct flame impingement. It is extremely hard & chemically inert. It resists most of the acids, molten salts. Generally used in conjunction with ceramic tube.

Cermet (LT-1) which is metal ceramic composite (combination of chromium & aluminium oxide) is stable in oxidising atmospheres upto 1300°C. Cermet tubes are stronger & more resistant to thermal & mechanical shocks than ceramic protecting tubes. Main area of usage is in molten copper, open hearth furnace, blast furnace. Ceramic primary tube is recommended when Cermet is used.



Special Thermowells

One of the most difficult problems in temperature measurement of process parameters has been the rapid wearing out of Thermowells made out of conventional stainless steel. Various factors could cause the failure of the thermowells, the most difficult, have been the erosion due to severe particle impingement. The corrosion due to chemically aggressive fluids; the combination of high temperature, high velocity fluids & the thermal shock faced by the sensor protective sheaths in the glass & metallurgical industries.

With an experience of over three decades, *General* is in a position to offer some solutions to most of these problems. Some of the standard designs are described and illustrated in this literature.

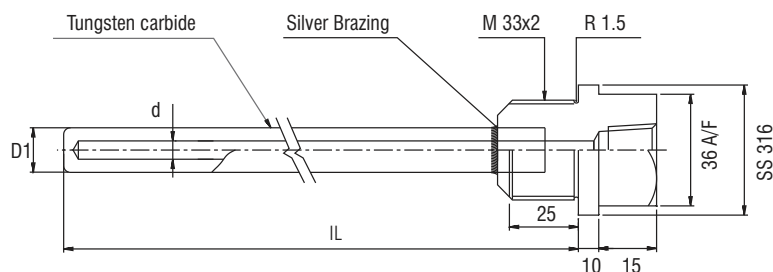


Solid Sintered Tungsten Carbide Thermowell

These thermowells are ideally suited for use in very abrasive environment such as in air preheaters & coal mills of coal based power plants (mill classifier or pulveriser outlet) or steam generation units, for temperature measurement of coal and air mixture.

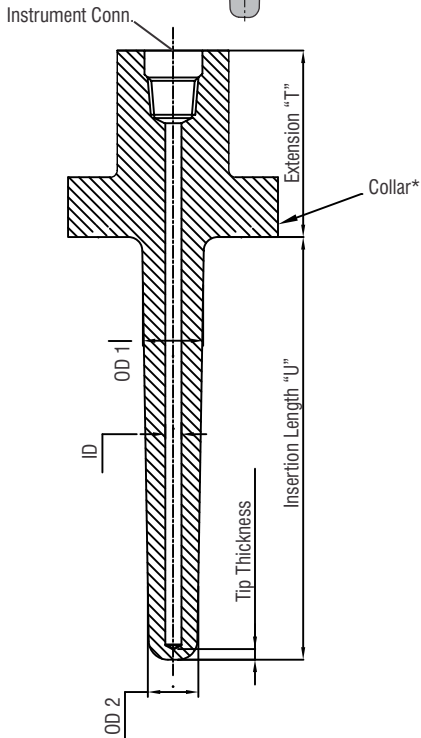
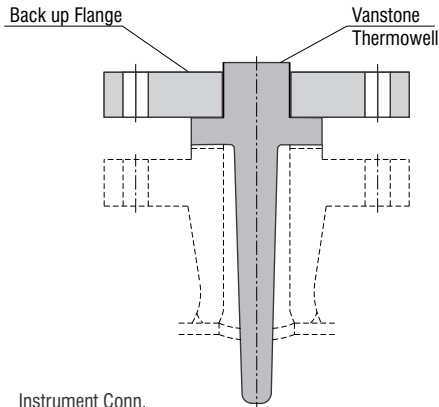
Typical Specifications

- Type** : Built-up threaded
- Material** : Solid Sintered Tungsten Carbide brazed to 316 SS threaded bushing.
- Process connection** : M33 x 2 or as required
- Bore** : 7 mm, 10.5 mm
- Outer diameter** : 16 mm, 20 mm as standard or else to be specified
- Immersion length** : IL - 160, 200, 250, 320, 400
- Extension length** : EL - 100, 160 in the form of 1/2" schedule 80 nipple generally
- Note** : When the length are longer, it is recommended to use tungsten carbide only for the tail portion of say 200 to 250 mm.



| Sensor & Bulb dia (mm) | d | D1 | IL |
|--------------------------------|------|----|-------------------------|
| MI TC 6 mm dia | 6.5 | 16 | 160, 200, 250, 320, 350 |
| MI RTD 6 mm dia | 6.5 | 16 | 160, 200, 250, 320, 350 |
| Temp Gauge or Switch 10 mm dia | 10.5 | 20 | 160, 200, 250, 320, 350 |

TW BV 01 - Vanstone Type Thermowell



* Collar OD shall be same as RF Dia of Back up Flange

| | Other Options |
|---|----------------------------------------------|
| 0 | None |
| 1 | Plug & Chain |
| 2 | IBR |
| 3 | Radiography Test (RT) for Bore Concentricity |
| 4 | Ultrasonic Test (UT) for Bore Concentricity |
| 5 | NACE to MR-01-75/-MR-01-03 |

TWBV - 01

Thermowell Material

| | | | |
|------------|------------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | KAN | Kanthal |
| S6L | SS316L | HCC | Hastelloy® C-276 |
| CST | CS | HCB | Hastelloy® B |
| 410 | SS410 | MN4 | Monel® 400 |
| S7S | SS317 | MN5 | Monel® 500 |
| S7L | SS317L | TI2 | Ti-II |
| N20 | Nickel 200 | | |

**Special material on Request

OD 1 (Cold End)

Pl. Specify in mm

OD 2 (Hot End)

Pl. Specify in mm

Bore ID

Pl. Specify in mm

Instrument Connection

| THREADED - T | | | | | |
|--------------|------------|-----------|-----------|-------|----------|
| Size | Code | Type | Code | M / F | Code |
| 1/4" | 06 | NPS | NS | M | M |
| 3/8" | 10 | NPT | NT | F | F |
| 1/2" | 15 | BSP | BP | | |
| 3/4" | 20 | BSPT | BT | | |
| 1" | 25 | Gas | GS | | |
| M20 | M20 | Pitch 1.5 | C | | |

Process Connection

| FLANGED - F | | | | | |
|-------------|-----------|--------|----------|--------|-----------|
| Size | Code | Rating | Code | Facing | Code |
| 1-1/2" | 40 | 150 | A | RF | RF |
| 2" | 50 | 300 | B | FF | FF |
| 3" | 80 | 600 | C | RTJ | RJ |
| | | 900 | D | ST | ST |
| | | 1500 | E | SG | SG |
| | | 2500 | F | LT | LT |
| | | | | LG | LG |

Back up Flange Material

| | | | |
|------------|--------|------------|------------------|
| S4S | SS304 | 825 | Incoloy® 825 |
| S6S | SS316 | 600 | Inconel® 600 |
| 310 | SS310 | 800 | Incoloy® 800 |
| 446 | SS446 | 321 | SS321 |
| S4L | SS304L | S6L | SS316L |
| CST | CS | HCC | Hastelloy® C-276 |
| 410 | SS410 | HCB | Hastelloy® B |
| S7S | SS317 | MN4 | Monel® 400 |
| S7L | SS317L | MN5 | Monel® 500 |
| TI2 | Ti-II | N20 | Nickel 200 |

**Special material on Request

Insertion Length ("U")

Pl. Specify in mm

Extension Length ("T")

Pl. Specify in mm

Tip Thickness

Pl. Specify in mm

Ordering Example:- TWBV01-S6L-30-18-7-T15NTF-50BRF-CST-255-50-5-0