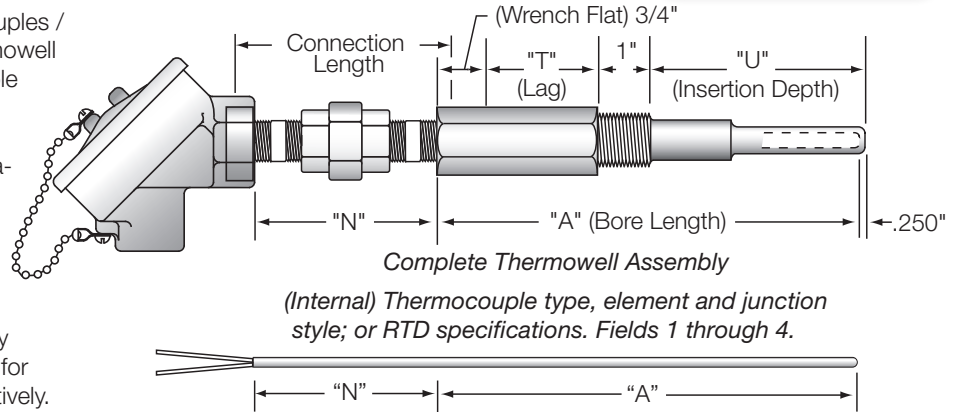


Thermowell Assemblies

Thermowells provide protection for thermocouples / RTDs in pressure vessels and pipelines. A thermowell permits checking and replacing the thermocouple without draining the vessel or pipeline.

Thermowells are available in a variety of materials, sizes and styles. Thermowell specifications are generally determined by the corrosion conditions of the well environment and also include the strength, temperature and pressure requirements.

The selection of a standard bore diameter (0.260" or 0.385") can produce extreme flexibility within the plant, providing a maximum diameter for the sensing element of 0.252" or 0.377" respectively.



Determine the internal thermocouple type, element and junction style; or RTD specifications by making the selections in Fields 1 through 4. Select only the options available within the MgO, Ceramic or RTD section below. (Fields 2 through 4 should all be from the same section.)

| Code | Type |
|----------|----------|
| K | Type K |
| J | Type J |
| E | Type E |
| T | Type T |
| R | RTD Only |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|

MgO Insulated Thermowells

Use only this row for MgO (MI) Insulated Elements

| MgO FIELD 2 | Code | Diameter |
|-------------|--------|----------|
| 5 | 0.188" | |
| 6 | 0.250" | |

| MgO FIELD 3 | Code | Mgo Sheath Material |
|-------------|-------------|---------------------|
| 1 | 304 SS | |
| 2 | Inconel 600 | |
| 3 | 316 SS | |

| MgO FIELD 4 | Code | Elements | Junction |
|-------------|--------|------------|----------|
| W | Single | Grounded | |
| Y | Single | Ungrounded | |
| V | Dual | Grounded | |
| Z | Dual | Isolated | |

Ceramic Insulated Thermowells

Use only this row for Ceramic Insulated Elements. (For wells with 0.385" bore only)

| CERAMIC FIELDS 2, 3 | Code | Ga. | Limits |
|---------------------|------|-----|----------|
| | 14 | 14 | Standard |
| | 15 | 14 | Special |
| | 20 | 20 | Standard |
| | 21 | 20 | Special |

| Type | Max Temperature Rating | |
|----------|------------------------|----------------|
| | 14 Ga. | 20 Ga. |
| K | 1093°C (2000°F) | 982°C (1800°F) |
| J | 593°C (1100°F) | 482°C (900°F) |
| E | 649°C (1200°F) | 538°C (1000°F) |
| T | 260°C (500°F) | 200°C (400°F) |

| CERAMIC FIELD 4 | Code | Elements | Style | Junction |
|-----------------|--------|-------------|------------|----------|
| W | Single | Twisted | Grounded | |
| 2 | Single | Twisted | Ungrounded | |
| 3 | Single | Butt Welded | Grounded | |
| 4 | Single | Butt Welded | Ungrounded | |
| 5 | Dual | Common | Ungrounded | |
| 6 | Dual | Butt Welded | Isolated | |
| V | Dual | Twisted | Grounded | |

RTD Thermowells

Use only this row for RTD Elements

| RTD FIELD 2 | Code | RTD Element |
|-------------|--|-------------|
| 5 | .00391 Ω/Ω/°C with RTD Bulb | |
| 7 | .00385 Ω/Ω/°C with RTD Thin Film Element | |

| RTD FIELD 3 | Code | Insulation | Temp. Rating | Accuracy |
|-------------|------------|------------|--------------|----------|
| 1 | Teflon | 500°F | .25% | |
| 2 | Teflon | 500°F | .10% | |
| 3 | Fiberglass | 932°F | .25% | |
| 4 | Fiberglass | 932°F | .10% | |

| RTD FIELD 4 | Code | Elements | Wires |
|-------------|--------|----------|-------|
| 1 | Single | 3 | |
| 2 | Dual | 3 | |
| 5 | Single | 4 | |

Element Only

Use this row for the Element only. No thermowell. Use Element Selections for Fields 1 through 4 from above.

Skip all options on page 2.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|

Fields 7, 8, 9 Element Length for Element Only
 Enter actual whole inches using two digits "02" with the third digit representing a half inch increment in field 9 by entering a "5". For no fraction enter a "0".
 Example: 020 = 2", 025 = 2.5", 100 = 10", 105 = 10.5"
 Use the dimensions of the existing thermowell to calculate the element length by adding A + N. See page T - 2 for the appropriate calculations.

| FIELDS 14, 15 | Code | Cold End Termination |
|---------------|--|----------------------|
| 00 | None | |
| 90 | Element with SS double-ended bushing | |
| 91 | Element with spring loaded SS double-ended bushing | |
| 96 | Element with spring loaded and terminal block | |
| 97 | Element Only | |

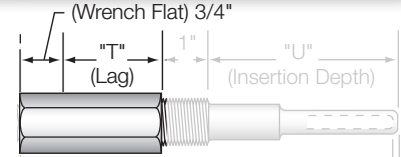
Thermowell Assemblies

Determine the Thermowell Style in Field 5. Threaded, Socket Weld or Flanged. Note the Bore Size columns.

Additional Lag Dimension permits clearance for insulation or other material surrounding the pipe or process vessel.

| Thermowell Type | Code | Thermowell Style | 0.385" Bore maximum sensing element diameter of 0.377" | | 0.260" Bore maximum sensing element diameter of 0.252" | |
|-----------------|------|---------------------------|--|-----------------------------|--|------------------|
| | | | Code | Thermowell Style | Code | Thermowell Style |
| | A | Tapered Shank | M | Tapered Shank | | |
| | B | Straight Shank | N | Straight Shank | | |
| | E | Straight Shank | R | Straight Shank, Reduced Tip | | |
| | | | P | Straight Shank, Reduced Tip | | |
| | D | Straight Shank | Q | Straight Shank | | |
| | F | Straight Shank - Vanstone | S | Straight Shank - Vanstone | | |
| | | | T | Tapered Shank | | |
| | | | U | Straight Shank, Reduced Tip | | |

| Code | LAG (Dimension "T") |
|------|---|
| 0 | Enter "0" for basic 3/4" wrench allowance |
| T | Enter Lag Dimension "T" in whole inches up to 8" NOTE: For lengths over 8" specify 9 and add 9 = "Length" on order. |



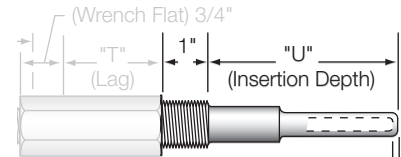
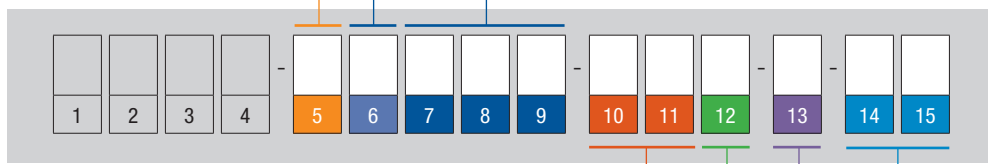
Field 6

Field 7, 8, 9

Insertion Length (Dimension "U")

Enter actual whole inches using two digits "020" with the third digit representing a half inch increment in field 9 by entering a "5". For no fraction enter a "0".

Example: 020 = 2", 025 = 2.5", 100 = 10", 105 = 10.5"

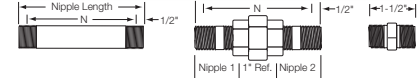
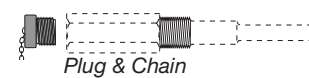


| Material & Mounting Code | (Field 5) | | | | |
|--------------------------|-----------|--------|--------|------------|-------------------------|
| | 304 SS | 316 SS | C-1018 | Brass | Size |
| AL | BL | CL | UL | 1/2" NPT | Threaded |
| AA | BA | CA | UA | 3/4" NPT | Threaded or Socket Weld |
| AB | BB | CB | UB | 1" NPT | Threaded |
| AC | BC | CC | UC | 1-1/4" NPT | Threaded |
| AD | BD | CD | | 1" | 150# Flange |
| AE | BE | CE | | 1-1/2" | |
| AF | BF | CF | | 1-1/2" | 300# Flange |
| AG | BG | CG | | 1-1/2" | 600# Flange |
| AH | BH | CH | UH | 1" | Vanstone Flange |
| AJ | BJ | CJ | UJ | 1-1/2" | |
| AK | BK | CK | UK | 2" | Flange |

| Code | Options |
|------|--|
| 0 | None |
| 1 | Brass Plug & Chain |
| 2 | 304 SS Plug & Chain |
| 3 | Internal Hydrostatic Test |
| 4 | Dye Penetration Test |
| 5 | Full Penetration Weld |
| 6 | Material Certification |
| 7 | Stress Relief |
| 9 | Two or more of the above listed options. |

| Code | Head to Well Connection |
|------|-------------------------------------|
| 0 | None, Thermowell or Element Only. |
| A | 4" Black Steel Nipple |
| B | Same as above but specify length |
| C | 4" Stainless Steel Nipple |
| D | Same as above but specify length |
| E | 4" Black Steel Nipples & Union |
| F | Same as above but specify length |
| J | 4" Galvanized Steel Nipples & Union |
| K | Same as above but specify length |
| L | 1/2" NPT Double-Ended Bushing |

| Code | Cold End Termination |
|------|---|
| 00 | None |
| 10 | Weatherproof Cast Iron, Non-Spring Loaded (Replaces Code 08) |
| 22 | Explosion Proof, Aluminum, Non-Spring Loaded |
| 25 | Weatherproof Cast Iron, Spring Loaded (Replaces Code 23) |
| 26 | Explosion Proof, Aluminum, Spring Loaded |
| 27 | Weatherproof, Aluminum, Non-Spring Loaded (Replaces Code 09) |
| 28 | Weatherproof, Aluminum, Spring Loaded (Replaces Code 24) |
| 32 | Weatherproof, Aluminum Head with Transmitter *Must specify the range of the sensor on the order. (i.e., 0°F - 800°F) |
| 34 | 316 Stainless Steel, Weatherproof |
| 35 | 316 Stainless Steel, Explosion Proof |



| Thermowell Style | Determine "A" | Connector Codes | Determine "N" |
|---------------------|---|-----------------------|--------------------------------------|
| A, B, E, M, N, P, R | A = U + T + 1-1/2" | A, C, E, J (Field 13) | N = 3" |
| D, Q, F, S, T, U | A = U + T + 2" | B, D (Field 13) | N = Nipple length less 1" |
| | Use the dimensions of the existing thermowell to calculate the element length by adding A + N | F, K (Field 13) | N = Combined length of nipples 1 & 2 |
| | | O, L, G, H (Field 13) | N is not compatible |

THERMOWELL ONLY

Use "TH00" for Fields 1 through 4 and select the options for Fields 5 through 12. Use "0" for Fields 13, 14 & 15.

T H 0 0 - 0 0 0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15