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PRESSURE GAUGES

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Solid Front • Field Liquid Fillable • Turret Case

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## PRESSURE GAUGES

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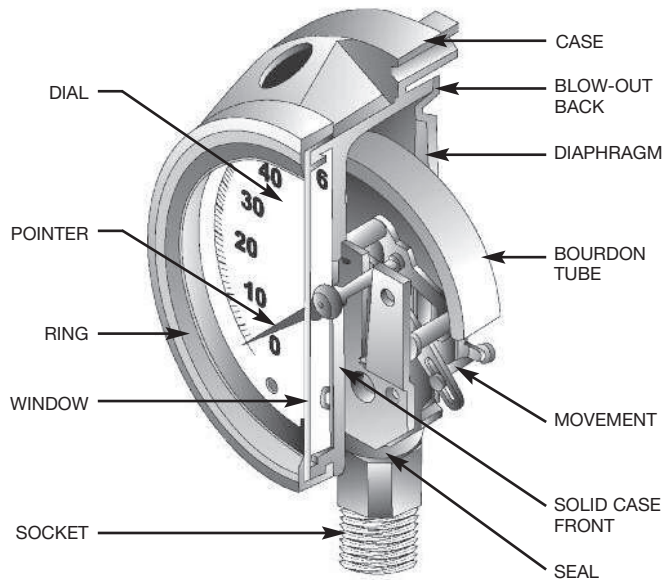
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# Pressure Gauges

## DESIGN & OPERATION



### Description

A pressure gauge is a mechanical instrument designed to measure the internal pressure and/or vacuum of a vessel or system. Trerice Pressure Gauges are offered in a variety of styles, sizes, and wetted part materials to meet the demands of standard and special applications.

### Principles of Operation

Most Trerice Pressure Gauges are constructed with a bourdon tube sensing element. When the sensing element is subjected to pressure, it flexes and the resulting motion is transmitted as a measurement through a mechanical movement to the dial face pointer.

## Selecting a Pressure Gauge

### Case

Cases are available in a wide variety of materials and configurations. The combination of material and configuration is generally determined by the demands of the application, as well as the preferences of the gauge specifier. The more demanding the environment, the more rugged the case construction (i.e., polypropylene or stainless steel for industrial applications vs. aluminum or steel for construction or commercial applications). Gauge mounting or retrofitting needs may affect case selection (i.e., a gauge to be panel mounted will require either a front flange or u-clamp style case). For safety considerations, a "solid-front" case style may be required. Each application will have a unique set of requirements which will help guide the specifier in selecting the appropriate case style.

All Trerice Pressure Gauges should be carefully selected to meet the demands of the particular application. The information contained in this catalog is only offered as a guide to assist in making the proper selection.

Improper application may cause failure of the gauge, resulting in possible personal injury or property damage. For correct use and application of all pressure gauges, please refer to Pressure Gauge Standard ASME B40.100. This document may be obtained from the American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990.

### Wetted Parts and Pressure Medium

Under normal operating conditions, only the tube and socket assembly (Wetted Parts) of a pressure gauge will come into contact with the fluid being measured (Pressure Medium). The selection of the assembly will be determined by the composition of the medium. Air, gas, steam, water and other non-corrosive media are usually satisfied by a bronze or brass bourdon tube and brass socket assembly. Stainless steel or Monel wetted parts are used when the medium contains corrosive elements or when high operating pressures or temperatures will be encountered. A diaphragm seal is recommended for highly corrosive media or that which may solidify or deposit solids within the tube and socket assembly of the gauge. (See the Diaphragm Seal section of this catalog.)

## Connection and Mounting

The socket connection provides an entrance port for the process medium as well as a means to mount the gauge to a pipeline or vessel. Male connections can be provided with NPT, BSPT, or other thread styles, in sizes from 1/8" through 1/2". A high-pressure, 9/16" LHT connection is also available. The mounting location indicates where the connection protrudes from the case. Trerice Pressure Gauges are available with three standard mounting locations: lower male (LM), lower back male (LBM), and center back male (CBM). Other connection locations may be available on some models.

## Window and Ring

The window provides a means for viewing the measurement, as well as protection of the dial face and pointer of the instrument, and is normally held in place by a ring, which is screwed or snapped to the case of the gauge. Plastic, clear glass and laminated glass are common window materials. Ring styles include threaded, bayonet, friction, crimped and hinged, depending upon the case type.

## Pointer

There are essentially three types of pointers available on Trerice Pressure Gauges: a micro-adjustable pointer (providing high quality and accuracy); a friction-type pointer (providing adjustability and durability); and a plain, non-adjustable pointer (providing economic reliability).

## Accuracy

The accuracy of a pressure gauge is expressed as a percentage (plus or minus) of the maximum scale range. Please refer to Pressure Gauge Standard ASME B40.100.

## Measurement Range and Dial

The maximum operating pressure of the application should not exceed 75% of the measurement range selected. Therefore, the specified range should be twice the normal operating point of the gauge to avoid damage to the gauge internal. A wide variety of measurement ranges is available, from 30" Hg vacuum through 20,000 psi pressure. Ranges are indelibly presented in black figures and markings upon a white dial face.

**During system start-up or shut-down, system pressures can greatly exceed intended conditions. Pressure gauges should be protected by appropriate isolation devices such as, but not limited to, needle valves, gauge cocks, etc.**

## Environmental Conditions

Pressure gauge selection will be influenced by the environmental conditions under which the gauge is expected to perform. Condensation or waterproofing concerns can be addressed through the use of hermetically sealed or weatherproofed gauges. Case construction should be considered when selecting a gauge to be used in conditions of extreme or sustained heat or cold, or where the atmospheric environment may contain corrosive elements.

**Pressure gauges provide an excellent and reliable means of measuring and indicating process conditions, however they are passive devices. They are not substitutes for active safety devices. For start-up or test situations on closed loop systems, a safety relief device must be used.**

## Liquid Filling

Liquid filling (glycerin, silicone or other fills) can prolong the life of a pressure gauge by minimizing wear on the gauge internal resulting from vibration or oscillation. Liquid filling also acts as a permanent lubricant to the moving parts of the instrument.

# 450 Series

Solid Front • Field Liquid Fillable • Turret Case

PROCESS GAUGES



450B shown



- ▶ 4 1/2" Dial Size
- ▶ ±0.5% Accuracy
- ▶ Solid Front/Blow-Out Back
- ▶ Field Liquid Fillable

The Trerice **450 Series** Process Gauge is designed for the petrochemical and industrial process industries. This solid front, blow-out back gauge is noted for its fiberglass reinforced polypropylene turret case and screwed ring; its sturdy interior design; and its field liquid-fill capability (no kit required). The 450 Series can withstand the most rugged industrial applications, while maintaining precise accuracy. Wetted parts are bronze tube/brass socket, stainless steel, or Monel.

- **Optional features available: Please consult the Options & Accessories Section for details.**
- **For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.**

## Specifications

Models	Wetted Parts
450B (dry) 450LFB (liquid-filled)	Brass tube, brass socket
450SS (dry) 450LFSS (liquid-filled)	316L stainless steel* tube and socket
450M (dry) 450LFM (liquid-filled)	Monel tube and socket (meets NACE MR 01.75)

<b>Dial Size</b>	4 1/2"
<b>Fill</b>	Glycerine. Other fills available. See Options & Accessories
<b>Movement</b>	Stainless steel
<b>Connection</b>	Lower male or lower back male, 1/4 or 1/2 NPT
<b>Case</b>	Fiberglass reinforced polypropylene, turret, solid front with blow-out back
<b>Ring</b>	Threaded fiberglass reinforced polypropylene
<b>Window</b>	Acrylic
<b>Pointer</b>	Micro adjustable, black finished
<b>Dial Face</b>	Aluminum, white background with black graduations and markings

**Additional Features**  
Overload and underload stops

**Accuracy**  
±0.5% Full Scale, ASME B40.100 Grade 2A

**Maximum Temperature**  
450B, 450SS, 450M:  
**250°F (121°C)**  
450LFB, 450LFSS, 450LFM:  
**150°F (65°C)**

**Approximate Shipping Weight**  
450B, 450SS, 450M:  
2.2 lbs [1.00 kg]  
450LFB, 450LFSS, 450LFM:  
3.1 lbs [1.41 kg]

\* Ranges over 10,000 PSI have Ni-Span-C tube.

## HOW TO ORDER

Sample Order Number: **450LFB 45 02 L D 110**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
450B 450LFB 450SS 450LFSS 450M 450LFM	45 4 1/2"	02 1/4 NPT 04 1/2 NPT 09 9/16-18 UNF-2A-LH*	L Lower B Back	A psi B kPa C kg/cm <sup>2</sup> D psi/kPa E psi & kg/cm <sup>2</sup>	See Standard Ranges

\* For use with 9/16 high-pressure female fittings

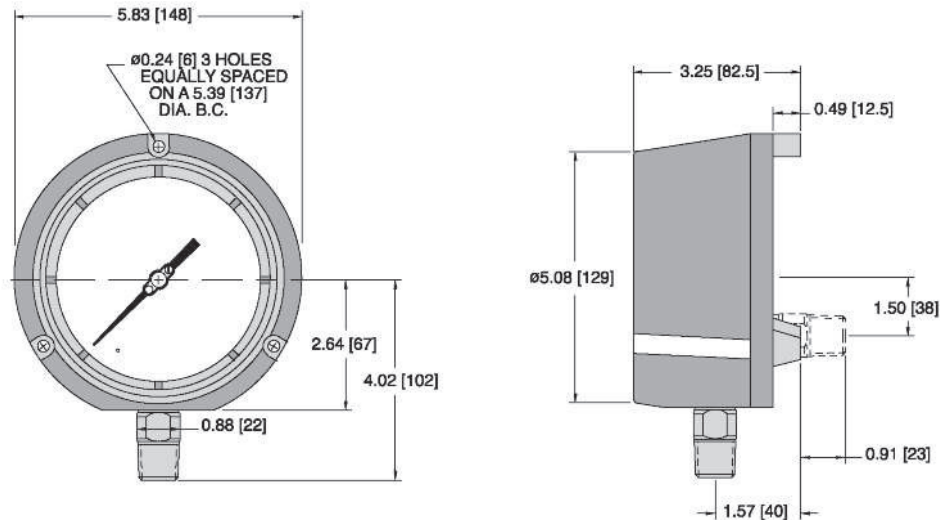


# 450 Series

All dimensions are nominal. Dimensions in [ ] are in millimeters.

**Solid Front • Field Liquid Fillable • Turret Case**

PROCESS GAUGES



## Standard Ranges

psi Ranges (A)				kPa Ranges (B)				kg/cm <sup>2</sup> Ranges (C)			
Range Code	Specific Range (psi)	Figure Intervals	Minor Divisions	Range Code	Specific Range	Figure Intervals	Minor Divisions	Range Code	Specific Range	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.2	010	-100 to 0 kPa	10	1	010	76 cm Hg to 0	10	0.5
020	30" Hg to 15 psi	5/5	0.5/0.2	020	-100 to 100 kPa	20/20	2/2	020	76 cm Hg to 1 kg/cm <sup>2</sup>	20/0.2	1/0.2
030	30" Hg to 30 psi	10/5	1/0.5	030	-100 to 200 kPa	50/50	2/2	030	76 cm Hg to 2 kg/cm <sup>2</sup>	20/0.5	2/0.2
040	30" Hg to 60 psi	10/10	1/1	040	-100 to 400 kPa	50/50	5/5	040	76 cm Hg to 4 kg/cm <sup>2</sup>	25/0.5	5/0.5
050	30" Hg to 100 psi	30/10	2/1	050	-100 to 700 kPa	100/100	10/10	050	76 cm Hg to 7 kg/cm <sup>2</sup>	76/1	5/0.1
060	30" Hg to 150 psi	30/20	5/2	060	-100 to 1000 kPa	100/100	10/10	060	76 cm Hg to 10 kg/cm <sup>2</sup>	76/1	15/0.1
070	30" Hg to 300 psi	30/50	5/2	070	-100 to 2000 kPa	200/100	20/20	070	76 cm Hg to 21 kg/cm <sup>2</sup>	76/3	19/0.2
080	0 to 15 psi	3	0.1	080	0 to 100 kPa	10	1	080	0 to 1 kg/cm <sup>2</sup>	0.1	0.01
090	0 to 30 psi	5	0.2	090	0 to 200 kPa	20	2	090	0 to 2 kg/cm <sup>2</sup>	0.2	0.02
100	0 to 60 psi	10	0.5	100	0 to 400 kPa	50	5	100	0 to 4.2 kg/cm <sup>2</sup>	0.5	0.05
110	0 to 100 psi	10	1	110	0 to 700 kPa	100	5	110	0 to 7 kg/cm <sup>2</sup>	1	0.05
120	0 to 160 psi	20	1	120	0 to 1100 kPa	200	10	120	0 to 11 kg/cm <sup>2</sup>	1	0.1
130	0 to 200 psi	20	2	130	0 to 1400 kPa	200	10	130	0 to 14 kg/cm <sup>2</sup>	2	0.1
140	0 to 300 psi	50	2	140	0 to 2000 kPa	200	20	140	0 to 21 kg/cm <sup>2</sup>	3	0.2
150	0 to 400 psi	50	5	150	0 to 2800 kPa	400	20	150	0 to 28 kg/cm <sup>2</sup>	4	0.2
160	0 to 600 psi	50	5	160	0 to 4000 kPa	500	50	160	0 to 42 kg/cm <sup>2</sup>	6	0.5
180	0 to 1000 psi	100	10	180	0 to 7000 kPa	1000	50	180	0 to 70 kg/cm <sup>2</sup>	10	0.5
<b>Ranges over 1000 psi are not available on 450B and 450LFB.</b>											
190	0 to 1500 psi	300	10	190	0 to 10,000 kPa	1000	100	190	0 to 100 kg/cm <sup>2</sup>	10	1
200	0 to 2000 psi	200	20	200	0 to 14,000 kPa	2000	100	200	0 to 140 kg/cm <sup>2</sup>	20	1
210	0 to 3000 psi	500	20	210	0 to 20,000 kPa	2000	200	210	0 to 210 kg/cm <sup>2</sup>	30	2
220	0 to 5000 psi	500	50	220	0 to 35,000 kPa	5000	250	220	0 to 350 kg/cm <sup>2</sup>	50	2
230	0 to 10,000 psi	1000	100	230	0 to 70,000 kPa	10,000	500	230	0 to 700 kg/cm <sup>2</sup>	100	10
<b>Ranges over 10,000 psi are only available on 450SS and 450LFSS, and have Ni-Span-C tubes.</b>											
240	0 to 15,000 psi	3000	100	240	0 to 100,000 kPa	10,000	1000	240	0 to 1000 kg/cm <sup>2</sup>	100	10
250	0 to 20,000 psi	2000	200	250	0 to 140,000 kPa	20,000	1000	250	0 to 1400 kg/cm <sup>2</sup>	200	10

For dual scale ranges, specify the appropriate Units of Measure: **D** (psi/kPa) or **E** (psi & kg/cm<sup>2</sup>) followed by the equivalent **A** (psi) Range Code. Other pressure ranges are also available including: Altitude, Ammonia, Refrigerant and Receiver. Consult Special Application Ranges section or factory for availability.

# 500X Series

Dial Sizes thru 12" • Cast Aluminum Case

INDUSTRIAL GAUGES



500XB shown



- ▶ 4 1/2", 6", 8 1/2", 12" Dial Sizes
- ▶ ±0.5% Accuracy
- ▶ Cast Aluminum Case

The Trerice **500X Series** Industrial Gauge is designed to withstand the most demanding applications of a variety of industries. This pressure gauge has a back flanged, cast aluminum case and stainless steel ring. Wetted parts are either bronze tube with Lead-Free (PBF) brass socket or stainless steel tube and socket.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

## Specifications

Models	Wetted Parts
500XB	Bronze tube, brass socket Lead-Free (PBF) Meets NSF/ANSI Standards 372 and 61
500XSS	316L stainless steel tube and socket *
<b>Dial Sizes</b>	4 1/2", 6", 8 1/2", 12"
<b>Movement</b>	Stainless Steel
<b>Connection</b>	Lower male or lower back male, 1/4 or 1/2 NPT
<b>Case</b>	Cast aluminum, black finished, surface mounted back flanged
<b>Ring</b>	4 1/2", 6" Dial Size: Friction type, 304 stainless steel  8 1/2", 12" Dial Size: Slotted Stainless Steel
<b>Window</b>	Clear glass
<b>Pointer</b>	4 1/2", 6", 8 1/2" Dial Size: Micro adjustable, black finished  12" Dial Size: Plain, black finished
<b>Dial Face</b>	Aluminum, white background with black graduations and markings
<b>Accuracy</b>	±0.5% Full Scale, ASME B40.100 Grade 2A
<b>Maximum Temperature</b>	<b>250°F (121°C)</b>
<b>Approximate Shipping Weight</b>	4 1/2" Dial Size: 2.0 lbs [0.91 kg]  6" Dial Size: 2.8 lbs [1.27 kg]  8 1/2" Dial Size: 5.8 lbs [2.63 kg]  12" Dial Size: 14.6 lbs [6.62 kg]

\* Ranges over 10,000 psi have a Ni-Span-C bourdon tube.

## HOW TO ORDER

Sample Order Number: **500XB 45 02 L A 110**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
500XB	45 4 1/2"	02 1/4 NPT	L Lower	A psi	See Standard Ranges
500XSS	60 6"	04 1/2 NPT	B Back	B kPa	
	85 8 1/2"			C kg/cm <sup>2</sup>	
	12 12"			D psi/kPa	
				E psi & kg/cm <sup>2</sup>	

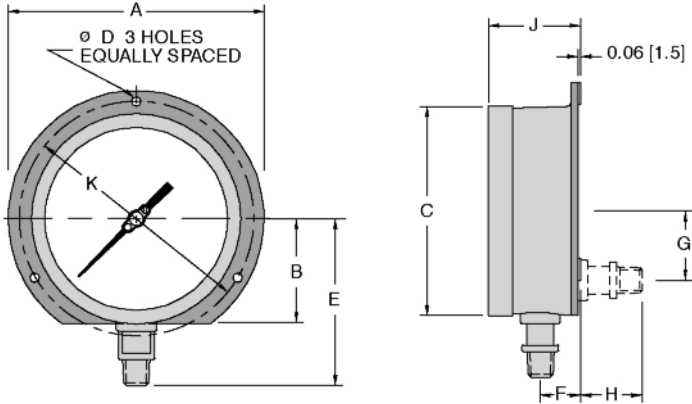




# 500X Series

## Dial Sizes thru 12" • Cast Aluminum Case

All dimensions are nominal. Dimensions in [ ] are in millimeters.



Dial Size	A	B	C	D	E	F	G	H	J	K
4 1/2"	5.88 [149.7]	2.39 [60.7]	4.79 [121.7]	0.22 [5.6]	3.83 [97.2]	0.94 [23.8]	1.63 [41.3]	1.41 [35.7]	2.06 [52.4]	5.38 [136.5]
6"	7.62 [193.6]	3.14 [79.8]	6.29 [159.8]	0.28 [7.1]	4.70 [119.5]	0.93 [23.8]	1.63 [41.3]	1.41 [35.7]	2.09 [53]	7.00 [177.8]
8 1/2"	10.25 [260.4]	4.38 [111.1]	8.80 [223.4]	0.28 [7.1]	5.81 [147.5]	0.97 [24.6]	1.63 [41.3]	1.41 [35.7]	2.24 [56.8]	9.63 [244.5]
12"	14.25 [362]	N/A	12.66 [321.5]	0.28 [7.1]	7.90 [200.7]	1.02 [25.9]	1.63 [41.3]	1.19 [30.2]	2.53 [64.3]	13.50 [343]

### Standard Ranges

psi Ranges (A)				kPa Ranges (B)				kg/cm <sup>2</sup> Ranges (C)			
Range Code	Specific Range (psi)	Figure Intervals	Minor Divisions	Range Code	Specific Range	Figure Intervals	Minor Divisions	Range Code	Specific Range	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.2	010	-100 to 0 kPa	10	1	010	76 cm Hg to 0	10	0.5
020	30" Hg to 15 psi	5/5	0.5/0.2	020	-100 to 100 kPa	20/20	2/2	020	76 cm Hg to 1 kg/cm <sup>2</sup>	20/0.2	1/0.2
030	30" Hg to 30 psi	10/5	1/0.5	030	-100 to 200 kPa	50/50	2/2	030	76 cm Hg to 2 kg/cm <sup>2</sup>	20/0.5	2/0.2
040	30" Hg to 60 psi	10/10	1/1	040	-100 to 400 kPa	50/50	5/5	040	76 cm Hg to 4 kg/cm <sup>2</sup>	25/0.5	5/0.5
050	30" Hg to 100 psi	30/10	2/1	050	-100 to 700 kPa	100/100	10/10	050	76 cm Hg to 7 kg/cm <sup>2</sup>	76/1	5/0.1
060	30" Hg to 150 psi	30/20	5/2	060	-100 to 1000 kPa	100/100	10/10	060	76 cm Hg to 10 kg/cm <sup>2</sup>	76/1	15/0.1
070	30" Hg to 300 psi	30/50	5/2	070	-100 to 2000 kPa	200/100	20/20	070	76 cm Hg to 21 kg/cm <sup>2</sup>	76/3	19/0.2
080	0 to 15 psi	3	0.1	080	0 to 100 kPa	10	1	080	0 to 1 kg/cm <sup>2</sup>	0.1	0.01
090	0 to 30 psi	5	0.2	090	0 to 200 kPa	20	2	090	0 to 2 kg/cm <sup>2</sup>	0.2	0.02
100	0 to 60 psi	10	0.5	100	0 to 400 kPa	50	5	100	0 to 4.2 kg/cm <sup>2</sup>	0.5	0.05
110	0 to 100 psi	10	1	110	0 to 700 kPa	100	5	110	0 to 7 kg/cm <sup>2</sup>	1	0.05
120	0 to 160 psi	20	1	120	0 to 1100 kPa	200	10	120	0 to 11 kg/cm <sup>2</sup>	1	0.1
130	0 to 200 psi	20	2	130	0 to 1400 kPa	200	10	130	0 to 14 kg/cm <sup>2</sup>	2	0.1
140	0 to 300 psi	50	2	140	0 to 2000 kPa	200	20	140	0 to 21 kg/cm <sup>2</sup>	3	0.2
150	0 to 400 psi	50	5	150	0 to 2800 kPa	400	20	150	0 to 28 kg/cm <sup>2</sup>	4	0.2
160	0 to 600 psi	50	5	160	0 to 4000 kPa	500	50	160	0 to 42 kg/cm <sup>2</sup>	6	0.5
180	0 to 1000 psi	100	10	180	0 to 7000 kPa	1000	50	180	0 to 70 kg/cm <sup>2</sup>	10	0.5
<b>Ranges over 1000 psi are not available on 500XB.</b>											
190	0 to 1500 psi	300	10	190	0 to 10,000 kPa	1000	100	190	0 to 100 kg/cm <sup>2</sup>	10	1
200	0 to 2000 psi	200	20	200	0 to 14,000 kPa	2000	100	200	0 to 140 kg/cm <sup>2</sup>	20	1
210	0 to 3000 psi	500	20	210	0 to 20,000 kPa	2000	200	210	0 to 210 kg/cm <sup>2</sup>	30	2
220	0 to 5000 psi	500	50	220	0 to 35,000 kPa	5000	250	220	0 to 350 kg/cm <sup>2</sup>	50	2
230	0 to 10,000 psi	1000	100	230	0 to 70,000 kPa	10,000	500	230	0 to 700 kg/cm <sup>2</sup>	100	10
<b>Ranges over 10,000 psi are only available on 500XSS, and have Ni-Span-C tubes.</b>											
240	0 to 15,000 psi	3000	100	240	0 to 100,000 kPa	10,000	1000	240	0 to 1000 kg/cm <sup>2</sup>	100	10
250	0 to 20,000 psi	2000	200	250	0 to 140,000 kPa	20,000	1000	250	0 to 1400 kg/cm <sup>2</sup>	200	10

For dual scale ranges, specify the appropriate **Units of Measure: D (psi/kPa) or E (psi & kg/cm<sup>2</sup>)** followed by the equivalent **A (psi) Range Code**. Other pressure ranges are also available including: Altitude, Ammonia, Refrigerant and Receiver. Consult Special Application Ranges section or factory for availability.

# 575SS

## Field Test Gauge



575SS shown

- ▶ **Mirrored Dial**
- ▶ **Includes Carrying Case**
- ▶ **NIST Traceable Certification**

The Trerice **575SS** offers portable inspecting and testing of pressure systems and vessels prior to start up or to trouble shoot existing applications. This gauge has a mirrored dial face, adjustable pointer and NIST traceable certification allowing for the best in-field testing.

For correct use and application of all pressure gauges refer to: Pressure Gauge Standard ASME B40.100.



### HOW TO ORDER

Sample Order Number: **575SS 45 02 L A 140**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
575SS	45 4 1/2"	02 1/4 NPT	L Lower	A psi	See Standard Ranges

### Specifications

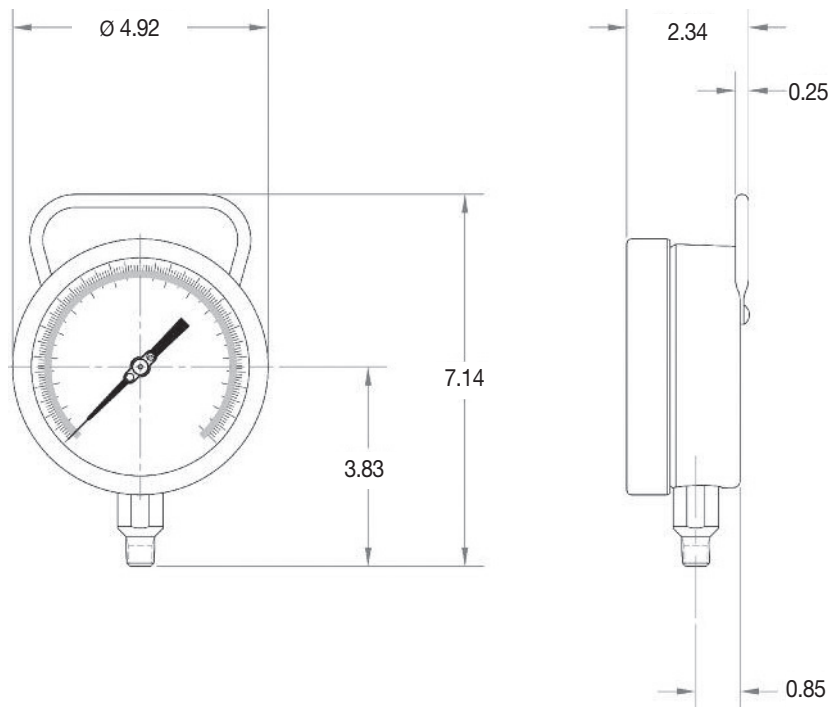
<b>Model</b>	<b>575SS</b>
<b>Dial Size</b>	<b>4 1/2"</b>
<b>Wetted Parts</b>	316L stainless steel tube and socket
<b>Movement</b>	Stainless steel, Delrin bushings and sector gear
<b>Connection</b>	1/4 NPT lower male
<b>Case</b>	Cast aluminum, chrome-plated finish NEMA 2
<b>Ring</b>	Cast aluminum, threaded chrome-plated finish
<b>Window</b>	Laminated safety glass
<b>Pointer</b>	Black knife edge, slotted micro-adjustable
<b>Dial Face</b>	Aluminum, white background with mirrored band, black graduations and markings
<b>Accuracy</b>	+/- 0.5% Full Scale, ASME B40.100 Grade 2A
<b>Safety</b>	Rear mounted blow-out disc and overload/underload stops
<b>Carrying Case</b>	Blue hard sided with foam insert for shock resistance
<b>Certification</b>	NIST traceable certificate of accuracy included with serial number printed on dial
<b>Features</b>	Heavy duty wrench Carry handle on case Restrictor screw

**Approximate Shipping Weight**  
3.2 lbs [1.45 kg]

# 575SS

## Field Test Gauge

INDUSTRIAL GAUGES



### Standard Ranges

psi Ranges (A)			
Range Code	Specific Range (psi)	Figure Intervals	Minor Divisions
010	30" Hg to 0 psi	5	0.2
020	30" Hg to 15 psi	5/5	0.5/0.2
030	30" Hg to 30 psi	10/5	1/0.5
040	30" Hg to 60 psi	10/10	1/1
050	30" Hg to 100 psi	30/10	2/1
060	30" Hg to 150 psi	30/20	5/2
070	30" Hg to 300 psi	30/50	5/2
080	0 to 15 psi	3	0.1
090	0 to 30 psi	5	0.2
100	0 to 60 psi	10	0.5
110	0 to 100 psi	10	1
120	0 to 160 psi	20	1
130	0 to 200 psi	20	2
140	0 to 300 psi	50	2
150	0 to 400 psi	50	5
160	0 to 600 psi	50	5
180	0 to 1000 psi	100	10
190	0 to 1500 psi	300	10
200	0 to 2000 psi	200	20
210	0 to 3000 psi	500	20
220	0 to 5000 psi	500	50

# 700 Series

Field Liquid Fillable • Stainless Steel Case

INDUSTRIAL GAUGES



700SS shown



- ▶ 2 1/2", 4", 6" Dial Sizes
- ▶ ±1.0% Accuracy
- ▶ Stainless Steel Case
- ▶ Field Liquid Fillable

The Trerice **700 Series** Industrial Gauge is designed for the varying needs of the world's industrial applications. This gauge has a stainless steel case and ring. Its sturdy interior design and field liquid-fill capability (no kit required) provide the durability and accuracy required for industrial process environments. Available wetted parts are bronze tube with Lead-Free (PBF) brass socket, stainless steel tube and socket, or Monel tube and socket.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

## Specifications

Models	Wetted Parts
700B (dry) 700LFB (liquid-filled)	Bronze tube, brass socket Lead-Free (PBF) Meets NSF/ANSI Standards 372 and 61
700SS (dry) 700LFSS (liquid-filled)	316 stainless steel tube and socket
700M (dry) 700LFM (liquid-filled)	Monel tube and socket (meets NACE MR 01.75)

<b>Dial Sizes</b>	2 1/2", 4", 6"
<b>Fill</b>	Glycerine. Other fills available. See Options & Accessories.
<b>Movement</b>	700B Brass, 700SS, 700M Stainless steel
<b>Connection</b>	2 1/2" Dial Size: Lower male or center back male, 1/4 NPT 4", 6" Dial Size: Lower male or lower back male, 1/4 or 1/2 NPT
<b>Case</b>	304 stainless steel, satin finished, stem-mounted flangeless
<b>Ring</b>	Bayonet type, 304 stainless steel
<b>Window</b>	Laminated safety glass
<b>Pointer</b>	2 1/2" Dial Size: Adjustable, black finished 4", 6", Dial Size: Micro adjustable, black finished
<b>Dial Face</b>	Aluminum, white background with black graduations and markings
<b>Accuracy</b>	±1.0% Full Scale, ASME B40.100 Grade 1A
<b>Maximum Temperature</b>	700SS, 700M: <b>250°F (121°C)</b> 700B, 700LFB, 700LFSS, 700LFM: <b>150°F (65°C)</b>

### Approximate Shipping Weight

700B, 700SS 2 1/2" Dial Size: 0.4 lbs [0.18 kg]  
700LFB, 700LFSS, 700LFM 2 1/2" Dial Size: 0.5 lbs [0.23 kg]  
700B, 700SS, 700M 4" Dial Size: 1.3 lbs [0.59 kg]  
700LFB, 700LFSS, 700LFM 4" Dial Size: 2.1 lbs [0.95 kg]  
700B, 700SS, 700M 6" Dial Size: 2.0 lbs [0.91 kg]  
700LFB, 700LFSS, 700LFM 6" Dial Size: 3.8 lbs [1.72 kg]

## HOW TO ORDER

Sample Order Number: **700LFSS 25 02 B A 140**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
700B	25 2 1/2" *	02 1/4 NPT	L Lower	A psi	See Standard Ranges
700LFB	40 4"	04 1/2 NPT	B Back	D psi/kPa	
700SS	60 6"				
700LFSS					
700M					
700LFM					

\* Not available with Monel wetted parts or with 1/2 NPT connection.

# 700 Series

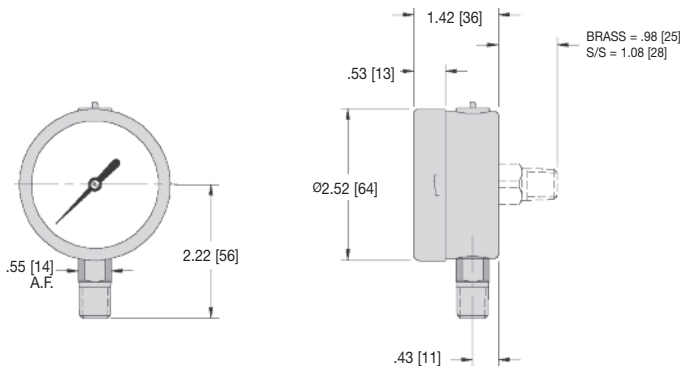
All dimensions are nominal. Dimensions in [ ] are in millimeters.

## Field Liquid Fillable • Stainless Steel Case

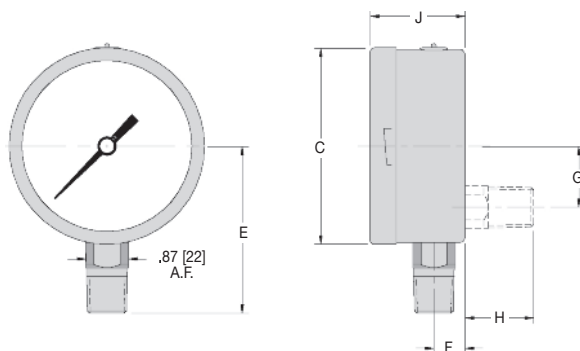
INDUSTRIAL GAUGES

Dial Size	Material	C	E	F	G	H	J
4"	Brass	3.98 [101]	3.39 [86]	0.94 [24]	1.04 [27]	1.44 [37]	2.24 [57]
	SS	3.98 [101]	3.39 [86]	0.94 [24]	1.36 [35]	1.38 [35]	2.24 [57]
6"	Brass	6.34 [161]	4.57 [116]	0.69 [18]	1.04 [27]	1.44 [37]	1.97 [50]
	SS	6.34 [161]	4.57 [116]	0.69 [18]	1.36 [35]	1.38 [35]	1.97 [50]

### 2 1/2"



### 4" & 6"



### Standard Ranges

psi Ranges (A)			
All Sizes			
Range Code	Specific Range (psi)	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.5
020	30" Hg to 15 psi	10/5	1.0/0.5
030	30" Hg to 30 psi	10/5	1/1
040	30" Hg to 60 psi	10/10	2/1
050	30" Hg to 100 psi	30/20	2/2
060	30" Hg to 150 psi	30/20	5/2
070	30" Hg to 300 psi	30/50	5/5
080	0 to 15 psi	3	0.2
090	0 to 30 psi	5	0.5
100	0 to 60 psi	10	1
110	0 to 100 psi	10	1
120	0 to 160 psi	20	2
130	0 to 200 psi	20	2
140	0 to 300 psi	50	5
150	0 to 400 psi	50	5
160	0 to 600 psi	1000	10
Ranges over 600 psi are not available in 700B or 700LFB in 4" or 6" Dial Sizes.			
180	0 to 1000 psi	100	20
190	0 to 1500 psi	300	20
200	0 to 2000 psi	200	20
210	0 to 3000 psi	500	50
220	0 to 5000 psi	1000	100
230	0 to 10,000 psi	1000	200
Ranges over 10,000 psi are ONLY available in 700SS or 700LFSS in 4" or 6" Dial Sizes.			
240	0 to 15,000 psi	3000	200

For dual scale ranges, specify the appropriate **Units of Measure: D (psi/kPa)** followed by the corresponding **A (psi) Range Code**. Other pressure ranges are also available including: *Altitude, Ammonia, Refrigerant and Receiver*. Consult *Special Application Ranges* section or factory for availability.

# D80 Series

Dry or Liquid Filled • Stainless Steel Case

UTILITY GAUGES



D82LFB shown



- ▶ 1 1/2", 2", 2 1/2", 4" Dial Sizes
- ▶ ±1.6% Accuracy (1% Optional)
- ▶ Stainless Steel Case
- ▶ Glycerine Fill Standard

The Trerice **D80 Series** Industrial Gauge is designed for rugged performance requirements at an economical cost. This liquid filled gauge is furnished with a stainless steel case and crimped ring. Wetted parts are either bronze tube with Lead-Free (PBF) brass socket or stainless steel.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

## Specifications

Models	Wetted Parts	
<b>D82B</b>	(dry)	Bronze tube, brass socket
<b>D82LFB</b>	(liquid filled)	Lead-Free (PBF) Meets NSF/ANSI Standards 372 and 61
<b>D83SS</b>	(dry)	316 Stainless steel tube & socket
<b>D83LFSS</b>	(liquid filled)	
<b>Dial Sizes</b>	1 1/2", 2", 2 1/2", 4"	
<b>Fill</b>	Glycerine, other fills available See Optional Features Section	
<b>Movement</b>	<b>D82:</b> Brass <b>D83:</b> 316 Stainless steel	
<b>Connection</b>	Lower male or center back male, (Lower back male 4" Dial only)	
<b>Case</b>	304 stainless steel, stem-mounted flangeless	
<b>Ring</b>	Crimped 304 stainless steel	
<b>Window</b>	Acrylic	
<b>Pointer</b>	Plain, black finished	
<b>Dial Face</b>	Aluminum, white background with black graduations and markings	
<b>Accuracy</b>	±1.6% Full Scale (1% available as an option)	
<b>Maximum Temperature</b>	<b>150°F (65°C)</b>	

### Approximate Shipping Weight

- 1 1/2" Dial Size: 0.4 lbs [0.18 kg]
- 2" Dial Size: 0.4 lbs [0.18 kg]
- 2 1/2" Dial Size: 0.5 lbs [0.23 kg]
- 4" Dial Size: 1.0 lbs [0.45 kg]

## HOW TO ORDER

Sample Order Number: **D82LFB 25 02 L A 110**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
<b>D82LFB</b>	15 1 1/2"	01 1/8 NPT*	L Lower	A psi	See Standard Ranges
<b>D83LFSS</b>	20 2"	02 1/4 NPT**	B Back	D psi/kPa	
<b>D82B</b>	25 2 1/2"	04 1/2 NPT***			
<b>D83SS</b>	40 4"				

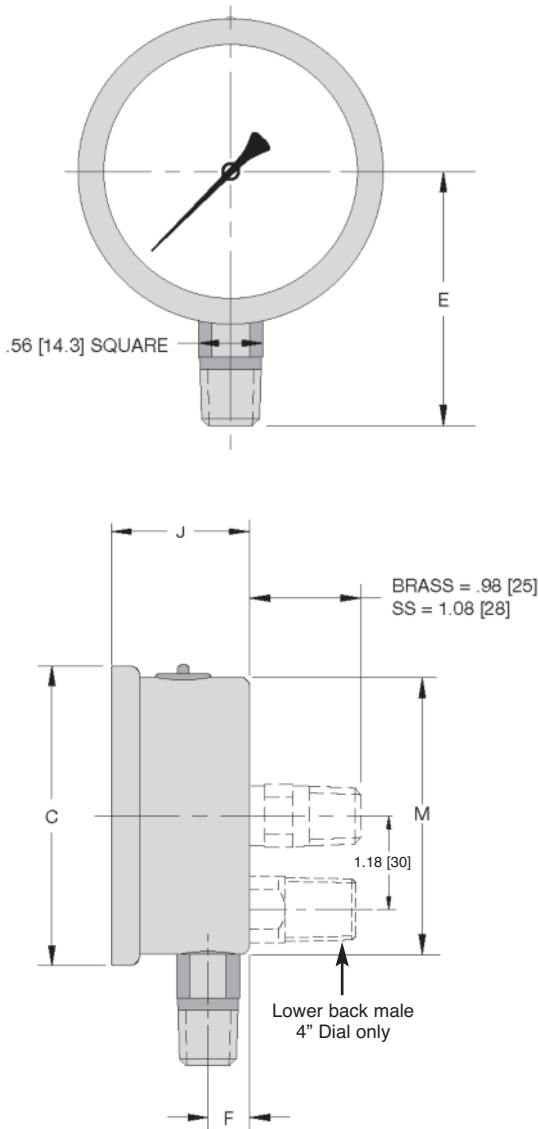
- \* 1/8 NPT connection size not available with 4" dial size.
- \*\* 1/4 NPT connection size not available with 1 1/2" dial size.
- \*\*\* 1/2 NPT connection size only available with 4" dial size.

# D80 Series

## Dry or Liquid Filled • Stainless Steel Case

All dimensions are nominal. Dimensions in [ ] are in millimeters.

UTILITY GAUGES



### Standard Ranges

psi Ranges (A)		D82		D83	
Range Code	Specific Range (psi)	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.5	5	0.5
020	30" Hg to 15 psi	10/5	1/0.5	10/5	1/0.5
030	30" Hg to 30 psi	10/5	1/1	10/5	1/1
040	30" Hg to 60 psi	10/10	2/1	10/10	2/1
050	30" Hg to 100 psi	30/20	2/2	30/20	2/2
060	30" Hg to 150 psi	30/30	5/2	30/30	5/2
070	30" Hg to 300 psi	30/50	5/5	30/50	5/5
080	0 to 15 psi	3	0.2	3	0.2
090	0 to 30 psi	5	0.5	5	0.5
100	0 to 60 psi	10	1	10	1
110	0 to 100 psi	10	1	10	1
120	0 to 160 psi	20	2	20	2
130	0 to 200 psi	20	2	20	2
140	0 to 300 psi	50	5	50	5
150	0 to 400 psi	50	5	50	5
160	0 to 600 psi	100	10	100	10
180	0 to 1000 psi	100	20	100	20
190	0 to 1500 psi	300	20	300	20
200	0 to 2000 psi	200	20	200	20
210	0 to 3000 psi	500	50	500	50
220	0 to 5000 psi	1000	100	1000	100

Ranges over 5000 PSI are not available on D82LFB.

230	0 to 10000 psi	N/A	N/A	2000	200
240	0 to 15000 psi	N/A	N/A	3000	200

For dual scale ranges specify the appropriate **Units of Measure: D** (psi/kPa) followed by the corresponding **A** (psi) Range Code

Dial Size	C	E	F	J	M
1 1/2" D82	1.85 [47]	1.50 [38]	0.32 [8]	1.06 [27]	1.61 [41]
1 1/2" D83	1.85 [47]	1.50 [38]	0.32 [8]	1.06 [27]	1.61 [41]
2" D82	2.28 [58]	1.89 [48]	0.39 [10]	1.14 [29]	2.05 [52]
2" D83	2.28 [58]	2.05 [52]	0.35 [9]	1.18 [30]	2.05 [52]
2 1/2" D82	2.68 [68]	2.24 [57]	0.39 [10]	1.18 [30]	2.44 [62]
2 1/2" D83	2.68 [68]	2.32 [59]	0.51 [13]	1.38 [35]	2.44 [62]
4" D82	4.29 [109]	3.07 [78]	0.47 [12]	1.42 [36]	3.90 [99]
4" D83	4.29 [109]	3.94 [100]	0.75 [19]	1.93 [49]	3.94 [100]

# 875LFB

## Brass Case Gauge



875LFB shown

- ▶ Forged Brass Case & Socket
- ▶ Glycerin Fill Standard
- ▶ NEMA 4X Protection

The Trerice **875LFB** is designed for severe service applications. The one piece forged brass case and socket is able to withstand the harshest industrial processes. The standard glycerin fill helps protect against vibration and shock. Wetted parts are Lead-Free (PBF) brass.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

### Specifications

<b>Models</b>	<b>875LFB</b> (liquid filled)
<b>Dial Size</b>	<b>2 1/2", 4"</b>
<b>Wetted Parts</b>	Copper alloy tube and forged brass socket
<b>Fill</b>	Glycerin. Other fills available. See Options & Accessories.
<b>Movement</b>	Brass
<b>Connection</b>	Lower male
<b>Case</b>	Forged Brass
<b>Ring</b>	Stainless steel crimped ring with Polycarbonate Cover
<b>Window</b>	Polycarbonate
<b>Pointer</b>	Aluminum, black finished
<b>Dial Face</b>	Aluminum, white background with black gradations and markings
<b>Accuracy</b>	2 1/2" Dial Size: ±2-1-2% Full Scale, ASME B40.100 Grade A 4" Dial Size: ±1% Full Scale, ASME B40.100 Grade 1A
<b>Weather Protection</b>	NEMA 4X / IP65
<b>Maximum Temperature</b>	140° F / 60° C
<b>Approximate Shipping Weight</b>	0.8 lbs [0.34 kg]

### HOW TO ORDER

Sample Order Number: **875LFB 25 02 L A 130**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
<b>875LFB</b>	<b>25</b> 2 1/2" <b>40</b> 4"	<b>02</b> 1/4 NPT <b>04</b> 1/2 NPT*	<b>L</b> Lower	<b>A</b> psi <b>D</b> psi/kPa	See Standard Ranges

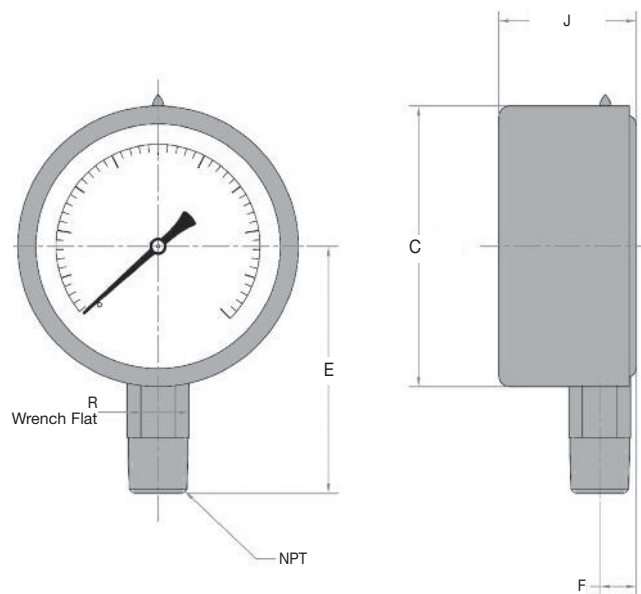
\*1/2 NPT connection size only available with 4" dial size.



# 875LFB

## Brass Case Gauge

All dimensions are nominal. Dimensions in [ ] are in millimeters.



Dial Size	C	E	F	J	R	NPT
2 1/2"	2.58 [66]	2.09 [53]	0.36 [9]	1.42 [36]	0.55 [14]	1/4
4"	3.94 [100]	3.46 [88]	0.51 [13]	1.93 [49]	0.87 [22]	1/4 or 1/2

### Standard Ranges

psi Ranges (A)			
Range Code	Specific Range	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.5
020	30" Hg to 15 psi	10/5	1/0.5
030	30" Hg to 30 psi	10/5	1/1
040	30" Hg to 60 psi	10/10	2/1
050	30" Hg to 100 psi	30/20	2/2
060	30" Hg to 150 psi	30/30	5/2
070	30" Hg to 300 psi	30/50	5/5
080	0 to 15 psi	3	0.2
090	0 to 30 psi	5	0.5
100	0 to 60 psi	10	1
110	0 to 100 psi	10	1
120	0 to 160 psi	20	2
130	0 to 200 psi	20	2
140	0 to 300 psi	50	5
150	0 to 400 psi	50	5
160	0 to 600 psi	100	10
180	0 to 1000 psi	100	20
190	0 to 1500 psi	300	20
200	0 to 2000 psi	300	20
210	0 to 3000 psi	500	50
220	0 to 5000 psi	1000	100
230	0 to 10,000 psi	1000	200

For dual scale ranges specify the appropriate **Units of Measure: D** (psi/kPa) followed by the corresponding **A** (psi) Range Code

# 600CB

## Cast Aluminum Case

COMMERCIAL • CONTRACTOR GAUGES



600CB shown



- ▶ 3 1/2" & 4 1/2" Dial Sizes
- ▶ ±1.0% Accuracy
- ▶ Cast Aluminum Case
- ▶ Adjustable Pointer

The **600CB** Trerice Contractor Gauge is among the most frequently specified HVACR gauges within the construction industry. This gauge offers high reliability at a moderate price. The 600CB is furnished with a cast aluminum case and an adjustable pointer. Wetted parts are Lead-Free (PBF) brass.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

### Specifications

**Model**

600CB

**Dial Sizes** 3 1/2", 4 1/2"

**Wetted Parts**

Bronze tube, brass socket  
Lead-Free (PBF)  
Meets NSF/ANSI Standards  
372 and 61

**Movement** Brass

**Connection** Lower male, 1/4 NPT

**Case** Cast aluminum, black finished, stem-mounted flangeless

**Ring** Friction type, 304 Stainless steel

**Window** Clear glass

**Pointer** Adjustable, black finished

**Dial Face** Aluminum, white background with black graduations and markings

**Accuracy** ±1.0% Full Scale,  
ASME B40.100 Grade 1A

**Maximum Temperature**  
212°F (100°C)

**Approximate Shipping Weight**

3 1/2" Dial Size:  
0.7 lbs [0.32 kg]

4 1/2" Dial Size:  
1.1 lbs [0.50 kg]

### HOW TO ORDER

Sample Order Number: **600CB 35 02 L A 090**

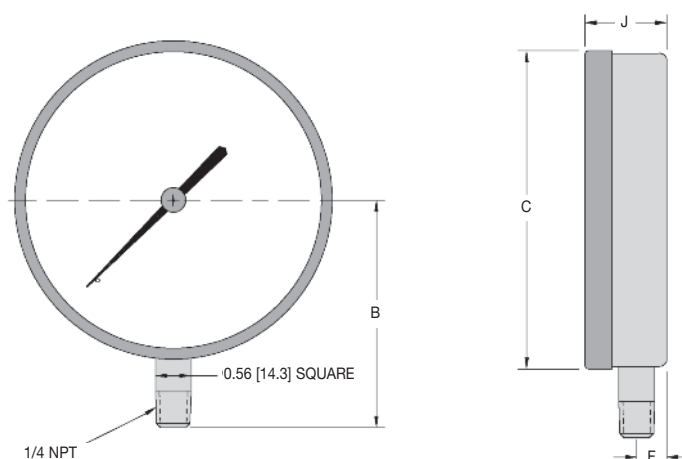
Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
600CB	35 3 1/2" 45 4 1/2"	02 1/4 NPT	L Lower	A psi B kPa C kg/cm <sup>2</sup> D psi/kPa E psi & kg/cm <sup>2</sup>	See Standard Ranges

# 600CB

## Cast Aluminum Case

All dimensions are nominal. Dimensions in [ ] are in millimeters.

COMMERCIAL • CONTRACTOR GAUGES



Dial Size	B	C	F	J
3 1/2"	3.06 [77.8]	3.88 [98.6]	0.44 [11.2]	1.22 [31]
4 1/2"	3.54 [89.9]	4.96 [126]	0.47 [11.9]	1.28 [32.5]

### Standard Ranges

psi Ranges (A)				kPa Ranges (B)				kg/cm <sup>2</sup> Ranges (C)			
Range Code	Specific Range (psi)	Figure Intervals	Minor Divisions	Range Code	Specific Range	Figure Intervals	Minor Divisions	Range Code	Specific Range	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.5	010	-100 to 0 kPa	10	2	010	76 cm Hg to 0	10	1
020	30" Hg to 15 psi	10/5	1/0.5	020	-100 to 100 kPa	20/20	2/2	020	76 cm Hg to 1 kg/cm <sup>2</sup>	20/0.2	1/0.2
030	30" Hg to 30 psi	10/5	1/1	030	-100 to 200 kPa	50/50	5/5	030	76 cm Hg to 2 kg/cm <sup>2</sup>	20/0.5	2/0.2
040	30" Hg to 60 psi	10/10	2/1	040	-100 to 400 kPa	100/100	10/10	040	76 cm Hg to 4 kg/cm <sup>2</sup>	25/0.5	5/0.5
050	30" Hg to 100 psi	30/20	2/2	050	-100 to 700 kPa	100/100	10/10	050	76 cm Hg to 7 kg/cm <sup>2</sup>	76/1	5/0.1
060	30" Hg to 150 psi	30/30	5/2	060	-100 to 1000 kPa	100/100	10/10	060	76 cm Hg to 10 kg/cm <sup>2</sup>	76/1	15/0.1
070	30" Hg to 300 psi	30/50	5/5	070	-100 to 2000 kPa	100/200	20/20	070	76 cm Hg to 21 kg/cm <sup>2</sup>	76/3	19/0.2
080	0 to 15 psi	3	0.2	080	0 to 100 kPa	10	1	080	0 to 1 kg/cm <sup>2</sup>	0.1	0.02
090	0 to 30 psi	5	0.5	090	0 to 200 kPa	20	2	090	0 to 2 kg/cm <sup>2</sup>	0.2	0.02
100	0 to 60 psi	10	1	100	0 to 400 kPa	50	5	100	0 to 4.2 kg/cm <sup>2</sup>	0.5	0.05
110	0 to 100 psi	10	1	110	0 to 700 kPa	100	10	110	0 to 7 kg/cm <sup>2</sup>	1	0.1
120	0 to 160 psi	20	2	120	0 to 1100 kPa	100	10	120	0 to 11 kg/cm <sup>2</sup>	1	0.1
130	0 to 200 psi	20	2	130	0 to 1400 kPa	200	20	130	0 to 14 kg/cm <sup>2</sup>	2	0.2
140	0 to 300 psi	50	5	140	0 to 2000 kPa	200	20	140	0 to 21 kg/cm <sup>2</sup>	3	0.2
150	0 to 400 psi	50	5	150	0 to 2800 kPa	400	20	150	0 to 28 kg/cm <sup>2</sup>	4	0.2
160	0 to 600 psi	100	10	160	0 to 4000 kPa	500	50	160	0 to 42 kg/cm <sup>2</sup>	6	0.5
180	0 to 1000 psi	100	20	180	0 to 7000 kPa	1000	100	180	0 to 70 kg/cm <sup>2</sup>	10	1

For dual scale ranges, specify the appropriate **Units of Measure: D (psi/kPa) or E (psi & kg/cm<sup>2</sup>)** followed by the equivalent **A (psi) Range Code**. Other pressure ranges are also available including: Altitude, Ammonia, Refrigerant and Receiver. Consult Special Application Ranges section or factory for availability.

# 610CB

## Glass Filled Nylon Case

COMMERCIAL • CONTRACTOR GAUGES



610CB shown



- ▶ 4 1/2" Dial Size
- ▶ ±1.0% Accuracy
- ▶ Back Flanged, Glass Filled Nylon Case
- ▶ Adjustable Pointer

The **610CB Trerice** Contractor Gauge is designed to service the pressure measurement requirements of the construction and transportation industries. The 610CB is furnished with a corrosion resistant plastic case and an adjustable pointer. Wetted parts are a bronze tube with Lead-Free (PBF) brass socket.

- **Optional features and case style variations available:** Please consult the **Options & Accessories** Section for details.
- **For correct use and application of all pressure gauges, please refer to:** Pressure Gauge Standard ASME B40.100.

### Specifications

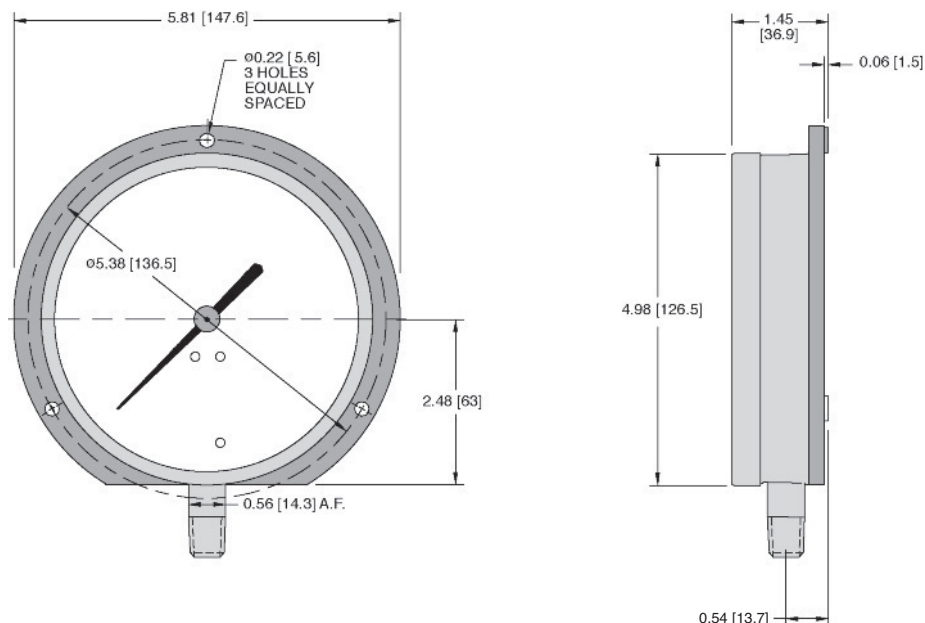
<b>Model</b>	610CB
<b>Dial Size</b>	4 1/2"
<b>Wetted Parts</b>	Bronze tube, brass socket Lead-Free (PBF) Meets NSF/ANSI Standards 372 and 61
<b>Movement</b>	Brass
<b>Connection</b>	Lower male, 1/4 NPT
<b>Case</b>	Glass filled nylon, surface mounted back flanged
<b>Ring</b>	Friction type, 304 stainless steel
<b>Window</b>	Clear glass
<b>Pointer</b>	Adjustable, black finished
<b>Dial Face</b>	Aluminum, white background with black graduations and markings
<b>Accuracy</b>	±1.0% Full Scale, ASME B40.100 Grade 1A
<b>Maximum Temperature</b>	212°F (101°C)
<b>Approximate Shipping Weight</b>	0.9 lbs [0.41 kg]

### HOW TO ORDER

Sample Order Number: **610CB 45 02 L A 110**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
610CB	45 4 1/2"	02 1/4 NPT	L Lower	A psi B kPa C kg/cm <sup>2</sup> D psi/kPa E psi & kg/cm <sup>2</sup>	See Standard Ranges

All dimensions are nominal. Dimensions in [ ] are in millimeters.



### Standard Ranges

psi Ranges (A)				kPa Ranges (B)				kg/cm <sup>2</sup> Ranges (C)			
Range Code	Specific Range (psi)	Figure Intervals	Minor Divisions	Range Code	Specific Range	Figure Intervals	Minor Divisions	Range Code	Specific Range	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.5	010	-100 to 0 kPa	10	2	010	76 cm Hg to 0	10	1
020	30" Hg to 15 psi	10/5	1/0.5	020	-100 to 100 kPa	20/20	2/2	020	76 cm Hg to 1 kg/cm <sup>2</sup>	20/0.2	1/0.2
030	30" Hg to 30 psi	10/5	1/1	030	-100 to 200 kPa	50/50	5/5	030	76 cm Hg to 2 kg/cm <sup>2</sup>	20/0.5	2/0.2
040	30" Hg to 60 psi	10/10	2/1	040	-100 to 400 kPa	100/100	10/10	040	76 cm Hg to 4 kg/cm <sup>2</sup>	25/0.5	5/0.5
050	30" Hg to 100 psi	30/20	2/2	050	-100 to 700 kPa	100/100	10/10	050	76 cm Hg to 7 kg/cm <sup>2</sup>	76/1	5/0.1
060	30" Hg to 150 psi	30/30	5/2	060	-100 to 1000 kPa	100/100	10/10	060	76 cm Hg to 10 kg/cm <sup>2</sup>	76/1	15/0.1
070	30" Hg to 300 psi	30/50	5/5	070	-100 to 2000 kPa	100/200	20/20	070	76 cm Hg to 21 kg/cm <sup>2</sup>	76/3	19/0.2
080	0 to 15 psi	3	0.2	080	0 to 100 kPa	10	1	080	0 to 1 kg/cm <sup>2</sup>	0.1	0.02
090	0 to 30 psi	5	0.5	090	0 to 200 kPa	20	2	090	0 to 2 kg/cm <sup>2</sup>	0.2	0.02
100	0 to 60 psi	10	1	100	0 to 400 kPa	50	5	100	0 to 4.2 kg/cm <sup>2</sup>	0.5	0.05
110	0 to 100 psi	10	1	110	0 to 700 kPa	100	10	110	0 to 7 kg/cm <sup>2</sup>	1	0.1
120	0 to 160 psi	20	2	120	0 to 1100 kPa	100	10	120	0 to 11 kg/cm <sup>2</sup>	1	0.1
130	0 to 200 psi	20	2	130	0 to 1400 kPa	200	20	130	0 to 14 kg/cm <sup>2</sup>	2	0.2
140	0 to 300 psi	50	5	140	0 to 2000 kPa	200	20	140	0 to 21 kg/cm <sup>2</sup>	3	0.2
150	0 to 400 psi	50	5	150	0 to 2800 kPa	400	20	150	0 to 28 kg/cm <sup>2</sup>	4	0.2
160	0 to 600 psi	100	10	160	0 to 4000 kPa	500	50	160	0 to 42 kg/cm <sup>2</sup>	6	0.5
180	0 to 1000 psi	100	20	180	0 to 7000 kPa	1000	100	180	0 to 70 kg/cm <sup>2</sup>	10	1

For dual scale ranges, specify the appropriate **Units of Measure: D (psi/kPa) or E (psi & kg/cm<sup>2</sup>)** followed by the equivalent **A (psi) Range Code**. Other pressure ranges are also available including: Altitude, Ammonia, Refrigerant and Receiver. Consult Special Application Ranges section or factory for availability.

# 620B

## Stainless Steel Case

COMMERCIAL • CONTRACTOR GAUGES



620B shown



- ▶ 4 1/2" Dial Size
- ▶ ±1.0% Accuracy
- ▶ Stainless Steel Case
- ▶ Recalibrator Screw

The **620B** Trerice Contractor Gauge is designed to service the general pressure measurement requirements of the construction industry. The 620B offers high reliability at an economic price. This gauge features a corrosion resistant, stainless steel case and acrylic window. Wetted parts are Lead-Free (PBF) brass.

- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

### Specifications

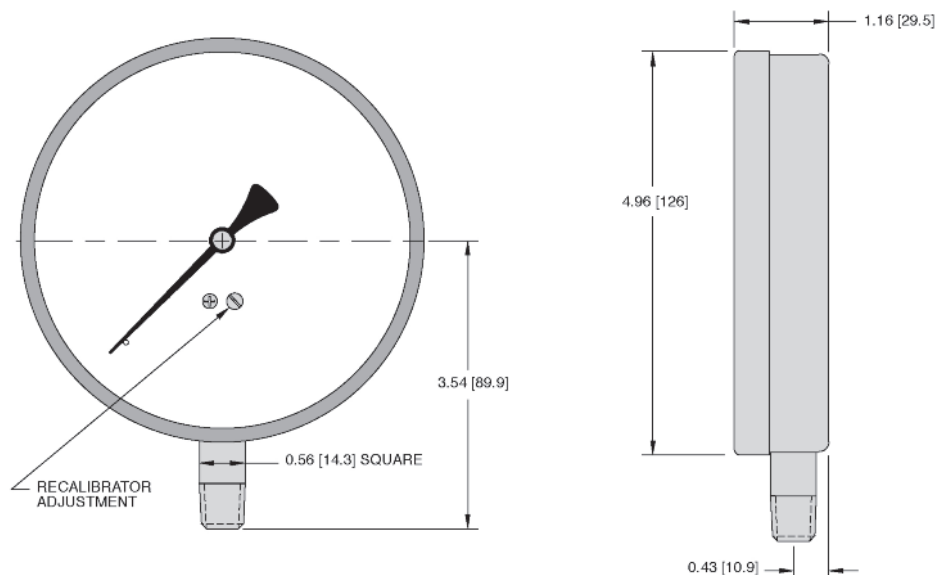
<b>Model</b>	620B
<b>Dial Size</b>	4 1/2"
<b>Wetted Parts</b>	Bronze tube, brass socket Lead-Free (PBF) Meets NSF/ANSI Standards 372 and 61
<b>Movement</b>	Brass
<b>Connection</b>	Lower male, 1/4 NPT
<b>Case</b>	304 stainless steel, stem-mounted flangeless
<b>Ring</b>	Friction type, 304 stainless steel
<b>Window</b>	Acrylic
<b>Pointer</b>	Plain, black finished Adjustable via screw on dial face
<b>Dial Face</b>	Aluminum, white background with black graduations and markings
<b>Accuracy</b>	±1.0% Full Scale, ASME B40.100 Grade 1A
<b>Maximum Temperature</b>	<b>212°F (100° C)</b>
<b>Approximate Shipping Weight</b>	0.8 lbs [0.36 kg]

### HOW TO ORDER

Sample Order Number: **620B 45 02 L D 140**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
620B	45 4 1/2"	02 1/4 NPT	L Lower	A psi D psi/kPa	See Standard Ranges

All dimensions are nominal. Dimensions in [ ] are in millimeters.



### Standard Ranges

psi Ranges (A)				psi/kPa Ranges (D)					
Range Code	Specific Range (psi)	Figure Intervals	Minor Divisions	Range Code	Specific Range	psi		kPa	
						Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.5	010	30" Hg to 0 / -100 to 0 kPa	5	0.5	10	1
020	30" Hg to 15 psi	10/5	1/0.5	020	30" Hg to 15 psi / -100 to 100 kPa	10/5	1/0.5	20/20	2/2
030	30" Hg to 30 psi	10/5	1/1	030	30" Hg to 30 psi / -100 to 200 kPa	10/5	1/1	50/50	5/5
040	30" Hg to 60 psi	10/10	2/1	040	30" Hg to 60 psi / -100 to 400 kPa	10/10	2/1	100/100	10/10
050	30" Hg to 100 psi	30/20	2/2	050	30" Hg to 100 psi / -100 to 700 kPa	30/20	2/2	100/100	10/10
060	30" Hg to 150 psi	30/30	5/2	060	30" Hg to 150 psi / -100 to 1000 kPa	30/30	5/2	100/100	10/10
070	30" Hg to 300 psi	30/50	5/5	070	30" Hg to 300 psi / -100 to 2000 kPa	30/50	5/5	100/200	20/20
080	0 to 15 psi	3	0.2	080	0 to 15 psi / 0 to 100 kPa	3	0.2	10	1
090	0 to 30 psi	5	0.5	090	0 to 30 psi / 0 to 200 kPa	5	0.5	20	2
100	0 to 60 psi	10	1	100	0 to 60 psi / 0 to 400 kPa	10	1	50	5
110	0 to 100 psi	10	1	110	0 to 100 psi / 0 to 700 kPa	10	1	100	5
120	0 to 160 psi	20	2	120	0 to 160 psi / 0 to 1100 kPa	20	2	200	10
130	0 to 200 psi	20	2	130	0 to 200 psi / 0 to 1400 kPa	20	2	300	10
140	0 to 300 psi	50	5	140	0 to 300 psi / 0 to 2000 kPa	50	5	200	20
150	0 to 400 psi	50	5	150	0 to 400 psi / 0 to 2800 kPa	50	5	300	50
160	0 to 600 psi	100	10	160	0 to 600 psi / 0 to 4000 kPa	100	10	500	50

# 690 Series

## Multiple Stainless Steel Case Styles

COMMERCIAL • CONTRACTOR GAUGES



690B shown



- ▶ 3 1/2" Dial Size
- ▶ ±1.0% Accuracy
- ▶ Polished Stainless Steel Case
- ▶ Multiple Case Styles

Trerice **690 Series** Commercial Gauges are offered in a polished stainless steel case to provide the durability and styling required in OEM and other applications. This gauge is available in a variety of case styles. Wetted parts are a bronze tube with Lead-Free (PBF) brass socket.

- **Optional features available:** Please consult the **Options & Accessories** Section for details.
- **For correct use and application of all pressure gauges, please refer to:** Pressure Gauge Standard ASME B40.100.

### HOW TO ORDER







Sample Order Number: **690B 35 02 L D 110**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
690B	35 3 1/2"	02 1/4 NPT	L Lower *	D psi/kPa	See Standard Ranges
691B			B Back **	A psi	
692B				B kPa	
693B					
694B					
696B					

\* For Models 690B & 692B only

\*\* For Models 691B, 693B, 694B & 696B only

### Specifications

Models	Case Styles
690B	 <b>Flangeless,</b> stem mounted with bottom outlet
691B	 <b>Flangeless,</b> stem mounted with back outlet
692B	 <b>Surface Mounted,</b> back flanged with bottom outlet
693B	 <b>Flush Mounted,</b> front flanged with back outlet
694B	 <b>Flush Mounted,</b> u-clamp with back outlet
696B	 <b>Surface Mounted,</b> back flanged with back outlet

**Dial Size** 3 1/2"

#### Wetted Parts

Bronze tube, brass socket  
Lead-Free (PBF)  
Meets NSF/ANSI Standards 372 and 61

**Movement** Brass

**Connection** **690B, 692B:**  
Lower male, 1/4 NPT  
**691B, 693B, 694B, 696B:**  
Center back male, 1/4 NPT

**Case** Stainless Steel

**Window** Acrylic, snap-in

**Pointer** Adjustable, black finish

**Dial Face** Aluminum, white background with black graduations and markings

**Accuracy** ±1.0% Full Scale,  
ASME B40.100 Grade 1A

**Maximum Temperature**  
150°F (65°C)

**Approximate Shipping Weight**  
690B, 691B, 692B, 696B:  
0.6 lbs [0.27 kg]  
693B:  
0.8 lbs [0.36 kg]  
694B:  
0.9 lbs [0.41 kg]

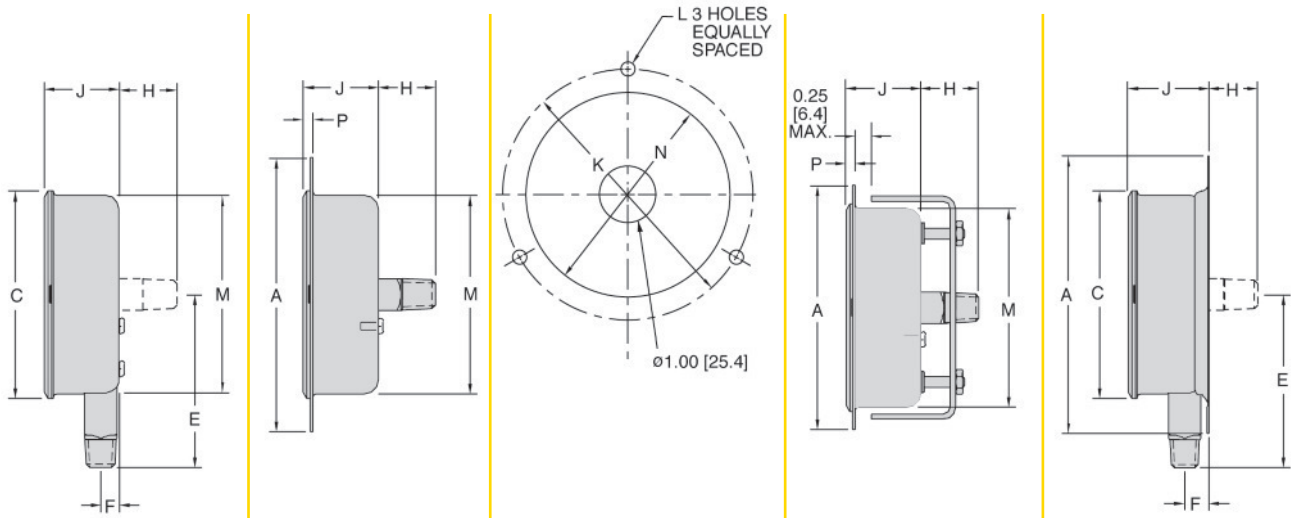


# 690 Series

## Multiple Stainless Steel Case Styles

All dimensions are nominal. Dimensions in [ ] are in millimeters.

COMMERCIAL • CONTRACTOR GAUGES



**690B / 691B      693B      692B / 693B / 696B      694B      692B / 696B**

Model	A	C	E	F	H	J	K	L	M	N	P
690B	N/A	3.67 [93.2]	3.06 [77.8]	0.32 [8.2]	N/A	1.33 [33.8]	N/A	N/A	3.51 [89.2]	N/A	0.17 [4.3]
691B	N/A	3.67 [93.2]	N/A	N/A	1.01 [25.8]	1.33 [33.8]	N/A	N/A	3.51 [89.2]	N/A	0.17 [4.3]
692B	4.91 [124.7]	3.67 [93.2]	3.06 [77.8]	0.43 [11]	0.90 [23.0]	1.44 [36.6]	4.25 [108]	0.25 [6.4]	N/A	N/A	N/A
693B	4.84 [122.9]	N/A	N/A	N/A	1.01 [25.8]	1.33 [33.8]	4.25 [108]	0.25 [6.4]	3.51 [89.2]	3.62 [92]	0.17 [4.3]
694B	4.31 [109.5]	N/A	N/A	N/A	1.01 [25.8]	1.33 [33.8]	N/A	N/A	3.51 [89.2]	3.62 [92]	0.17 [4.3]
696B	4.91 [124.7]	3.67 [93.2]	N/A	N/A	0.90 [23]	1.44 [36.6]	4.25 [108]	0.25 [6.4]	N/A	N/A	N/A

### Standard Ranges

Range Code	psi/kPa Ranges (D)		psi (A)		kPa (B)	
	Specific Range (psi)		Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
010	30" Hg to 0 / -100 to 0 kPa		5	0.5	10	2
020	30" Hg to 15 psi / -100 to 100 kPa		10/5	1/0.5	20/20	2/2
030	30" Hg to 30 psi / -100 to 200 kPa		10/5	1/1	50/50	5/5
040	30" Hg to 60 psi / -100 to 400 kPa		10/10	2/1	100/100	10/10
050	30" Hg to 100 psi / -100 to 700 kPa		30/20	2/2	100/100	10/10
060	30" Hg to 150 psi / -100 to 1000 kPa		30/30	5/2	100/100	10/10
070	30" Hg to 300 psi / -100 to 2000 kPa		30/50	5/5	100/200	20/20
080	0 to 15 psi / 0 to 100 kPa		3	0.2	10	1
090	0 to 30 psi / 0 to 200 kPa		5	0.5	20	2
100	0 to 60 psi / 0 to 400 kPa		10	1	50	5
110	0 to 100 psi / 0 to 700 kPa		10	1	100	5
120	0 to 160 psi / 0 to 1100 kPa		20	2	200	10
130	0 to 200 psi / 0 to 1400 kPa		20	2	200	20
140	0 to 300 psi / 0 to 2000 kPa		50	5	200	20
150	0 to 400 psi / 0 to 2800 kPa		50	5	400	20
160	0 to 600 psi / 0 to 4000 kPa		100	10	500	50
180	0 to 1000 psi / 0 to 7000 kPa		100	20	1000	100

Other pressure ranges are also available including: Altitude, Refrigerant and Receiver. Consult Special Application Ranges section or factory for availability.



# 800B

Dry • Black Finished Steel Case

UTILITY GAUGES



800B shown



- ▶ 1 1/2", 2", 2 1/2", 4" Dial Sizes
- ▶ ±1.6% Accuracy
- ▶ Drawn Steel Case

The Trerice **800B** Utility Gauge is designed for general pressure indication requirements. This gauge provides reliable service at an economical cost. Wetted parts are bronze tube and Lead-Free (PBF) brass socket.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

## Specifications

**Model**  
800B

**Dial Sizes** 1 1/2", 2", 2 1/2", 4"

**Wetted Parts**

Bronze tube, brass socket  
Lead-Free (PBF)  
Meets NSF/ANSI Standards  
372 and 61

**Movement** Brass

**Connection**

1 1/2" Dial Size: Lower male or center back male, 1/8 NPT

2", 2 1/2" Dial Size: Lower male or center back male, 1/8 or 1/4 NPT

4" Dial Size: Lower male or center back male, 1/4 NPT

**Case**

Drawn steel, black finished, stem-mounted flangeless

**Window**

Acrylic

**Pointer**

Plain, black finished

**Dial Face**

Aluminum, white background with black graduations and markings

**Accuracy**

±1.6% Full Scale

**Maximum Temperature**

180°F (82°C)

**Approximate Shipping Weight**

1 1/2" Dial Size:  
0.2 lbs [0.09 kg]

2" Dial Size:  
0.3 lbs [0.14 kg]

2 1/2" Dial Size:  
0.3 lbs [0.14 kg]

4" Dial Size:  
0.6 lbs [0.27 kg]

## HOW TO ORDER

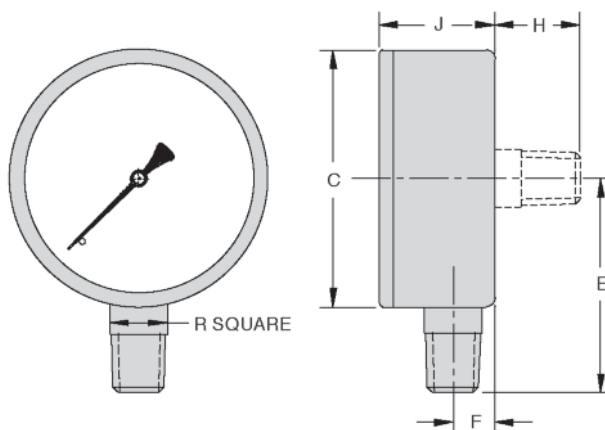
Sample Order Number: **800B 15 01 B D 110**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
800B	15 1 1/2"	01 1/8 NPT	L Lower	A psi	See Standard Ranges
	20 2"	02 1/4 NPT	B Back	D psi/kPa	
	25 2 1/2"				
	40 4"				

All dimensions are nominal. Dimensions in [ ] are in millimeters.

Dry • Black Finished Steel Case

UTILITY GAUGES



Dial Size	C	E	F	H	J	R
1 1/2" Lower	1.57 [40]	1.54 [39]	0.35 [9]	0.71 [18]	1.02 [26]	0.43 [11]
1 1/2" Back	1.57 [40]	1.54 [39]	0.35 [9]	0.68 [17]	1.15 [29]	0.43 [11]
2"	1.97 [50]	1.93 [49]	0.39 [10]	0.89 [23]	1.16 [29]	0.55 [14]
2 1/2"	2.48 [63]	2.20 [56]	0.39 [10]	0.87 [22]	1.16 [29]	0.55 [14]
4"	3.94 [100]	2.87 [73]	0.39 [10]	0.95 [24]	1.38 [35]	0.55 [14]

## Standard Ranges

psi Ranges (A)				psi/kPa Ranges (D)					
Range Code	Specific Range	Figure Intervals	Minor Divisions	Range Code	Specific Range	psi		kPa	
						Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.5	010	30" Hg to 0 / -100 to 0 kPa	5	0.5	10	2
020	30" Hg to 15 psi	10/5	1/0.5	020	30" Hg to 15 psi / -100 to 100 kPa	10/5	1/0.5	20/20	2/2
030	30" Hg to 30 psi	10/5	1/1	030	30" Hg to 30 psi / -100 to 200 kPa	10/5	1/1	50/50	5/5
040	30" Hg to 60 psi	10/10	2/1	040	30" Hg to 60 psi / -100 to 400 kPa	10/10	2/1	100/100	10/10
050	30" Hg to 100 psi	30/20	2/2	050	30" Hg to 100 psi / -100 to 700 kPa	30/20	2/2	100/100	10/10
060	30" Hg to 150 psi	30/30	5/2	060	30" Hg to 150 psi / -100 to 1000 kPa	30/30	5/2	100/100	10/10
070	30" Hg to 300 psi	30/50	5/5	070	30" Hg to 300 psi / -100 to 2000 kPa	30/50	5/5	100/200	20/20
080	0 to 15 psi	3	0.2	080	0 to 15 psi / 0 to 100 kPa	3	0.2	10	1
090	0 to 30 psi	5	0.5	090	0 to 30 psi / 0 to 200 kPa	5	0.5	20	2
100	0 to 60 psi	10	1	100	0 to 60 psi / 0 to 400 kPa	10	1	50	5
110	0 to 100 psi	10	1	110	0 to 100 psi / 0 to 700 kPa	10	1	100	10
120	0 to 160 psi	20	2	120	0 to 160 psi / 0 to 1100 kPa	20	2	200	10
130	0 to 200 psi	20	2	130	0 to 200 psi / 0 to 1400 kPa	20	2	200	20
140	0 to 300 psi	50	5	140	0 to 300 psi / 0 to 2000 kPa	50	5	200	20
150	0 to 400 psi	50	5	150	0 to 400 psi / 0 to 2800 kPa	50	10	400	20
160	0 to 600 psi	100	10	160	0 to 600 psi / 0 to 4000 kPa	100	20	500	50
180	0 to 1000 psi	100	20	180	0 to 1000 psi / 0 to 7000 kPa	100	20	1000	100
190	0 to 1500 psi	300	20	190	0 to 1500 psi / 0 to 10,000 kPa	300	20	1000	200
200	0 to 2000 psi	200	20	200	0 to 2000 psi / 0 to 14,000 kPa	200	50	2000	200
210	0 to 3000 psi	500	50	210	0 to 3000 psi / 0 to 20,000 kPa	500	100	2000	200
220	0 to 5000 psi	1000	100	220	0 to 5000 psi / 0 to 35,000 kPa	1000	100	5000	500

# 800LFB

Liquid Filled • Plastic Case

UTILITY GAUGES



800LFB shown

- ▶ 2", 2 1/2", 3 1/2" Dial Sizes
- ▶ ±1.6% Accuracy (2", 2 1/2")
- ▶ ±1.0% Accuracy (3 1/2")
- ▶ Liquid Filled

The Trerice **800LFB** Utility Gauge is designed to meet the needs of general industrial applications. The gauge features a rugged, plastic, liquid filled case to withstand minor vibration and pulsation conditions. Wetted parts are bronze tube with brass socket.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

## Specifications

<b>Model</b>	<b>800LFB</b> (liquid filled)
<b>Dial Sizes</b>	2", 2 1/2", 3 1/2"
<b>Wetted Parts</b>	Bronze tube, brass socket
<b>Fill</b>	Glycerine, other fills available See Optional Features Section
<b>Movement</b>	Brass
<b>Connection</b>	Lower male or center back male 1/8 or 1/4 NPT
<b>Case</b>	2", 2 1/2" Dial Size: ABS plastic, stem-mounted flangeless  3 1/2" Dial Size: Nylon, stem-mounted flangeless
<b>Ring</b>	Crimped aluminum, black finished
<b>Window</b>	Styrene-acrylonitrile
<b>Pointer</b>	Plain, black finish
<b>Dial Face</b>	Aluminum, white background with black graduations and markings
<b>Accuracy</b>	2", 2 1/2" Dial Size: ±1.6% Full Scale  3 1/2" Dial Size: ±1.0% Full Scale, ASME B40.100 Grade 1A
<b>Maximum Temperature</b>	<b>150°F (65°C)</b>

### Approximate Shipping Weight

2" Dial Size:  
0.4 lbs [0.18 kg]  
  
2 1/2" Dial Size:  
0.5 lbs [0.23 kg]  
  
3 1/2" Dial Size:  
1.0 lbs [0.45 kg]

## HOW TO ORDER

Sample Order Number: **800LFB 25 02 L A 110**

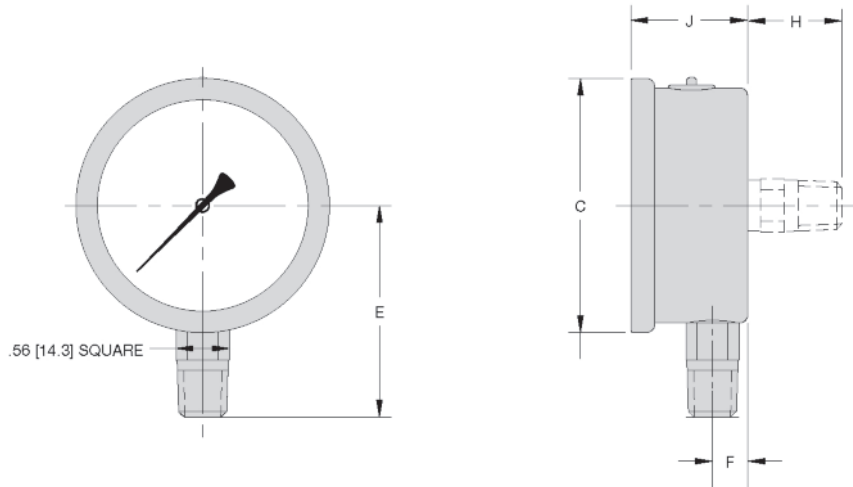
Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
800LFB	20 2"	01 1/8 NPT*	L Lower	A psi	See Standard Ranges
	25 2 1/2"	02 1/4 NPT	B Back	D psi/kPa	
	35 3 1/2"				

\* 1/8 NPT connection size not available with 3 1/2" dial size.

# 800LFB

## Liquid Filled • Plastic Case

All dimensions are nominal. Dimensions in [ ] are in millimeters.



Dial Size	C	E	F	H	J
2"	2.09 [53.1]	1.91 [48.5]	0.48 [12.2]	0.98 [24.9]	1.24 [31.2]
2 1/2"	2.67 [67.8]	2.19 [55.5]	0.39 [10.0]	0.99 [25.1]	1.26 [32.5]
3 1/2"	4.23 [107]	2.87 [73.0]	0.48 [12.2]	1.06 [27]	1.41 [36.0]

### Standard Ranges

		psi Ranges (A)			
Range Code	Specific Range	2 & 2 1/2" Dial Size		3 1/2" Dial Size	
		Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	1	5	0.5
020	30" Hg to 15 psi	10/5	1/0.5	10/5	1/0.5
030	30" Hg to 30 psi	10/5	1/1	10/5	1/1
040	30" Hg to 60 psi	10/10	2/1	10/10	2/1
050	30" Hg to 100 psi	30/20	2/2	30/20	2/2
060	30" Hg to 150 psi	30/30	5/2	30/30	5/2
070	30" Hg to 300 psi	30/50	5/5	30/50	5/5
080	0 to 15 psi	3	0.2	3	0.2
090	0 to 30 psi	5	0.5	5	0.5
100	0 to 60 psi	10	1	10	1
110	0 to 100 psi	10	1	10	1
120	0 to 160 psi	20	2	20	2
130	0 to 200 psi	20	2	20	2
140	0 to 300 psi	50	5	50	5
150	0 to 400 psi	50	5	50	5
160	0 to 600 psi	100	10	100	10
180	0 to 1000 psi	100	20	100	20
190	0 to 1500 psi	300	20	300	20
200	0 to 2000 psi	200	20	200	20
210	0 to 3000 psi	500	50	500	50
220	0 to 5000 psi	1000	100	1000	100

For dual scale ranges specify the appropriate **Units of Measure: D (psi/kPa)** followed by the corresponding **A (psi) Range Code**

UTILITY GAUGES

# Test Gauges

For Gas or Water Service

UTILITY GAUGES



Gas Test Gauge



Water Test Gauge

- ▶ **Gas Test: 2" Dial**
- ▶ **Water Test: 2 1/2" Dial**
- ▶ **Gas Test: 3/4 NPT Female**
- ▶ **Water Test: 3/4 NPT Hose Bib**

Terice **Gas** and **Water Test Gauges** are integral tools for passing building inspections. Once the system has been pressurized, any leaks are visible as a pressure drop on the dial of the Gas Test Gauge. The Water Test Gauge has a 3/4 NPT hose bib connection mounted at 12 o'clock for easy viewing and accurately measures in-line water pressure. A maximum register pointer is available on either gauge having a dial range of 60 psi or greater.

## Specifications

### Models

<b>120</b>	Gas Test Gauge
<b>122</b>	Water Test Gauge

<b>Dial Sizes</b>	Gas Test: 2" (50mm) Water Test: 2 1/2" (63mm)
-------------------	--

### Wetted Parts

Bronze tube, lead-free (PBF) brass socket

<b>Connection</b>	Gas Test: 3/4 NPT female Water Test: 3/4 female hose-bib connection, 12 o'clock mount
-------------------	--

<b>Case</b>	Steel, black painted
-------------	----------------------

<b>Ring</b>	Steel, black painted
-------------	----------------------

<b>Window</b>	Acrylic
---------------	---------

<b>Pointer</b>	Steel, black painted Adjustable via screw on dial face
----------------	---

<b>Accuracy</b>	3-2-3%, Grade B
-----------------	-----------------

### Maximum Temperature

150°F (65°C)

### Approximate Shipping Weight

2" Gas Test:  
0.6 lbs. (0.27 kg)

2 1/2" Water Test:  
0.4 lbs. (0.18 kg)

Gas Test Gauge Part Number *	Water Test Gauge Part Number *	Range
PGT12010	N/A	0 to 15 psi
PGT120190	N/A	0 to 15 psi/kPa
PGT120191	N/A	0 to 30 psi/kPa
PGT120192	N/A	0 to 60 psi/kPa
PGT120193	N/A	0 to 100 psi/kPa
N/A	PWT122194	0 to 160 psi/kPa
N/A	PWT122196	0 to 300 psi/kPa

\* Add MAX to any part number for Maximum Registering Pointer. (60 psi and greater only)

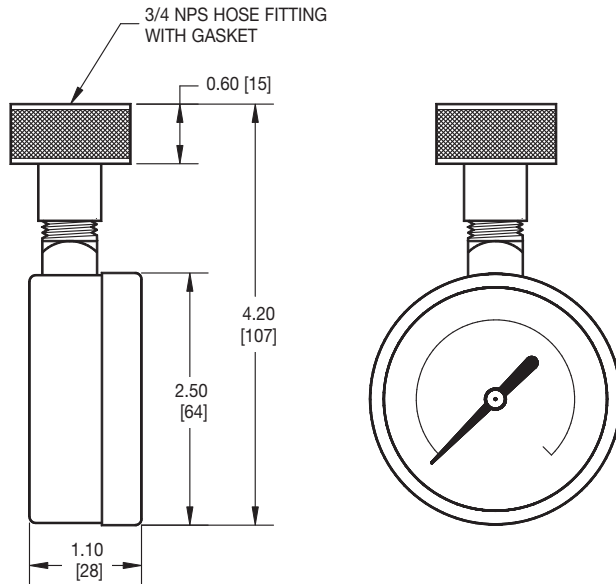
Example: PGT120192MAX

# Test Gauges

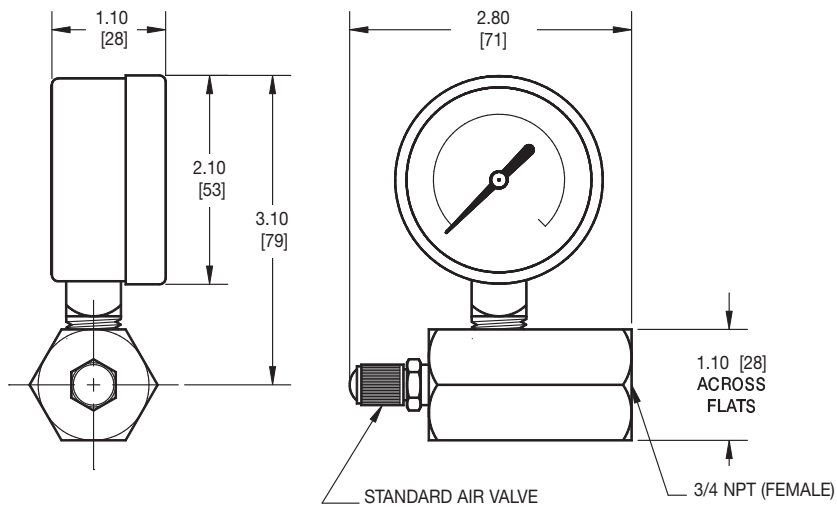
For Gas or Water Service

All dimensions are nominal. Dimensions in [ ] are in millimeters.

## WATER TEST GAUGE



## GAS TEST GAUGE



UTILITY GAUGES

# 760B

## Low Pressure Gauge • Black Finished Steel Case

SPECIALTY GAUGES



760B shown

▶ 2 1/2", 4" Dial Sizes

▶ ±1.6% Accuracy

▶ Drawn Steel Case

The Trerice **760B** Low Pressure Gauge is designed to accurately measure extreme low pressure conditions. This pressure gauge employs a diaphragm capsule sensing element to measure the low pressure. Case material is drawn steel with brass wetted parts.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

### Specifications

#### Model

760B

**Dial Sizes** 2 1/2", 4"

#### Wetted Parts

316L stainless steel diaphragm capsule, brass socket

**Movement** Brass

**Connection** 2 1/2" Dial Size: Lower male or center back male, 1/4 NPT  
4" Dial Size: Lower male or center back male, 1/4 or 1/2 NPT

**Case** Drawn steel, black finished, stem-mounted flangeless

**Window** Polycarbonate, snap-in

**Pointer** Plain, black finished  
Adjustable via screw on dial face

**Dial Face** Aluminum, white background with black graduations and markings

**Accuracy** ±1.6% Full Scale

**Maximum Temperature**  
140°F (60°C)

**Approximate Shipping Weight**  
2 1/2" Dial Size:  
0.3 lbs [0.14 kg]  
4" Dial Size:  
0.89 lbs [0.36 kg]

### HOW TO ORDER

Sample Order Number: **760B 25 02 L T 660**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
760B	25 2 1/2" 40 4"	02 1/4 NPT 04 1/2 NPT*	L Lower B Back	T Pressure W Vacuum	See Standard Ranges

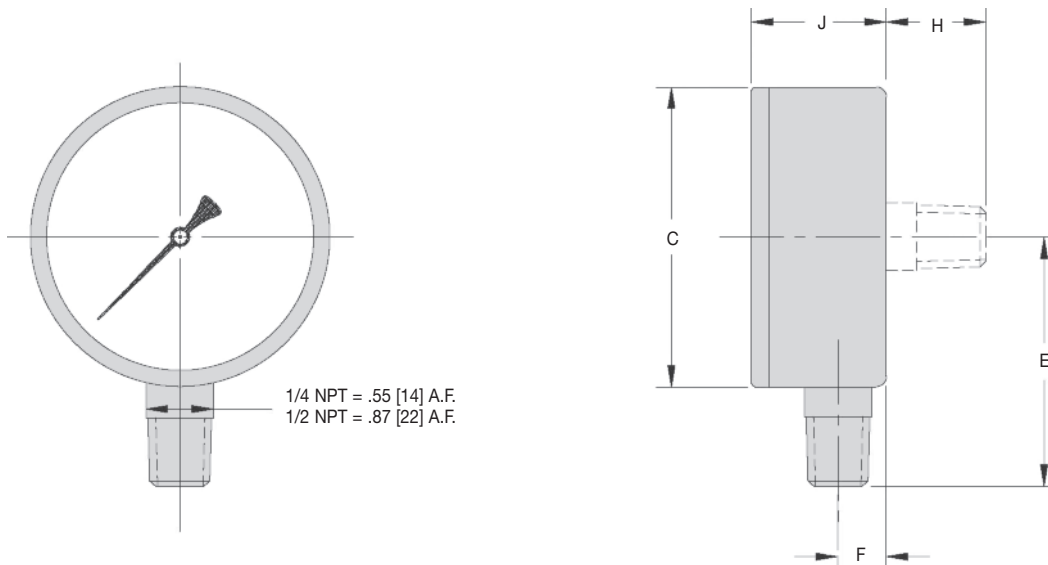
\* 1/2 NPT connection size available only with 4" dial size.



# 760B

All dimensions are nominal. Dimensions in [ ] are in millimeters.

## Low Pressure Gauge • Black Finished Steel Case



Dial Size	C	E	F	H	J
2 1/2"	2.44 [62]	2.20 [56]	0.37 [9.5]	0.98 [25]	1.34 [34]
4"	3.90 [99]	3.23 [82]	0.61 [16]	0.98 [25]	1.22 [44]
4" (1/2 NPT)	3.90 [99]	3.43 [87]	0.61 [16]	1.38 [35]	1.22 [44]

### Standard Ranges\*

Pressure (T)			
Range Code	Specific Range	Figure Intervals	Minor Divisions
645	0/10 in. H <sub>2</sub> O	1	0.2
650	0/15 in. H <sub>2</sub> O	3	0.2
660	0/30 in. H <sub>2</sub> O	5	0.5
670	0/60 in. H <sub>2</sub> O	10	1
680	0/100 in. H <sub>2</sub> O	10	1
690	0/160 in. H <sub>2</sub> O	20	2
700	0/200 in. H <sub>2</sub> O	20	2
720	0/300 in. H <sub>2</sub> O	50	5
652	0/10 oz./in. <sup>2</sup>	1	0.2
655	0/15 oz./in. <sup>2</sup>	3	0.2
662	0/20 oz./in. <sup>2</sup> & 0/34 in. H <sub>2</sub> O	2/5	0.2/0.2
667	0/30 oz./in. <sup>2</sup>	5	0.5
665	0/60 oz./in. <sup>2</sup>	10	1
695	0/100 oz./in. <sup>2</sup>	10	1
725	0/160 oz./in. <sup>2</sup>	20	2
750	0/250 oz./in. <sup>2</sup>	50	2
675	0/3 psi	0.5	0.05
685	0/5 psi	0.5	0.05
715	0/10 psi	1	0.2

### Standard Ranges\*

Vacuum (W)			
Range Code	Specific Range	Figure Intervals	Minor Divisions
580	15/0 in. H <sub>2</sub> O	5	0.2
600	30/0 in. H <sub>2</sub> O	5	0.5
610	60/0 in. H <sub>2</sub> O	10	1
620	100/0 in. H <sub>2</sub> O	10	2
635	200/0 in. H <sub>2</sub> O	20	2
595	15/0 oz./in. <sup>2</sup>	5	0.2
605	30/0 oz./in. <sup>2</sup>	5	0.5
625	60/0 oz./in. <sup>2</sup>	10	1
633	100/0 oz./in. <sup>2</sup>	10	2

\* Compound ranges are also available. Please consult factory.

SPECIALTY GAUGES

# 765B/766SS

## Low Pressure Gauge • Stainless Steel Case

SPECIALTY GAUGES



766SS shown



- ▶ 2 1/2", 4", 6" Dial Sizes
- ▶ ±1.6% Accuracy (2 1/2", 4")
- ▶ ±2.0% Accuracy (6")
- ▶ Stainless Steel Case

The Trerice **765B/766SS Series** Low Pressure Gauge is designed to accurately measure extreme low pressure conditions. This pressure gauge employs a diaphragm capsule sensing element to measure the low pressure. Case material and wetted parts are either brass or stainless steel.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

### Specifications

Model	Wetted Parts
<b>765B</b>	316L stainless steel diaphragm, brass socket
<b>766SS</b>	316L stainless steel diaphragm, 316L stainless steel socket
<b>Dial Sizes</b>	2 1/2", 4", 6"
<b>Movement</b>	316 Stainless Steel
<b>Connection</b>	Lower male or center back male, 1/4 or 1/2 NPT
<b>Case</b>	304 stainless steel, satin finished, stem-mounted flangeless
<b>Ring</b>	Bayonet type, 304 stainless steel
<b>Window</b>	Safety glass
<b>Pointer</b>	Plain, black finished Adjustable via screw on dial face
<b>Dial Face</b>	Aluminum, white background with black graduations and markings
<b>Accuracy</b>	2 1/2" Dial Size: ±1.6% Full Scale 4" Dial Size: ±1.6% Full Scale 6" Dial Size: ±2.0% Full Scale

### Maximum Temperature

**765B 140°F (68°C)**  
**766SS 212°F (100°C)**

### Approximate Shipping Weight

2 1/2" Dial Size:  
0.3 lbs [0.14 kg]  
4" Dial Size:  
1.4 lbs [0.64 kg]  
6" Dial Size:  
1.9 lbs [0.86 kg]

### HOW TO ORDER

Sample Order Number: **766SS 40 02 L W 600**

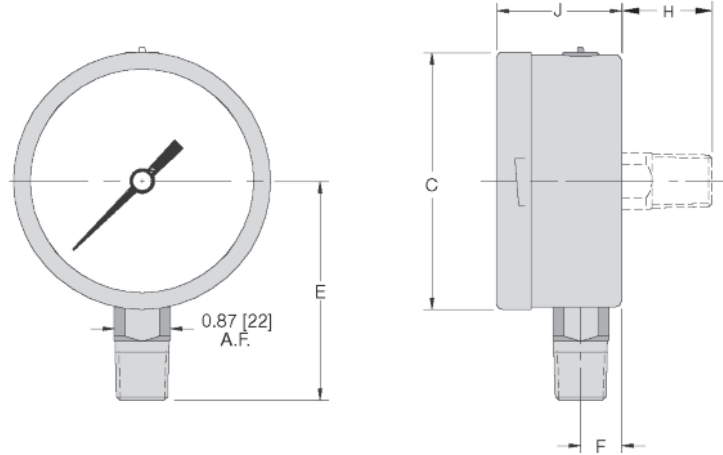
Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
<b>765B</b>	25 2 1/2"	02 1/4 NPT	L Lower	T Pressure	See Standard Ranges
<b>766SS</b>	40 4"	04 1/2 NPT*	B Back	W Vacuum	
	60 6"				

\* Not available with 2 1/2" dial size.

# 765B/766SS

## Low Pressure Gauge • Stainless Steel Case

All dimensions are nominal. Dimensions in [ ] are in millimeters.



Dial Size	C	E	F	H	J
2 1/2"	2.48 [63]	2.09 [53]	0.43 [11]	1.06 [27]	1.46 [37]
4"	3.98 [101]	3.43 [87]	0.63 [16]	1.38 [35]	1.93 [49]
6"	6.34 [161]	4.76 [121]	0.69 [18]	1.38 [35]	1.97 [50]

### Standard Ranges\*

Pressure (T)			
Range Code	Specific Range	Figure Intervals	Minor Divisions
645	0/10 in. H <sub>2</sub> O	1	0.2
650	0/15 in. H <sub>2</sub> O	3	0.2
660	0/30 in. H <sub>2</sub> O	5	0.5
670	0/60 in. H <sub>2</sub> O	10	1
680	0/100 in. H <sub>2</sub> O	10	1
690	0/160 in. H <sub>2</sub> O	20	2
700	0/200 in. H <sub>2</sub> O	20	2
720	0/300 in. H <sub>2</sub> O	50	5
652	0/10 oz./in. <sup>2</sup>	1	0.2
655	0/15 oz./in. <sup>2</sup>	3	0.2
662	0/20 oz./in. <sup>2</sup> & 0/34 in. H <sub>2</sub> O	2/5	0.2/0.2
667	0/30 oz./in. <sup>2</sup>	5	0.5
665	0/60 oz./in. <sup>2</sup>	10	1
695	0/100 oz./in. <sup>2</sup>	10	1
725	0/160 oz./in. <sup>2</sup>	20	2
750	0/250 oz./in. <sup>2</sup>	50	2
675	0/3 psi	0.5	0.05
685	0/5 psi	0.5	0.05
715	0/10 psi	1	0.2

### Standard Ranges\*

Vacuum (W)			
Range Code	Specific Range	Figure Intervals	Minor Divisions
580	15/0 in. H <sub>2</sub> O	5	0.2
600	30/0 in. H <sub>2</sub> O	5	0.5
610	60/0 in. H <sub>2</sub> O	10	1
620	100/0 in. H <sub>2</sub> O	10	2
635	200/0 in. H <sub>2</sub> O	20	2
595	15/0 oz./in. <sup>2</sup>	5	0.2
605	30/0 oz./in. <sup>2</sup>	5	0.5
625	60/0 oz./in. <sup>2</sup>	10	1
633	100/0 oz./in. <sup>2</sup>	10	2

\* Compound ranges are also available. Please consult factory.

SPECIALTY GAUGES

# 750 Series

Solid Front • Field Liquid Fillable • Stainless Steel Case

SPECIALTY GAUGES



750SS shown

- ▶ 2 1/2", 4" Dial Size
- ▶ ±1.0% Accuracy
- ▶ Stainless Steel Case
- ▶ Solid Front/Blow-Out Back
- ▶ Field Liquid Fillable

The Trerice **750 Series** Process Gauge is designed for the varying needs of the world's process industries. This solid front/blow-out back gauge features a stainless steel case and ring. Its sturdy interior design and field liquid-fill capability (no kit required) provide the durability, accuracy and safety required for industrial process applications. Wetted parts are stainless steel or Monel.

- **Optional features available:** Please consult the **Options & Accessories Section** for details.
- **For correct use and application of all pressure gauges, please refer to:** Pressure Gauge Standard ASME B40.100.

## HOW TO ORDER

Sample Order Number: **750SS 40 04 L D 120**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
750SS	25 2 1/2"	02 1/4 NPT	L Lower	A psi	See Standard Ranges
750LFSS	40 4"	04 1/2 NPT		D psi/kPa	
750M					
750LFM					

\* 2 1/2" dial size only available with 1/4 NPT connection size

## Specifications

Models	Wetted Parts
750SS (dry)	316 stainless steel tube and socket
750LFSS (liquid-filled)	
750M (dry)	Monel tube and socket (meets NACE MR 01.75)
750LFM (liquid-filled)	
<b>Dial Size</b>	2 1/2", 4"
<b>Fill</b>	Glycerine. Other fills available. See Options & Accessories.
<b>Movement</b>	Stainless steel
<b>Connection</b>	Lower male, 1/4 or 1/2 NPT
<b>Case</b>	304 stainless steel, satin finished, stem-mounted flangeless, solid front with blow-out back
<b>Ring</b>	Bayonet type, 304 stainless steel
<b>Window</b>	Laminated safety glass
<b>Pointer</b>	Plain, black finished Micro-adjustable, black finished
<b>Dial Face</b>	Aluminum, white background with black graduations and markings
<b>Accuracy</b>	±1.0% Full Scale, ASME B40.100 Grade 1A
<b>Maximum Temperature</b>	750SS, 750M: <b>250°F (121°C)</b> 750LFSS, 750LFM: <b>150°F (65°C)</b>

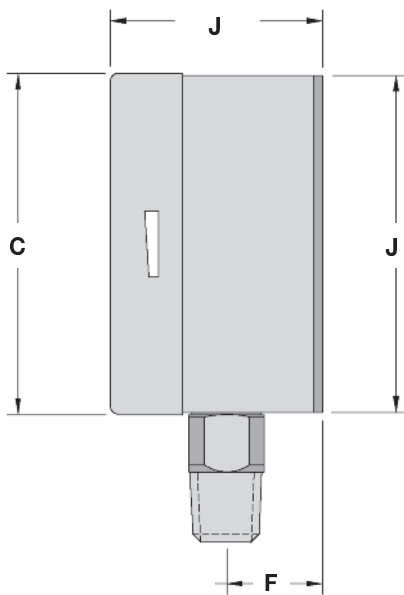
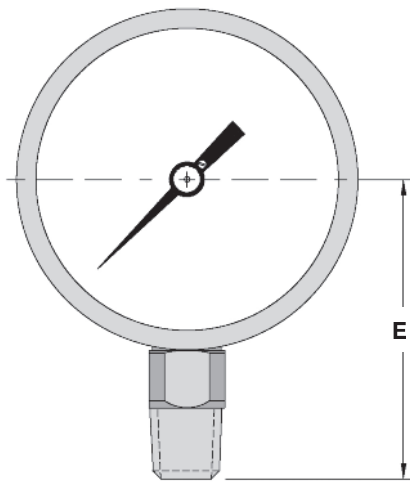
## Approximate Shipping Weight

2 1/2" Dial size:	750SS, 750M, 0.4 lbs [0.18kg]
4" Dial size:	750SS, 750M, 1.3 lbs [0.59 kg]
4" Dial size:	750LFSS, 750LFM, 1.8 lbs [0.82 kg]

# 750 Series

Solid Front • Field Liquid Fillable • Stainless Steel Case

All dimensions are nominal.  
Dimensions in [ ] are in millimeters



Dial Size	C	E	F	J
2 1/2"	2.48 [63]	2.13 [54]	0.71 [18]	1.61 [41]
4"	3.95 [99]	3.47 [88]	1.11 [28]	2.45 [63]

## Standard Ranges

psi Ranges (A)			
Range Code	Specific Range (psi)	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.5
020	30" Hg to 15 psi	10/5	1/0.5
030	30" Hg to 30 psi	10/5	1/1
040	30" Hg to 60 psi	10/10	2/1
050	30" Hg to 100 psi	30/20	2/2
060	30" Hg to 150 psi	30/30	5/2
070	30" Hg to 300 psi	30/50	5/5
080	0 to 15 psi	3	0.2
090	0 to 30 psi	5	0.5
100	0 to 60 psi	10	1
110	0 to 100 psi	10	1
120	0 to 160 psi	20	2
130	0 to 200 psi	20	2
140	0 to 300 psi	50	5
150	0 to 400 psi	50	5
160	0 to 600 psi	100	10
180	0 to 1000 psi	100	20
190	0 to 1500 psi	300	20
200	0 to 2000 psi	200	20
210	0 to 3000 psi	500	50
220	0 to 5000 psi	1000	100
230	0 to 10,000 psi	1000	200
Ranges over 10,000 psi are ONLY available on 750SS or 750LFSS.			
240	0 to 15,000 psi	3000	200
250	0 to 20,000 psi	2000	200

For dual scale ranges, specify the appropriate **Units of Measure: D** (psi/kPa) followed by the corresponding **A** (psi) Range Code. Other pressure ranges are also available including: Altitude, Ammonia, Refrigerant and Receiver. Consult Special Application Ranges section or factory for availability.

SPECIALTY GAUGES

# 700TA Series

## Sanitary Gauge with Integrated Diaphragm Seal

SPECIALTY GAUGES



700TA shown

- ▶ 2 1/2", 4" Dial Sizes
- ▶ Stainless Steel Case
- ▶ Liquid Fillable
- ▶ 1 1/2", 2" Tri-clamp Type Connections

The Trerice **700TA Series** Sanitary Gauge is 3A approved and especially suited for use in the dairy and food processing industries. This field liquid fillable (no kit required) gauge has a stainless steel case, ring, and process housing. All wetted parts are stainless steel.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- Please refer to 3A Standard 37-01, 3A Standard for Liquid Pressure and Level Sensing Devices
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

### HOW TO ORDER

Sample Order Number: **700TA 40 15T L A 130**

Model	Dial Size	Connection Size	Connection Location	Units of Measure	Range Code
700TA	25 2 1/2"	15T 1 1/2" Tri-Clamp	L Lower	A psi	See Standard Ranges
700TALF	40 4"	20T 2" Tri-Clamp	B Back	D psi/kPa	

### Specifications

#### Models

**700TA** (dry)  
**700TALF** (liquid filled)

**Dial Sizes** 2 1/2", 4"

#### Wetted Parts

316 stainless steel diaphragm

#### Fill

Mineral Oil, other fills available. See Options & Accessories.

#### Movement

Stainless steel

#### Connection

2 1/2" Dial Size: Lower or center back Tri-clamp, 1 1/2" or 2"  
4" Dial Size: Lower or lower back, Tri-clamp, 1 1/2" or 2"

#### Case

304 stainless steel, stem mounted flangeless

#### Ring

Crimped 304 stainless steel, highly polished

#### Window

Safety glass

#### Pointer

Plain black finished

#### Dial Face

Aluminum, white background with black graduations and markings

#### Accuracy

±1.6% Full Scale

#### Maximum Temperature

250°F (121°C)

#### Approximate Shipping Weight

700TA 2 1/2" Dial Size, 1 1/2" Tri-clamp, 1.4 lbs [0.64 kg]

700TA 2 1/2" Dial Size, 2" Tri-clamp, 1.9 lbs [0.86 kg]

700TALF 2 1/2" Dial Size, 1 1/2" Tri-clamp, 1.9 lbs [0.86 kg]

700TALF 2 1/2" Dial Size, 2" Tri-clamp, 2.6 lbs [1.18 kg]

700TA 4" Dial Size, 1 1/2" Tri-clamp, 2.6 lbs [1.18 kg]

700TA 4" Dial Size, 2" Tri-clamp, 3.3 lbs [1.50 kg]

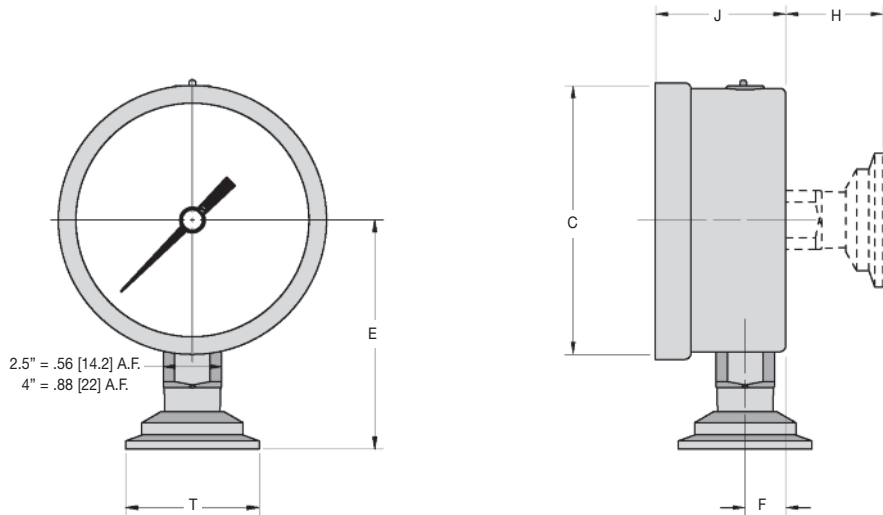
700TALF 4" Dial Size, 1 1/2" Tri-clamp, 3.3 lbs [1.50 kg]

700TALF 4" Dial Size, 2" Tri-clamp, 4.0 lbs [1.81 kg]

# 700TA Series

All dimensions are nominal. Dimensions in [ ] are in millimeters.

## Sanitary Gauge with Integrated Diaphragm Seal



Clamps, gaskets and ferrules are not supplied by Terrice.

Dial Size	Tri-Clamp Size	C	E	F	H	J	T
2 1/2" [63]	1 1/2"	2.68 [68]	2.64 [67]	0.37 [9.5]	1.52 [38.5]	1.20 [30.5]	1.98 [50.5]
	2"	2.68 [68]	2.64 [67]	0.37 [9.5]	1.52 [38.5]	1.20 [30.5]	2.51 [64.0]
4" [100]	1 1/2"	4.18 [106.2]	3.35 [85]	0.46 [11.8]	1.52 [38.5]	1.32 [33.5]	1.98 [50.5]
	2"	4.18 [106.2]	3.35 [85]	0.46 [11.8]	1.52 [38.5]	1.32 [33.5]	2.51 [64.0]

### Standard Ranges

psi Ranges (A)			
Range Code	Specific Range	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.5
020	30" Hg to 15 psi	10/5	10/0.5
030	30" Hg to 30 psi	10/10	2/1
040	30" Hg to 60 psi	30/20	2/2
050	30" Hg to 100 psi	30/20	5/2
060	30" Hg to 150 psi	30/20	10/2
070	30" Hg to 300 psi	30/30	5/10
080	0 to 15 psi	3	0.2
090	0 to 30 psi	5	0.5

psi Ranges (A)		
Range Code	Specific Range	Figure Intervals
100	0 to 60 psi	10
110	0 to 100 psi	20
120	0 to 160 psi	20
130	0 to 200 psi	50
140	0 to 300 psi	50
150	0 to 400 psi	100
160	0 to 600 psi	100
180	0 to 1000 psi	200

For dual scale ranges, specify the appropriate Units of Measure: **D** (psi/kPa) followed by the corresponding **A** (psi) Range Code. Other pressure ranges are also available including: Altitude, Ammonia, Refrigerant and Receiver. Consult Special Application Ranges section or factory for availability.

SPECIALTY GAUGES

# 700Plus Series

## Industrial Transmitter Gauge

SPECIALTY GAUGES



703SS shown

- ▶ 4" Dial Size
- ▶ ±1.0% Accuracy
- ▶ Stainless Steel Case
- ▶ Liquid Fillable

The Trerice **700Plus Series** Transmitter Gauge is designed to provide both local and remote pressure readings through the integration of an independent pressure transmitter to the pressure gauge. This gauge has a stainless steel case and ring, and is field liquid fillable (no kit required). Wetted parts include a stainless steel tube and socket with a ceramic transmitter.

- Optional features and case style variations available: Please consult the Options & Accessories Section for details.
- For correct use and application of all pressure gauges, please refer to: Pressure Gauge Standard ASME B40.100.

### HOW TO ORDER

Sample Order Number: **703SS 40 02 L 3 A 110**

Model	Dial Size	Connection Size	Connection Location	Output Signal	Units of Measure	Range Code
703SS 703LFSS	40 4"	02 1/4 NPT 04 1/2 NPT	L Lower	3 4 to 20 mA	A psi D psi/kPa	See Standard Ranges

### Specifications

#### Models

703SS (dry)  
703LFSS (liquid filled)

Dial Size 4"

#### Wetted Parts

Transmitter: stainless steel  
Gauge: 316L stainless steel tube & socket

Fill Mineral Oil

Movement Stainless Steel

#### Process Connection

Lower male,  
1/4 or 1/2 NPT

Case 304 Stainless steel,  
stem mounted flangeless

Ring Bayonet type, 304 stainless steel

Window Clear glass

Pointer Micro adjustable knife edge,  
black finished

Dial Face Aluminum, white background with  
black graduations and markings

#### Electrical Connection

Wiring cable

#### Supply Voltage

12 to 36 VDC

#### Output Signal

4 to 20 mA  
(load resistance maximum **W**) =  
V supply - 12  
0.02

Accuracy Transmitter: ±0.5% Full Scale Max.

Gauge: ±1.0% Full Scale,  
ASME B40.100 Grade 1A

#### Maximum Temperature

212°F (100°C)

#### Approximate Shipping Weight

1.52 lbs [0.69 kg]

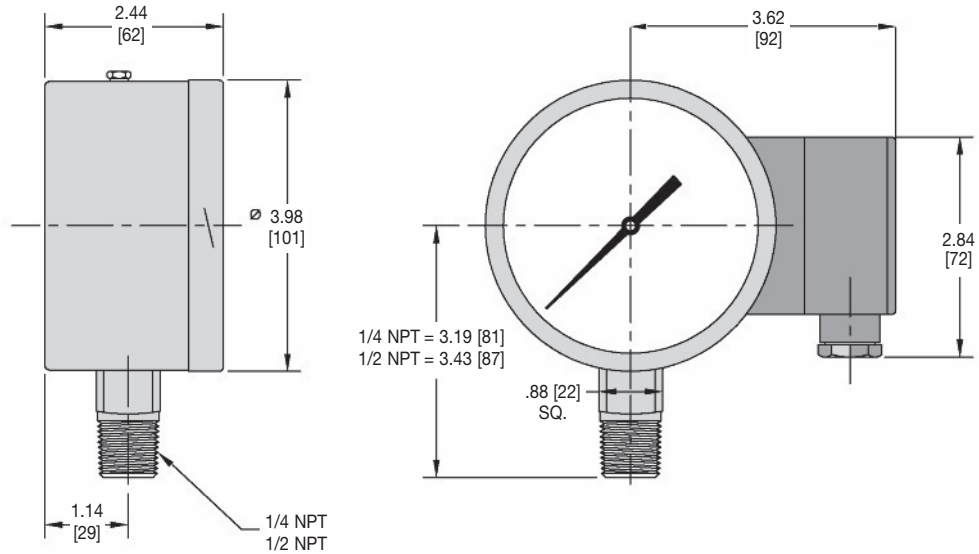


# 700Plus Series

## Industrial Transmitter Gauge

All dimensions are nominal. Dimensions in [ ] are in millimeters.

SPECIALTY GAUGES



### Standard Ranges

psi Ranges (A)			
Range Code	Specific Range	Figure Intervals	Minor Divisions
010	30" Hg to 0	5	0.5
020	30" Hg to 15 psi	10/5	0.5/0.5
030	30" Hg to 30 psi	10/5	1/1
040	30" Hg to 60 psi	10/10	2/1
050	30" Hg to 100 psi	30/20	2/2
060	30" Hg to 150 psi	30/20	5/2
070	30" Hg to 300 psi	30/50	5/5
080	0 to 15 psi	3	0.2

psi Ranges (A)			
Range Code	Specific Range	Figure Intervals	Minor Divisions
090	0 to 30 psi	5	0.5
100	0 to 60 psi	10	1
110	0 to 100 psi	10	2
120	0 to 160 psi	20	2
130	0 to 200 psi	20	2
140	0 to 300 psi	50	5
150	0 to 400 psi	50	5
160	0 to 600 psi	100	10

For dual scale ranges, specify the appropriate **Units of Measure: D (psi/kPa)** followed by the corresponding **A (psi) Range Code**. Other pressure ranges are also available including: Altitude, Ammonia, Refrigerant and Receiver. Consult Special Application Ranges section or factory for availability.

# Special Application Ranges

The H.O. Trerice Co. offers a broad spectrum of pressure gauges to satisfy the specialized applications of today's industry. The following Special Application Ranges can be specified on almost all Trerice Pressure Gauges. Please consult Availability Table on page 44.

## Liquid Level Ranges (Altitude)

A Liquid Level range is calibrated to measure feet or meters of H<sub>2</sub>O (water). Gauges with this type of range are usually specified with either an optional red set hand (not available on 8 1/2" or 12" Dial Sizes) or an index pointer (not available on liquid filled gauges). See Options & Accessories section for complete availability. Dual scale ranges with ft H<sub>2</sub>O and corresponding psi scales are available.

### Standard Liquid Level Ranges

psi & Feet of Water Ranges (H)					
Range Code	Range	psi		ft H <sub>2</sub> O	
		Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
010	30" Hg to 0 / -34 to 0 ft H <sub>2</sub> O	5	0.2	5	0.2
020	30" Hg to 15 psi / -34 to 34 ft H <sub>2</sub> O	5/5	0.5/0.2	10/10	1/1
030	30" Hg to 30 psi / -34 to 70 ft H <sub>2</sub> O	10/5	1/0.5	10/10	1/1
040	30" Hg to 60 psi / -34 to 140 ft H <sub>2</sub> O	10/10	1/1	10/20	1/1
050	30" Hg to 100 psi / -34 to 230 ft H <sub>2</sub> O	30/10	2/1	34/20	2/2
060	30" Hg to 150 psi / -34 to 350 ft H <sub>2</sub> O	30/20	5/2	34/50	2/5
070	30" Hg to 300 psi / -34 to 700 ft H <sub>2</sub> O	30/50	5/2	34/100	5/5
080	0 to 15 psi / 0 to 34 ft H <sub>2</sub> O	3	0.1	5	0.2
090	0 to 30 psi / 0 to 70 ft H <sub>2</sub> O	5	0.2	10	0.5
100	0 to 60 psi / 0 to 140 ft H <sub>2</sub> O	10	0.5	20	1
110	0 to 100 psi / 0 to 230 ft H <sub>2</sub> O	10	1	20	2
120	0 to 160 psi / 0 to 370 ft H <sub>2</sub> O	20	1	50	5
130	0 to 200 psi / 0 to 460 ft H <sub>2</sub> O	20	2	50	5
140	0 to 300 psi / 0 to 700 ft H <sub>2</sub> O	50	2	100	5

Feet of Water Ranges (J)			
Range Code	Range	Figure Intervals	Minor Divisions
080	0 to 34 ft H <sub>2</sub> O	5	0.2
090	0 to 70 ft H <sub>2</sub> O	10	0.5
095	0 to 100 ft H <sub>2</sub> O	10	1
100	0 to 140 ft H <sub>2</sub> O	20	1
110	0 to 230 ft H <sub>2</sub> O	20	2
120	0 to 370 ft H <sub>2</sub> O	50	5
130	0 to 460 ft H <sub>2</sub> O	50	5

Meters of Water Ranges (K)			
Range Code	Range	Figure Intervals	Minor Divisions
080	0 to 10 m H <sub>2</sub> O	1	0.1
090	0 to 20 m H <sub>2</sub> O	2	0.2
095	0 to 30 m H <sub>2</sub> O	5	0.2
100	0 to 40 m H <sub>2</sub> O	5	0.5
110	0 to 70 m H <sub>2</sub> O	10	0.5
120	0 to 120 m H <sub>2</sub> O	20	1

Other ranges available, consult factory.

# Special Application Ranges

## Ammonia Ranges

An Ammonia Range is calibrated to measure vacuum and pressure (vac/psi) along with the corresponding ammonia temperatures (°F of ammonia). Pressure gauges with this range type require stainless steel wetted parts.

### Standard Ammonia Ranges (P)

Range Code	Range	psi	
		Figure Intervals	Minor Divisions
310	30" Hg to 150 psi / °F Ammonia	30/20	5/2
320	30" Hg to 300 psi / °F Ammonia	30/50	5/2

*Other ranges available, consult factory.*

## Refrigerant Ranges

A Refrigerant Range is calibrated to measure vacuum and pressure (vac/psi) along with the corresponding refrigerant temperatures (°F of R).

### Standard Refrigerant Ranges (R)

Range Code	Range	psi	
		Figure Intervals	Minor Divisions
310	30" Hg to 150 psi / °F R12/R22	30/20	5/2
320	30" Hg to 150 psi / °F R123	30/20	5/2
330	30" Hg to 150 psi / °F R134A	30/20	5/2
340	30" Hg to 300 psi / °F R12/R22	30/50	5/2
350	30" Hg to 300 psi / °F R123	30/50	5/2
360	30" Hg to 300 psi / °F R134A	30/50	5/2

*Other ranges available, consult factory.*

## Receiver Ranges

A Receiver Range is calibrated to translate the output signal from a 3 to 15 psi pneumatic transmitter into a specified measurement (i.e., temperature, pressure, square root, percent, etc.). Pressure gauges ordered with a receiver range are furnished with a 3 to 15 psi bourdon tube measuring element. **Care should be taken to ensure the maximum pressure never exceeds 15 psi.**

### Standard Receiver Ranges (S)

Range Code	Range	Figure Intervals	Minor Divisions
060	0 to 10 linear	1	0.1
110	0 to 10 sq. rt.	1*	0.1*
370	0 to 100 linear	10	1
440	0 to 100 sq. rt.	10**	1**
420	0 to 100%	10	1

*\*Non linear scale, stated interval and division at 3.*

*\*\*Non linear scale, stated interval and division at 30.*

*Other ranges available, consult factory.*

# Special Application Ranges

## Availability

The following table indicates the special application range availability of Trerice Pressure Gauges.

Model	Liquid Level (Altitude)	Ammonia	Refrigerant	Receiver
450B, 450LFB	✓	N/A	✓	✓
450M, 450LFM	✓	N/A	✓	✓
450SS, 450LFSS	✓	✓	✓	
500XB	✓	N/A	✓	✓
500XSS	✓	✓	✓	✓
600CB	✓	N/A	✓	N/A
610CB	✓	N/A	✓	N/A
620B	N/A	N/A	N/A	N/A
690 Series	✓	N/A	✓	N/A
700B, 700LFB	✓	N/A	✓	✓
700M, 700LFM	✓	N/A	✓	✓
700Plus	✓	✓	N/A	N/A
700SS, 700LFSS	✓	✓	✓	✓
700TA, 700TALF*	✓	✓	✓	N/A
750M, 750LFM	✓	N/A	✓	✓
750SS, 750LFSS	✓	✓	✓	✓
760B*	N/A	N/A	N/A	N/A
766SS*	N/A	N/A	N/A	N/A
800B	✓	N/A	✓	N/A
800LFB*	✓	N/A	✓	N/A
D82LFB*	✓	N/A	✓	✓
D83LFSS*	✓	✓	✓	✓

\*Red set hand or index pointer not available with these models.

## Specialty Gauge Models

Listed below are Specialty Gauge Models that were previously available. In response to demand, we can now make available a wide number of ranges to customize most Trerice Pressure Gauges to suit specific measurement applications. Please order using the current model and specify the range required.

Previous Model	Current Model and Range
435SS	450SS with Ammonia Range
515XB	500XB with Liquid Level Range and Red Set Hand
535XSS	500XSS with Ammonia Range
545XB	500XB with Refrigerant Range
580B	500XB with Receiver Range
615B	500XB with Liquid Level Range and Red Set Hand
615CB	600CB with Liquid Level Range and Red Set Hand
635SS	500XSS with Ammonia Range
645B	500XB with Refrigerant Range
680B	500XB with Receiver Range
775SS	700SS with Ammonia Range

## HOW TO ORDER

Sample Order Number: **500XB 45 02L H 110**

Specify the Units of Measure and Range Code as required.

# Notes

SPECIALTY GAUGES

# Optional Case Styles

## 500X Series

All dimensions are nominal. Dimensions in [ ] are in millimeters.

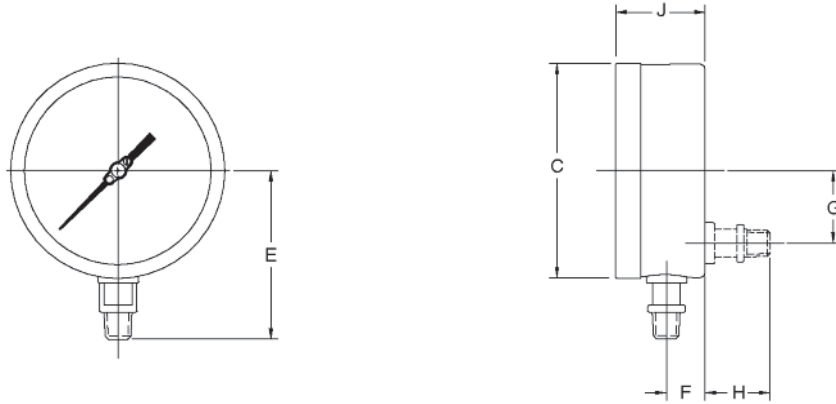
**How to Order:** Specify the Optional Case Code at the end of the Instrument Ordering Code.

**Sample Order Number:** 500XB 45 02 L A 110 - FSL

Optional Case Styles for 500X	Dial Size			
	4 1/2"	6"	8 1/2"	12"
Flangeless, Black Finished, Cast Aluminum Case, Lower Connection	FSL	FSL	N/A	N/A
Flangeless, Black Finished, Cast Aluminum Case, Back Connection	FSB	FSB	N/A	N/A
Panel Mounted, Hinged Ring Case Back Connection	HRB	HRB	N/A	HRB
Panel Mounted, Hinged Ring Case Lower Connection	HRL	HRL	N/A	HRL

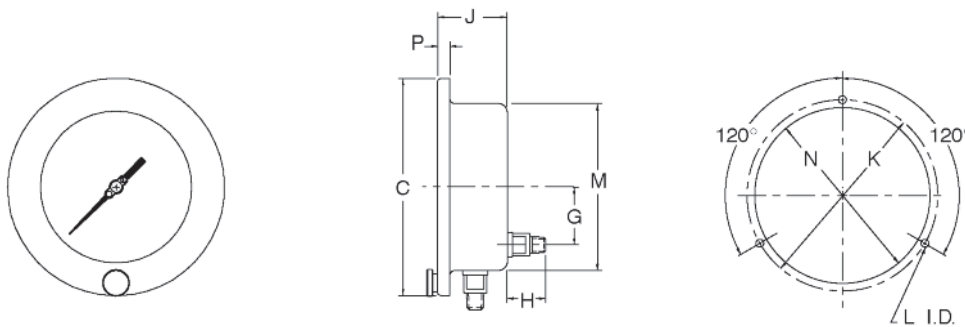
N/A = Not available. Please order using the code listed.

### Flangeless



Dial Size	C	E	F	G	H	J
4 1/2"	4.79 [121.7]	3.83 [97.2]	0.94 [23.8]	1.63 [41.3]	1.46 [37.1]	2.00 [50.8]
6"	6.29 [159.8]	4.70 [119.5]	0.94 [23.8]	1.63 [41.3]	1.46 [37.1]	2.03 [51.6]

### Hinged Ring



Dial Size	C	G	H	J	K	L	M	N	P
4 1/2"	6.10 [155]	1.62 [41]	1.59 [40]	1.97 [50]	5.38 [136]	0.22 [5]	4.78 [121]	4.94 [125]	0.34 [8]
6"	7.69 [195]	1.62 [41]	1.59 [40]	1.97 [50]	7.00 [177]	0.28 [7]	6.22 [158]	6.44 [163]	0.34 [8]
12"	14.75 [375]	1.62 [41]	1.38 [35]	2.50 [63.5]	13.50 [342]	0.28 [7]	12.50 [317]	12.81 [325]	0.73 [18.5]

# Optional Case Styles

## 600C

All dimensions are nominal. Dimensions in [ ] are in millimeters.

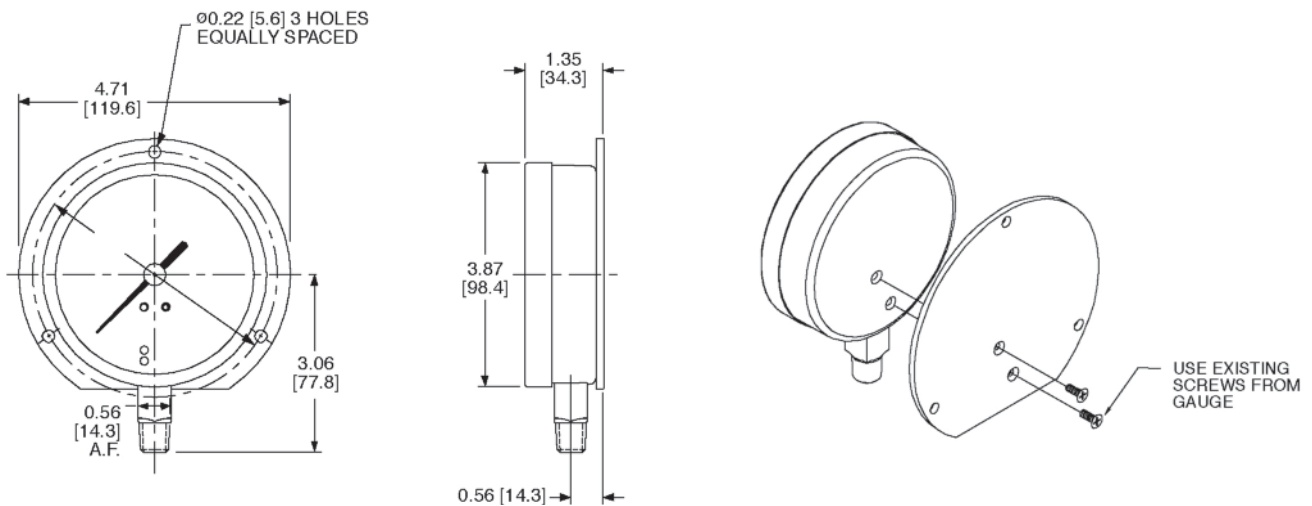
OPTIONS & ACCESSORIES

### Kit Only. Not Factory installed.

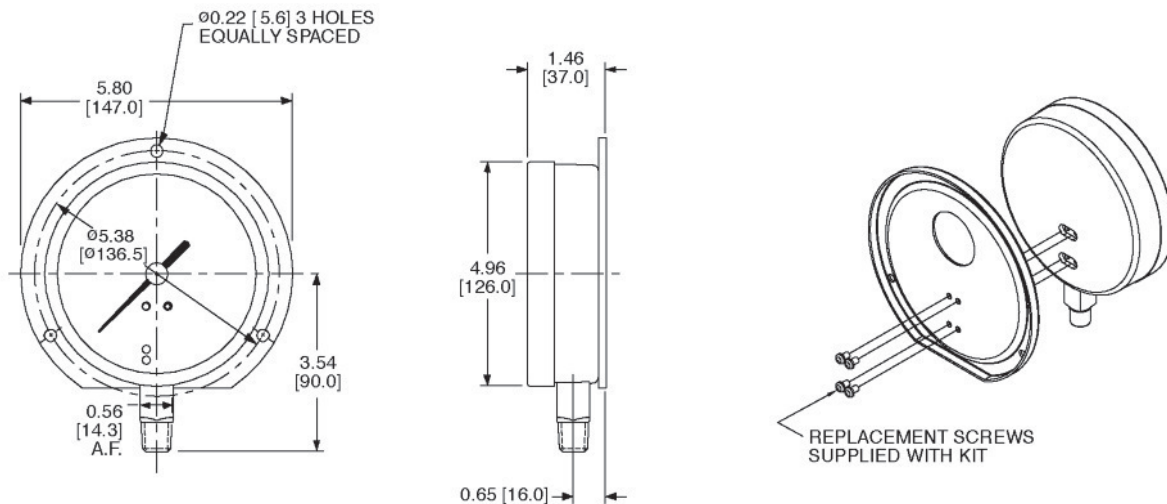
Optional Case Style - 600C	Dial Size	
	3 1/2"	4 1/2"
Surface Mounted Back Flange Kit	198-0023	198-0016

Please order using the code listed.

### 3 1/2" Includes back flange. Use existing screws from gauge.



### 4 1/2" Includes back flange and replacement screws.



# Optional Case Styles

## 700 Series

All dimensions are nominal. Dimensions in [ ] are in millimeters.

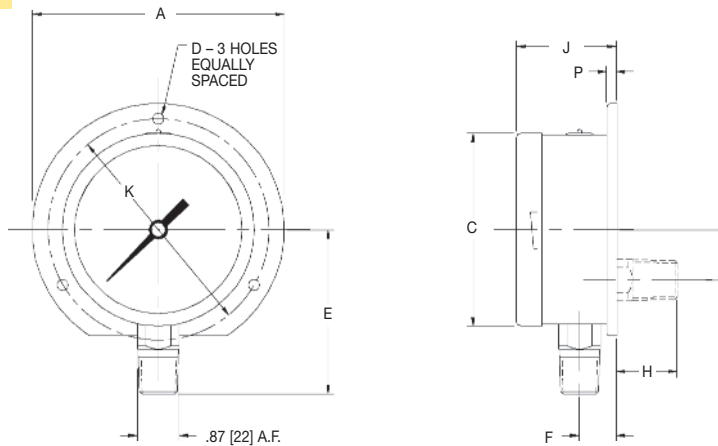
**How to Order:** Specify the Optional Case Code at the end of the Instrument Ordering Code.

**Sample Order Number:** 700SS 40 04 B D 220 - FMB

Case Style - 700 Series	DIAL SIZE		
	2 1/2"	4"	6"
Surface Mounted Case with Back Flange, Lower Connection	SML	SML	SML
Surface Mounted Case with Back Flange, Back Connection	SMB	SMB	SMB
Flush Mounted Case with Front Flange, Back Connection	FMB	FMB	FMB
Flush Mounted Case with Front Flange, Lower Connection	N/A	FML	FML
Panel Mounted Case with U-Clamp, Back Connection	UCB	UCB	UCB

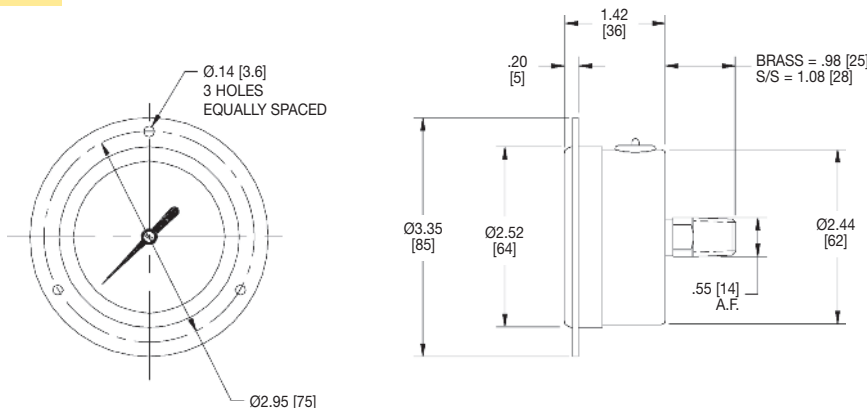
N/A = Not available. Please order using the code listed.

### 2 1/2", 4" & 6" Surface Mount



Dial Size	Material	A	C	D	E	F	G	H	J	K	P
2 1/2" [63]	Brass	3.35 [85]	2.52 [64]	0.14 [3.6]	2.22 [56.5]	0.57 [14.5]	0 [0]	0.98 [25]	1.56 [39.5]	2.95 [75]	0.22 [5.5]
	SS	3.35 [85]	2.52 [64]	0.14 [3.6]	2.22 [56.5]	0.57 [14.5]	0 [0]	0.98 [25]	1.56 [39.5]	2.95 [75]	0.22 [5.5]
4" [100]	Brass	5.20 [132]	3.98 [101]	0.19 [5]	3.39 [86]	0.75 [19]	1.04 [27]	1.32 [34]	2.07 [53]	4.57 [116]	0.22 [5.5]
	SS	5.20 [132]	3.98 [101]	0.19 [5]	3.39 [86]	0.75 [19]	1.36 [35]	1.26 [32]	2.07 [53]	4.57 [116]	0.22 [5.5]
6" [150]	Brass	7.72 [196]	6.34 [161]	0.23 [6]	4.57 [116]	0.81 [21]	1.04 [27]	1.32 [34]	2.09 [53]	7.01 [178]	0.24 [6]
	SS	7.72 [196]	6.34 [161]	0.23 [6]	4.57 [116]	0.81 [21]	1.36 [35]	1.26 [32]	2.09 [53]	7.01 [178]	0.24 [6]

### 2 1/2" Front Flange





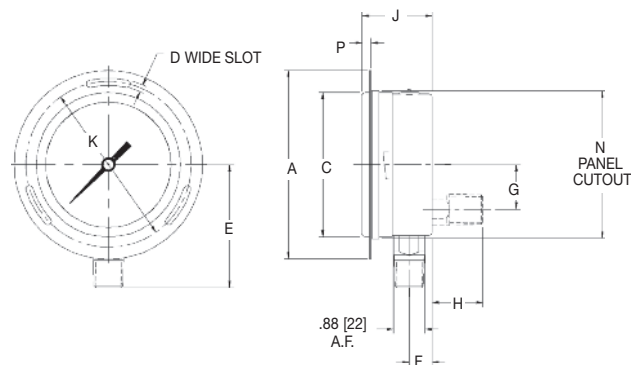
# Optional Case Styles

## 700 Series

All dimensions are nominal. Dimensions in [ ] are in millimeters.

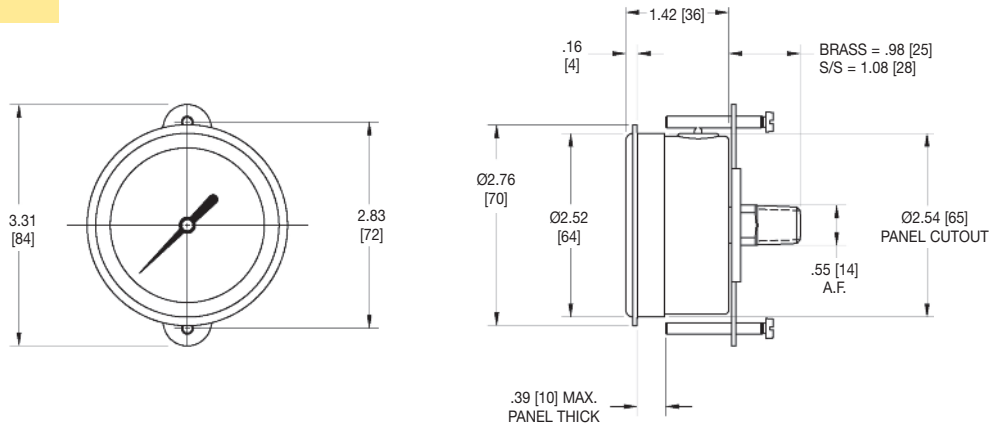
OPTIONS & ACCESSORIES

### 4" & 6" Front Flange

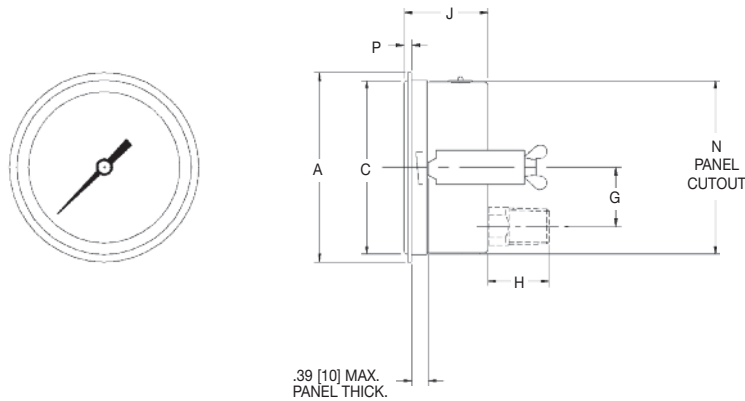


Dial Size	Material	A	C	D	E	F	G	H	J	K	N	P
4" [100]	Brass	5.20 [132]	3.98 [101]	0.19 [5]	3.39 [86]	0.63 [16]	1.04 [27]	1.44 [37]	1.93 [49]	4.57 [116]	4.13 [105]	0.24 [6]
	SS	5.20 [132]	3.98 [101]	0.19 [5]	3.39 [86]	0.63 [16]	1.36 [35]	1.38 [35]	1.93 [49]	4.57 [116]	4.13 [105]	0.24 [6]
6" [150]	Brass	7.72 [196]	6.34 [161]	0.23 [6]	4.57 [116]	0.69 [18]	1.04 [27]	1.44 [37]	1.97 [50]	7.01 [178]	6.50 [165]	0.24 [6]
	SS	7.72 [196]	6.34 [161]	0.23 [6]	4.57 [116]	0.69 [18]	1.36 [35]	1.38 [35]	1.97 [50]	7.01 [178]	6.50 [165]	0.24 [6]

### 2 1/2" U-Clamp



### 4" & 6" U-Clamp



Dial Size	Material	A	C	G	H	J	N	P
4" [100]	Brass	4.33 [110]	3.98 [101]	1.04 [27]	1.44 [37]	1.93 [49]	4.02 [102]	0.18 [5]
	SS	4.33 [110]	3.98 [101]	1.36 [35]	1.38 [35]	1.93 [49]	4.02 [102]	0.18 [5]
6" [150]	Brass	6.69 [170]	6.34 [161]	1.04 [27]	1.44 [37]	1.97 [50]	6.39 [162]	0.24 [6]
	SS	6.69 [170]	6.34 [161]	1.36 [35]	1.38 [35]	1.97 [50]	6.39 [162]	0.24 [6]

# Optional Case Styles

## 760B, 765B & 766SS

All dimensions are nominal. Dimensions in [ ] are in millimeters.

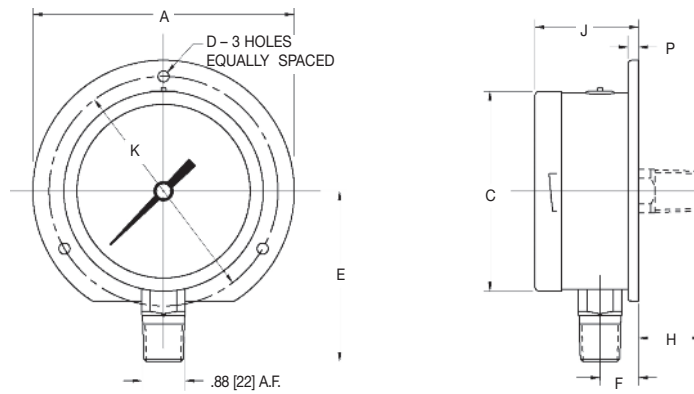
**How to Order:** Specify the Optional Case Code at the end of the Instrument Ordering Code.

**Sample Order Number:** 766SS 60 02 L M 660 - SML

	760B	760B	765B/766SS	765B/766SS	765B/766SS
<b>Optional Case Styles for 760B, 765B &amp; 766SS</b>	<b>2 1/2"</b>	<b>4"</b>	<b>2.5"</b>	<b>4"</b>	<b>6"</b>
Surface Mounted Case with Back Flange, Lower Connection	N/A	N/A	N/A	SML	SML
Surface Mounted Case with Back Flange, Back Connection	N/A	N/A	N/A	SMB	SMB
Flush Mounted Case with Front Flange, Back Connection	FMB	FMB	N/A	FMB	FMB
Flush Mounted Case with Front Flange, Lower Connection	N/A	N/A <td N/A	FML	FML	
Panel Mounted Case with U-Clamp, Back Connection	UCB*	N/A	UCB	UCB	UCB

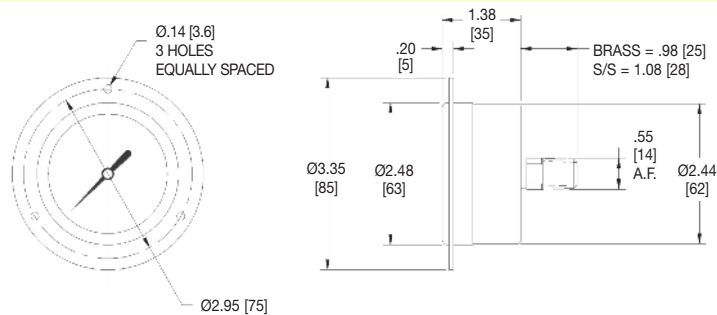
N/A = Not available. Please order using the code listed.  
 \*Supplied with stainless steel case.

### 765B & 766SS 4" & 6" Surface Mount



Dial Size	A	C	D	E	F	H	J	K	P
4" [100]	5.20 [132]	3.98 [101]	0.19 [5]	3.43 [87]	0.75 [19]	1.26 [32]	2.07 [53]	4.57 [116]	0.22 [5.5]
6" [150]	7.72 [196]	6.34 [161]	0.23 [6]	4.84 [123]	0.81 [21]	1.26 [32]	2.09 [53]	7.01 [178]	0.22 [5.5]

### 760B 2 1/2" Front Flange



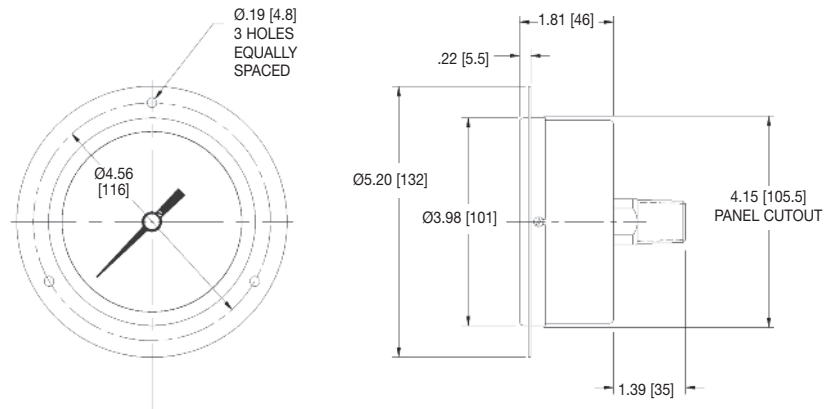
# Optional Case Styles

## 760B, 765B & 766SS

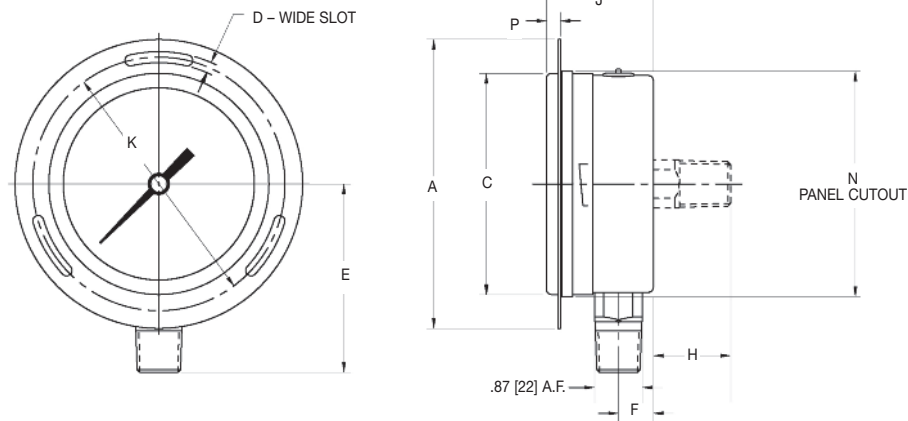
All dimensions are nominal. Dimensions in [ ] are in millimeters.

OPTIONS & ACCESSORIES

### 760B 4" Front Flange

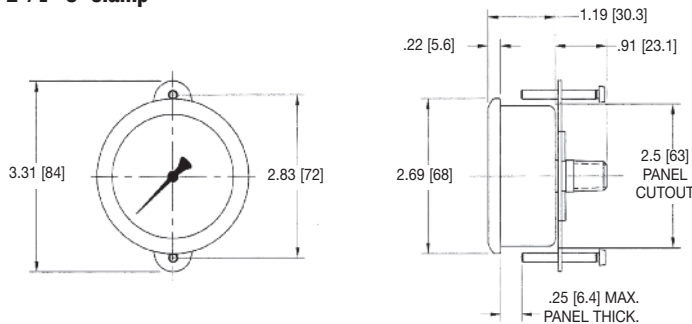


### 765B/766SS 4" & 6" Front Flange

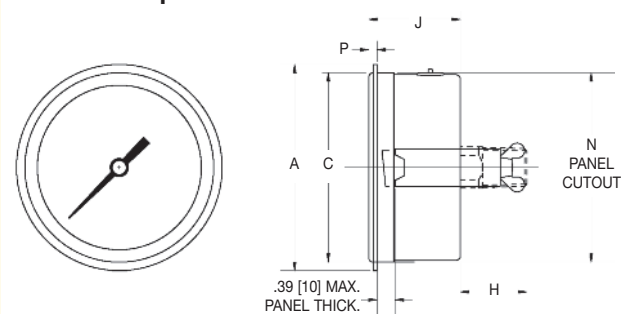


Dial Size	Material	A	C	D	E	F	H	J	K	N	P
4" [100]	Brass	5.20 [132]	3.98 [101]	0.19 [5]	3.43 [87]	0.63 [16]	1.38 [35]	1.93 [49]	4.57 [116]	4.13 [105]	0.24 [6]
	SS	5.20 [132]	3.98 [101]	0.19 [5]	3.43 [87]	0.63 [16]	1.38 [35]	1.93 [49]	4.57 [116]	4.13 [105]	0.24 [6]
6" [150]	Brass	7.72 [196]	6.34 [161]	0.23 [6]	4.76 [121]	0.69 [18]	1.38 [35]	1.97 [50]	7.01 [178]	6.50 [165]	0.24 [6]
	SS	7.72 [196]	6.34 [161]	0.23 [6]	4.84 [123]	0.69 [18]	1.38 [35]	1.97 [50]	7.01 [178]	6.50 [165]	0.24 [6]

### 765B/766SS 2 1/2" U-Clamp



### 765B/766SS 4" & 6" U-Clamp



Dial Size	Material	A	C	H	J	N	P
4" [100]	Brass	4.33 [110]	3.98 [101]	1.44 [37]	1.93 [49]	4.02 [102]	0.18 [5]
	SS	4.33 [110]	3.98 [101]	1.38 [35]	1.93 [49]	4.02 [102]	0.18 [5]
6" [150]	Brass	6.69 [170]	6.34 [161]	1.44 [37]	1.97 [50]	6.39 [162]	0.24 [6]
	SS	6.69 [170]	6.34 [161]	1.38 [35]	1.97 [50]	6.39 [162]	0.24 [6]

# Optional Case Styles

## D80 Series

All dimensions are nominal. Dimensions in [ ] are in millimeters.

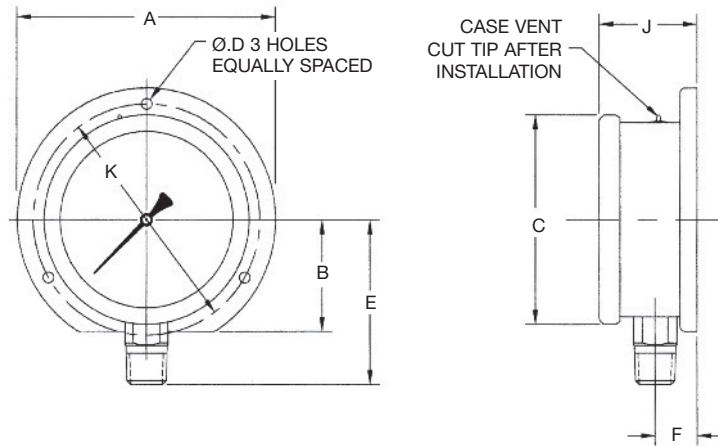
**How to Order:** Specify the Optional Case Code at the end of the Instrument Ordering Code.

**Sample Order Number:** *D82LFB 25 02 L A 160 - SML*

Case Style - D80 Series	Dial Size		
	2"	2 1/2"	4"
Surface Mounted, Back Flange Case for Lower Connection	N/A	SML	SML
* Panel Mounted, Front Flange Kit for Back Connection	198-0028	198-0025	FMB
* Panel Mounted, Front Ring Kit for Back Connection	N/A	198-0024	N/A
Panel Mounted, U-Clamp Kit for Back Connection	034-0036	034-0037	UCB

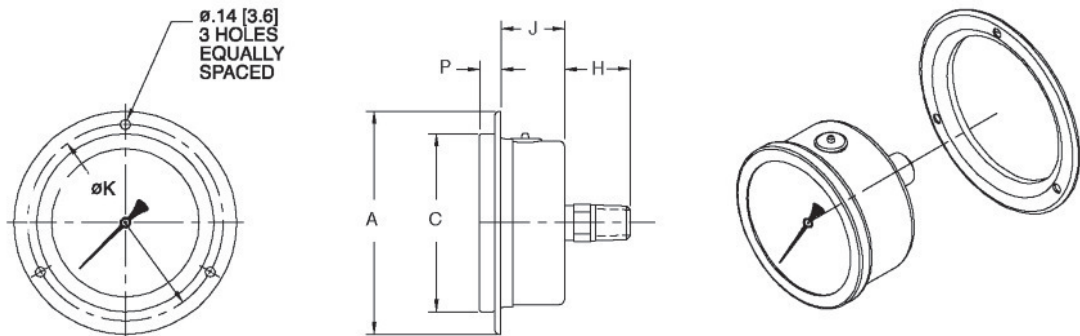
\* Kit Only. Not Factory installed.

### 2 1/2" & 4" Surface Mount



Dial Size	A	B	C	D	E	F	J	K
2 1/2"	3.35 [85]	1.43 [36.3]	2.68 [68]	0.14 [3.6]	2.23 [56.6]	0.52 [13.2]	1.38 [35.1]	2.95 [75]
4"	5.20 [132]	2.19 [55.6]	4.18 [106]	0.19 [4.8]	3.07 [78]	0.62 [15.7]	1.47 [37.3]	4.57 [116]

### 2", 2 1/2" & 4" Front Flange



Dial Size	A	C	H	J	K	P
2"	3.03 [77]	2.09 [53]	0.99 [25]	0.94 [24]	2.65 [65]	0.32 [8]
2 1/2"	3.35 [85]	2.67 [68]	0.99 [25]	0.82 [21]	2.95 [75]	0.32 [8]
4"	5.20 [132]	4.17 [106]	0.99 [25]	0.91 [23]	4.56 [116]	0.42 [10]

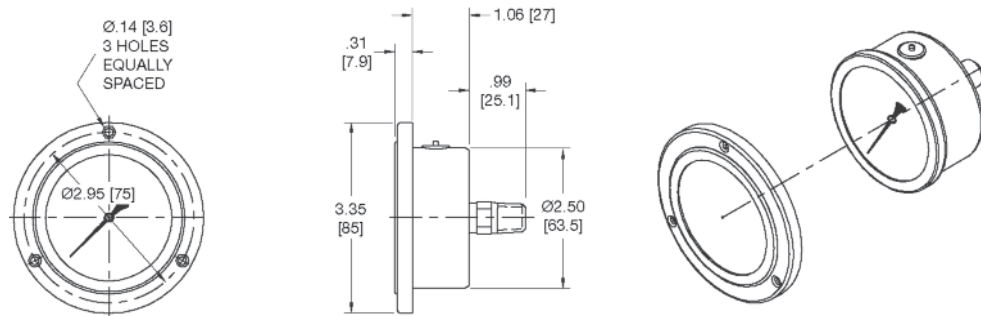
# Optional Case Styles

## D80 Series

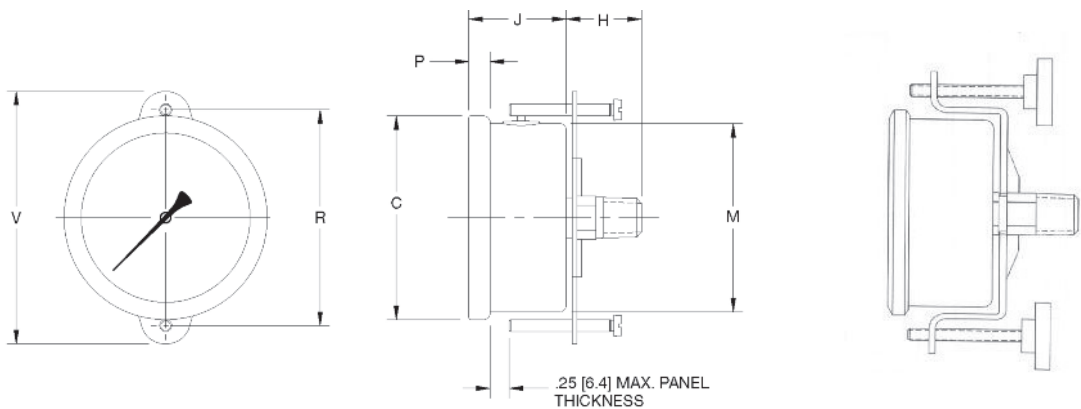
All dimensions are nominal. Dimensions in [ ] are in millimeters.

OPTIONS & ACCESSORIES

### 2 1/2" Front Ring



### 2", 2 1/2" & 4" U-Clamp



Dial Size	C	H	J	M	P	R	V
2"	2.09 [53]	0.99 [25]	1.10 [28]	1.91 [48.5]	0.18 [4.5]	2.28 [58]	2.76 [70]
2 1/2"	2.68 [68]	0.99 [25]	1.20 [30.5]	2.44 [62]	0.28 [7]	2.83 [72]	3.31 [84]
4"	4.17 [106]	0.99 [25]	1.32 [33.5]	3.88 [98.6]	0.28 [7]	4.33 [110]	4.80 [122]

# Optional Case Styles

## 800 Series

All dimensions are nominal. Dimensions in [ ] are in millimeters.

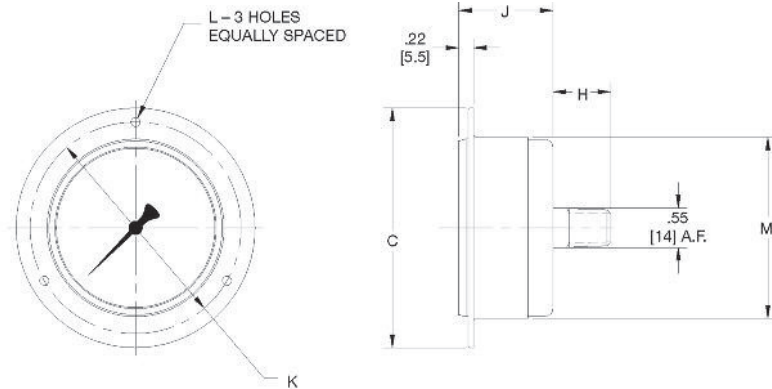
**How to Order:** Specify the Optional Case Code at the end of the Instrument Ordering Code.

**Sample Order Number:** 800B 15 01 B D 140 - UCB

Case Styles - 800 Series	Dial Size			
	1 1/2"	2"	2 1/2"	4"
Panel Mounted Case with Front Flange, Back Connection	FMB	FMB	FMB	FMB
Panel Mounted Case with U-Clamp, Back Connection	UCB	UCB	UCB	N/A

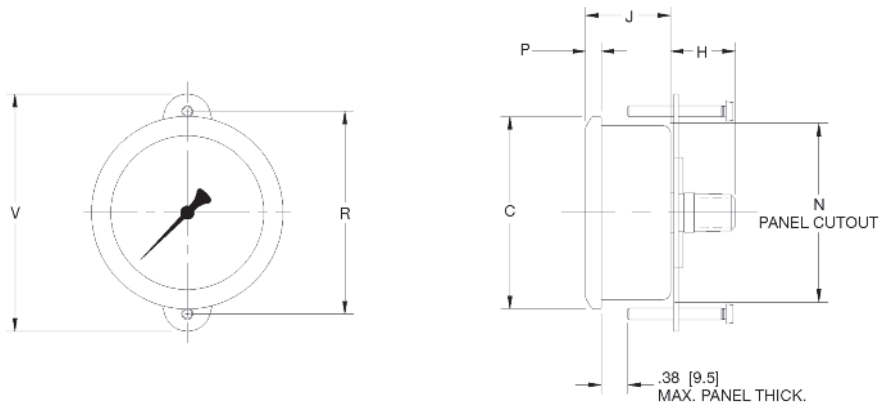
Please order using the code listed.

### Front Flange



Dial Size	C	H	J	K	L	M
1 1/2"	2.40 [61]	0.73 [18.5]	0.98 [25]	1.97 [50]	0.14 [3.5]	1.61 [41]
2"	2.80 [71]	0.83 [21]	1.02 [26]	2.36 [60]	0.14 [3.5]	1.97 [50]
2 1/2"	3.35 [85]	0.83 [21]	1.06 [27]	2.95 [75]	0.14 [3.5]	2.52 [64]
4"	5.20 [132]	0.98 [25]	1.26 [32]	4.57 [116]	0.19 [4.8]	3.96 [100.5]

### 1 1/2", 2", 2 1/2" U-Clamp



Dial Size	C	H	J	N	P	R	V
1 1/2"	1.73 [44]	1.08 [27.5]	1.12 [28.5]	1.57 [40]	0.24 [6]	1.97 [50]	2.44 [62]
2"	2.13 [54]	1.02 [26]	1.18 [30]	1.97 [50]	0.22 [5.5]	2.28 [58]	2.76 [70]
2 1/2"	2.68 [68]	1.02 [26]	1.18 [30]	2.48 [63]	0.22 [5.5]	2.83 [72]	3.31 [84]

# Optional Case Styles

## 800LF Series

All dimensions are nominal. Dimensions in [ ] are in millimeters.

**How to Order:** Specify the Optional Case Code at the end of the Instrument Ordering Code.

**Sample Order Number:** 800LFB 35 02 B A 030 - UCB

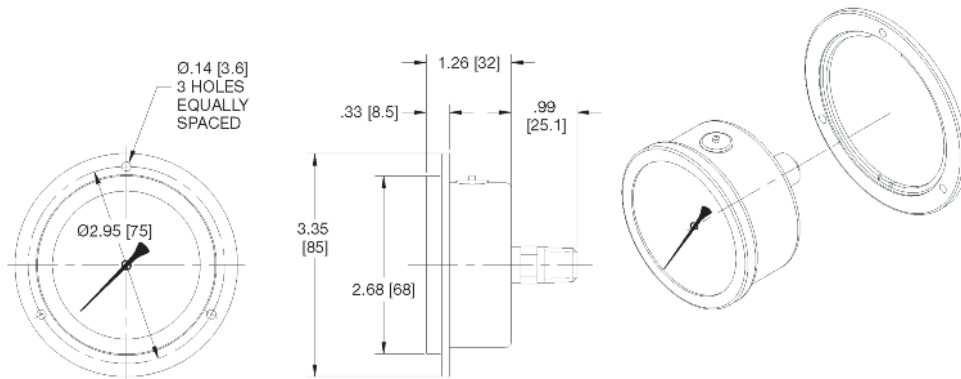
Case Styles - 800LF Series	Dial Size	
	2 1/2"	3 1/2"
* Panel Mounted, Front Flange Kit for Back Connection	198-0020	N/A
* Surface Mounted, Back Flange Kit for Lower Connection	198-0022	N/A
* Panel Mounted, Front Ring Kit for Back Connection	198-0021	N/A
* Panel Mounted, U-Clamp Kit for Back Connection	198-0026	N/A
Panel Mounted Case with U-Clamp, Back Connection	N/A	UCB

\* **Kit Only. Not Factory installed.**

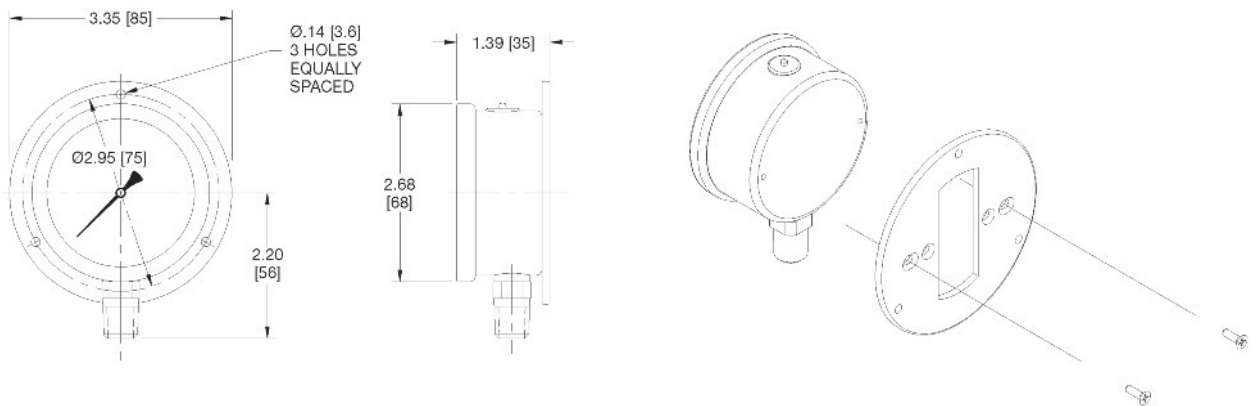
Please order using the code listed.

OPTIONS & ACCESSORIES

### 2 1/2" Front Flange



### 2 1/2" Back Flange

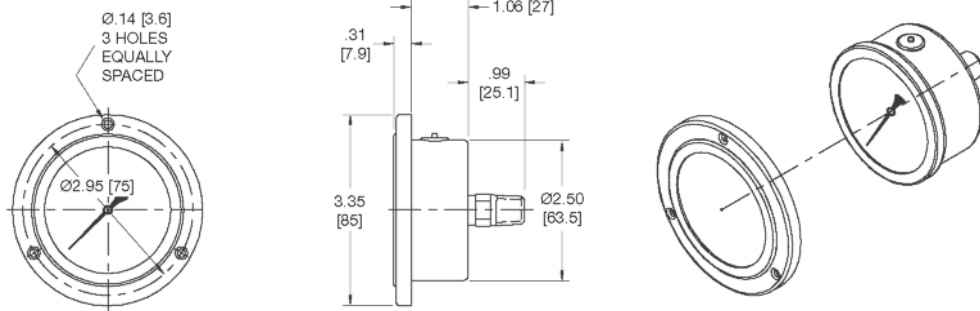


# Optional Case Styles

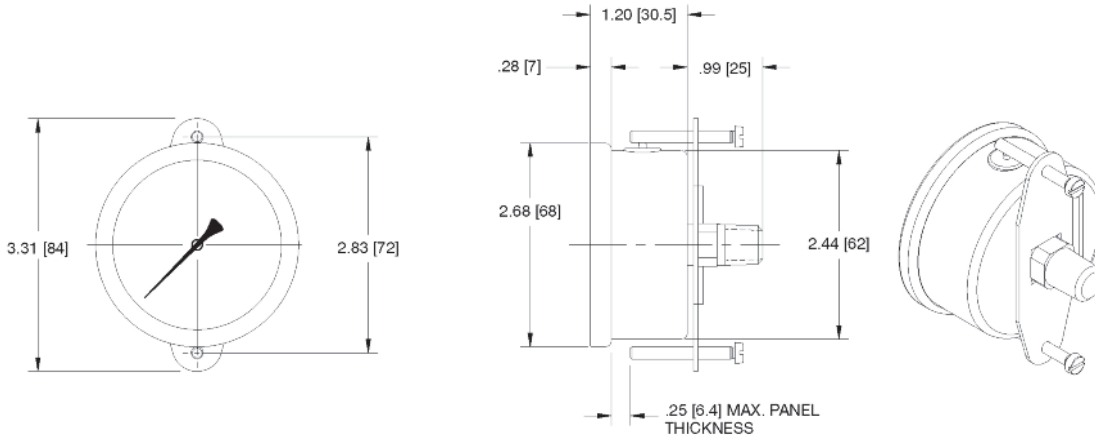
## 800LF Series (continued)

All dimensions are nominal. Dimensions in [ ] are in millimeters.

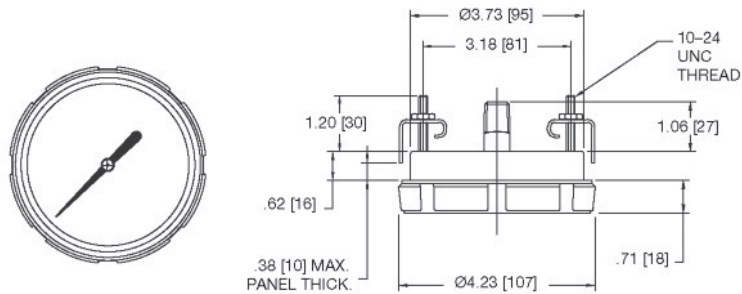
### 2 1/2" Front Ring



### 2 1/2" U-Clamp



### 3 1/2" U-Clamp





# Optional Features

## PRESSURE GAUGES

### Windows (PLW/SGW)

Trerice offers a complete line of window options, including: plastic (acrylic) and laminated safety glass. Please consult the Option Application Table for window availability. Replacement windows are sold separately; please consult the price sheet for item numbers.

### Red Set Hand (RSH)

Attached at the center of the dial face, a red set hand can be adjusted to indicate a desired predetermined reference point. The set point is adjusted by removing the ring and window of the gauge (dry gauge only). When used on a liquid filled gauge, please specify the set point when ordering. Please consult the Option Application Table for set hand availability.



### Maximum Registering Pointers (MAX)

Maximum registering pointers can be furnished on most dry 3 1/2" dial size and larger pressure gauges having a pressure range of 60 psi or greater. The pointer is designed to indicate the maximum or minimum pressure attained by the process being measured since the pointer was last reset. The pointer assembly is installed to an acrylic window, with an external knob for manually resetting the pointer. Please consult the Option Application Table for maximum registering pointer availability.



### Electric Contacts

Electric contact assemblies can be supplied on most 4", 4 1/2" and 6" pressure gauges. These units are well suited for making the electrical contact required to activate alarms, signals, or other electrical devices. Each unit is provided with an external adjustment key, making it easy to adjust and providing for tamper-resistant operation. The contacts have adjustable magnets to eliminate pointer bounce caused by vibration, and have pass/repass capability, allowing the pointer to move past the set point while maintaining contact. For applications that require a liquid-filled gauge, a special inductive type contact is required. Please consult factory for additional information.



#### Electric Contact Configurations

Optional Feature Code	Contact Style	Contact Action
EC1	Single High	Single contact: Makes on clockwise rotation
EC2	Single Low	Single contact: Breaks on clockwise rotation
EC3	High-Low	Double contact: High contact makes on clockwise rotation Low contact breaks on clockwise rotation
EC4	Double High	Double contact: 1st makes on clockwise rotation 2nd makes on clockwise rotation

Please consult the Option Application Table for electric contact availability.

#### Recommended Load Limits

Volts	Resistive	Inductive
110 Vac	0.25 A	0.13 A
24 Vdc	0.40 A	0.25 A

# Optional Features

## PRESSURE GAUGES

### Weatherproofed Cases (WPC)

Trerice pressure gauges may be sealed for outdoor use, or for use in applications where sprays and washes will come in contact with the gauge. Trerice Series 450, 700, 750 and all liquid-filled gauges are hermetically sealed and are inherently weatherproof. The weatherproofing option is available for most other pressure gauges.

### Pressure Relief Plugs (PRP)

This feature is designed to release non-instantaneously developed internal case pressure at 3 to 5 psi, and can be supplied on most 3 1/2" and larger pressure gauges. Please consult the Option Application Table for pressure relief plug availability.

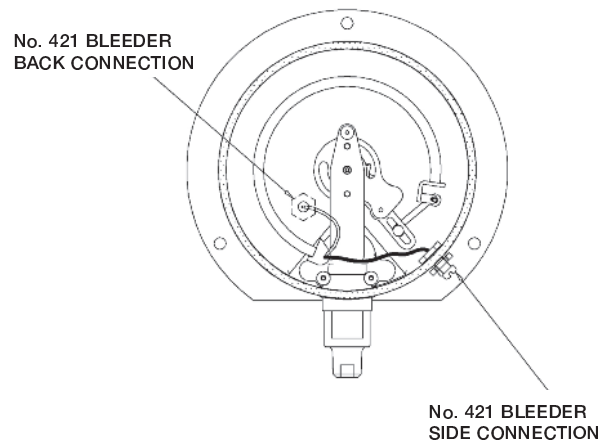


### Silicone Dampened Movements (SDM)

The application of a highly viscous silicone oil to the gear, sector, and all bearing points of the movement will help reduce the effects of vibration and pulsation to which the gauge may be subjected. This feature will extend the life of the gauge by reducing wear on the movement, and is available on most Trerice Pressure Gauges. Please consult the Option Application Table for silicone dampened movement availability.

### Capillary Tube Bleeder (CTB)

The No. 421 Capillary Bleeder has been designed as an accessory for the Model 500XSS Pressure Gauge. This feature makes it possible to completely eliminate air or other pressure media that may be trapped in the bourdon tube of a gauge. After installation, the bleeder must be opened to allow the entrapped air or medium to be purged from the bourdon tube. After purging, the bleeder can be closed, permitting proper action of the gauge. The bleeder assembly is manufactured from 347 stainless steel, and has a maximum pressure of 5000 psi. Please consult the Option Application Table for capillary bleeder availability.



### Orifice Screws and Restrictors

An orifice screw or restrictor may be installed in the gauge socket to reduce shock to the gauge and prevent wear on the movement, and should be installed where sudden pressure surges or oscillations are expected. Orifice screws and restrictors reduce pulsation by forcing the pressure medium through a precision sized orifice, while restrictors use a small orifice for pulsation reduction. Trerice also offers externally mounted pressure snubbers. Please consult the Accessories section for details.

#### Orifice Screws and Restrictors

Optional Feature Code	Item No. (if ordered deparately)	Service	Construction
SS2	D368	Air & other gases	316 stainless steel body 1/4-20 UNC thread, 0.018 orifice
SS4	D369	Vapor & low viscosity fluids under 30 SSU	316 stainless steel body 1/4-20 UNC thread, 0.022 orifice
SS6	D370	Water and oils 30 SSU to 250 SSU	316 stainless steel body 1/4-20 UNC thread, 0.025 orifice
SS8	D371	Heavy oils and viscous fluids 250 SSU to 500 SSU	316 stainless steel body 1/4-20 UNC thread, 0.040 orifice
RES	104-0005.3	Air, gases & fluids	Brass, push-in, 0.018 orifice

Please consult the Option Application Table for orifice screw and restrictor availability.

### Alternate Fill Fluids (SLF & HLF)

By minimizing wear on the gauge internals resulting from vibration or oscillation, liquid filling can prolong the life of a pressure gauge. Liquid filling also acts a permanent lubricant to the moving parts of the instrument. Trerice provides glycerine as the standard fill material. Silicone (**SLF**) and halocarbon (**HLF**) are available as alternate fills. Please consult factory for availability.

### Recalibration and Certification

The factory is equipped to recalibrate and/or certify pressure gauges having  $\pm 0.5\%$  Full Scale ASME B40.100 Grade 2A or lesser accuracy in ranges from 30" Hg vacuum to 20,000 psi pressure. Price is determined by range, gauge accuracy and number of points certified; please consult factory.

# Optional Features

## OPTION AVAILABILITY TABLE

### Optional Feature Codes

	PLW	SGW	RSH	MAX	EC-X	WPC	PRP	SDM	CTB	SS-X	RES
	Plastic Window (Acrylic)	Laminated Safety Glass Window	Red Set Hand <sup>1</sup>	Maximum Registering Pointer <sup>2</sup>	Electric Contact <sup>3</sup>	Weather-Proofed Case	Pressure Relief Plug	Silicone Dampened Movement	Capillary Tube Bleeder <sup>4</sup>	Orifice Screw	Push-in Restrictor
<b>450 Series (Dry)</b>	S	O	O	O	O	S	N/A	O	N/A	O	N/A
<b>450 Series Liquid Filled</b>	S	O	O	N/A	O	S	N/A	N/A	N/A	O	N/A
<b>500X Series</b>	O	O	O	O	O	O	O	O	O	O	N/A
<b>600 Series</b>	O	N/A	O	N/A	N/A	O	O	O	N/A	N/A	O
<b>690 Series</b>	S	N/A	O	O	N/A	O	N/A	O	N/A	N/A	O
<b>700 Series</b>	O	S	N/A	O	O	S	S	O	N/A	O	N/A
<b>750 Series</b>	O	S	N/A	O	N/A	S	S	N/A	N/A	O	N/A

<sup>1</sup> Red set hand is not available with 1 1/2", 2", 8 1/2", or 12" dial size. Set hand for 2 1/2" dial size is an adhesive decal, applied directly to inside surface window.

<sup>2</sup> Maximum registering pointer not available on liquid filled gauges or 2 1/2" dial sizes.

<sup>3</sup> Electric contact only available with 4", 4 1/2", or 6" dial sizes. Consult factory for liquid filled gauge applications.

<sup>4</sup> Capillary Tube Bleeder only available with model 500XSS

S – Standard Product Feature    O – Optional Feature at Additional Charge    N/A – Not Available

### How to Order

Specify the Optional Feature Ordering Code at the end of the Instrument Ordering Code.

Sample Order Number: **600CB 45 02 L A 110** **PLW**

# 870 Series Impulse Dampeners



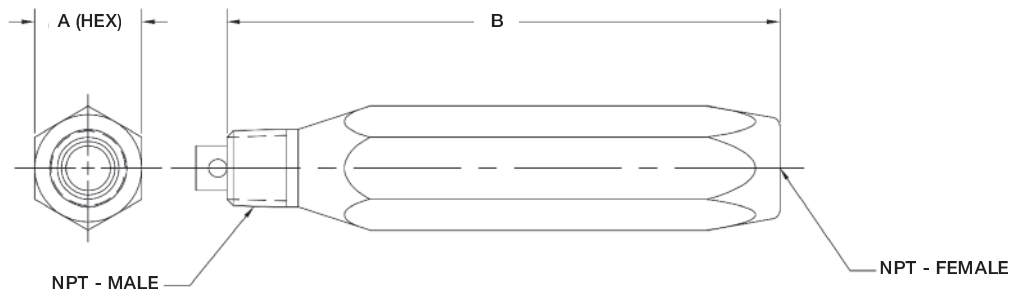
**870 Series** Pressure Impulse Dampeners are designed to improve readability and prevent wear on delicate gauge mechanisms by slowing rapid pressure changes and reducing shock and chattering. An impulse dampener should be installed on a gauge in any application where pressure spikes and/or pulsations may be present. Trerice Impulse Dampeners are engineered for field serviceability (cleaning and parts replacement) and are constructed from brass or stainless steel for use on a variety of pressure media.

## 870 Series Impulse Dampeners

Item No.	Body & Insert Material	Connection Size (NPT)	Maximum Pressure (psig)	Service	Approximate Shipping Weight
<b>870-1</b>	Brass*	1/4	1000	Air, water, steam and gases	0.5 lbs [0.23 kg]
<b>870-2</b>	Brass*	1/4	1000	Gasoline and light oils	0.5 lbs [0.23 kg]
<b>870-3</b>	Brass*	1/4	1000	Lubricating and heavy oils	0.5 lbs [0.23 kg]
<b>870-7</b>	303SS	1/4	5000	Includes 3 pistons for various viscosities	0.5 lbs [0.23 kg]
<b>870-10</b>	303SS	1/2	10,000	Includes 3 pistons for various viscosities	0.8 lbs [0.36 kg]
<b>870-13</b>	316SS	1/4	5000	Includes 3 pistons for various viscosities	0.5 lbs [0.23 kg]
<b>870-16</b>	316SS	1/2	10,000	Includes 3 pistons for various viscosities	0.8 lbs [0.36 kg]

\* Add (PBF) to the end of part number to specify Lead-Free brass.

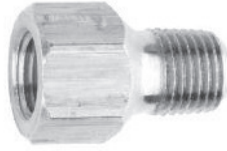
All dimensions are nominal. Dimensions in [ ] are in millimeters.



Part No.	A	B	NPT
<b>870-1</b>			
<b>870-2</b>	0.75 [19]	3.88 [99]	1/4 - 18
<b>870-3</b>			
<b>870-7</b>	0.75 [19]	3.46 [88]	1/4 - 18
<b>870-10</b>	1.13 [29]	3.61 [92]	1/2 - 14
<b>870-13</b>	0.75 [19]	3.46 [88]	1/4 - 18
<b>870-16</b>	1.13 [29]	3.61 [92]	1/2 - 14

# 872 Series

## Pressure Snubbers



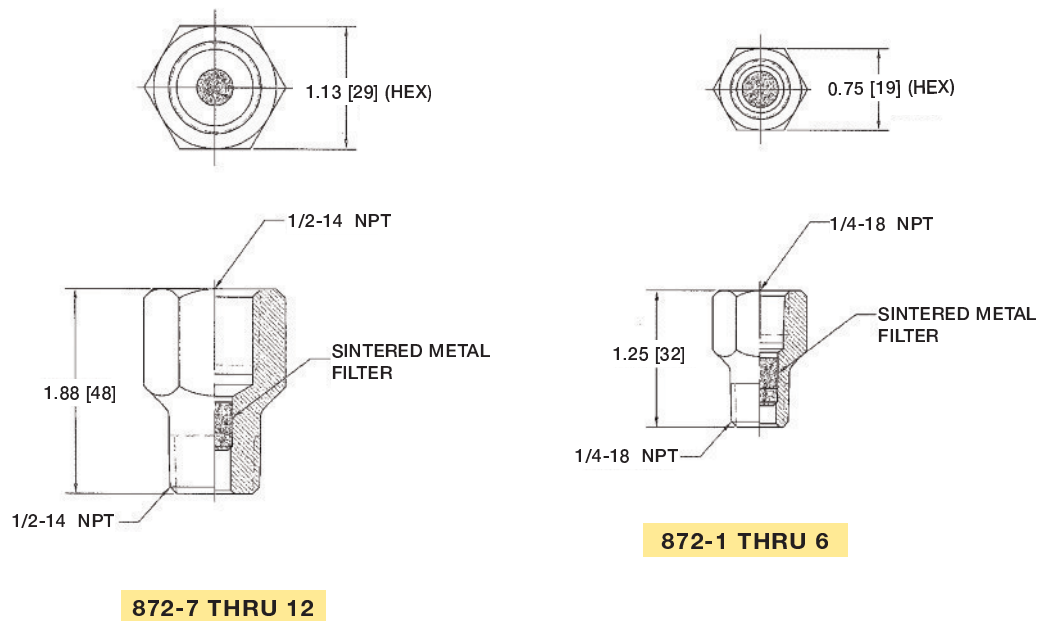
**872 Series** Pressure Snubbers are designed to improve readability and prevent wear on delicate gauge mechanisms by slowing rapid pressure changes and reducing shock and chattering. A pressure snubber should be installed on a gauge in any application where pressure spikes and/or pulsations may be present. If a single snubber does not correct the oscillation, it is recommended to place an additional snubber in line with the first. Trerice Pressure Snubbers reduce the pulsation by forcing the pressure medium through a porous metal core and are constructed from brass or 303 stainless steel for use on a variety of pressure media.

### 872 Series Pressure Snubbers

Item No.	Body & Insert Material	Connection Size (NPT)	Maximum Pressure (psig)	Service	Approximate Shipping Weight
872-1	Brass*	1/4	1000	Air and gases	0.1 lbs [0.05 kg]
872-2	Brass*	1/4	1000	Water, steam, gasoline and light oils	0.1 lbs [0.05 kg]
872-3	Brass*	1/4	1000	Lubricating and heavy oils	0.1 lbs [0.05 kg]
872-4	303SS	1/4	2000	Air and gases	0.3 lbs [0.14 kg]
872-5	303SS	1/4	2000	Water, steam, gasoline and light oils	0.3 lbs [0.14 kg]
872-6	303SS	1/4	2000	Lubricating and heavy oils	0.3 lbs [0.14 kg]
872-7	Brass*	1/2	5000	Air and gases	0.1 lbs [0.05 kg]
872-8	Brass*	1/2	5000	Water, steam, gasoline and light oils	0.1 lbs [0.05 kg]
872-9	Brass*	1/2	5000	Lubricating and heavy oils	0.1 lbs [0.05 kg]
872-10	303SS	1/2	10,000	Air and gases	0.3 lbs [0.14 kg]
872-11	303SS	1/2	10,000	Water, steam, gasoline and light oils	0.3 lbs [0.14 kg]
872-12	303SS	1/2	10,000	Lubricating and heavy oils	0.3 lbs [0.14 kg]

\* Add (PBF) to the end of part number to specify Lead-Free brass.

All dimensions are nominal. Dimensions in [ ] are in millimeters.



# 885 Series

## Coil Syphons

**885 Series** Coil Syphons are designed for use on steam service to form a pocket of water between the pressure gauge and the process steam, thereby preventing the steam from reaching the bourdon tube of the pressure gauge. Trerice Coil Syphons are constructed of steel, brass, or 304 stainless steel with a 180° coil for use on a variety of requirements. Other materials and coil styles are available; consult factory.

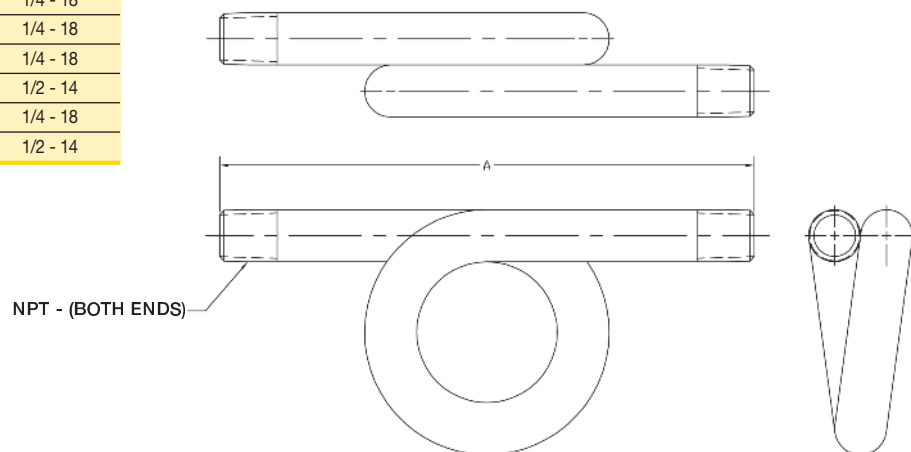


### 885 Series Coil Syphons

Item No.	Material	Style	Connection Size (NPT)	Maximum Pressure (psig)	Maximum Temperature	Approximate Shipping Weight
885-1	Welded steel, schedule 40	180° coil	1/4	600	750°F	0.4 lbs [0.18 kg]
885-1.1	Seamless steel, schedule 40	180° coil	1/2	800	650°F	1.4 lbs [0.64 kg]
885-2	Seamless brass, schedule 40	180° coil	1/4	250	406°F	0.4 lbs [0.18 kg]
885-3	Chrome plated brass, schedule 40	180° coil	1/4	250	406°F	0.4 lbs [0.18 kg]
885-4	Seamless 304SS, schedule 40	180° coil	1/4	1300	650°F	0.4 lbs [0.18 kg]
885-4.1	Seamless 304SS, schedule 40	180° coil	1/2	1000	650°F	1.4 lbs [0.64 kg]
885-6	Seamless 316SS, schedule 40	180° coil	1/4	1300	650°F	0.4 lbs [0.18 kg]
885-6.1	Seamless 316SS, schedule 40	180° coil	1/2	1000	650°F	1.4 lbs [0.64 kg]

All dimensions are nominal. Dimensions in [ ] are in millimeters.

Part No.	A	NPT
885-1	4.3	1/4 - 18
885-1.1	9.0	1/2 - 14
885-2	5.6	1/4 - 18
885-3	5.6	1/4 - 18
885-4	5.6	1/4 - 18
885-4.1	9.0	1/2 - 14
885-6	4.3	1/4 - 18
885-6.1	9.0	1/2 - 14

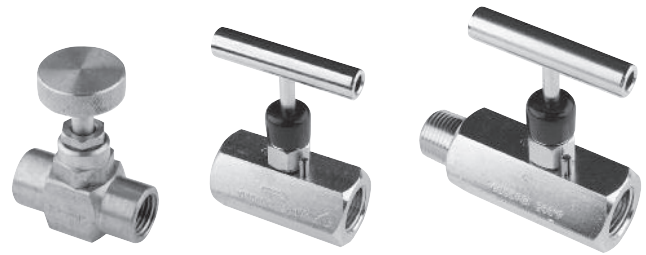


# 735/740 Series

## Needle Valves

**735/740 Series Needle Valves** are of the rising stem type and are designed to shut off the flow of the process media to the pressure instrument, thereby allowing the instrument to be isolated from the pressure media or removed from service. Needle valves may also be used to throttle flow and aid in dampening pulsations. Trerice Needle Valves are constructed from brass, carbon steel and stainless steel for use on a variety of pressure media.

**It is recommended to place a needle valve, ball valve or gauge cock in line before every pressure gauge installation.**



735-2  
735-4

735-8  
740-3  
740-11

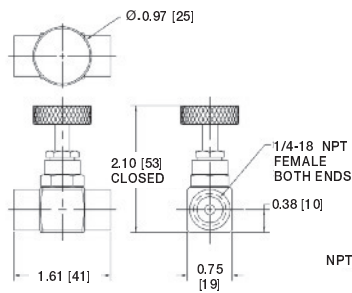
735-9  
740-4  
740-9

### 735/740 Series Needle Valves

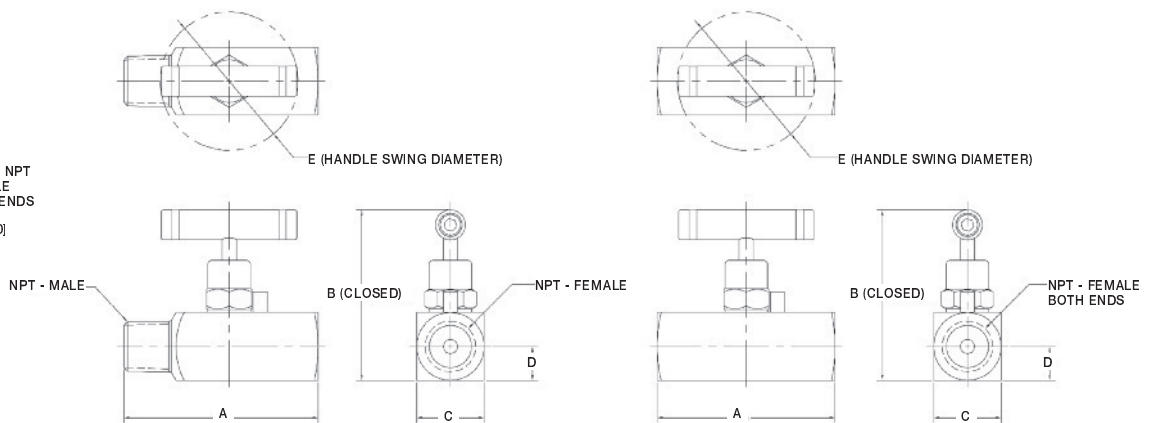
Item No.	Type	Connection Size (NPT)	Body	Seat	Stem	Packing	Maximum Pressure (psig)	Maximum Temperature	Approximate Shipping Weight
735-2	F X F	1/4	Brass*	Brass	Brass	Teflon	2000	200°F	0.3 lbs [0.14 kg]
735-4	F X F	1/4	Carbon steel	Teflon	316SS	Teflon	4000	200°F	0.3 lbs [0.14 kg]
735-8	F X F	1/4	316SS	316SS	316SS	Teflon	6000	200°F	0.3 lbs [0.14 kg]
735-9	M X F	1/4	316SS	316SS	316SS	Teflon	6000	200°F	0.3 lbs [0.14 kg]
740-3	F X F	1/2	Carbon steel	Carbon steel	316SS	Teflon	10,000	200°F	1.0 lbs [0.45 kg]
740-4	M X F	1/2	Carbon steel	Carbon steel	316SS	Teflon	10,000	200°F	1.3 lbs [0.59 kg]
740-9	M X F	1/2	316SS	Delrin	316SS	Teflon	6000	200°F	1.3 lbs [0.59 kg]
740-11	F X F	1/2	316SS	316SS	316SS	Teflon	10,000	200°F	1.0 lbs [0.45 kg]

\* Add (PBF) to the end of part number to specify Lead-Free brass.

All dimensions are nominal. Dimensions in [ ] are in millimeters.



PART NO. 735-2



Part No.	A	B	C	D	E	NPT
735-9	2.29 [58]	2.39 [61]	0.75 [19]	0.38 [10]	1.87 [47]	1/4 - 18
740-4	3.23 [82]	2.83 [72]	1.13 [29]	0.56 [14]	2.29 [58]	1/2 - 14
740-9						

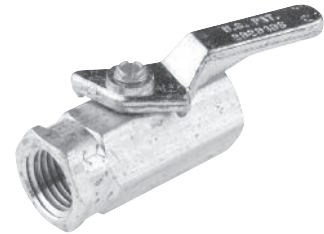
Part No.	A	B	C	D	E	NPT
735-4						
735-8	2.29 [58]	2.39 [61]	0.75 [19]	0.38 [10]	1.87 [47]	1/4 - 18
740-3						
740-11	2.96 [75]	2.83 [72]	1.13 [29]	0.56 [14]	2.29 [58]	1/2 - 14



# 866 Series

## Ball Valve

**866 Ball Valve** is a single entry flow valve, incorporating a Teflon seat to shut off the flow of process media to the pressure instrument, thereby allowing the instrument to be isolated from the pressure media or removed from service. The Trerice 866 Ball Valve is constructed from brass, for use on air, water, oil and other non-corrosive process media. **It is recommended to place a needle valve, ball valve or gauge cock in line before every pressure gauge installation.**

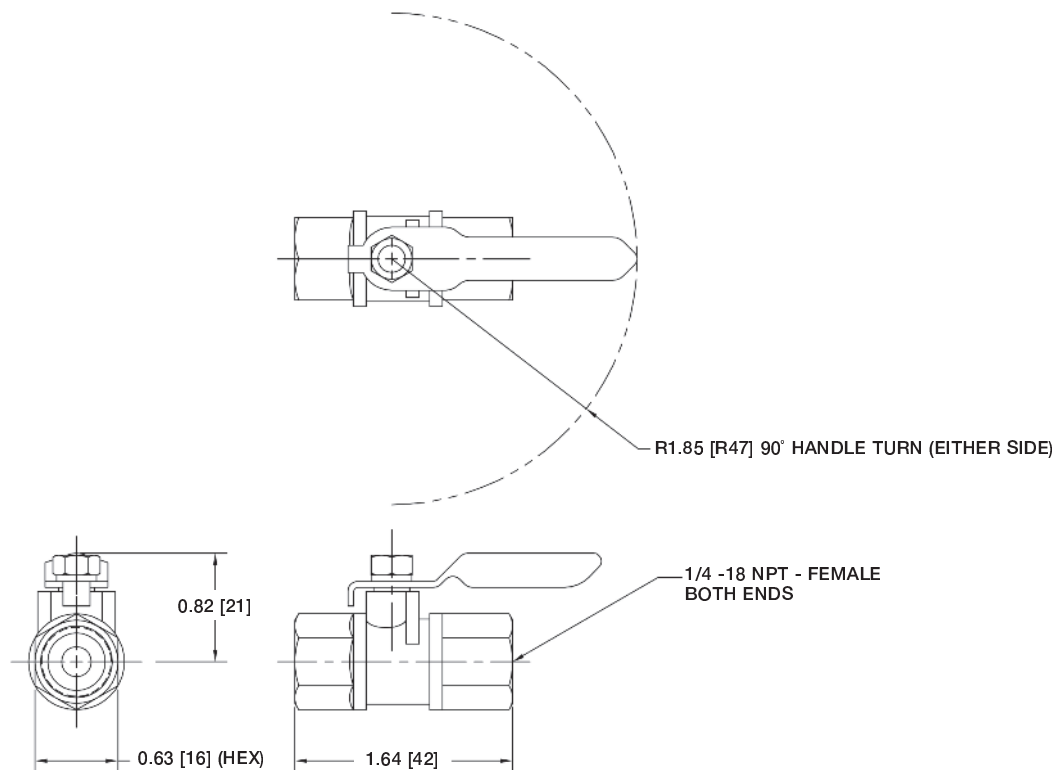


### 866 Ball Valve

Item No.	Type	Connection Size	Body	Seat	Ball	Handle	Maximum Pressure (psig)	Maximum Temperature	Approximate Shipping Weight
866	FXF	1/4 NPT	Brass*	Teflon	Plated brass	Lever	500 psig	180°F	0.1 lbs [0.05 kg]

\* Add (PBF) to the end of part number to specify Lead-Free brass.

All dimensions are nominal. Dimensions in [ ] are in millimeters.



# 865/880 Series

## Gauge Cocks

**865/880 Series** Quarter Turn Gauge Cocks provide an economical way to shut off the flow of air to the pressure instrument, thereby allowing the instrument to be isolated from the pressure media or removed from service. Trerice Gauge Cocks are constructed from brass and are intended for use on air lines where leakage is not of concern. **It is recommended to place a needle valve, ball valve or gauge cock in line before every pressure gauge installation.**

In applications where process media leakage may result in possible personal injury or property damage, gauge cocks should not be specified as they contain no packing gland and leakage may result. For tight shut-off and prevention of leakage, use of a Trerice Ball Valve or Needle Valve is required.



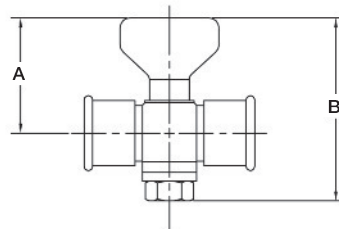
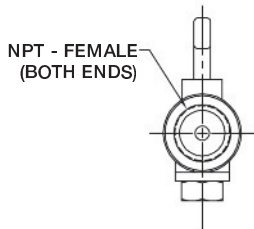
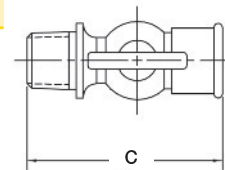
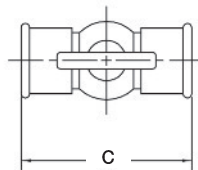
### 865/880 Series Gauge Cocks

Item No.	Type	Connection Size	Body	Plug	Maximum Pressure (psig)	Maximum Temperature	Approximate Shipping Weight
865	FXF	1/4 NPT	Brass*	Brass	200	500°F	0.1 lbs [0.05 kg]
865MFG	MXF	1/4 NPT	Brass*	Brass	200	500°F	0.1 lbs [0.05 kg]
865-1	FXF	1/4 NPT	Brass	Brass	300	500°F	0.3 lbs [0.14 kg]
880	MXF	1/4 Union	Brass	Brass	150	500°F	0.5 lbs [0.23 kg]

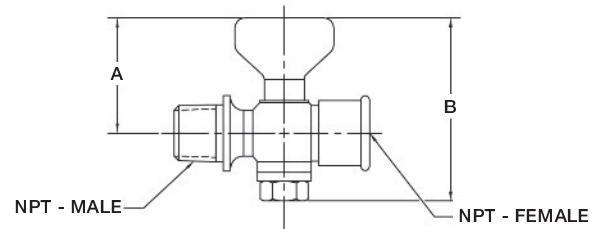
\* Add (PBF) to the end of part number to specify Lead-Free brass.

All dimensions are nominal. Dimensions in [ ] are in millimeters.

Part No.	A	B	C	NPT
865	1.09 [28]	1.73 [44]	1.62 [41]	1/4 - 18
865-1	1.04 [26]	1.78 [45]	2.26 [41]	1/4 - 18
865MFG	1.09 [28]	1.73 [44]	1.86 [47]	1/4 - 18
880	1.12 [28]	1.82 [46]	3.31 [84]	1/4 - 18



865 & 865-1



865MFG & 880

# Test Plugs & Accessories

PRESSURE GAUGES

The **Trerice Test Plug** provides a convenient access port for determining the pressure and/or temperature of process media contained in a pipe line or vessel. The test plug is designed for use in chilled or hot water systems and is permanently installed in the system at the desired test location. A test thermometer or pressure gauge with test adapter can be inserted through the plug to determine the conditions within the system. When the probe is withdrawn, the inner valve plug closes to seal the system. The test plug includes a removable cap to protect the inner valve plug and provide a secondary seal.



D3742 shown

Nordel, otherwise known as EPDM, provides excellent service in hot or cold water. **Nordel should not be used with hydrocarbon solvents, hydrocarbon oils, chlorinated hydro carbons or turpentine.**

Neoprene, a synthetic rubber, provides excellent service in ammonia, high aniline point petroleum oils and silicate ester lubricants. **Neoprene should not be used with silicone greases, silicone oils or di-ester based lubricants.**

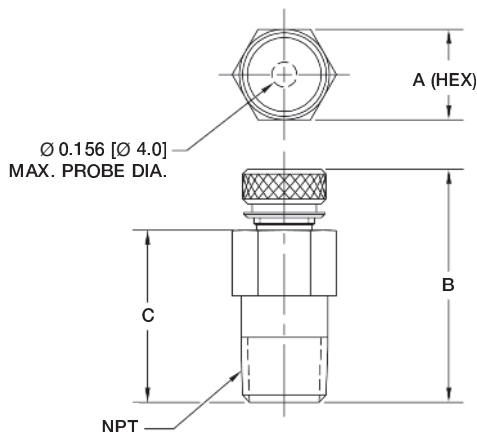
Test plugs are designed for initial startup and testing, not continuous or frequent use. If continuous or frequent use is desired or expected, a test well should be installed for temperature applications and a needle valve installed for pressure applications.

Tests should be made as quickly as possible because the inner plug resealing time is dependent upon the length of time the probe remains inserted, as well as the temperature and pressure of the system. The test plug may take longer to reseal at lower temperatures or pressures. The probe used for testing should never exceed a diameter of 0.156" (4 mm). The pressure gauge used for testing should always have a range of twice the system pressure.

## Test Plugs

Test Plug Item No.	Test Plug with Retainer Item No.	Connection Size (NPT)	Body Length	Body & Cap	Core	Max Pres. (psig)	Max Temp.	Approximate Shipping Weight
D3741	D3764	1/4	1 1/2"	Brass*	Nordel	1000	350°F	0.1 lbs [0.05 kg]
D3743	D3763	1/4	1 1/2"	Brass*	Neoprene	1000	200°F	0.1 lbs [0.05 kg]
D3758	D3766	1/4	1 1/2"	316SS	Nordel	1000	350°F	0.1 lbs [0.05 kg]
D3757	D3765	1/4	1 1/2"	316SS	Neoprene	1000	200°F	0.1 lbs [0.05 kg]
D3742	D3770	1/2	1 1/2"	Brass*	Nordel	1000	350°F	0.2 lbs [0.09 kg]
D3744	D3769	1/2	1 1/2"	Brass*	Neoprene	1000	200°F	0.2 lbs [0.09 kg]
D3762	D3772	1/2	1 1/2"	316SS	Nordel	1000	350°F	0.2 lbs [0.09 kg]
D3761	D3771	1/2	1 1/2"	316SS	Neoprene	1000	200°F	0.2 lbs [0.09 kg]
D3767	D3773	1/4	3"	Brass	Nordel	1000	350°F	0.4 lbs [0.18 kg]
D3768	D3774	1/4	3"	Brass	Neoprene	1000	200°F	0.4 lbs [0.18 kg]

\* Add (PBF) to the end of part number to specify Lead-Free brass.



All dimensions are nominal. Dimensions in [ ] are in millimeters.

Part No.	A	B	C	NPT
D3741	0.56 [14]	1.50 [38]	1.06 [27]	1/4 - 18
D3743				
D3758				
D3757				
D3742	0.88 [22]	1.50 [38]	1.06 [27]	1/2 - 14
D3744				
D3762				
D3761	0.56 [14]	3.00 [76]	2.56 [65]	1/4 - 18
D3767				
D3768				

# Test Plugs & Accessories

## Test Kits

Item No.	Pressure Range (psi)	Approximate Shipping Weight
D3750	0 to 100	1.4 lbs [0.64 kg]
D3751	0 to 200	1.4 lbs [0.64 kg]
D3752	0 to 300	1.4 lbs [0.64 kg]
D3748	0 to 600	1.4 lbs [0.64 kg]

Each test kit contains:

- (1) 700B Pressure Gauge,
- (1) B82105P03F&C Thermometer,
- (1) B82105P05F&C Thermometer,
- (1) D3747 Gauge Adapter,
- (1) Carrying Case



## Test Kit Replacement Items

Item No.	Description	Approximate Shipping Weight
700B2502LA110	700B Pressure Gauge, 2 1/2", 1/4 NPT, lower connection, 0 to 100 psi	0.4 lbs [0.18 kg]
700B2502LA130	700B Pressure Gauge, 2 1/2", 1/4 NPT, lower connection, 0 to 200 psi	0.4 lbs [0.18 kg]
700B2502LA140	700B Pressure Gauge, 2 1/2", 1/4 NPT, lower connection, 0 to 300 psi	0.4 lbs [0.18 kg]
700B2502LA160	700B Pressure Gauge, 2 1/2", 1/4 NPT, lower connection, 0 to 600 psi	0.4 lbs [0.18 kg]
B82105P03	B82105 Bimetal Thermometer, 1 3/4" dial size, 5" stem, 25° to 125°F & C	0.4 lbs [0.18 kg]
B82105P05	B82105 Bimetal Thermometer, 1 3/4" dial size, 5" stem, 20° to 240°F & C	0.4 lbs [0.18 kg]

## Accessories

Item No.	Description	Approx. Shipping Weight
D3747	Gauge Adapter, 1/8" diameter	0.1 lbs [0.05 kg]
D3749*	2" Brass Extension, 1/4 NPT	0.1 lbs [0.05 kg]
D3753*	2" Brass Extension, 1/2 NPT	0.2 lbs [0.09 kg]

\* Add (PBF) to the end of part number to specify Lead-Free brass.

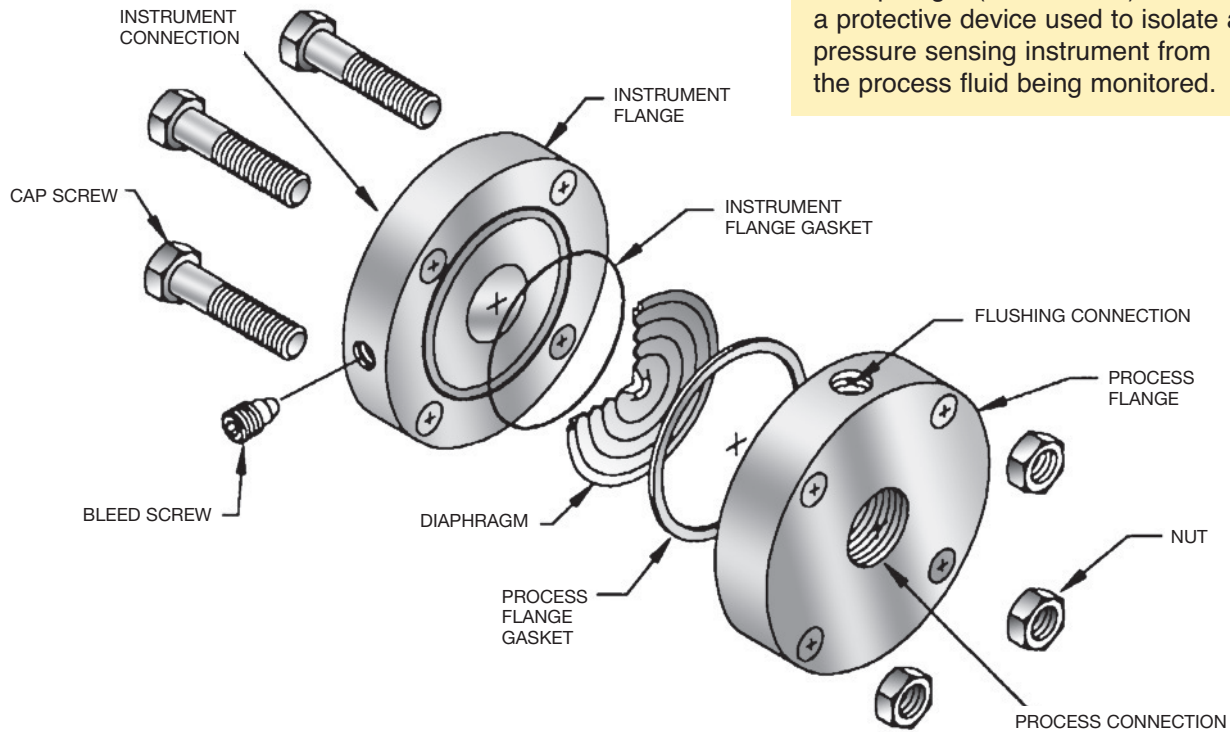


# Diaphragm Seals

## DESIGN & OPERATION

### Description

A Diaphragm (or Chemical) Seal is a protective device used to isolate a pressure sensing instrument from the process fluid being monitored.



### Principles of Operation

A Diaphragm Seal is a device consisting of a diaphragm clamped between two suitable housings that are properly gasketed to prevent leakage of liquid or gas. The diaphragm (a dividing membrane or thin partition) acts as a barrier to isolate and protect the sensing element of a pressure instrument from potentially destructive process media. Without such a barrier, the process media might clog or corrode the pressure instrument, causing failure or inaccurate response. The sensing element of the pressure instrument, as well as the space above the diaphragm of the seal, is evacuated and then filled with an incompressible liquid. When force (process media) is applied to the diaphragm seal, the internal diaphragm will flex and the displaced liquid fill will then transmit the force to the sensing element of the pressure instrument, resulting in a pressure measurement.

### Features

#### Continuous Seal Operation

Terice Diaphragm Seals (except Mini Seals and Sanitary Seals) are designed for continuous seal operation. A diaphragm stop plate, located within the instrument housing, enables the diaphragm to assist in containing the process media should the pressure instrument be damaged or removed. This allows the process to continue to operate until it can be shut down to repair or replace the instrument or seal. This safety feature is especially important where the process media is corrosive or harmful.

#### Various Diaphragm Sizes

Terice Diaphragm Seals are available in a variety of diaphragm sizes: Mini (Series 2), Compact (Series 3), Sanitary (Series 4), Standard (Series 5) and Large (Series 6). Mini and Compact diaphragm sizes are designed to provide economical protection for pressure gauges (Contractor/Commercial/Utility) with a dial face size of 4 1/2" or smaller. Sanitary Diaphragm Seals are designed for use with Tri-Clamp process connections. Standard and Large diaphragm sizes are the most versatile, with a variety of available materials and connections. The Large diaphragm size has twice the diaphragm surface area of the Standard diaphragm size and is therefore more sensitive and better suited for low pressure applications.

## Fill Port

Trerice Diaphragm Seals are furnished standard with a fill port in the side of the instrument housing. This port provides access to the fill area above the diaphragm. An adapter fitting can be connected so that the assembly can be evacuated and completely filled with liquid without entrapping air, thereby maintaining the integrity of the system. A bleed screw is inserted after filling to plug the port and provide a means to bleed excess fill during the instrument calibration process.

## Clean-out Design

Most Trerice Diaphragm Seals are of the Clean-out design, utilizing a snap-in or welded style diaphragm, with an o-ring gasket between the diaphragm and instrument housing. This allows the bolts to be removed and the housings separated to permit inspection, cleaning or installation of the process housing without loss of the liquid fill fluid in the instrument housing.

Note: Should the bolts of a Non Clean-out design diaphragm seal (Styles 05, 10 and 11) be loosened or removed, loss of the liquid fill will result.

## Flushing Connection

Most Trerice Diaphragm Seals can be ordered with a 1/4 NPT Flushing Connection (located in the side of the process housing), which enables periodic back flushing of solids from the system.

## Selecting A Diaphragm Seal

In choosing the appropriate diaphragm seal, it is essential to have an understanding of the pressure instrument to be isolated, the process medium, and any temperature or pressure considerations. The process housing (or adapter ring), diaphragm, and process housing gasket are “wetted” parts which come in contact with the process medium, making proper material selection critical. The instrument housing, instrument housing gasket, nuts and bolts, and liquid fill fluid do not come into contact with the process medium and therefore are “non-wetted” parts. External environmental considerations, such as atmospheric conditions or extreme temperatures, may influence material and design selection.

All Trerice Diaphragm Seals should be carefully selected to meet the demands of the particular application. The information contained in this catalog is offered only as a guide to assist in making the proper selection. Selection of the proper diaphragm seal, as well as the liquid fill fluid, is the sole responsibility of the user. Improper application may cause failure of the seal, resulting in possible personal injury or property damage. For correct use and application of all diaphragm seals, please refer to Diaphragm Seal Standard ASME B40.2. This document may be obtained from the American Society of Mechanical Engineers (ASME), United Engineering Center, 345 East 42nd Street, New York, NY 10017.

## Process Housing or Adapter Ring

Generally, the material chosen is identical to that used in the piping system. Many different metal alloys, as well as nonmetallic materials, are available. A unique, patented Teflon-lined process housing is offered for use with Teflon-lined piping systems. The Teflon-lined steel housing can safely withstand high pressures and temperatures without leakage. Diaphragm seals supplied with nonmetallic process housings are furnished with a steel pressure plate under the fasteners, which spreads the bolting pressure over a large area and prevents the nuts or bolts from imbedding themselves into the process housing.

# Diaphragm Seals

## DESIGN & OPERATION

### Diaphragm

Both welded and removable metal diaphragms are available, as are Teflon and Viton diaphragm materials. Trerice metal diaphragms have both radial and spoke corrugations, resulting in an extremely flexible diaphragm. This flexibility increases the diaphragm's ability to displace fill fluid into the pressure instrument, providing excellent accuracy at low pressures. Trerice Teflon diaphragms provide greater sensitivity than metal diaphragms and are compatible with many caustic process media. Trerice Viton diaphragms are extremely pliable and offer optimum sensitivity at low pressures.

#### ▶ Type W (Welded Metal)

- ▶ Diaphragm is welded at its outer edge directly to the instrument housing.
- ▶ Ensures no leakage of the fill fluid.
- ▶ Best choice for high temperature applications.
- ▶ Economically priced.
- ▶ Diaphragm and instrument housing must be replaced as a complete assembly.
- ▶ Clean-out design.

#### ▶ Type M (Removable Metal)

- ▶ Diaphragm is replaceable if worn or damaged.
- ▶ Can be rebuilt many times to "like new" condition.
- ▶ Very cost effective.
- ▶ Available in Clean-out or Non Clean-out design.

#### ▶ Type T (Teflon)

- ▶ Offers excellent compatibility with most process media.
- ▶ Greater sensitivity than metal diaphragms.
- ▶ Best choice for abrasive fluid applications.
- ▶ Available in Clean-out or Non Clean-out design.

#### ▶ Type V (Viton)

- ▶ Compatible with most process media.
- ▶ Most sensitive diaphragm material available.
- ▶ Ideal for low pressure applications.
- ▶ Available in Clean-out or Non Clean-out design.

For Viton diaphragm applications that also require pulsation damping, a .040 orifice should be specified. Standard porous stones are not recommended. Please consult factory.

### Process Housing Gasket

Process housing gaskets are installed in all seals (except Mini Seals and Sanitary Seals). They seat into a recessed area of the process housing, eliminating the possibility of causing damage to the gasket by over-tightening the bolts. The process housing gasket is self-energized (utilizing process pressure to seat the gasket), reducing the possibility of leakage. Process housing gaskets are normally made of Teflon for applications up to 500°F, but can be supplied in Grafoil for temperature requirements up to 800°F. Consult factory for availability.

### Instrument Housing

The instrument housing is isolated from the process media by the diaphragm and is normally furnished in nickel plated, carbon steel. For severe environmental conditions, a 316 stainless steel housing with stainless steel nuts and bolts is also available. For other material requirements, consult factory.

### Instrument Housing Gasket

Viton instrument housing gaskets are used in Type M (Removable Metal) and Type T (Teflon) seals, and have a 500°F temperature limit. No instrument housing gasket is required on Type V (Viton) seals as the diaphragm provides a "self-gasketed" seal.



## Nuts and Bolts

Bolts are normally hexagonal head, heat treated alloy steel, while nuts are hexagonal type stainless steel. Stainless steel bolts are furnished with stainless steel instrument housings and are also available with standard nickel plated, carbon steel instrument housings. Special materials are also available; consult factory. (Mini Seals and Sanitary Seals are of welded construction and, therefore, nuts and bolts are not required for assembly.)

## Liquid Fill Fluids

The liquid fill fluid transmits the process pressure acting upon the diaphragm to the sensing element of the pressure instrument. Because fill fluids may freeze at low temperatures, vaporize at high temperatures, or react chemically with process media or other materials, caution must be exercised when selecting the liquid fill fluid. Please consult the table below for liquid fill temperature limits. Other fill fluids may be available; consult factory.

### Liquid Fill Fluid Temperature Limits

Standard Instrument Oil	10°F to 300°F
Glycerine	0°F to 210°F
High Temperature Silicone	- 60°F to 500°F
Halocarbon	- 50°F to 500°F
Neobee M20	5°F to 250°F

### Fill Fluid Pressure Limits

Standard Instrument Oil	Vacuum/Pressure
Glycerine	Pressure Only
Silicone	Vacuum/Pressure
Halocarbon	Vacuum/Pressure
Neobee M20	Vacuum/Pressure

## Temperature and Pressure Limitations

### Temperature and Operating Range Limitations

Diaphragm Size	Diaphragm Type	Maximum Temperature*	Minimum Pressure Gauge Range	Maximum Readable Vacuum (30" Hg to 0 Range)
Series 6	M, W	500°F	0 to 30 psi	24" Hg
	T	500°F	0 to 30 psi	26" Hg
Series 5	M, W	500°F	0 to 60 psi	21" Hg
	T	500°F	0 to 60 psi	23" Hg
	V	350°F	0 to 5 psi	29" Hg
Series 4	W472	500°F	Range Dependent**	Not Recommended
Series 3	W305	500°F	0 to 60 psi	Not Recommended
Series 2	W205	500°F	0 to 100 psi	Not Recommended

\* Choice of fill fluids may affect maximum temperature. Please refer to Liquid Fill Fluid Temperature Limits above.

\*\* See Sanitary Gauge product data page for minimum operating pressures.

### Maximum Working Pressure

Style	Maximum Pressure
Pipe-Mounted	2500 psi @ 100°F (5000 psi @ 100°F – optionally available – consult factory)
Flanged	ASA flange pressure rating
In-Line Flow-Thru	600 psi @ 100°F**
Saddle-Welded	600 psi @ 100°F**
Drop-In Welded	600 psi @ 100°F**
Mini Diaphragm	2000 psi @ 100°F
Compact Diaphragm	1000 psi @ 100°F
Sanitary	1000 psi @ 100°F

\*\* Should not exceed pressure rating of pipe being used.

For applications other than those listed, please consult factory. The above temperature, pressure, and vacuum limits apply only when diaphragm seals are properly mounted, installed, operated and maintained.

The accuracy of a pressure instrument may be affected when mounted to a diaphragm seal, especially in ranges of 100 psi or below. Please consult factory for further information.

Seals with a polypropylene, PVC or Teflon process housing have a maximum working pressure of 300 psi at a maximum temperature of 140°F.

# Threaded-NPT Diaphragm Seals

DIAPHRAGM SEALS



M511 shown

- ▶ Clean-out or Non Clean-out Design
- ▶ Flushing Connection Available
- ▶ Threaded Process Connection

The Trerice **Threaded NPT Diaphragm Seal** is offered in both Clean-out and Non Clean-out designs, with female threaded connections of 1/4 NPT through 1 NPT. The Non Clean-out design can be furnished with diaphragm materials of Teflon (T), Viton (V), or Removable Metal (M), while the Clean-out design is available with all diaphragm choices, including Welded Metal (W).

**Selection of the proper diaphragm seal is the sole responsibility of the user. Temperature and pressure limitations must be considered. Please refer to the Diaphragm Seal Design & Operation Section of this catalog. Improper application may cause failure of the seal, resulting in possible personal injury or property damage.**

For correct use and application of all diaphragm seals, please refer to Diaphragm Seal Standard ASME B40.2.

## SPECIFICATIONS

Style	Available Diaphragm Types*	Diaphragm Size	Process Connection	Clean-out Design	1/4 NPT Flushing Connection
510	M, T, V	Standard	Threaded	No	No
511	M, T, V	Standard	Threaded	No	Yes
515	M, T, V, W	Standard	Threaded	Yes	No
516	M, T, V, W	Standard	Threaded	Yes	Yes
610	M, T	Large	Threaded	No	No
611	M, T	Large	Threaded	No	Yes
615	M, T, W	Large	Threaded	Yes	No
616	M, T, W	Large	Threaded	Yes	Yes

\*M = Removable Metal, T = Teflon, V = Viton, W = Welded Metal

Note: Due to the variety of available diaphragm seal configurations and materials, it is not possible to list each weight in this catalog. Please consult factory.

## HOW TO ORDER

Sample Order Number: **M 5 10 04 S S CC**

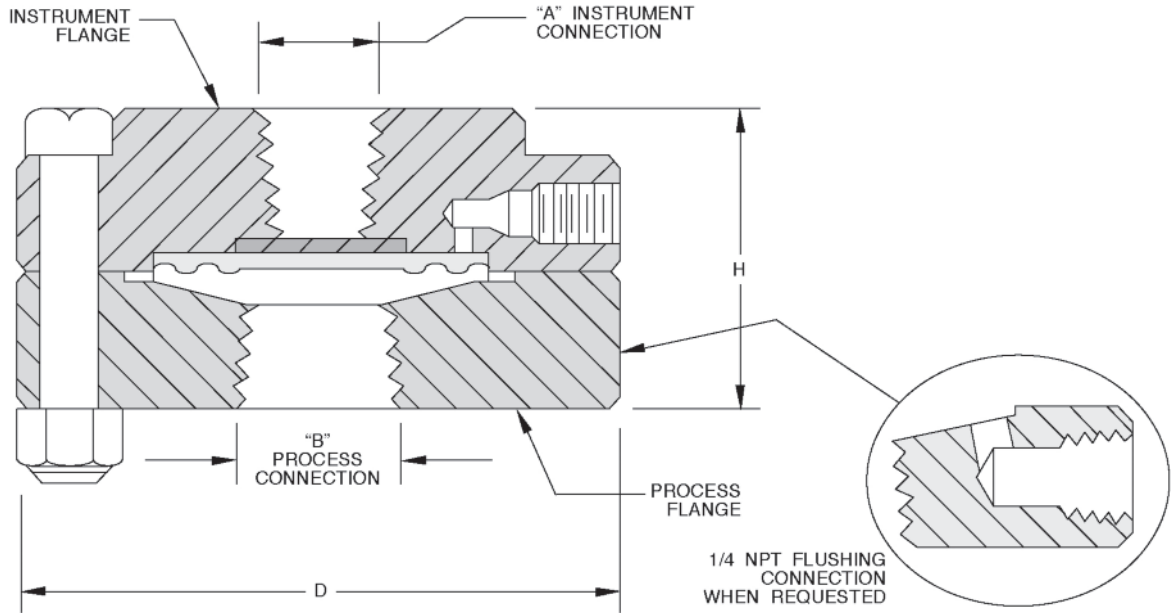
Diaphragm Type	Diaphragm Size	Style	Connection Size	Diaphragm Material	Process Housing Material	Instrument Housing & Bolt Material
M Metal	5 Standard	10 Non Clean-out, Non-Flushing	See Connection Sizes	See Diaphragm Materials	See Process Housing Materials	CC Carbon Steel SS 316 Stainless Steel
T Teflon	6 Large	11 Non Clean-out, Flushing				
V Viton**		15 Clean-out, Non-Flushing				
W Welded†		16 Clean-out, Flushing				

\*\*Diaphragm Type V available only with Diaphragm Size 5.  
†Diaphragm Type W available only with Styles 15 and 16.

See Sizes and Materials Table

# Threaded-NPT Diaphragm Seals

All dimensions are nominal. Dimensions in [ ] are in millimeters.



DIAPHRAGM SEALS

Diaphragm Type and Size	A	B	H	D
M, T, W 5 Series	1/4, 1/2 NPT as specified	1/4, 1/2, 3/4, 1 NPT as specified	1.63 [41]	3.25 [83]
V 5 Series	1/4, 1/2 NPT as specified	1/4, 1/2, 3/4, 1 NPT as specified	1.88 [48]	3.25 [83]
M, T, W 6 Series	1/4, 1/2 NPT as specified	1/4, 1/2, 3/4, 1 NPT as specified	1.63 [41]	4.00 [102]

## Sizes and Materials

Connection Sizes			Diaphragm Materials		Process Housing Materials	
Code	Instrument Connection (NPT)	Process Connection (NPT)	Code	Material	Code	Material
01	1/4	1/4	D	Carpenter 20	C	Steel
02	1/2	1/4	F	304 Stainless Steel*	D	Carpenter 20
03	1/4	1/2	G	Hastelloy B	F	304 Stainless Steel
04	1/2	1/2	H	Hastelloy C-276	G	Hastelloy B
05	1/4	3/4	M	Monel	H	Hastelloy C-276
06	1/2	3/4	N	Nickel	M	Monel
07	1/4	1	S	316L Stainless Steel	N	Nickel
08	1/2	1	T	Teflon	P	Polypropylene
			U	Tantalum	S	316L Stainless Steel
			V	Viton**	T	Teflon
					Z	PVC

\* 304 Stainless Steel diaphragm not available with Diaphragm Size 6.

\*\* Viton Diaphragm available only with Diaphragm Size 5.

# Flange-Mounted Diaphragm Seals

DIAPHRAGM SEALS



M530 shown

- ▶ Clean-out Design
- ▶ Flushing Connection Available
- ▶ ANSI Raised Face Flanged Process Connection

The **Trerice Flange-Mounted Diaphragm Seal** is furnished with a Clean-out design in ANSI Raised Face Flange (RFF) sizes of 1/2" through 3". Process housing flanges mate with the piping flange, which is supplied by the user. Available diaphragm choices include: Teflon (T), Viton (V), Removable Metal (M) and Welded Metal (W).

Selection of the proper diaphragm seal is the sole responsibility of the user. Temperature and pressure limitations must be considered. Please refer to the Diaphragm Seal Design & Operation Section of this catalog. Improper application may cause failure of the seal, resulting in possible personal injury or property damage.

For correct use and application of all diaphragm seals, please refer to Diaphragm Seal Standard ASME B40.2.

## SPECIFICATIONS

Style	Available Diaphragm Types*	Diaphragm Size	Process Connection	Clean-out Design	1/4 NPT Flushing Connection
525	M, T, V, W	Standard	1/2" ANSI RFF	Yes	No
526	M, T, V, W	Standard	1/2" ANSI RFF	Yes	Yes
530	M, T, V, W	Standard	1" to 3" ANSI RFF	Yes	No
531	M, T, V, W	Standard	1" to 3" ANSI RFF	Yes	Yes
625	M, T, W	Large	1/2" and 1" ANSI RFF	Yes	No
626	M, T, W	Large	1/2" and 1" ANSI RFF	Yes	Yes
630	M, T, W	Large	1 1/2" to 3" ANSI RFF	Yes	No
631	M, T, W	Large	1 1/2" to 3" ANSI RFF	Yes	Yes

\*M = Removable Metal, T = Teflon, V = Viton, W = Welded Metal

Note: Due to the variety of available diaphragm seal configurations and materials, it is not possible to list each weight in this catalog. Please consult factory.

## HOW TO ORDER

Sample Order Number: **M 5 25 04 S S CC**

Diaphragm Type	Diaphragm Size	Style	Connection Size	Diaphragm Material	Process Housing Material	Instrument Housing & Bolt Material
M Metal	5 Standard	25 Small Flange, Non-Flushing	See Connection Sizes	See Diaphragm Materials	See Process Housing Materials	CC Carbon Steel SS 316 Stainless Steel
T Teflon	6 Large	26 Small Flange, Flushing				
V Viton**		30 Large Flange, Non-Flushing				
W Welded		31 Large Flange, Flushing				

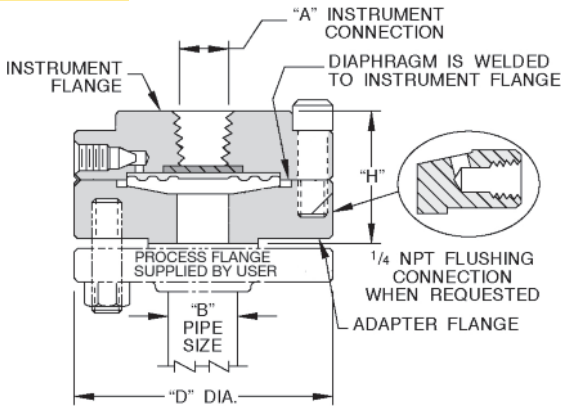
\*\*Diaphragm Type V available only with Diaphragm Size 5.

See Sizes and Materials Table

# Flange-Mounted Diaphragm Seals

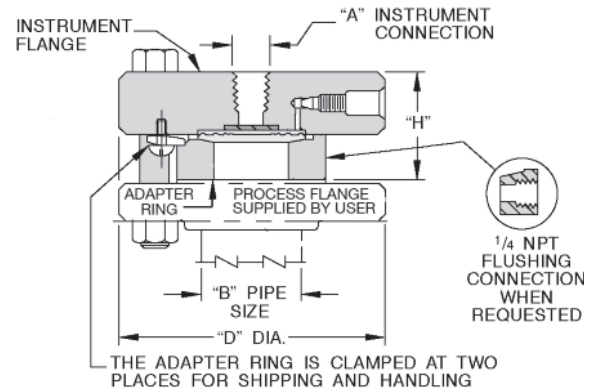
All dimensions are nominal. Dimensions in [ ] are in millimeters.

## Styles 25 & 26



Diaphragm Type and Size	A	B	Flange Rating	H	D
M, T, V, W 5 Series	1/4, 1/2 NPT as specified	1/2	150# 300#	1.69 [43] 1.69 [43]	3.25 [83] 3.50 [89]
M, T, W 6 Series	1/4, 1/2 NPT as specified	1/2 1	150# 300# 150# 300#	1.69 [43] 1.69 [43] 1.69 [43] 1.81 [46]	4.00 [102] 4.00 [102] 4.00 [102] 4.50 [114]

## Styles 30 & 31



Diaphragm Type and Size	A	B	Flange Rating	H	D
M, T, V, W All Series	1/4, 1/2 NPT as specified	1 1 1/2	150# 300# 150# 300# 150# 300#	1.69 [43] 1.69 [43] 1.63 [41] 1.63 [41] 1.63 [41] 1.63 [41]	4.25 [108] 4.75 [121] 5.00 [127] 6.00 [152] 6.00 [152] 6.50 [165] 7.50 [191] 8.00 [203]

## Sizes and Materials

Connection Sizes			Diaphragm Materials		Process Housing Materials	
Code	Instrument Connection (NPT)	Process Connection	Code	Material	Code	Material
The following are available only on Styles 25 and 26.			D	Carpenter 20	C	Steel
01	1/4	1/2" 150# RFF	F	304 Stainless Steel <sup>1</sup>	D	Carpenter 20
02	1/2	1/2" 150# RFF	G	Hastelloy B	F	304 Stainless Steel
03	1/4	1/2" 300# RFF	H	Hastelloy C-276	G	Hastelloy B
04	1/2	1/2" 300# RFF	M	Monel	H	Hastelloy C-276
The following are available only on Styles 530, 531, 625 and 626.			N	Nickel	L	Teflon-lined <sup>3</sup>
21	1/4	1" 150# RFF	S	316L Stainless Steel	M	Monel
22	1/2	1" 150# RFF	T	Teflon	N	Nickel
23	1/4	1" 300# RFF	U	Tantalum	P	Polypropylene <sup>4</sup>
24	1/2	1" 300# RFF	V	Viton <sup>2</sup>	S	316L Stainless Steel
The following are available only on Styles 30 and 31.					T	Teflon <sup>4</sup>
41	1/4	1 1/2" 150# RFF			Z	PVC <sup>4</sup>
42	1/2	1 1/2" 150# RFF				
43	1/4	1 1/2" 300# RFF				
44	1/2	1 1/2" 300# RFF				
51	1/4	2" 150# RFF				
52	1/2	2" 150# RFF				
53	1/4	2" 300# RFF				
54	1/2	2" 300# RFF				
61	1/4	3" 150# RFF				
62	1/2	3" 150# RFF				
63	1/4	3" 300# RFF				
64	1/2	3" 300# RFF				

<sup>1</sup> 304 Stainless Steel diaphragm not available with Diaphragm Size 6.

<sup>2</sup> Viton Diaphragm available only with Diaphragm Size 5.

<sup>3</sup> Teflon-lined Process Housing available only with Style 30.

DIAPHRAGM SEALS

# In-Line Threaded Diaphragm Seals

DIAPHRAGM SEALS



M535 shown

- ▶ Clean-out Design
- ▶ Threaded or Socket-Welded Process Connection

The Trerice **In-Line Threaded Diaphragm Seal** is furnished with a Clean-out design in threaded or socket-welded pipe connections of 1/4" through 1". Since the diaphragm seal is installed "in line" to the system piping, the process media will flow through the seal, eliminating the "dead-end" area found on threaded or flanged seals. Available diaphragm choices include: Teflon (T), Viton (V), Removable Metal (M) and Welded Metal (W).

Selection of the proper diaphragm seal is the sole responsibility of the user. Temperature and pressure limitations must be considered. Please refer to the Diaphragm Seal Design & Operation Section of this catalog. Improper application may cause failure of the seal, resulting in possible personal injury or property damage.

For correct use and application of all diaphragm seals, please refer to Diaphragm Seal Standard ASME B40.2.

## SPECIFICATIONS

Style	Available Diaphragm Types*	Diaphragm Size	Process Connection	Clean-out Design	1/4 NPT Flushing Connection
535	M, T, V, W	Standard	Threaded	Yes	No
540	M, T, V, W	Standard	Socket-Welded	Yes	No
635	M, T, W	Large	Threaded	Yes	No
640	M, T, W	Large	Socket-Welded	Yes	No

\*M = Removable Metal, T = Teflon, V = Viton, W = Welded Metal

Note: Due to the variety of available diaphragm seal configurations and materials, it is not possible to list each weight in this catalog. Please consult factory.

## HOW TO ORDER

Sample Order Number: **T 5 35 06 T T CC**

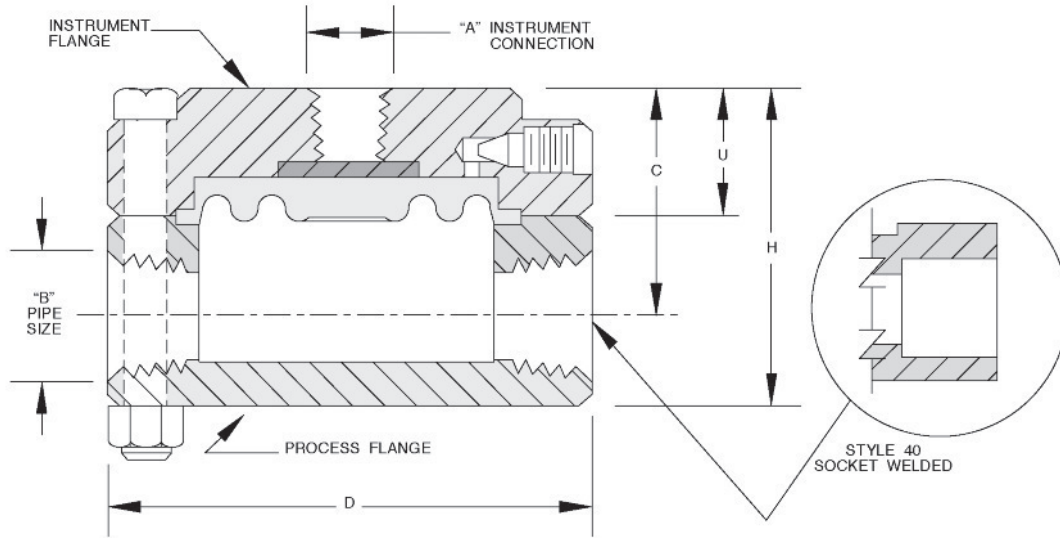
Diaphragm Type	Diaphragm Size	Style	Connection Size	Diaphragm Material	Process Housing Material	Instrument Housing & Bolt Material
M Metal T Teflon V Viton** W Welded	5 Standard 6 Large	35 Threaded 40 Socket-Welded	See Connection Sizes	See Diaphragm Materials	See Process Housing Materials	CC Carbon Steel SS 316 Stainless Steel

\*\*Diaphragm Type V available only with Diaphragm Size 5.

See Sizes and Materials Table

# In-Line Threaded Diaphragm Seals

All dimensions are nominal. Dimensions in [ ] are in millimeters.



DIAPHRAGM SEALS

Diaphragm Type and Size	A	B	H	U	C	D
M, T, W 5 Series	1/4, 1/2 NPT as specified	1/4 NPT	1.63 [41]	0.88 [22]	1.24 [32]	3.25 [83]
		1/2 NPT	2.13 [54]	0.88 [22]	1.50 [38]	3.25 [83]
		3/4 NPT	2.38 [60]	0.88 [22]	1.63 [41]	3.25 [83]
		1 NPT	2.63 [67]	0.88 [22]	1.75 [44]	3.25 [83]
V 5 Series	1/4, 1/2 NPT as specified	1/4 NPT	1.63 [41]	1.00 [25]	1.24 [32]	3.25 [83]
		1/2 NPT	2.13 [54]	1.00 [25]	1.50 [38]	3.25 [83]
		3/4 NPT	2.38 [60]	1.00 [25]	1.63 [41]	3.25 [83]
		1 NPT	2.63 [67]	1.00 [25]	1.75 [44]	3.25 [83]
M, T, W 6 Series	1/4, 1/2 NPT as specified	1/4 NPT	1.63 [41]	0.88 [22]	1.24 [32]	4.00 [102]
		1/2 NPT	2.13 [54]	0.88 [22]	1.50 [38]	4.00 [102]
		3/4 NPT	2.38 [60]	0.88 [22]	1.63 [41]	4.00 [102]
		1 NPT	2.63 [67]	0.88 [22]	1.75 [44]	4.00 [102]

## Sizes and Materials

Connection Sizes			Diaphragm Materials		Process Housing Materials	
Code	Instrument Connection (NPT)	Process Connection	Code	Material	Code	Material
01	1/4	1/4" NPT/SW	D	Carpenter 20	C	Steel
02	1/2	1/4" NPT/SW	F	304 Stainless Steel*	D	Carpenter 20
03	1/4	1/2" NPT/SW	G	Hastelloy B	F	304 Stainless Steel
04	1/2	1/2" NPT/SW	H	Hastelloy C-276	G	Hastelloy B
05	1/4	3/4" NPT/SW	M	Monel	H	Hastelloy C-276
06	1/2	3/4" NPT/SW	N	Nickel	M	Monel
07	1/4	1" NPT/SW	S	316L Stainless Steel	N	Nickel
08	1/2	1" NPT/SW	T	Teflon	P	Polypropylene
			U	Tantalum	S	316L Stainless Steel
			V	Viton**	T	Teflon
					Z	PVC

\* 304 Stainless Steel diaphragm not available with Diaphragm Size 6.

\*\* Viton Diaphragm available only with Diaphragm Size 5.

# Saddle-Welded Diaphragm Seals

DIAPHRAGM SEALS



M545 shown

- ▶ Clean-out Design
- ▶ Saddle-Welded Process Connection

The Trerice **Saddle-Welded Diaphragm Seal** is furnished with a Clean-out design, for use on pipe sizes of 1" through 8". The diaphragm seal is installed by welding the process housing directly onto the pipe. Available diaphragm choices include: Teflon (T), Viton (V), Removable Metal (M) and Welded Metal (W).

Selection of the proper diaphragm seal is the sole responsibility of the user. Temperature and pressure limitations must be considered. Please refer to the Diaphragm Seal Design & Operation Section of this catalog. Improper application may cause failure of the seal, resulting in possible personal injury or property damage.

For correct use and application of all diaphragm seals, please refer to Diaphragm Seal Standard ASME B40.2.

## SPECIFICATIONS

Style	Available Diaphragm Types*	Diaphragm Size	Process Connection	Clean-out Design	1/4 NPT Flushing Connection
545	M, T, V, W	Standard	Welded	Yes	No
645	M, T, W	Large	Welded	Yes	No

\*M = Removable Metal, T = Teflon, V = Viton, W = Welded Metal

Note: Due to the variety of available diaphragm seal configurations and materials, it is not possible to list each weight in this catalog. Please consult factory.

## HOW TO ORDER

Sample Order Number: **W 5 45 05 S S CC**

Diaphragm Type	Diaphragm Size	Style	Connection Size	Diaphragm Material	Process Housing Material	Instrument Housing & Bolt Material
M Metal T Teflon V Viton** W Welded	5 Standard 6 Large	45 Saddle-Welded	See Connection Sizes	See Diaphragm Materials	See Process Housing Materials	CC Carbon Steel SS 316 Stainless Steel

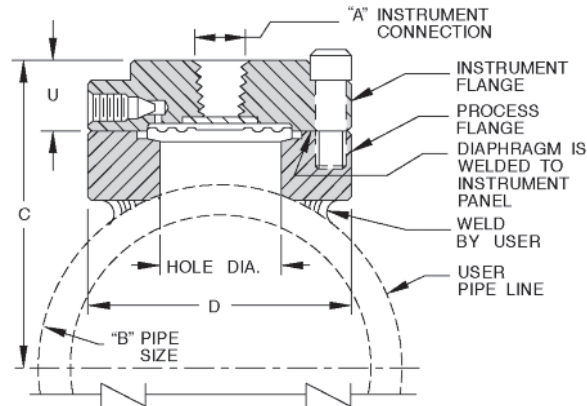
\*\*Diaphragm Type V available only with Diaphragm Size 5.

See Sizes and Materials Table



# Saddle-Welded Diaphragm Seals

All dimensions are nominal. Dimensions in [ ] are in millimeters.



DIAPHRAGM SEALS

Diaphragm Type and Size	A	B	U	C	D	Hole Diameter
M, T, W 5 Series	1/4, 1/2 NPT as specified	1	0.88 [22]	2.13 [55]	3.50 [89]	1.00 [25]
		1 1/2	0.88 [22]	2.38 [60]	3.50 [89]	1.50 [38]
		2	0.88 [22]	2.63 [67]	3.50 [89]	1.50 [38]
		3	0.88 [22]	3.25 [83]	3.50 [89]	1.50 [38]
		4	0.88 [22]	3.81 [97]	3.50 [89]	1.50 [38]
		6	0.88 [22]	4.94 [125]	3.50 [89]	1.50 [38]
V 5 Series	1/4, 1/2 NPT as specified	1	1.00 [25]	2.13 [55]	3.50 [89]	1.00 [25]
		1 1/2	1.00 [25]	2.38 [60]	3.50 [89]	1.50 [38]
		2	1.00 [25]	2.63 [67]	3.50 [89]	1.50 [38]
		3	1.00 [25]	3.25 [83]	3.50 [89]	1.50 [38]
		6	1.00 [25]	4.94 [125]	3.50 [89]	1.50 [38]
		8	1.00 [25]	5.94 [151]	3.50 [89]	1.50 [38]
M, T, W 6 Series	1/4, 1/2 NPT as specified	1	0.88 [22]	2.13 [55]	4.25 [108]	1.00 [25]
		1 1/2	0.88 [22]	2.38 [60]	4.25 [108]	1.50 [38]
		2	0.88 [22]	2.63 [67]	4.25 [108]	1.50 [38]
		3	0.88 [22]	3.25 [83]	4.25 [108]	1.50 [38]
		4	0.88 [22]	3.81 [97]	4.25 [108]	1.50 [38]
		6	0.88 [22]	4.94 [125]	4.25 [108]	1.50 [38]
8	0.88 [22]	5.94 [151]	4.25 [108]	1.50 [38]		

## Sizes and Materials

Connection Sizes			Diaphragm Materials		Process Housing Materials	
Code	Instrument Connection (NPT)	Process Connection	Code	Material	Code	Material
01	1/4	1" Pipe	D	Carpenter 20	C	Steel
02	1/2	1" Pipe	F	304 Stainless Steel*	D	Carpenter 20
05	1/4	1 1/2" Pipe	G	Hastelloy B	F	304 Stainless Steel
06	1/2	1 1/2" Pipe	H	Hastelloy C-276	G	Hastelloy B
07	1/4	2" Pipe	M	Monel	H	Hastelloy C-276
08	1/2	2" Pipe	N	Nickel	M	Monel
09	1/4	3" Pipe	S	316L Stainless Steel	N	Nickel
10	1/2	3" Pipe	T	Teflon	S	316L Stainless Steel
11	1/4	4" Pipe	U	Tantalum		
12	1/2	4" Pipe	V	Viton**		
13	1/4	6" Pipe				
14	1/2	6" Pipe				
15	1/4	8" Pipe				
16	1/2	8" Pipe				

\* 304 Stainless Steel diaphragm not available with Diaphragm Size 6.

\*\* Viton Diaphragm available only with Diaphragm Size 5.

# Drop-In Welded Diaphragm Seals

DIAPHRAGM SEALS



M565 shown

- ▶ Clean-out Design
- ▶ Welded Process Connection

The Trerice **Drop-In Welded Diaphragm Seal** is furnished with a Clean-out design for use on piping 4" or larger in diameter. The diaphragm seal is installed by welding the process housing directly into the pipe. Available diaphragm choices include: Teflon (T), Viton (V), Removable Metal (M) and Welded Metal (W).

Selection of the proper diaphragm seal is the sole responsibility of the user. Temperature and pressure limitations must be considered. Please refer to the Diaphragm Seal Design & Operation Section of this catalog. Improper application may cause failure of the seal, resulting in possible personal injury or property damage.

For correct use and application of all diaphragm seals, please refer to Diaphragm Seal Standard ASME B40.2.

## SPECIFICATIONS

Style	Available Diaphragm Types*	Diaphragm Size	Process Connection	Clean-out Design	1/4 NPT Flushing Connection
565	M, T, V, W	Standard	Threaded	Yes	No

\*M = Removable Metal, T = Teflon, V = Viton, W = Welded Metal

Note: Due to the variety of available diaphragm seal configurations and materials, it is not possible to list each weight in this catalog. Please consult factory.

## HOW TO ORDER

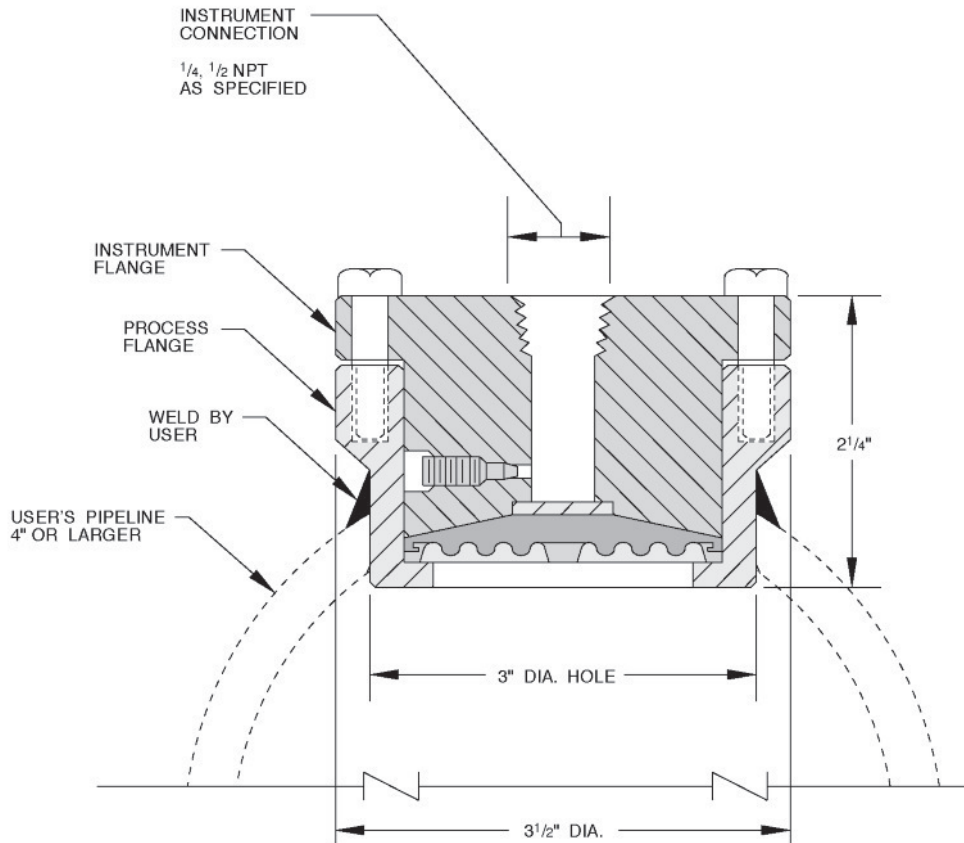
Sample Order Number: **M 5 65 11 S S CC**

Diaphragm Type	Diaphragm Size	Style	Connection Size	Diaphragm Material	Process Housing Material	Instrument Housing & Bolt Material
M Metal T Teflon V Viton W Welded	5 Standard	65 Drop-In Welded	See Connection Sizes	See Diaphragm Materials	See Process Housing Materials	CC Carbon Steel SS 316 Stainless Steel

See Sizes and Materials Table

# Drop-In Welded Diaphragm Seals

All dimensions are nominal.



DIAPHRAGM SEALS

## Sizes and Materials

Connection Sizes			Diaphragm Materials		Process Housing Materials	
Code	Instrument Connection (NPT)	Process Connection	Code	Material	Code	Material
11	1/4	3" Process Housing	D	Carpenter 20	C	Steel
12	1/2	3" Process Housing	F	304 Stainless Steel	D	Carpenter 20
			G	Hastelloy B	F	304 Stainless Steel
			H	Hastelloy C-276	G	Hastelloy B
			M	Monel	H	Hastelloy C-276
			N	Nickel	M	Monel
			S	316L Stainless Steel	N	Nickel
			T	Teflon	S	316L Stainless Steel
			U	Tantalum		
			V	Viton		

# Mini & Compact Diaphragm Seals

DIAPHRAGM SEALS



W205 shown

- ▶ All-Welded Design  
No Gaskets or Bolts
- ▶ 1/4 NPT or 1/2 NPT  
Process Connections
- ▶ 316L Stainless Steel  
Construction

Trerice **Mini & Compact Diaphragm Seals** provide an economical way to isolate and protect pressure instruments from corrosion and clogging.

**Style 205** Diaphragm Seals are designed for use with pressure ranges of 100 psi or greater and can be mounted to pressure gauges of 3 1/2" dial size or smaller.

**Style 305** Diaphragm Seals are designed for use with pressure ranges of 60 psi or greater and can be mounted to pressure gauges of 4 1/2" dial size or smaller.

**Style 306** Diaphragm Seals include all features found on the 305 with the addition of a 1/4 NPT flushing connection.

Selection of the proper diaphragm seal is the sole responsibility of the user. Temperature and pressure limitations must be considered. Please refer to the Diaphragm Seal Design & Operation Section of this catalog. Improper application may cause failure of the seal, resulting in possible personal injury or property damage.

For correct use and application of all diaphragm seals, please refer to Diaphragm Seal Standard ASME B40.2.

## SPECIFICATIONS

Style	Diaphragm Type	Diaphragm Size	Minimum Pressure Range	Process Connection	Clean-out Design	1/4 NPT Flushing Connection
205	Welded Metal	Mini	0 to 100 psi when mounted to 3 1/2" gauge	Threaded	No	No
305	Welded Metal	Compact	0 to 60 psi when mounted to 4 1/2" gauge	Threaded	No	No
306	Welded Metal	Compact	0 to 60 psi when mounted to 4 1/2" gauge	Threaded	No	Yes

## HOW TO ORDER

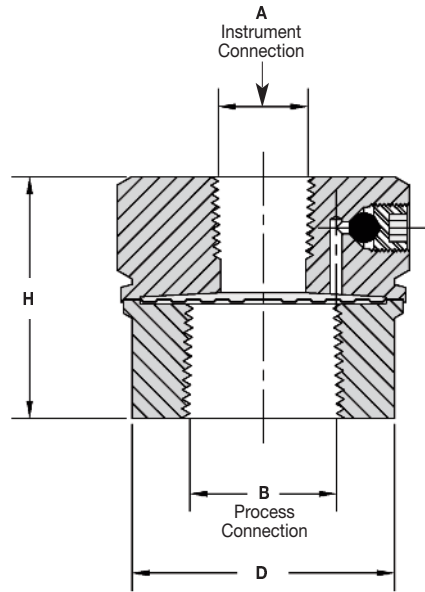
Sample Order Number: **W 2 05 01 S S S**

Diaphragm Type	Diaphragm Size	Style	Connection Size	Diaphragm Material	Process Housing Material	Instrument Housing Material
W Welded	2 Mini	05 Non Clean-out, Welded Body	See Connection Sizes Table	S 316 SS	S 316 SS	S 316 SS
	3 Compact	06 Flushing, Welded Body				

# Mini & Compact Diaphragm Seals

All dimensions are nominal. Dimensions in [ ] are in millimeters.

DIAPHRAGM SEALS



Style	A	B	H	D
205	1/4 NPT	1/4, 1/2 NPT as specified	1.24 [31]	1.35 [34]
305	1/4, 1/2 NPT as specified	1/4, 1/2 NPT as specified	1.75 [44]	2.25 [57]
306	1/4, 1/2 NPT as specified	1/4, 1/2 NPT as specified	1.50 [38]	1.89 [48]

## Sizes

Connection Sizes		
Code	Instrument Connection (NPT)	Process Connection (NPT)
01	1/4	1/4
02*	1/2	1/4
03	1/4	1/2
04*	1/2	1/2

\* Not available on style 205.

# Sanitary Diaphragm Seals

DIAPHRAGM SEALS



W472 shown

- ▶ External Tri-Clamp
- ▶ Clean-out Design
- ▶ All Welded Design

The Trerice **Sanitary Diaphragm Seal** is intended for use in the food and pharmaceutical industries, or in any application where a thorough cleaning of the wetted surface is required. Ease of maintenance is ensured as surfaces that contact the process media are virtually free of crevices. The all welded construction and external Tri-Clamp connection allow for easy removal and cleaning.

Selection of the proper diaphragm seal is the sole responsibility of the user. Temperature and pressure limitations must be considered. Please refer to the Diaphragm Seal Design & Operation Section of this catalog. Improper application may cause failure of the seal, resulting in possible personal injury or property damage.

For correct use and application of all diaphragm seals, please refer to Diaphragm Seal Standard ASME B40.2.

## SPECIFICATIONS

Style	Available Diaphragm Types*	Diaphragm Size	Process Connection	Clean-out Design	1/4 NPT Flushing Connection
472	Type W	Sanitary	Tri-Clamp	Yes	No

\* W = Welded Metal

Note: Due to the variety of available diaphragm seal configurations and materials, it is not possible to list each weight in this catalog. Please consult factory.

## HOW TO ORDER

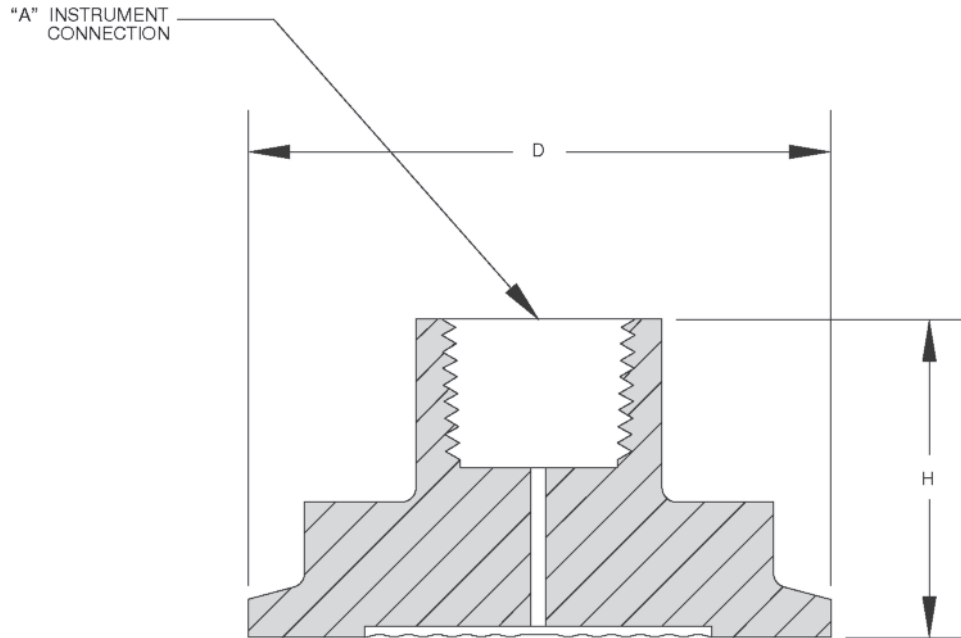
Sample Order Number: **W 4 72 09 S S S**

Diaphragm Type	Diaphragm Size	Style	Connection Size	Diaphragm Material	Process Housing Material	Instrument Housing Material
W Welded	4 Sanitary	72 Tri-Clamp	See Connection Sizes on Sizes Table	S 316 Stainless Steel	S 316 Stainless Steel	S 316 Stainless Steel

# Sanitary Diaphragm Seals

All dimensions are nominal. Dimensions in [ ] are in millimeters.

DIAPHRAGM SEALS



Tri-Clamp Size	A	H	D
1 1/2"	1/4, 1/2 NPT as specified	1.81 [46]	2.00 [50]
2"	1/4, 1/2 NPT as specified	1.38 [35]	2.50 [64]

## Sizes

Connection Sizes		
Code	Instrument Connection (NPT)	Process Connection
07	1/4	1 1/2" Tri-Clamp
08	1/2	1 1/2" Tri-Clamp
09	1/4	2" Tri-Clamp
10	1/2	2" Tri-Clamp

Clamps, gaskets and ferrules are not supplied by Trerice.

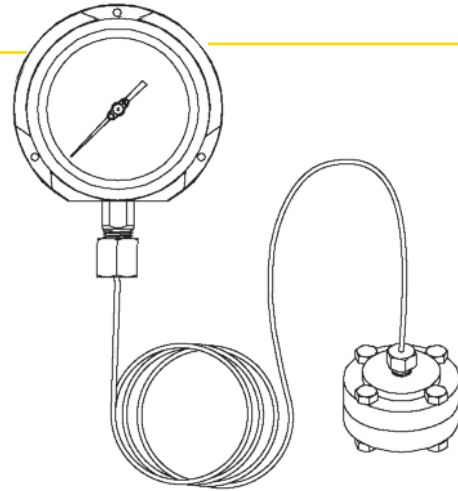
# Options & Accessories

## Diaphragm Seals

DIAPHRAGM SEALS

### Capillary Tubing

Capillary tubing assemblies are used to remote mount a pressure sensing instrument away from the process area. This is typically done to facilitate monitoring or isolate the pressure instrument from conditions of extreme vibration or temperature. Standard tubing is 1/8" O.D. 304 stainless steel (316 stainless steel optional), with silver soldered 303 stainless steel fittings. A 302 stainless steel armored covering is also available. Please consult the table below for the standard configurations.



Connection Fitting Size		304 Stainless Steel Capillary	304 Stainless Steel Capillary with 302 Stainless Steel Armor
1/4 NPT Male	x 1/4 NPT Male	DT5560 – □□	DT5580 – □□
1/4 NPT Male	x 1/4 NPT Female	DT5561 – □□	DT5581 – □□
1/4 NPT Male	x 1/2 NPT Male	DT5562 – □□	DT5582 – □□
1/4 NPT Male	x 1/2 NPT Female	DT5563 – □□	DT5583 – □□
1/4 NPT Female	x 1/4 NPT Female	DT5564 – □□	DT5584 – □□
1/4 NPT Female	x 1/2 NPT Male	DT5565 – □□	DT5585 – □□
1/4 NPT Female	x 1/2 NPT Female	DT5566 – □□	DT5586 – □□
1/2 NPT Male	x 1/2 NPT Male	DT5567 – □□	DT5587 – □□
1/2 NPT Male	x 1/2 NPT Female	DT5568 – □□	DT5588 – □□
1/2 NPT Female	x 1/2 NPT Female	DT5569 – □□	DT5589 – □□

Please specify capillary length in feet.

Example: DT5561-

### Fittings and Bushings

A variety of fittings are available for mounting virtually any pressure instrument to a diaphragm seal. Bushings are also available to reduce or increase instrument or process connection sizes. Consult factory for availability.



# Options & Accessories

## Diaphragm Seals

### Diaphragms

Replacement diaphragms are available for all seals (except Type W, Mini and Sanitary seals). Please specify the item number from the table below.

Material	Series 5 Clean-out	Series 5 Non Clean-out	Series 6 Clean-out	Series 6 Non Clean-out
Carpenter 20	DM5403-D	DM5401-D	DM6403-D	DM6401-D
304 Stainless Steel	DM5403-F	DM5401-F	DM6403-F	DM6401-F
Hastelloy B	DM5403-G	DM5401-G	DM6403-G	DM6401-G
Hastelloy C-276	DM5403-H	DM5401-H	DM6403-H	DM6401-H
Monel	DM5403-M	DM5401-M	DM6403-M	DM6401-M
Nickel	DM5403-N	DM5401-N	DM6403-N	DM6401-N
316 Stainless Steel	DM5403-S	DM5401-S	DM6403-S	DM6401-S
Teflon	DM5403-T	DM5404-T	DM6403-T	DM6404-T
Tantalum	DM5403-U	DM5401-U	DM6403-U	DM6401-U
Viton	DM5403-V	DM5403-V	N/A	N/A

N/A = Not Available

### Gaskets

Trerice recommends replacing the diaphragm gasket and/or instrument housing gasket any time the diaphragm is replaced. The process housing gasket should be replaced if it shows wear or damage. Please see the table below for gasket ordering information.

#### Instrument Housing and Diaphragm Gaskets (Viton)

Material	Series 5 Clean-out	Series 5 Non Clean-out	Series 6 Clean-out	Series 6 Non Clean-out
Type M	T5410	M5406	T6410	M6406
Type T	T5411 & M5406	T5411 & M5406	T5410 & M6406	T5410 & M6406

#### Process Housing Gaskets (Teflon)

Material	Series 5 Clean-out	Series 5 Non Clean-out	Series 6 Clean-out	Series 6 Non Clean-out
Type M	T5407	M5411	T6407	M6411
Type T	T5407	T5407	T6407	T6407
Type W	T5407	N/A	T6407	N/A

N/A = Not Available

### Fill Fluids

Pressure Gauges can be mounted to diaphragm seals at the Trerice Factory. Please see the table below for fill fluids and model numbers. Please see page 73 for fill fluid temperature limits.

Fill Fluids	Model Number
Instrument Oil	D99100
Silicone	D99200
Halocarbon	D99300
Glycerine	D99400
Neobee M20	D99600

# Table of Contents

## TEMPERATURE INSTRUMENTATION

### Industrial Thermometers

Trerice Industrial Thermometers are either of the liquid-in-glass or light-powered digital type.



Design & Operation **92-93**

**SX9** Solar Therm • Light-Powered Digital **94**

**Adjustable Angle** Series **96**

**Rigid Stem** Series **98**

**BX Plus** Series • with Integrated RTD **100**

**Hydro-Therm** Series **102**

**Econo-Therm** Series **104**

Options & Accessories **106-107**

### Dial Thermometers

Direct or Remote mounted thermometers suited for a variety of temperature measuring requirements



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Direct Mounted thermometers with all stainless steel construction and hermetically sealed cases are designed for use in demanding industrial applications.



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Provide leak-tight protection for applications where the process media may be corrosive or contained under pressure.



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# Industrial Thermometers

## DESIGN & OPERATION



Light-Powered Digital



Liquid-in-Glass

### Description

A thermometer is an instrument designed to measure and indicate the temperature of a specific application or condition. An Industrial Thermometer, commonly known as a “Liquid-In-Glass” or Light-Powered Digital Thermometer, is installed at the point of measurement and is usually read from that location.

### Principles of Operation

#### Liquid-in-Glass

This thermometer is comprised of a liquid-filled sealed glass tube and bulb, which is affixed to the front of a metal temperature scale, and extends into a metal bulb chamber (stem). Flaked graphite is used within the bulb chamber to transfer the measured temperature to the glass bulb. Temperature changes cause the thermo-active fill to expand or contract within the tube. This activity is instantly visible in the tube against the calibrated markings of the temperature scale. For purposes of readability, the tube is formed with a lens front to create a magnified indicating column.

#### Light-Powered Digital

This thermometer is comprised of a thermistor wire that extends into the stem. Flaked graphite is used to transfer the measured temperature to the thermistor. Temperature change causes a change in the output of the thermistor; this output is translated through a pre-programmed algorithm in the microprocessor resulting in a digital display of the temperature.

All Trerice Industrial Thermometers should be carefully selected to meet the demands of the particular application. The information contained in this catalog is offered only as a guide to assist in making the proper selection. Improper applications may cause failure of the instrument, resulting in possible personal injury or property damage. For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process.

## Selecting an Industrial Thermometer (Liquid in-glass only)

### Case

---

The case is durable, die cast aluminum with dark blue epoxy powder coating (Hydro-Therm is furnished with Valox Case), and is available in scale sizes from 5½" through 12". Cases are available in adjustable angle, rigid straight, and rigid 90° angle configurations. The adjustable angle case can be moved to any viewing position for enhanced readability.

*Aluminum case meets CAN/CGSB-14.4-M.88 (par. 5.2).*

### Stem

---

The stem is the sensitive portion of the instrument that is inserted into the process. Stems can be provided in aluminum, brass, or stainless steel. Aluminum and brass stems include a brass coupling nut, while the stainless steel stem includes a stainless steel coupling nut.

**Aluminum stems must always be installed in a thermowell. Brass and stainless steel stems may be installed using a union connection bushing in place of a thermowell. Terice however, recommends the use of a thermowell to facilitate the removal of the thermometer.**

### Window

---

Windows are supplied in clear ultraviolet protective acrylic that prevents deterioration of thermoactive fill (ranges through 300°F), or double-strength glass (standard on ranges above 300°F).

### Accuracy

---

The accuracy of an industrial thermometer is expressed as a variance (plus or minus) in scale divisions. All Terice Industrial Thermometers are accurate to within one scale division of the temperature range.

**Extreme ambient conditions (above 120° F or below 30° F) may more than double the allowable accuracy tolerance of spirit filled thermometers. This effect increases on thermometers operating at the high end of their scale, and decreases on thermometers operating at the low end of their scale. Please consult factory for further information.**

### Range and Scale

---

A wide variety of ranges are available in Fahrenheit, Celsius, or dual scale; in temperatures from -40°F (-40°C) through 500°F (260°C). Ranges are indelibly presented in black figures and markings upon an aluminum scale in lengths from 5½" to 12". Space constraints, as well as measurement readability, should be considered when selecting a scale size.

### Thermoactive Fill

---

Terice Industrial Thermometers are supplied with a blue-colored, organic spirit fill. This proprietary fill is used on temperatures of 500°F or below.

### Thermowells

---

For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process. Thermowells are available in various lengths, connections, sizes, and materials. Please consult the Thermowell Section of this catalog.

**To ensure minimum response time, Terice Heat Transfer Paste should be applied to the sensing portion of the stem before installation into a thermowell. 1/2 oz. tube: Item No. 107-0001**

# SX9 Solar Therm

Light-Powered Digital Thermometer • Weatherproof NEMA-4X Case



INDUSTRIAL THERMOMETERS



SX91403 shown

- ▶ Light Powered  
No Batteries Required
- ▶ Large LCD °F/°C  
Switchable Display
- ▶ Cast Aluminum Case  
NEMA-4X/IP 65
- ▶ Min/Max Feature

The Trerice **SX9 "Solar Therm"** now comes standard with a NEMA-4X case, making it the perfect choice for outdoor applications and in areas that require "spray-down." Our industry first "Casule-Tite" sealing technology insures that the electronics stay dry no matter what the application. The **SX-9** is the ideal replacement for existing mercury-in-glass thermometers in environmentally conscious applications. It features a rugged cast aluminum case, easy to read LCD display and an adjustable-angle stem that is fully interchangeable with industrial liquid-in-glass thermometers. Also available is a bimetal type stem for applications where a digital thermometer is preferred over existing analog bimetals. The **"Solar Therm"** requires no external power and needs only 10 lux of illumination to operate. The unique Min/Max feature provides instant recall of minimum and maximum temperatures over a given period and is easily reset.

- Optional features available: Please consult the Options & Accessories Section for details.

**Thermowell**

- For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process. (Refer to page 158)

## Specifications

<b>Model</b>	<b>Scale Size</b>
<b>SX9</b>	7" Adjustable Angle
<b>Case</b>	Cast Aluminum, Blue epoxy finish NEMA-4X / IP 65
<b>Stem</b>	Industrial, Bimetal or Air-Duct
<b>Connection</b>	Industrial: 1 1/4"-18 UNEF-2A coupling nut  Bimetal: 304 Stainless steel 1/4" diameter  Air-Duct: Reversible mounting flange with 3 bolt holes
<b>Sensor</b>	Glass passivated thermistor
<b>Range</b>	-40 to 300° F (-40° to 150° C)
<b>Display</b>	9/16" LCD digits switchable between F/C. Push button min/max readings with reset
<b>Accuracy</b>	1% or 1° F, whichever is greater
<b>Resolution</b>	1/10°
<b>Update Interval</b>	10 seconds
<b>Lux Rating</b>	10 Lux (one foot candle)
<b>Ambient Operating Temperature</b>	-40° to 140° F (-40° to 60° C)
<b>Ambient Temperature Error</b>	None
<b>Humidity</b>	Maximum: 95 RH, non condensing
<b>Approximate Shipping Weight</b>	1.5 lbs [0.68 kg]

*Note: Suitable for outdoor use.*

## HOW TO ORDER

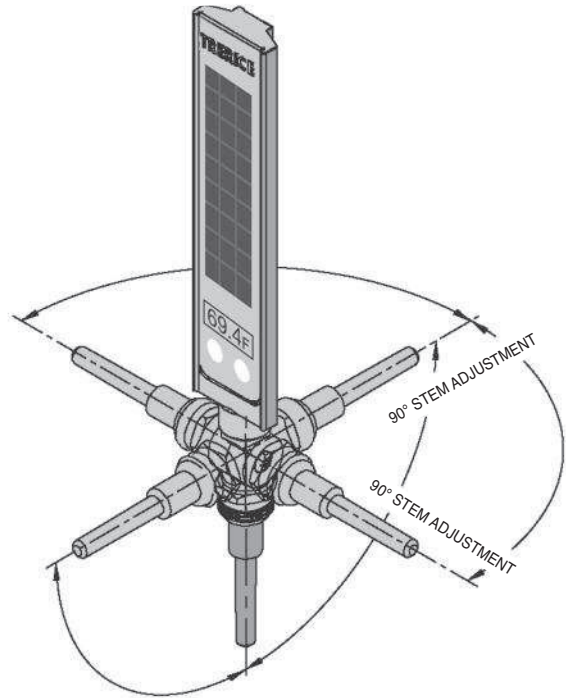
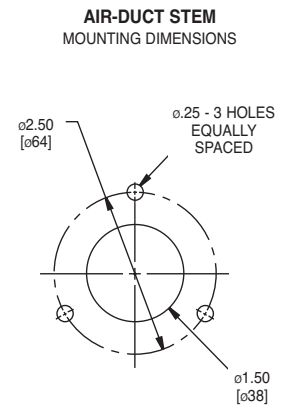
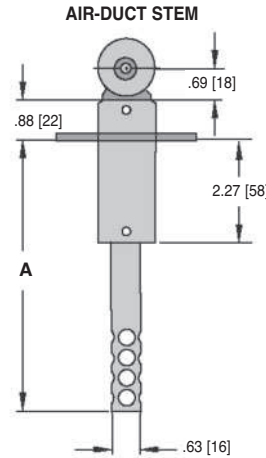
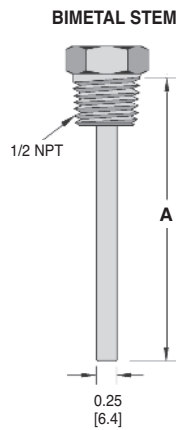
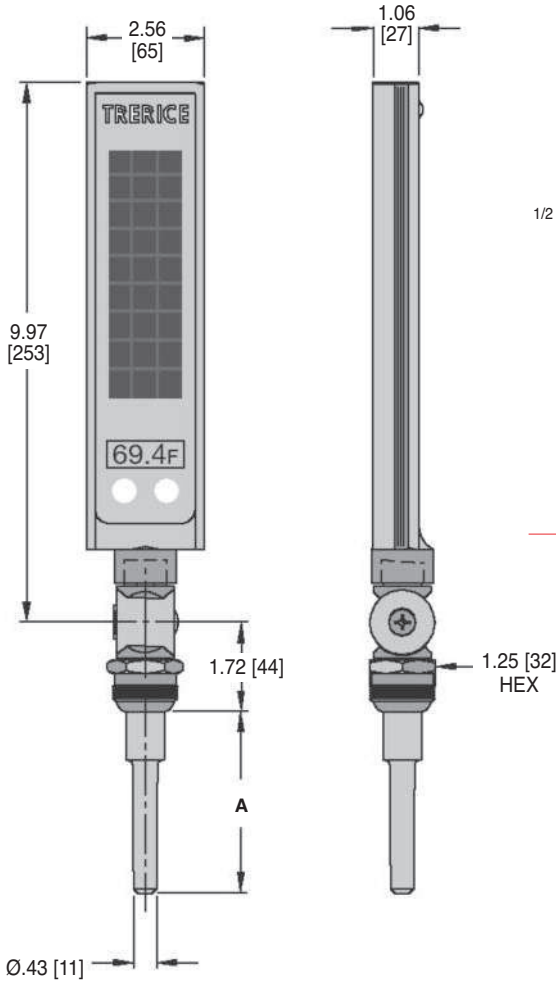
Sample Order Number: **SX9 1 403 05**

Model	Stem (Style & Material)	Stem (Length)	Specific Range
<b>SX9</b> 7" Adjustable	1 Industrial (Aluminum)	<b>403</b> 3 1/2" (standard)	<b>05</b> -40° to 300° F/C
		<b>406</b> 6" (standard)	
		<b>602</b> 2 1/2" Bimetal	
	5 Bimetal (304 SS)	<b>604</b> 4" Bimetal	
		<b>606</b> 6" Bimetal	
		9 Air-Duct (Aluminum)*	
	<b>012</b> 12" Air-Duct		

\* Not for use with Thermowell

# SX9 Solar Therm

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.



(A) Stem Length	Dimension
3 1/2" Industrial	3.50 [88.9]
6" Industrial	6.00 [152.4]
2 1/2" Bimetal	2.50 [63.0]
4" Bimetal	4.00 [101.6]
6" Bimetal	6.00 [152.4]
6" Air-Duct	6.00 [152.4]
12" Air-Duct	12.00 [304.8]

## Thermowells for SX9 Solar-Therm

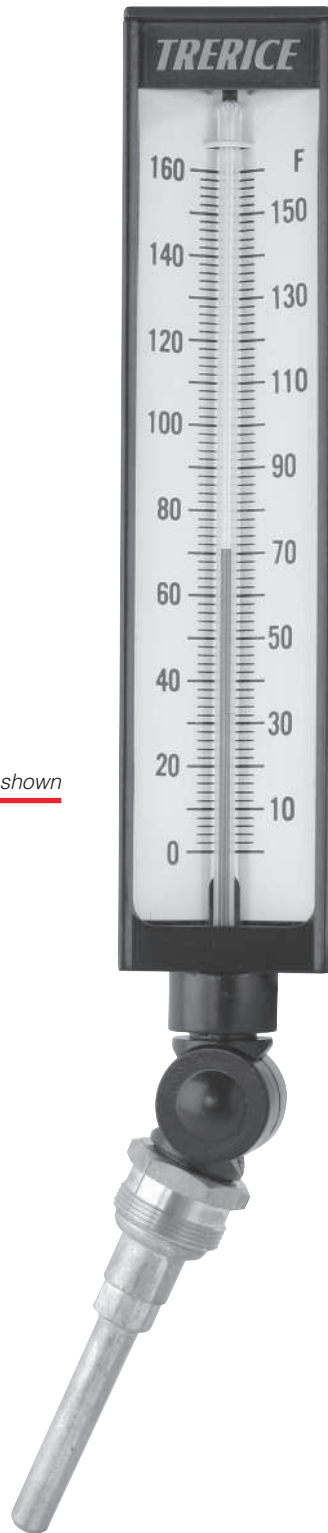
for INDUSTRIAL STYLE Stems				for BIMETAL STYLE Stems			
Model	Stem Length	Insertion Length	Material	Model	Stem Length	Insertion Length	Model
3-4F2	3 1/2"	2 1/2"	Brass	76-4G2	4"	2 1/2"	Brass
3-4FA2	3 1/2"	1.7" with 1" lagging extension	Brass	76-4GA2	4"	2" with 1" lagging extension	Brass
3-4J2	6"	5"	Brass	76-4J2	6"	4 1/2"	Brass
3-4JD2	6"	2 1/2" with 2 1/2" lagging extension	Brass	76-4JC2	6"	2 1/2" with 2" lagging extension	Brass

INDUSTRIAL THERMOMETERS

# Adjustable Angle

7" • 9" • 12" Scale Sizes

INDUSTRIAL THERMOMETERS



BX91403 shown

- ▶ 7", 9", 12" Scale
- ▶ ± 1 Scale Division Accuracy
- ▶ Cast Aluminum Case
- ▶ Adjustable Angle Stem

Recognized globally as the Trerice "BX" Industrial Thermometer, this is an instrument of extreme accuracy and rugged dependability. Available in scale sizes of 7" (AX9), 9" (BX9), & 12" (CX9), with a durable cast aluminum case, this universally adjustable, liquid-in-glass thermometer is the most widely specified instrument of its kind.

- Optional features available: Please consult the Options & Accessories Section for details.

#### Thermowell

- For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process. (Refer to page 158)

## Specifications

Models	Scale Sizes		
AX9 BX9 CX9	7" 9" 12"	Adjustable Angle	
<b>Fill Type</b>	Spirit: Blue colored, organic		
<b>Case</b>	Cast Aluminum, blue epoxy finish		
<b>Stem</b>	Aluminum, brass, 304 stainless steel or air-duct style available		
<b>Connection</b>	Standard: 1 1/4-18 UNEF-2A coupling nut		
	Air-Duct: Reversible mounting flange with 3 bolt holes		
<b>Window</b>	Ultraviolet protective acrylic on ranges to 300° F Glass on ranges over 300° F		
<b>Tube</b>	Lens front, magnifying type		
<b>Scale</b>	Aluminum, white background with black graduations and markings		
<b>Top Plate</b>	ABS		
<b>Accuracy</b>	±1 scale division		
<b>Approximate Shipping Weight</b>			
	AX9: 1.5 lbs [0.68 kg] BX9: 1.6 lbs [0.73 kg] CX9: 2.0 lbs [0.91 kg]		

## HOW TO ORDER

Sample Order Number: **BX9 1 403 07**

Model	Stem (Material)	Stem (Length)	Specific Range
AX9 7" Adjustable	1 Aluminum (standard)	403 31/2"	See Standard Ranges
BX9 9" Adjustable	2 Brass	406 6"	
CX9 12" Adjustable	3 304 SS	408 8"	
		512 12"	
		006 6" Air-Duct	
	9 Air-Duct (Aluminum)*	012 12" Air-Duct	

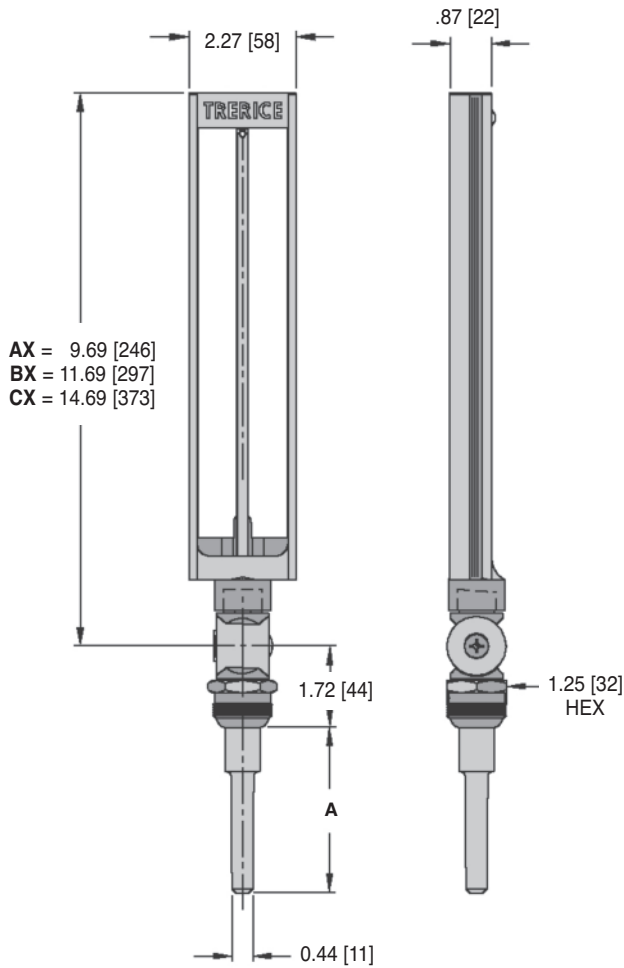
\* Not for use with Thermowells



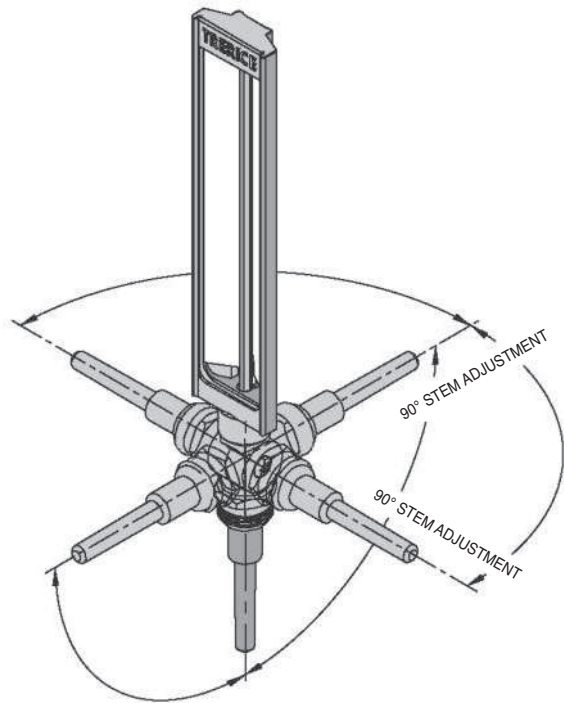
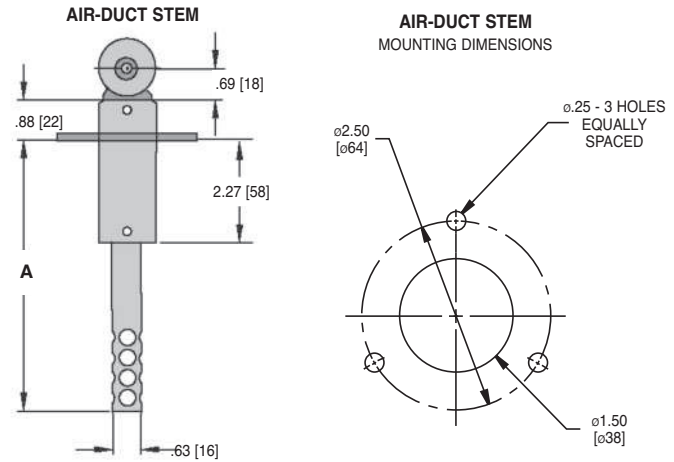
# Adjustable Angle

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

INDUSTRIAL THERMOMETERS



(A) Stem Length	Dimension
3 1/2"	3.50 [88.9]
6"	6.00 [152.4]
8"	8.00 [203.2]
12"	12.00 [304.8]



## Standard Ranges

Fahrenheit Scale		Celsius Scale		Dual Scale		Fahrenheit		Celsius	
Range Code	Range	Range Code	Range	Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
01	-40° to 110°F	17	-40° to 40°C	41	-40° to 110°F & -40° to 40°C	10°	2°	5°	1°
02	0° to 100°F	24	-18° to 38°C	42	0° to 100°F & -18° to 38°C	5°	1°	5°	0.5°
03	30° to 130°F	25	0° to 55°C	43	30° to 130°F & 0° to 55°C	5°	1°	5°	1°
04	0° to 160°F	26	-18° to 70°C	44	0° to 160°F & -18° to 70°C	10°	2°	5°	1°
06	30° to 180°F	27	0° to 83°C	46	30° to 180°F & 0° to 83°C	10°	2°	5°	1°
07	30° to 240°F	19	0° to 115°C	47	30° to 240°F & 0° to 115°C	10°	2°	5°	1°
08	30° to 300°F	20	0° to 150°C	48	30° to 300°F & 0° to 150°C	10°	2°	10°	2°
09	50° to 400°F	28	10° to 205°C	49	50° to 400°F & 10° to 205°C	25°	5°	10°	2°
15	50° to 500°F	31	10° to 260°C	55	50° to 500°F & 10° to 260°C	25°	5°	10°	2°

Dual scale figure intervals may differ

# Rigid Stem

7" • 9" • 12" Scale Sizes

INDUSTRIAL THERMOMETERS



BX12403 shown

- ▶ 7", 9", 12" Scale
- ▶ ± 1 Scale Division Accuracy
- ▶ Cast Aluminum Case
- ▶ Rigid Straight or Rigid 90° Angle Case

The **Rigid Stem Industrial Thermometer** is offered for applications where a non-adjustable case is preferred. The durable cast aluminum case is available in rigid straight or rigid 90° angle forms. This thermometer features accuracy, responsiveness and durability.

- Optional features available: Please consult the Options & Accessories Section for details.

**Thermowell**

- For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process. (Refer to page 158)

## Specifications

Models	Scale Sizes	
AX1	7"	] Rigid Straight
BX1	9"	
CX1	12"	
AX2	7"	] Rigid 90° Angle
BX2	9"	
CX2	12"	
<b>Fill Type</b>	Spirit: Blue colored, organic	
<b>Case</b>	Cast Aluminum, blue epoxy finish	
<b>Stem</b>	Aluminum, brass, 304 stainless steel	
<b>Connection</b>	1 1/4"-18 UNEF-2A coupling nut	
<b>Window</b>	Ultraviolet protective acrylic on ranges to 300° F Glass on ranges over 300° F	
<b>Tube</b>	Lens front, magnifying type	
<b>Scale</b>	Aluminum, white background with black graduations and markings	
<b>Top Plate</b>	ABS	
<b>Accuracy</b>	±1 scale division	

**Approximate Shipping Weight**

- AX1: 1.2 lbs [0.55 kg]
- BX1: 1.4 lbs [0.64 kg]
- CX1: 1.8 lbs [0.82 kg]
- AX2: 1.0 lbs [0.45 kg]
- BX2: 1.3 lbs [0.59 kg]
- CX2: 1.7 lbs [0.77 kg]

## HOW TO ORDER

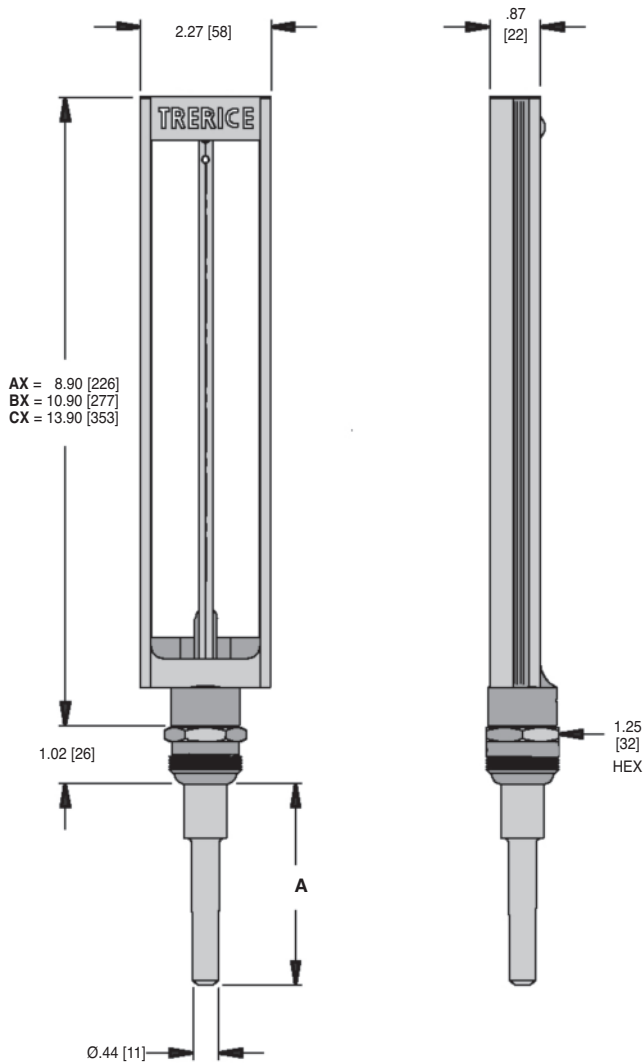
Sample Order Number: **CX1 2 406 15**

Model	Stem (Material)	Stem (Length)	Specific Range
AX1 7" ] Rigid	1 Aluminum	403 3 1/2"	See Standard Ranges
BX1 9" ] Straight	2 Brass	406 6"	
CX1 12" ]	3 304 SS	408 8"	
AX2 7" ] Rigid		512 12"	
BX2 9" ] 90° Angle			
CX2 12" ]			

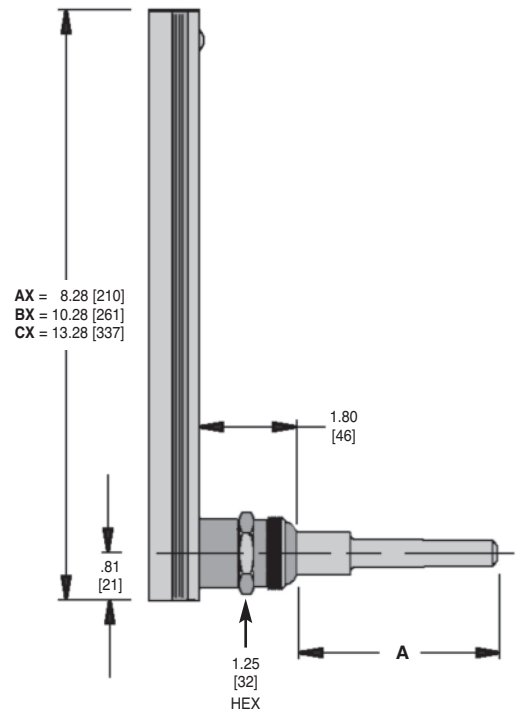
# Rigid Stem

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

## Rigid-Straight



## Rigid-90° Angle



(A) Stem Length	Dimension
3 1/2"	3.50 [88.9]
6"	6.00 [152.4]
8"	8.00 [203.2]
12"	12.00 [304.8]

## Standard Ranges

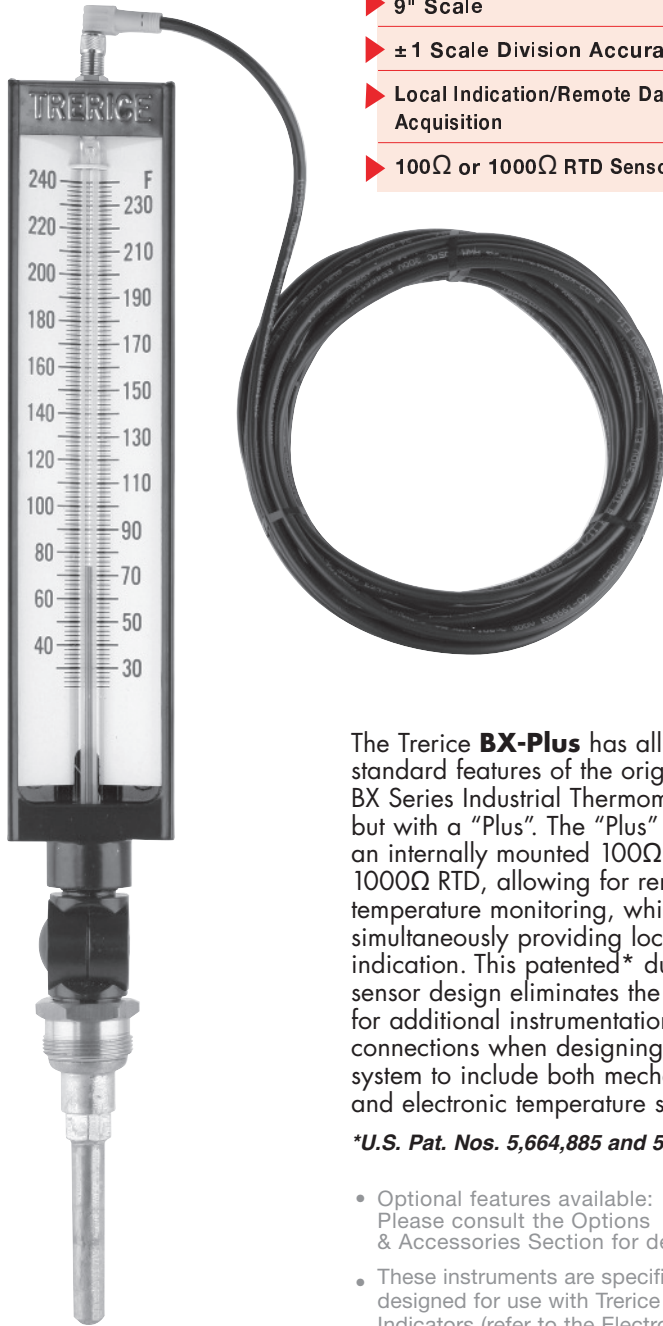
Fahrenheit Scale		Celsius Scale		Dual Scale		Fahrenheit		Celsius	
Range Code	Range	Range Code	Range	Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
01	-40° to 110°F	17	-40° to 40°C	41	-40° to 110°F & -40° to 40°C	10°	2°	5°	1°
02	0° to 100°F	24	-18° to 38°C	42	0° to 100°F & -18° to 38°C	5°	1°	5°	0.5°
03	30° to 130°F	25	0° to 55°C	43	30° to 130°F & 0° to 55°C	5°	1°	5°	1°
04	0° to 160°F	26	-18° to 70°C	44	0° to 160°F & -18° to 70°C	10°	2°	5°	1°
06	30° to 180°F	27	0° to 83°C	46	30° to 180°F & 0° to 83°C	10°	2°	5°	1°
07	30° to 240°F	19	0° to 115°C	47	30° to 240°F & 0° to 115°C	10°	2°	5°	1°
08	30° to 300°F	20	0° to 150°C	48	30° to 300°F & 0° to 150°C	10°	2°	10°	2°
09	50° to 400°F	28	10° to 205°C	49	50° to 400°F & 10° to 205°C	25°	5°	10°	2°
15	50° to 500°F	31	10° to 260°C	55	50° to 500°F & 10° to 260°C	25°	5°	10°	2°

Dual scale figure intervals may differ

# BX Plus

## Industrial Thermometer with Integrated RTD

INDUSTRIAL THERMOMETERS



- ▶ 9" Scale
- ▶ ± 1 Scale Division Accuracy
- ▶ Local Indication/Remote Data Acquisition
- ▶ 100Ω or 1000Ω RTD Sensors available

The Trerice **BX-Plus** has all the standard features of the original BX Series Industrial Thermometer, but with a "Plus". The "Plus" being an internally mounted 100Ω or 1000Ω RTD, allowing for remote temperature monitoring, while simultaneously providing local indication. This patented\* dual sensor design eliminates the need for additional instrumentation or connections when designing a system to include both mechanical and electronic temperature sensing.

\*U.S. Pat. Nos. 5,664,885 and 5,769,542.

- Optional features available: Please consult the Options & Accessories Section for details.
- These instruments are specifically designed for use with Trerice Digital Indicators (refer to the Electronic Temperature Sensor Section) and Electronic Controllers (refer to the Control Section).

### Specifications

Models	Scale Size	
<b>BX9</b>	9"	Adjustable Angle
<b>BX1</b>	9"	Rigid Straight
<b>BX2</b>	9"	Rigid 90° Angle
<b>Fill Type</b>	Spirit: Blue colored, organic	
<b>Case</b>	Cast Aluminum, blue epoxy finish	
<b>Stem</b>	Aluminum, Brass, or 304 Stainless Steel	
<b>Process Connection</b>	1 1/4-18 UNEF-2A coupling nut	
<b>Electrical Connection</b>	Molded cordset with coupling nut and six meter cable	
<b>Window</b>	Ultraviolet protective acrylic on ranges to 300° F Glass on ranges over 300° F	
<b>Tube</b>	Lens front, magnifying type	
<b>Scale</b>	Aluminum, white background with black graduations and markings	
<b>Top Plate</b>	Stainless Steel	
<b>Sensor</b>	International grade thin film platinum, 3-wire, 100Ω or 1000Ω RTD $\alpha = 0.00385\Omega/\Omega/^{\circ}\text{C}$	
<b>Accuracy</b>	Thermometer: ±1 scale division RTD: ±3°C or 0.6% of temperature	

### Approximate Shipping Weight

- BX9: 1.9 lbs [0.86 kg]
- BX1: 1.7 lbs [0.77 kg]
- BX2: 1.6 lbs [0.73 kg]

MODEL BX9240307RTC

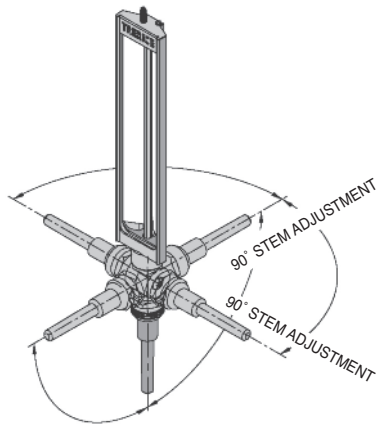
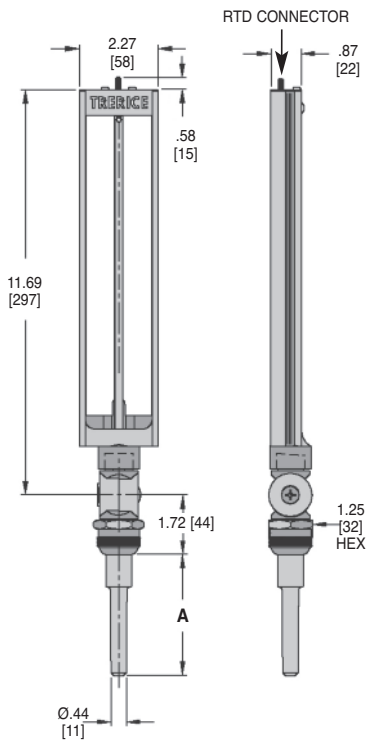
### HOW TO ORDER

Sample Order Number: **BX9 1 403 07 RTC**

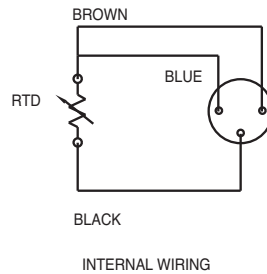
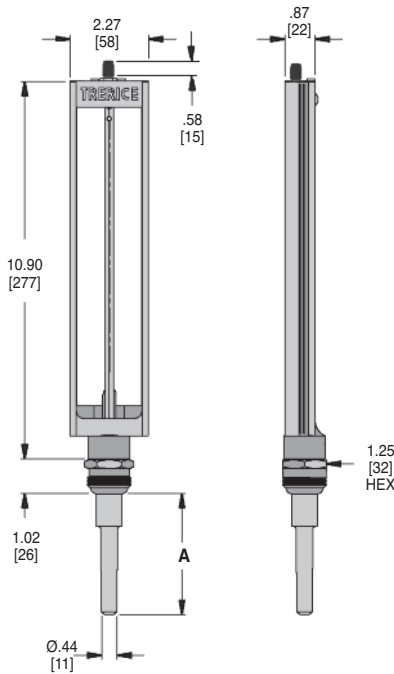
Model	Stem Material	Stem (Length)	Specific Range	Sensor Type
<b>BX9</b> 9" Adjustable	1 Aluminum (standard)	<b>403</b> 3 1/2"	See Standard Ranges	<b>RTC</b> 100Ω RTD <b>RTM</b> 1000Ω RTD
<b>BX1</b> 9" Straight		<b>406</b> 6"		
<b>BX2</b> 9" 90° Angle	2 Brass	<b>408</b> 8"		
	3 304 SS	<b>512</b> 12"		

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

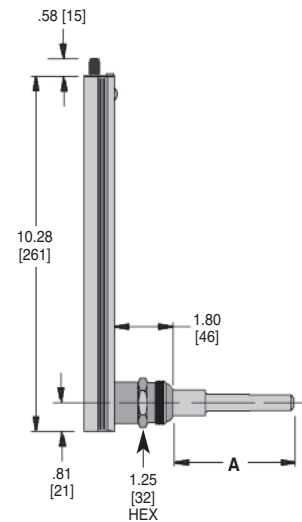
## Adjustable-Angle



## Rigid-Straight



## Rigid-90° Angle



(A) Stem Length	Dimension
3 1/2"	3.50 [88.9]
6"	6.00 [152.4]
8"	8.00 [203.2]
12"	12.00 [304.8]

## Standard Ranges

Fahrenheit Scale		Celsius Scale		Dual Scale		Fahrenheit		Celsius	
Range Code	Range	Range Code	Range	Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
01	-40° to 110°F	17	-40° to 40°C	41	-40° to 110°F & -40° to 40°C	10°	2°	5°	1°
02	0° to 100°F	24	-18° to 38°C	42	0° to 100°F & -18° to 38°C	5°	1°	5°	0.5°
03	30° to 130°F	25	0° to 55°C	43	30° to 130°F & 0° to 55°C	5°	1°	5°	1°
04	0° to 160°F	26	-18° to 70°C	44	0° to 160°F & -18° to 70°C	10°	2°	5°	1°
06	30° to 180°F	27	0° to 83°C	46	30° to 180°F & 0° to 83°C	10°	2°	5°	1°
07	30° to 240°F	19	0° to 115°C	47	30° to 240°F & 0° to 115°C	10°	2°	5°	1°
08	30° to 300°F	20	0° to 150°C	48	30° to 300°F & 0° to 150°C	10°	2°	10°	2°
09	50° to 400°F	28	10° to 205°C	49	50° to 400°F & 10° to 205°C	25°	5°	10°	2°
15	50° to 500°F	31	10° to 260°C	55	50° to 500°F & 10° to 260°C	25°	5°	10°	2°

Dual scale figure intervals may differ

# Hydro-Therm

INDUSTRIAL THERMOMETERS



HT30 shown



HT31 shown

- ▶ 5 1/2" Scale Size
- ▶ ± 2% Accuracy
- ▶ Valox Case
- ▶ 1/2 NPT Brass Thermowell included

The **NEW Trerice Hydro-Therm** is the ideal instrument for both hot and chilled water hydronic applications. The blue, organic "spirit" fill is easily read without the environmental concerns of mercury. The sturdy Valox case is available in rigid straight or rigid 90° angle configurations. The 2" stem makes this the perfect instrument for smaller pipeline and other such applications. The 1/2 NPT brass thermowell is included.

## Specifications

Models	Scale Size
HT30	5 1/2" Rigid Straight
HT31	5 1/2" Rigid 90° Angle
<b>Fill Type</b>	Spirit: Blue colored, organic
<b>Case</b>	Valox
<b>Stem</b>	Brass
<b>Connection</b>	1/2 NPT brass thermowell (included)
<b>Window</b>	Acrylic
<b>Tube</b>	Lens front, magnifying type
<b>Scale</b>	Aluminum, white background with black graduations and markings
<b>Top Plate</b>	ABS
<b>Accuracy</b>	±2%

## Approximate Shipping Weight

0.5 lbs [0.23 kg]

## HOW TO ORDER

Sample Order Number: **HT30 47**

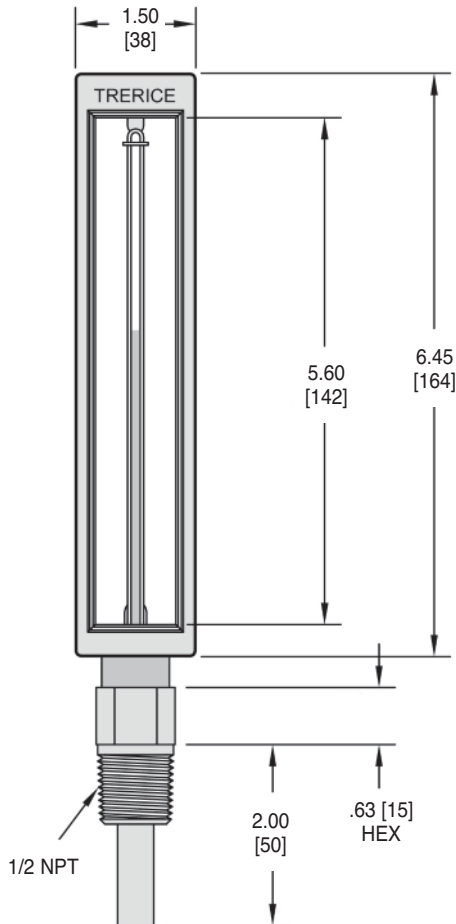
Model		Specific Range
HT30	Straight	41 -40° to 110° F/C
HT31	90° Angle	47 30° to 240° F/C

# Hydro-Therm

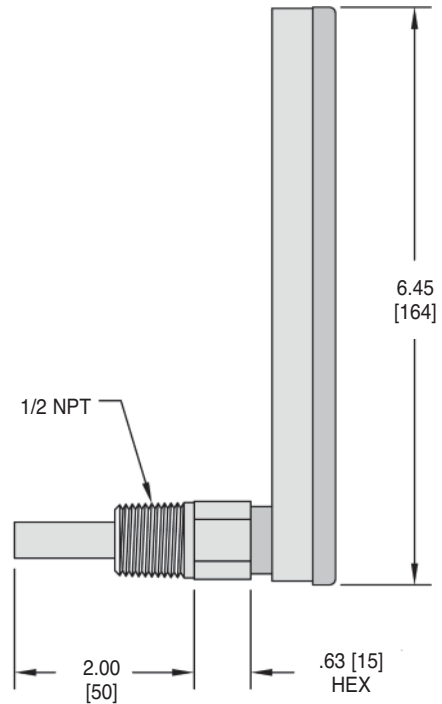
All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

INDUSTRIAL THERMOMETERS

**HT30**



**HT31**



Note: Shown with included thermowell.

## Standard Ranges

Dual Scale		Fahrenheit		Celsius	
Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
41	-40° to 110°F & -40° to 40°C	20°	2°	10°	1°
47	30° to 240°F & 0° to 120°C	20°	2°	20°	2°

# Econo-Therm



4352 shown

- ▶ 5 1/2" Scale Size
- ▶ ± 1 Scale Division Accuracy
- ▶ Cast Aluminum Case
- ▶ Rigid Straight or Rigid 90° Angle Case

The Trerice **Econo Thermometer** provides accuracy and durability at an economical price. This liquid-in-glass thermometer has a durable cast aluminum case and a polycarbonate frame front and window. Rigid straight and rigid 90° angle cases are available.

- Optional features available: Please consult the Options & Accessories Section for details.
- Trerice Econo Thermometers (air-duct stem excluded) have no external mounting hardware, and as such, require the use of a thermowell, which is attached to the stem via a set screw. The thermowell must be ordered separately – please refer to page 161 of the Thermowell Section.

## Specifications

Models	Scale Size
4350	5 1/2" Rigid Straight
4352	5 1/2" Rigid 90° Angle
<b>Fill Type</b>	Spirit: Blue colored, organic
<b>Case</b>	Cast aluminum, blue epoxy finish
<b>Stem</b>	Aluminum, brass or air-duct style
<b>Connection</b>	Use of thermowell required (must be ordered separately) Air-duct stem has mounting flange with 3 bolt holes
<b>Window</b>	Polycarbonate frame front
<b>Tube</b>	Lens front, magnifying type
<b>Scale</b>	Aluminum, white background with black graduations and markings
<b>Accuracy</b>	±1 scale division
<b>Approximate Shipping Weight</b>	0.5 lbs [0.23 kg]

## HOW TO ORDER

Sample Order Number: **4350 1 02 07**

Model	Stem (Material)	Stem (Length)	Specific Range
4350 Straight	1 Aluminum*	02 2" (Aluminum Stem only)	See Standard Ranges
4352 90° Angle	2 Brass	04 4" (Brass Stem only)	
	9 Air-Duct **	06 6" (Air-Duct Stem)	

\*Use of thermowell required (must be ordered separately-refer to page 161).

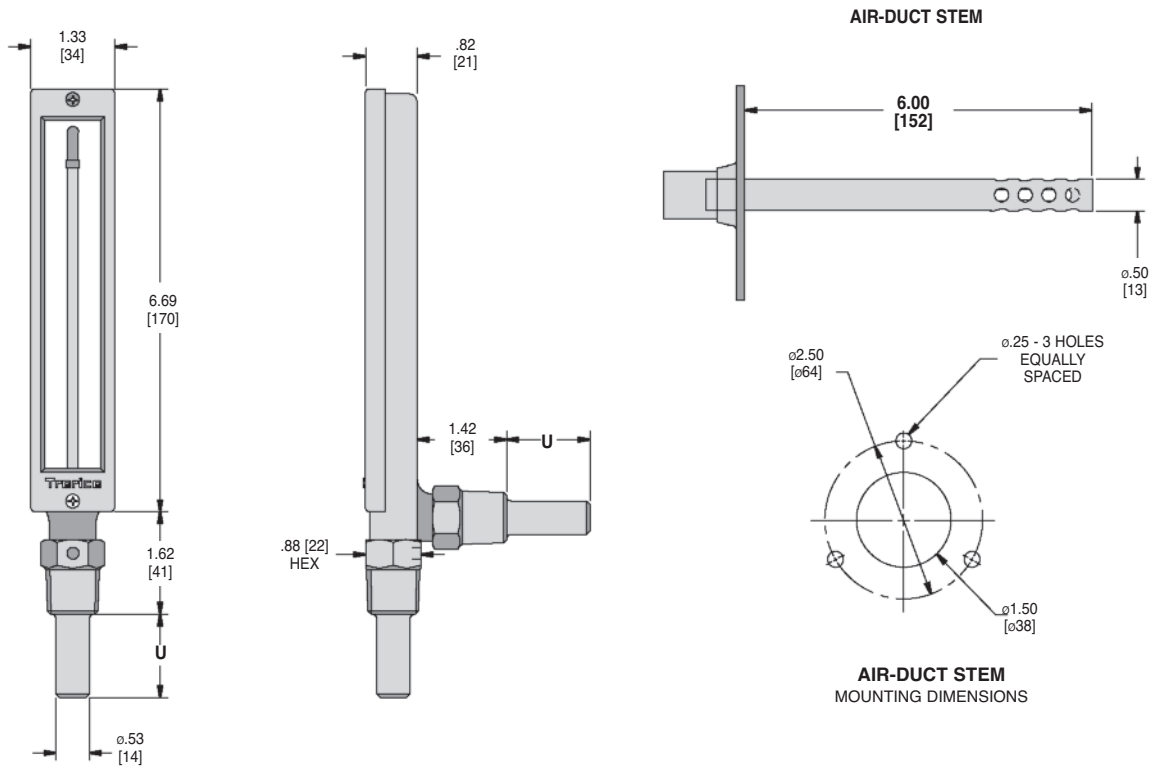
\*\*Model 4352 only



# Econo-Therm

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

INDUSTRIAL THERMOMETERS



Note: Shown with required thermowell (must be ordered separately. Refer to page 161.)

U Length	Dimension
2" (Aluminum)	1.31 [33.3]
4" (Brass)	3.25 [82.6]
6" (Air-Duct)	6.00 [152.4]

## Standard Ranges

Fahrenheit Scale		Celsius Scale		Dual Scale		Fahrenheit		Celsius	
Range Code	Range	Range Code	Range	Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
01	-40° to 110°F	17	-40° to 40°C	41	-40° to 110°F & -40° to 40°C	20°	2°	10°	1°
03	30° to 130°F	25	0° to 55°C	43	30° to 130°F & 0° to 55°C	10°	1°	5°	1°
06	30° to 180°F	27	0° to 83°C	46	30° to 180°F & 0° to 83°C	20°	2°	10°	1°
07	30° to 240°F	19	0° to 115°C	47	30° to 240°F & 0° to 115°C	20°	2°	10°	1°

Dual scale figure intervals may differ.

# Options & Accessories

## Industrial Thermometers

### Stem Materials

Most Trerice Industrial Thermometers are furnished standard with an aluminum stem. Brass and 304 stainless steel stems are optionally available. An air-duct stem, provided with a 3" O.D. reversible aluminum flange (mounted using three sheet metal screws) and perforated aluminum guard, will deliver maximum sensitivity in air ducts. Air-duct stems are available on Adjustable Angle Industrial Thermometers and Econo Thermometers. Please consult the "How to Order" section of the appropriate product data page.

### Integrated RTD "Plus" Option (RTC/RTM)

Most Trerice Industrial Thermometers can be ordered with a "Plus." The "Plus" being an internally mounted 100Ω or 1000Ω RTD, allowing for remote temperature monitoring, while simultaneously providing local indication. This patented\* dual sensor design eliminates the need for additional instrumentation when designing a system to include both mechanical and electronic temperature sensing. Please order using option codes **RTC** (100Ω RTD) or **RTM** (1000Ω RTD).

\*U.S. Pat. Nos. 5,664,885 and 5,769,542.

### Specifications

Sensor Temperature	Accuracy	Electrical Connection	Maximum
International grade thin film platinum, 3-wire 100Ω or 1000Ω RTD $\alpha = 0.00385\Omega/\Omega/^\circ\text{C}$	$\pm 0.3^\circ\text{C}$ or 0.6% of temperature	Molded cordset with coupling nut and six meter cable	500°F (260°C)

### Cases (BPC/CPC)

Industrial Thermometers can be provided with brass or chrome plated cases in 9" (BX) scale size. Please order using option codes **BPC** (brass plated case) or **CPC** (chrome plated case).

### Window (GLW)

Windows are furnished in an ultraviolet protective acrylic or double strength glass. Please consult the table below for available window options.

Window Material	Temperature Range	
	Up to 300°F (150°C)	Over 300°F (150°C)
Ultraviolet Protective Acrylic	Standard	N/A
Double Strength Glass	<b>GLW</b>	Standard

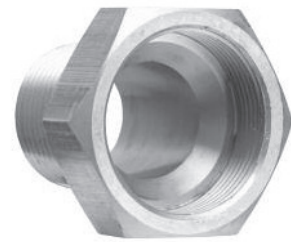
### Weatherproofed Cases (WPC)

Trerice Industrial and Econo Thermometers may be sealed for outdoor use, or for use in applications where sprays and washes may come in contact with the thermometer. Please order using option code **WPC** (weatherproofed case).

### Union Connection Bushings

Trerice Industrial Thermometers with brass or 304 stainless steel stems may be installed using a union connection bushing in place of a thermowell. Please consult the table below for bushing item numbers.

**Thermometers with an aluminum stem must always be installed in a thermowell to protect the thermometer stem.**



#### Union Connection Bushings

Material	Connection	Without Extension Neck	With 2 1/2" Extension Neck
Brass	3/4 NPT	703-05D6	082-0013
Brass	1 NPT	703-06D6	082-0096
304 Stainless Steel	3/4 NPT	703-05D6.2	082-0013.2
304 Stainless Steel	1 NPT	703-06D6.2	082-0096.2

### How to Order

Specify the Optional Feature Code at the end of the Instrument Ordering Code.

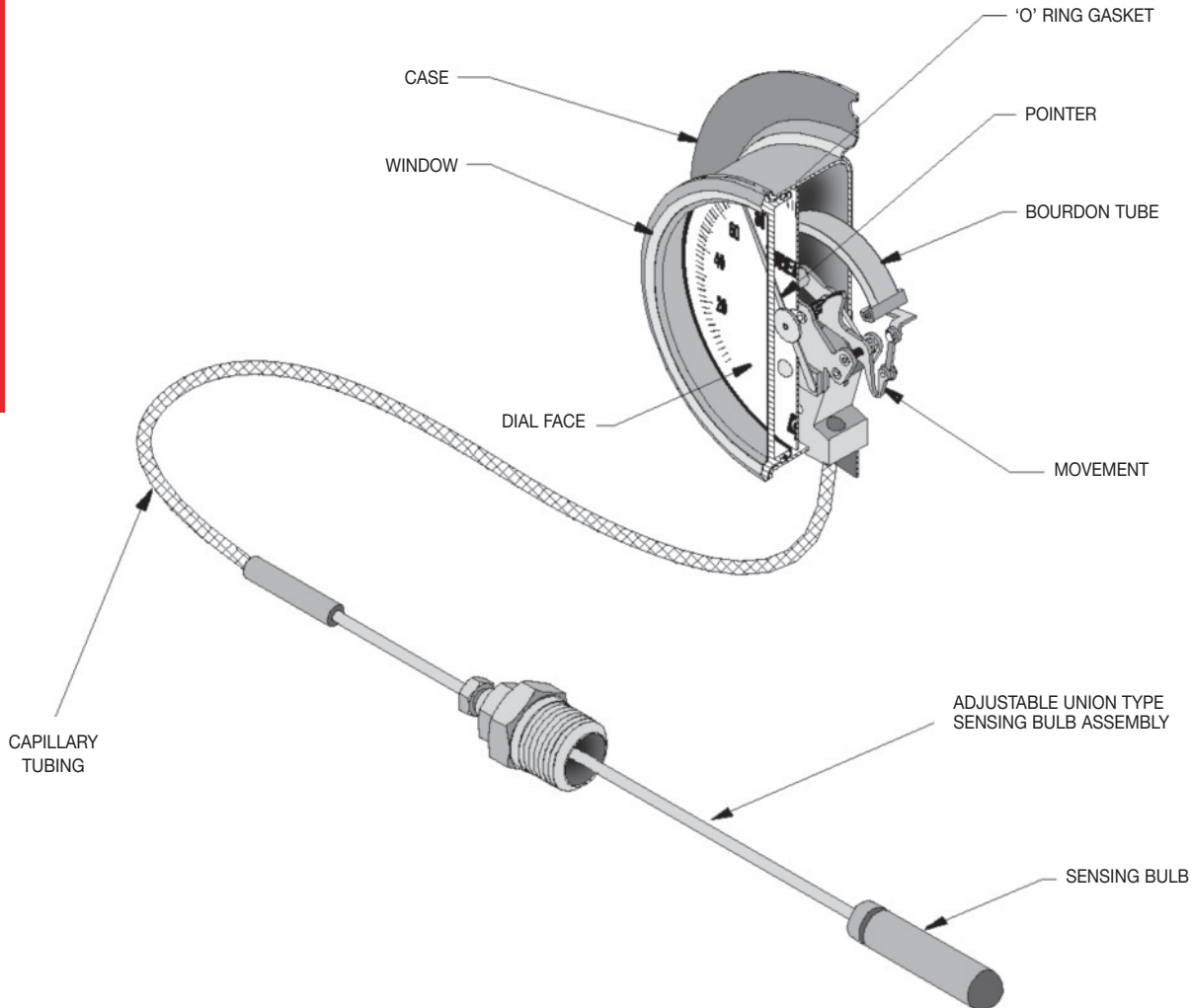
Sample Order Number: **BX1 1 403 07** **WPC**

# Dial Thermometers

## DESIGN & OPERATION

### Description

A thermometer is an instrument designed to measure and indicate the temperature of a specific application or condition. A Dial Thermometer (filled system thermometer) can either be read at the point of measurement or from a remote location using a desired length of capillary tubing.



### Principles of Operation

Trerice Dial Thermometers operate using a filled thermal system. This system consists of capillary tubing and a sensing bulb, which are filled with an expandable chemical compound. The fill is contained within the sealed thermal system, and is affected (expands or contracts) by temperature changes at the sensing bulb. As temperature increases, expanding fill travels via the capillary tube system to the bourdon tube within the instrument's case. The expansion causes the bourdon tube to flex and the resulting motion is transmitted as a temperature measurement through a mechanical movement to the pointer and dialface.

## Selecting a Dial Thermometer

All Trerice Filled System Dial Thermometers should be carefully selected to meet the demands of the particular application. The information contained in this catalog is offered only as a guide to assist in making the proper selection. Improper application may cause failure of the instrument, resulting in possible personal injury or property damage. For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process.

### Thermal System Actuation

Trerice Dial Thermometers are available with either Vapor or Liquid actuation fills.

#### Vapor Actuation

Trerice Vapor Actuated Dial Thermometers are the industry standard and are noted for their economical cost and excellent speed of response. The physical principles of vapor actuation require that the dialface be printed with a nonlinear, progressively graduated temperature scale. These instruments are available for direct mounting, or for remote mounting with capillary lengths up to 100 feet. Sensing bulb length is dependent upon the capillary length selected (a longer capillary length will require a longer sensing bulb length). Vapor Dial Thermometers are available in temperature ranges up to 450°F (232°C). **Note: Erratic performance may be encountered if the measured process temperature rapidly crosses ambient temperature.**

**CAUTION: Vapor Dial Thermometers should be installed with the case, capillary tubing, and sensing bulb located at a similar elevation to avoid measurement inaccuracies. If the sensing bulb must be installed at a different elevation than the case, please advise the factory when ordering so that the instrument can be calibrated accordingly.**

#### Liquid Actuation

Trerice Liquid Actuated Dial Thermometers have a good response time and are furnished with a temperature scale of linear graduation. These instruments are available for direct mounting, or for remote mounting with capillary lengths up to 20 feet. Sensing bulb length is consistent and not affected by capillary length or temperature range. Liquid Dial Thermometers are available in temperature ranges up to 300°F (150°C), and are ideally suited for measuring process temperatures which routinely cross ambient. However, care should be taken to insure against the exposure of the capillary to temperatures above or below the factory calibration temperature of 75°F (24°C).

**CAUTION: Temperature indication error will be introduced whenever the capillary tubing is exposed to ambient temperatures above or below 75°F. The following formula MUST be considered when specifying liquid actuation:**

Where:      S = thermometer range span in °F  
                  L = capillary length in feet  
                  T = capillary temperature variation from 75°F

**Error = 0.000082 x S x L x T**

Example:    S = 210 (30 to 240°F)  
                  L = 20  
                  T = 10 (85°F)

**Error = 0.000082 x 210 x 20 x 10 = 3.4°**

#### Vapor and Liquid Actuated Dial Faces

The physical principles of vapor actuation require that the dialface for vapor dial thermometers be printed with a non-linear progressively graduated temperature scale. Liquid actuated dial thermometers are furnished with linear dialfaces. Please see the Thermal System Selection section of our online catalog for sample vapor and liquid actuated dialfaces.

# Dial Thermometers

## DESIGN & OPERATION

### Thermal System Actuation Comparison

Consideration	Vapor Actuation	Liquid Actuation
Price	Economical	Premium
Response Time	Excellent	Good
Dialface	Non-linear	Linear
Maximum Temperature Range	450°F (232°C)	300°F (149°C)
Cross Ambient Applications	Not recommended	Recommended
Available Thermal Systems	All (except averaging)	All
Bulb Size	Dependent on capillary length	Consistent
Maximum Capillary Length	100 feet	20 feet
Accuracy	±1 scale division	±1 scale division

#### Case

Cases are made from stainless steel or cast aluminum, in sizes from 3 1/2" through 8 1/2". Trerice Dial Thermometers can be directly mounted, or remotely mounted using capillary tubing, so that the measurement can be read from a convenient viewing location. Direct mounted thermometers are available with adjustable angle or universal angle connections, while remote mounted thermometers can be ordered for almost any surface or panel mounting requirement.

#### Window and Ring

The window is normally held in place by a ring or snapped directly to the case of the thermometer. Plastic and clear glass are typical window materials. Ring styles include threaded, friction and hinged, depending upon the case type chosen.

#### Accuracy

The accuracy of a dial thermometer is expressed as a variance (plus or minus) in scale divisions. All Trerice Dial Thermometers are accurate to within one scale division of the measured range. Ambient temperature conditions and elevation variances may affect measurement accuracy.

### Measurement Range and Dial

---

Terice Dial Thermometers are available in Fahrenheit, Celsius, and Dual Scale temperature ranges from -40°F (-40°C) through 450° (-230°C). Ranges are indelibly presented in black figures and markings upon a white finished aluminum dialface. The physical principles of vapor actuation require the dialface to have a non-linear, progressively graduated temperature scale; therefore, the temperature range should be selected so that the intended measuring point falls within the upper two-thirds of the range scale. Liquid Actuated Dial Thermometers have temperature scales of linear graduation, thus, the intended measuring point should fall within the middle third of the range scale.

### Thermal System

---

- **Bulb** – Terice Dial Thermometers are furnished with copper, brass or stainless steel sensing bulbs, depending upon the system actuation and the requirements of the application. A fixed union connection is standard, with an adjustable union connection optionally available. The fixed union connection is furnished with a standard sensing bulb length of 1<sup>3</sup>/<sub>4</sub>" to 5<sup>5</sup>/<sub>8</sub>", depending upon the actuation and capillary length. The adjustable union connection may be adjusted over a 24-inch length prior to initial insertion. This allows the sensing bulb to be installed at any desired insertion length (U-length). Plain and Teflon covered bulbs are available for open tank applications. Other bulb styles, including averaging and air-sensing, can be furnished on some models. Please see the Dial Thermometer Sensing Bulb Section for complete bulb specifications.
- **Capillary** – Terice Dial Thermometers can be specified with various capillary materials and special covers to meet the requirements of any application.

### Thermowells

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For applications where the process media may be corrosive or contained under pressure, the use of a Terice Thermowell is required to prevent damage to the thermometer and facilitate its removal from the process. Thermowells are available in various lengths, connections, sizes, and materials. Please consult page 162 of the Thermowell Section.

**To ensure minimum response time, Terice Heat Transfer Paste should be applied to the sensing portion of the bulb before installation into a thermowell. 1/2 oz. tube: Item No. 107-0001**

# Remote Mounted Dial Thermometer

## 3 1/2" Stainless Steel Case

DIAL THERMOMETERS



V80025 shown

The Trerice **Remote Mounted Dial Thermometer** is used extensively in the building and construction industry and is the preferred temperature instrument for OEMs worldwide. The stainless steel case is available in many styles for panel and surface mounting. This instrument has a 3 1/2" dial size and is available with either vapor or liquid actuation.

- ▶ 3 1/2" Dial Size
- ▶ ± 1 Scale Division Accuracy
- ▶ Stainless Steel Case
- ▶ Vapor or Liquid Actuated





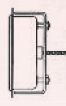
- Optional features available: Please consult the Optional Features Section for details.

#### Thermowell

- For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process.

(Refer to page 162)

### Specifications

Models	Dial Size	Case Styles
80025	3 1/2" 	<b>Adjustable Angle</b> , with mounting bracket
80035	3 1/2" 	<b>Surface Mounted</b> , back flanged, with bottom outlet
80036	3 1/2" 	<b>Surface Mounted</b> , back flanged with back outlet
80040	3 1/2" 	<b>Flush Mounted</b> , front flanged, with back outlet
80041	3 1/2" 	<b>Flush Mounted</b> , u-clamp with back outlet

**Movement** Brass

#### Case Material

Stainless Steel

#### Window

Acrylic, snap-in with Nitrile O-ring seal

#### Pointer

Adjustable, black finish

#### Dialface

Aluminum, white background with black graduations and markings

#### Accuracy

±1 scale division

#### Approximate Shipping Weight

1.3 lbs [0.59 kg]

### HOW TO ORDER

Sample Order Number: **V 80035 110 B01 05**

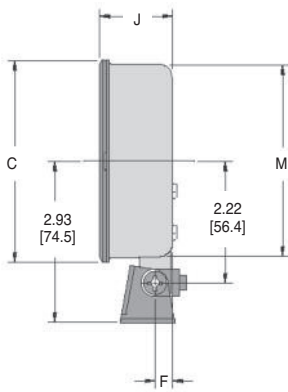
Actuation	Model	Range Code	Thermal System	Capillary Length*
V Vapor	80025	See Standard Ranges	See Thermal Selection (pages 120-121)	05 5 Feet
L Liquid	80035			10 10 Feet
	80036			15 15 Feet
	80040			20 20 Feet
	80041			

\* Other Capillary lengths available: Specify in feet. Vapor: 100 Feet Max  
Liquid: 20 Feet Max

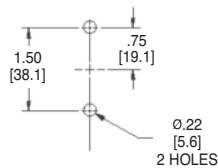


All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

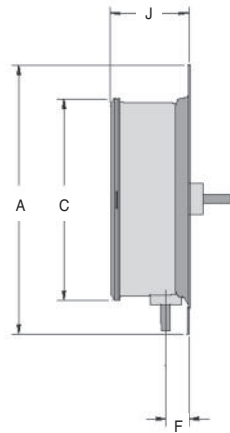
**80025 Adjustable Angle with mounting bracket**



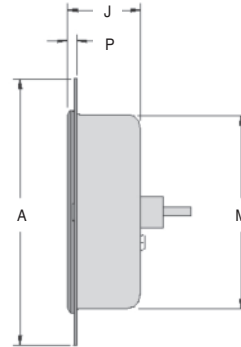
Mounting Dimensions for 80025



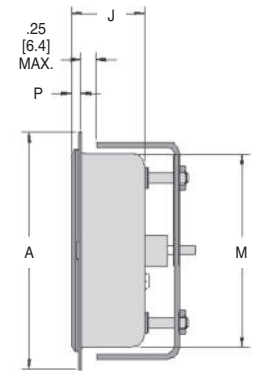
**80035 & 80036 Surface Mounted back flanged**



**80040 Flush Mounted front flanged**

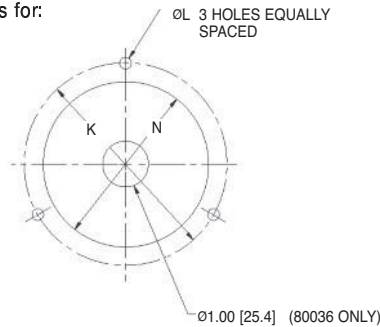


**80041 Flush Mounted U-clamp**



Drilling Dimensions for:

- 80035
- 80036
- 80040
- 80041



Model	A	C	F	J	K	L	M	N	P
80025	N/A	3.67 [93.2]	0.32 [8.2]	1.33 [33.9]	N/A	N/A	3.51 [89.2]	N/A	N/A
80035	4.91 [124.7]	3.67 [93.2]	0.43 [11.0]	1.44 [36.6]	4.25 [108]	0.25 [6.4]	N/A	N/A	N/A
80036	4.91 [124.7]	3.67 [93.2]	N/A	1.44 [36.6]	4.25 [108]	0.25 [6.4]	N/A	N/A	N/A
80040	4.84 [122.9]	N/A	N/A	1.33 [33.6]	4.25 [108]	0.25 [6.4]	3.51 [89.2]	3.62 [92.0]	0.17 [4.3]
80041	4.31 [109.5]	N/A	N/A	1.33 [33.8]	N/A	N/A	3.51 [89.2]	3.62 [92.0]	0.17 [4.3]

**Standard Ranges (Dual Scale includes both Fahrenheit & Celsius)**

Vapor Actuated				
Fahrenheit Scale Range Code	Fahrenheit Scale Range	Celsius Scale Range Code	Celsius Scale Range	Dual Scale Range Code
030	-40° to 150°F	430	-40° to 65°C	230
040	-20° to 100°F	440	-30° to 40°C	240
050	0° to 100°F	450	-20° to 40°C	250
065	0° to 160°F	465	-20° to 70°C	265
100	30° to 180°F	500	0° to 85°C	300
110	30° to 240°F	510	0° to 115°C	310
120	30° to 300°F	520	0° to 150°C	320
145	100° to 350°F	545	40° to 180°C	345
160	200° to 450°F	560	90° to 230°C	360

Liquid Actuated				
Fahrenheit Scale Range Code	Fahrenheit Scale Range	Celsius Scale Range Code	Celsius Scale Range	Dual Scale Range Code
020	-40° to 120°F	420	-40° to 50°C	220
050	0° to 100°F	450	-20° to 40°C	250
060	0° to 160°F	460	-20° to 70°C	260
100	30° to 180°F	495	0° to 80°C	300
110	30° to 240°F	510	0° to 115°C	310
130	50° to 300°F	530	10° to 150°C	330

DIAL THERMOMETERS

# Remote Mounted Dial Thermometer

4 1/2" • 6" • 8 1/2" Cast Aluminum Case

DIAL THERMOMETERS



V80341 shown

- ▶ 4 1/2", 6", 8 1/2" Dial Sizes
- ▶ ± 1 Scale Division Accuracy
- ▶ Cast Aluminum Case
- ▶ Vapor or Liquid Actuated

This Trerice **Remote-Mounted Dial Thermometer** is furnished with a rugged cast aluminum case in 4 1/2", 6" and 8 1/2" dial sizes. This instrument is designed for a wide variety of industrial applications, and is available with vapor or liquid actuation.




- Optional features available: Please consult the Optional Features Section for details.

#### Thermowell

- For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process.

(Refer to page 162)

## Specifications

Models	Dial Sizes	Case Styles
80341 80361 80381	4 1/2" 6" 8 1/2"	 <b>Surface Mounted,</b> back flanged, with bottom outlet
80342 80362 80382	4 1/2" 6" 8 1/2"	 <b>Surface Mounted,</b> back flanged, with back outlet
80345 80365	4 1/2" 6"	 <b>Flush Mounted,</b> hinged ring, with back outlet

**Movement** Brass

#### Case Material

Cast Aluminum, black finish

#### Window

Clear glass

#### Ring

Friction type, 304 stainless steel (hinged type, black finished aluminum; 80345, 80365 only)

#### Pointer

Adjustable, black finish

#### Dialface

Aluminum, white background with black graduations and markings

#### Accuracy

±1 scale division

#### Approximate Shipping Weight

4 1/2" Dial: 2.4 lbs [1.09 kg]

6" Dial: 3.0 lbs [1.36 kg]

8 1/2" Dial: 4.0 lbs [1.82 kg]

## HOW TO ORDER

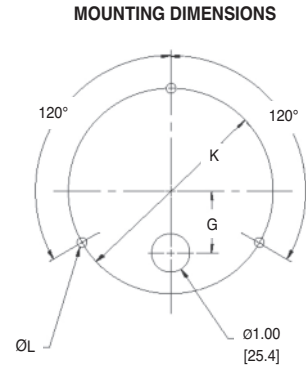
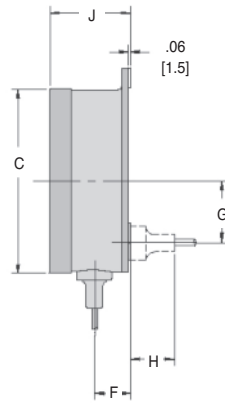
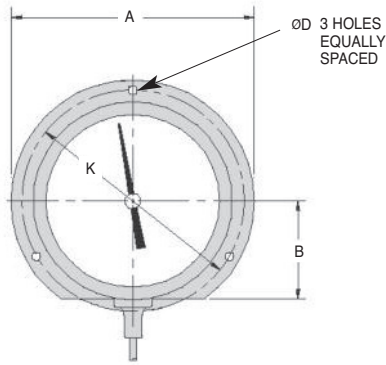
Sample Order Number: **V 80341 050 B02 20**

Actuation	Model	Range Code	Thermal System	Capillary Length*
V Vapor	80341	4 1/2"	See Thermal System Selection (pages 120-121)	05 5 Feet 10 10 Feet 15 15 Feet 20 20 Feet
L Liquid	80361	6"		
	80381	8 1/2"		
	80342	4 1/2"		
	80362	6"		
	80382	8 1/2"		
	80345	4 1/2"		
	80365	6"		

\* Other Capillary lengths available: Specify in feet. Vapor: 100 Feet Max  
Liquid: 20 Feet Max

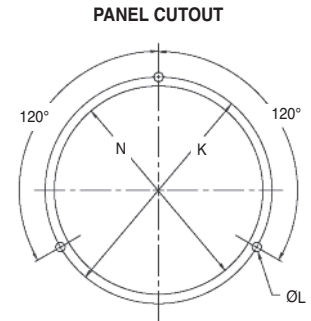
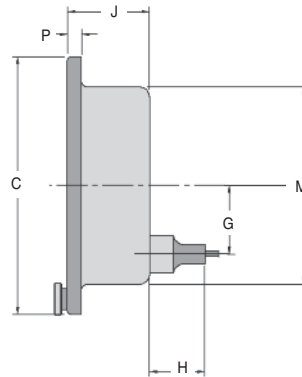
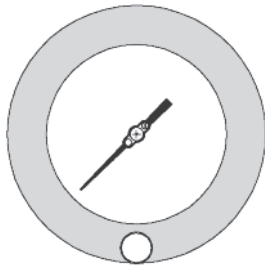
All dimensions are nominal. Dimensions in [ ] are in millimeters.

## Surface Mount Back Flange Case **Models 80341, 80361, 80381 (bottom outlet), Models 80342, 80362, 80382 (back outlet)**



Dial Size	A	B	C	D	F	G	H	J	K	L
4 1/2"	5.88 [149.7]	2.39 [60.7]	4.79 [121.7]	0.22 [5.6]	0.94 [23.8]	1.63 [41.3]	1.41 [35.7]	2.06 [52.4]	5.38 [136.5]	0.25 [6.4]
6"	7.62 [193.6]	3.14 [79.8]	6.29 [159.8]	0.28 [7.1]	0.94 [23.8]	1.63 [41.3]	1.41 [35.7]	2.09 [53.0]	7.00 [177.8]	0.31 [7.9]
8 1/2"	10.25 [260.4]	4.38 [111.1]	8.80 [223.4]	0.28 [7.1]	0.97 [24.6]	1.63 [41.3]	1.41 [35.7]	2.24 [56.8]	9.63 [244.5]	0.31 [7.9]

## Flush Mount Hinged Ring Case **Models 80345 & 80365**



Dial Size	C	G	H	J	K	L	M	N	P
4 1/2"	6.10 [155.0]	1.62 [41.1]	1.31 [33.4]	1.97 [50.0]	5.38 [136.7]	0.22 [5.6]	4.78 [121.4]	4.94 [125.5]	0.34 [8.6]
6"	7.69 [195.3]	1.62 [41.1]	1.31 [33.4]	1.97 [50.0]	7.00 [177.8]	0.28 [7.1]	6.22 [158.0]	6.44 [163.5]	0.34 [8.6]

## Standard Ranges (Dual Scale includes both Fahrenheit & Celsius)

Vapor Actuated				
Range Code	Fahrenheit Scale Range	Range Code	Celsius Scale Range	Dual Scale Range Code
030	-40° to 150°F	430	-40° to 65°C	230
040	-20° to 100°F	440	-30° to 40°C	240
050	0° to 100°F	450	-20° to 40°C	250
065	0° to 160°F	465	-20° to 70°C	265
100	30° to 180°F	500	0° to 85°C	300
110	30° to 240°F	510	0° to 115°C	310
120	30° to 300°F	520	0° to 150°C	320
145	100° to 350°F	545	40° to 180°C	345
160	200° to 450°F	560	90° to 230°C	360

Liquid Actuated				
Range Code	Fahrenheit Scale Range	Range Code	Celsius Scale Range	Dual Scale Range Code
020	-40° to 120°F	420	-40° to 50°C	220
050	0° to 100°F	450	-20° to 40°C	250
060	0° to 160°F	460	-20° to 70°C	260
100	30° to 180°F	495	0° to 80°C	300
110	30° to 240°F	510	0° to 115°C	310
130	50° to 300°F	530	10° to 150°C	330

# Direct Mounted Dial Thermometer

4 1/2" & 6" Cast Aluminum Case • Universal Angle

DIAL THERMOMETERS



V80742 shown

- ▶ 4 1/2", 6" Dial Sizes
- ▶ ± 1 Scale Division Accuracy
- ▶ Cast Aluminum Case
- ▶ Vapor or Liquid Actuated

The Trerice **Universal Angle Dial Thermometer** is available in 4 1/2" and 6" dial sizes with a rugged cast aluminum case. After the sensing bulb has been installed, the case may be adjusted 180° front to back, and rotated 360° for maximum readability. This instrument is available with vapor or liquid actuation.

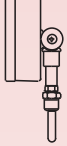
- Optional features available: Please consult the Optional Features Section for details.

**Thermowell**

- For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process.

(Refer to page 162)

## Specifications

Models	Dial Sizes	Case Style
80742	4 1/2"	 Universal Angle
80762	6"	

<b>Movement</b>	Brass
<b>Case Material</b>	Cast Aluminum, black finish
<b>Window</b>	Clear glass
<b>Ring</b>	Friction type, stainless steel
<b>Pointer</b>	Adjustable, black finish
<b>Dialface</b>	Aluminum, white background with black graduations and markings

<b>Accuracy</b>	±1 scale division
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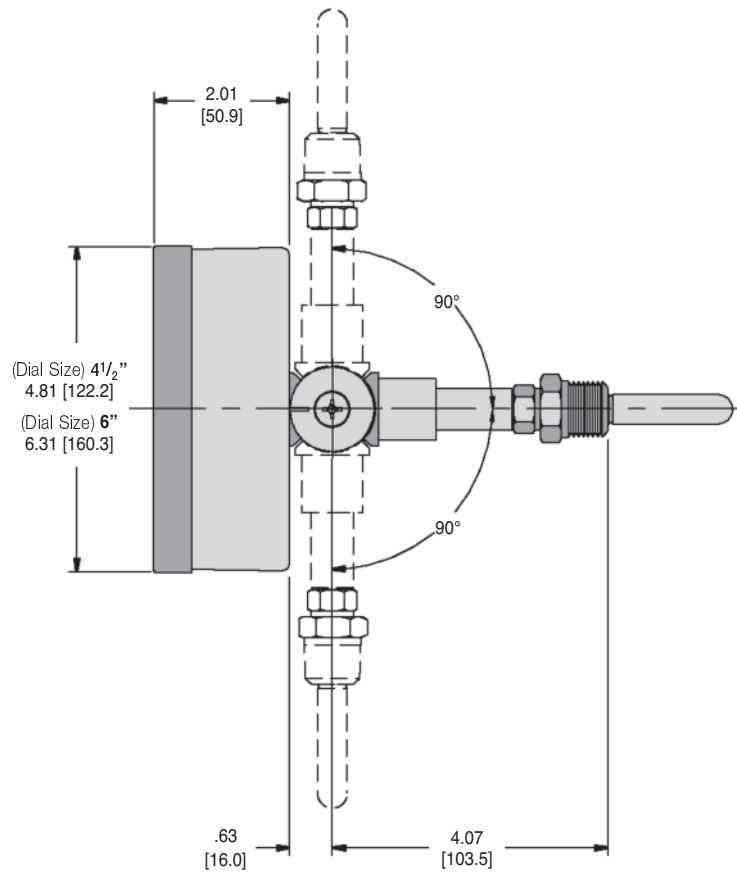
<b>Approximate Shipping Weight</b>	80742: 2.0 lbs [0.91 kg] 80762: 2.4 lbs [1.09 kg]
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### HOW TO ORDER

Sample Order Number: **L 80742 110 B35**

Actuation	Model	Range Code	Thermal System
V Vapor	80742	See Standard Ranges	See Thermal System Selection (pages 120-121)
L Liquid	80762		

All dimensions are nominal. Dimensions in [ ] are in millimeters.



**Standard Ranges (Dual Scale includes both Fahrenheit & Celsius)**

Vapor Actuated				
Fahrenheit Scale Range Code	Fahrenheit Scale Range	Celsius Scale Range Code	Celsius Scale Range	Dual Scale Range Code
030	-40° to 150°F	430	-40° to 65°C	230
040	-20° to 100°F	440	-30° to 40°C	240
050	0° to 100°F	450	-20° to 40°C	250
065	0° to 160°F	465	-20° to 70°C	265
100	30° to 180°F	500	0° to 85°C	300
110	30° to 240°F	510	0° to 115°C	310
120	30° to 300°F	520	0° to 150°C	320
145	100° to 350°F	545	40° to 180°C	345
160	200° to 450°F	560	90° to 230°C	360

Liquid Actuated				
Fahrenheit Scale Range Code	Fahrenheit Scale Range	Celsius Scale Range Code	Celsius Scale Range	Dual Scale Range Code
020	-40° to 120°F	420	-40° to 50°C	220
050	0° to 100°F	450	-20° to 40°C	250
060	0° to 160°F	460	-20° to 70°C	260
100	30° to 180°F	495	0° to 80°C	300
110	30° to 240°F	510	0° to 115°C	310
130	50° to 300°F	530	10° to 150°C	330

# Direct Mounted Dial Thermometer

3 1/2" Stainless Steel Case & 4 1/2" Cast Aluminum Case • Adjustable Angle

DIAL THERMOMETERS



V80445 shown

- ▶ 3 1/2", 4 1/2" Dial Sizes
- ▶ ± 1 Scale Division Accuracy
- ▶ Stainless Steel or Cast Aluminum Case
- ▶ Vapor or Liquid Actuated

The Trerice **Adjustable Angle Dial Thermometer** is intended for use within the construction and HVAC industries. Once the sensing bulb has been installed, the angle of the dialface may be adjusted forward and backward to provide maximum readability. This instrument is available in 3 1/2" and 4 1/2" dial sizes with a flangeless, stainless steel or cast aluminum case.

- Optional features available: Please consult the Optional Features Section for details.

**Thermowell**

- For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process.

(Refer to page 162)

## Specifications

Models	Dial Sizes	Case Styles
80030	3 1/2"	Adjustable Angle



80445 (Vapor Only)	4 1/2"	Adjustable Angle
-----------------------	--------	------------------



**Movement** Brass

**Case Material**

- 80030: Stainless steel
- 80445: Cast aluminum, black finish

**Window**

- 80030: Acrylic, snap-in with Nitrile O-ring seal
- 80445: Clear glass

**Ring**

- 80030: None
- 80445: Friction-type, stainless steel

**Pointer**

Adjustable, black finish

**Dialface**

Aluminum, white background with black graduations and markings

**Accuracy**

±1 scale division

**Approximate Shipping Weight**

- 80030: 1.3 lbs [0.59 kg]
- 80445: 1.4 lbs [0.64 kg]

**HOW TO ORDER**

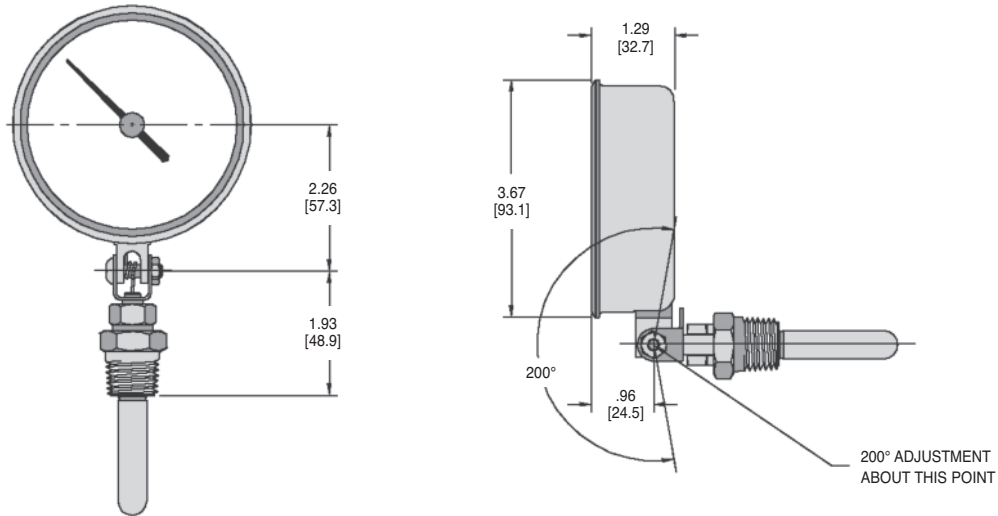
Sample Order Number: **V 80445 110 B31**

Actuation	Model	Specific Range	Thermal System
V Vapor L Liquid	80030 80445 (vapor only)	See Standard Ranges	See Thermal System Selection (pages 120-121)*

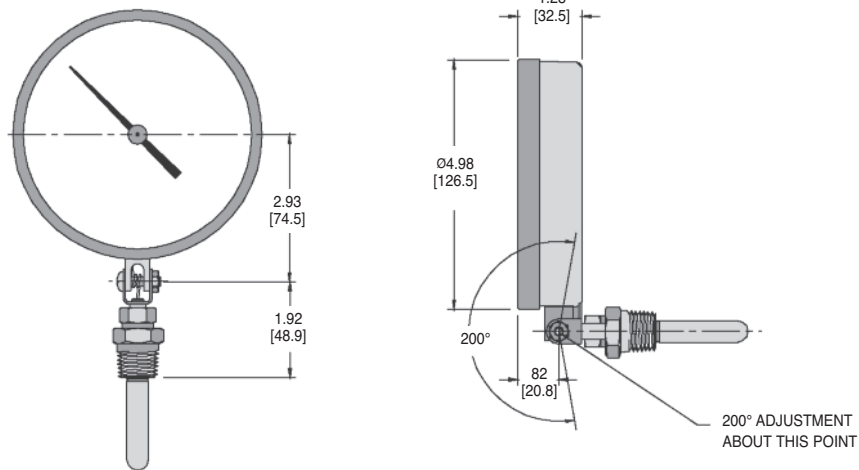
Stainless steel thermal system not available with V80445.

All dimensions are nominal. Dimensions in [ ] are in millimeters.

**80030**



**80445**



**Standard Ranges (Dual Scale includes both Fahrenheit & Celsius)**

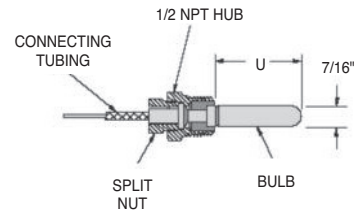
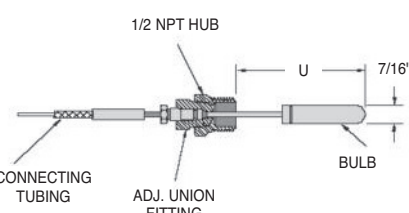
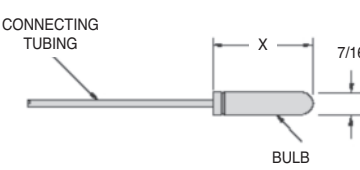
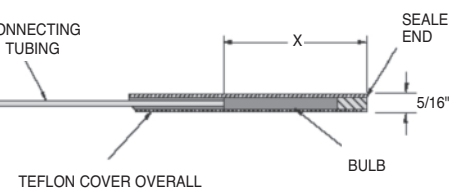
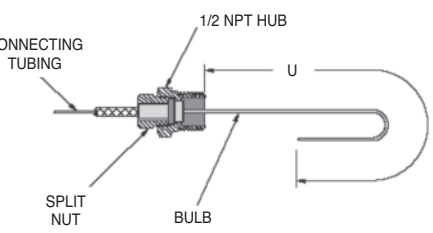
Vapor Actuated					Liquid Actuated				
Fahrenheit Scale Range Code	Fahrenheit Scale Range	Celsius Scale Range Code	Celsius Scale Range	Dual Scale Range Code	Fahrenheit Scale Range Code	Fahrenheit Scale Range	Celsius Scale Range Code	Celsius Scale Range	Dual Scale Range Code
030	-40° to 150°F	430	-40° to 65°C	230	020	-40° to 120°F	420	-40° to 50°C	220
040	-20° to 100°F	440	-30° to 40°C	240	050	0° to 100°F	450	-20° to 40°C	250
050	0° to 100°F	450	-20° to 40°C	250	060	0° to 160°F	460	-20° to 70°C	260
065	0° to 160°F	465	-20° to 70°C	265	100	30° to 180°F	495	0° to 80°C	300
100	30° to 180°F	500	0° to 85°C	300	110	30° to 240°F	510	0° to 115°C	310
110	30° to 240°F	510	0° to 115°C	310	130	50° to 300°F	530	10° to 150°C	330
120	30° to 300°F	520	0° to 150°C	320					
145	100° to 350°F	545	40° to 180°C	345					
160	200° to 450°F	560	90° to 230°C	360					

# Thermal System Selection

DIAL THERMOMETERS

U = Insertion Length  
X = Bulb Length

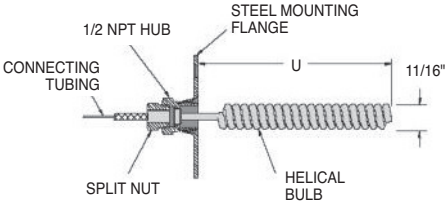
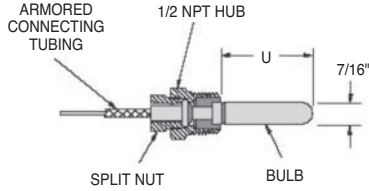
## Remote Mounted Dial Thermometers

Bulb & Capillary Style	Order Code	Connection Style & Material	Bulb Material	Capillary Tubing Material	Minimum Bulb Insertion Length for Capillary Length (in feet) shown			
					Vapor Actuated up to 10	15-50	over 50	Liquid Act. All Lengths
<b>Union Connection</b> 	B01	Brass, 1/2 NPT	Vapor: Copper Liquid: Brass	Copper with Bronze Braided Armour	2"	3 3/4"	5 5/8"	2"
	B10	Stainless Steel, 1/2 NPT	Stainless Steel	Stainless Steel	2"	3 3/4"	5 5/8"	2"
<b>Adjustable Union Connection</b> 	B02	Brass, 1/2 NPT	Vapor: Copper Liquid: Brass	Copper with Bronze Braided Armour	1 3/4"	3 1/2"	5 1/4"	1 3/4"
	B04	Stainless Steel, 1/2 NPT	Stainless Steel	Stainless Steel	Adjustable up to 24"			
<b>Plain Bulb</b> 	B05	None	Vapor: Copper Liquid: Brass	Copper with Bronze Braided Armour	2"	3 3/4"	5 5/8"	2"
	B06	None	Stainless Steel	Stainless Steel	2"	3 3/4"	5 5/8"	2"
<b>Teflon Covered Bulb</b> 	B08	None	Vapor: Copper Liquid: Brass with Teflon Cover	Bronze Braided Armour with Teflon Cover	15"	15"	15"	2 3/4"
	B07	None	Stainless Steel with Teflon Cover	Stainless Steel with Teflon Cover	15"	15"	15"	2 3/4"
<b>Averaging Bulb</b> 	B11*	Brass, 1/2 NPT	Copper	Copper with Bronze Braided	N/A	N/A	N/A	Approx. 8 Feet
	B12*	Stainless Steel, 1/2 NPT	Stainless Steel	Stainless Steel	N/A	N/A	N/A	Approx. 8 Feet

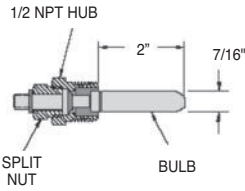
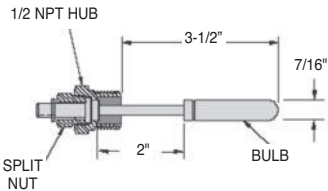
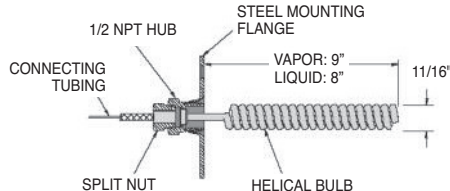
\* B11 and B12 Averaging Bulbs are not available with vapor actuation.



## Remote Mounted Dial Thermometers (cont'd)

Bulb & Capillary Style	Order Code	Connection Style & Material	Bulb Material	Capillary Tubing Material	Minimum Bulb Insertion Length for Capillary Length (in feet) shown			
					Vapor Actuated up to 10	15-50	over 50	Liquid Act. All Lengths
<b>Air Sensitive Bulb</b> 	<b>B13</b>	Steel Mounting Flange, Brass Fittings	Copper	Copper with Bronze Braided Armor	9"	9"	11"	8"
<b>Union Connection with Spiral Armour</b> 	<b>B15</b>	Brass, 1/2 NPT	Vapor: Copper Liquid: Brass	Copper with Bronze Braid & SS Spiral Armor	2"	3 3/4"	5 5/8"	2"
	<b>B16</b>	Stainless Steel, 1/2 NPT	Stainless Steel	Stainless Steel with SS Spiral Armor	2"	3 3/4"	5 5/8"	2"

## Direct Mounted Dial Thermometers

Bulb Style	Order Code	Connection Material	Bulb Material	Minimum Bulb Insertion Length	
				Vapor Actuated	Liquid Act.
<b>Union Connection</b> 	<b>B31</b>	Brass, 1/2 NPT	Vapor: Copper Liquid: Brass	2"	2"
	<b>B32*</b>	Stainless Steel, 1/2 NPT	Stainless Steel	2"	2"
<b>Union Connection with Bendable Extension</b> 	<b>B33</b>	Brass, 1/2 NPT	Vapor: Copper Liquid: Brass	3 1/2"	3 1/2"
	<b>B34*</b>	Stainless Steel, 1/2 NPT	Stainless Steel	3 1/2"	3 1/2"
<b>Air Sensitive Bulb</b> 	<b>B35</b>	Steel Mounting Flange, Brass Fittings	Copper	9"	8"

\* B32 and B34 thermal systems are not available with model V80445.

# Temperature Ranges

## Dial Thermometers

DIAL THERMOMETERS

Trerice offers a variety of temperature ranges to satisfy virtually any application. The following tables list the standard available ranges with figure intervals and minor divisions for Vapor or Liquid actuated dial thermometers.

Vapor actuated dial thermometers have a progressive scale. Maximum readability and stated intervals are in the upper two thirds of the scale. Liquid actuated dial thermometers have a linear scale. Figure intervals are equal throughout the range. Fahrenheit is primary (outside) scale on dual scale ranges.

### Vapor Actuated Ranges with Major and Minor Divisions

Fahrenheit Scale		Celsius Scale		Dual Scale		Fahrenheit		Celsius	
Range Code	Range	Range Code	Range	Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
030	-40° to 150°F	430	-40° to 65°C	230	-40° to 150°F & -40° to 65°C	20°	2°	10°	1°
040	-20° to 100°F	440	-30° to 40°C	240	-20° to 100°F & -30° to 40°C	10°	2°	5°	1°
050	0° to 100°F	450	-20° to 40°C	250	0° to 100°F & -20° to 40°C	10°	1°	10°	1°
065	0° to 160°F	465	-20° to 70°C	265	0° to 160°F & -20° to 70°C	20°	2°	10°	1°
100	30° to 180°F	500	0° to 85°C	300	30° to 180°F & 0° to 85°C	20°	2°	10°	1°
110	30° to 240°F	510	0° to 115°C	310	30° to 240°F & 0° to 115°C	20°	2°	10°	1°
120	30° to 300°F	520	0° to 150°C	320	30° to 300°F & 0° to 150°C	20°	2°	10°	1°
145	100° to 350°F	545	40° to 180°C	345	100° to 350°F & 40° to 180°C	30°	2°	10°	1°
160	200° to 450°F	560	90° to 230°C	360	200° to 450°F & 90° to 230°C	30°	2°	10°	2°

Vapor actuated dial thermometers have a progressive scale. Maximum readability and stated intervals are in the upper two thirds of the scale.

### Liquid Actuated Ranges with Major and Minor Divisions

Fahrenheit Scale		Celsius Scale		Dual Scale		Fahrenheit		Celsius	
Range Code	Range	Range Code	Range	Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Division
020	-40° to 120°F	420	-40° to 50°C	220	-40° to 120°F & -40° to 50°C	20°	2°	10°	1°
050	0° to 100°F	450	-20° to 40°C	250	0° to 100°F & -20° to 40°C	10°	1°	10°	0.5°
060	0° to 160°F	460	-20° to 70°C	260	0° to 160°F & -20° to 70°C	20°	2°	10°	1°
100	30° to 180°F	495	0° to 80°C	300	30° to 180°F & 0° to 85°C	20°	2°	10°	1°
110	30° to 240°F	510	0° to 115°C	310	30° to 240°F & 0° to 115°C	20°	2°	10°	1°
130	50° to 300°F	530	10° to 150°C	330	50° to 300°F & 10° to 150°C	50°	5°	20°	2°

Liquid actuated dial thermometers have a linear scale. Figure intervals are equal throughout the range.

### Vapor and Liquid Actuated Dial Faces

The physical principles of vapor actuation require that the dialface for vapor dial thermometers be printed with a non-linear progressively graduated temperature scale. Liquid actuated dial thermometers are furnished with linear dialfaces. Please see the Thermal System Selection section of our online catalog for sample vapor and liquid actuated dialfaces.

# Options & Accessories

## Dial Thermometers

### Windows (PLW/GLW/SGW)

Terrice offers a complete set of window options, including: plastic (acrylic PLW), glass (GLW), and laminated safety glass (SGW). Please consult the Option Availability Table for window availability. Replacement windows are sold separately, please consult the price sheet for item numbers.

### Red Set Hand (RSH)

Attached at the center of the dialface, a red set hand can be adjusted to indicate a desired pre-determined reference point. The set point is adjusted by removing the ring and window of the thermometer. Please consult the Option Availability Table for set hand availability. A second red set hand may be available on some models – please consult factory.



### Maximum Registering Pointer (MAX)

A maximum registering pointer can be furnished on most Terrice Dial Thermometers. This pointer is designed to indicate the maximum or minimum temperature attained by the process being measured since the pointer was last reset. The pointer assembly is installed to an acrylic window, with an external knob for manually resetting the pointer. Please consult the Option Availability Table for maximum registering pointer availability.



### Electric Contacts

Electric contact assemblies can be supplied on most 4½" & 6" dial thermometers. These units are well suited for making the electrical contact required to activate alarms, signals, or other electrical devices. Each unit is provided with an external adjustment key, making it easy to adjust and providing for tamper resistant operation. The contacts have adjustable magnets to eliminate bounce caused by vibration, and have pass/repass capability, allowing the pointer to move past the set point while maintaining contact.



#### Electric Contact Configurations

Optional Feature Code	Contact Style	Contact Action
EC1	Single High	<b>Single contact:</b> Makes on clockwise rotation
EC2	Single Low	<b>Single contact:</b> Breaks on clockwise rotation
EC3	High-Low	<b>Double contact:</b> High contact makes on clockwise rotation Low contact breaks on clockwise rotation
EC4	Double High	<b>Double contact:</b> 1st makes on clockwise rotation 2nd makes on clockwise rotation

Please consult the Option Availability Table for electric contact availability.

#### Recommended Load Limits

Volts	Resistive	Inductive
110 Vac	0.25 A	0.13 A
24 Vdc	0.40 A	0.25 A

# Options & Accessories (cont'd)

## Dial Thermometers

All dimensions are nominal. Dimensions in [ ] are in millimeters.

DIAL THERMOMETERS

### Weatherproofed Cases (WPC)

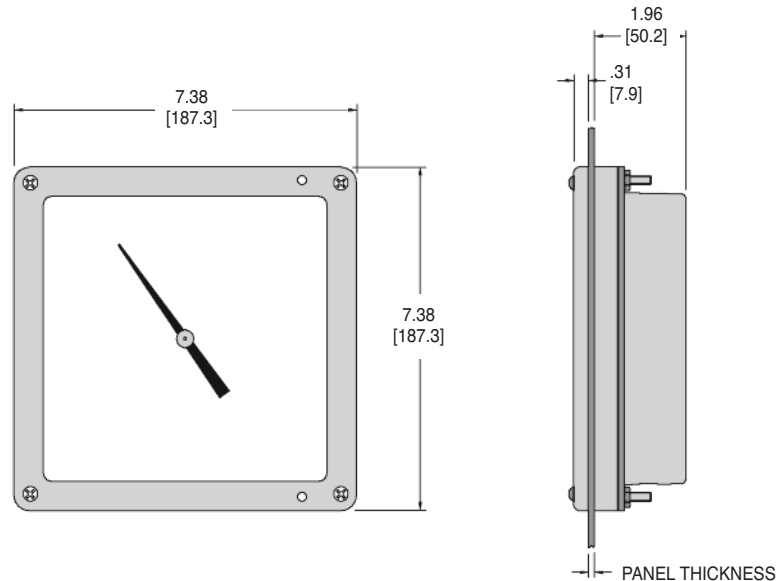
Trerice Dial Thermometers may be sealed (NEMA 3) for outdoor use, or for use in applications where sprays and washes may come in contact with the thermometer. Please consult the Option Availability Table for weatherproofed case availability.

### Silicone Dampened Movements (SDM)

The application of highly viscous silicone to the gear, sector, and all bearing points of the movement will help reduce the effects of vibration to which the thermometer may be subjected. This feature will extend the life of the instrument by reducing wear on the movement, and is available on most Trerice Filled System Dial Thermometers. Please consult the Option Availability Table for silicone dampened movement availability.

### 7 3/8" Square Case

This 7 3/8" square front, back outlet case (Model 80373) is constructed from black finished cast aluminum. A black steel bezel ring is included for panel mounting the thermometer. Please consult the Option Availability Table for square case availability, and order as model V80373 or L80373.



### Micro Switches (MSS/MSD)

Single (MSS) or double (MSD) Micro Switches, designed to operate low current alarms and warning lights, are available on 6" and 7 3/8" Trerice Vapor Dial Thermometers. The switches are factory-set to close and operate a circuit when the temperature reaches a predetermined point. Red set hands are provided to indicate the temperature at which the switches have been set to operate. Although Micro Switches are designed for applications where the alarm temperature remains at the factory set point, they may be field adjusted if required. When ordering, please provide the set point(s) required.

#### Recommended Load Limits

Volts	Resistive	Inductive
250 VAC	10 A	10 A
125 VDC	0.4 A	0.3 A

### 3/4 NPT Hub (SHB/SHS)

A 3/4 NPT union connection hub is available in brass (SHB) or 316 stainless steel (SHS). This hub may be installed by the factory or ordered as a separate unit. When ordering separately, please use the item numbers listed in table.

Material	Item Number
Brass	082-0015
316 Stainless Steel	082-0015.2

# Options & Accessories

## Option Availability Table

The following table indicates optional features that are available for Trerice Dial Thermometers.

DIAL THERMOMETERS

Optional Feature Code	Plastic Window (acrylic)	Laminated Safety Glass Window	Glass Window	Red Set Hand	Maximum Registering Pointer	Electric Contact	Weatherproofed Case	Silicone Dampened Movement	Micro Switch Single or Double	3/4 NPT Hub Brass or SS
	PLW	SGW	GLW	RSH	MAX	EC-X	WPC	SDM	MS-X	SH-X
<b>Model</b>										
80025	S	N/A	O	O	O	N/A	N/A	O	N/A	O
80030	S	N/A	O	O	O	N/A	N/A	O	N/A	O
80035	S	N/A	O	O	O	N/A	N/A	O	N/A	O
80036	S	N/A	O	O	O	N/A	O	O	N/A	O
80040	S	N/A	O	O	O	N/A	O	O	N/A	O
80041	S	N/A	O	O	O	N/A	O	O	N/A	O
80341	O	O	S	O	O	O	O	O	N/A	O
80342	O	O	S	O	O	O	O	O	N/A	O
80345	O	O	S	O	O	O	O	O	N/A	O
80361	O	O	S	O	O	O	O	O	O*	O
80362	O	O	S	O	O	O	O	O	O*	O
80365	O	O	S	O	O	O	O	O	O*	O
80381	O	O	S	O	O	N/A	O	O	N/A	O
80382	O	O	S	O	O	N/A	O	O	N/A	O
80445	O	N/A	S	O	N/A	N/A	N/A	O	N/A	O
80742	O	O	S	O	O	O	N/A	O	N/A	O
80762	O	O	S	O	O	O	N/A	O	O	O
80373	N/A	N/A	S	O	O	N/A	N/A	O	O	O

S - Standard Product Feature    O - Optional Feature at Additional Charge    N/A - Not Available

\* 6" Vapor Dial Thermometers only.

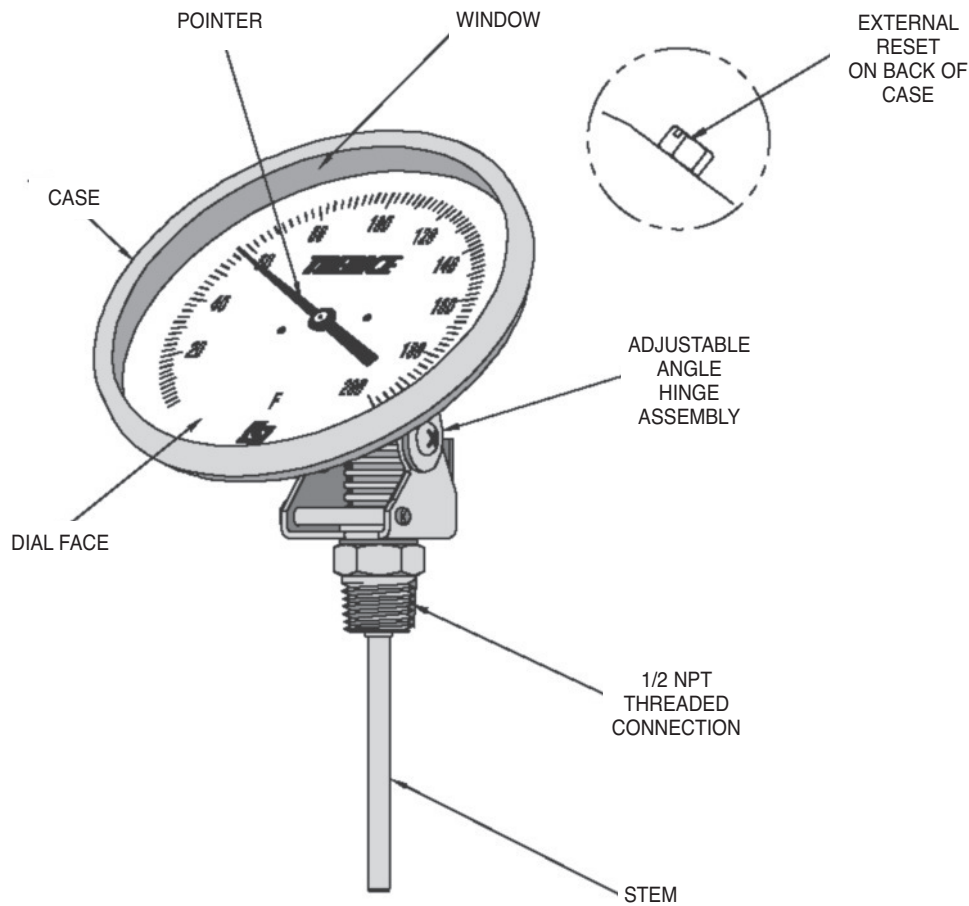
## How to Order

Specify the Optional Feature Code (from the table above) at the end of the Instrument Ordering Code.

Sample Order Number: V 80341 110 B01 05 EC1

# Bimetal Thermometers

## DESIGN & OPERATION



### Description

A thermometer is an instrument designed to measure and indicate the temperature of a specific application or condition. A bimetallic dial thermometer, commonly known as a bimetal thermometer, is installed at the point of measurement and is usually read from that location.

### Principles of Operation

The Trerice Bimetal Thermometer employs a bimetallic sensing element which reacts consistently to temperature change, producing an accurately calibrated temperature measurement. The sensing element consists of two dissimilar metals welded together (in the form of a coil), and encased in a stainless steel stem. The coil is silicone dampened (ranges up to 300°F) to protect against vibration, and connected to a dial pointer on the instrument face. When the stem is exposed to temperature change, the coil expands or contracts, and the corresponding reaction is transmitted to the pointer, thereby indicating the temperature of the process.

## Selecting a Bimetal Thermometer

All Trerice Bimetal Thermometers should be carefully selected to meet the demands of the particular application. The information contained in this catalog is offered only as a guide to assist in making the proper selection. Improper application may cause failure of the instrument, resulting in possible personal injury or property damage. For correct use and application of all bimetal thermometers, please refer to Bimetallic Actuated Thermometer Standard ASME B40.3. This document may be obtained from the American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990.

For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process.

### Case

The Trerice Bimetal Thermometer is available in an adjustable angle, rear or lower connected case. The hermetically sealed case is made from highly polished, type 300 stainless steel in sizes from 1" through 5".

### Window and Ring

Double strength glass and plastic are standard window materials. The window is held in place by a ring, which is crimped around the case of the instrument.

### Accuracy

The accuracy of a bimetal thermometer is expressed as a percentage (plus or minus) of the maximum scale range. Trerice Bimetal Thermometers are accurate to  $\pm 1.0\%$  Full Scale, ASME B40.3 Grade A (except pocket type:  $\pm 5.0\%$  Full Scale, ASME B40.3 Grade 3).

### Measurement Range and Dial

A wide variety of measurement ranges are available in Dual Scales (Fahrenheit and Celsius) from  $-100^{\circ}$  through  $1000^{\circ}\text{F}$ . Single scale Fahrenheit or Celsius is available on special order. Ranges are indelibly presented in black ( $^{\circ}\text{F}$ ) and blue ( $^{\circ}\text{C}$ ) graduations with black markings upon a white painted dialface. Fahrenheit is the primary (outside) scale on dual scale ranges.

Ranges up to  $250^{\circ}\text{F}$  ( $120^{\circ}\text{C}$ ) are provided with overrange protection of 100% of range span. Ranges over  $250^{\circ}\text{F}$  ( $120^{\circ}\text{C}$ ) are provided with overrange protection of 50% of range span.

### External Reset

Most Trerice Bimetal Thermometers are equipped with an external reset. This feature allows the instrument to be calibrated at any specific point within the measuring range.

### Stem and Connection

Trerice Bimetal Thermometers are furnished with a 0.250" or 0.125" O.D. stainless steel stem in lengths from  $2\frac{1}{2}$ " though 72". Connection styles are either threaded ( $\frac{1}{4}$  or  $\frac{1}{2}$  NPT) or plain (non-threaded).

### Environmental Conditions

The Trerice Bimetal Thermometer is hermetically sealed. The case should not be exposed to sustained temperatures in excess of  $200^{\circ}\text{F}$  ( $93^{\circ}\text{C}$ ). For applications where vibration may be present, the thermometer case can be silicone filled to protect the internals of the instrument.

The thermometer should not be operated continuously above  $800^{\circ}\text{F}$  ( $425^{\circ}\text{C}$ ), as damage to the instrument may result.

### Thermowells

For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the thermometer and facilitate its removal from the process. Thermowells are available in various lengths, connections, sizes, and materials. Please consult the Thermowell Section of this catalog.

To ensure minimum response time, Trerice Heat Transfer Paste should be applied to the sensing portion of the stem before installation into a thermowell. 1/2 oz. tube: Item No. 107-0001

# Adjustable Angle

BIMETAL THERMOMETERS



B85606 shown

The Trerice **Adjustable Angle Bimetal Thermometer** can be configured to the most desirable viewing angle. This instrument has a hermetically sealed, stainless steel case designed to withstand the rigors of industrial environments, while producing an accurate, responsive measurement.

- Optional features available: Please consult the Options & Accessories Section for details.

#### Thermowell

- For corrosive or pressure applications, use of a thermowell is recommended to prevent damage to the thermometer and facilitate its removal from the process (refer to pages 163-169).

For correct use and application of all Bimetallic thermometers, please refer to the Bimetallic Actuated Thermometer Standard ASME B40.3.

- ▶ 3", 5" Dial Size
- ▶ ± 1.0% Full Scale Accuracy
- ▶ Stainless Steel Case & Stem
- ▶ External Reset

## Specifications

Models	Dial Sizes
B836	3"
B856	5"
<b>Case</b>	300 stainless steel, hermetically sealed
<b>Stem</b>	300 stainless steel 1/4" diameter
<b>Coil</b>	Bimetallic, silicone dampened on ranges to 300°F (148°C), above 300°F not dampened
<b>Connection</b>	Adjustable angle, 1/2 NPT
<b>Window</b>	Double strength glass
<b>Pointer</b>	Balanced, black finish
<b>Dial Face</b>	Aluminum, white background with black and blue graduations and markings
<b>External Reset</b>	Yes
<b>Accuracy</b>	±1.0 % Full Scale ASME B40.3 Grade A

#### Approximate Shipping Weight

B836: 1.1 lbs [0.5 kg]  
B856: 1.5 lbs [0.68 kg]

## HOW TO ORDER

Sample Order Number: **B856 06 05**

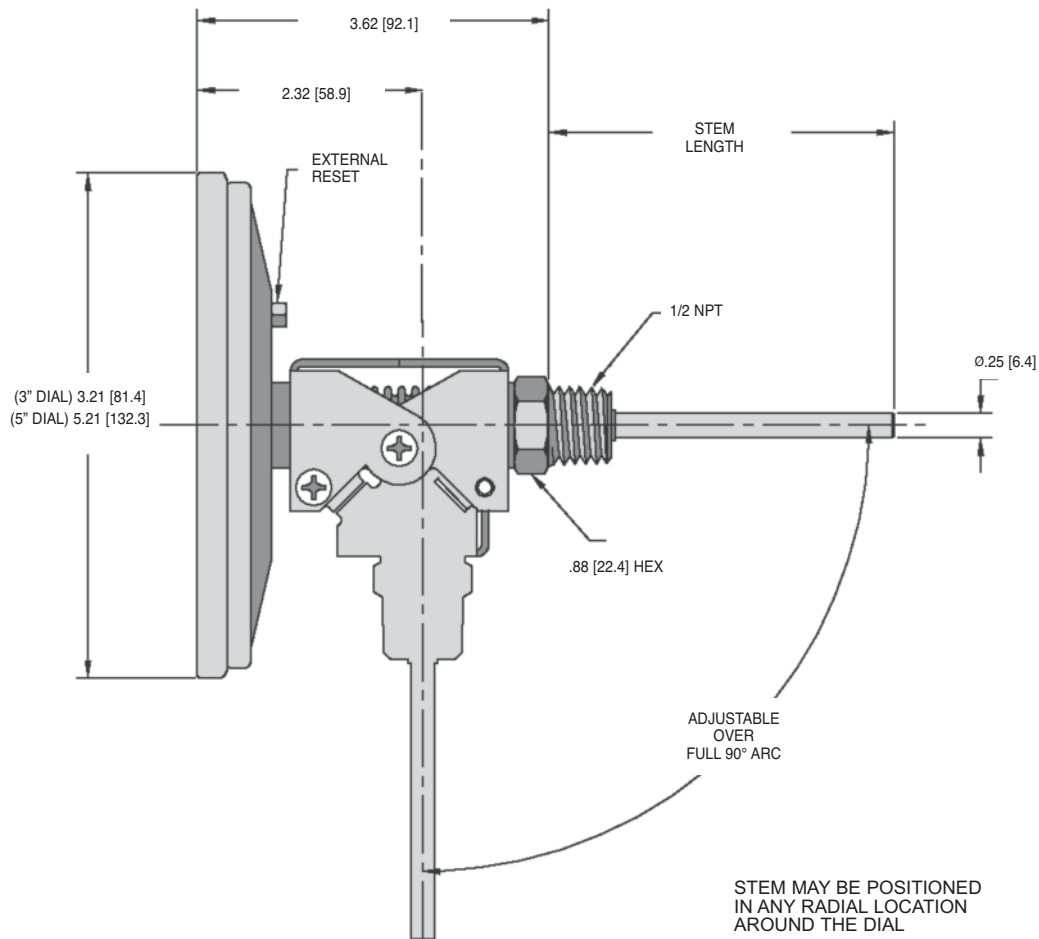
Model	Stem (Length)	Range Code
B836	02 2 1/2" Stem	See Standard Ranges
B856	04 4" Stem	
	06 6" Stem	
	09 9" Stem	
	12 12" Stem	
	15 15" Stem	
	18 18" Stem	
	24 24" Stem	

Other lengths available: Specify in inches (72" maximum)



# Adjustable Angle

All dimensions are nominal. Dimensions in [ ] are in millimeters.



BIMETAL THERMOMETERS

## Standard Ranges

Dual Scale (Fahrenheit & Celsius Range)		Fahrenheit only Range		Celsius only Range		Fahrenheit		Celsius	
Range Code	Range	Range Code	Range	Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
01*†	-100° to 100°F & -75° to 40°C	01F*†	-100° to 100°F	01C*†	-75° to 40°C	20°	2°	10°	1°
02	-40° to 160°F & -40° to 70°C	02F	-40° to 160°F	02C	-40° to 70°C	20°	2°	10°	1°
12*†	0° to 100°F & -20° to 40°C	12F*†	0° to 100°F	12C*†	-20° to 40°C	10°	1°	10°	1°
03*†	25° to 125°F & -5° to 50°C	03F*†	25° to 125°F	03C*†	-5° to 50°C	10°	1°	5°	1/2°
04	0° to 200°F & -20° to 95°C	04F	0° to 200°F	04C	-20° to 95°C	20°	2°	10°	1°
05	20° to 240°F & -10° to 115°C	05F	20° to 240°F	05C	-10° to 115°C	20°	2°	10°	1°
27	0° to 250°F & -20° to 120°C	27F	0° to 250°F	27C	-20° to 120°C	50°	2°	20°	2°
06	50° to 300°F & 10° to 150°C	06F	50° to 300°F	06C	10° to 150°C	50°	2°	20°	2°
07	50° to 400°F & 10° to 200°C	07F	50° to 400°F	07C	10° to 200°C	50°	5°	50°	2°
08	50° to 500°F & 10° to 260°C	08F	50° to 500°F	08C	10° to 260°C	50°	5°	50°	2°
09*	150° to 750°F & 50° to 400°C	09F*	150° to 750°F	09C*	50° to 400°C	100°	10°	50°	5°
10*	200° to 1000°F & 100° to 550°C	10F*	200° to 1000°F	10C*	100° to 550°C	100°	10°	100°	5°

\* Minimum stem length for these ranges is 4".

† Minimum insertion length for these ranges is 3".

See Thermowells for Bimetal Thermometers & Temperature Sensors (page 163-169) for applicable insertion lengths.

# Bottom Connect

BIMETAL THERMOMETERS



B85404 shown

- ▶ 3", 5" Dial Size
- ▶ ± 1.0% Full Scale Accuracy
- ▶ Stainless Steel Case & Steel
- ▶ External Reset

The Trerice **Bottom Connection Bimetal Thermometer** has been designed to meet the needs of standard industrial applications and installations. This instrument features a stainless steel, hermetically sealed case, providing weather tight protection.

- Optional features available: Please consult the Options & Accessories Section for details.

**Thermowell**

- For corrosive or pressure applications, use of a thermowell is recommended to prevent damage to the thermometer and facilitate its removal from the process (refer to pages 163-169). For correct use and application of all Bimetallic thermometers, please refer to the Bimetallic Actuated Thermometer Standard ASME B40.3.

## Specifications

Models	Dial Sizes
<b>B834</b>	<b>3"</b>
<b>B854</b>	<b>5"</b>
<b>Case</b>	300 stainless steel, hermetically sealed
<b>Stem</b>	300 stainless steel, 1/4" diameter
<b>Coil</b>	Bimetallic, silicone dampened on ranges to 300°F (148°C), above 300°F not dampened
<b>Connection</b>	Bottom, 1/2 NPT
<b>Window</b>	Double strength glass
<b>Pointer</b>	Balanced, black finished
<b>Dial Face</b>	Aluminum, white background with black and blue graduations and markings
<b>External Reset</b>	Yes
<b>Accuracy</b>	±1.0 % Full Scale ASME B40.3 Grade A

### Approximate Shipping Weight

B834: 0.8 lbs [0.36 kg]  
B854: 1.6 lbs [0.72 kg]

## HOW TO ORDER

Sample Order Number: **B834 04 04**

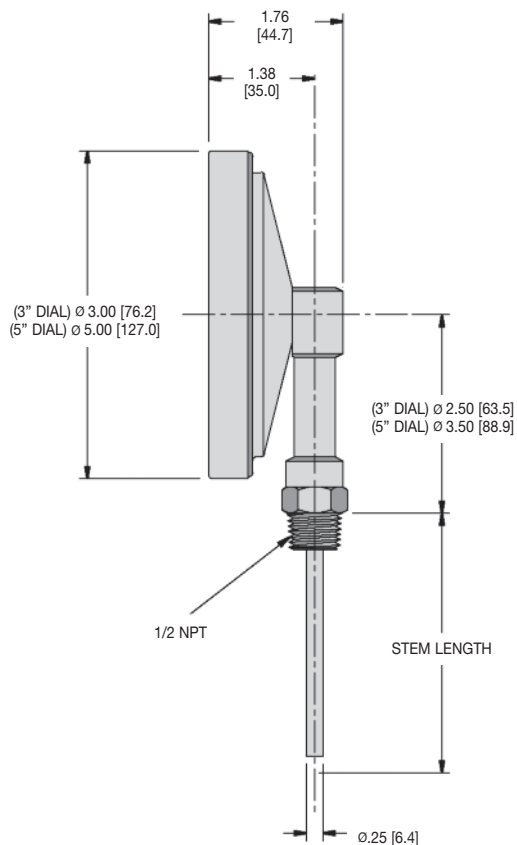
Model	Stem Length	Range Code
B834	02 2 1/2" Stem	See Standard Ranges
B854	04 4" Stem	
	06 6" Stem	
	09 9" Stem	
	12 12" Stem	
	15 15" Stem	
	18 18" Stem	
	24 24" Stem	

Other lengths available: Specify in inches (72" maximum)

# Bottom Connect

All dimensions are nominal. Dimensions in [ ] are in millimeters.

BIMETAL THERMOMETERS



## Standard Ranges

Dual Scale (Fahrenheit & Celsius Range)		Fahrenheit only Range		Celsius only Range		Fahrenheit		Celsius	
Range Code	Range	Range Code	Range	Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
01	-100° to 100°F & -75° to 40°C	01F	-100° to 100°F	01C	-75° to 40°C	20°	2°	10°	1°
02	-40° to 160°F & -40° to 70°C	02F	-40° to 160°F	02C	-40° to 70°C	20°	2°	10°	1°
03*†	25° to 125°F & -5° to 50°C	03F*†	25° to 125°F	03C*†	-5° to 50°C	10°	1°	5°	1/2°
04	0° to 200°F & -20° to 95°C	04F	0° to 200°F	04C	-20° to 95°C	20°	2°	10°	1°
05	20° to 240°F & -10° to 115°C	05F	20° to 240°F	05C	-10° to 115°C	20°	2°	10°	1°
27	0° to 250°F & -20° to 120°C	27F	0° to 250°F	27C	-20° to 120°C	50°	2°	20°	2°
06	50° to 300°F & 10° to 150°C	06F	50° to 300°F	06C	10° to 150°C	50°	2°	20°	2°
07	50° to 400°F & 10° to 200°C	07F	50° to 400°F	07C	10° to 200°C	50°	5°	50°	2°
08	50° to 500°F & 10° to 260°C	08F	50° to 500°F	08C	10° to 260°C	50°	5°	50°	2°
09	150° to 750°F & 50° to 400°C	09F	150° to 750°F	09C	50° to 400°C	100°	10°	50°	5°
10	200° to 1000°F & 100° to 550°C	10F	200° to 1000°F	10C	100° to 550°C	100°	10°	100°	5°

\* Minimum stem length is 4".

† Minimum insertion length is 3".

See Thermowells for Bimetal Thermometers & Temperature Sensors (page 163-169) for applicable insertion lengths.

# Rear Connect

BIMETAL THERMOMETERS



B85204 shown

- ▶ 3", 5" Dial Sizes
- ▶ ± 1.0% Full Scale Accuracy
- ▶ Stainless Steel Case & Stem
- ▶ External Reset

## Specifications

Models	Dial Sizes
<b>B832</b>	<b>3"</b>
<b>B852</b>	<b>5"</b>
<b>Case</b>	300 stainless steel, hermetically sealed
<b>Stem</b>	300 stainless steel, 1/4" diameter
<b>Coil</b>	Bimetallic, silicone dampened ranges to 300°F (148°F), above 300°F not dampened
<b>Connection</b>	Rear, 1/2 NPT
<b>Window</b>	Double strength glass
<b>Pointer</b>	Balanced, black finished
<b>Dial Face</b>	Aluminum, white background with black and blue graduations and markings
<b>External Reset</b>	Yes
<b>Accuracy</b>	±1.0 % Full Scale ASME B40.3 Grade A

## Approximate Shipping Weight

B832: 0.7 lbs [0.31 kg]  
B852: 1.2 lbs [0.54 kg]

The Trerice **Rear Connect Bimetal Thermometer** has been designed to meet the needs of standard industrial applications and installations. This instrument features a stainless steel, hermetically sealed case, providing weather tight protection.

- Optional features available: Please consult the Options & Accessories Section for details.

### Thermowell

- For corrosive or pressure applications, use of a thermowell is recommended to prevent damage to the thermometer and facilitate its removal from the process (refer to pages 163-169).

For correct use and application of all Bimetallic thermometers, please refer to the Bimetallic Actuated Thermometer Standard ASME B40.3.

## HOW TO ORDER

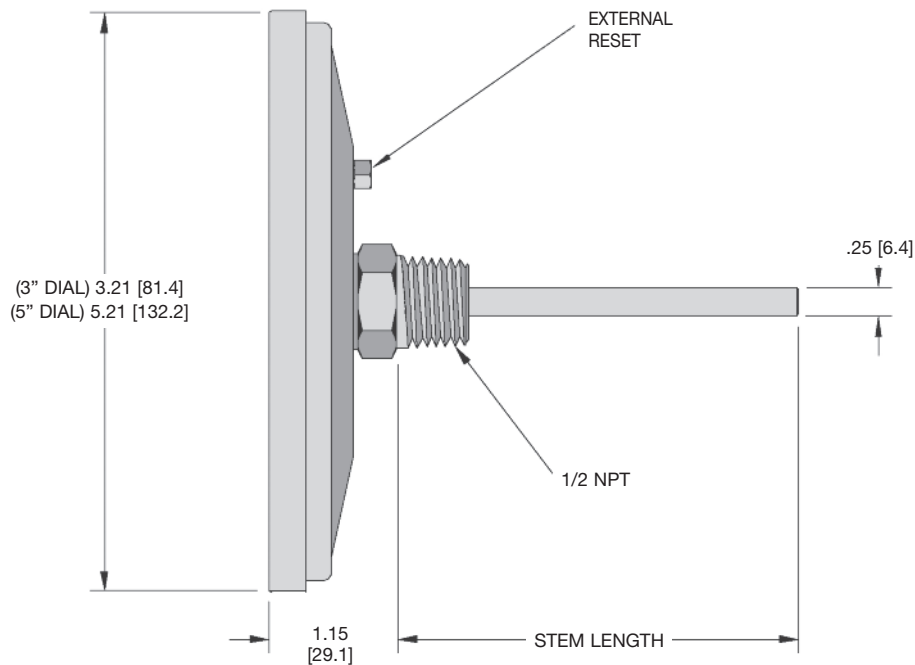
Sample Order Number: **B832 02 06**

Model	Stem Length	Range Code
<b>B832</b>	<b>02</b> 2 1/2" Stem	See Standard Ranges
<b>B852</b>	<b>04</b> 4" Stem	
	<b>06</b> 6" Stem	
	<b>09</b> 9" Stem	
	<b>12</b> 12" Stem	
	<b>15</b> 15" Stem	
	<b>18</b> 18" Stem	
	<b>24</b> 24" Stem	

Other lengths available: Specify in inches (72" maximum)

# Rear Connect

All dimensions are nominal. Dimensions in [ ] are in millimeters.



BIMETAL THERMOMETERS

## Standard Ranges

Dual Scale (Fahrenheit & Celsius Range)		Fahrenheit only Range		Celsius only Range		Fahrenheit		Celsius	
Range Code	Range	Range Code	Range	Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
01	-100° to 100°F & -75° to 40°C	01F	-100° to 100°F	01C	-75° to 40°C	20°	2°	10°	1°
02	-40° to 160°F & -40° to 70°C	02F	-40° to 160°F	02C	-40° to 70°C	20°	2°	10°	1°
12*†	0° to 100°F & -20° to 40°C	12F*†	0° to 100°F	12C*†	-20° to 40°C	10°	1°	10°	1°
03*†	25° to 125°F & -5° to 50°C	03F*†	25° to 125°F	03C*†	-5° to 50°C	10°	1°	5°	1/2°
04	0° to 200°F & -20° to 95°C	04F	0° to 200°F	04C	-20° to 95°C	20°	2°	10°	1°
05	20° to 240°F & -10° to 115°C	05F	20° to 240°F	05C	-10° to 115°C	20°	2°	10°	1°
27	0° to 250°F & -20° to 120°C	27F	0° to 250°F	27C	-20° to 120°C	50°	2°	20°	2°
06	50° to 300°F & 10° to 150°C	06F	50° to 300°F	06C	10° to 150°C	50°	2°	20°	2°
07	50° to 400°F & 10° to 200°C	07F	50° to 400°F	07C	10° to 200°C	50°	5°	50°	2°
08	50° to 500°F & 10° to 260°C	08F	50° to 500°F	08C	10° to 260°C	50°	5°	50°	2°
09*	150° to 750°F & 50° to 400°C	09F*	150° to 750°F	09C*	50° to 400°C	100°	10°	50°	5°
10*	200° to 1000°F & 100° to 550°C	10F*	200° to 1000°F	10C*	100° to 550°C	100°	10°	100°	5°

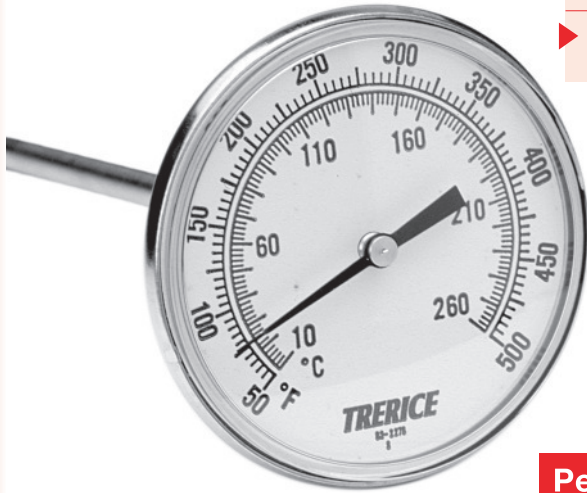
\* Minimum stem length for these ranges is 4".

† Minimum insertion length for these ranges is 3".

See Thermowells for Bimetal Thermometers & Temperature Sensors (page 163-169) for applicable insertion lengths.

# Rear Connect X-Series

BIMETAL THERMOMETERS



- ▶ 3" Dial Size
- ▶ ± 1.0% Full Scale Accuracy
- ▶ Stainless Steel Case & Stem
- ▶ Hermetically Sealed Design

**Perfect for OEM Applications**

B831X04 shown

The Trerice **X-Series OEM Bimetal Thermometer** is designed to meet the demands of the OEM and industrial marketplace, but at an economical price. It features a hermetically sealed case with a narrow, space saving profile. This instrument does not include an external reset, ensuring tamperproof operation throughout the life of the unit.

- Optional features available: Please consult the Options & Accessories Section for details.

**Thermowell**

- For corrosive or pressure applications, use of a thermowell is recommended to prevent damage to the thermometer and facilitate its removal from the process (refer to pages 163-169). For correct use and application of all Bimetallic thermometers, please refer to the Bimetallic Actuated Thermometer Standard ASME B40.3.

**HOW TO ORDER**

Sample Order Number: **B831X 04 05**

Model	Stem Length	Range Code
B831X	02 2 1/2" Stem	See Standard Ranges
	04 4" Stem	
	06 6" Stem	
	09 9" Stem	
	12 12" Stem	
	15 15" Stem	
	18 18" Stem	
24 24" Stem		

Other lengths available: Specify in inches (72" maximum)

**Specifications**

Model	Dial Size
<b>B831X</b>	<b>3"</b>
<b>Case</b>	300 stainless steel, hermetically sealed
<b>Stem</b>	300 stainless steel 1/4" diameter
<b>Coil</b>	Bimetallic, silicone dampened ranges to 300°F (148°F), above 300°F not dampened
<b>Connection</b>	Rear 1/2 NPT
<b>Window</b>	Polycarbonate
<b>Pointer</b>	Balanced, black finished
<b>Dial Face</b>	Aluminum, white background with black and blue graduations and markings
<b>External Reset</b>	No
<b>Accuracy</b>	±1.0 % Full Scale ASME B40.3 Grade A

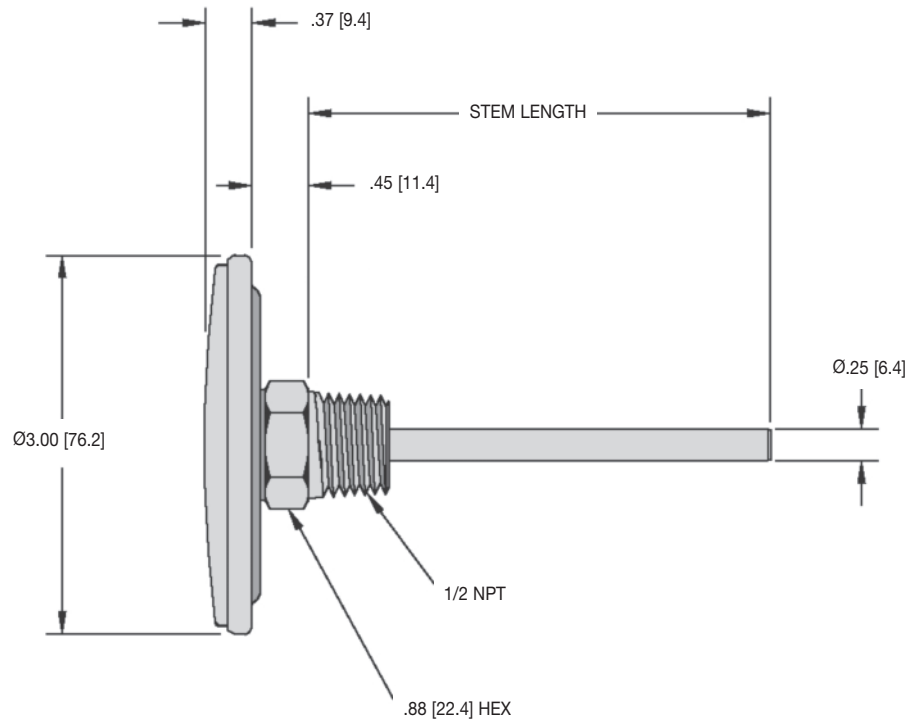
**Approximate Shipping Weight**

B831X: 0.5 lbs [0.22 kg]

# Rear Connect X-Series

All dimensions are nominal. Dimensions in [ ] are in millimeters.

BIMETAL THERMOMETERS



## Standard Ranges

Dual Scale (Fahrenheit & Celsius Range)		Fahrenheit Only Range		Celsius Only Range		Fahrenheit		Celsius	
Range Code	Range	Range Code	Range	Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
01	-100° to 100°F & -75° to 40°C	01F	-100° to 100°F	01C	-75° to 40°C	20°	2°	10°	1°
02	-40° to 160°F & -40° to 70°C	02F	-40° to 160°F	02C	-40° to 70°C	20°	2°	10°	1°
12*†	0° to 100°F & -20° to 40°C	12F*†	0° to 100°F	12C*†	-20° to 40°C	10°	1°	10°	1°
03*†	25° to 125°F & -5° to 50°C	03F*†	25° to 125°F	03C*†	-5° to 50°C	10°	1°	5°	1/2°
04	0° to 200°F & -20° to 95°C	04F	0° to 200°F	04C	-20° to 95°C	20°	2°	10°	1°
05	20° to 240°F & -10° to 115°C	05F	20° to 240°F	05C	-10° to 115°C	20°	2°	10°	1°
27	0° to 250°F & -20° to 120°C	27F	0° to 250°F	27C	-20° to 120°C	50°	2°	20°	2°
06	50° to 300°F & 10° to 150°C	06F	50° to 300°F	06C	10° to 150°C	50°	2°	20°	2°
07	50° to 400°F & 10° to 200°C	07F	50° to 400°F	07C	10° to 200°C	50°	5°	50°	2°
08	50° to 500°F & 10° to 260°C	08F	50° to 500°F	08C	10° to 260°C	50°	5°	50°	2°

\* Minimum stem length for these ranges is 4".

† Minimum insertion length for these ranges is 3".

See Thermowells for Bimetal Thermometers & Temperature Sensors (page 163-169) for applicable insertion lengths.

# Rear Connect Compact Style

BIMETAL THERMOMETERS



B822Y04 shown

- ▶ 2" Dial Size
- ▶ ± 1.0% Full Scale Accuracy
- ▶ Stainless Steel Case & Stem
- ▶ Hermetically Sealed Design

Designed for minimum space applications, this compact, low-cost thermometer maintains the accuracy, responsiveness, and durability for which the Trerice Line of Bimetal Thermometers is known. The stainless steel case is hermetically sealed.

- Optional features available: Please consult the Options & Accessories Section for details.

Thermowell – Special Order Only

For correct use and application of all Bimetallic thermometers, please refer to the Bimetallic Actuated Thermometer Standard ASME B40.3.

## Specifications

Models	Dial Size
B822Y	2" (Threaded)
B822YP	2" (Plain)
<b>Case</b>	300 stainless steel, hermetically sealed
<b>Stem</b>	<b>B822Y:</b> 300 stainless steel 1/4" diameter <b>B822YP:</b> 300 stainless steel 9/64" diameter
<b>Coil</b>	Bimetallic, silicone dampened on ranges to 300°F (148°C), above 300°F not dampened
<b>Connection</b>	<b>B822Y:</b> Rear, 1/4 NPT <b>B822YP:</b> Rear, unthreaded
<b>Window</b>	Glass
<b>Pointer</b>	Balanced, black finished
<b>Dial Face</b>	Aluminum, silver background with black graduations and markings
<b>External Reset</b>	Yes
<b>Accuracy</b>	±1.0 % Full Scale ASME B40.3 Grade A

## HOW TO ORDER

Sample Order Number: **B822Y 04 05**

Model	Stem Length	Range Code
B822Y	02 2 1/2"	Stem See Standard Ranges
B822YP	04 4" Stem	
	06 6" Stem	

Other stem lengths and ranges available. Please consult factory.

## Standard Ranges

Dual Scale (Fahrenheit & Celsius Range)		Fahrenheit		Celsius	
Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
02	-40° to 160°F & -40° to 70°C	20°	2°	10°	1°
03	25° to 125°F & -5° to 50°C	10°	1°	5°	1/2°
27	0° to 250°F & -20° to 120°C	50°	2°	20°	2°
05	20° to 240°F & -10° to 115°C	20°	2°	10°	1°
08	50° to 500°F & 10° to 260°C	50°	5°	20°	2°

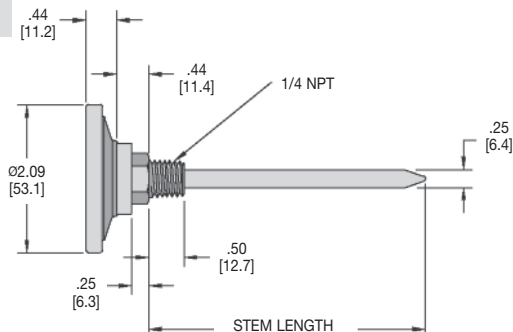
## Approximate Shipping Weight

0.4 lbs [0.18 kg]

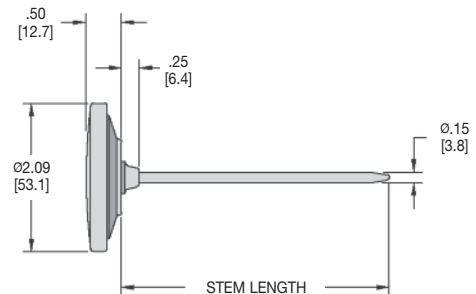
## Additional Notes:

2 1/2" stem for B822YP is pointed.  
Stem for 4" and longer is rounded.

**B822Y**



**B822YP**



All dimensions are nominal. Dimensions in [ ] are in millimeters.



# Pocket Bimetal

BIMETAL THERMOMETERS

Specifications	
<b>Model</b>	<b>Dial Size</b>
<b>B811</b>	<b>1"</b>
<b>Case</b>	300 stainless steel, hermetically sealed
<b>Stem</b>	300 stainless steel, 9/64" diameter
<b>Coil</b>	Bimetallic
<b>Connection</b>	Rear, unthreaded
<b>Window</b>	Acrylic
<b>Pointer</b>	Black finished
<b>Dial Face</b>	White background with black graduations and markings
<b>External Reset</b>	Yes
<b>Accuracy</b>	±5.0 % Full Scale ASME B40.3 Grade C
<b>Approximate Shipping Weight</b>	
0.1 lbs [0.05 kg]	



*B81105 shown*

- ▶ 1" Dial Size
- ▶ ± 5.0% Full Scale Accuracy
- ▶ Stainless Steel Case & Stem
- ▶ Plastic Stem Protector with Pocket Clip

The Trerice **Pocket Bimetal Thermometer** is designed to deliver temperature indications for general and informal testing purposes. This thermometer has a hermetically sealed stainless steel case with a plain connection and comes complete with a plastic stem protector with pocket clip.

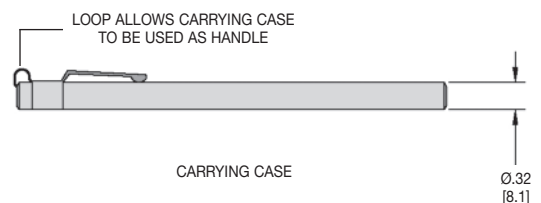
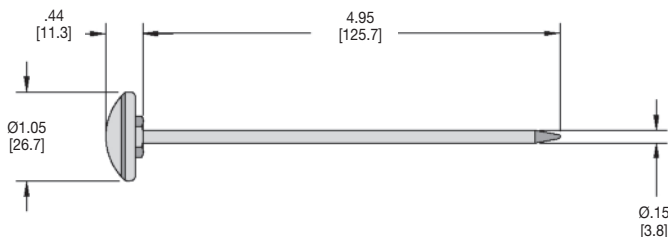
For correct use and application of all bimetallic thermometers, please refer to Bimetallic Actuated Thermometer Standard ASME B40.3.

## HOW TO ORDER

Sample Order Number: **B811 05 13**

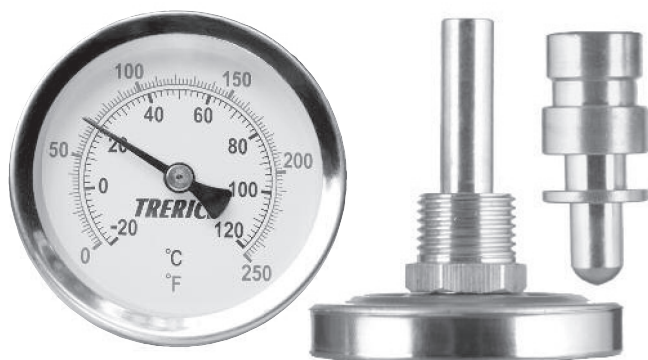
Model	Stem Length	Range Code
<b>B811</b>	<b>05</b> 5" Stem	<b>11</b> -20° to 120°F (20° Figure intervals / 2° Minor Divisions)
		<b>13</b> 0° to 220°F (20° Figure intervals / 2° Minor Divisions)
		<b>15</b> 50° to 500°F (50° Figure intervals / 5° Minor Divisions)
		<b>18</b> 0° to 120°C (10° Figure intervals / 1° Minor Divisions)
		<b>20</b> 0° to 250°C (50° Figure intervals / 2° Minor Divisions)

All dimensions are nominal. Dimensions in [ ] are in millimeters



# Economy Bimetal

BIMETAL THERMOMETERS



- ▶ 2 1/2" and 4" Dial Sizes
- ▶ With Recalibration
- ▶ Multiple Connections

PEB130 Shown

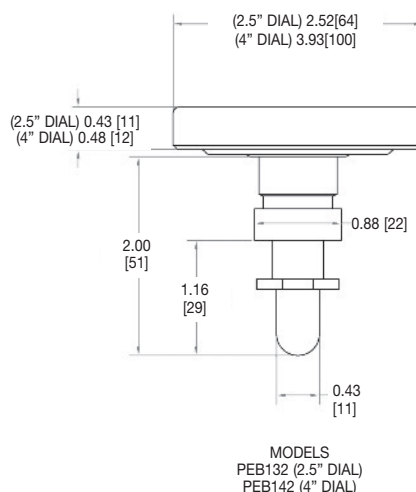
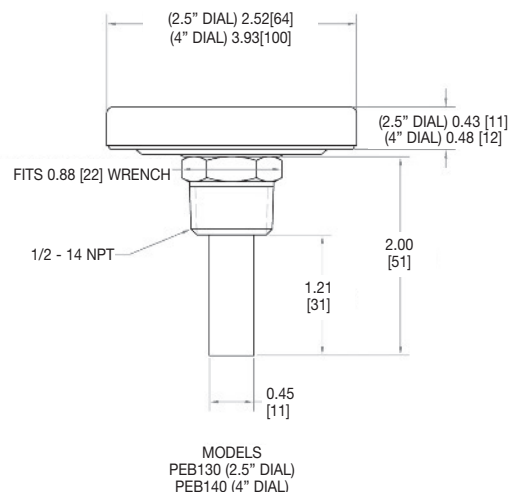
The **Terrice "Econo-Met"** thermometer is both an accurate and cost effective way to measure hot water in hydronic systems. The 2" stem make this the ideal instrument where there are space restrictions. An included 1/2 NPT brass thermowell or brass sweatwell for 3/4 tee provide alternate means of installation.

## Specifications

Models	Dial Size	Connections
PEB130	2 1/2"	1/2 NPT Brass Thermowell Brass Sweatwell for 3/4 tee
PEB140	4"	
PEB132	2 1/2"	
PEB142	4"	

<b>Case</b>	Zinc plated steel
<b>Ring</b>	304 stainless steel
<b>Stem</b>	Brass, 9mm diameter
<b>Coil</b>	Bimetallic
<b>Connection</b>	1/2 NPT brass thermowell or brass sweatwell for 3/4 tee
<b>Window</b>	Glass, hermetically sealed
<b>Pointer</b>	Aluminum, Black Painted
<b>Dial Face</b>	Aluminum, white background with black & red graduations and markings
<b>External Reset</b>	Yes
<b>Accuracy</b>	2% Full Scale
<b>Approximate Shipping Weight</b>	0.3 lbs [0.14 kg]

Part Number	Dial Size	Connection	Range
PEB13027	2 1/2" (63mm)	1/2 NPT Brass Thermowell	0° to 250° F/C
PEB14027	4" (100mm)	1/2 NPT Brass Thermowell	0° to 250° F/C
PEB13227	2 1/2" (63mm)	Brass Sweatwell for 3/4 tee	0° to 250° F/C
PEB14227	4" (100mm)	Brass Sweatwell for 3/4 tee	0° to 250° F/C



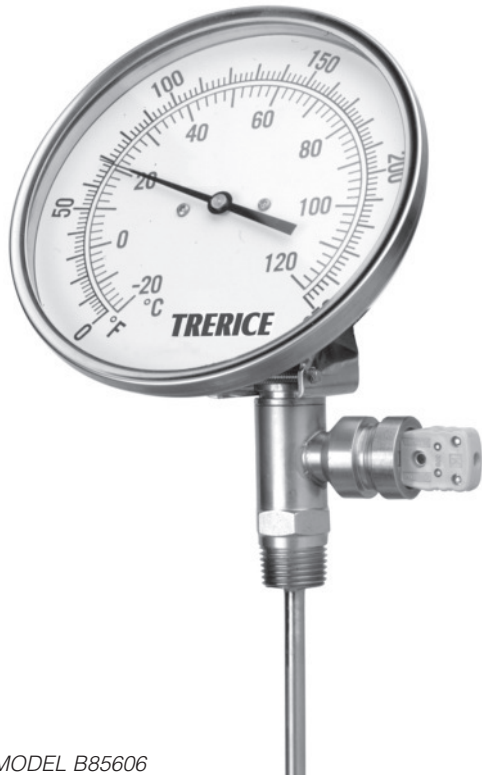
All dimensions are nominal.  
Dimensions in [ ] are in millimeters.



# Bimetal Plus

Integrated Thermocouple or RTD

BIMETAL THERMOMETERS



MODEL B85606

- ▶ 3", 5" Dial Sizes
- ▶ ± 1.0% Full Scale Accuracy
- ▶ Local Indication/Remote Data Acquisition
- ▶ Thermocouple or RTD Sensors available

The Trerice **Bimetal Plus** has all the standard features of the Trerice Bimetal Thermometer, but with a "Plus." The "Plus" being an internally mounted thermocouple or RTD. This allows for remote temperature monitoring while still providing local indication. This dual sensor design eliminates the need for additional instrumentation or connections when designing a system to include both mechanical and electronic temperature sensing.

- Optional features available: Please consult the Options & Accessories Section for details.

**Thermowell**

- For corrosive or pressure applications, use of a thermowell is recommended to prevent damage to the thermometer and facilitate its removal from the process (refer to pages 163-169). For correct use and application of all Bimetallic thermometers, please refer to the Bimetallic Actuated Thermometer Standard ASME B40.3.

## Specifications

Models	Dial Sizes/Stem Styles
B836 B856	3" } Adjustable Angle 5" }
B832 B852	3" } Rear Connection 5" }
<b>Case</b>	300 stainless steel, hermetically sealed
<b>Stem</b>	300 stainless steel, 1/4" diameter
<b>Coil</b>	Bimetallic, silicone dampened on ranges to 300°F (148°C), above 300°F not dampened
<b>Process Connection</b>	Adjustable or rear, 1/2 NPT
<b>Electrical Connection</b>	T/C: Miniature plug RTD: Plug with molded cordset
<b>Window</b>	Double strength glass
<b>Pointer</b>	Balanced, black finished
<b>Dial Face</b>	Aluminum, white background with black and blue graduations and markings
<b>External Reset</b>	Yes
<b>Accuracy</b>	±1.0 % Full Scale ASME B40.3 Grade A

### Approximate Shipping Weight

- B832: 0.9 lbs [0.41 kg]
- B852: 1.4 lbs [0.64 kg]
- B836: 1.3 lbs [0.29 kg]
- B856: 1.7 lbs [0.77 kg]

## HOW TO ORDER

Sample Order Number: **B856 06 05 TCJ**

Model	Stem Length *	Range Code	Sensor Type
B836	04 4" Stem	See Standard Ranges	TCE Type E Thermocouple
B856	06 6" Stem		TCJ Type J Thermocouple
B832	09 9" Stem		TCK Type K Thermocouple
B852	12 12" Stem		TCT Type T Thermocouple
	15 15" Stem		RTC 100Ω RTD
	18 18" Stem		RTM 1000Ω RTD
	24 24" Stem		

Other lengths available: Specify in inches (48" maximum).

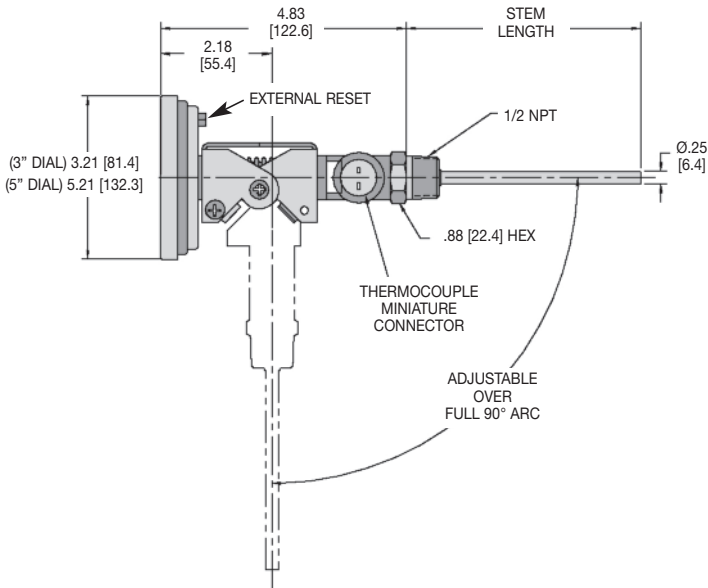
\* Minimum insertion length is 3 1/2".

# Bimetal Plus

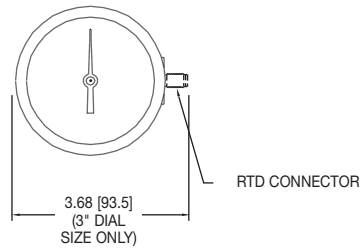
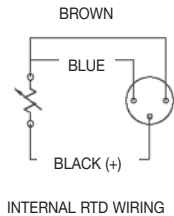
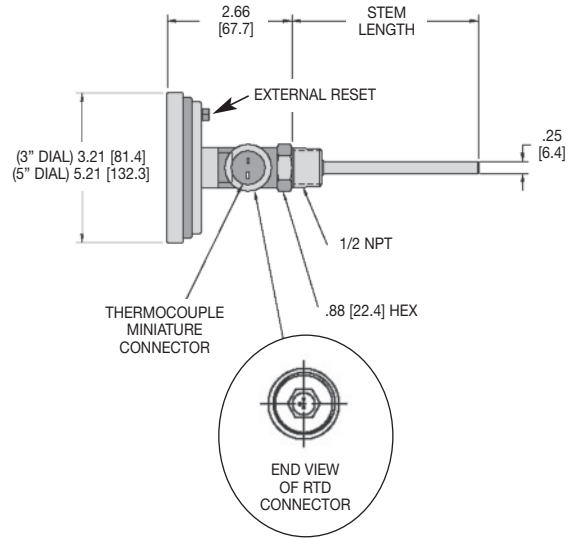
All dimensions are nominal. Dimensions in [ ] are in millimeters

BIMETAL THERMOMETERS

## Adjustable Angle



## Rear Connection



## Standard Ranges\*

Dual Scale (Fahrenheit & Celsius Range)		Fahrenheit Only Range		Celsius Scale Only Range		Fahrenheit		Celsius	
Range Code	Range	Range Code	Range	Range Code	Range	Figure Intervals	Minor Divisions	Figure Intervals	Minor Divisions
01	-100 to 100°F & -75° to 40°C	01F	-100° to 100°F	01C	75° to 40°C	20°	2°	10°	1°
02	-40° to 160°F & -40° to 70°C	02F	-40° to 160°F	02C	-40° to 70°C	20°	2°	10°	1°
12	0° to 100°F & -20° to 40°C	12F	0° to 100°F	12C	-20° to 40°C	10°	1°	10°	1°
03	25° to 125°F & -5° to 50°C	03F	25° to 125°F	03C	-5° to 50°C	10°	1°	5°	1/2°
04	0° to 200°F & -20° to 95°C	04F	0° to 200°F	04C	-20° to 95°C	20°	2°	10°	1°
05	20° to 240°F & -10° to 115°C	05F	20° to 240°F	05C	-10° to 115°C	20°	2°	10°	1°
27	0° to 250°F & -20° to 120°C	27F	0° to 250°F	27C	-20° to 120°C	50°	2°	20°	2°
06	50° to 300°F & 10° to 150°C	06F	50° to 300°F	06C	10° to 150°C	50°	2°	20°	2°
08	50° to 500°F & 10° to 260°C	08F	50° to 500°F	08C	10° to 260°C	50°	2°	50°	2°

\* Minimum insertion length for all ranges is 3 1/2".

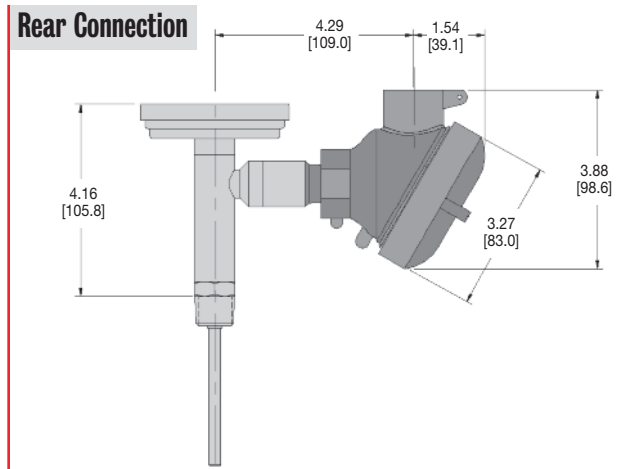
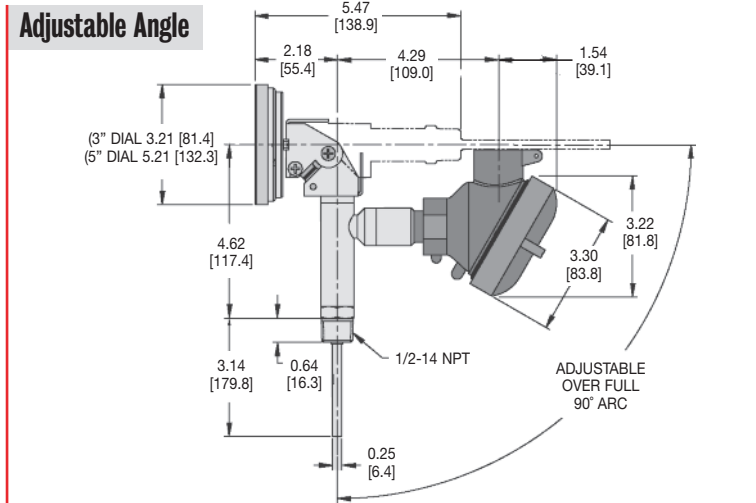
See Thermowells for Bimetal Thermometers & Temperature Sensors (page 163-169) for applicable insertion lengths.

# Bimetal Plus

## Options & Accessories

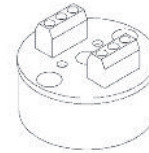
### Connection Head with Terminal Block or Transmitter

The connection head is designed to provide a weatherproof, yet accessible conduit connection, and is used to house a terminal connection block or Trerice TRT30 Temperature Transmitter. The head is available with a screw cover (cast aluminum or stainless steel) or a flip cover (polypropylene), and includes a 3/4 NPT conduit connection.

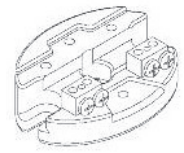


The terminal block provides an electrical hook-up point within the connection head, allowing for quick and easy attachment of extension wiring. The Terminal Block is available with either a 2-wire (thermocouple) or 3-wire (RTD) connection. The Trerice TRT30 Series Temperature Transmitter will convert a thermocouple or output signal to a 2-wire 4-20 mA signal, thus eliminating electrical interference and allowing the signal to be transmitted over long distances. These units are specifically designed for installation into the connection head.

**Transmitter**



**Terminal Block**



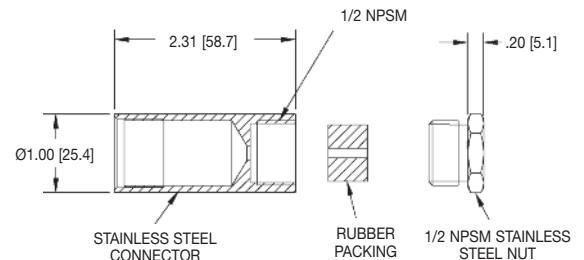
Specifications					
Model	Input	Accuracy	Adjustment Range	Maximum Output Load	Output Signal
TRT30	Type J, K or T Thermocouple or 100Ω Platinum RTD	±0.1% of input span	±35% for both zero and span	Thermocouple: R max=(V supply-12V)/20 mA RTD: R max=(V supply-10V)/20 mA	4-20 mA

#### Ordering Codes

Connection Head	Terminal Block		Transmitter	
	Thermocouple	RTD	Thermocouple	RTD
Aluminum screw cover	ABT	ABR	ATT	ATR
Polypropylene flip cover	PBT	PBR	PTT	PTR
Stainless steel screw cover	SBT	SBR	STT	STR

### Weatherproofed Conduit Connection (WCC)

The conduit connection allows the Trerice Bimetal Plus Thermometer to be mounted directly to conduit piping, or used in applications where sprays and washes may come in contact with the electrical connection. This option consists of a stainless steel conduit connection tube, a packing grommet and a stainless steel connection fitting. Note: The Bimetal Plus with RTD Sensor does not require this option for weatherproof protection, as the RTD connection and cable are sealed for outdoor use. Please order using Option Code **WCC** (weatherproofed conduit connection).



### How to Order

Specify the Optional Feature Code at the end of the Instrument Ordering Code. Sample Order Number: **B856 06 05 TJC WCC**

### Windows (PLW/SGW)

Plastic (Acrylic) Windows are optionally available with ranges up to 500°F (260°C) on 3" and 5" dial size bimetal thermometers. Laminated Safety Glass Windows are available on 3" and 5" dial size bimetal thermometers (except B831X Series). Please order using Option Code **PLW** (plastic window) or **SGW** (safety glass window).

### Maximum Registering Pointer (MAX)

Maximum Registering Pointers can be furnished on the B832 Series Bimetal Thermometers (except Range Codes 03, 03C, 03F). This pointer is designed to indicate the maximum or minimum temperature attained by the process being measured since the pointer was last reset. The pointer assembly is installed to a plexiglass window, with an external knob for manually resetting the pointer. Please order using Option Code **MAX** (maximum registering pointer).

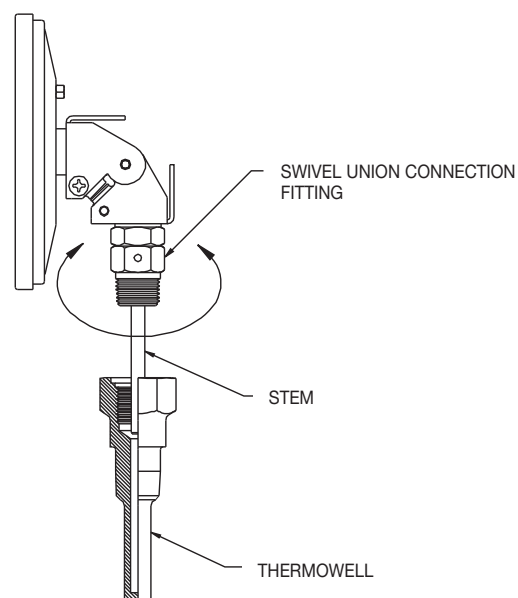


### Silicone Liquid Fill (SLF)

Tertrice Bimetal Thermometers (except B831X and B81105 Series) with temperature ranges up to 500°F (260°C) can be silicone liquid filled to reduce pointer oscillation resulting from application vibration. This feature also acts as a permanent lubricant to the moving parts of the instrument. Please order using Option Code **SLF** (silicone liquid fill). This feature is not available with 5" plastic window.

### Swivel Union Connection (SWV)

Tertrice Series B832, B836, B852 and B856 Bimetal Thermometers are available with an optional swivel union connection. This feature allows the thermometer to be rotated to the desired reading position before being tightened into the process connection. Thermometers with the swivel connection must be installed with a thermowell. Please order using Option Code **SWV** (swivel union connection).



# Options & Accessories

## Bimetal Thermometers

### Silicone Free Construction (SFC)

For applications where silicone is not permitted within the process (i.e., paint systems), Trerice Bimetal Thermometers (except B831X and B81105) can be manufactured to be silicone free. Bimetal Thermometers (except B831X and B81105) with ranges above 300°F are supplied standard as “silicone free.” Please order using Option Code **SFC** (silicone free construction).

### Flanges and Hubs

Trerice offers a variety of instrument mounting accessories. Please consult the table below for mounting flange and adapter hub item numbers.

#### Mounting Flanges and Adapter Hubs

Description	Material	Instrument Connection	Mounting Connection	Item Number
Mounting Flange	Zinc plated steel	1/2 NPT	2 3/8" bolt circle, 3 3/8" O.D.	065-0015
Swivel Flange	Zinc plated steel with brass hub	1/2 NPT	2 5/16" slotted bolt circle 3" O.D.	065-0032A
Adapter Hub	Brass	1/2 NPT Female	3/4 NPT Male	024-0039
Adapter Hub	Stainless steel	1/2 NPT Female	3/4 NPT Male	024-0063

### Identification Tags

Trerice Identification Tags are available in a variety of materials. Please consult the table below for tag item numbers.

Tag Material	Maximum No. of Characters	Item Number
Aluminum	80	152-0015.2A
Paper	90	152-0016A
Stainless steel	80	152-0015A
Stainless steel foil	25	152-0018

### How to Order

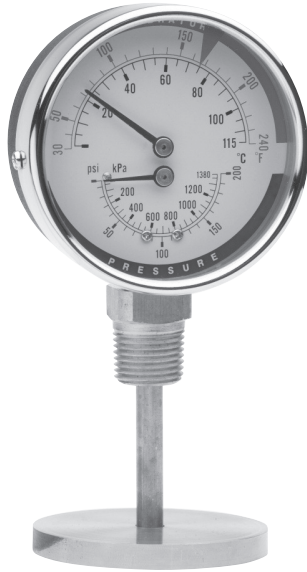
Specify the Optional Feature Code at the end of the Instrument Ordering Code.

Sample Order Number: **B856 06 05** **SLF**



# Tridicator

2 1/2" & 3" • Steel Case



- ▶ 2 1/2" & 3" Dial Size
- ▶ 3% Temperature Accuracy
- ▶ 3-2-3% Pressure Accuracy
- ▶ Ranges are compliant with ASME Boiler Code Section IV HG-612

Trerice Tridicators are designed specifically for use with hot water boilers. Because Tridicators provide both temperature and pressure measurement, only one access point to the boiler is required. Available in 2 1/2" and 3" dial sizes with rear and bottom connections, there is a Trerice Tridicator to suit your needs.

Part Number	Dial Size	Connection	Range
PTC14001	2 1/2" (63mm)	1/4 NPT Rear	30° to 250° F/C & 0 to 75 psi/kPa
PTC14007	2 1/2" (63mm)	1/4 NPT Rear	50° to 320° F/C & 0 to 75 psi/kPa
PTC14201	2 1/2" (63mm)	1/4 NPT Rear w/lag	30° to 250° F/C & 0 to 75 psi/kPa
PTC14401	3" (76mm)	1/2 NPT Bottom	30° to 250° F/C & 0 to 75 psi/kPa
PTC14403	3" (76mm)	1/2 NPT Bottom	30° to 250° F/C & 0 to 100 psi/kPa
PTC14405	3" (76mm)	1/2 NPT Bottom	30° to 250° F/C & 0 to 200 psi/kPa
PTC14409	3" (76mm)	1/2 NPT Bottom	50° to 250° F/C & 0 to 250 psi/kPa
PTC14601	3" (76mm)	1/2 NPT Rear	30° to 250° F/C & 0 to 75 psi/kPa
PTC14603	3" (76mm)	1/2 NPT Rear	30° to 250° F/C & 0 to 100 psi/kPa
PTC14605	3" (76mm)	1/2 NPT Rear	30° to 250° F/C & 0 to 200 psi/kPa
PTC14609	3" (76mm)	1/2 NPT Rear	50° to 250° F/C & 0 to 250 psi/kPa

## Specifications

Models	Dial Sizes	Case Style
140	2 1/2" (63mm)	Rear Connection
142	2 1/2" (63mm)	Rear Connection with lag
144	3" (76mm)	Bottom Connection
146	3" (76mm)	Rear Connection

**Wetted Parts** Bronze tube, brass socket

**Connection** 2 1/2": 1/4 NPT  
3": 1/2 NPT

**Case Material** Steel, black painted

**Window** 2 1/2": Acrylic, screw on  
3": Glass

**Pointers** Steel, black painted

**Ring** 2 1/2": Plastic, screwed on  
3": Steel

**Temperature Accuracy** 3%, Full Scale

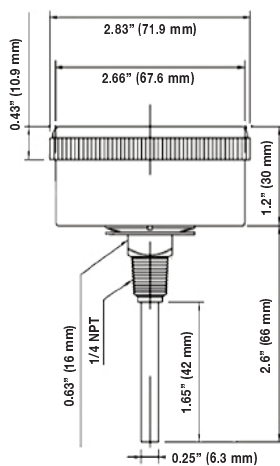
**Pressure Accuracy** 3-2-3% Grade B

**Maximum Operating Pressure** 2/3 of full scale range

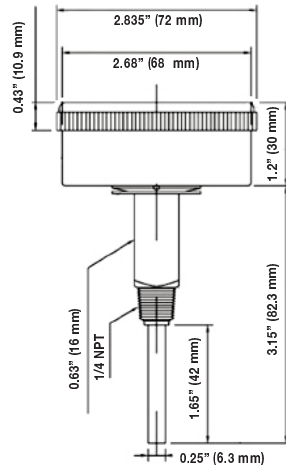
### Approximate Shipping Weight

2 1/2": 0.3 lbs [0.14 kg]  
3": 0.55 lbs [0.25 kg]

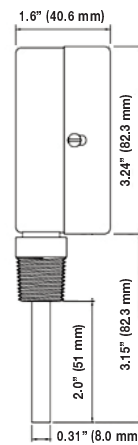
BIMETAL THERMOMETERS



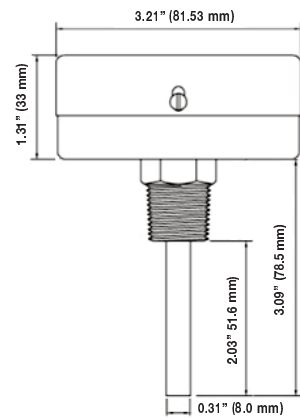
Model 140



Model 142



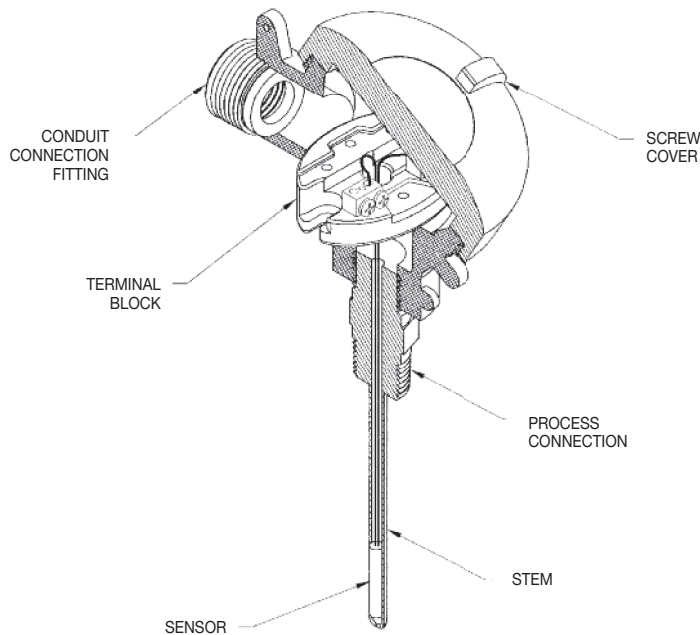
Model 144



Model 146

# Electronic Temperature Sensors

## DESIGN & OPERATION



### Description

A temperature sensor is a device, typically a thermocouple or RTD, that provides for temperature measurement through an electrical signal. A thermocouple (T/C) is made from two dissimilar metals that generate electrical voltage in direct proportion to changes in temperature. An RTD (Resistance Temperature Detector) is a variable resistor that will change its electrical resistance in direct proportion to changes in temperature in a precise, repeatable and nearly linear manner.

### Principles of Operation

#### Thermocouples

A thermocouple is made from two dissimilar metal wires. The wires are joined together at one end to form a measuring (hot) junction. The other end, known as the reference (cold) junction, is connected across an electronic measurement device (controller or digital indicator). A thermocouple will generate a measurement signal not in response to actual temperature, but in response to a difference in temperature between the measuring and reference junctions. A small ambient temperature sensor is built into the electronic measuring device near the point where the reference junction is attached. The ambient temperature is then added to the thermocouple differential temperature by the measuring device in order to determine and display the actual measured temperature.

Only two wires are necessary to connect a thermocouple to an electrical circuit; however, these connecting wires must be made from the same metals as the thermocouple itself. Adding wire made from other materials (such as common copper wire) will create new measuring junctions that will result in incorrect readings.

#### RTDs

To greater or lesser degrees, all electrical conducting materials have some amount of resistance to the flow of electricity. When a known electric voltage is applied across a conductor, the resistance varies based on the temperature of the conductor. This resistance can be measured and will correspond to a specific temperature. While various elements are affected by temperature in different ways, platinum is commonly used in an RTD due to its purity, linearity and stability over a wide range of temperatures. An electronic readout device, such as a controller or digital indicator designed to measure resistance, is required for use with RTD sensors.

Only two standard copper wires are necessary to connect an RTD to an electrical circuit, however, these connecting wires are also subject to small changes in resistance based on surrounding temperature. For this reason an "extra" third hookup wire is built into most RTDs as a compensation wire to allow the controller or display unit to correct for these variations.

## Selecting an Electronic Temperature Sensor

All Trerice Thermocouples and RTDs should be carefully selected to meet the demands of the particular application. The information contained in this catalog is only offered as a guide to assist in making the proper selection. Improper application may cause failure of the sensor, resulting in possible personal injury or property damage.

To ensure minimum response time, Trerice Heat Transfer Paste should be applied to the sensing portion of the stem before installation into a thermowell. 1/2 oz. tube: Item No. 107-0001

### Style

---

Trerice Temperature Sensors are available in a variety of styles. The weather proofed screw cover style provides an electrical conduit connection and can be used to house a transmitter (optional). For open system sensing, a non-threaded style is offered. This design is provided with integrated leadwire and can be Teflon covered to protect the stem and leadwire against corrosive environments. A standard plug with a mating jack may also be furnished.

### Stem (Sheath)

---

All Trerice Thermocouples and RTDs are furnished with a 316 stainless steel stem, with the internal wiring packed in powdered ceramic. The screw head cover style is available in two stem types: welded and spring loaded. The welded stem is suitable for use in liquid applications. The spring loaded stem is designed to bottom out inside a thermowell, providing maximum heat sensitivity. Spring loaded stems are not pressure tight and may allow process media to escape; therefore, they must always be installed in a thermowell.

### Insertion (U) Length

---

The insertion (U) length of a thermocouple or RTD represents its depth into the process vessel or thermowell. Trerice Thermocouples and RTDs are available in standard U-lengths from 2" to 24". Other lengths are available upon special order; please consult factory.

### Measuring (Hot) Junction

---

Trerice Thermocouples are available in Type J and Type K, and use ceramic insulation to provide an ungrounded measuring junction. Other thermocouple types may be available, please consult factory.

Trerice RTDs are a platinum, 3-wire design, and are furnished with either 100 $\Omega$  or 1000 $\Omega$  resistance at 32°F (0°C), and a temperature coefficient of 0.00385  $\Omega/\Omega/^\circ\text{C}$ .

### Connection (Termination)

---

Trerice Thermocouples are provided with terminal block (screw cover head), mating jack, or integrated leadwire connections. The terminal block connection has no leadwire, therefore extension wire must be attached and routed to the electronic measuring device. Thermocouple extension wire must be identical to the thermocouple type, otherwise multiple measuring junctions will be made, causing inaccurate temperature readings.

Trerice RTDs are provided with a terminal block (screw cover head) or integrated leadwire connection. The terminal block connection has no leadwire, therefore extension wire must be attached and routed to the indicator or controller.

# Electronic Temperature Sensor

Connection Head Type • RTD or Thermocouple Element

ELECTRONIC TEMPERATURE SENSORS



- ▶ Thermocouple or RTD
- ▶ Cast Aluminum, Polypropylene or Stainless Steel Head
- ▶ Weather Proof
- ▶ Welded or Spring Loaded Stem

## Specifications

Models	Sensor Type
TJD	Type J T/C
TKD	Type K T/C
TDD	100Ω RTD
TMD	1000Ω RTD
<b>Hot Junction:</b> T/C: Ungrounded RTD: Platinum, 3-wire	
<b>Stem</b>	316 stainless steel 1/4" diameter
<b>Insulation</b>	Ceramic
<b>Head</b>	Cast aluminum, polypropylene or stainless steel
<b>Process Connection</b>	1/2 NPT welded or spring loaded
<b>Conduit Connection</b>	3/4 NPT female

## Approximate Shipping Weight

1.1 lbs [0.50 kg]

TJDZ04UWA shown

The Tertrice **Connection Head** is available with both Type J and Type K Thermocouples, as well as RTD sensors. The weatherproofed head provides a conduit connection and is available in cast aluminum (screw cover), polypropylene (flip cover) and stainless steel (screw cover). The stem is either welded directly to the 1/2 NPT threaded connection, or is spring loaded to provide maximum sensitivity. The spring loaded stem must always be installed in a thermowell.

- Extension wire and transmitter accessories are also available. Please consult the Temperature Sensor Accessories Section for details.
- For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the sensor and facilitate its removal from the process. To prevent leakage of the process media, spring loaded sensors must always be installed in a thermowell. (Refer to pages 163-169)

## HOW TO ORDER

Sample Order Number: **TJD Z 04 U W A**

Model	Stem Style	Stem Length	Hot Junction	Connection	Head Material
TJD Type J T/C TKD Type K T/C TDD 100Ω RTD TMD 1000Ω RTD	Z 316SS, 1/4 O.D.	02 2 1/2" Stem 04 4" Stem 06 6" Stem 09 9" Stem 12 12" Stem	U Ungrounded (T/C) D 3 Wire (RTD)	S Spring Loaded, 1/2 NPT W Welded, 1/2 NPT	A Aluminum P Polypropylene S Stainless Steel

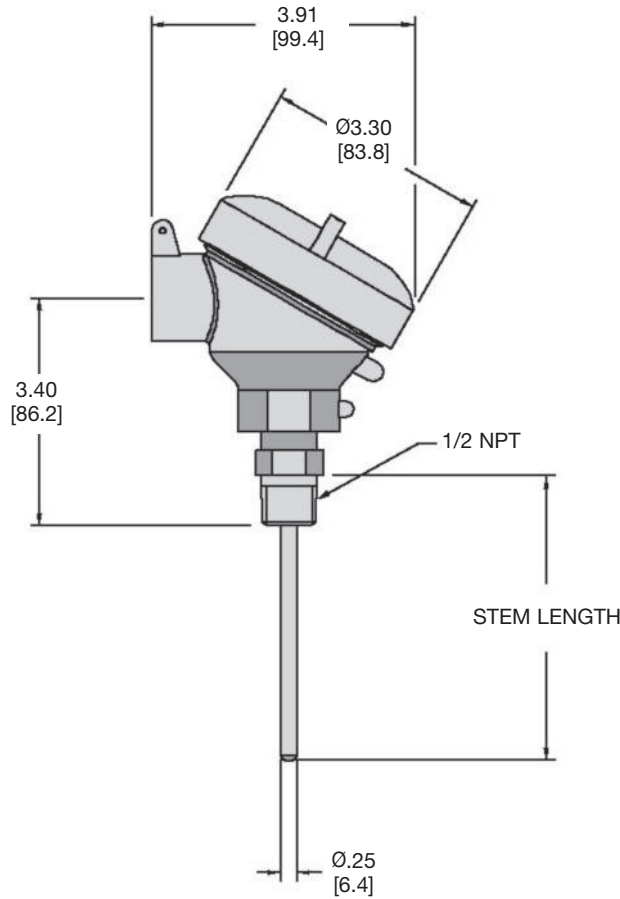
Other stem lengths available: Specify in inches (24" maximum).

# Electronic Temperature Sensor

Connection Head Type

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

ELECTRONIC TEMPERATURE SENSORS



## Sensor Specifications

### Thermocouple

Type	Color Code	Positive Lead	Negative Lead	Temperature Range
J	Black	Iron* (Fe) [white]	Constantan (Cu-Ni) [red]	32° to 1382°F (0° to 750°C)
K	Yellow	Nickel-Chromium (Ni-Cr) [yellow]	Nickel-Aluminum* (Ni-Al) [red]	32° to 2282°F (0° to 1250°C)

\*magnetic lead

### RTD

Type	Material	Resistance	Temperature Coefficient	Temperature Range
D	Platinum (Pt)	100Ω	$\alpha = 0.00385 \Omega/\Omega/^\circ\text{C}$	-50° to 700°F (-45° to 370°C)
M	Platinum (Pt)	1000Ω	$\alpha = 0.00385 \Omega/\Omega/^\circ\text{C}$	-50° to 700°F (-45° to 370°C)

# Electronic Temperature Sensor

Integral Leadwire • RTD or Thermocouple Element

ELECTRONIC TEMPERATURE SENSORS



- ▶ Thermocouple or RTD
- ▶ Self-Contained Design
- ▶ Plain or Teflon Covered Stem

TJDZ06UR120 shown

Trerice **Integral Leadwire Sensors** are available with an RTD, or a Type J or K Thermocouple. The stem transition includes a spring relief to prevent damage to the leadwire. A Teflon covered sensor and leadwire is offered for use with open tanks or corrosive process media (the Teflon covered sensor does not include a spring relief).

For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the sensor and facilitate its removal from the process. (Refer to pages 163-169)

## Specifications

Models	Sensor Type
TJD	Type J T/C
TKD	Type K T/C
TDD	100Ω RTD
TMD	1000Ω RTD

**Hot Junction:** T/C: Ungrounded  
RTD: Platinum, 3-wire

**Stem** 316 stainless steel  
1/4" diameter

**Insulation** Ceramic

**Termination** Integral leadwire with spring relief or Teflon sheath  
(450°F / 230°C maximum)

**Leadwire Jacketing** T/C: Fiberglass  
RTD: Teflon

### Approximate Shipping Weight

0.5 lbs [0.23 kg]

## HOW TO ORDER

Sample Order Number: **TDD Z 06 D T 024**

Model	Stem Style	Stem Length	Hot Junction	Connection Style	Leadwire Length
TJD Type J T/C TKD Type K T/C TDD 100Ω RTD TMD 1000Ω RTD	Z 316SS, 1/4 O.D.	02 2 1/2" Stem 04 4" Stem 06 6" Stem 09 9" Stem 12 12" Stem	U Ungrounded (T/C) D 3 Wire (RTD)	R Integral Leadwire with Relief Spring T Integral Leadwire with Teflon Sheath	Specify Length in inches (i.e., 10 feet=120)

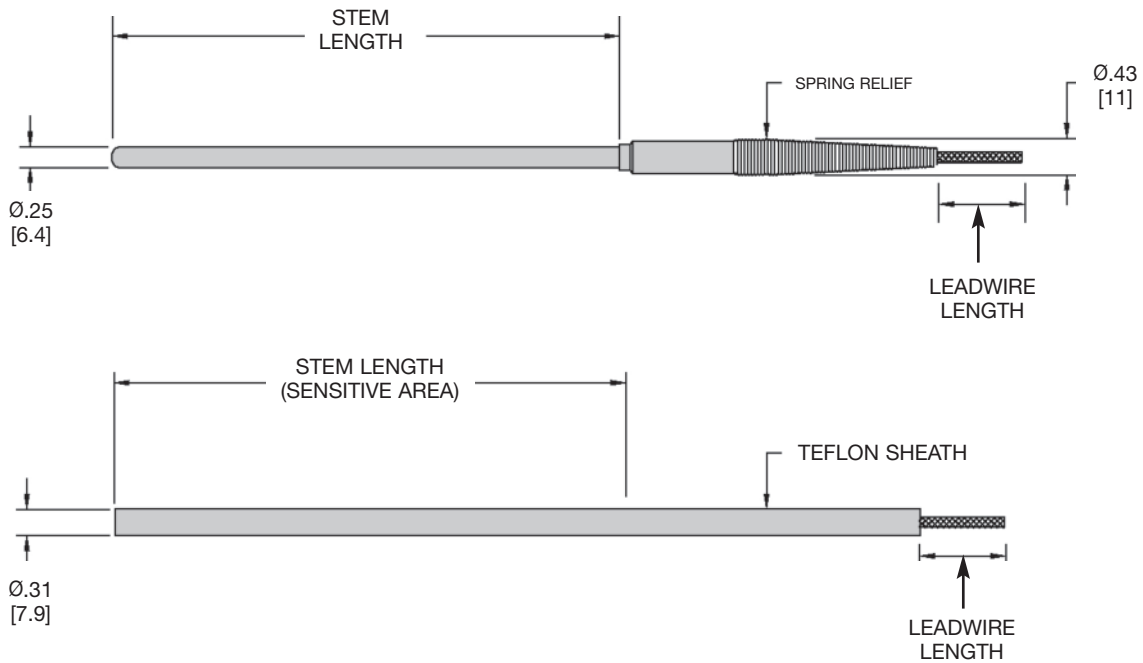
Other stem lengths available: Specify in inches (24" maximum).

# Electronic Temperature Sensor

Integral Leadwire

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

ELECTRONIC TEMPERATURE SENSORS



## Sensor Specifications

### Thermocouple

Type	Color Code	Positive Lead	Negative Lead	Temperature Range
J	Black	Iron* (Fe) [white]	Constantan (Cu-Ni) [red]	32° to 1382°F (0° to 750°C)
K	Yellow	Nickel-Chromium (Ni-Cr) [yellow]	Nickel-Aluminum* (Ni-Al) [red]	32° to 2282°F (0° to 1250°C)

\* Magnetic lead

### RTD

Type	Material	Resistance	Temperature Coefficient	Temperature Range
D	Platinum (Pt)	100Ω	$\alpha = 0.00385 \Omega/\Omega/^\circ\text{C}$	-50° to 700°F (-45° to 370°C)
M	Platinum (Pt)	1000Ω	$\alpha = 0.00385 \Omega/\Omega/^\circ\text{C}$	-50° to 700°F (-45° to 370°C)

Note: Teflon covered sensors are limited to 450°F (232°C).

# Electronic Temperature Sensor

Plug with Mating Jack • Thermocouple Element

ELECTRONIC TEMPERATURE SENSORS



- ▶ Type J or K Thermocouple
- ▶ Color-coded Plug
- ▶ Polarized Mating Jack

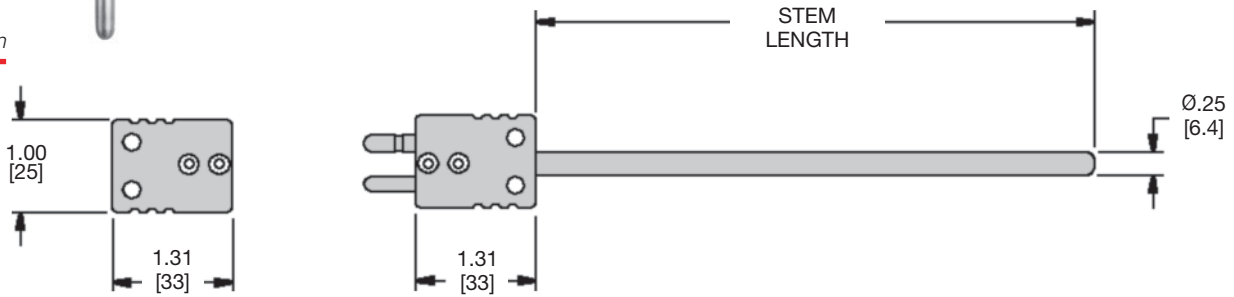
The **Trerice Plug with Mating Jack Sensor** is available with a Type J or Type K Thermocouple. This sensor is of a simple design, and provides for easy installation or replacement. The plug is color coded by thermocouple type, and the mating jack is polarized to ensure proper installation.

Extension wire is also available. Please consult the Temperature Sensor Accessories Section for details.

## Specifications

Models	Sensor Type
TJD	Type J T/C
TKD	Type K T/C
<b>Hot Junction</b> Ungrounded	
<b>Stem</b>	316 stainless steel 1/4" diameter
<b>Insulation</b>	Ceramic
<b>Connection</b>	Standard size plug with mating jack
<b>Plug</b>	Quick Disconnect, color coded
<b>Approximate Shipping Weight</b>	
0.3 lbs [0.14 kg]	

TJDZ06UP shown



## Sensor Specifications

### Thermocouple

Type	Color Code	Positive Lead	Negative Lead	Temperature Range
J	Black	Iron* (Fe) [white]	Constantan (Cu-Ni) [red]	32° to 1382°F (0° to 750°C)
K	Yellow	Nickel-Chromium (Ni-Cr) [yellow]	Nickel-Aluminum* (Ni-Al) [red]	32° to 2282°F (0° to 1250°C)

\*magnetic lead

NOTE: Plug is limited to 400° F (205°C)

## HOW TO ORDER

Sample Order Number: **TKD Z 06 U P**

Model	Stem Style	Stem (Length)	Hot Junction	Connection Style
TJD Type J T/C TKD Type K T/C	Z 316SS, 1/4 O.D.	02 2 1/2" Stem 04 4" Stem 06 6" Stem 09 9" Stem 12 12" Stem	U Ungrounded	P Plug with Mating Jack

Other stem lengths: Specify in inches (24" maximum).



# Options & Accessories

## Temperature Sensors

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

### TRT30 Series Temperature Transmitter

The Trerice TRT30 Series Loop Powered Temperature Transmitter will convert a thermocouple or RTD signal to a 4-20 mA signal. The signal conversion will prevent electrical interference and allow the signal to be transmitted over long distances. The transmitter is designed for installation into the Connection Head Sensor.

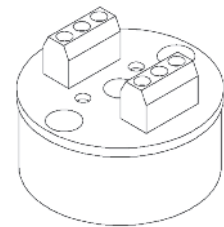
#### Specifications

Model	Input	Accuracy	Adjustment Range	Maximum Output Load	Output Signal
TRT30	Type J, K or T Thermocouple, or 100Ω platinum RTD	±0.1% of input span	±35% for both zero and span	Thermocouple: R max=(V supply-12V)/20 mA RTD: R max=(V supply-10V)/20 mA	4-20 mA

#### HOW TO ORDER

Sample Order Number **TRT30 TC 05**

Model	Input	Range
TRT30	<b>TC</b> Type J, K and T Thermocouple <b>RTD</b> 100 Ω Platinum RTD	Order using "Range Code" from Page 129 (e.g., Range Code: 05, Range: 20° to 240°F and -10° to 115°C, etc.)



### Thermocouple and RTD Extension Wire

Trerice Extension Wire for use Type J and K Thermocouples and RTDs is available in both 16 AWG and 20 AWG, and is covered with PVC insulation and jacketing. The wires are color coded to ensure proper installation. Other wire may be available, please consult factory. Please note the recommended maximum lengths listed below.

#### Recommended Maximum Length

Sensor Wire Type	Wire Gauge	
	20 AWG	16 AWG
Type J Thermocouple	100'	250'
Type K Thermocouple	100'	250'
3-Wire Platinum RTD	250'	500'

#### HOW TO ORDER

Sample Order Number: **TAJ 16 P 0100**

Sensor Wire Type	Wire Gauge	Insulation	Length
<b>TAJ</b> Type J Thermocouple	<b>16</b> 16 AWG	<b>P</b> PVC	Specify Length in Feet (i.e., 100' = 0100)
<b>TAK</b> Type K Thermocouple	<b>20</b> 20 AWG		
<b>TAD</b> 3-Wire Platinum RTD			

# Digital Temperature Indicator TRD16

ELECTRONIC TEMPERATURE SENSORS

- ▶ 96 mm x 48 mm (1/8 DIN)
- ▶ Multi-inputs and Multi-Ranges
- ▶ Large 20mm Red LED Display
- ▶ 2 Times per Second Sampling Code



The Trerice **TRD16 Digital Indicator** is a superb choice when remote digital indication is required. The 2 times per second sampling cycle provides accurate, reliable monitoring, and the large LED display provides easy readability. The TRD16 can be used with any Trerice RTD or Thermocouple. Size is 96 mm x 48 mm (1/8 DIN).

The TRD16 Digital Indicator is specifically designed to interface with the TRS16 Selector Switch by means of an included snap bracket.

## Specifications

**Model**  
TRD16

**Display** 4 digit, 20 mm red LED  
Sampling Cycle: 2x/second

**Input** **Multi** (switchable between)  
Thermocouple: B, R, S, K, E, J, T, N;  
or RTD: Platinum, 100Ω, 3-wire  
Voltage (mV, V): 0-10 mVDC,  
0-5 VDC, 0-10 VDC, 1-5 VDC

**Current:** 4-20 mA

### Power Requirements

Supply Voltage:  
100-240 VAC/50/60 Hz,  
24 VAC/VDC (option)

Consumption:  
11 VA (AC) Max  
7 W (DC) Max

**Accuracy** ±0.3% + 1 digit of measuring range

### Ambient Temperature

Maximum: 122°F (50°C)  
Minimum: 14°F (-10°C)

**Humidity** Maximum: 90% RH  
Non-condensing

### Approximate Shipping Weight

0.6 lbs [0.27 kg]

## HOW TO ORDER

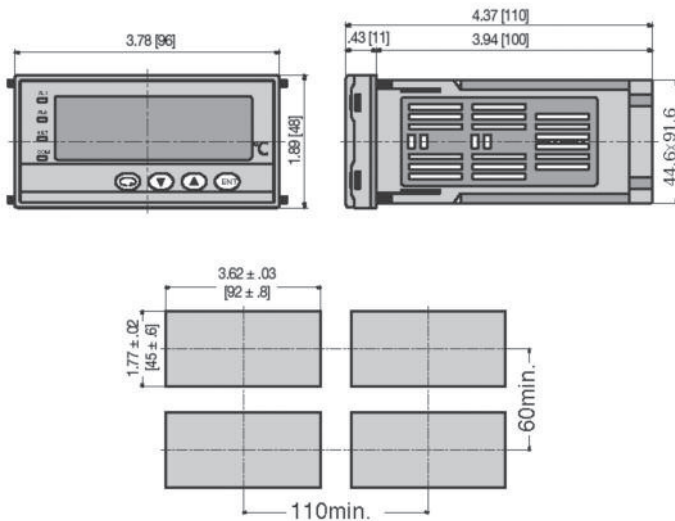
Sample Order Number: **TRD16 8 90 0 4 0**

Model	Input	Power Supply	Alarm	Analog Output	Communication Function
TRD16	8 Multi (T/C, RTD mV, V) 4 mA	90 100-240 VAC 50/60 Hz	0 None	0 None	0 None
		08 24 VAC or 24 VDC 50/60 Hz	1 High/Low	3 0 to 10 mVDC 4 4 to 20 mA 6 0 to 10 VDC	5 RS485 7 RS232C

# Digital Temperature Indicator TRD16

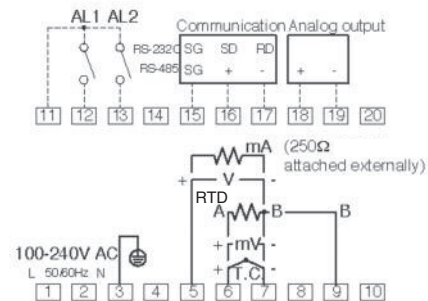
All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

## EXTERNAL DIMENSIONS



## PANEL CUTOUT DIMENSIONS

## TERMINAL ARRANGEMENT



ELECTRONIC TEMPERATURE SENSORS

## Programmable Inputs and Ranges

### Thermocouple Input

Code	Type	Range (°C)	Range (°F)
01	B	0 ~1800	0 ~ 3300
02	R	0 ~1700	0 ~ 3100
03	S	0 ~1700	0 ~ 3100
04	K	-199.9 ~ 800.0	-300 ~ 1500
05	K	0 ~1200	0 ~ 2200
06	E	0 ~ 700	0 ~ 1300
07	J	0 ~ 600	0 ~ 1100
08	T	-199.9 ~ 300.0	-300 ~ 600
09	N	0 ~1300	0 ~ 2300
10	*1 U	-199.9 ~ 300.0	-300 ~ 600
11	*1 L	0 ~ 600	0 ~ 1100
12	*2 WRe5-26	0 ~ 2300	0 ~ 4200

### RTD Input

31	Pt100Ω	-200 ~ 600	-300 ~ 1100
32	Pt100Ω	-100.0 ~ 100.0	-150.0 ~ 200.0

### Voltage Input

Code	Type	Range (°C)	Range (°F)
71	0~10mV	Initial value: 0.0~100.0	Thermocouple B, R, S, K, E, J, T, N: JIS/ANSI/IEC
81	0~ 5V	Scaling setting range: -1999~9999	*1 Thermocouple U, L: DIN 43710
82	1~ 5V	Span: 10~5000 counts	*2 Thermocouple WRe5-26: Made of Hoskins
83	0~10V		
Current Input			
95	4~20mA*		

\*Uses supplied shunt resistor.

Input and Range Codes are not required for ordering, but are used for field programming.

**WARNING:** The TRD16 Indicator is designed for the control of temperature, humidity and other physical values of general industrial equipment. (It is not to be used for any purpose which regulates the prevention of serious effects on human life or safety.)

**CAUTION:** If the possibility of loss or damage to your system or property as a result of failure of any part of the process exists, proper safety measures must be made before the instrument is put into use so as to prevent the occurrence of trouble.

# Indicator Selector Switch TRS16

- ▶ 96 mm x 48 mm (1/8 DIN)
- ▶ Two Wire Type Switching Circuit
- ▶ Six-Point Switching
- ▶ Push Button Operation



The Trerice **TRS16 Selector Switch** is the ideal accompaniment for the Trerice TRD16 Digital Indicator. The TRS16 allows economical measurement of multiple individual processes (using the same thermocouple type) while requiring only one digital indicator. The push buttons indicate which process measurement is currently displayed on the indicator. Size is 96 mm x 48 mm (1/8 DIN).

The TRS16 Selector Switch is specifically designed to interface with the TRD16 Digital Indicator by means of an included snap bracket.

## Specifications

**Model**  
TRS16

**Input** Thermocouple

**Switching Method**  
Push-button switching

**Switching Points**  
Six (all switching points must use identical sensors)

**Switching Circuits**  
Two wire type

**Contact Rating**  
Voltage: 30 V maximum, AC/DC  
Current: 100 mA maximum  
Resistance: 300 mΩ (0.3 ohm) maximum/circuit

**Ambient Temperature**  
Maximum: 122°F (50°C)  
Minimum: 14°F (-10°C)

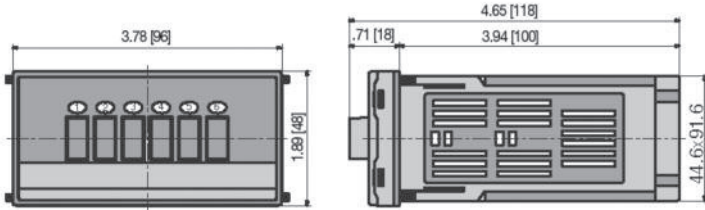
**Humidity** Maximum: 90% RH  
Non-Condensing

**Approximate Shipping Weight**  
0.7 lbs [0.32 kg]

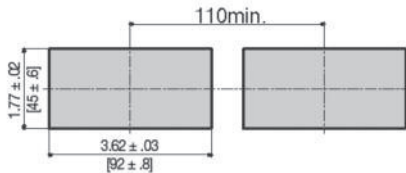
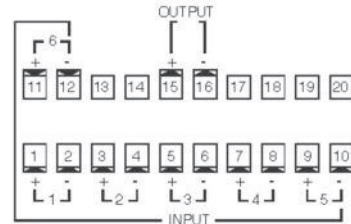
# Indicator Selector Switch TRS16

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

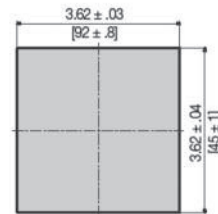
## EXTERNAL DIMENSIONS



## TERMINAL ARRANGEMENT

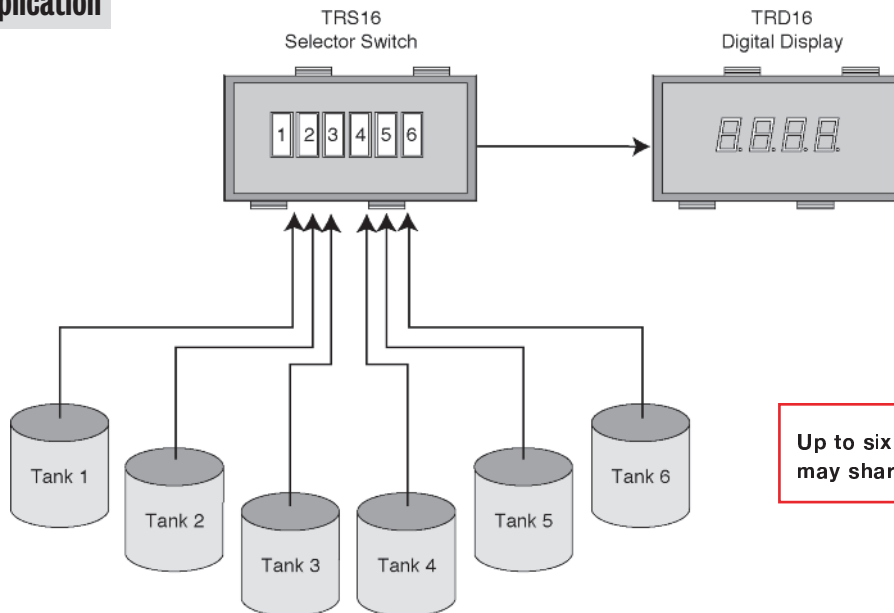


## PANEL CUTOUT DIMENSIONS



## WIRING DIAGRAM

## Typical Application



Up to six sensors (two leads each) may share a common display.

**WARNING:** The TRD16 Indicator is designed for the control of temperature, humidity and other physical values of general industrial equipment. (It is not to be used for any purpose which regulates the prevention of serious effects on human life or safety.)

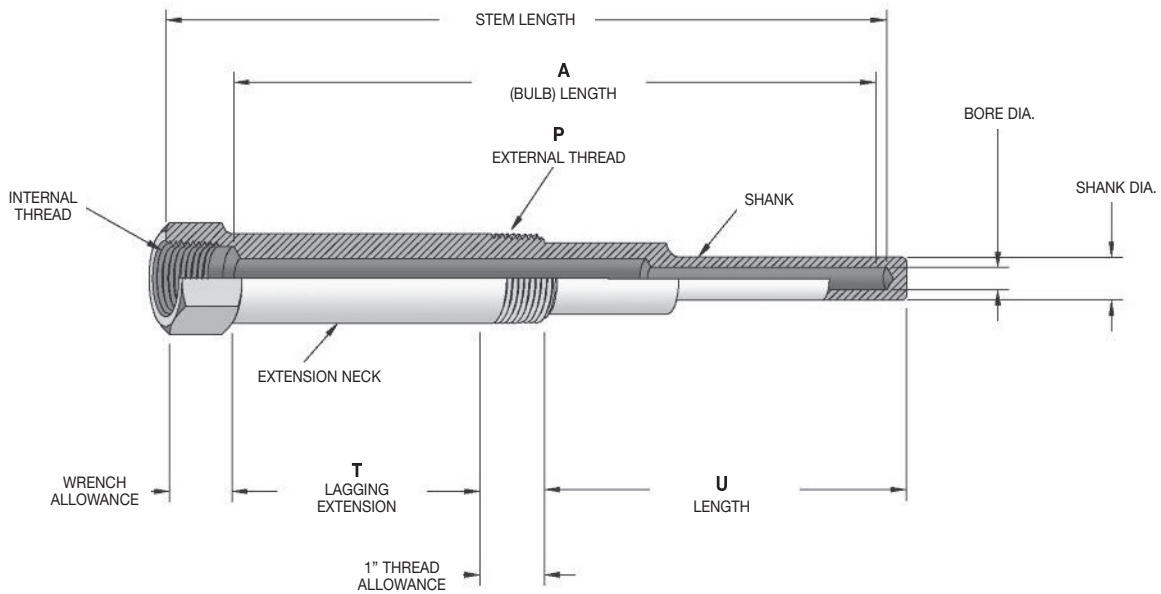
**CAUTION:** If the possibility of loss or damage to your system or property as a result of failure of any part of the process exists, proper safety measures must be made before the instrument is put into use so as to prevent the occurrence of trouble.

# Thermowells

## DESIGN & OPERATION

### Description

A thermowell is a pressure tight receptacle designed to accept a temperature sensing element and provide a means to insert that element into a vessel or pipe.



### Principles of Operation

A thermowell acts as a barrier between a process medium and the sensing element of a temperature measuring device. It protects against corrosive process media, media contained under pressure, or media flowing at a high velocity. A thermowell also allows the sensing element to be removed from the application while maintaining a closed system.

## Selecting a Thermowell

Temperature Instrumentation and Control Products, including: Thermometers, Thermocouples, RTDs, and Temperature Controllers.

All Trerice Thermowells should be carefully selected to meet the demands of the particular application. The information contained in this catalog is only offered as a guide to assist in making the proper selection. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage.

To ensure minimum response time, Trerice Heat Transfer Paste should be applied to the sensing portion of the instrument before installation into a thermowell. 1/2 oz. tube: Item No. 107-0001

### Connection

Trerice Thermowells are available in a variety of process connection styles. Threaded connections in 1/2, 3/4 and 1 NPT are the most widely specified. Socket weld, weld-in, raised face flanged, Van Stone flanged, and sanitary (Tri-Clamp) connection styles are also available.

All Trerice Bimetal Thermowells are provided with a 1/2 NPSM instrument connection to allow for pressure relief within the thermowell.

### U-Length

The U-length (insertion length) of a thermowell indicates its insertion depth into a process vessel or piping system and is measured from the tip of the thermowell to the underside of the threads. The U-length must equal or exceed the length of the sensitive portion of the temperature instrument's stem or bulb. Trerice Thermowells are available in U-lengths from 2" to 72".

### Material

The material chosen must be compatible with the process medium to which it is exposed. In applications of high pressure or velocity, the material may be chosen for its strength or durability. Trerice offers thermowells in a variety of materials, including: brass, Lead-Free brass (PBF), carbon steel, stainless steel, Monel, Carpenter 20, Hastelloy B or C, Inconel 600, Incoloy 800, Nickel and Titanium. Other alloys or compounds may also be available, please consult factory.

Threaded, welded and Van Stone flanged thermowells are made from forgings or bar stock. Raised face flanged and sanitary thermowells are of a two-piece welded construction.

### Bore

The bore of each Trerice Thermowell is designed to fit the sensing element of a specific Trerice Temperature Instrument.

### Shank

Trerice Thermowells are available in stepped, tapered, and straight shank configurations. Stepped shank thermowells are normally used on standard duty applications. Tapered shank thermowells are designed for use on heavy duty applications. Straight shank thermowells are designed for use with instruments that have wide stem diameters or short stem lengths.

### Lagging Extension

Lagging extension thermowells are used on applications where insulation covers the vessel or piping system. The extension length (T-length) is the measurement between the instrument connection and process connection of the thermowell.

# Thermowells

## for Industrial Thermometers

All dimensions are nominal. Dimensions in [ ] are in millimeters.

THERMOWELLS

- SX9 Solar
- AX9, BX9, CX9 Adjustable Angle
- AX, BX, CX Rigid Stem
- BX Plus

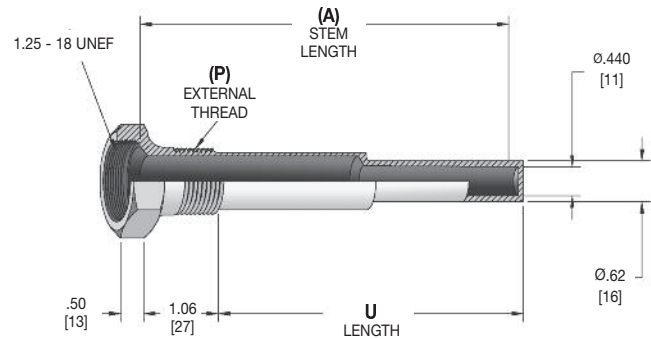
### Lengths

(A) Stem Length	Standard	with Lagging Extension	
	U Length	(T)	U Length
3 1/2"	2.50 [64]	1.00 [25]	1.75 [44]
6"	5.00 [127]	3.00 [76]	2.50 [64]
8"	7.00 [178]	3.00 [76]	4.50 [114]
12"	11.00 [279]	3.00 [76]	8.50 [216]

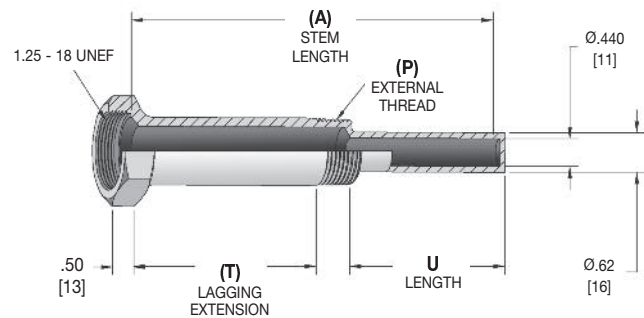
### Pressure Rating (psi)

Material	Operating Temperature			
	70°F	200°F	400°F	600°F
304 Stainless Steel	630	570	460	380
316 Stainless Steel	650	600	570	500
Monel	540	480	440	400
Brass/PBF Brass	300 psi @ 150°F, 250 psi @ 350°F			

### Standard



### with Lagging Extension



Alternative materials and accessories are also available. Please consult the Options and Accessories Section for details.

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage.

### HOW TO ORDER

Sample Order Number: **3-4 F 2**

Thermowell Style	(P) External Thread	(A) Stem Length	(T) Lagging Extension	Material
3 - Industrial	3 1/2 NPT*	F 3 1/2" Stem**	A 1" Extension (3 1/2" Stem only)	2 Brass††
	4 3/4 NPT	J 6" Stem	D 2 1/2" Extension (6" and longer Stem only)	4 Monel
	5 1 NPT	L 8" Stem	Omit if None	5 304SS
		R 12" Stem†		6 316SS

\* Only available with 3 1/2" stem and 1" extension.

\*\* 3 1/2" stem Straight Shank.

† 12" stem requires 1 NPT external thread.

†† Add (PBF) to end of part number to specify Lead-Free brass



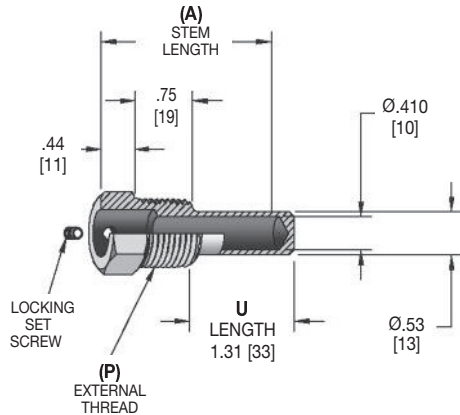
# Thermowells

for **4350 Econo** Thermometers

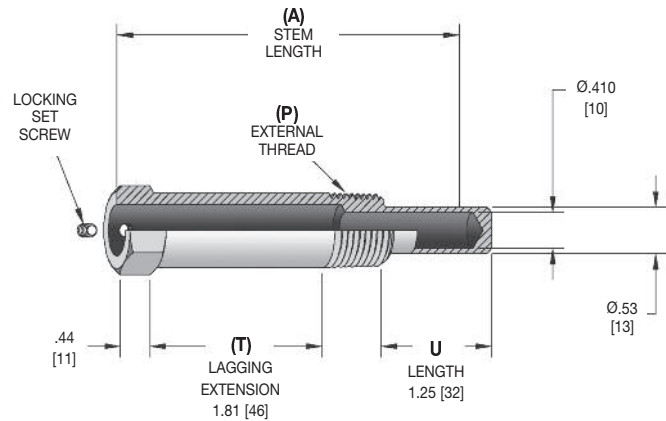
All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

THERMOWELLS

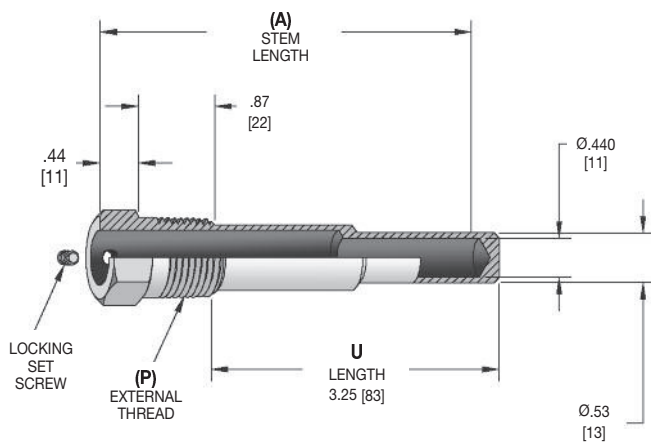
## Standard 2" Stem Length



## with Lagging Extension 4" Stem Length



## Standard 4" Stem Length



### Pressure Rating (psi)

Material	Operating Temperature			
	70°F	200°F	400°F	600°F
304 Stainless Steel	1200	1100	940	800
316 Stainless Steel	1200	1200	1140	1000
Brass/PBF Brass	600 psi @ 150°F,		540 psi @ 350°F	

Alternative materials and accessories are also available. Please consult the Options and Accessories Section for details.

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage.

## HOW TO ORDER

Sample Order Number: **3-3 C 6**

Thermowell Style	(P) External Thread	(A) Stem Length	(T) Lagging Extension	Material
3 - Econo	3 1/2 NPT	C 2" Stem	C 1 3/4 Extension (4" Stem only) Omit if None	2 Brass*
	4 3/4 NPT	G 4" Stem		5 304SS
				6 316SS

\* Add (PBF) to end of part number to specify Lead-Free brass

# Thermowells

## for Dial Thermometers

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

THERMOWELLS

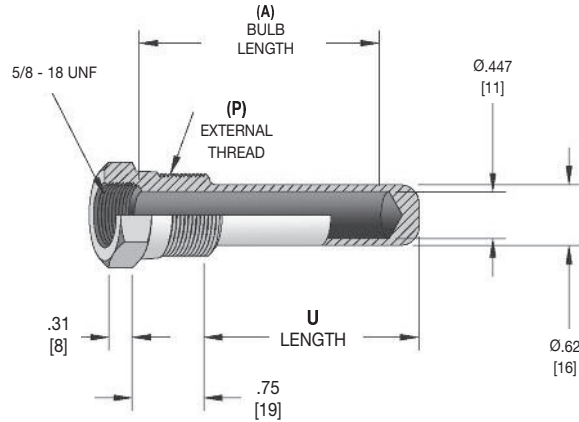
### Lengths

(A) Bulb Length	Standard	with Lagging Extension	
	U Length	(T)	U Length
2"	2.13 [54]	-	-
4"	3.88 [99]	2.00 [51]	2.13 [54]
6"	5.75 [146]	2.00 [51]	3.88 [99]
8"	7.75 [197]	2.00 [51]	5.75 [146]
12"	11.75 [299]	3.00 [76]	7.50 [191]
18"	17.75 [451]	3.00 [76]	15.75 [400]
24"	23.75 [603]	3.00 [76]	21.75 [552]

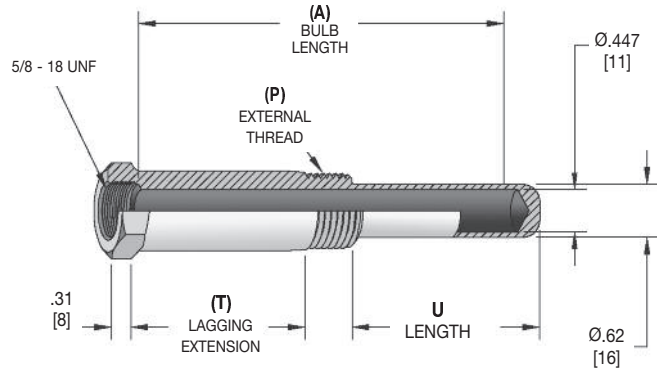
### Pressure Rating (psi) per ASME Boiler Code, Section VIII, Part UG28

Material	Operating Temperature			
	70°F	200°F	400°F	600°F
304 Stainless Steel	2780	2280	2100	1700
316 Stainless Steel	2770	2660	2500	2300
Brass/PBF Brass	1330 psi @ 150°F,		1280 psi @ 350°F	

### Standard



### with Lagging Extension



Alternative materials and accessories are also available. Please consult the Options and Accessories Section for details.

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage.

### HOW TO ORDER

Sample Order Number: **7-3 G 2**

Thermowell Style	(P) External Thread	(A) Bulb Length**	(T) Lagging Extension	Material
7 - Dial	3 1/2 NPT 4 3/4 NPT	D 2" Bulb	C 2" Extension (4" and longer Bulb only) E 3" Extension (12" and longer Bulb only) Omit if None	2 Brass† 5 304SS 6 316SS
		G 4" Bulb		
	J 6" Bulb			
	L 8" Bulb			
	R 12" Bulb*			
	Wa 18" Bulb*			
	Wk 24" Bulb*			

\*Not available with 1/2 NPT external thread.

\*\*Dial Thermowells with Bulb Lengths over 6" are typically for use with Adjustable Union or Bendable Extension Connections.

† Add (PBF) to end of part number to specify Lead-Free brass

# Thermowells

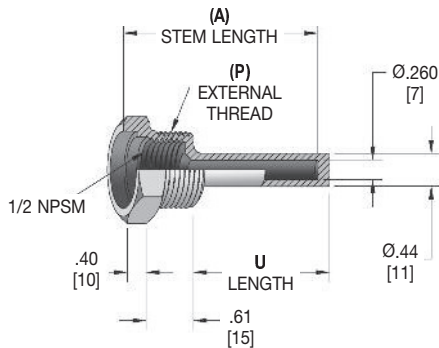
for **Bimetal Thermometers & Temperature Sensors**  
Threaded-Stepped Shank

All dimensions are nominal.  
Dimensions in [ ] are in millimeters

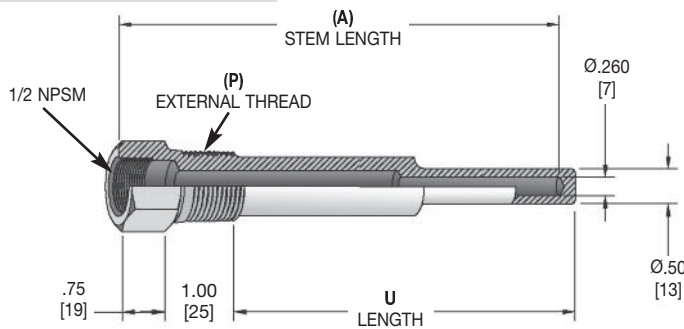


THERMOWELLS

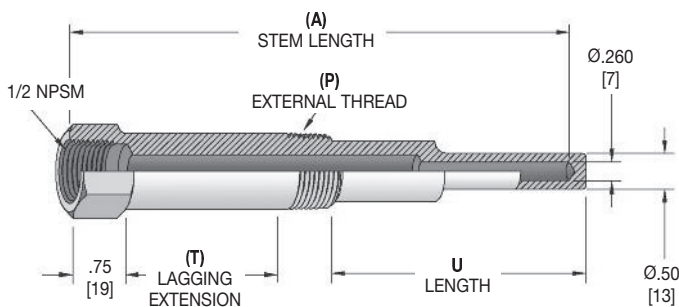
## Standard (2 1/2" - 6")



## Standard (9 - 24")



## with Lagging Extension



### Lengths

(A) Stem Length	Standard		with Lagging Extension	
	U Length	(T)	U Length	
2 1/2"	1.75 [44]	-	-	-
4"	2.50 [64]	0.60 [15]	1.90 [48]	
6"	4.50 [114]	2.00 [51]	2.50 [64]	
9"	7.50 [191]	3.00 [76]	4.50 [114]	
12"	10.50 [267]	3.00 [76]	7.50 [191]	
15"	13.50 [343]	3.00 [76]	10.50 [267]	
18"	16.50 [419]	3.00 [76]	13.50 [343]	
24"	22.50 [572]	3.00 [76]	19.50 [495]	

### Pressure Rating (psi)

Material	Operating Temperature					
	70°F	200°F	400°F	600°F	800°F	1000°F
304 stainless steel	6550	6000	4860	4140	3510	3130
316 stainless steel	6540	6400	6000	5270	5180	4660
Monel	5530	4990	4660	4450	4450	-
Brass/PBF Brass	3170 psi @ 150°F,		2930 psi @ 350°F			

Alternative materials and accessories are also available. Please consult the Options and Accessories Section for details.

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage. For correct use and application, please refer to the Thermowells For Thermometers and Electrical Temperature Sensors Standard ASME B40.9.

## HOW TO ORDER

Sample Order Number: **76-4 J 6**

Thermowell Style	(P) External Thread	(A) Stem Length	(T) Lagging Extension	Material
76 - Bimetal/Sensor Stepped shank*	3 1/2 NPT**	D 2 1/2" Stem	A 1" Extension (4" Stem only)	2 Brass†
	4 3/4 NPT	G 4" Stem	C 2" Extension (6" Stem only)	4 Monel
	5 1 NPT**	J 6" Stem	E 3" Extension (9" and longer Stem only)	5 304SS
		M 9" Stem	Omit if None	6 316SS
		R 12" Stem		
		V 15" Stem		
		Wa 18" Stem		
		Wk 24" Stem		

\* 2 1/2" - 6" stem straight shank.

\*\* Not available with 2 1/2" stem length.

† Add (PBF) to end of part number to specify Lead-Free brass

# Thermowells

for **Bimetal Thermometers & Temperature Sensors**

Heavy Duty • Tapered Shank for High Pressure Applications



THERMOWELLS

### Lengths

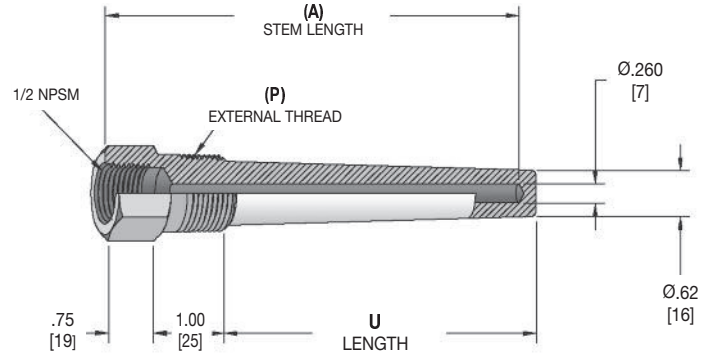
(A) Stem Length	Standard		with Lagging Extension	
	U Length	(T)	U Length	
4"	2.50 [64]	-	-	-
6"	4.50 [114]	2.00 [51]	2.50 [64]	
9"	7.50 [191]	3.00 [76]	4.50 [114]	
12"	10.50 [267]	3.00 [76]	7.50 [191]	
15"	13.50 [343]	3.00 [76]	10.50 [267]	
18"	16.50 [419]	3.00 [76]	13.50 [343]	
24"	22.50 [572]	3.00 [76]	19.50 [495]	

### Pressure Rating (psi)

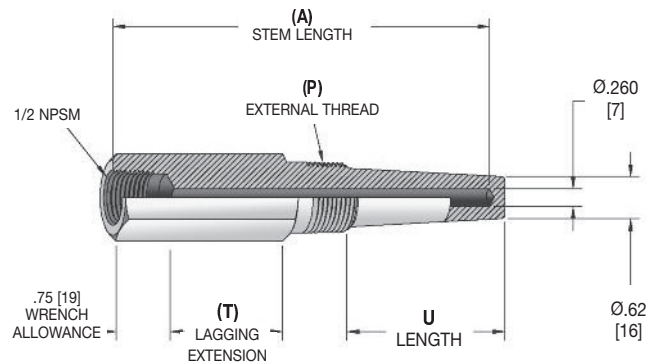
Material	Operating Temperature					
	70°F	200°F	400°F	600°F	800°F	1000°F
Carbon steel	5950	5750	5450	5250	4000	-
304 stainless steel	7800	7050	6300	5360	4350	4100
316 stainless steel	7800	7800	7250	7100	6700	5800
Monel	7170	6670	6040	5770	5770	-
Brass	4140 psi @ 150°F,		3790 psi @ 350°F			

### Standard

All dimensions are nominal.  
Dimensions in [ ] are in millimeters



### with Lagging Extension



Alternative materials and accessories are also available. Please consult the Options and Accessories Section for details.

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage. For correct use and application, please refer to the Thermowells For Thermometers and Electrical Temperature Sensors Standard ASME B40.9.

### HOW TO ORDER

Sample Order Number: **90-4 G 4**

Thermowell Style	(P) External Thread	(A) Stem Length	(T) Lagging Extension	Material	
90- Bimetal/Sensor Tapered Shank	4 3/4 NPT	G 4" Stem	C 2" Extension (6" Stem only)	2 Brass 3 Steel 4 Monel 5 304SS 6 316SS	
		J 6" Stem			
	5 1 NPT	M 9" Stem	E 3" Extension (9" and longer Stem only) Omit if None		
		R 12" Stem			
			V 15" Stem		
			Wa 18" Stem		
			Wk 24" Stem		

# Thermowells

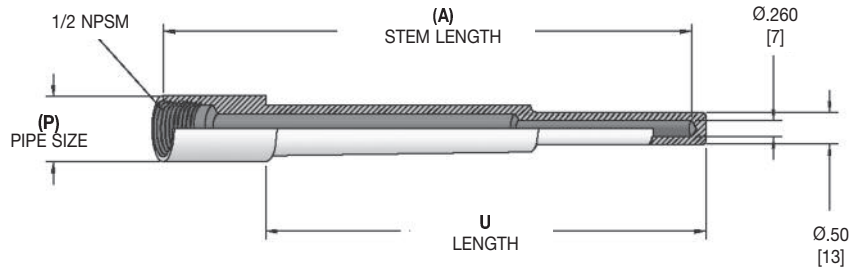
for **Bimetal Thermometers & Temperature Sensors**  
**Socket-Weld Style • Stepped or Heavy Duty Tapered Shank**

All dimensions are nominal.  
 Dimensions in [ ] are in millimeters.

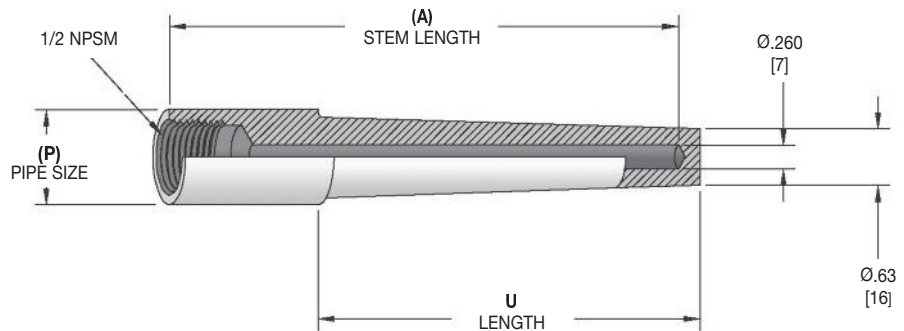


THERMOWELLS

## Stepped Shank



## Tapered Shank



### Lengths

(A) Stem Length	U Length
4"	2.50 [64]
6"	4.50 [114]
9"	7.50 [191]
12"	10.50 [267]
15"	13.50 [343]
18"	16.50 [419]
24"	22.50 [572]

### Other Dimensions

Nominal Pipe Size	Actual (P) Diameter
3/4"	1.050 [23.67]
1"	1.315 [33.40]

### Pressure Rating (psi)

	Material	Operating Temperature					
		70°F	200°F	400°F	600°F	800°F	1000°F
Stepped Shank	Carbon Steel	5200	5000	4800	4600	3500	-
	304 Stainless Steel	6550	6000	4860	4140	3510	3130
	316 Stainless Steel	6540	6400	6000	5270	5180	4660
Tapered Shank	Carbon Steel	5950	5750	5450	5250	4000	-
	304 Stainless Steel	7800	7050	6300	5360	4350	4100
	316 Stainless Steel	7800	7800	7250	7100	6700	5800

Note: Trerice Socket-Weld Thermowells are furnished standard with Schedule 10. For other wall thicknesses, Please consult factory.

Alternative materials and accessories are also available. Please consult the Options and Accessories Section for details.

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage. For correct use and application, please refer to the Thermowells For Thermometers and Electrical Temperature Sensors Standard ASME B40.9.

## HOW TO ORDER

Sample Order Number: **90-S5 M 6**

Thermowell Style	(P) Nominal Pipe Size	(A) Stem Length	Material
76- Bimetal/Sensor Stepped Shank	S4 3/4" S5 1"	G 4" Stem	3 Steel
		J 6" Stem	5 304SS
		M 9" Stem	6 316SS
		R 12" Stem	
		V 15" Stem	
90- Bimetal/Sensor Tapered Shank		Wa 18" Stem	
		Wk 24" Stem	

# Thermowells

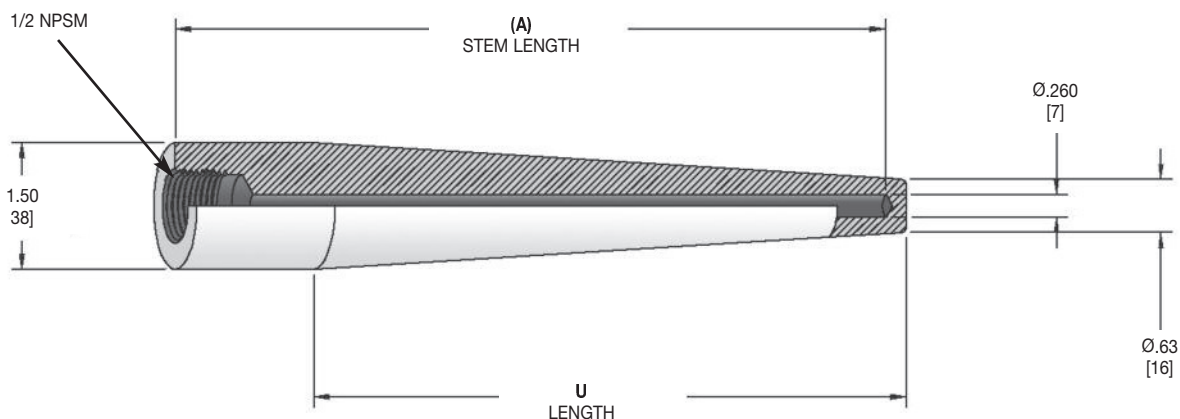
for **Bimetal Thermometers & Temperature Sensors**

Weld-In Style



## Tapered Shank

All dimensions are nominal. Dimensions in [ ] are in millimeters



### Lengths

(A) Stem Length	U Length
4"	2.50 [64]
6"	4.50 [114]
9"	7.50 [191]
12"	10.50 [267]
15"	13.50 [343]
18"	16.50 [419]
24"	22.50 [572]

### Pressure Rating (psi)

Material	Operating Temperature					
	70°F	200°F	400°F	600°F	800°F	1000°F
Carbon steel	5950	5750	5450	5250	4000	-
304 stainless steel	7800	7050	6300	5360	4350	4100
316 stainless steel	7800	7800	7250	7100	6700	5800

Alternative materials and accessories are also available. Please consult the Options and Accessories Section for details.

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage. For correct use and application, please refer to the Thermowells For Thermometers and Electrical Temperature Sensors Standard ASME B40.9.

### HOW TO ORDER

Sample Order Number: **90-W7 V 6**

Thermowell Style	Connection	(A) Stem Length	Material
90 - Bimetal/Sensor Tapered Shank	W7 1 1/2"	<b>G</b> 4" Stem	<b>3</b> Steel
		<b>J</b> 6" Stem	<b>5</b> 304SS
		<b>M</b> 9" Stem	<b>6</b> 316SS
		<b>R</b> 12" Stem	
		<b>V</b> 15" Stem	
		<b>Wa</b> 18" Stem	
		<b>Wk</b> 24" Stem	

# Thermowells

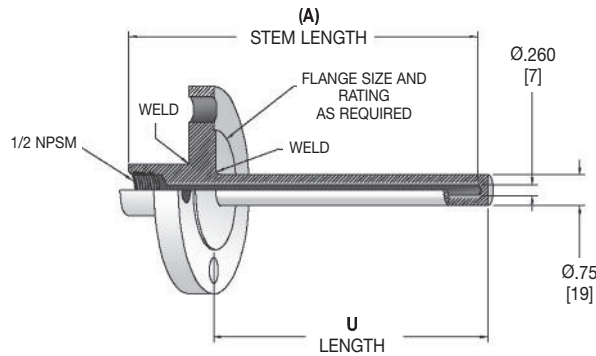
for **Bimetal Thermometers & Temperature Sensors**

Flanged Style • Straight or Heavy Duty Tapered Shank

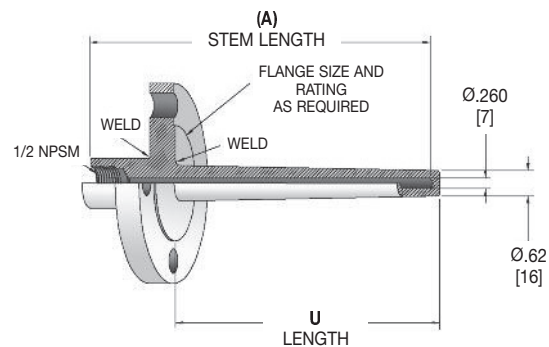
All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

THERMOWELLS

## Straight Shank



## Tapered Shank



### Pressure Rating

Maximum pressure and temperature ratings are limited by the choice of flange. Please see ANSI/ASME B16.5-2003 for more information.

### Lengths

(A) Stem Length	U Length
4"	2.00 [51]
6"	4.00 [102]
9"	7.00 [178]
12"	10.00 [254]
15"	13.00 [330]
18"	16.00 [406]
24"	22.00 [559]

Alternative materials and accessories are also available. Please consult the Options and Accessories Section for details.

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage. For correct use and application, please refer to the Thermowells For Thermometers and Electrical Temperature Sensors Standard ASME B40.9.

## HOW TO ORDER

Sample Order Number: **78-81 J 6**

Thermowell Style	Flange Size and Rating		(A) Stem Length	Material
78 - Bimetal/Sensor Straight Shank	51	1"	G 4" Stem J 6" Stem M 9" Stem R 12" Stem V 15" Stem Wa 18" Stem Wk 24" Stem	3 Steel 4 Monel 5 304SS 6 316SS
	71	1 1/2"		
	81	2"		
90 - Bimetal/Sensor Tapered Shank	181	3"		
	53	1"		
	73	1 1/2"		
	83	2"		
	183	3"		
	56	1"		
	76	1 1/2"		
	86	2"		
	186	3"		

Other Flange Sizes and Ratings available; consult factory.

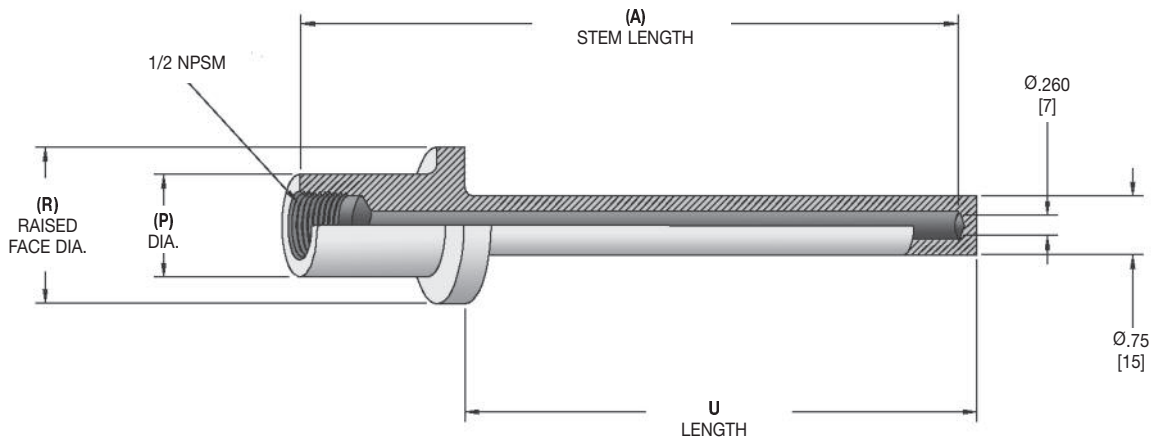
# Thermowells

for **Bimetal Thermometers & Temperature Sensors**

Van Stone Style

All dimensions are nominal. Dimensions in [ ] are in millimeters.

## Straight Shank



Thermowell does not include backing flange; when required, a carbon steel backing flange can be supplied. Consult factory.

### Lengths

(A) Stem Length	U Length
4"	2.00 [51]
6"	4.00 [102]
9"	7.00 [178]
12"	10.00 [254]
15"	13.00 [330]
18"	16.00 [406]
24"	22.00 [559]

### Other Dimensions

Nominal Pipe Size	Actual (P) Diameter	Raised Face (R) Diameter
1"	1.32 [33]	2.00 [51]
1 1/2"	1.90 [48]	2.88 [73]

### Pressure Rating

Maximum pressure and temperature ratings are limited by the choice of flange. Please see ANSI/ASME B16.5-2003 for more information.

Alternative materials and accessories are also available. Please consult the Options and Accessories Section for details.

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage. For correct use and application, please refer to the Thermowells For Thermometers and Electrical Temperature Sensors Standard ASME B40.9.

## HOW TO ORDER

Sample Order Number: **78-V7 R 6**

Thermowell Style	(P) Nominal Pipe Size	(A) Stem Length	Material
78 - Bimetal/Sensor Straight Shank	V5 1" V7 1 1/2"	G 4" Stem	3 Steel
		J 6" Stem	4 Monel
		M 9" Stem	5 304SS
		R 12" Stem	6 316SS
		V 15" Stem	
		Wa 18" Stem	
		Wk 24" Stem	



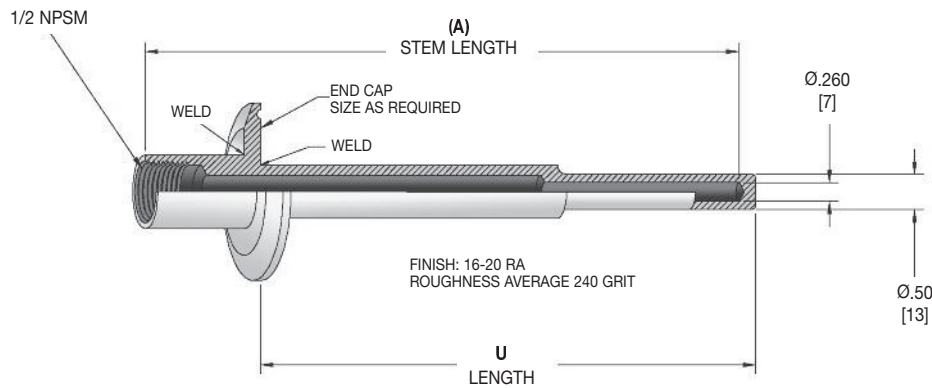
# Thermowells

for **Bimetal Thermometers & Temperature Sensors**

Sanitary Style

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

## Stepped



THERMOWELLS

### Lengths

(A) Stem Length	U Length
4"	2.50 [64]
6"	4.50 [114]
9"	7.50 [191]
12"	10.50 [267]
15"	13.50 [343]
18"	16.50 [419]
24"	22.50 [572]

Designed to meet 3A Dairy Certification requirements.

Pressure ratings are dependent upon the clamps, gaskets and ferrules used, which are not supplied by Trerice.

Alternative materials and accessories are also available. Please consult the Options and Accessories Section for details.

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage. For correct use and application, please refer to the Thermowells For Thermometers and Electrical Temperature Sensors Standard ASME B40.9.

### HOW TO ORDER

Sample Order Number: **76-T8 M 6**

Thermowell Style	End Cap Size	(A) Stem Length	Material
76 - Bimetal/Sensor Stepped Shank	<b>T7</b> 1 1/2"	<b>G</b> 4" Stem	<b>5</b> 304SS
	<b>T8</b> 2"	<b>J</b> 6" Stem	<b>6</b> 316SS
	<b>T18</b> 3"	<b>M</b> 9" Stem	
		<b>R</b> 12" Stem	
		<b>V</b> 15" Stem	
		<b>Wa</b> 18" Stem	
		<b>Wk</b> 24" Stem	

# Thermowells

## Options & Accessories

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### Alternative Materials

Terice offers a variety of alternative thermowell materials to ensure compatibility with special service applications. Please order using the material code listed in the table below. Other alloys or compounds may also be available, please consult factory.

Code	Material
7	Carpenter 20
8	Hastelloy B
9	Hastelloy C
10	Inconel 600
11	Incoloy 800
12	Nickel
13	Titanium

### Protective Caps for Test Wells

A cap and lanyard is available to keep the thermowell bore clean when used in non permanent instrument installations. Please order using the item numbers listed in the table below.

Thermowell Style	Cap Material			
	Aluminum	Brass	Steel	Stainless Steel
Industrial	N/A	026-0032A	N/A	N/A
Econo	N/A	N/A	116-0193A	N/A
Dial	026-0001A	N/A	N/A	N/A
Bimetal or Sensor	N/A	026-0034A	N/A	026-0034.1A

### Thermowell Conversion Kits

A Thermowell Conversion Kit permits the installation of a Terice Bimetal or Dial Thermometer into an existing Industrial Thermometer thermowell. The Industrial to Bimetal kit includes an aluminum stem spacer, a brass (400°F max.) or stainless steel (750°F max.) 1/2 NPT x 1 1/4 bushing and a tube of heat transfer paste. The Dial to Bimetal kit includes brass 1/2 NPT x 1 1/4 bushing and a 1/2 oz. tube of heat transfer paste.

Description	Item Number
Thermowell Adapter Kit; Industrial to Bimetal	001-0099A (400°F max.)
High Temperature Thermowell Adapter Kit; Industrial to Bimetal	001-0099H (750°F max.)
Thermowell Adapter Kit; Industrial to Dial*	198-0012

\* You must use an adjustable union (remote mount) or union connection with bendable extension thermal system with the Industrial to Dial thermowell conversion kit.

Industrial Thermowell (A) Length	Bimetal Thermometer Stem Length Required	Dial Thermometer Bulb Length Required
3 1/2"	4" Stem	4 3/4"
6"	7" Stem (special order length)	7 1/4"
8"	9" Stem	9 1/4"

### Heat Transfer Paste

To ensure minimum response time, Terice Heat Transfer Paste should be applied to the sensing portion of the instrument before installation into a thermowell.

Description	Item Number
1/2 oz. Tube	107-0001



# Table of Contents

## REGULATORS & CONTROL VALVES

### The Control Loop

174-175

The necessary components to provide basic, single-loop process control.

### Temperature Regulators

Provide reliable temperature control without the need for an external power source.



Design & Operation **176-181**

**91000** Series (91000, 91400 & 91600) **182-184**

Thermowells for 91000 Series **185**

Thermal System Selection for 91000 Series **186-187**

Valve Bodies for 91000 & 91400 **188-195**

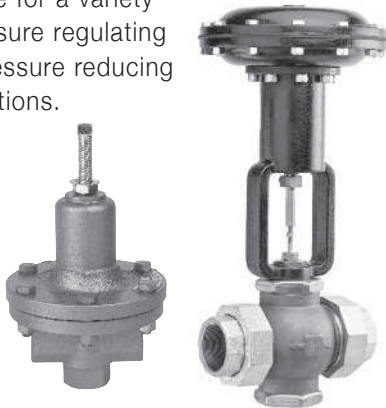
Valve Bodies for 91600 **196**

**91000XT** Series Tank Thermostat **198**

Thermowells for 91000XT **199**

### Pressure Regulators

Suitable for a variety of pressure regulating and pressure reducing applications.



Design & Operation **200-203**

**921** Series (High Capacity) Steam, Air or Water **204**

**995** Series (Standard Capacity) Steam, Air, Water, Oil **206**

**1100** Series Pipeline Strainer **208**

### Controllers

Electronic PID and Electric Contact controllers providing single-loop control.



Design & Operation **209-211**

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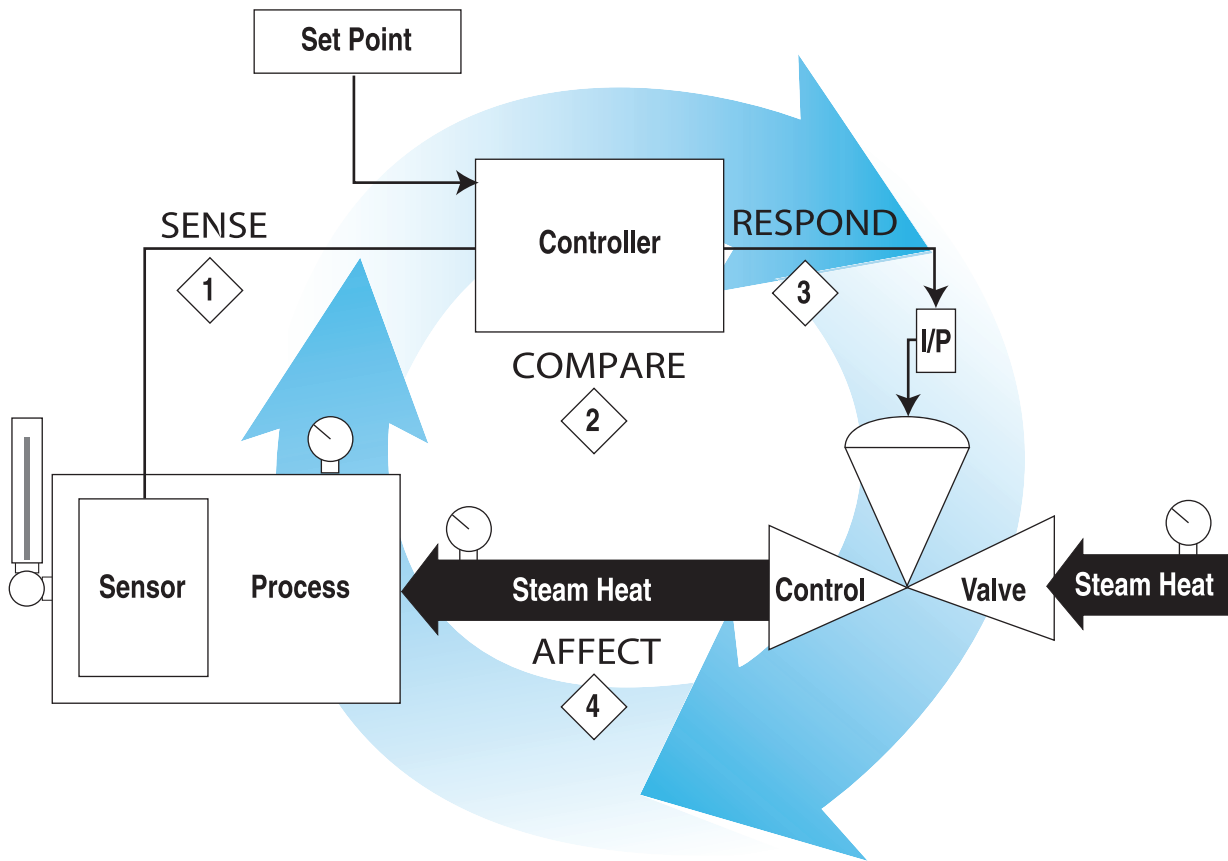
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### Technical Information

# Control Loop

## Understanding a Control Loop



### Control Loop

A control loop is a process management system designed to maintain a process variable at a desired set point. Each step in the loop works in conjunction with the others to manage the system. Once the set point has been established, the control loop operates using a four-step process.

- 1 Sense**  
Measure the current condition of the process using a sensor, which can be an electronic (thermocouple, RTD or transmitter) or a mechanical device (thermal system).
  - 2 Compare**  
Evaluate the measurement of the current condition against the set point using an electronic or electric contact controller.
  - 3 Respond**  
React to any error that may exist by generating a corrective pneumatic or electric control signal.
  - 4 Affect**  
Actuate a final control element (valve, heater or other device) that will produce a change in the process variable.
- The loop continually cycles through the steps, affecting the process variable in order to maintain the desired set point. Trerice is unique in its ability to provide all of the necessary components to create a complete control loop.

The following list are components required to create a basic control loop.  
All products can be found within this catalog.

## Electro-Pneumatic Control Loop (PID)

Temperature		Pressure
<ul style="list-style-type: none"> <li>• Thermocouple or RTD Temperature Sensor</li> <li>• Thermowell</li> </ul>	Sense	<ul style="list-style-type: none"> <li>• 700Plus Series Industrial Transmitter Gauge</li> </ul>
<ul style="list-style-type: none"> <li>• TR890 Series Electronic Controller</li> <li>• No. TA901 I/P Transducer</li> <li>• No. TA987 Air Filter/Regulator</li> </ul>	Compare-Respond	<ul style="list-style-type: none"> <li>• TR890 Series Electronic Controller</li> <li>• No. TA901 I/P Transducer</li> <li>• No. TA987 Air Filter/Regulator</li> </ul>
<ul style="list-style-type: none"> <li>• 910 or 940 Series Control Valve</li> <li>• 1100 Series Pipeline Strainer</li> </ul>	Affect	<ul style="list-style-type: none"> <li>• 910 or 940 Series Control Valve</li> <li>• 1100 Series Pipeline Strainer</li> </ul>

## Electric Control Loop (PID)

Temperature		Pressure
<ul style="list-style-type: none"> <li>• Thermocouple or RTD Temperature Sensor</li> <li>• Thermowell</li> </ul>	Sense	<ul style="list-style-type: none"> <li>• 700Plus Series Industrial Transmitter Gauge</li> </ul>
<ul style="list-style-type: none"> <li>• TR890 Series Electronic Controller</li> </ul>	Compare-Respond	<ul style="list-style-type: none"> <li>• TR890 Series Electronic Controller</li> </ul>
<ul style="list-style-type: none"> <li>• 940E Series Control Valve</li> <li>• 1100 Series Pipeline Strainer</li> </ul>	Affect	<ul style="list-style-type: none"> <li>• 940E Series Control Valve</li> <li>• 1100 Series Pipeline Strainer</li> </ul>

## Electric Control Loop (On/Off)

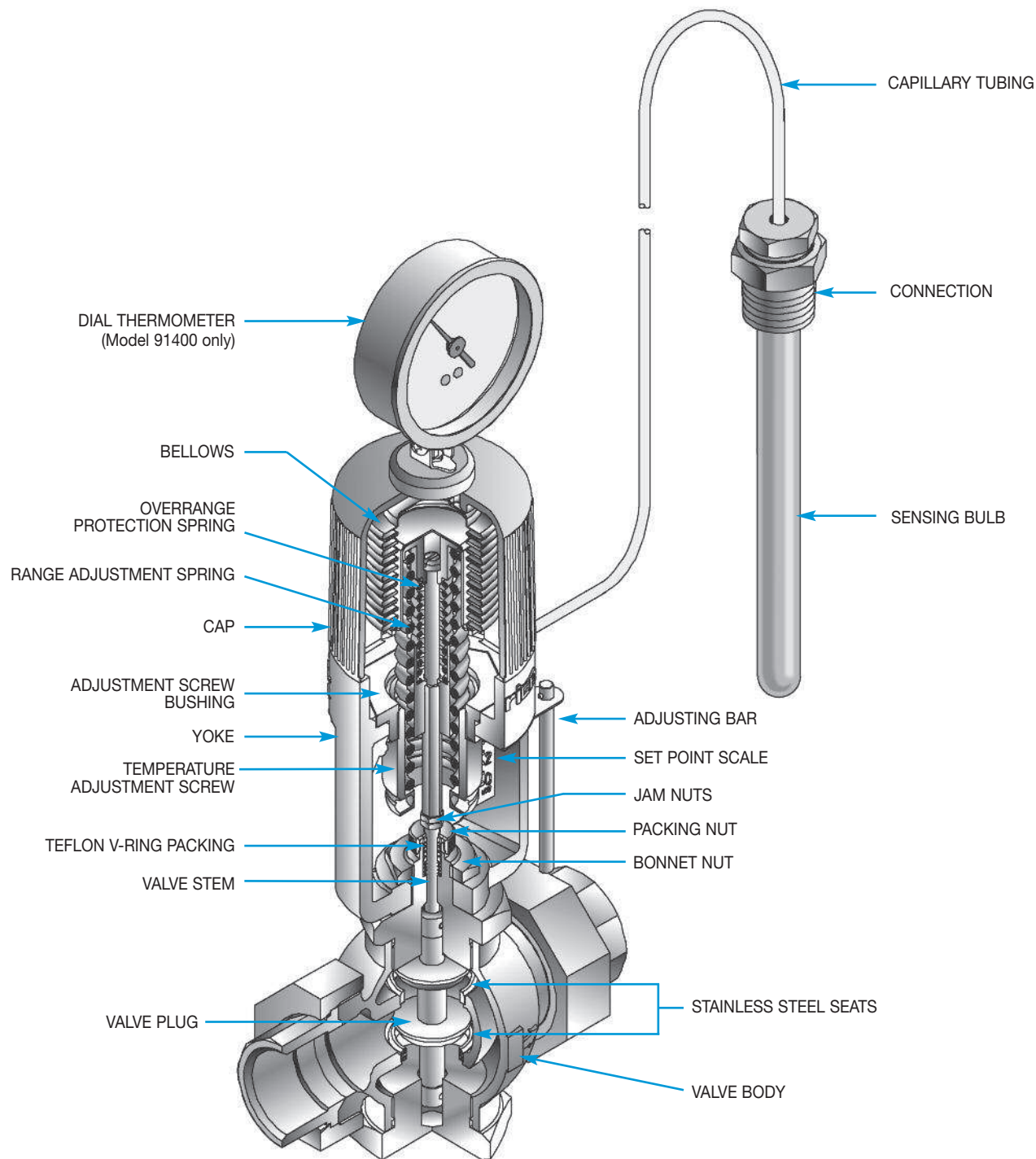
Temperature		
<ul style="list-style-type: none"> <li>• L84000 Series Electric Contact Controller</li> <li>• Thermowell</li> </ul>	Sense-Compare-Respond	
<ul style="list-style-type: none"> <li>• 960 Series Solenoid Valve</li> <li>• 1100 Series Pipeline Strainer</li> </ul>	Affect	

## Self-Operating Regulation Loop (Proportional)

Temperature		Pressure
<ul style="list-style-type: none"> <li>• 91000 Series Temperature Regulator</li> <li>• Thermowell</li> <li>• 1100 Series Pipeline Strainer</li> </ul>	Sense-Compare-Respond-Affect	<ul style="list-style-type: none"> <li>• 921 Series Pressure Regulator</li> <li>• 1100 Series Pipeline Strainer</li> </ul>

# Temperature Regulators

## DESIGN & OPERATION



### Housing Assembly

The housing consists of a cap and yoke constructed from precision die cast aluminum. This assembly ensures permanent alignment with the valve body, while protecting the bellows assembly. The yoke includes a set point scale used to reference the setting of the temperature adjustment screw. The entire housing is finished in a corrosion resistant, baked blue epoxy.



## Description

The Self-Operating Temperature Regulator is a mechanically operated device designed to regulate system temperature by modulating the flow of a heating or cooling fluid in response to temperature changes.

## Principles of Operation

The Trerice “Self-Op” Temperature Regulator is a fully self-contained unit, requiring no external power source (i.e., compressed air or electricity). Regulation takes place when the sensing element (bulb) of the thermal system is exposed to changes in temperature. The thermal system is charged with a predetermined amount of vapor fill, which, when heated, will cause a bellows within the unit’s actuator housing to expand. As the bellows expands, it compresses a return spring while simultaneously moving the valve stem downward to stroke the valve. When the process temperature decreases (or in the event of thermal system failure), the return spring will move the valve stem upward to the “out” position. The choice of valve action (stem In-To-Close or stem In-To-Open) will determine its system failure position.

## Selecting a Temperature Regulator

The Trerice “Self-Op” Temperature Regulator is recommended for controlling the flow on relatively stable systems, where small valve stroke modulations will correct temperature drift. Where sudden or large load changes, or rapid temperature changes occur, a pneumatically or electrically powered Trerice Control Valve should be specified. Please consult the Control Valve Section of this catalog.

**Trerice “Self-Op” Temperature Regulators are NOT intended for use in applications where the media comes in direct contact with the skin or body, such as showers, baths, lavatories or wash fountains.**

**Trerice “Self-Op” Temperature Regulators should be carefully selected to meet the demands of the particular application. The information contained within this catalog is offered only as a guide to assist in making the proper selection. Selection of the proper temperature regulator is the sole responsibility of the user. Improper application may cause failure, resulting in possible personal injury or property damage.**

## Actuator

The actuator consists of the following assemblies: housing, bellows and spring return, and thermal system. Three actuator models are available:

- **Model 91000** is non-indicating and direct acting.
- **Model 91400** is equipped with an integral dial thermometer to indicate sensing bulb temperature and is direct acting.
- **Model 91600** (Fail-Safe) is non-indicating and direct acting. It is specifically designed to cause the valve to move to the cooler position in case of thermal system failure.

### Actuator: Direct Acting

Direct Acting actuators are designed to move the valve stem to the “in” position as the control signal (temperature) increases.

# Temperature Regulators

## DESIGN & OPERATION

### Bellows and Spring Return Assembly

The accordion type bellows is corrosion resistant to provide accurate response for the life of the regulator. An adjusting bar is provided to turn the brass temperature adjustment screw, which compresses or expands the range adjustment spring, thereby setting the control point of the unit.

### Thermal System Assembly

The thermal system (sensing bulb and capillary tubing) is available in copper (for best heat transfer) or 316 stainless steel (for corrosive applications), and can be ordered with a variety of protective coverings, including Teflon or stainless steel spiral armor. Capillary tubing lengths can be specified from 8 to 52 feet.

### Integral Dial Thermometer

The integral dial thermometer (Model 91400 only) displays the temperature at the sensing bulb. This allows for easy adjustment of the temperature set point, as well as for continuous monitoring of the application, without the installation of an additional thermometer. The thermometer has a 3<sup>1</sup>/<sub>2</sub>" dial face and can be rotated and tilted for maximum readability.

### Temperature Range

Nominal ranges from 20°F (-10°C) through 440°F (225°C) are available. The nominal range defines the entire temperature range of the unit. The service conditions and the choice of valve style and action will determine the actual operating range (recommended working span) of the unit. The nominal range should be selected so the set point falls within the recommended working span for the specified valve style and action. Models 91000 and 91400 include an overrange protection spring, which allows the sensing bulb to be heated 100°F above the upper limit of the unit's nominal range for system cleaning or temporary situations.

### Accuracy

The Trerice "Self-Op" Temperature Regulator is a "set-and-forget" regulating device. Once the proper control point setting has been achieved, the unit requires virtually no adjustments and very little maintenance. Control point accuracy is dependent upon the sensing bulb location, load change size and speed, and valve size. The sensing bulb must be installed in an area within the process that is most representative of overall process conditions. Care should be taken not to locate the bulb in close proximity to the valve, as the regulator might respond to temperature changes before the process has had time to reach the control point. Where sudden or large load changes occur, a pneumatically or electrically powered Trerice Control Valve should be specified. Please consult the Control Valve Section of this catalog.

#### Sensing Bulb Installation:

Care must be taken to ensure that entire length of the sensing bulb is immersed into the medium at the sensing location. Partial immersion will result in faulty control. When the sensing bulb is installed into a pipeline, constant flow must be continued through the line in order to maintain an active thermal signal to the bulb. Should a closed valve cause stoppage of flow to the bulb, a reduced bypass flow must be installed to maintain thermal signal.

The sensing bulb is designed to be installed in either a horizontal position or a vertical position with the tip down. If the tip must be installed upwards, please specify when ordering, as a special bulb construction is required.

## Accuracy (continued)

Valve sizing also plays a major part in regulator performance. A valve that is too small will not be able to provide the desired capacity during peak load conditions, while a valve that is too large may overshoot the control point and operate with the valve plug too close to the seat, resulting in undue wear of the plug and seat. As part of a well-designed system, a properly sized valve (operating in the 60-90% open position) can control to within 2° to 5°F.

## Valve

Trerice “Self-Op” Temperature Regulators are available with a wide variety of globe valves in various styles, materials, connections and sizes.

## Style

Trerice Regulator Valves are offered in single seated, double seated and three-way designs.

- **Single Seated Valves** are designed for applications where tighter close-off is required. However, this design is unbalanced and limited in the pressure that it will close-off against. The leakage rate is approximately 0.1% of the maximum capacity.
- **Double Seated Valves** are nearly pressure balanced and, therefore, are able to close the valve plug against higher operating pressures. However, since temperature fluctuations may cause expansion and contraction across the seats, tight close-off is not always possible. The leakage rate is approximately 0.5% of the maximum capacity. Double seated valves have a faster flow response and greater capacity than single seated valves, and are recommended when tight close-off is not required.
- **3-Way Valves** are used for mixing two flows together, or for diverting a flow to or around a device (bypass). In order to produce consistent flow quantity for stable operation, the pressure drop across both flow paths (inlet to outlet) must be nearly equal.

3-Way Valves are of the Sleeve Type (common port on the bottom). This type is most commonly used for diverting applications, however due to its design it can also be used for mixing applications. The Sleeve Type design is constructed with an O-ring around the sleeve. This O-ring is suitable for water or glycol type service, up to a maximum of 300°F. A higher temperature O-ring for use with other fluids, such as oil, or for temperatures up to 410°F is available. Consult factory.

**Trerice “Self-Op” Temperature Regulators are NOT intended for use in applications where the media comes in direct contact with the skin or body, such as showers, baths, lavatories or wash fountains.**

Temperature Regulators are not considered close-off valves. A pressure surge may force a single seated valve plug open. The Trerice Temperature Regulator is a balanced equilibrium system at the set point and provides no power to tightly seat the valve plug. A separate power driven or hand actuated valve is required to ensure tight close-off when necessary.

Trerice 3-Way Valve are not designed for use in steam applications.

# Temperature Regulators

## DESIGN & OPERATION

### Action

Trerice Single and Double Seated Valves are available as stem In-To-Close (fail-open) for heating applications, or stem In-To-Open (fail-closed) for cooling applications. The action of bronze bodied valves is field reversible. Trerice 3-Way Valves can be plumbed for either mixing or diverting service.

Temperature Regulator Valve Action		
Application	Stem Action	Fail Position*
Heating	In-To-Close	Fail-open
Cooling	In-To-Open	Fail-closed

*\*91000 and 91400 only. 91600 is designed to fail in the cooler position.*

### Body Material and Connection

Trerice "Self-Op" Temperature Regulators are available with bronze, cast-iron, cast steel and stainless steel valve bodies. Union, flanged and threaded connection styles are available.

### Trim

Valve trim is composed of the stem and plug assembly, and the seats within the ports. Trerice single and double seated bronze bodied valves employ a stainless steel, tapered plug for enhanced modulation, as well as permanently brazed-in stainless steel seats for smooth performance throughout the life of the valve. The valve plug is both top and bottom guided to ensure positive seating alignment. Trerice 3-Way valves use a stainless steel sleeve and brass seating surface to change flow direction within the body.

### Packing

Trerice valves feature a self-energizing Teflon V-Ring packing, which reduces leakage around the valve stem. V-Ring packing is spring loaded to maintain proper compression and does not require manual adjustment.

### Size

The proper sizing of a regulating valve is one of the most important factors in its selection. A valve that is too small will not be able to provide the desired capacity during peak load conditions, while a valve that is too large may overshoot the control point and operate with the valve plug too close to the seat, resulting in undue wear of the plug and seat. The valve coefficient ( $C_v$ ) is mathematically determined through an evaluation of the system service conditions (operating pressures and flow). From this evaluation, a valve body with the appropriate port size can be selected. Port sizes from 1/8" through 6" and connection sizes from 1/2" through 6" are available. Please consult the Valve Selection Section of this catalog.

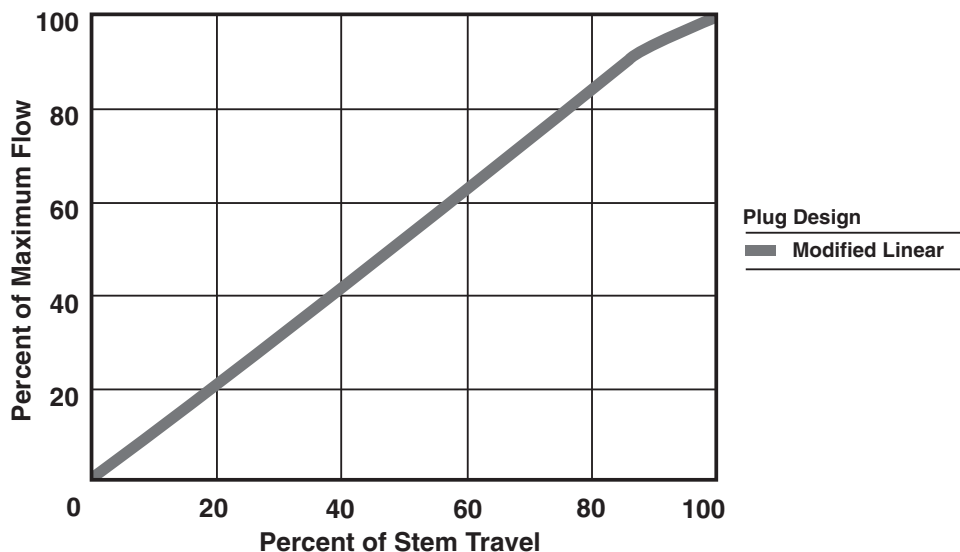
#### Valve Coefficient ( $C_v$ )

The rated valve coefficient is used to describe the relative flow capacity of the valve based on standard test conditions. Please refer to the Valve Selection Section for detailed information.

## Temperature Regulator Valve Availability

Body Material	Connection	Style	Size											
			1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	
Bronze	Iron Unions	Single	✓*	✓	✓	✓	✓	✓	✓					
		Double		✓	✓	✓	✓	✓						
		3-Way	✓	✓	✓	✓	✓	✓						
Cast-Iron	Class 125 Flanged	Double								✓	✓	✓	✓	✓
		3-Way								✓	✓	✓		
Cast-Steel	Threaded	Single		✓*	✓*									
Stainless Steel	Threaded	Single	✓*	✓	✓		✓	✓						
		3-Way	✓	✓	✓		✓	✓						

\*Reduced port sizes are available.



### Thermowell

For applications in which the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the sensing bulb. A thermowell will also facilitate the removal of the sensing bulb and thermal system from the operating process. Thermowells are available in a variety of connection styles, materials and lengths.

To ensure minimum response time, Trerice Heat Transfer Paste should be applied to the sensing portion of the bulb before installation.

1/2 oz. tube: Item No. 107-0001

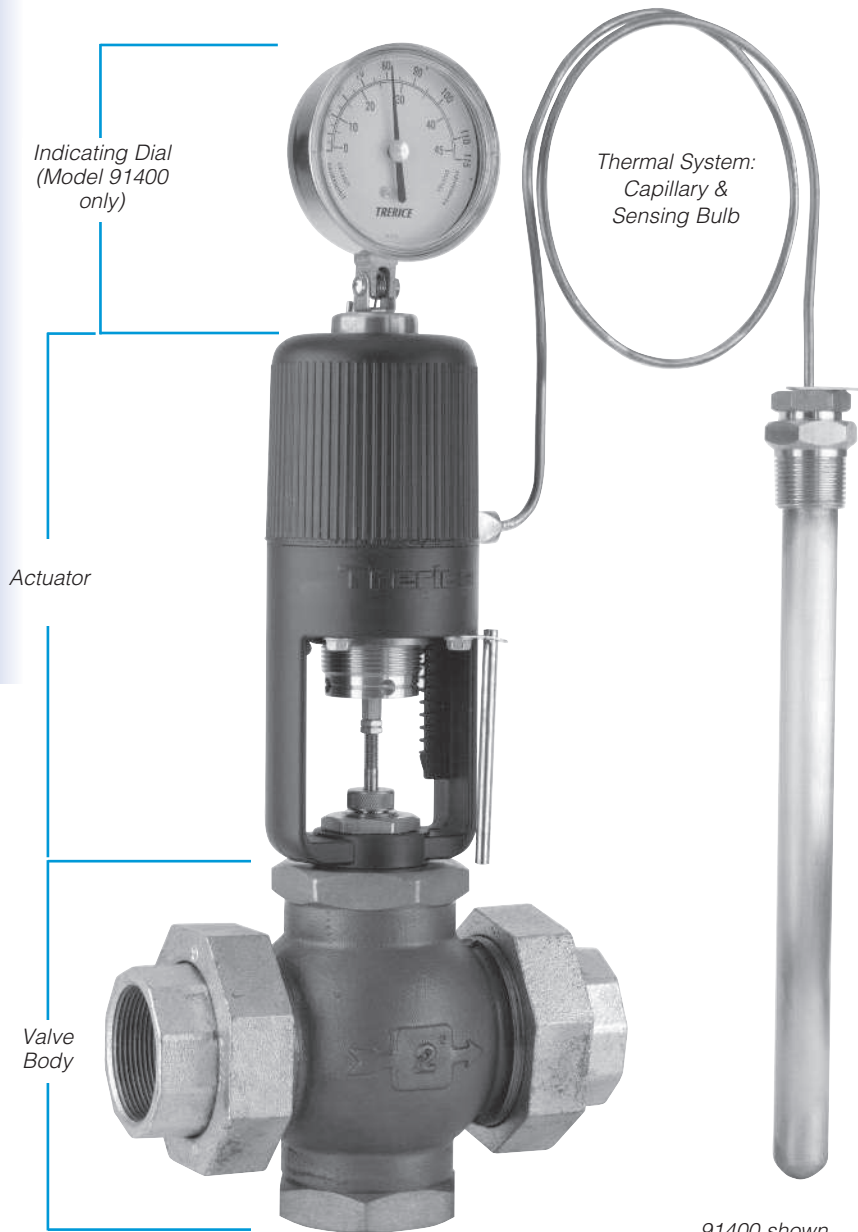
### Pipeline Strainer

A Trerice Series 1100 Pipeline Strainer should always be installed upstream of a Trerice Regulator. This Y-Type strainer employs a stainless steel screen to remove debris from the line, which will prevent jamming of the valve and extend its life. See "Pressure Regulator Section."

# 91000 Series Temperature Regulator

## The "Self-Op" (Self-Operated Temperature Regulator)

TEMPERATURE REGULATORS



91400 shown

- ▶ Self-Operating Design
- ▶ Indicating, Non Indicating or Safety Models Available
- ▶ Heavy Duty Die Cast Aluminum Housing
- ▶ 1/2" thru 6" Valve Sizes
- ▶ Fully Enclosed Bellows
- ▶ Internal Overrange protection

The **91000 Series** (Models 91000, 91400 & 91600) Self-Operating Temperature Regulator is the preferred choice of original equipment manufacturers, mechanical contractors and specifying engineers. These regulators require no external power source and are ideal for regulating the temperature of tanks, process streams and various types of industrial equipment. The Actuator is noted for its rugged die-cast aluminum housing, fully enclosed bellows assembly and internal over range protection.

Valve bodies for the **91000** are offered in single-seated, double-seated and 3-way designs and are available in Bronze, Cast-Iron, Cast-Steel and Stainless Steel construction.

The Model **91000** (without indicating dial) features a lower profile and should be specified where space constraints may be an issue.

The Model **91400** (with indicating dial) will allow the operator to verify the process temperature and to aid in temperature adjustment.

The Model **91600** Fail-Safe Actuator is designed to cause the valve to fail in the safe control position (open in a cooling application, closed in a heating application) should accidental damage to the thermal system occur, resulting in loss of the pressure charge.

**For optimal performance, the service conditions (medium, flow, temperature, inlet and outlet pressures) of the application must be considered when selecting a valve. Please refer to the Valve Selection Section of this catalog. For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the regulator bulb and facilitate its removal from the process. Improper application may cause failure of the valve, resulting in possible personal injury or property damage.**

For replacement or service parts please see Accessories and Replacement Parts in the Regulators and Control Valves section of the list price sheet.

### HOW TO ORDER

Sample Order Number: **91400 R06 08 B01 W01 - A26**

Models	Range	Capillary Length†	Thermal System	Thermowell**	Valve Body Selection
<b>91000</b> Non-Indicating	Refer to	<b>08</b> 8 Feet	Refer to Thermal System Selection Chart (pages 186-187)	<b>W01</b> - Brass	For 91000/91400 Models (refer to pages 188-195)
<b>91400</b> Indicating Dial	Standard	<b>12</b> 12 Feet		<b>W02</b> - Steel	
<b>91600</b> Fail Safe	Ranges	<b>16</b> 16 Feet		<b>W04</b> - 316SS (Omit if not required)	For 91600 Models (refer to page 196) (Omit this selection if purchasing Actuator only)
	(page 184)	<b>20</b> 20 Feet			

\* Thermowell sized to fit bulb as specified. To purchase a thermowell separately, please consult Page 185.

† Other Capillary Lengths available: Specify in 4 Foot increments (52' maximum)

### Specifications

#### Actuator Models

<b>91000</b>	(Non-Indicating)
<b>91400</b>	(Indicating Dial)
<b>91600</b>	(Fail-Safe)

#### Power Requirements

Fully self-contained –  
no external power required

#### Dial Thermometer

3 1/2" dial, stainless steel case,  
swivel and angle adjustment  
(Model 91400 only)

#### Housing

Die cast aluminum, epoxy powder  
coated blue finish

#### Set Point Scale

Integral to housing

#### Bellows

High pressure brass, corrosion  
resistant, tin plated finish

#### Adjustment Screw

Brass

#### Adjustment Screw Bushing

Lubricant impregnated  
sintered bronze

#### Range Adjustment Spring

Cadmium Plated

#### Overrange Protection

Upper range limit +100°F for  
temporary situations  
(not available for Model 91600)

#### Approximate Shipping Weight

##### Actuator

91000: 6.0 lbs [2.70 kg]  
91400: 6.6 lbs [2.97 kg]  
91600: 9.5 lbs [4.32 kg]

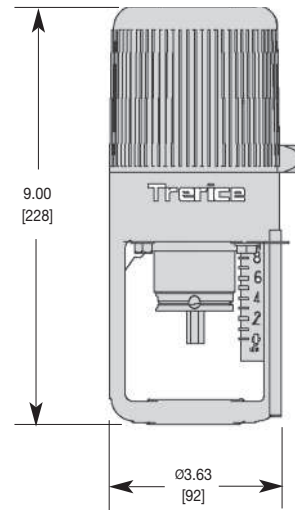
##### Valve

See Valve Selection tables

All dimensions are nominal. Dimensions in [ ] are in millimeters.

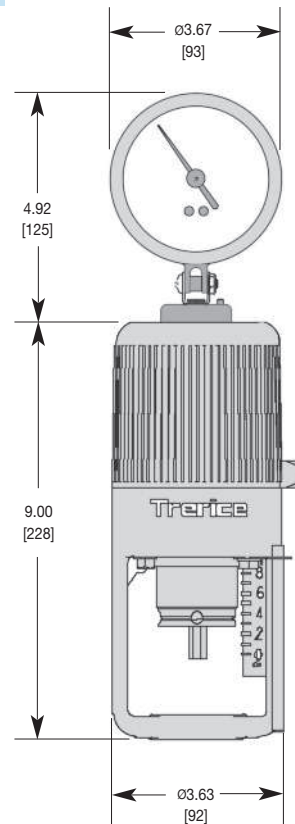
### 91000

#### Non-Indicating Actuator



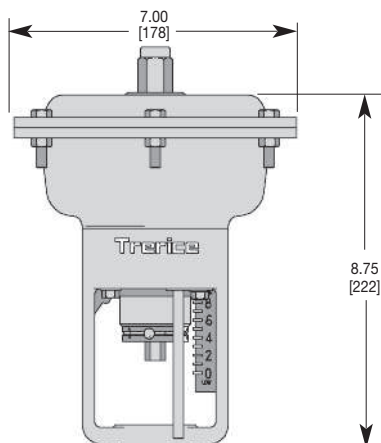
### 91400

#### Indicating Actuator



### 91600

#### Fail-Safe Actuator



# Temperature Ranges

## The “Self-Op” Temperature Regulator (91000, 91400, & 91600 Models)

### Standard Ranges

91000 & 91400 Actuators				
Range Code	Nominal Range	Recommended Working Span		Dial Thermometer Range (Model 91400 only)
		Single Seat, In-To-Close Valves Double Seat, In-To-Close Valves Double Seat, In-To-Open Valves All 3-Way Valves	Single Seat In-To-Open Valves	
R01*	20° to 70°F & -10° to 20°C	40° to 65°F & 5° to 20°C	N/A	30° to 115°F & C
R02*	40° to 90°F & 5° to 30°C	65° to 85°F & 20° to 30°C	N/A	50° to 140°F & C
R03	30° to 115°F & 0° to 45°C	85° to 110°F & 30° to 45°C	50° to 80°F & 10° to 25°C	30° to 115°F & C
R04	50° to 140°F & 10° to 60°C	110° to 135°F & 45° to 60°C	80° to 105°F & 25° to 45°C	50° to 140°F & C
R05	75° to 165°F & 25° to 70°C	135° to 160°F & 60° to 70°C	105° to 130°F & 40° to 50°C	75° to 165°F & C
R06	105° to 195°F & 40° to 90°C	160° to 190°F & 70° to 90°C	130° to 155°F & 50° to 65°C	105° to 195°F & C
R07	125° to 215°F & 55° to 100°C	190° to 210°F & 90° to 100°C	155° to 180°F & 65° to 80°C	125° to 215°F & C
R09	155° to 250°F & 70° to 120°C	210° to 245°F & 100° to 120°C	180° to 215°F & 80° to 100°C	155° to 250°F & C
R10	200° to 280°F & 95° to 135°C	245° to 275°F & 120° to 135°C	215° to 245°F & 100° to 120°C	200° to 280°F & C
R11	225° to 315°F & 110° to 155°C	275° to 310°F & 135° to 155°C	245° to 280°F & 120° to 140°C	225° to 315°F & C
R12	255° to 370°F & 125° to 185°C	305° to 365°F & 155° to 185°C	275° to 335°F & 135° to 165°C	255° to 370°F & C
R13	295° to 420°F & 145° to 215°C	365° to 415°F & 185° to 215°C	335° to 385°F & 165° to 195°C	295° to 420°F & C
R14	310° to 440°F & 155° to 225°C	415° to 435°F & 215° to 225°C	385° to 405°F & 195° to 205°C	310° to 440°F & C

\*Not recommended for single seated valves.

The recommended working span typically falls within the upper third of the nominal range. Single Seat In-To-Close, all Double Seat, and all 3-Way valves have a recommended working span in this part of the nominal range. However, due to differing thrust requirements, Single Seat In-To-Open valves have a recommended working span in the middle one-third of the nominal range.

### Standard Ranges

91600 Fail-Safe Actuators		
Range Code	Nominal Range and Recommended Working Span	
R81	40° to 65°F	& 5° to 20°C
R82	55° to 80°F	& 15° to 25°C
R83	65° to 90°F	& 20° to 30°C
R84	80° to 110°F	& 25° to 40°C
R85	90° to 115°F	& 30° to 45°C
R86	110° to 140°F	& 40° to 60°C
R89	140° to 175°F	& 60° to 80°C
R90	170° to 195°F	& 80° to 90°C
R91	190° to 210°F	& 85° to 100°C
R92	205° to 225°F	& 95° to 105°C
R93	215° to 250°F	& 100° to 120°C
R94	230° to 265°F	& 110° to 130°C
R95	245° to 280°F	& 120° to 135°C
R96	270° to 300°F	& 135° to 150°C



# Thermowells

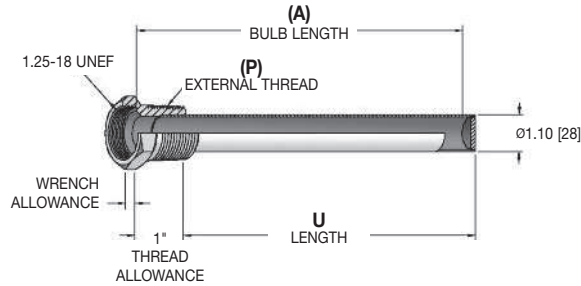
for Temperature Regulator (91000, 91400, & 91600 Models)

If Thermowells are to be purchased as a separate item, or if a Special Thermowell is required, please refer to this page. If a complete Temperature Regulator is purchased, the proper Thermowell to match the sensing bulb ordered will be supplied. Please note sensing bulb size is affected by capillary length. Indicate W01 for Brass, W02 for Steel or W04 for 316SS.

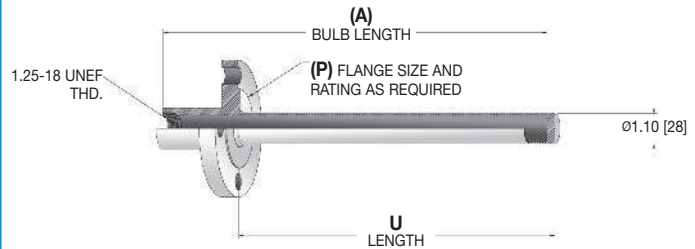
## Thermowell to fit Standard Bulb

All dimensions are nominal. Dimensions in [ ] are in millimeters.

### Threaded



### Flanged



### Pressure Rating (psi)

Material	Operating Temperature		
	70°F	300°F	500°F
Carbon Steel	780	780	600
316 Stainless Steel	750	690	600
Brass	350 psi @ 150°F, 280 @ 350°F		

### Lengths

(A) BULB LENGTH	U Length
13"	12.25 [311]
16"	15.25 [387]
20"	19.25 [489]
24"	23.25 [591]

Maximum pressure and temperature ratings are limited by the choice of flange. Please see ANSI/ASME B16.5-2003 for more information.

## HOW TO ORDER

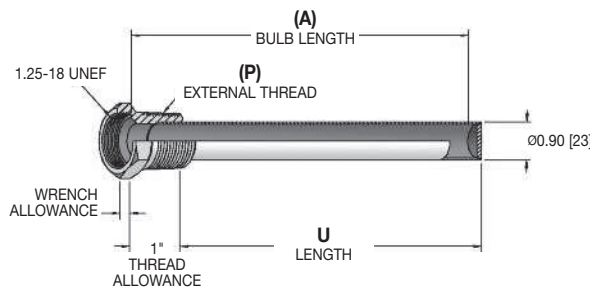
Sample Order Number: **53-6S6**

Thermowell Style	(P) External Connection	(A) Bulb Length	Material
53 - Temperature Regulator	6 1 1/4 NPT	S 13" Bulb	2 Brass (500 psi max.)
	71 1 1/2" 150# RFF *	Se 16" Bulb	3 Steel (500 psi max.)
	81 2" 150# RFF *	We 20" Bulb	6 316SS (1000 psi max.)
	181 3" 150# RFF *	Wk 24" Bulb	

\* Not available in Brass.

Other connections and lengths may be available, consult factory.

## Thermowell to fit Special "Small" Bulb



### Lengths

(A) Bulb Length	Thermowell U Length
9"	8.25 [210]
12"	11.25 [286]

### Pressure Rating (psi)

Material	Operating Temperature		
	70°F	300°F	500°F
Carbon Steel	850	850	680
316 Stainless Steel	850	780	730
Brass	480 psi @ 150°F, 400 @ 350°F		

## HOW TO ORDER

Sample Order Number: **53-5M2**

Thermowell Style	(P) External Thread	(A) Bulb Length	Material
53 - Temperature Regulator	5 1 NPT	M 9" Bulb	2 Brass (500 psi max.)
		R 12" Bulb	3 Steel (500 psi max.)
			6 316SS (1000 psi max.)

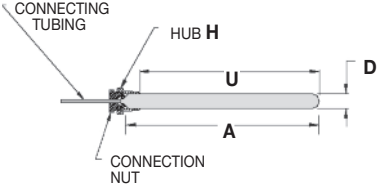
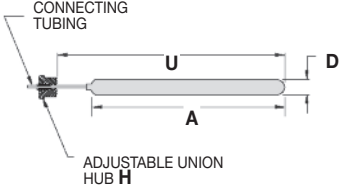
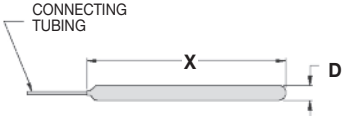
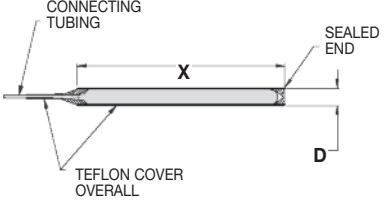
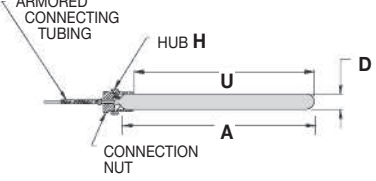
Selection of the proper thermowell is the sole responsibility of the user. Pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage.

# Thermal System Selection

## Temperature Regulator (91000, 91400, & 91600 Models)

U = Insertion Length  
X = Bulb Length

TEMPERATURE REGULATORS

Bulb and Capillary Style	Order Code	Connection Style & Material	Bulb Material	Capillary Tubing Material
<b>Union Connection</b>				
	<b>B01</b>	Brass Union Hub	Copper	Copper
	<b>B10</b>	Stainless Steel Union Hub	Stainless Steel	Stainless Steel
<b>Adjustable Union Connection</b>				
	<b>B02</b>	Brass Union Hub	Copper	Copper
	<b>B04</b>	Stainless Steel Union Hub	Stainless Steel	Stainless Steel
		Adjustable over entire capillary length		
		Adjustable over entire capillary length		
<b>Plain Bulb</b>				
	<b>B05</b>	None	Copper	Copper
	<b>B06</b>	None	Stainless Steel	Stainless Steel
<b>Teflon Covered Bulb</b>				
	<b>B08</b>	None	Copper with Teflon Covering	Copper with Teflon Covering
	<b>B07</b>	None	Stainless Steel with Teflon Covering	Stainless Steel with Teflon Covering
		450°F (232°C) Maximum Temperature		
		450°F (232°C) Maximum Temperature		
<b>Union Connection with Spiral Armor</b>				
	<b>B15</b>	Brass Union Hub	Copper	Copper with Stainless Steel Spiral Armor
	<b>B16</b>	Stainless Steel Union Hub	Stainless Steel	Stainless Steel with Stainless Steel Spiral Armor

Bulb Pressure Limits: Copper = 250 psi, Stainless Steel = 500 psi

## Bulb Dimensions & Minimum Insertion Lengths

		Standard Bulb				Special "Small" Bulb		
Dim.	91000 / 91400 Capillary Length				91600 Capillary Length 8 Feet*	91000 / 91400		91600
	8 to 16 Feet	20 Feet	24 to 36 Feet	40 to 52 Feet		Order Code	All	
A	13"	16"	20"	24"	16"	<b>SB01</b>	9"	12"
U	12.25"	15.25"	19.25"	23.25"	15.25"		8.25"	11.25"
D	1"	1"	1"	1"	1"		3/4"	3/4"
H	1 NPT	1 NPT	1 NPT	1 NPT	1 NPT		3/4 NPT	3/4 NPT
A	13"	16"	20"	24"	16"	<b>SB10</b>	9"	12"
U	12.25"	15.25"	19.25"	23.25"	15.25"		8.25"	11.25"
D	1"	1"	1"	1"	1"		3/4"	3/4"
H	1 NPT	1 NPT	1 NPT	1 NPT	1 NPT		3/4 NPT	3/4 NPT
A	13"	16"	20"	24"	16"	<p><b>Note: This bulb is available for applications where space considerations exist, and may only be used when the temperature of the actuator housing will always remain lower than that of the sensing bulb. If the temperature of the actuator housing rises above the sensing bulb temperature, the unit will not operate properly. The temperature of the actuator housing is dependent upon both the surrounding environment and the temperature of the flow medium and may easily reach 150°F on steam service.</b></p> <p><b>This bulb is only available on union connected thermal systems.</b></p> <p><b>Always use the Standard Bulb unless special requirements exist and full details of the application are known, consult factory.</b></p>		
U	12.25"	15.25"	19.25"	23.25"	15.25"			
D	1"	1"	1"	1"	1"			
H	1 NPT	1 NPT	1 NPT	1 NPT	1 NPT			
X	13"	16"	20"	24"	16"			
D	1"	1"	1"	1"	1"			
X	13"	16"	20"	24"	16"			
D	1"	1"	1"	1"	1"			
X	15"	18"	22"	26"	18"			
D	1.16"	1.16"	1.16"	1.16"	1.16"			
X	15"	18"	22"	26"	18"			
D	1.16"	1.16"	1.16"	1.16"	1.16"			
A	13"	16"	20"	24"	16"	<b>SB15</b>	9"	12"
U	12.25"	15.25"	19.25"	23.25"	15.25"		8.25"	11.25"
D	1"	1"	1"	1"	1"		3/4"	3/4"
H	1 NPT	1 NPT	1 NPT	1 NPT	1 NPT		3/4 NPT	3/4 NPT
A	13"	16"	20"	24"	16"	<b>SB16</b>	9"	12"
U	12.25"	15.25"	19.25"	23.25"	15.25"		8.25"	11.25"
D	1"	1"	1"	1"	1"		3/4"	3/4"
H	1 NPT	1 NPT	1 NPT	1 NPT	1 NPT		3/4 NPT	3/4 NPT

\*On Model 91600, Minimum Insertion Length increases by 1" for each additional 4 ft. capillary increment.

# Valve Body Selection (for 91000 & 91400 Temperature Regulators)

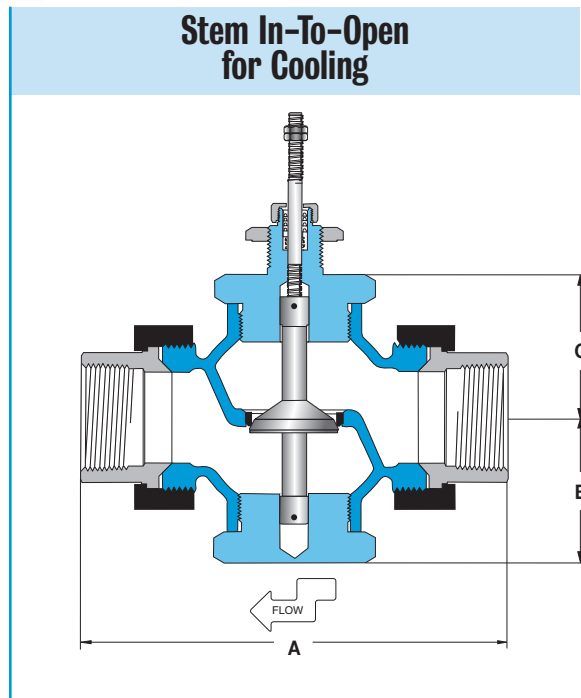
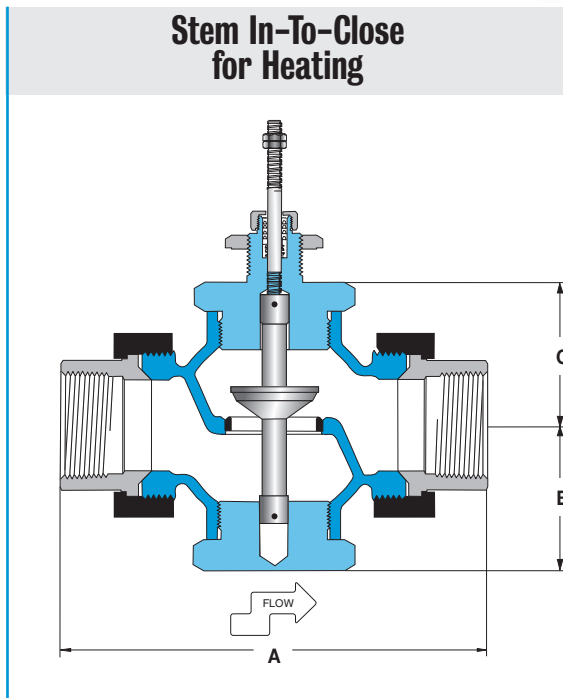
# BRONZE

## Single Seat • 1/2" – 2"



All dimensions are nominal. Dimensions in [ ] are in millimeters.

TEMPERATURE REGULATORS



### Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Bronze	Stainless steel	Modified linear	Threaded, malleable iron union ends	250 PSI @ 410°F (210°C)

### Valve Body Selection

Valve Body Number		Size		Capacity C <sub>v</sub>	Maximum Close-Off Pressure (psid)	Dimensions			Approximate Shipping Wt.
In-To-Close Heating	In-To-Open Cooling	Connection (NPT)	Nominal Port			A	B	C	
A02	A03	1/2	1/8"	0.17	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A05	A06	1/2	3/16"	0.35	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A08	A09	1/2	1/4"	0.7	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A11	A12	1/2	3/8"	1.4	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A14	A15	1/2	1/2"	2.8	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A19	A22	3/4	3/4"	5.6	140	5.6 [142]	2.3 [58]	2.3 [58]	4.9 lbs [2.21 kg]
A26	A30	1	1"	8.4	80	6.0 [152]	2.3 [58]	2.3 [58]	6.0 lbs [2.70 kg]
A36	A41	1 1/4	1 1/4"	15	50	7.2 [183]	2.6 [66]	2.6 [66]	9.7 lbs [4.37 kg]
A47	A52	1 1/2	1 1/2"	21	35	7.7 [196]	2.6 [66]	2.6 [66]	10.8 lbs [4.86 kg]
A58	A63	2	2"	33	20	8.6 [218]	3.1 [79]	3.1 [79]	16.3 lbs [7.34 kg]

# BRONZE

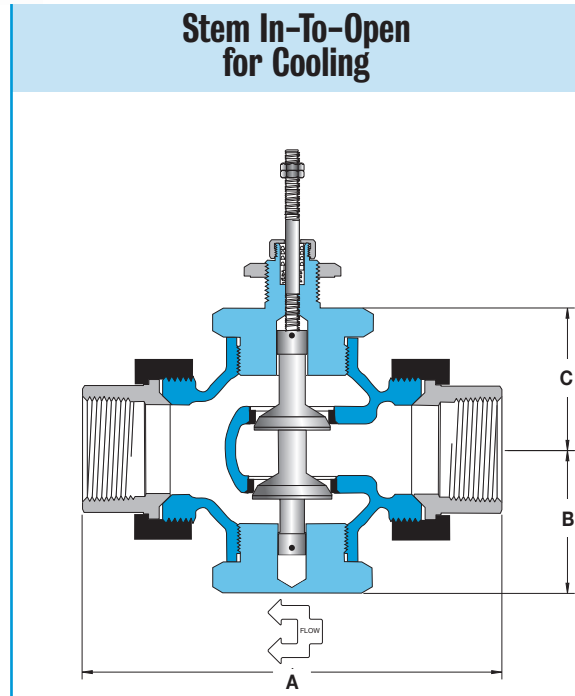
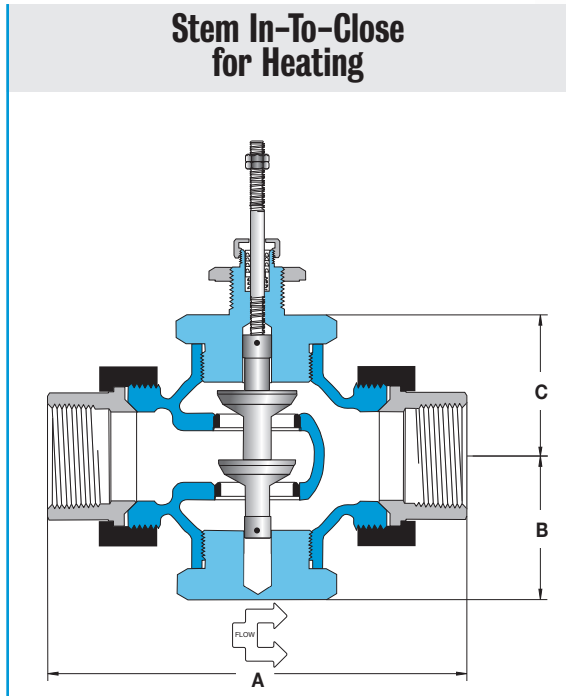
# Valve Body Selection (for 91000 & 91400 Temperature Regulators)

All dimensions are nominal. Dimensions in [ ] are in millimeters.



Double Seat • 3/4" – 2"

TEMPERATURE REGULATORS



## Specifications

Body Material	Trim	Material	Trim Style Connection	Pressure & Temperature Rating
Bronze	Stainless steel	Modified linear	Threaded, malleable iron union ends	250 PSI @ 410°F (210°C)

## Valve Body Selection

Valve Body Number		Size		Capacity C <sub>v</sub>	Maximum Close-Off Pressure (psid)	Dimensions			Approximate Shipping Wt.
In-To-Close Heating	In-To-Open Cooling	Connection (NPT)	Nominal Port			A	B	C	
A21	A24	3/4	3/4"	8	250	5.6 [142]	2.3 [58]	2.3 [58]	5.0 lbs [2.25 kg]
A29	A33	1	1"	12	250	6.0 [152]	2.3 [58]	2.3 [58]	6.1 lbs [2.75 kg]
A39	A44	1 1/4	1 1/4"	21	250	7.2 [183]	2.6 [66]	2.6 [66]	10.1 lbs [4.55 kg]
A50	A55	1 1/2	1 1/2"	30	250	7.7 [196]	2.6 [66]	2.6 [66]	11.1 lbs [5.00 kg]
A61	A66	2	2"	47	250	8.6 [218]	3.1 [79]	3.1 [79]	17.0 lbs [7.65 kg]

# Valve Body Selection (for 91000 & 91400 Temperature Regulators)

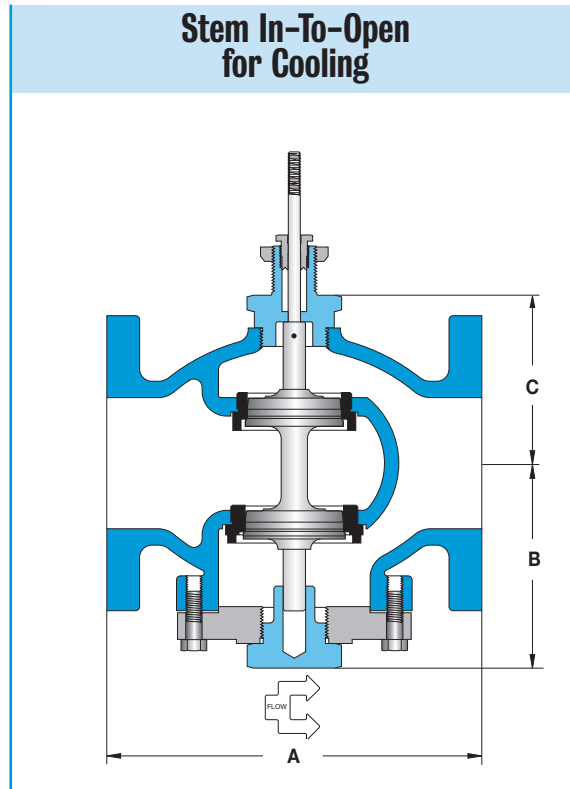
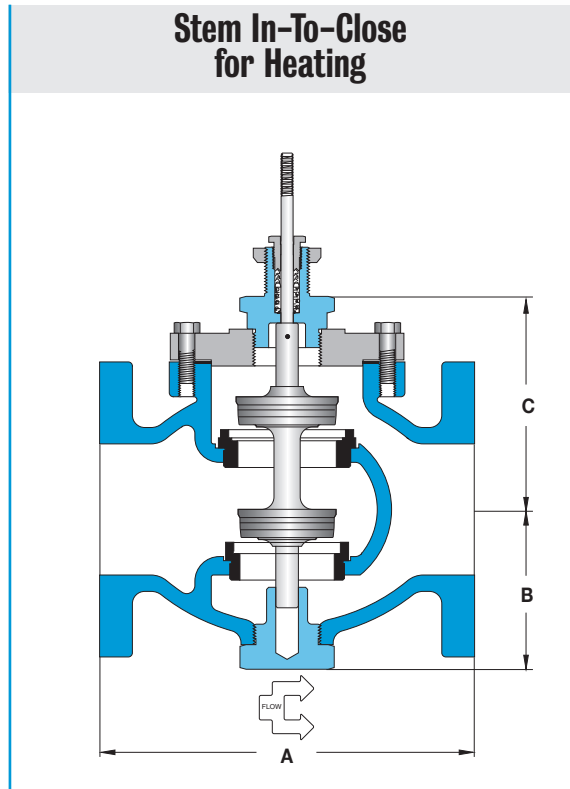
# CAST IRON

Double Seat • 2½" – 6"



All dimensions are nominal. Dimensions in [ ] are in millimeters.

TEMPERATURE REGULATORS



## Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Cast-iron	Stainless steel	Modified linear	Class 125 flanged	125 PSI @ 350°F (149°C)

## Valve Body Selection

Valve Body Number		Size		Capacity C <sub>v</sub>	Maximum Close-Off Pressure (psid)	Dimensions			Approximate Shipping Wt.
In-To-Close Heating	In-To-Open Cooling	Connection	Nominal Port			A	B	C	
B73	B74	2½"	2½"	69	65	7.8 [198]	4.8 [122]	5.4 [137]	45 lbs [20 kg]
B78	B79	3"	3"	90	50	9.0 [229]	5.0 [127]	5.6 [142]	70 lbs [32 kg]
B83	B84	4"	4"	196	40	11.4 [290]	6.3 [160]	6.5 [165]	100 lbs [45 kg]
B88	B89	5"	5"	248	30	12.0 [305]	6.9 [175]	7.3 [185]	155 lbs [70 kg]
B93	B94	6"	6"	340	25	14.1 [358]	7.5 [191]	8.0 [203]	180 lbs [82 kg]

# CAST STEEL

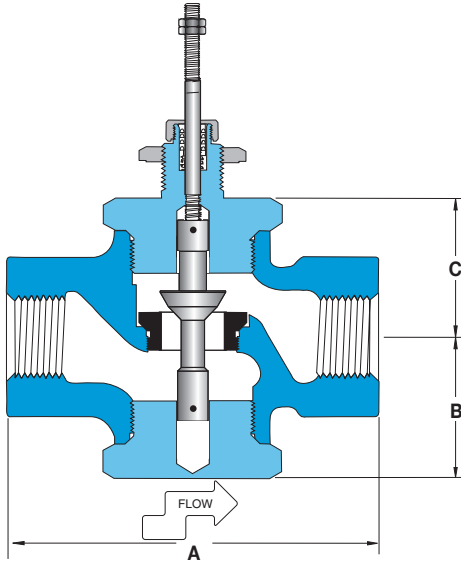
# Valve Body Selection (for 91000 & 91400 Temperature Regulators)

All dimensions are nominal. Dimensions in [ ] are in millimeters.

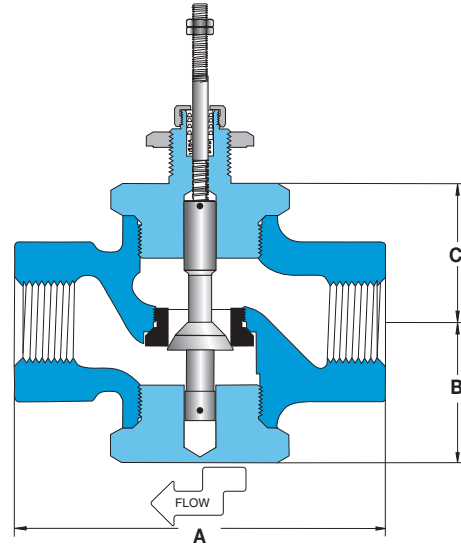
Single Seat • 3/4" – 1"

TEMPERATURE REGULATORS

**Stem In-To-Close  
for Heating**



**Stem In-To-Open  
for Cooling**



## Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Cast-Steel	Stainless steel	Modified linear	Threaded	250 PSI @ 410°F (210°C)

## Valve Body Selection

Valve Body Number		Size		Capacity C <sub>v</sub>	Maximum Close-Off Pressure (psid)	Dimensions			Approximate Shipping Wt.
In-To-Close Heating	In-To-Open Cooling	Connection (NPT)	Nominal Port			A	B	C	
C01	—	3/4	1/8"	0.17	250	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C02	—	3/4	3/16"	0.35	250	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C03	—	3/4	1/4"	0.7	250	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C04	—	3/4	3/8"	1.4	250	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C05	C15	3/4	1/2"	2.8	250	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C06	C16	3/4	3/4"	5.6	140	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C51	—	1	1/8"	0.17	250	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C52	—	1	3/16"	0.35	250	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C53	—	1	1/4"	0.7	250	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C54	—	1	3/8"	1.4	250	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C55	C65	1	1/2"	2.8	250	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C56	C66	1	3/4"	5.6	140	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C57	C67	1	1"	8.4	80	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]

# Valve Body Selection

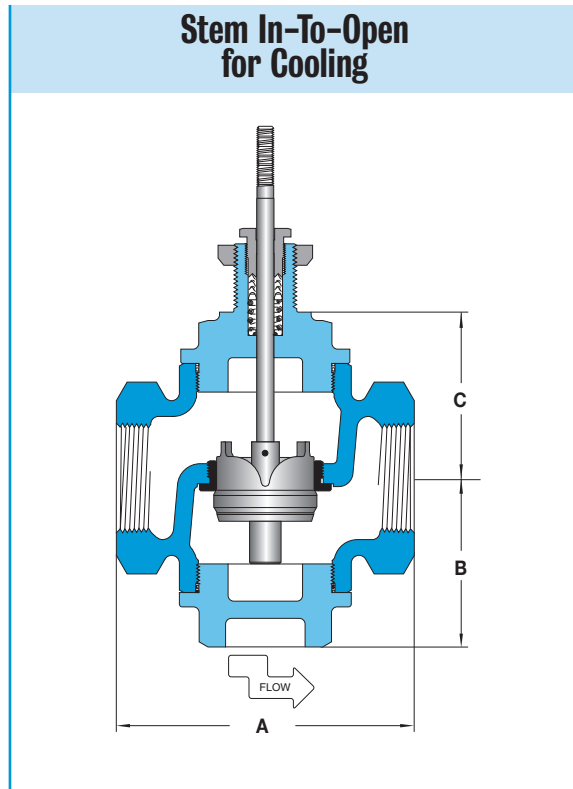
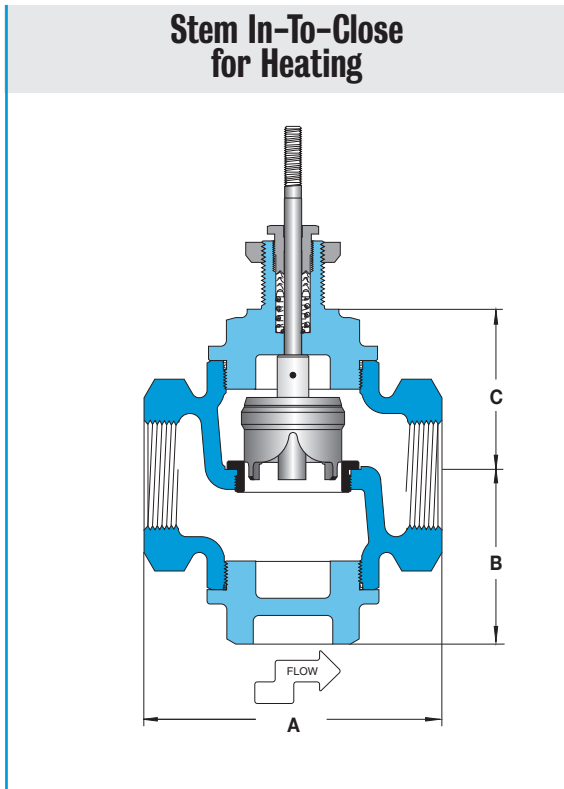
(for 91000 & 91400 Temperature Regulators)

# STAINLESS STEEL

Single Seat • 1/2" – 2"

All dimensions are nominal. Dimensions in [ ] are in millimeters.

TEMPERATURE REGULATORS



## Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
316 stainless steel	Stainless steel	Modified linear	Threaded	250 PSI @ 410°F (210°C)

## Valve Body Selection

Valve Body Number		Size		Capacity C <sub>v</sub>	Maximum Close-Off Pressure (psid)	Dimensions			Approximate Shipping Wt.
In-To-Close Heating	In-To-Open Cooling	Connection (NPT)	Nominal Port			A	B	C	
D02	D03	1/2	1/8"	0.34	250	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D05	D06	1/2	3/16"	0.76	250	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D08	D09	1/2	1/4"	1.5	250	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D11	D12	1/2	3/8"	3.4	250	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D14	D15	1/2	1/2"	6.0	250	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D19	D22	3/4	3/4"	8.6	140	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D26	D30	1	1"	14	60	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D47	D52	1 1/2	1 1/2"	27	25	6.1 [155]	3.5 [89]	4.0 [102]	15.5 lbs [7.05 kg]
D58	D63	2	2"	33	15	6.5 [165]	3.9 [99]	4.2 [107]	19.0 lbs [8.64 kg]



All dimensions are nominal. Dimensions in [ ] are in millimeters.

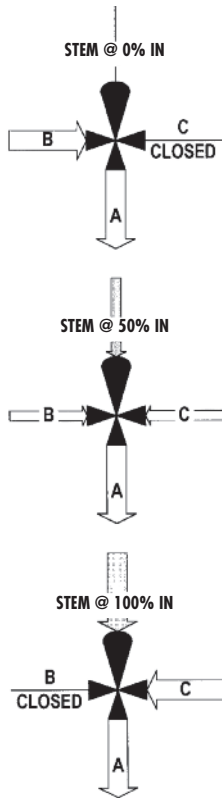


3-WAY • 1/2" - 2"

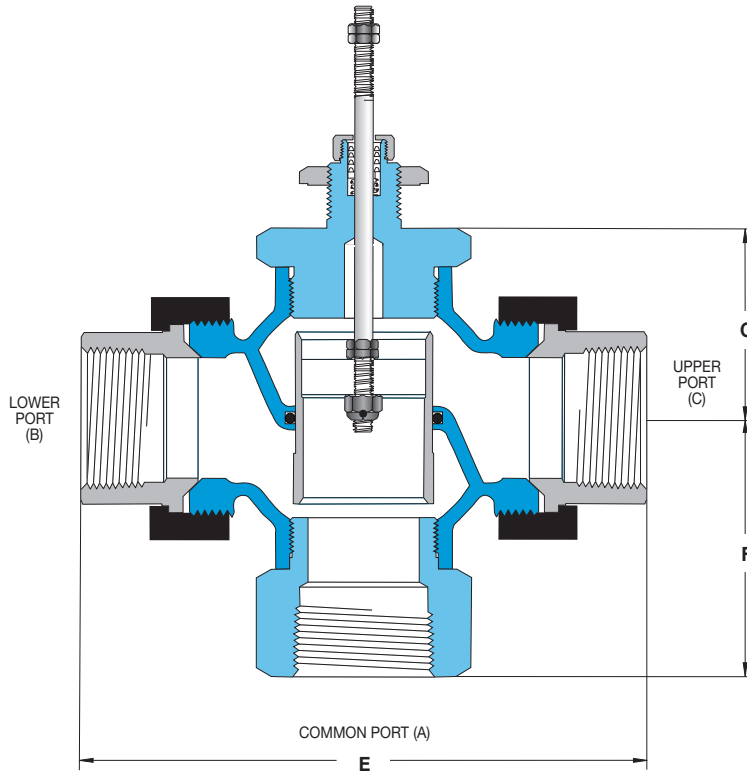
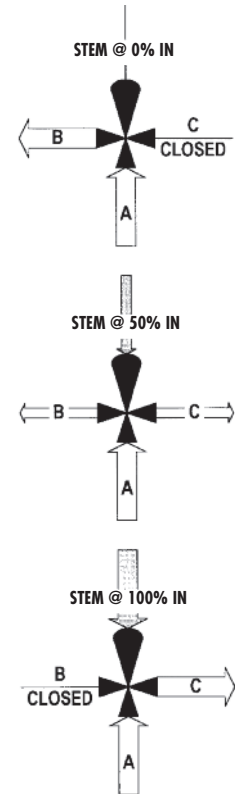
TEMPERATURE REGULATORS

## for Mixing or Diverting

MIXING FLOW DIAGRAM



DIVERTING FLOW DIAGRAM



Trerice 3-Way Valves are not designed for use in steam applications. To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

### Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Bronze	Bronze	Modified linear	Threaded, malleable iron union ends	250 PSI @ 300°F (149°C)

### Valve Body Selection

Valve Body Number	Size		Capacity C <sub>v</sub>	Maximum Close-Off Pressure (psid)	Dimensions			Approximate Shipping Wt.
	Connection (NPT)	Nominal Port			E	F	G	
A18	1/2	1/2"	2.8	250	4.8 [122]	1.8 [46]	1.8 [46]	2.9 lbs [1.31 kg]
A25	3/4	3/4"	5.6	250	5.6 [142]	2.3 [58]	2.3 [58]	4.7 lbs [2.12 kg]
A34	1	1"	8.4	250	6.0 [152]	2.3 [58]	2.3 [58]	5.7 lbs [2.57 kg]
A45	1 1/4	1 1/4"	15	250	7.2 [183]	2.8 [71]	2.6 [66]	9.5 lbs [4.28 kg]
A56	1 1/2	1 1/2"	21	250	7.7 [196]	3.5 [89]	2.6 [66]	11.1 lbs [5.00 kg]
A67	2	2"	33	250	8.6 [218]	4.1 [104]	3.1 [79]	16.7 lbs [7.55 kg]

# Valve Body Selection (for 91000 & 91400 Temperature Regulators)

# CAST IRON

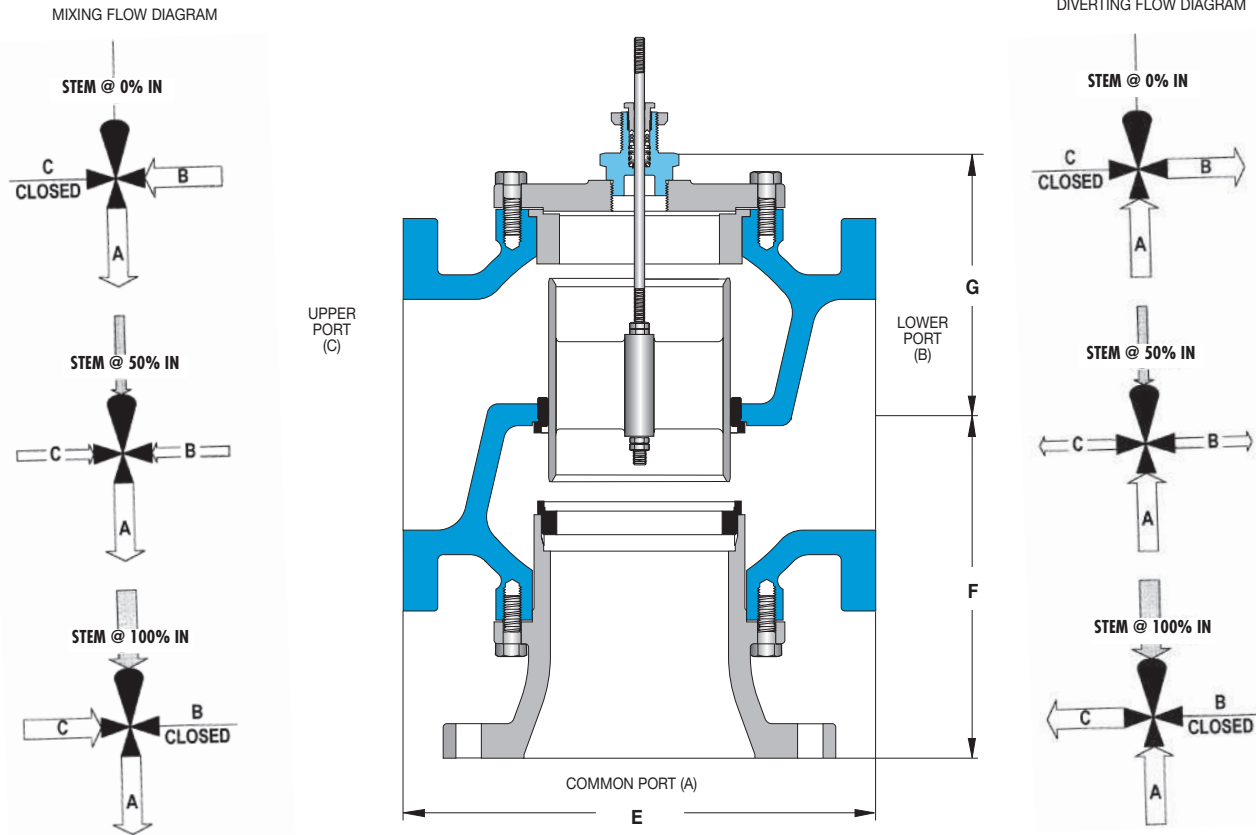
## 3-WAY • 2 1/2" - 4"



All dimensions are nominal. Dimensions in [ ] are in millimeters.

TEMPERATURE REGULATORS

## for Mixing or Diverting



Trerice 3-Way Valves are not designed for use in steam applications.  
To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

### Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Cast-Iron	Bronze	Modified linear	Class 125 flanged	125 PSI @ 300°F (149°C)

### Valve Body Selection

Valve Body Number	Size		Capacity C <sub>v</sub>	Maximum Close-Off Pressure (psid)	Dimensions			Approximate Shipping Wt.
	Connection	Nominal Port			E	F	G	
B75	2 1/2"	2 1/2"	68	125	9.0 [229]	7.1 [180]	5.2 [132]	62 lbs [28 kg]
B80	3"	3"	85	125	10.0 [254]	8.0 [203]	6.0 [152]	80 lbs [36 kg]
B85	4"	4"	160	125	13.0 [330]	10.0 [254]	6.9 [175]	140 lbs [64 kg]

# STAINLESS STEEL (for 91000 & 91400 Temperature Regulators)

## Valve Body Selection

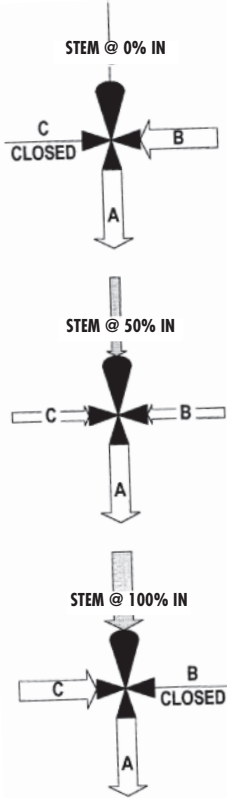
All dimensions are nominal. Dimensions in [ ] are in millimeters.

3-WAY • 1/2" – 2"

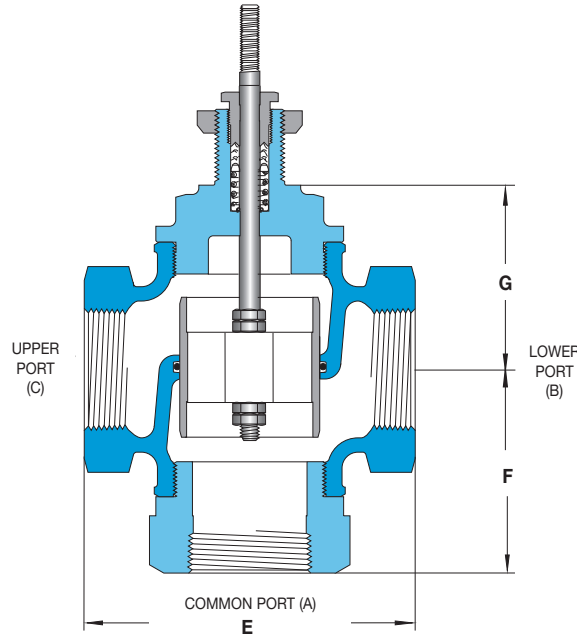
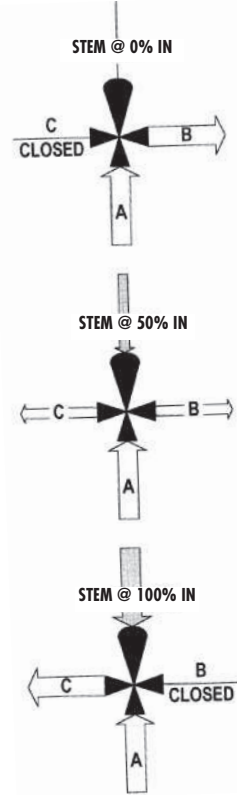
TEMPERATURE REGULATORS

### for Mixing or Diverting

MIXING FLOW DIAGRAM



DIVERTING FLOW DIAGRAM



Trerice 3-Way Valves are not designed for use in steam applications. To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

### Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
316 stainless steel	Stainless steel	Modified linear	Threaded	250 PSI @ 300°F (149°C)

### Valve Body Selection

Valve Body Number	Size		Capacity C <sub>v</sub>	Maximum Close-Off Pressure (psid)	Dimensions			Approximate Shipping Wt.
	Connection (NPT)	Nominal Port			E	F	G	
D18	1/2	1/2"	6	250	5 [127]	2.9 [74]	3.4 [86]	7.5 lbs [3.41 kg]
D25	3/4	3/4"	8	250	5 [127]	2.9 [74]	3.4 [86]	7.5 lbs [3.41 kg]
D34	1	1"	11	250	5 [127]	2.9 [74]	3.4 [86]	7.5 lbs [3.18 kg]
D56	1 1/2	1 1/2"	20	250	6.1 [155]	3.4 [86]	4.0 [102]	15.0 lbs [6.82 kg]
D67	2	2"	30	250	6.5 [165]	3.8 [97]	4.2 [107]	18.5 lbs [8.41 kg]

# Valve Body Selection

(for 91600 Fail Safe Temperature Regulators)

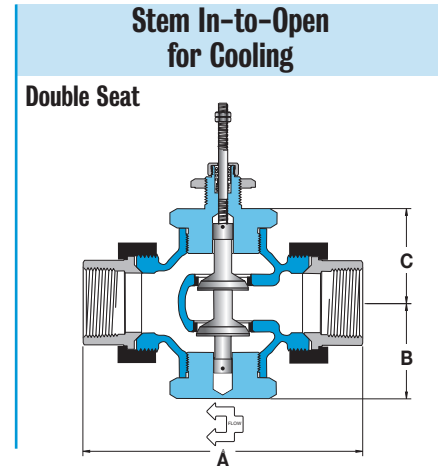
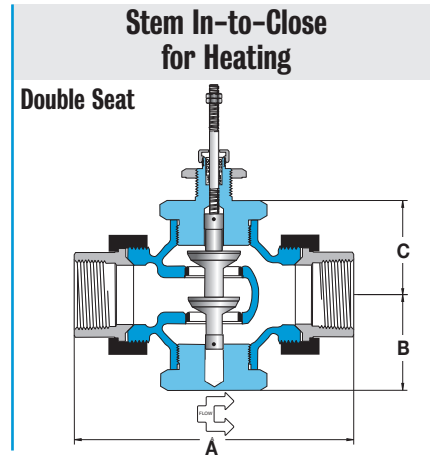
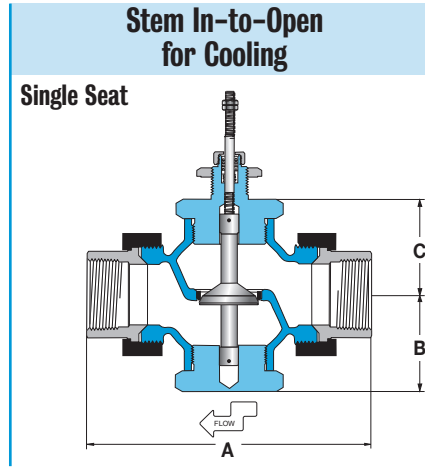
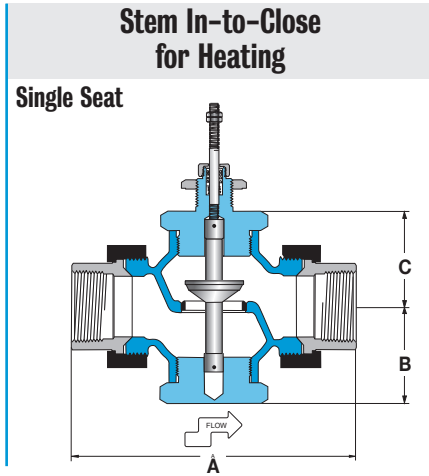
# BRONZE

Double Seat • 1/2" – 2"



All dimensions are nominal. Dimensions in [ ] are in millimeters.

TEMPERATURE REGULATORS



## Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Bronze	Stainless steel	Modified linear	Threaded, malleable iron union ends	250 PSI @ 410°F (210°C)

## Valve Body Selection

Valve Body Number		Size		No. of Seats	Effective** Cv	Max. Close-Off Pressure (psid)	Dimensions			Approximate Shipping Wt.
In-To-Close Heating	In-To-Open Cooling	Connection (NPT)	Nominal Port				A	B	C	
A02	A03	1/2 *	1/8"	1	0.12	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A05	A06	1/2 *	3/16"	1	0.25	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A08	A09	1/2 *	1/4"	1	0.5	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A11	A12	1/2 *	3/8"	1	1.0	150	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A14	A15	1/2 *	1/2"	1	2.0	100	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A21	A24	3/4	3/4"	2	5.6	250	5.6 [142]	2.3 [58]	2.3 [58]	5.0 lbs [2.25 kg]
A29	A33	1	1"	2	8.4	200	6.0 [152]	2.3 [58]	2.3 [58]	6.1 lbs [2.75 kg]
A39	A44	1 1/4	1 1/4"	2	15	175	7.2 [183]	2.6 [66]	2.6 [66]	10.1 lbs [4.55 kg]
A50	A55	1 1/2	1 1/2"	2	21	150	7.7 [196]	2.6 [66]	2.6 [66]	11.1 lbs [5.00 kg]
A61	A66	2	2"	2	33	100	7.6 [218]	3.1 [79]	3.1 [79]	17.0 lbs [7.65 kg]

\* 1/2" Single Seat, \*\*The 91600 Safety Actuator has a reduced valve stroke, resulting in a reduced effective Cv as shown.



# 91000XT Series Tank Thermostat

for Oil Field Heaters, Treaters & Separators

TEMPERATURE REGULATORS



- ▶ Self-Operating Design
- ▶ Heavy Duty Die Cast Aluminum Housing
- ▶ 3/4 & 1 NPT Valve Sizes
- ▶ Soft Seated Valve for Tight Close-Off
- ▶ Fully Enclosed Bellows

91000XT shown

The **91000XT Tank Thermostat** is specifically designed to control the temperature of heaters, treaters and separators within the petroleum industry. It is entirely self-contained, requires no external power source, and is the most widely preferred unit of its kind. When installed in a treater, the fail-open valve will automatically close-off the flow of gas as temperature increases, thereby regulating temperature within the treater. The Trerice 91000XT is ruggedly constructed with a heavy duty, die cast aluminum actuator housing and fully enclosed bellows assembly. Its single seated, cast-iron valve body is fitted with a stainless steel plug assembly and soft seating Viton o-ring to provide tight close-off.

**Warning: This valve may only be installed in outdoor applications. The Teflon v-ring packing will allow fugitive emissions to escape. Improper application may cause failure of the valve, resulting in possible personal injury or property damage.**

**For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the sensing bulb and facilitate its removal from the process.**

For replacement or service parts please see Accessories and Replacement Parts in the Regulators and Control Valves section of the list price sheet.

## Specifications

<b>Model</b>	91000XT
<b>Power Requirements</b>	Fully self-contained – no external power required
<b>Housing</b>	Die cast aluminum, epoxy powder coated blue finish
<b>Set Point Scale</b>	Integral to housing
<b>Bellows</b>	High pressure brass, corrosion resistant, tin plated finish
<b>Adjustment Screw</b>	Brass
<b>Adjustment Screw Bushing</b>	Lubricant impregnated sintered bronze
<b>Range Adjustment Spring</b>	Cadmium plated
<b>Overrange Protection</b>	Upper range limit +100°F for temporary situations
<b>Thermal System</b>	Bulb: Copper, .80" x 8", with 3/4 NPT union connection for thermowell Capillary: Copper, available in 10' or 20' lengths
<b>Thermowell</b>	Steel, 1 NPT connection
<b>Valve</b>	Single seat, fail-open Body: Cast-iron Trim: Stainless steel plug assembly with soft seating Viton o-ring, iron seat Port Size: 1/2" Connection: 3/4 NPT or 1 NPT threaded ends
<b>Valve Seat</b>	Viton® O-ring standard Minimum ambient operating Temperature 5°F (-15°C) For extreme cold weather conditions a NBR (Buna N) O-ring can be supplied. Minimum ambient operating temperature -40°F (-40°C) Please consult factory.
<b>Approximate Shipping Weight</b>	10.3 lbs [4.68 kg]

## HOW TO ORDER

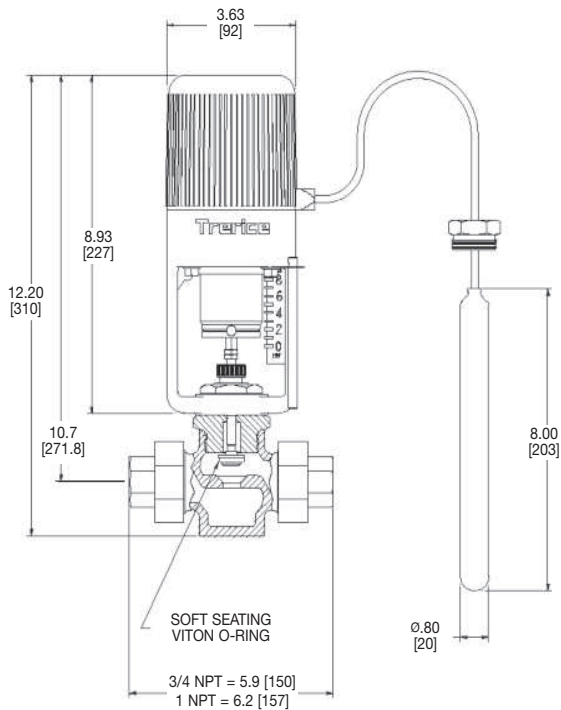
Sample Order Number: **91000XT X01 10 W02-X75**

Model	Range	Capillary Length	Thermowell	Valve Size
91000XT	See Standard Ranges	10 10 Feet	W02 Steel Thermowell (Omit if not required)	X75 3/4 NPT X10 1 NPT
		20 20 Feet		

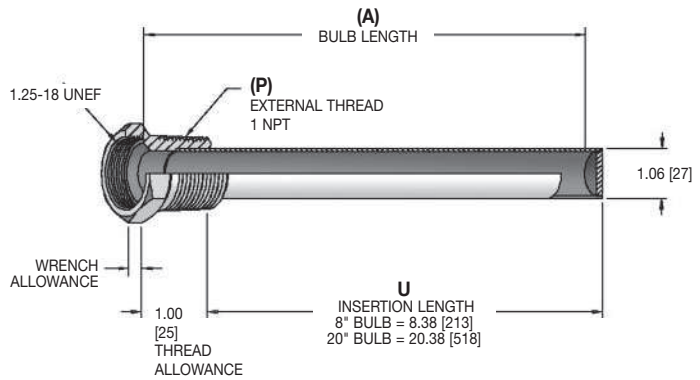
# 91000XT Series Tank Thermostat

All dimensions are nominal. Dimensions in [ ] are in millimeters.

## Thermostat



## Thermowell



### Pressure Rating (psi)

Material	Operating Temperature		
	70°F	300°F	500°F
Carbon Steel	780	780	600

### HOW TO ORDER

Thermowell Style	(P) External Thread	Bulb Length	Material
53 Tank Thermostat	5 1 NPT	L 8" Bulb We 20" Bulb*	3 Steel 6 316 SS

\* For ranges X07 and X08 only.

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage.

If Thermowells are to be purchased as a separate item, or if a Special Thermowell is required, please refer to this page.  
If a complete Temperature Regulator is purchased, the proper Thermowell to match the sensing bulb ordered will be supplied.

## Standard Ranges

Range Code	Nominal Range	Recommended Working Span	Bulb Length (A)
X13	85° to 115°F & 30° to 45°C	85° to 115°F & 30° to 45°C	8"
X11	80° to 140°F & 25° to 60°C	110° to 140°F & 45° to 60°C	8"
X15	130° to 160°F & 50° to 70°C	130° to 160°F & 50° to 70°C	8"
X01	110° to 190°F & 45° to 90°C	160° to 190°F & 70° to 90°C	8"
X03	125° to 215°F & 55° to 100°C	180° to 210°F & 80° to 100°C	8"
X12	200° to 280°F & 95° to 135°C	250° to 280°F & 120° to 140°C	8"
X10	225° to 315°F & 110° to 155°C	280° to 310°F & 135° to 155°C	8"
X16	310° to 365°F & 155° to 185°C	310° to 365°F & 155° to 185°C	8"
X14	295° to 420°F & 145° to 215°C	360° to 420°F & 180° to 215°C	8"
X08*	45° to 115°F & 10° to 45°C	85° to 115°F & 30° to 45°C	20"
X07*	65° to 140°F & 20° to 60°C	110° to 140°F & 45° to 60°C	20"

\*Except for Range Codes X07 and X08, the actuator housing and capillary tubing must always be exposed to a temperature lower than the required control point for proper thermostat operation.

## Valve Capacities

Gas (Specific Gravity = 0.6)																		
Inlet Pressure (PSIG)	5		10		20		30		40		50							
Outlet Pressure (PSIG)	4	2	0	8	5	0	15	10	5	25	20	10	30	20	15	40	30	25
Capacity (scfh)	970	1585	1935	1450	2140	2700	2685	3480	3870	3100	4120	5030	4650	6000	6200	5320	6870	7250

# Pressure Regulators

## DESIGN & OPERATION

### One-Piece Design



### Description

A Pressure Regulator is a mechanical device designed to regulate system flow pressure in response to upstream or downstream pressure changes.

### Principles of Operation

Trerice Pressure Regulators are available in two basic configurations: a one-piece design with an integrated actuation system, or a two-piece design comprised of individual components (actuator and globe valve), which are factory assembled into a complete regulator.

#### One-Piece Pressure Regulators (995 Series)

have an internal diaphragm that is attached to a valve plug. The diaphragm is balanced between the downward force of an adjustment spring and the upward force of the reduced downstream pressure within the regulator. As the downstream pressure decreases, the adjustment spring pushes down on the diaphragm, which in turn opens the valve. Conversely, as downstream pressure increases, the diaphragm is forced upward, overcoming the force of the spring and closing the valve.

### Two-Piece Design



**Two-Piece Pressure Regulators (921 Series)** employ a user-supplied pressure line connecting the actuator to the point of regulation within the pipeline or process. The process pressure will depress a diaphragm within the actuator housing and the subsequent movement of the diaphragm will push an attached valve stem to the “in” position. Choice of a stem In-To-Close or stem In-To-Open globe valve will determine if the assembled pressure regulator is for reducing downstream pressure (ITC or fail-open) or relieving upstream pressure (ITO or fail-closed). This unit features spring-opposed actuation: when the controlled pressure decreases, the adjustment spring will push the diaphragm upward, which will in turn move the valve stem back to the “out” position.



## Selecting a Pressure Regulator

- **Trerice 921 Series Pressure Regulators** provide a quick response to large system load changes, while maintaining precise flow regulation of steam, air or water. The 921 Series is capable of both downstream pressure reduction and back pressure relief. Valve sizes from 1/2" through 6" port are available.
- **Trerice 995 Series Pressure Regulators** are designed for steam, air, water or oil. Valve sizes from 1/2" through 2" port are available.

All Trerice Pressure Regulators should be carefully selected to meet the demands of the particular application. The information contained within this catalog is offered only as a guide to assist in making the proper selection. Selection of the proper pressure regulator is the sole responsibility of the user. Improper application may cause failure, resulting in possible personal injury or property damage.

Trerice Pressure Regulators are NOT intended for use in applications where the media comes in direct contact with the skin or body, such as showers, baths, lavatories or wash fountains.

### Pressure Range and Set Point

Each Trerice Pressure Regulator is designed to operate efficiently within a specified operating range. The regulator, when properly specified, will modulate pressure flow at the set point desired within the selected pressure range. The set point can be modified using the range adjustment screw provided on the unit.

### Pressure Regulator Valve Availability

Series	Body Material	Connection	Size												
			1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"
921	Bronze	Iron Unions			✓	✓	✓	✓	✓	✓					
	Cast-Iron	Class 125 Flanged									✓	✓	✓	✓	✓
995	Cast-Iron	Threaded		✓	✓	✓	✓	✓	✓	✓					

\*Reduced port sizes are available.

# Pressure Regulators

## DESIGN & OPERATION

### Valve

Trerice Two-Piece Pressure Regulators are available with a wide variety of globe valve designs, materials, connections and sizes.

### Style

Trerice Pressure Regulator Valve Bodies are available in single seated and double seated designs.

- **Single Seated Valves** are an excellent choice when a higher degree of close-off is required. However, this design is unbalanced and limited in the pressure that it will close-off against. The leakage rate is approximately 0.1% of the maximum capacity.
- **Double Seated Valves** are nearly pressure balanced and, therefore, are able to close the valve plug against higher operating pressures. However, since temperature fluctuations may cause expansion and contraction across the seats, tight close-off is not always possible. The leakage rate is approximately 0.5% of the maximum capacity. Double seated valves have a faster flow response and greater capacity than single seated valves, and are recommended when tight close-off is not required.

The Trerice Pressure Regulator is a balanced equilibrium system at the set point and provides no power to tightly seat the valve plug. The valve is not considered a close-off valve. Large pressure surges may force a single seated valve plug open. A power driven or hand actuated valve is required to ensure tight close-off when necessary.

### Action

Trerice 921 Series Pressure Regulators can be specified for use in either pressure reducing or back pressure relief applications. All other Trerice Pressure Regulators are designed for pressure reducing applications only.

Pressure Regulator Valve Action		
Application	Stem Action	Fail Position
Pressure Reducing	In-To-Close	Fail-open
Back Pressure Relief	In-To-Open	Fail-closed

## Body Material and Construction

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Trerice Pressure Regulators are available with bronze or cast-iron valve bodies. Union and flanged connection styles are available.

## Trim

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Valve trim is composed of the stem and plug assembly, and the seats within the ports. Trerice single and double seated, bronze valve bodies employ a stainless steel, tapered plug for enhanced modulation, as well as permanently brazed-in stainless steel seats for smooth performance throughout the life of the valve. The valve plug is both top and bottom guided to ensure positive seating alignment.

## Packing

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Trerice valves feature a self-energizing Teflon V-Ring packing, which reduces leakage around the valve stem. V-Ring packing is spring loaded to maintain proper compression and **does not** require manual adjustment.

## Size

---

The proper sizing of a regulating valve is one of the most important factors in its selection. A valve that is too small will not be able to provide the desired capacity during peak load conditions, while a valve that is too large may overshoot the control point and operate with the valve plug too close to the seat, resulting in undue wear of the plug and seat. The valve coefficient (**C<sub>v</sub>**) is mathematically determined through an evaluation of the system service conditions (operating pressures and flow). From this evaluation, a valve body with the appropriate port size can be selected. Port sizes from 1/4" through 6" and connection sizes from 1/2" through 6" are available. Please consult the Valve Selection Section of this catalog.

## Pipeline Strainer

---

A Trerice Series 1100 Pipeline Strainer should always be installed upstream of a Trerice Regulator. This Y-Type strainer employs a stainless steel screen to remove debris from the line, which will prevent jamming of the valve and extend its life.

# 921 Series Pressure Regulator

Pressure Reducing or Back Pressure Relief Valve (For Steam, Air or Water Service)

PRESSURE REGULATORS



921 shown

- ▶ Self-Contained Design
- ▶ Spring-loaded Diaphragm Actuated
- ▶ Cast Ductile Iron Housing & Yoke
- ▶ 1/2" - 6" Valve Sizes

The Trerice **921 Series** Pressure Regulator is fully self-contained and requires no external power source. This regulator requires that a user-supplied pressure sensing line be connected from the controlled point to the diaphragm actuator. Pressure in this line acts upon the diaphragm to develop the necessary thrust to stroke the valve, thereby maintaining the system at the desired condition.

- For pressure reducing applications, the pressure sensing line is mounted downstream, and the valve closes as this sensed pressure increases.

**Reduced outlet pressure not to be less than 10% of inlet pressure.**

- For back pressure relief applications, the sensing line is mounted upstream, and the valve opens as the sensed pressure increases.

**For optimal performance, the service conditions (medium, flow, temperature, inlet and outlet pressures) of the application must be considered when selecting a valve. Please refer to the Valve Selection Section of this catalog. Improper application may cause failure of the valve, resulting in possible personal injury or property damage.**

For replacement or service parts please see Accessories and Replacement Parts in the Regulators and Control Valves section of the list price sheet.

## Specifications

### Actuator Models

**921PRV** (Pressure Reducing Valve)  
**921BPR** (Back Pressure Relief)

**Housing** Cast ductile iron, black finish

**Pressure Plate** Cast iron

**Diaphragm Material** Nylon reinforced Neoprene

**Regulated Pressures**  
2-100 psi

**Maximum PRV Inlet Pressure**  
 1/2" - 2": 200 psi  
 2 1/2" - 6": 125 psi\*

**Maximum BPR Set Pressure**  
100 psi

**Pressure Connection**  
1/4 NPT

**Adjustment Nut**  
Steel

**Adjustment Screw**  
Brass

**Adjustment Spring**  
Cadmium plated steel

**Body Material**  
 1/2"-2": Bronze  
 2 1/2"-6": Cast iron

**Trim Material** Stainless steel

**Trim Style** Quick-opening

**Connection**  
 1/2"-2": Threaded, malleable Iron union ends  
 2 1/2"-6": Class 125 Flanged

**Pressure & Temperature Rating**  
 1/2"-2": 250 psi @ 410° F (210° C)  
 2 1/2"-6": 125 psi @ 350° F (175° C)

## HOW TO ORDER

Sample Order Number: **921PRV-A55-075060**

Model	Valve	Inlet Pressure	Outlet Pressure
<b>921PRV-</b> (Pressure Reducing Valve) <b>921BPR-</b> (Back Pressure Relief)	See Available Valves	Specify Upstream Pressure in psig (i.e., 75 psig = 075)	Specify Downstream Pressure in psig (i.e., 60 psig = 060) Omit if 921BPR

\*200 psi inlet available with Class 250 flanged valve body. Consult Factory.

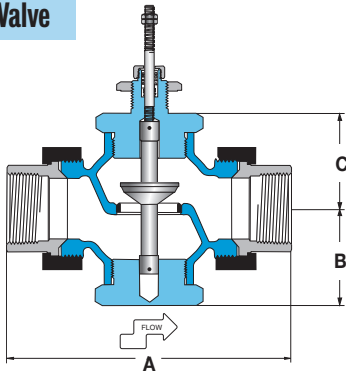
# 921 Series Pressure Regulator

PRESSURE REGULATORS

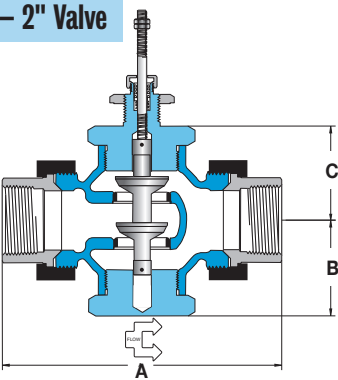
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## Pressure Reducing (PRV)

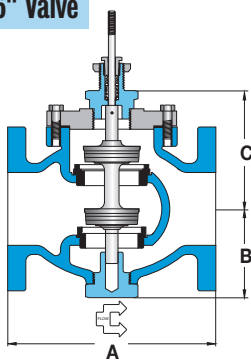
1/2" Valve



3/4" - 2" Valve

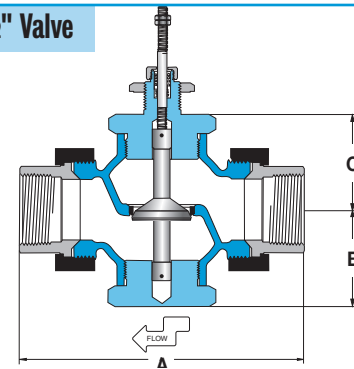


2 1/2" - 6" Valve

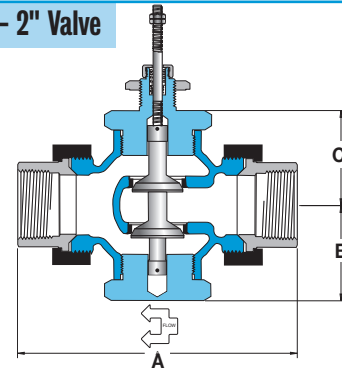


## Back Pressure Relief (BPR)

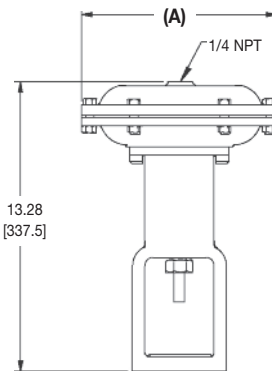
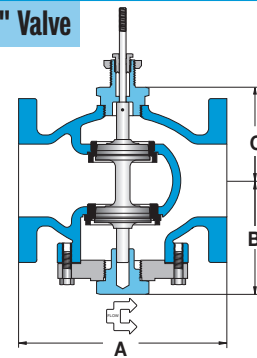
1/2" Valve



3/4" - 2" Valve



2 1/2" - 6" Valve



### Actuator (A) Dimension

A	6.1 [155]
B	7.0 [178]
C	8.1 [206]
D	9.0 [229]
E	11.0 [279]

Note: Actuator size and internal spring are determined by the inlet and outlet pressure requirements and will be specified by the factory at the time of order.

## Valve Selection

(PRV) Pressure Reducing	(BPR) Back Pressure Relief	Size Connection	Nominal Port	Number of Seats	Capacity C <sub>v</sub> *	Maximum** Inlet (psig)	Dimensions			Approximate Shipping Wt.
							A	B	C	
A14	N/A	1/2 NPT	1/2"	1	2.8	200	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A21	A24	3/4 NPT	3/4"	2	8	200	5.6 [142]	2.3 [58]	2.3 [58]	5.0 lbs [2.25 kg]
A29	A33	1 NPT	1"	2	12	200	6.0 [152]	2.3 [58]	2.3 [58]	6.1 lbs [2.75 kg]
A39	A44	1 1/4 NPT	1 1/4"	2	21	200	7.2 [183]	2.6 [66]	2.6 [66]	10.1 lbs [4.55 kg]
A50	A55	1 1/2 NPT	1 1/2"	2	30	200	7.7 [196]	2.6 [66]	2.6 [66]	11.1 lbs [5.00 kg]
A61	A66	2 NPT	2"	2	47	200	7.6 [218]	3.1 [79]	3.1 [79]	17.0 lbs [7.65 kg]
B73	B74	2 1/2"	2 1/2"	2	78	125	7.8 [198]	4.8 [122]	5.4 [137]	45 lbs [20 kg]
B78	B79	3"	3"	2	110	125	9.0 [229]	5.0 [127]	5.6 [142]	70 lbs [32 kg]
B83	B84	4"	4"	2	220	125	11.4 [290]	6.3 [160]	6.5 [165]	100 lbs [45 kg]
B88	B89	5"	5"	2	275	125	12.0 [305]	6.9 [175]	7.3 [185]	155 lbs [70 kg]
B93	B94	6"	6"	2	378	125	14.1 [358]	7.5 [191]	8.0 [203]	180 lbs [82 kg]

\*The valve selected should have a C<sub>v</sub> approximately two times that required by the service conditions. This will allow the valve to operate in approximately the 50% open position. \*\* Maximum BPR set pressure 100 psi.

# 995 Series Pressure Regulator

for Steam, Air, Water or Oil Service

PRESSURE REGULATORS



995 shown

- ▶ **Cast-Iron Body**
- ▶ **Stainless Steel Seat & Disc**
- ▶ **3/8 NPT – 2 NPT Sizes**
- ▶ **Double Spring Available with Extended Outlet Pressure Range**

For optimal performance, the service conditions (medium, flow, temperature, inlet and outlet pressures) of the application must be considered when selecting a valve. Please refer to the Valve Selection Section of this catalog. Improper application may cause failure of the valve, resulting in possible personal injury or property damage.

The Trerice **995 Series** Pressure Regulator is used in reducing pressure in steam, air and water systems. The 995 includes a spring-loaded diaphragm that can be externally adjusted to provide uniform outlet pressure. It features a cast-iron body and either a bronze diaphragm for steam service or Viton diaphragm for water, oil or air service. This regulator is designed for use in a variety of commercial, institutional and industrial applications.

## Specifications

Model	Diaphragm	Service
<b>995B</b>	Bronze	Steam
<b>995V</b>	Viton	Air, Water, Oil
<b>Body</b>	Cast-Iron	
<b>Trim</b>	Hardened 420 Stainless Steel	
<b>Strainer</b>	Stainless Steel (3/4 NPT HC & larger)	
<b>Minimum Inlet Pressure</b>		
15 psi		
<b>Maximum Inlet Pressure</b>		
250 psi		
<b>Minimum Differential Pressure</b>		
15 psi		
<b>Maximum Differential Pressure</b>		
125 psi		
<b>Maximum Operating Temperature</b>		
<b>995B</b>	Maximum: 450°F (230°C)	
<b>995V</b>	Maximum: 300°F (150°C)	

## Pressure-Adjusting Spring Ranges – Spring No. & Color Code

Single Spring	Outlet Pressure (psi)	Size (NPT)							
		3/8	1/2	3/4	3/4 HC	1	1 1/4	1 1/2	2
A	0 to 10	13 blue/yellow	13 blue/yellow	13 blue/yellow	3 red	7 red/green	7 red/green	8 red/blue	8 red/blue
B	10 to 30	–	–	–	4 green	8 red/blue	8 red/blue	9 red/yellow	9 red/yellow
C	10 to 50	14 black/yellow	14 black/yellow	14 black/yellow	–	–	–	–	–
D	30 to 50	–	–	–	5 blue	9 red/yellow	9 red/yellow	10 green/blue	10 green/blue
E	40 to 85	–	–	–	6 yellow	10 green/blue	10 green/blue	11 green/yellow	11 green/yellow
H	40 to 100	9 red/yellow	9 red/yellow	9 red/yellow	–	–	–	–	–
J	100 to 200	10 green/blue	10 green/blue	10 green/blue	–	–	–	–	–
<b>Double Spring</b>									
P	0 to 75	–	–	–	7, red/green 8, red/blue	8, red/blue 9, red/yellow	8, red/blue 9, red/yellow	8, red/blue 9, red/yellow	8, red/blue 9, red/yellow
Q	30 to 130	–	–	–	8, red/blue 9, red/yellow	9, red/yellow 10, green/blue	9, red/yellow 10, green/blue	9, red/yellow 10, green/blue	9, red/yellow 10, green/blue

## HOW TO ORDER

Sample Order Number: **995B 04 C**

Model	Connection Size	Outlet Pressure Range*	
		(single spring)	(double spring)
<b>995B</b>	<b>02</b> 3/8 NPT	<b>A</b> 0 to 10 psi	<b>P</b> 0 to 75 psi
<b>995V</b>	<b>04</b> 1/2 NPT	<b>B</b> 10 to 30 psi	<b>Q</b> 30 to 130 psi
	<b>06</b> 3/4 NPT	<b>C</b> 10 to 50 psi	
	<b>07</b> 3/4 NPT HC*	<b>D</b> 30 to 50 psi	
	<b>08</b> 1 NPT	<b>E</b> 40 to 85 psi	
	<b>10</b> 1 1/4 NPT	<b>H</b> 40 to 100 psi	
	<b>12</b> 1 1/2 NPT	<b>J</b> 100 to 200 psi	
	<b>16</b> 2 NPT		

\* 3/4 NPT HC is high-capacity version of the standard 3/4 NPT valve.

## How to Size

From the capacity chart, find the inlet pressure and required regulator outlet pressure. Follow across the chart to nearest capacity of application service medium that meets or slightly exceeds demand requirements. Follow vertically up to determine appropriate size. When exact application values are not shown interpolation between values is acceptable. From the Spring Ranges chart, select the ideal spring range that accommodates the required outlet set pressure then confirm that system pressure requirements can be met.

Application: 195 pph of 100 psi steam reduced to 70 psi.  
Size/Model: 1/2 NPT 995B red/yellow spring

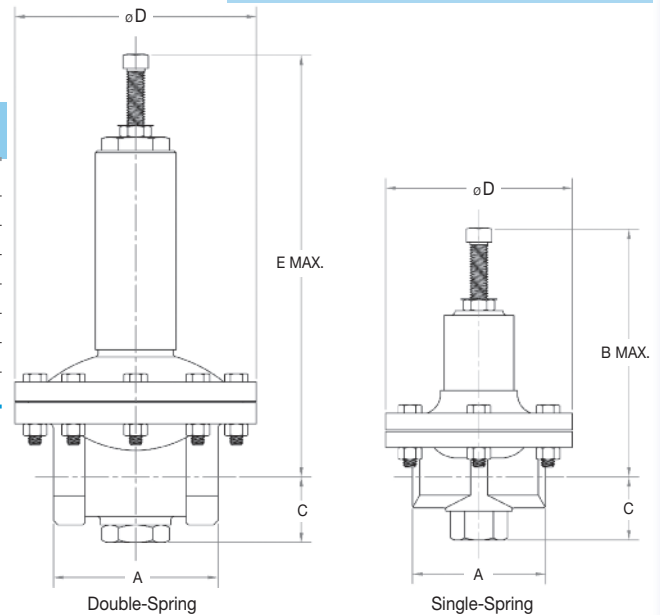
# 995 Series Pressure Regulator

All dimensions are nominal. Dimensions in [ ] are in millimeters

PRESSURE REGULATORS

Size (NPT)	A	B	C	D	E Double Spring	Approximate Shipping Wt.
3/8	4.25 [108]	6.5 [165]	4.0 [102]	5.2 [132]	-	8 lbs [3.6 kg]
1/2	3.6 [92]	6.5 [165]	4.0 [102]	5.2 [132]	-	8 lbs [3.6 kg]
3/4	3.6 [92]	6.5 [165]	4.0 [102]	5.2 [132]	-	8 lbs [3.6 kg]
3/4 HC*	3.6 [92]	8.0 [203]	2.0 [51]	5.9 [149]	10.5 [267]	15 lbs [6.8 kg]
1	4.5 [114]	8.5 [216]	2.0 [51]	6.7 [170]	11.0 [279]	18 lbs [8.2 kg]
1 1/4	4.5 [114]	8.5 [216]	2.0 [51]	6.7 [170]	11.0 [279]	18 lbs [8.2 kg]
1 1/2	6.5 [165]	8.8 [222]	3.3 [84]	8.9 [225]	11.3 [286]	40 lbs [18.1 kg]
2	6.5 [165]	8.8 [222]	3.3 [84]	8.9 [225]	11.3 [286]	40 lbs [18.1 kg]

\* 3/4 HC is high-capacity version of the standard 3/4 valve.



## Valve Capacities

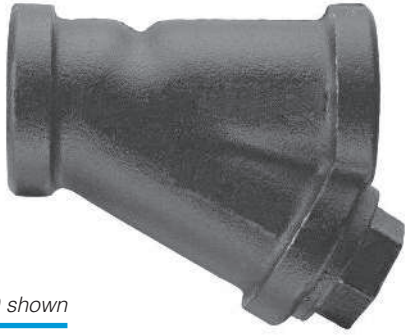
Inlet Press.		Outlet Press.			Inlet/Outlet Pressures (PSIG)																	
		3/8, 1/2, 3/4			3/4 HC *			1			1 1/4			1 1/2			2					
		Steam	Air	Water	Steam	Air	Water	Steam	Air	Water	Steam	Air	Water	Steam	Air	Water	Steam	Air	Water			
15	2	46	26	6	92	51	11	130	73	16	145	81	18	180	100	22	199	111	25			
	5	38	21	4	75	42	9	106	59	13	119	66	14	147	82	18	163	91	19			
20	5	65	36	8	130	72	15	184	102	22	205	114	25	254	141	30	281	156	34			
	10	61	34	6	123	69	13	174	97	18	194	109	20	241	134	25	266	149	27			
30	15	45	25	4	90	51	9	128	72	13	143	80	14	177	99	18	196	109	19			
	5	83	46	10	167	93	20	236	131	28	264	147	32	327	181	39	362	201	43			
50	10	83	46	10	167	93	18	236	131	25	264	147	28	327	181	35	362	201	39			
	20	71	40	6	142	79	13	201	112	18	225	126	20	278	155	25	308	172	27			
100	5	121	67	13	242	134	27	342	190	38	382	212	42	473	263	53	523	291	58			
	25	121	67	10	242	134	20	342	190	28	382	212	32	473	263	39	523	291	43			
150	40	87	49	6	174	97	13	247	138	18	276	154	20	341	191	25	377	211	27			
	30	214	119	17	428	238	33	607	337	47	678	376	53	839	466	66	928	515	73			
200	50	214	119	14	428	238	28	607	337	40	678	376	45	839	466	55	928	515	61			
	70	195	109	11	275	154	18	390	218	25	436	244	28	540	301	35	597	333	39			
250	30	261	145	19	522	290	39	739	410	55	826	458	62	1021	567	76	1130	627	84			
	50	261	145	17	522	290	35	739	410	49	826	458	55	1021	567	68	1130	627	75			
300	70	261	145	15	522	290	30	739	410	42	826	458	47	1021	567	58	1130	627	64			
	100	201	112	10	402	225	20	569	318	28	636	355	32	787	440	39	871	486	43			
400	30	307	171	22	615	341	44	871	484	62	974	540	69	1204	668	86	1332	740	95			
	50	307	171	20	615	341	40	871	484	57	974	540	63	1204	668	78	1332	740	87			
500	70	307	171	18	615	341	36	871	484	51	974	540	57	1204	668	70	1332	740	78			
	100	298	166	14	596	333	28	844	471	40	943	527	45	1167	652	55	1291	721	61			
600	120	239	133	11	478	267	22	677	378	31	756	422	35	935	523	43	1035	578	47			
	30	401	222	26	802	445	52	1135	630	74	1269	705	83	1570	871	102	1737	964	113			
800	50	401	222	24	802	445	49	1135	630	69	1269	705	78	1570	871	96	1737	964	106			
	70	401	222	23	802	445	46	1135	630	65	1269	705	72	1570	871	89	1737	964	99			
1000	100	401	222	20	802	445	40	1135	630	57	1269	705	63	1570	871	78	1737	964	87			
	50	494	274	28	988	549	57	1400	777	80	1565	869	90	1935	1074	111	2141	1189	123			
1200	70	494	274	27	988	549	54	1400	777	76	1565	869	85	1935	1074	105	2141	1189	116			
	125	494	274	22	988	549	45	1400	777	63	1565	869	71	1935	1074	88	2141	1189	97			

\* 3/4 HC is high-capacity version of the standard 3/4 valve.

\*\* Air and water capacities are based on using Viton diaphragm.

Note: For capacities of other gases multiply the air capacities by the following factors: Argon-0.85 CO<sub>2</sub>-0.81 Helium-2.69 Nitrogen-1.02

# 1100 Series Pipeline Strainer

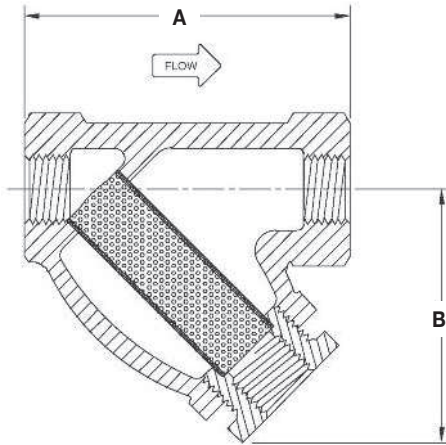


1100 shown

- ▶ Cast-Iron Construction
- ▶ Stainless Steel Seat
- ▶ Y-Type Design
- ▶ 3/8" - 6" Sizes

The Trerice **1100 Series** Pipeline Strainer is designed to be installed upstream of regulators, valves, or other similar equipment. This Y-Type Strainer removes debris from the line, thereby providing protection and extending the life of the regulator or valve. The 1100 Series has a generously proportioned, cast-iron body and a 1/64" perforated, stainless steel screen. A blow-out valve should be installed so that the screen may be cleaned periodically.

All dimensions are nominal. Dimensions in [ ] are in millimeters.



## Specifications

### Model

1100

### Body

Cast-Iron

### Connection

3/8" to 2": Threaded  
2 1/2 to 6": Cast 125 Flanged

### Screen

Stainless Steel, 1/64" perforations

### Cleanout Cover

Threaded Connection: Threaded  
Flanged Connection: Bolted

### Maximum Inlet Pressure & Temperature Steam

Threaded:  
250 psi @ 406° F (208° C)

Class 125 Flanged:  
125 psi @ 450° F (232° C)

### Water/Oil/Gas

Threaded:  
400 psi @ 150° F (66° C)

Class 125 Flanged:  
200 psi @ 100° F (38° C)

Item Number	Size	A	B	Approximate Shipping Wt.
1103	3/8 NPT	3.18 [81]	2.06 [52]	1.6 lbs [0.73 kg]
1104	1/2 NPT	3.18 [81]	2.06 [52]	1.6 lbs [0.73 kg]
1106	3/4 NPT	3.75 [95]	2.44 [61]	2.4 lbs [1.09 kg]
1108	1 NPT	4.00 [102]	2.63 [66]	3.0 lbs [1.36 kg]
1110	1 1/4 NPT	5.00 [127]	3.38 [85]	5.2 lbs [2.36 kg]
1112	1 1/2 NPT	5.75 [146]	3.88 [98]	8.0 lbs [3.64 kg]
1116	2 NPT	7.00 [177]	4.75 [121]	13 lbs [5.9 kg]
1120	2 1/2 Flange	10.00 [254]	6.50 [165]	28 lbs [12.7 kg]
1124	3 Flange	10.13 [257]	7.00 [178]	34 lbs [15.5 kg]
1132	4 Flange	12.13 [308]	8.25 [210]	60 lbs [27 kg]
1140	5 Flange	15.63 [397]	11.25 [286]	95 lbs [43 kg]
1148	6 Flange	18.50 [470]	13.50 [343]	133 lbs [60 kg]

## HOW TO ORDER

Sample Order Number: **1103**



# Controllers

## DESIGN & OPERATION

### Description

A controller is a comparative device that receives an input signal from a measured process variable, compares this value with that of a predetermined control point value (set point), and determines the appropriate amount of output signal required by the final control element to provide corrective action within a control loop. Trerice offers two different types of controllers:

- An Electronic PID Controller uses electrical signals and digital algorithms to perform its receptive, comparative and corrective functions.
- An Electric Contact Controller is a mechanical device designed to measure temperature and transmit a corrective electrical signal to the final control element by the activation of one or more electrical switches.

### Principles of Operation (Electronic PID Controller)

An electronic sensor (thermocouple, RTD or transmitter) installed at the measurement location continuously sends an input signal to the controller. At set intervals the controller compares this signal to a predefined set point. If the input signal deviates from the set point, the controller sends a corrective output signal to the control element. This electric signal must be converted to a pneumatic signal when used with an air operated valve, such as a Trerice Series 910 or 940 Control Valve. The conversion can be made using a Trerice TA901 I/P Transducer, which converts a 4 to 20 mA electric signal to a 3 to 15 psi air signal.

### Features (Electronic PID Controller)

An electronic controller is best suited for applications where large load changes are encountered and/or fast response changes are required. Trerice Electronic Controllers have full auto tuning and PID capabilities, and offer a host of available options, including user selectable inputs and ranges, outputs, setback functions, and alarms.

**PID Control** is a feature of most Trerice Electronic Controllers. PID combines the proportional, integral and derivative functions into a single unit.

- **Proportional (P)** — Proportional control reacts to the size of the deviation from set point when sending a corrective signal. The size of the corrective signal can be adjusted in relation to the size of the error by changing the width of the proportional band. A narrow proportional band will cause a large corrective action in relation to a given amount of error, while a wider proportional band will cause a smaller corrective action in relation to the same amount of error.
- **Integral (I)** — Integral control reacts to the length of time that the deviation from set point exists when sending a corrective signal. The longer the error exists, the greater the corrective signal.
- **Derivative (D)** — Derivative control reacts to the speed in which the deviation is changing. The corrective signal will be proportional to the rate of change within the process.

### Auto-Tuning

Auto-tuning will automatically select the optimum values for **P**, **I** and **D**, thus eliminating the need for the user to calculate and program these values at system startup. This feature can be overridden when so desired. On some models, the control element can be manually operated.

# Controllers

## DESIGN & OPERATION

### Selecting an Electronic PID Controller

All Trerice Electronic Controllers are designed to control the temperature or pressure of general industrial equipment and should be carefully selected to meet the demands of the particular application. The information contained within this catalog is offered only as a guide to assist in making the proper selection. Selection of the proper controller is the sole responsibility of the user. Improper application may cause process failure, resulting in possible personal injury or property damage.

#### Case Size

Case Size selection is determined by both available and designed space, and controller features. Trerice Electronic Controllers are available in the following panel sizes: 96 x 96 mm ( $\frac{1}{4}$  DIN), 72 x 72 mm, 48 x 96 mm ( $\frac{1}{8}$  DIN), and 48 x 48 mm ( $\frac{1}{16}$  DIN). The depth of the unit varies with the model selected.

#### Input

The Input is the measurement signal received by the controller from the sensor. A variety of input types are available, including thermocouple, RTD, voltage and current.

#### Control Output

The Control Output is the corrective signal transmitted from the controller to the control element. Various control output types are available, including contact, voltage, current and solid state relay driver.

#### Analog Output

The Analog Output is an optional secondary signal that transmits the measurement signal from the controller to a remote data acquisition device, such as a recorder, personal computer or display unit.

#### Alarms

Most models can be ordered with alarms, event outputs, or heater break alarms, which signal an external device to perform a specific task at a predetermined set point.

#### Setback Function

This feature, optionally available on some models, is designed to provide energy savings in applications where the process is idled at regular intervals through the connection of an external timer or switch.

## Principles of Operation (Electric Contact Controller)

The Trerice Electric Contact Controller operates through a coordination of its thermal sensing system and temperature indicating arm with internal linkage, which activates a preset electrical switch upon contact. The thermal system, installed within the process application, senses change in the measured variable and relays this information (input signal) to the controller through an expansion or contraction of the system fill. The temperature indicating arm moves around the dial face in response to the change in process temperature until such time as the internal linkage touches the preset electric switch. This contact sends a corrective electrical signal, which activates or deactivates external On/Off devices, such as solenoid valves or electric heaters. The subsequent control of these devices will result in an increase or decrease of the application temperature, thereby returning the process to the desired condition.

All Trerice Electric Contact Controllers are designed to control the temperature of general industrial equipment and should be carefully selected to meet the demands of the particular application. The information contained within this catalog is offered only as a guide to assist in making the proper selection. Selection of the proper controller is the sole responsibility of the user. Improper application may cause process failure, resulting in possible personal injury or property damage.

### Selecting an Electric Contact Controller

#### Control Function

Trerice Electric Contact Controllers are designed specifically for On/Off control. Processes which are characterized by stable load conditions can be controlled using On/Off control with a solenoid valve, electric heater or other electrically operated device.

- **On/Off (I/O)** – On/Off control recognizes only that a deviation exists. Any deviation between the set point and measured process variable will produce a full corrective signal.

#### Switching Point and Temperature Range

Trerice Electric Contact Controllers can be ordered with up to four switches per unit. The switches can be adjusted to any point within the temperature range of the controller. Multiple switch units are particularly useful for operating an alarm or other safety device, in addition to the main control element. A switching point indicator (set via an external knob) and a temperature indicator are read against the range plate. Temperature ranges from -100°F through 700°F are available.

#### Actuation System

The Trerice Electric Contact Controller is supplied with a liquid thermal actuation system. This actuation is desirable when controlling within ambient and cross ambient conditions. It is also suitable for low temperature demands. It is furnished with a small sensing bulb and a linear scale. These controllers can be specified with various capillary and sensing bulb materials, coverings and connections, to meet the requirements of any application. Consult factory for capillary systems in excess of 20 feet in length.

#### Thermowell

For applications in which the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the sensing bulb. A thermowell will also facilitate the removal of the sensing bulb from the operating process. Thermowells are available in a variety of lengths, connections and materials.

**CAUTION:** Temperature indication error will be introduced whenever the capillary tubing is exposed to ambient temperatures above or below 75°F. The following formula **MUST** be considered when specifying liquid actuation:

Where: S = thermometer range span in °F  
L = capillary length in feet  
T = capillary temperature variation from 75°F

$$\text{Error} = 0.000018 \times S \times L \times T$$

Example: S = 210 (30 to 240°F)  
L = 20  
T = 10 (85°F)

$$\text{Error} = 0.000018 \times 210 \times 20 \times 10 = 3.4^\circ$$

# TR890 Series Electronic PID Controller

## Features PID and Auto-Tuning

CONTROLLERS



TR893 shown

- ▶ **Multiple Sizes**
- ▶ **± 0.3% Accuracy**
- ▶ **Keyboard Programmable**
- ▶ **Reverse or Direct Acting**
- ▶ **Manual Output Override**

The Trerice **TR890 Series** Electronic PID Controller is designed for use on applications where large load changes are expected, or the need for extreme accuracy and fast response time exists. With full auto-tune capabilities and a large selection of available inputs, the TR890 Series is ideally suited for use with a Trerice Control Valve.

**Use of a Trerice No. TA987 Air Filter/Regulator is recommended for filtering and regulating the pressure of plant compressed air and delivering clean, dry air at the proper pressure to pneumatic control devices.**

### Approximate Shipping Weight

- TR891: 0.4 lbs [0.17 kg]
- TR892: 0.6 lbs [0.28 kg]
- TR893: 0.7 lbs [0.33 kg]
- TR894: 0.5 lbs [0.24 kg]

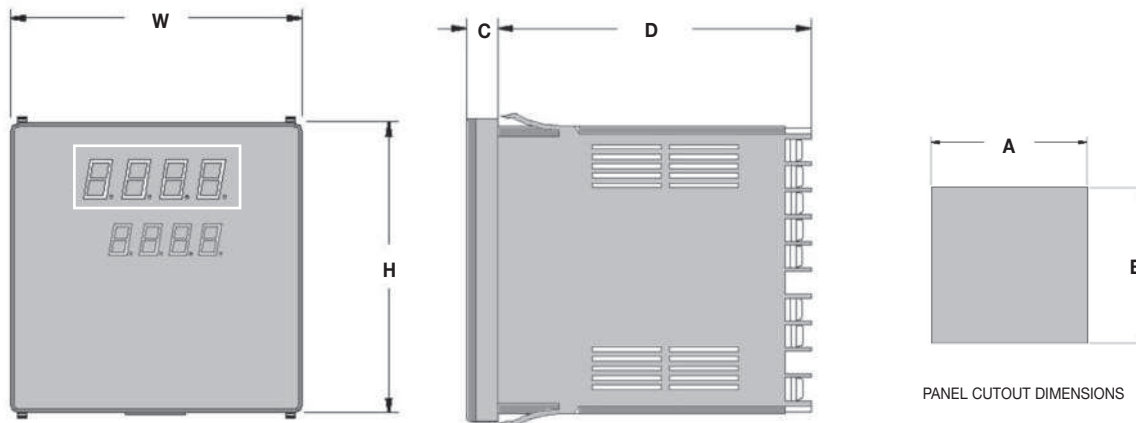
## Specifications

<b>Models</b>	<b>TR891:</b> 48 x 48 mm (1/16 DIN) <b>TR892:</b> 72 x 72 mm <b>TR893:</b> 96 x 96 mm (1/4 DIN) <b>TR894:</b> 96 x 48 mm (1/8 DIN)
<b>Control</b>	<b>Control Mode:</b> Auto-Tuning PID <b>Action:</b> Reverse acting (field switchable to direct acting)
<b>Proportional Band</b>	Off, 0.1-999.9% Full Scale Integral Time: Off, 1-6000 sec. Derivative Time: Off, 1-3600 sec.
<b>Accuracy</b>	± 0.3%
<b>Display</b>	Process Value: 4 Digit, 20 mm red LED Set Value: 4 digit, 10.2 mm green LED Sampling Cycle: 0.25 seconds
<b>Inputs</b>	<b>Multi</b> (switchable between) <ul style="list-style-type: none"> <li>▶ Thermocouple: B, R, S, K, E, J T, N, PL II, Wre5-26 {U,L (DIN 43710)}</li> <li>▶ RTD: Platinum 100Ω, 3 Wire</li> <li>▶ mV: (scalable) -10-10, 0-10, 0-20, 0-50, 10-50, 0-100 mV DC</li> </ul> <b>Current:</b> (scalable) 4-20, 0-20 mA <b>Voltage:</b> -1-1, 0-1, 0-2, 0-5, 1-5, 0-10 Vdc
<b>Control Output</b>	<b>Current:</b> 4-20 mA (load Resistance: 600Ω maximum) <b>Contact:</b> Proportional cycle, 1-120 sec. (capacity: 240 VAC 2A resistive / 1.2A inductive) <b>SSR Drive Voltage:</b> Proportional cycle 1-120 sec. (output rating: 12±1.5 Vdc / 30 mA maximum) <b>Voltage:</b> 0-10 Vdc Load Current 2mA max
<b>Power Requirements</b>	<b>Supply Voltage:</b> 100-240 VAC, 50/60 Hz <b>or</b> 24V AC/DC 50/60 Hz <b>Consumption:</b> 100-240 VAC 15VA 24Vdc 8W 24Vdc 9VA
<b>Data Storage</b>	Nonvolatile EEPROM memory
<b>Case Material</b>	Polyphenylene Oxide (PPO)
<b>Ambient Temp.</b>	14°F (-10°C) to 122°F (50°C)
<b>Humidity</b>	Maximum: 90% RH, non condensing
<b>Event Outputs</b>	(Contact Capacity 240 VAC 1A/resistive load) <ul style="list-style-type: none"> <li>Dual Event Outputs (High and/or Low Alarms)</li> <li>Single Event Output + Heater Break Alarm includes CT30A sensor</li> <li>Single Event Output + Heater Break Alarm includes CT50A sensor</li> </ul>
<b>Options:</b>	Analog Output 0-10mV DC (output resistance 10Ω ) Analog Output 4-20mA DC (load resistance 300Ω max ) Analog Output 0-10V DC (load current 2mA max )  <u>Digital Input (switch) including:</u> Setback Function setting range of -1999 - 5000, standby or DAVRA Selection Operated by either non-voltage contact or open collector input rated at approx. 5V DC/1mA max.

# TR890 Series

## Electronic PID Controller

All dimensions are nominal. Dimensions in [ ] are in millimeters.



PANEL CUTOUT DIMENSIONS

CONTROLLERS

### HOW TO ORDER

Sample Order Number: **TR893 8 A 90 1 00**

Model	Input	Control Output	Power Supply	Event Output	Options
TR891	8 Multi	A 4-20 mA	90 100-240 VAC 50/60 Hz	0 None	00 None
TR892	4 mA	C On/Off Contact	08 24 VAC/Vdc 50/60 Hz	1 Dual Event (high and/or low)	30 Analog Output (0-10 mVdc)
TR893	6 VDC	D SSR Driver		2 Single Event (high or low) and heater break CT30A	40 Analog Output (4-20 mA)
TR894		E 0-10 Vdc		3 Single Event (high or low) and heater break CT50A	60 Analog Output (0-10 Vdc)
			Event Outputs 2 or 3 require Control Outputs C or D		08 Digital Input (switch)
					38 Digital Input (switch) with 0-10 mVdc* Analog Output
					48 Digital Input (switch) with 4-20 mA* Analog Output
					68 Digital Input (switch) with 0-10 Vdc* Analog Output

\*Not available with Model TR891

Model	A	B	C	D	H	W
TR891	1.77 [45]	1.77 [45]	0.43 [11]	3.94 [100]	1.89 [48]	1.89 [48]
TR892	2.68 [68]	2.68 [68]	0.43 [11]	3.94 [100]	2.83 [72]	2.83 [72]
TR893	3.63 [92]	3.63 [92]	0.43 [11]	3.94 [100]	3.78 [96]	3.78 [96]
TR894	1.77 [45]	3.63 [92]	0.43 [11]	3.94 [100]	3.78 [96]	3.78 [96]

### Programmable Ranges

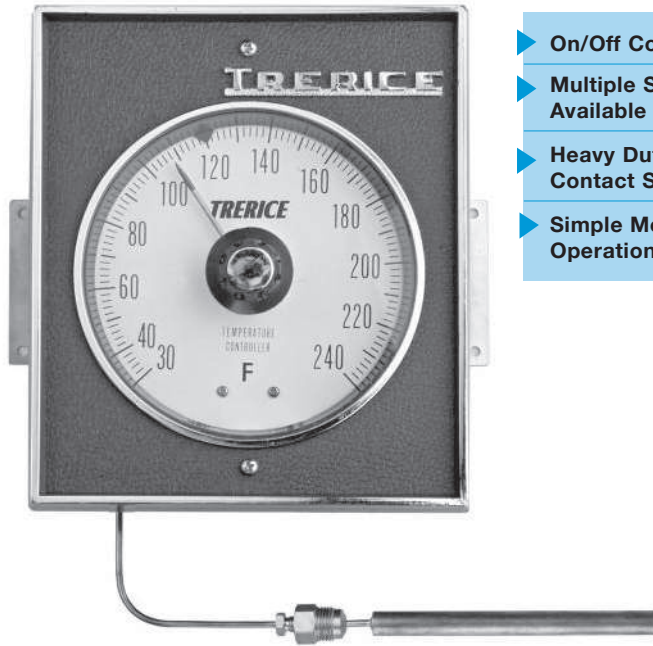
Thermocouple Inputs					RTD Inputs				Current & Voltage Inputs	
T/C Type	Range Code	Fahrenheit Range	Range Code	Celsius Range	Range Code	Fahrenheit Range	Range Code	Celsius Range	Range Code	Range (User-scalable Readout)
B*	15	0° to 3300°F	01	0° to 1800°C	47	-300° to 1100°F	31	-200° to 600°C	71	-10-10 mV
E	21	0° to 1300°F	07	0° to 700°C	48	-150.0° to 200.0°F	32	-100.0° to 100.0°C	72	0-10 mV
J	22	0° to 1100°F	08	0° to 600°C	49	-150° to 600°F	33	-100.0° to 300.0°C	73	0-20 mV
K	18	-150° to 750°F	04	-100.0° to 400.0°C	50	-50.0° to 120.0°F	34	-50.0° to 50.0°C	74	0-50 mV
K	19	0° to 1500°F	05	0° to 800°C	51	0.0° to 120.0°F	35	0.0° to 50.0°C	75	10-50 mV
K	20	0° to 2200°F	06	0° to 1200°C	52	0.0° to 200.0°F	36	0.0° to 100.0°C	76	0-100 mV
L	28	0° to 1100°F	14	0° to 600°C	53	0.0° to 400.0°F	37	0.0° to 200.0°C	81	-1-1 V
N	24	0° to 2300°F	10	0° to 1300°C	54	0° to 1000°F	38	0.0° to 500.0°C	82	0-1 V
PL II	25	0° to 2300°F	11	0° to 1300°C					83	0-2 V
R	16	0° to 3100°F	02	0° to 1700°C					84	0-5 V
S	17	0° to 3100°F	03	0° to 1700°C					85	1-5 V
T	23	-300° to 400°F	09	-199.9° to 200.0°C					86	0-10 V
U	24	-300° to 400°F	13	-199.9° to 200°C					94	0-20 mA
WRe5-26	26	0° to 4200°F	12	0° to 2300°C					95	4-20 mA

Range Codes are not required for ordering, but are used for field programming.

\*750°F (400°C) falls below the accuracy range

# L84000 Series Electric Contact Controller

CONTROLLERS



- ▶ On/Off Control
- ▶ Multiple Switches Available
- ▶ Heavy Duty Contact Switches
- ▶ Simple Mechanical Operation

L84000 shown

The Trerice **L84000 Series** Electric Contact Controller is designed for applications that require the opening and closing of electric solenoid valves, heaters, and other electrical devices. It is a rugged and versatile controller, capable of producing "On/Off" control over a wide range of temperatures from -100°F to 700°F. This controller includes a setting adjustment knob and one or more SPDT electric contact switches.

For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the controller and facilitate its removal from the process. (Refer to page 220)

## Specifications

### Models

- L84000** (1 switch)
- L84100** (2 switch)
- L84200** (3 switch)
- L84300** (4 switch)

**Control** On/Off, via electric contact switch

**Dial Size** 6"

**Movement** Stainless Steel and Brass

**Case** Blue ABS plastic, panel mounted

**Cover** Blue ABS plastic, close cell rubber gasketed

**Window** Acrylic

**Pointer** Brass

### Switch Ratings

L84000, L84100:  
10 A @ 125/250 VAC,  
0.25 A @ 120 Vdc

L84200, L84300:  
5 A @ 250 VAC,  
5 A res./3 A ind. @ 28 Vdc

**Dial face** Aluminum, white background with black graduations and markings

**Accuracy** ± One Scale Division

### Approximate Shipping Weight

9.0 lbs [4.09 kg]

## HOW TO ORDER

Sample Order Number: **L 84100 145 B10 10 W02**

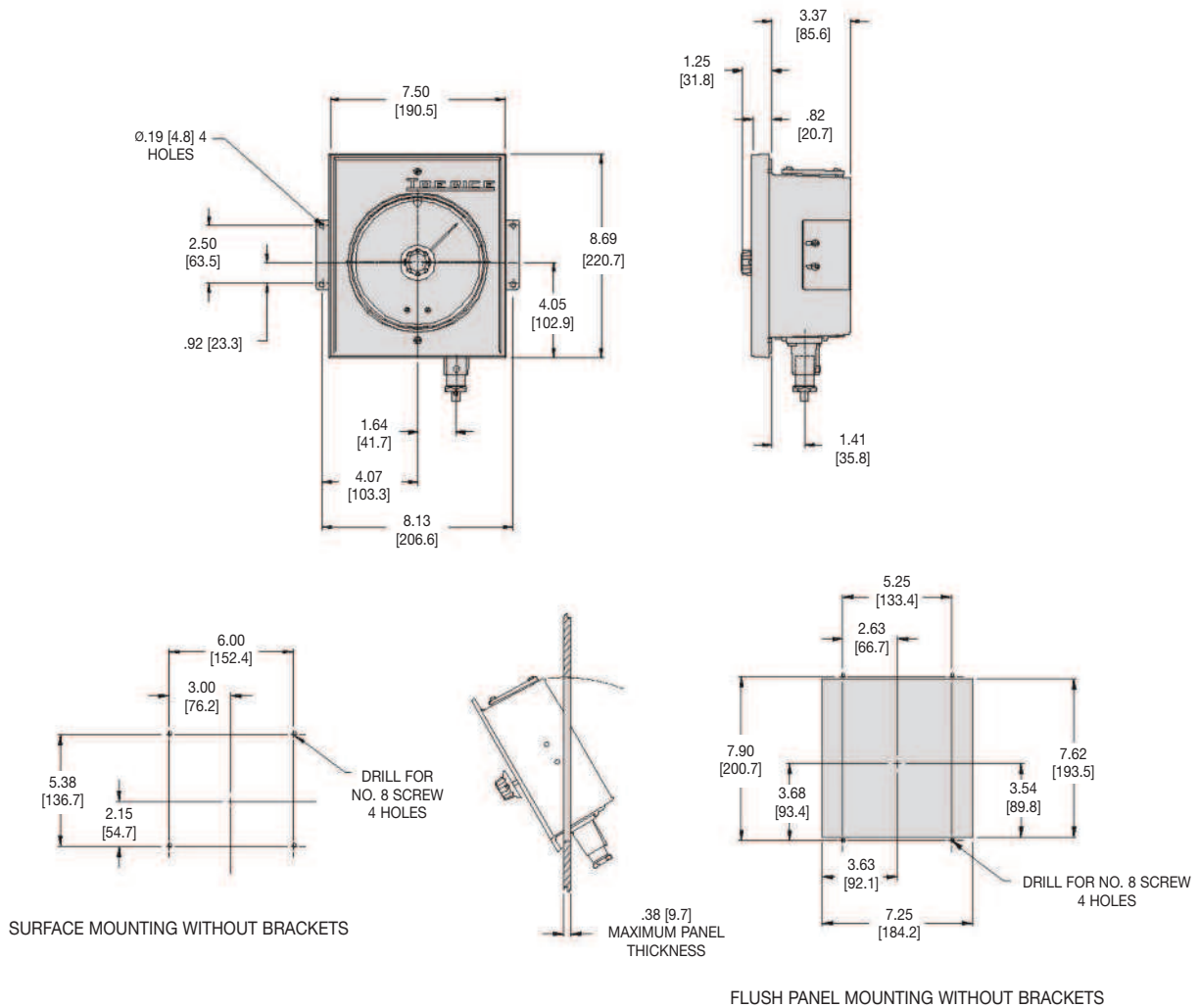
Actuation	Model	Specific Range	Thermal System	Capillary Length	Thermowell
L Liquid	<b>84000</b> 1 Switch	Refer to Standard Ranges (page 217)	Refer to Thermal System Selection (pages 218-219)	<b>05</b> 5 Feet	<b>W02</b> Brass <b>W05</b> 304 SS <b>W06</b> 316 SS
	<b>84100</b> 2 Switch			<b>10</b> 10 Feet	
	<b>84200</b> 3 Switch			<b>15</b> 15 Feet	
	<b>84300</b> 4 Switch			<b>20</b> 20 Feet	<b>W12</b> Brass <b>W15</b> 304 SS <b>W16</b> 316 SS
	20 Feet Maximum				

# L84000 Series

## Electric Contact Controller

All dimensions are nominal. Dimensions in [ ] are in millimeters

CONTROLLERS



### Standard Ranges

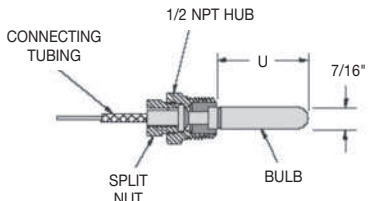
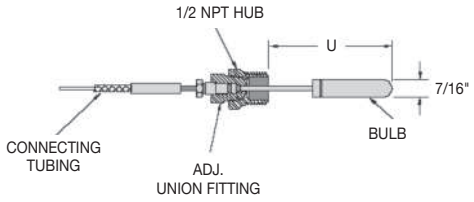
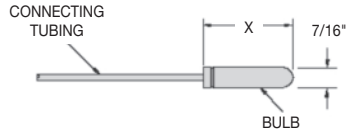
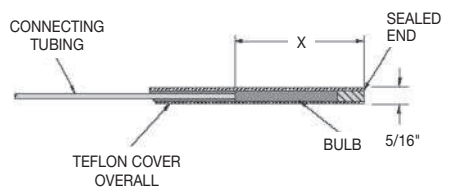
Fahrenheit Ranges		Celsius Ranges		Fahrenheit & Celsius Ranges	
Range Code	Range	Range Code	Range	Range Code	Range
105	-100° to 100°F	225	-70° to 40°C	325	-30° to 170°F & -35° to 75°C
125	-30° to 170°F	245	-35° to 75°C	345	50° to 350°F & 10° to 175°C
145	0° to 200°F	265	0° to 115°C	355	50° to 700°F & 10° to 370°C
165	30° to 240°F	295	10° to 175°C		
175	50° to 350°F	305	10° to 370°C		
195	50° to 700°F				
215	200° to 400°F				

# Thermal System Selection

for L84000 Series Electronic Contact Controller

U = Insertion Length  
X = Bulb Length

CONTROLLERS

Bulb and Capillary Style	Order Code	Connection Style & Material	Bulb Material	Capillary Tubing Material
<b>Union Connection</b>  	<b>B01*</b>	Brass, 1/2 NPT	Copper	Copper with Bronze Braided Armor
	<b>B10</b>	Stainless Steel, 1/2 NPT	Stainless Steel	Stainless Steel
	<b>B15*</b>	Brass, 1/2 NPT	Copper	Copper with Bronze Braid and Stainless Steel Spiral Armor
	<b>B16</b>	Stainless Steel, 1/2 NPT	Stainless Steel	Stainless Steel with Stainless Steel Spiral Armor
<b>Adjustable Union Connection</b>  	<b>B02*</b>	Brass, 1/2 NPT	Copper	Copper with Bronze Braided Armor
	<b>B04**</b>	Stainless Steel, 1/2 NPT	Stainless Steel	Stainless Steel
<b>Plain Bulb</b>  	<b>B05*</b>	None	Copper	Copper with Bronze Braided Armor
	<b>B06</b>	None	Stainless Steel	Stainless Steel
<b>Teflon Covered Bulb</b>  	<b>B08*</b>	None	Copper with Teflon Covering	Copper with Teflon Covering
	<b>B07*</b>	None	Stainless Steel with Teflon Covering	Stainless Steel with Teflon Covering

\*Not available with Temperature Ranges over 450°F (232°C).

\*\*Ranges over 450°F (232°C), one-time adjustment only.



# Thermal System Selection

for L84000 Series Electronic Contact Controller

## Minimum Bulb Insertion Length (U/X) Liquid Actuated

-100° to 100°F	Temperature Range			
	-30° to 170°F 0° to 200°F 30° to 240°F 200° to 400°C		50° to 350°F	50° to 700°F
37/8" (Use 6" thermowell)	53/8"		37/8" (Use 6" thermowell)	N/A
37/8" (Use 6" thermowell)	53/8"		37/8" (Use 6" thermowell)	15/8"
37/8" (Use 6" thermowell)	53/8"		37/8" (Use 6" thermowell)	N/A
37/8" (Use 6" thermowell)	53/8"		37/8" (Use 6" thermowell)	15/8"
37/8"	53/8"		37/8"	N/A
Adjustable up to 24"				
37/8"	53/8"		37/8"	15/8"
Adjustable up to 24"				
4"	51/2"		4"	N/A
4"	51/2"		4"	111/16"
N/A	22"		15"	N/A
N/A	22"		15"	N/A

# Thermowells

for L84000 Electric Contact Controllers

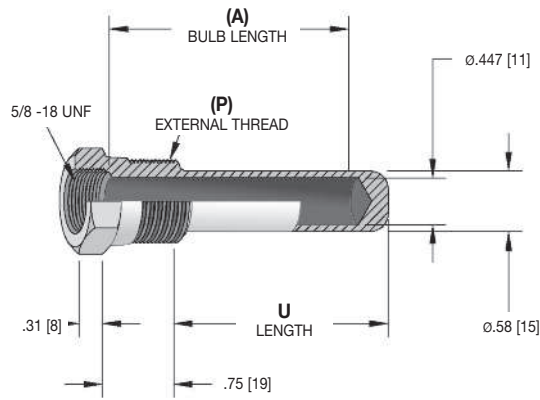
All dimensions are nominal. Dimensions in [ ] are in millimeters.

If Thermowells are to be purchased as a separate item, or if a Special Thermowell is required, please refer to this page. If a complete Electric Contact Controller is purchased, the proper Thermowell to match the sensing bulb ordered will be supplied. Please note sensing bulb size is affected by temperature range.

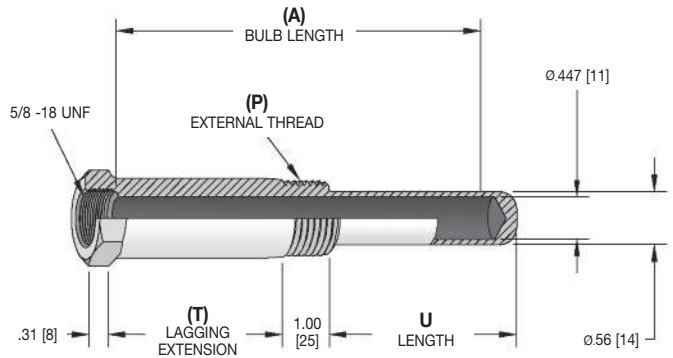
Indicate W02 for 1/2 NPT Brass, W05 for 1/2 NPT 304 SS or W06 for 1/2 NPT 316SS.  
Indicate W12 for 3/4 NPT Brass, W15 for 3/4 NPT 304 SS or W16 for 3/4 NPT 316SS.

CONTROLLERS

## Standard



## with Lagging Extension



### Lengths

(A) Bulb Length	Standard		Lagging	
	U Length	(T) Lagging Extension	U Length	
2"	2.13 [54]	—	—	
4"	3.88 [99]	1.50 [38]	2.13 [54]	
6"	5.75 [146]	1.50 [38]	3.88 [99]	
8"	7.75 [197]	1.50 [38]	5.75 [146]	
12"	11.75 [299]	1.50 [38]	7.50 [191]	
18"	17.75 [451]	1.50 [38]	15.75 [400]	
24"	23.75 [603]	1.50 [38]	21.75 [552]	

### Pressure Rating (psi) per ASME Boiler Code, Section VIII, Part UG28

Material	Operating Temperature			
	70°F	200°F	400°F	600°F
Carbon Steel	2500	2240	2020	1640
304 Stainless Steel	2780	2280	2100	1700
316 Stainless Steel	2770	2660	2500	2300
Brass	1330 psi @ 150°F,		1280 @ 350°F	

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage.

## HOW TO ORDER

Sample Order Number: **7-3 G 2**

Thermowell Style	(P) External Thread	Bulb Length**	(T) Lagging Extension	Material
7- Controller	3 1/2 NPT	D 2" Bulb	C 1 1/2" Extension (4" and longer Stem only) Omit if None	2 Brass 5 304SS 6 316SS
		G 4" Bulb		
	J 6" Bulb			
	L 8" Bulb			
	R 12" Bulb*			
	Wa 18" Bulb*			
	Wk 24" Bulb*			

\*Not available with 1/2 NPT external thread.

\*\*Controller Thermowells with Bulb Lengths over 6" are typically for use with Adjustable Union or Bendable Extension Connections.



# Solenoid Valve



960WA44 shown

- ▶ 1/8" through 3" Valve Sizes
- ▶ 2-Way Single Seat or 3-Way
- ▶ Piston Pilot Operated
- ▶ Threaded Ends

The Trerice **960 Series Solenoid Valve** is particularly suited for use with electric contact controllers. This packless, self-contained valve is designed to operate on a minimum of current and can be used for air, steam, water, oil other liquids that are not corrosive to brass. The valve is opened and closed by a balancing piston and is controlled by a small pilot valve. The Series 960 should always be mounted to a horizontal pipeline with the coil in an upright position.

**For optimal performance, the service conditions of the application must be considered when selecting a solenoid valve. Improper application may cause failure of the valve, resulting in possible personal injury or property damage.**

## How to Order

Please order using the Item Number listed.

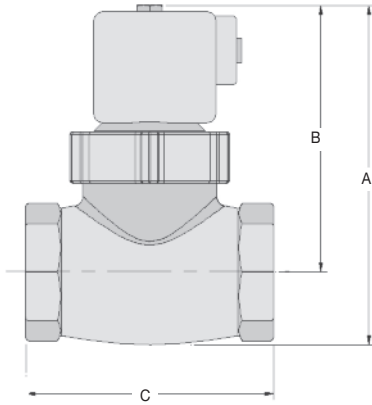
## Specifications

Model	Type	Coil	Service	Minimum Δ P	Maximum Temperature	Item Number	Pipe Size	C <sub>v</sub>	Approximate Shipping Weight						
960WB	General service, fail-closed, bronze body, Viton seat screw	120 Vac/60 Hz, 3/8 - 2 NPT: NEMA 4X 2 1/2 - 3 NPT: NEMA 1	Water, air, oil (<400 SSU), 125 PSI max.	5 PSI	220°F (104°C)	960WB44	3/8 NPT	2.9	3.0 lbs [1.36 kg]						
						960WB55	1/2 NPT	3.6	3.0 lbs [1.36 kg]						
						960WB66	3/4 NPT	6.8	4.0 lbs [1.82 kg]						
						960WB77	1 NPT	11.5	5.0 lbs [2.27 kg]						
						960WB88	1 1/4 NPT	18	7.0 lbs [3.18 kg]						
						960WB99	1 1/2 NPT	26	9.0 lbs [4.09 kg]						
						960WB10	2 NPT	48	14 lbs [6.36 kg]						
						960WB11	2 1/2 NPT	75	22 lbs [10.0 kg]						
						960WB13	3 NPT	100	35 lbs [15.9 kg]						
						960SB	High temperature, fail-closed, bronze body, Teflon seat screw	120 Vac/60 Hz, 3/8 - 2 NPT: NEMA 4X 2 1/2 - 3 NPT: NEMA 1	Steam, water, air, oil (<400 SSU), 125 PSI max.	5 PSI	356°F (180°C)	960SB44	3/8 NPT	2.9	3.0 lbs [1.36 kg]
												960SB55	1/2 NPT	3.6	3.0 lbs [1.36 kg]
												960SB66	3/4 NPT	6.8	4.0 lbs [1.82 kg]
												960SB77	1 NPT	11.5	5.0 lbs [2.27 kg]
960SB88	1 1/4 NPT	18	7.0 lbs [3.18 kg]												
960SB99	1 1/2 NPT	26	9.0 lbs [4.09 kg]												
960SB10	2 NPT	48	14 lbs [6.36 kg]												
960SB11	2 1/2 NPT	75	22 lbs [10.0 kg]												
960SB13	3 NPT	100	35 lbs [15.9 kg]												
960WA	General service, fail-open, bronze body, Teflon seat screw	120 Vac/60 Hz, NEMA 1	Water, air, oil (<400 SSU), 300 PSI max.	10 PSI	300°F (149°C)							960WA44	3/8 NPT	2.9	4.0 lbs [1.82 kg]
												960WA55	1/2 NPT	3.6	4.0 lbs [1.82 kg]
												960WA66	3/4 NPT	6.8	5.0 lbs [2.27 kg]
												960WA77	1 NPT	11.5	6.0 lbs [2.73 kg]
						960WA88	1 1/4 NPT	18	8.0 lbs [3.64 kg]						
						960WA99	1 1/2 NPT	26	10 lbs [4.55 kg]						
						960WA10	2 NPT	48	15 lbs [6.82 kg]						
						960WA11	2 1/2 NPT	75	22 lbs [10.0 kg]						
						960WA13	3 NPT	100	35 lbs [15.9 kg]						
						960SA	High temperature, fail-open, bronze body, Teflon seat screw	120 Vac/60 Hz, NEMA 1	Steam, water, air, oil (<400 SSU), 150 PSI max.	5 PSI	450°F (232°C)	960SA44	3/8 NPT	2.9	4.0 lbs [1.82 kg]
												960SA55	1/2 NPT	3.6	4.0 lbs [1.82 kg]
												960SA66	3/4 NPT	6.8	5.0 lbs [2.27 kg]
												960SA77	1 NPT	11.5	6.0 lbs [2.73 kg]
960SA88	1 1/4 NPT	18	8.0 lbs [3.64 kg]												
960SA99	1 1/2 NPT	26	10 lbs [4.55 kg]												
960SA10	2 NPT	48	15 lbs [6.82 kg]												
960SA11	2 1/2 NPT	75	22 lbs [10.0 kg]												
960SA13	3 NPT	100	35 lbs [15.9 kg]												
960WU	General service, 3-way, brass body	120 Vac/60 Hz, NEMA 1	Water, air, oil (<300 SSU), 50 PSI max.	N/A	180°F (82°C)							960WU1Z	1/8 NPT	.12	1.5 lbs [0.68 kg]
												960WU3Z	1/4 NPT	.12	2.0 lbs [0.91 kg]

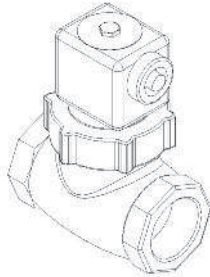
# Solenoid Valve

## 960 Series

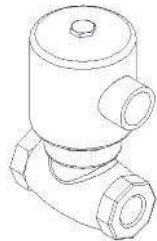
All dimensions are nominal. Dimensions in [ ] are in millimeters



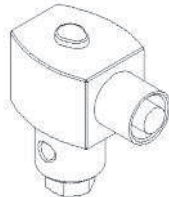
### STYLE "S"



### STYLE "R"



### STYLE "T"



Item Number	Style	A		B		C	
		in.	mm	in.	mm	in.	mm
960WB44	S	5.12	130	4.25	108	2.75	70
960WB55	S	5.12	130	4.25	108	2.75	70
960WB66	S	5.50	140	4.50	114	3.25	83
960WB77	S	5.75	146	4.56	116	3.81	97
960WB88	S	6.50	165	5.06	129	4.25	108
960WB99	S	7.06	179	5.38	137	4.88	124
960WB10	S	8.00	203	5.88	149	5.88	149
960WB11	R	9.81	249	7.94	202	7.00	178
960WB13	R	10.88	276	8.06	205	8.25	210

960SB44	S	5.12	130	4.25	108	2.75	70
960SB55	S	5.12	130	4.25	108	2.75	70
960SB66	S	5.50	140	4.50	114	3.25	83
960SB77	S	5.75	146	4.56	116	3.81	97
960SB88	S	6.50	165	5.06	129	4.25	108
960SB99	S	7.06	179	5.38	137	4.88	124
960SB10	S	8.00	203	5.88	149	5.88	149
960SB11	R	9.81	249	7.94	202	7.00	178
960SB13	R	10.88	276	8.06	205	8.25	210

960WA44	R	7.44	189	6.56	167	2.75	70
960WA55	R	7.44	189	6.56	167	2.75	70
960WA66	R	7.88	200	6.88	175	3.25	83
960WA77	R	8.12	206	6.94	176	3.81	97
960WA88	R	8.69	221	7.31	186	4.25	108
960WA99	R	9.44	240	7.75	197	4.88	124
960WA10	R	10.56	268	8.44	214	5.88	149
960WA11	R	10.81	275	8.38	213	7.00	178
960WA13	R	11.56	294	8.56	217	8.25	210

960SA44	R	7.44	189	6.56	167	2.75	70
960SA55	R	7.44	189	6.56	167	2.75	70
960SA66	R	7.88	200	6.88	175	3.25	83
960SA77	R	8.12	206	6.94	176	3.81	97
960SA88	R	8.69	221	7.31	186	4.25	108
960SA99	R	9.44	240	7.75	197	4.88	124
960SA10	R	10.56	268	8.44	214	5.88	149
960SA11	R	10.81	275	8.38	213	7.00	178
960SA13	R	11.56	294	8.56	217	8.25	210

960WU1Z	T	3.16	80	2.19	56	1.19	30
960WU3Z	T	3.16	80	2.19	56	1.19	30

CONTROLLER ACCESSORIES

# I/P Transducer

## TA901 • Electropneumatic

CONTROLLER ACCESSORIES



TA901 shown

- ▶ 4 to 20 mA Input
- ▶ 1 to 17 PSI Output
- ▶ Intrinsically Safe
- ▶ Zero and Span Adjustments

The Trerice **TA901 Electropneumatic (I/P) Transducer** converts a milliamp current signal to a linearly proportional pneumatic output pressure. This transducer is designed for control applications that require a high degree of reliability and repeatability. The TA901 is used in the control operation of valve actuators and pneumatic valve positioners in the petrochemical, HVAC, energy management, textile, paper, and food and drug industries.

The TA901 I/P Transducer is tested and approved by Factory Mutual as Intrinsically Safe Class I, II and III, Division I, Groups C, D, E, F and G when installed in accordance with the Installation, Operation and Maintenance Instructions. It should be installed in a vertical position in a vibration-free area.

The Trerice TA987 Air Filter/Regulator is recommended for filtering and regulating the pressure of plant compressed air and delivering clean, dry air at the proper pressure to pneumatic control devices.

### Specifications

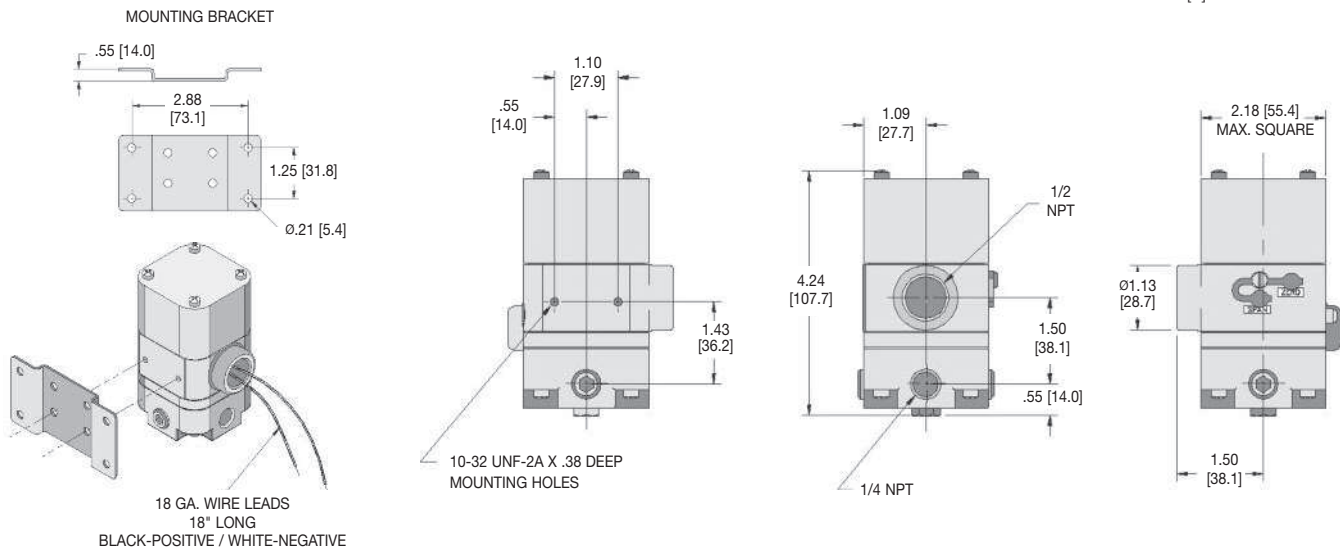
<p><b>Model</b> TA901</p> <p><b>Input</b> 4-20 mA</p> <p><b>Output</b> 1-17 psig Per ANSI/FCI 87-2 (can be calibrated to provide 1-9 psig or 9-17 psig)</p> <p><b>Volume Booster</b> Built-in volume booster allows flow capacity up to 20 SCFM</p> <p><b>Connections</b> Pneumatic: 1/4 NPT Electric: 1/2 NPT</p>	<p><b>Air Requirements</b> Clean, oil-free, dry air filtered to 40 microns</p> <p>Minimum Supply Pressure: 3 psig</p> <p>Maximum Supply Pressure: 100 psig</p> <p>Sensitivity: &lt;math&gt;\leq \pm 0.1\%&lt;/math&gt; of span per psig</p> <p>Air Consumption: 0.03 SCFH typical</p> <p>Flow Rate: 4.5 SCFM at 25 psig supply</p> <p>Relief Capacity: 2.0 SCFM at 5 PSIG above 20 psig setpoint</p>	<p><b>Mounting</b> Pipe, panel or bracket in a vibration-free area. Field adjustment will be required if mounted in a nonvertical position</p> <p><b>Adjustment</b> Adjustable zero and span</p> <p><b>Accuracy</b> Terminal Based Linearity: &lt;math&gt;\leq \pm 0.75\%&lt;/math&gt; of span Repeatability: &lt;math&gt;&lt; 0.5\%&lt;/math&gt; of span Hysteresis: &lt;math&gt;&lt; 1.0\%&lt;/math&gt; of span Response Time: &lt;math&gt;&lt; 0.25 \text{ sec.}&lt;/math&gt; @ 3-15 psig</p>	<p><b>Intrinsic Safety</b> Tested and approved by Factory Mutual as Intrinsically Safe Class I, II and III, Division I, Groups C, D, E, F and G when installed in accordance with Installation, Operation and Maintenance Instructions</p> <p><b>Ambient Temperature</b> -20°F (-30°C) to 140°F (60°C)</p> <p><b>Approximate Shipping Weight</b> 2.1 lbs [0.94 kg]</p>
--	--	--	--

### HOW TO ORDER

Please order using Item Number

**TA901**

All dimensions are nominal. Dimensions in [ ] are in millimeters.



# Air Filter/Regulator

## TA987

CONTROLLER ACCESSORIES



- ▶ **Cast Aluminum Housing**
- ▶ **Removable Nylon Mesh Filter**
- ▶ **Low Air Consumption**
- ▶ **Drip Well**

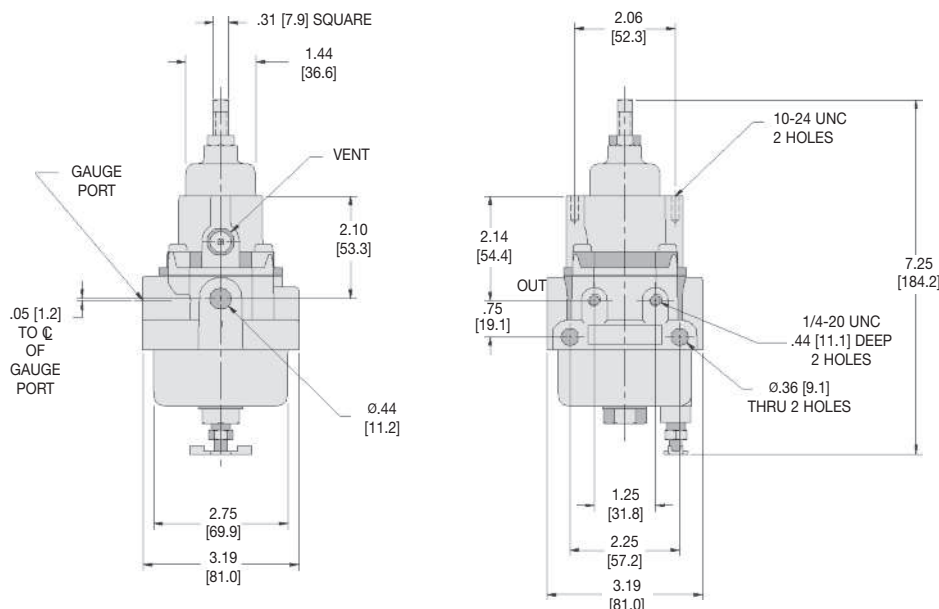
The Trerice **TA987 Air Filter/Regulator** is recommended for filtering and regulating the pressure of plant compressed air to deliver clean, dry air at the proper pressure to pneumatic control devices. Supply air enters the inlet port, passes through the filtering element, and exits through the reducing valve to the outlet port. The filtering element removes particles as small as 40 microns. A drip well is provided for the accumulation of oil and water and a drain cock is included to allow purging of the unit. The filtering element is readily accessible for cleaning by removal of the drip well bowl.

**The maximum allowable supply pressure to TA987 Air Filter/Regulator is 250 psig. Improper application may cause failure of the regulator, resulting in possible personal injury or property damage.**

## Specifications

<b>Model</b> <b>TA987</b>	<b>Air Requirements (cont.)</b> Flow Rate: 20 SCFM at 100 psig supply/20 psig output  Relief Capacity: 0.1 SCFM at 5 psig above setpoint  Effect of Supply Pressure Variation: <0.2 psig for 25 psig	<b>Filter</b> Removes particles 40 microns or greater	<b>Mounting</b> Side, pipe, panel or through body
<b>Air Requirements</b> Maximum Supply Pressure: 250 psig  Output Range: 0 to 30 psig, adjustable  Sensitivity: 0.036 psig  Air Consumption: <6 SCFH		<b>Port Size</b> 1/4 NPT	<b>Ambient Temperature</b> -20°F (-30°C) to 160°F (71°C)
		<b>Housing</b> Cast aluminum	<b>Approximate Shipping Weight</b> 1.9 lbs [0.86 kg]

All dimensions are nominal. Dimensions in [ ] are in millimeters.



# Solid State Relay

## TA600 Series • AC Output

CONTROLLER ACCESSORIES



TA625 shown

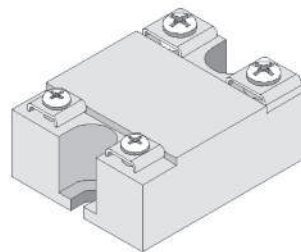
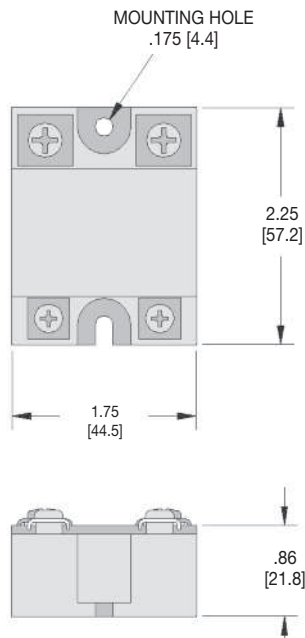
- ▶ UL Listed
- ▶ Arc Free Switching
- ▶ Opto-Isolated Input Circuits
- ▶ Compatible with DTL and TTL Logic

The Trerice **TA600 Series** Solid State Relay has no moving parts, rendering it impervious to shock and vibration, and giving it a virtually infinite life.

### HOW TO ORDER

Please order using Item Number **TA610**, **TA625** or **TA640**

All dimensions are nominal. Dimensions in [ ] are in millimeters.



### Specifications

#### Models

**TA610:** 10 A output  
**TA625:** 25 A output  
**TA640:** 40 A output

**Case** Epoxy molded with aluminum baseplate

**Connection** Screw terminals

**Input** Voltage: 3-32 Vdc  
Impedance: 1000Ω minimum  
Must turn on: 3.0 Vdc  
Must turn off: 1.0 Vdc  
Isolation signal to load: 7000 Vdc  
Isolation signal to base: 2500 Vdc  
Capacitance signal to load: 15 pt

**Output** Voltage: 20~300 Vrms  
Typical turn-on voltage: 5 Vrms  
Response time: 0.5 cycle max.  
OFF state DV/DT: 200 V/m sec  
OFF state leakage current: 15 mA  
Max. non-repetitive single cycle surge current: 400 A  
Cycle surge current: 400 A  
IT for fusing (T=8.3 ms): 400 AS  
Peak inverse voltage: 600 Vpk

#### Ambient Temperature

-20°F (-30°C) to 140°F (60°C)

#### Approximate Shipping Weight

0.2 lbs [0.09 kg]



# Enclosure TA302



- ▶ Polycarbonate Construction
- ▶ Aluminum Mounting Panel
- ▶ Termination Compartment
- ▶ NEMA 12 Protection

The Terrice **TA302 Enclosure** is ideal for mounting a Terrice Electronic Controller or Digital Indicator. The enclosure is constructed from rugged, impact-resistant polycarbonate and furnished with an anodized aluminum front mounting panel. It can accommodate all Terrice Electronic Control and Indicating devices.

## Specifications

### Model

TA302

**Size** 14.3" x 12.4" x 6.1"  
(363 x 316 x 156 mm)

### Application

Fits all electronic controls and indicating devices

### Mounting

Surface

### Body and Cover

Polycarbonate enclosure body and transparent cover

### Hinges

Polyamide, removable for left or right side mounting

### Knockouts

2 x 0.85" and 2 x 1.09"

### Front Panel

Anodized aluminum

### Protection

NEMA 12

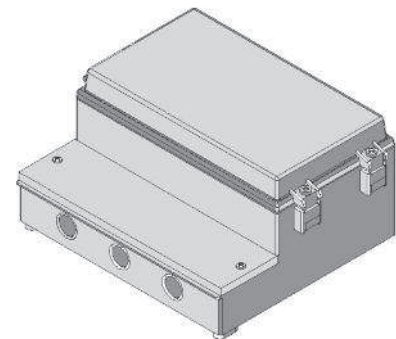
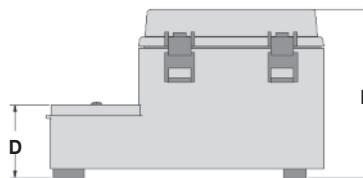
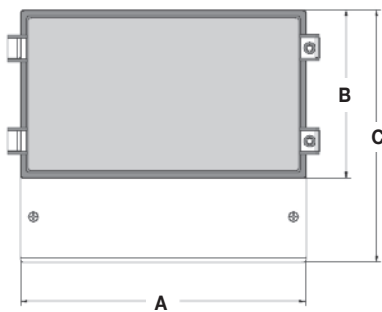
### Ambient Temperature

175°F (80°C) maximum

### Approximate Shipping Weight

5.5 lbs [2.50 kg]

All dimensions are nominal. Dimensions in [ ] are in millimeters.



A	B	C	D	E
14.3 [363]	9.2 [234]	12.4 [316]	3.0 [78]	6.1 [156]

# Electronic Temperature Sensor

Connection Head Type • RTD or Thermocouple

CONTROLLER ACCESSORIES



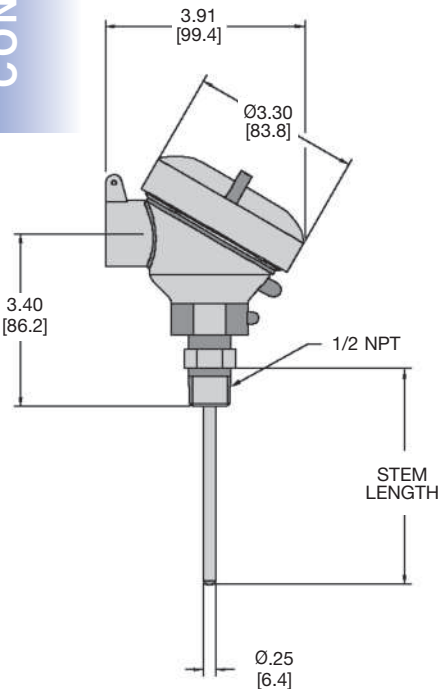
TJDZ04UWA shown

- ▶ Thermocouple or RTD
- ▶ Cast Aluminum Polypropylene or Stainless Steel Head
- ▶ Weather Proof
- ▶ Welded or Spring Loaded Stem

The Trerice **Connection Head** is available with both Type J and Type K Thermocouples, as well as RTD sensors. The weather proof head provides a conduit connection and is available in cast aluminum (screw cover), polypropylene (flip cover) and stainless steel (screw cover). The stem is either welded directly to the 1/2 NPT threaded connection, or is spring-loaded to provide maximum sensitivity. The spring-loaded stem must always be installed in a thermowell.

**Extension wire and transmitter accessories are also available. Please consult the Temperature Sensor Accessories Section for details.**

**For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the sensor and facilitate its removal from the process. To prevent leakage of the process media, spring loaded sensors must always be installed in a thermowell.**



All dimensions are nominal. Dimensions in [ ] are in millimeters.

## Specifications

Sensors	Description
TJD	Type J T/C
TKD	Type K T/C
TDD	100Ω RTD
TMD	1000Ω RTD

### Hot Junction

T/C: Ungrounded  
RTD: Platinum, 3-Wire

**Stem** 316 stainless steel  
1/4" diameter

**Insulation** Ceramic

**Head** Cast aluminum, polypropylene, stainless steel

### Process Connection

1/2 NPT welded or spring-loaded

### Conduit Connection

3/4 NPT Female

### Approximate Shipping Weight

1.1 lbs [0.50 kg]

## Sensor Specifications

### Thermocouple

Type	Color Code	Positive Lead	Negative Lead	Temperature Range
J	Black	Iron* (Fe) [white]	Constantan (Cu-Ni) [red]	32° to 1382°F (0° to 750°C)
K	Yellow	Nickel-Chromium (Ni-Cr) [yellow]	Nickel-Aluminum* (Ni-Al) [red]	32° to 2282°F (0° to 1250°C)

\*magnetic lead

### RTD

Type	Material	Resistance @ 0°C	Temperature Coefficient	Temperature Range
D	Platinum (Pt)	100Ω	a = 0.00385Ω/Ω/°C	-50° to 700°F (-45° to 400°C)
M	Platinum (Pt)	1000Ω	a = 0.00385Ω/Ω/°C	-50° to 700°F (-45° to 400°C)

## HOW TO ORDER

Sample Order Number: **TJD Z 04 U W A**

Sensor	Stem Style	Stem Length	Hot Junction	Connection	Head Material
TJD Type J T/C	Z 316SS, 1/4 O.D.	02 2 1/2" Stem	U Ungrounded (T/C)	S Spring Loaded, 1/2 NPT W Welded, 1/2 NPT	A Aluminum P Polypropylene S Stainless Steel
TKD Type K T/C		04 4" Stem			
TDD 100Ω RTD		06 6" Stem			
TMD 1000Ω RTD		09 9" Stem			
		12 12" Stem			

Other Lengths: Specify in inches (24" maximum)

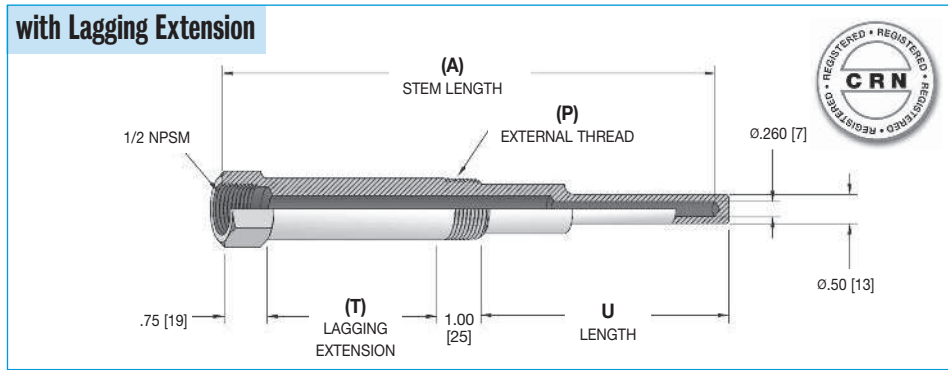
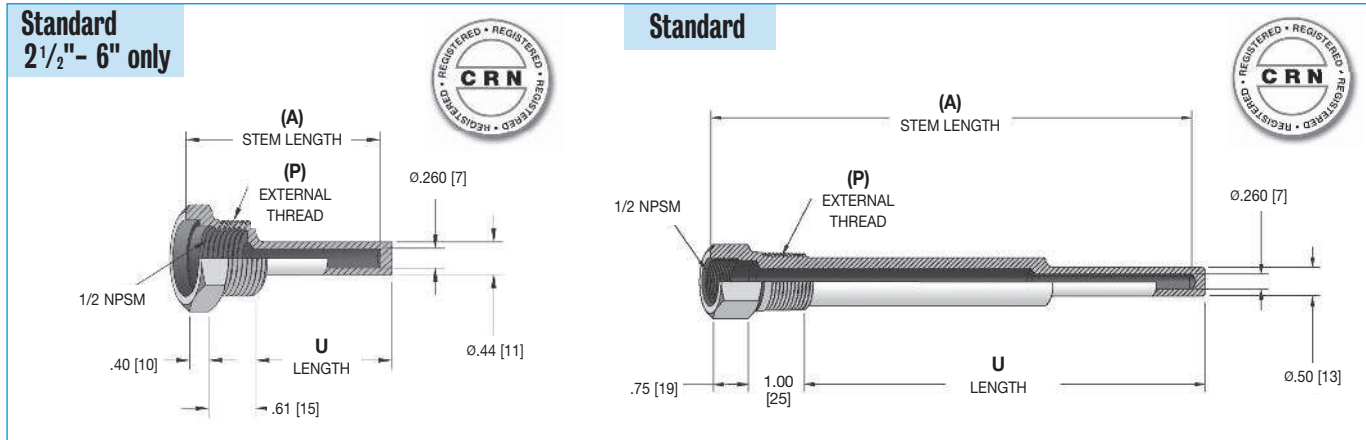
Other sensor styles available. Please consult the Trerice Temperature Section.

# Thermowells

for RTD & Thermocouple Temperature Sensors

All dimensions are nominal.  
Dimensions in [ ] are in millimeters.

CONTROLLER ACCESSORIES



### Lengths

(A) Stem Length	Standard U Length	Lagging (T) Lagging Extension	U Length
2 1/2"	1.75 [44]	—	—
4"	2.50 [64]	1.00 [25]	1.50 [38]
6"	4.50 [114]	2.00 [51]	2.50 [64]
9"	7.50 [191]	3.00 [76]	4.50 [114]
12"	10.50 [267]	3.00 [76]	7.50 [191]
15"	13.50 [343]	3.00 [76]	10.50 [267]
18"	16.50 [419]	3.00 [76]	13.50 [343]
24"	22.50 [572]	3.00 [76]	19.50 [495]

### Pressure Rating (PSI)

Material	Operating Temperature					
	70°F	200°F	400°F	600°F	800°F	1000°F
Carbon steel	5000	5000	4800	4600	3500	-
304 stainless steel	6550	6000	4860	4140	3510	3130
316 stainless steel	6540	6400	6000	5270	5180	4660
Monel	5530	4990	4660	4450	4450	-
Brass	3170 psi @ 150°F, 2930 @ 350°F					

Selection of the proper thermowell is the sole responsibility of the user. Temperature and pressure limitations must be considered. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage. For correct use and application, please refer to the Thermowells For Thermometers And Electrical Temperature Sensors Standard ASME B40.9.

### HOW TO ORDER

Sample Order Number: **76-4J6**

Thermowell Style	(P) External Thread	(A) Stem Length	(T) Lagging Extension	Material
76- Sensor, Stepped Shank (2 1/2" - 6" Stem Straight Shank)	3 1/2 NPT*	D 2 1/2" Stem	A 1" Extension (4" Stem only)	2 Brass
	4 3/4 NPT	G 4" Stem	C 2" Extension (6" Stem only)	3 Steel
	5 1 NPT*	J 6" Stem	E 3" Extension (9" and longer Stem only)	4 Monel
		M 9" Stem	Omit if None	5 304SS
		R 12" Stem		6 316SS
		V 15" Stem		
		Wa 18" Stem		
		Wk 24" Stem		

\*Not available with 2 1/2" Stem Length

Other thermowell styles available. Please consult pages 163-169 of the Trerice Temperature Section.

# Control Valves

## DESIGN & OPERATION

### Description

A control valve is a device capable of modulating flow at varying degrees between minimal flow and full capacity in response to a signal from an external control device. The control valve, often referred to as “the final control element,” is a critical part of any control loop, as it performs the physical work and is the element that directly affects the process.

**A control valve is not considered a close-off valve. A pressure surge may force a single seated valve plug open. The Trerice Control Valve is a balanced equilibrium system and provides no power to tightly seat the valve plug. A separate power driven or hand actuated valve is required to ensure tight close-off when necessary.**

### Principles of Operation

A control valve is comprised of an actuator mounted to a valve. The valve modulates flow through movement of a valve plug in relation to the port(s) located within the valve body. The valve plug is attached to a valve stem, which, in turn, is connected to the actuator. The actuator, which can be pneumatically or electrically operated, directs the movement of the stem as dictated by the external control device.

#### Pneumatic/Diaphragm Actuated

Trerice Pneumatic Actuators are direct acting and utilize an air signal from an external control device to create a modulating control action. The force of the air signal is received into the actuator through a top port and distributed across the full area of the actuator’s diaphragm. The diaphragm presses down on the diaphragm plate and spring return assembly, which then moves the valve stem and plug assembly downward to stroke the valve. This actuator will move to a stem-out position in the event of air signal failure. The choice of valve action (stem-In-To-Close or stem-In-To-Open) will determine its signal failure position.

#### Electric Actuated

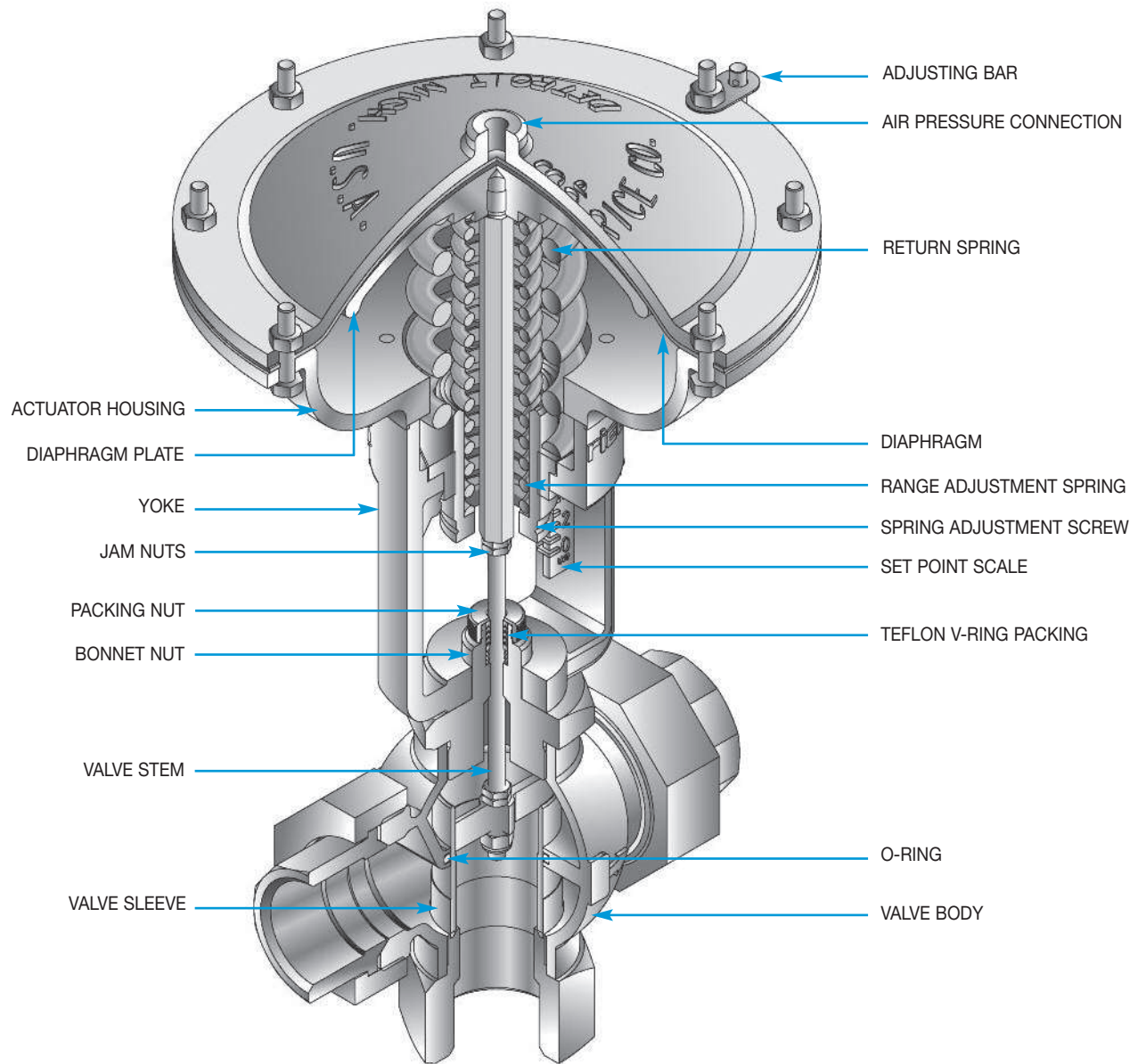
Trerice Electric Actuators utilize an electric motor to generate shaft rotation. This rotation is, in turn, translated by the unit’s gear set into a linear motion, which drives the valve stem and plug assembly for flow modulation. The motor position is controlled by a 4-20mA control signal, these actuators can be specified to fail in the open (stem out) or closed (stem in) position.

### Selecting a Control Valve

Selection of a control valve is primarily dependent upon on the service conditions and load characteristics of the application.

#### Actuator

- **910 Series (Pneumatic)** – The Trerice 910 Series Control Valve is designed for accurate performance within light industrial, HVAC and commercial process applications. The 910 Series utilizes a compact, pneumatic actuator. This actuator is direct-acting and features a “spring-opposed-diaphragm” design.
- **940 Series (Pneumatic)** – The Trerice 940 Series Control Valve is designed for high performance in industrial, demanding HVAC and commercial process applications. The 940 Series is furnished with a heavy duty, pneumatic actuator. This actuator features a “spring-opposed-diaphragm” design and is direct-acting. The valve can also be supplied with either a pneumatic or an electro-pneumatic positioner for greater stability and increased close-off pressure capabilities.



- **940E Series (Electric)** – The Trerice 940E Series Control Valve is designed for high performance in industrial, demanding HVAC and commercial process applications. It features a direct acting electric motor drive actuator, which can be used where an air supply is not available.

#### Actuator: Direct Acting

Direct Acting actuators are designed to move the valve stem to the “in” position as the control signal (pneumatic pressure or electrical signal) increases.

All Trerice Control Valves should be carefully selected to meet the demands of the particular application. The information contained within this catalog is offered only as a guide to assist in making the proper selection. Selection of the proper control valve is the sole responsibility of the user. Improper application may cause failure, resulting in possible personal injury or property damage.

# Control Valves

## DESIGN & OPERATION

### Control Valve Comparison

Consideration	910	910T	910EP	940	940E
Actuation	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Electric
Control Action	On/Off	Proportional	Proportional	Proportional	Proportional
Input Signal w/o Positioner	0/15 psi	3-15 psi	3-15 psi	3-15 psi: 9-15 psi: Single Seat Fail-closed only	4-20 mA or 2-10 VDC
Input Signal with Positioner	x	x	x	3-15 psi or 4-20 mA	x
Application	Standard Duty	Standard Duty	Standard Duty	Heavy Duty	Heavy Duty
Price	Economical	Moderate	Moderate	Premium	Premium
Response Time	Excellent	Excellent	Excellent	Excellent	Very Good
Available with Positioner	No	No	No	Yes	Not Required
Close-off Pressure*	≤ 250 psig	≤ 250 psig	≤ 250 psig	≤ 720 psig	≤ 300 psig
Valve Sizes	1/2" thru 4"	1/8" thru 4"	1/2" thru 2"	1/2" thru 8"	1/2" thru 6"
Valve Styles	Single Seat Double Seat	Double Seat** 3-Way	Single Seat	Single Seat Double Seat 3-Way	Single Seat Double Seat 3-Way
Valve Materials	Bronze Cast-Iron Cast-Steel Stainless Steel	Bronze Cast-Iron Stainless Steel	Bronze	Bronze Cast-Iron Stainless Steel	Bronze Cast-Iron Stainless Steel
Trim Styles	Modified Linear	Modified Linear	Equal Percentage	Equal Percentage Modified Linear	Equal Percentage Modified Linear

\* Allowable pressure is dependent upon body material, connection and temperature of the process fluid. Please consult the Valve Pressure Ratings table.

\*\* Single Seat - 1/2"

### Valve

Trerice Control Valves are available with a wide variety of valve bodies in various styles, materials, connections and sizes.

**A control valve is not considered a close-off valve. A pressure surge may force a single seated valve plug open. The Trerice Control Valve is a balanced equilibrium system and provides no power to tightly seat the valve plug. A separate power driven or hand actuated valve is required to ensure tight close-off when necessary.**

**Style** – Trerice Control Valve Bodies are available in single seated, double seated and 3-way designs.

- **Single Seated Valves** are an excellent choice when a higher degree of close-off is required. However, this design is unbalanced and limited in the pressure that it will close-off against. The leakage rate is approximately 0.01% (refer to Class IV) of the maximum capacity.
- **Double Seated Valves** are nearly pressure balanced and, therefore, are able to close the valve plug against higher operating pressures. However, since temperature fluctuations may cause expansion and contraction across the seats, tight close-off is not always possible. The leakage rate is approximately 0.5% (refer to Class II) of the maximum capacity. Double seated valves have a faster flow response and greater capacity than single seated valves and are recommended when tight close-off is not required.
- **3-Way Valves** are used for mixing two flows together, or for diverting a flow to or around a device (bypass). In order to produce consistent flow quantity for stable operation, the pressure drop across both flow paths (inlet to outlet) must be nearly equal.

3-Way Valves for 910 Series are exclusively of the Sleeve Type. 3-Way Valves for 940 Series are available in two styles: Plug Type (common port on the side) and Sleeve Type (common port on the bottom). The Plug Type is exclusively for use on mixing applications. The Sleeve Type is most commonly used for diverting applications, however due to its design it can also be used for mixing applications. The Sleeve Type design is constructed with an O-ring around the sleeve. The O-ring is suitable for water or glycol type service, up to a maximum of 300°F. A higher temperature viton O-ring for use with other fluids, such as oil, or for temperatures up to 410°F is available. Consult factory.

## Action

Trerice Single and Double Seated Valves are available as stem In-To-Close (fail-open), or stem In-To-Open (fail-closed) for various application requirements. The action of 910 Series, bronze-bodied valves is field reversible. Trerice 3-Way Valves can be specified for either mixing or diverting service.

**Trerice Control Valves are NOT intended for use in applications where the media comes in direct contact with the skin or body, such as showers, baths, lavatories or wash fountains.**

### Control Valve Action

Stem Action	Fail Position*
In-To-Close	Fail-open
In-To-Open	Fail-closed

\* The electric motor actuator of the 940E Series can be specified to move the valve to an open (stem out) or closed (stem in) position in case of electrical power failure or loss of control signal.

## Body Material and Connection

Trerice Control Valves are available with bronze, cast-iron, cast steel and stainless steel valve bodies. Union, flanged and threaded connection styles are available.

### Valve Pressure Ratings (psig)

Body Material	Connection	Operating Temperature									
		100°F (38°C)	150°F (66°C)	175°F (79°C)	200°F (93°C)	225°F (107°C)	250°F (121°C)	275°F (135°C)	300°F (149°C)	350°F (177°C)	400°F (204°C)
Bronze	Iron Unions	250	250	250	250	250	250	250	250	250	250
Bronze	Threaded	400	400	392	385	375	365	350	335	300	250
Cast-Iron	Threaded	400	400	385	370	355	340	325	310	280	250
Cast-Iron	Class 125 Flanged	175	175	170	165	157	150	145	140	125	—
Cast-Iron	Class 250 Flanged	400	400	385	370	355	340	325	310	280	250
Cast-Steel	Threaded	250	250	250	250	250	250	250	250	250	250
Stainless Steel	Threaded	720	670	645	620	605	590	575	560	537	515

## Trim

Valve trim is comprised of the stem and plug assembly, and the seats within the ports. 910 Series Control Valves employ either a quick-opening or equal percentage stainless steel valve plug and permanently brazed-in stainless steel seats for smooth performance throughout the life of the valve. The valve plug is both top and bottom guided to ensure positive seating alignment. Series 940 and 940E Two-Way Control Valves are furnished with an equal percentage plug design. A quick-opening plug design is ideally suited for use with an “On/Off” Controller, while an equal percentage design is typically used with a “Proportional” or “PID” Controller.

Trerice 3-Way Valves use a skirt-guided stainless steel sleeve and brass seating surface to change flow direction in a linear manner within the body.

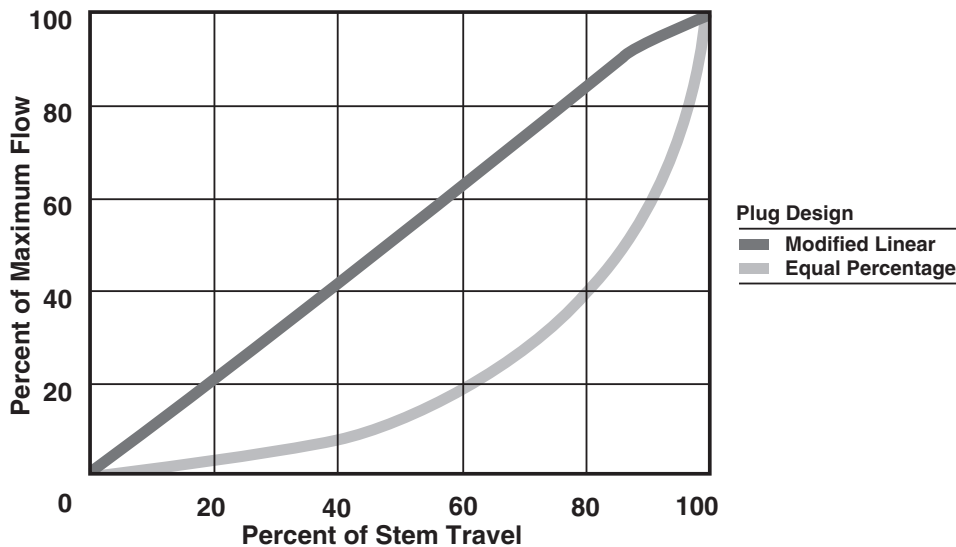
# Control Valves

## DESIGN & OPERATION

### Plug Design Availability

Series	Style	Plug Design	
		Modified Linear	Equal Percentage
910	2-Way	x	x
	3-Way	x	
940 / 940E	2-Way		x
	3-Way	x	

### Inherent Flow Characteristics



### Packing

Trerice valves feature a self-energizing Teflon V-Ring packing, which reduces leakage around the valve stem. V-Ring packing is spring loaded to maintain proper compression and **does not** require manual adjustment.

### Size

The proper sizing of a control valve is one of the most important factors in its selection. A valve that is too small will not be able to provide the desired capacity during peak load conditions, while a valve that is too large may overshoot the control point and operate with the valve plug too close to the seat, resulting in undue wear of the plug and seat. The valve coefficient ( $C_v$ ) is mathematically determined through an evaluation of the system operating pressures. From this factor, a valve body with the appropriate port size can be selected. Port Sizes from 1/8" through 8" and Connection Sizes from 1/2" through 8" are available. Please consult the Valve Selection Section of this catalog.

### Valve Coefficient ( $C_v$ )

The rated valve coefficient is used to describe the relative flow capacity of the valve based on standard test conditions. Please refer to the Valve Selection Section for detailed information.



## Control Valve Availability

910 Series			Size											
Body Material	Connection	Style	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"
Bronze	Iron Unions	Single	✓*	✓	✓	✓	✓	✓						
		Double		✓	✓	✓	✓	✓						
		3-Way	✓	✓	✓	✓	✓	✓						
Cast-Iron	Class 125 Flanged	Double							✓	✓	✓			
		3-Way							✓	✓	✓			
Cast-Steel	Threaded	Single		✓*	✓*									
Stainless Steel	Threaded	Single	✓	✓	✓		✓	✓						
		3-Way	✓	✓	✓		✓	✓						

940 / 940E Series			Size											
Body Material	Connection	Style	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"
Bronze	Threaded	Single	✓	✓	✓	✓	✓	✓						
		3-Way	✓	✓	✓		✓	✓						
Cast-Iron	Threaded	Double					✓	✓						
Cast-Iron	Class 125 Flanged	Single							✓	✓	✓	✓	✓†	
		Double							✓	✓	✓	✓	✓	✓†
		3-Way							✓	✓	✓	✓	✓	✓†
Cast-Iron	Class 250 Flanged	Single							✓	✓	✓	✓	✓	
		Double							✓	✓	✓	✓	✓	✓†
		3-Way	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓†
Stainless Steel	Threaded	Single	✓	✓	✓		✓	✓						
		3-Way	✓	✓	✓									

\*Reduced port sizes are available.

†Not available on 940E Series.

## Positioner

Trerice Valve Positioners (pneumatic and electropneumatic) are mechanical devices designed to provide enhanced control, stability, and close-off capability in extreme flow applications. The positioner, which is mounted to the valve's yoke assembly and linked to the valve stem, receives a signal from an external control source, compares the control signal to the actual position of the valve plug, and then sends a corrected signal to the valve's actuator, thereby positioning the valve plug for optimum flow modulation.

## Air Filter/Regulator

The Trerice No. TA987 Air Filter/Regulator is recommended for filtering and regulating the pressure of plant compressed air, while delivering clean, dry air at the proper pressure to pneumatic control devices.

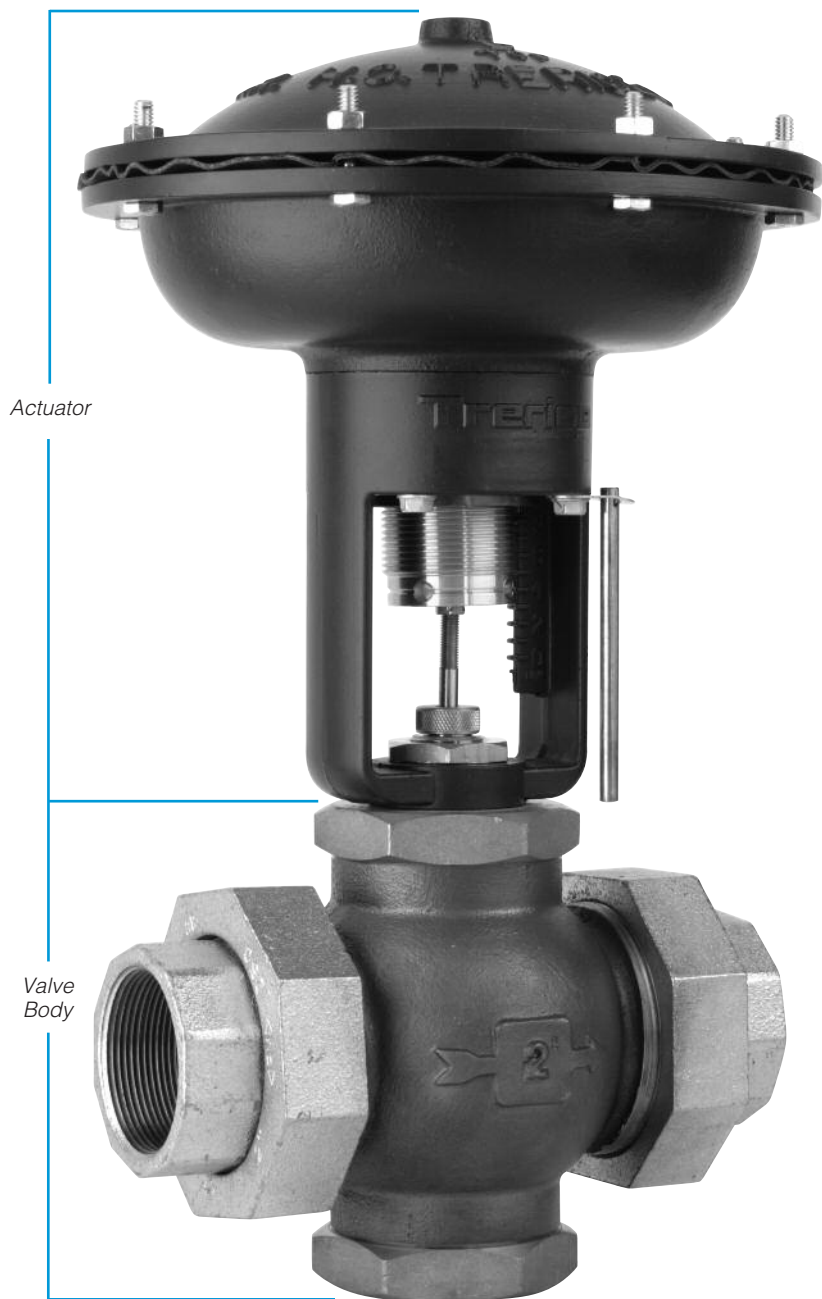
**Clean, filtered supply air is required by all pneumatic control systems and control devices.**

## Pipeline Strainer

A Trerice Series 1100 Pipeline Strainer should always be installed upstream of a Trerice Control Valve. This Y-Type strainer employs a stainless steel screen and will remove debris from the line, which will prevent jamming of the valve and extend its life.

# 910 Series Compact Control Valve

CONTROL VALVES



Actuator

Valve Body

910B shown

- ▶ Diaphragm Actuated
- ▶ 7", 9", & 12" Actuator Sizes
- ▶ Heavy Duty Die Cast Housing
- ▶ 1/2" - 4" Valve Sizes

The Trerice **910 Series Pneumatic Control Valve** offers high quality at an economical price, incorporating many features found only on more expensive units. Models are available to provide the proper flow response required by the application.

The **910A, 910B & 910C** are used for On/Off control applications, providing a quick-opening flow response when used with single or double seated valves.

The **910TB** is used for proportional or PID control applications, providing a throttling flow response when used with double seated or 3-way valves.

The **910EPA & 910EPC** is used for proportional or PID control applications, providing an equal percentage flow response when used with single seated valves.

For optimal performance, the service conditions (medium, flow, temperature, inlet and outlet pressures) of the application must be considered when selecting a valve. Please refer to the Valve Selection Section of this catalog. Consult the Valve Selection tables for the capabilities of a particular valve/actuator assembly. Improper application may cause failure of the valve, resulting in possible personal injury or property damage.

For replacement or service parts please see Accessories and Replacement Parts in the Regulators and Control Valves section of the list price sheet.

# 910 Series Compact Control Valve

## Specifications

Actuator Model	Diaphragm Size	Control Action	Input Signal
910A	7"	On/Off	0/15 psi
910B	10"	On/Off	0/15 psi
910C	12"	On/Off	0/15 psi
910TB	10"	Throttling*	3-15 psi
910EPA	7"	Equal Percentage	3-15 psi
910EPC	12"	Equal Percentage	3-15 psi

\*Includes 3-Way

### Housing

Die cast aluminum, epoxy powder coated blue finish

### Setting Scale

Integral to housing

### Adjustment Screw

Brass

### Adjustment Screw Bushing

Lubricant impregnated sintered bronze

### Range Adjustment Spring

Cadmium plated

### Pressure Plate

Aluminum

### Diaphragm

Nylon reinforced EDPM

### Air Pressure to Diaphragm

30 psig maximum

### Air Pressure Connection

1/8 NPT Female

### Operating Temperature

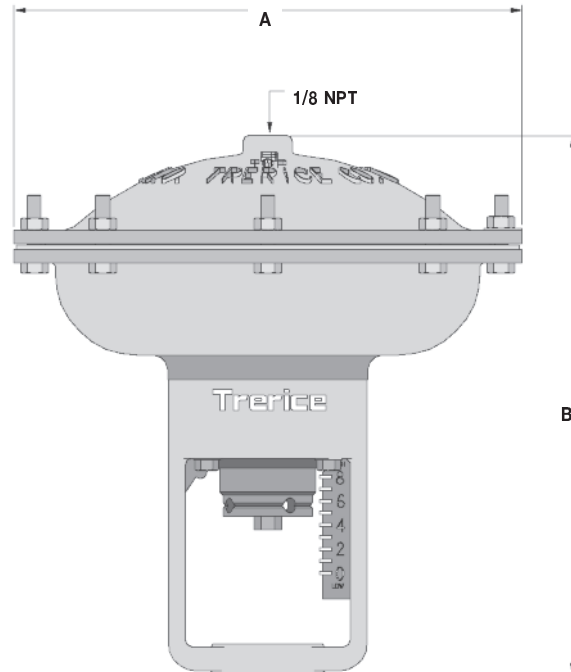
Ambient:

-40°F (-40°C) to 180°F (82°C)

Process Flow:

-40°F (-40°C) to 410°F (210°C)

All dimensions are nominal. Dimensions in [ ] are in millimeters



Actuator Number	A	B	Approx. Shipping Weight
910A	7.0 [178]	9.8 [249]	6.6 lbs [2.97 kg]
910B	9.3 [236]	9.8 [249]	8.5 lbs [3.83 kg]
910C	11.4 [290]	9.8 [249]	12.0 lbs [5.41 kg]
910TB	9.3 [236]	9.8 [249]	9.6 lbs [4.32 kg]
910EPA	7.0 [178]	9.8 [249]	7.6 lbs [3.42 kg]
910EPC	11.4 [290]	9.8 [249]	13.1 lbs [5.90 kg]

## HOW TO ORDER

Sample Order Number: **910TB - A56**

Actuator Model	(Control Action)	Valve Body Number
910A 910B 910C	On/Off	Refer to pages 238-242
910TB	Throttling	Refer to pages 243-246
910EPA 910EPC	Equal Percentage	Refer to page 247

- Determine** the Actuator Model (**910A, 910B, 910C, 910TB, 910EPA or 910EPC**) required. **Note:** Refer to the maximum close-off pressure columns in the Valve Body Selection tables to determine the Actuator size required by your application.
- Determine** the Valve Size, style and material required by the application. **Note:** Consult the Valve Selection Table to determine the required Valve Body Number.

# Valve Body Selection

(for 910A, 910B & 910C Control Valves)

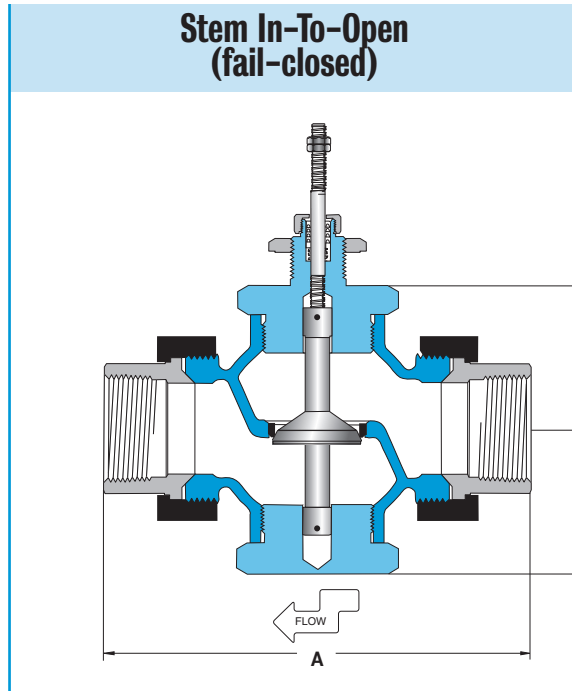
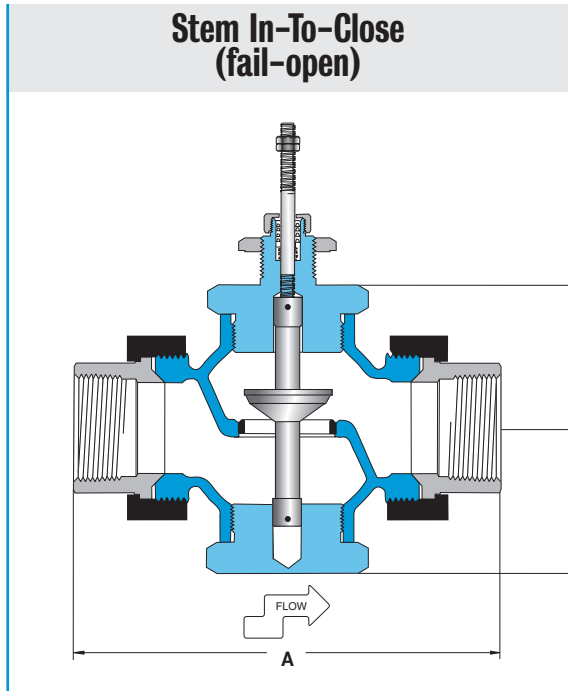
# BRONZE

Single Seat • 1/2" – 2"



All dimensions are nominal. Dimensions in [ ] are in millimeters

CONTROL VALVES



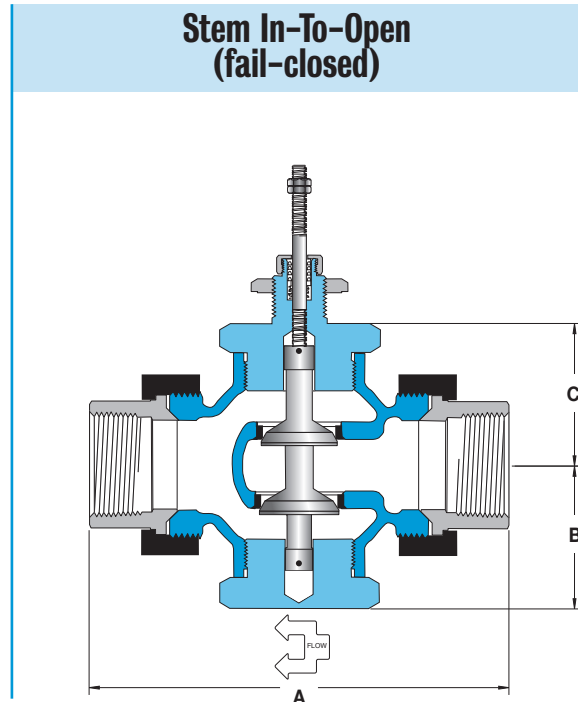
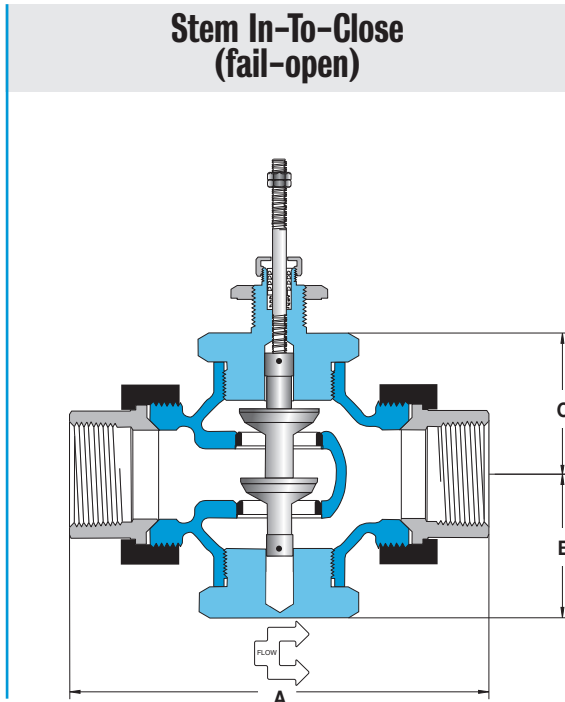
## Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Bronze	Stainless steel	Modified linear	Threaded, malleable iron union ends	250 PSI @ 410°F (210°C)

## Valve Body Selection

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	910A	910B	910C	A	B	C	
	Connection (NPT)	Nominal Port			Actuator					
A14	1/2	1/2"	2.8	250	x	x	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A19	3/4	3/4"	5.6	250	x	x	5.6 [142]	2.3 [58]	2.3 [58]	4.9 lbs [2.21 kg]
A26	1	1"	8.4	200	250	x	6.0 [152]	2.3 [58]	2.3 [58]	6.0 lbs [2.70 kg]
A36	1 1/4	1 1/4"	15	100	250	x	7.2 [183]	2.6 [66]	2.6 [66]	9.7 lbs [4.37 kg]
A47	1 1/2	1 1/2"	21	50	150	250	7.7 [196]	2.6 [66]	2.6 [66]	10.8 lbs [4.86 kg]
A58	2	2"	33	25	50	250	8.6 [218]	3.1 [79]	3.1 [79]	16.3 lbs [7.34 kg]

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	910A	910B	910C	A	B	C	
	Connection (NPT)	Nominal Port			Actuator					
A15	1/2	1/2"	2.8	250	x	x	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]
A22	3/4	3/4"	5.6	250	x	x	5.6 [142]	2.3 [58]	2.3 [58]	4.9 lbs [2.21 kg]
A30	1	1"	8.4	200	x	x	6.0 [152]	2.3 [58]	2.3 [58]	6.0 lbs [2.70 kg]
A41	1 1/4	1 1/4"	15	150	x	x	7.2 [183]	2.6 [66]	2.6 [66]	9.7 lbs [4.37 kg]
A52	1 1/2	1 1/2"	21	100	x	x	7.7 [196]	2.6 [66]	2.6 [66]	10.8 lbs [4.86 kg]
A63	2	2"	33	50	x	x	8.6 [218]	3.1 [79]	3.1 [79]	16.3 lbs [7.34 kg]



### Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Bronze	Stainless steel	Modified linear	Threaded, malleable iron union ends	250 PSI @ 410°F (210°C)

### Valve Body Selection

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	910A	910B	910C	A	B	C	
	Connection (NPT)	Nominal Port								
A21	3/4	3/4"	8	250	x	x	5.6 [142]	2.3 [58]	2.3 [58]	5.0 lbs [2.25 kg]
A29	1	1"	12	250	x	x	6.0 [152]	2.3 [58]	2.3 [58]	6.1 lbs [2.75 kg]
A39	1 1/4	1 1/4"	21	250	x	x	7.2 [183]	2.6 [66]	2.6 [66]	10.1 lbs [4.55 kg]
A50	1 1/2	1 1/2"	30	250	x	x	7.7 [196]	2.6 [66]	2.6 [66]	11.1 lbs [5.00 kg]
A61	2	2"	47	200	x	x	8.6 [218]	3.1 [79]	3.1 [79]	17.0 lbs [7.65 kg]

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	910A	910B	910C	A	B	C	
	Connection (NPT)	Nominal Port								
A24	3/4	3/4"	8	250	x	x	5.6 [142]	2.3 [58]	2.3 [58]	5.0 lbs [2.25 kg]
A33	1	1"	12	250	x	x	6.0 [152]	2.3 [58]	2.3 [58]	6.1 lbs [2.75 kg]
A44	1 1/4	1 1/4"	21	250	x	x	7.2 [183]	2.6 [66]	2.6 [66]	10.1 lbs [4.55 kg]
A55	1 1/2	1 1/2"	30	250	x	x	7.7 [196]	2.6 [66]	2.6 [66]	11.1 lbs [5.00 kg]
A66	2	2"	47	200	x	x	8.6 [218]	3.1 [79]	3.1 [79]	17.0 lbs [7.65 kg]

# Valve Body Selection

(for 910A, 910B & 910C Control Valves)

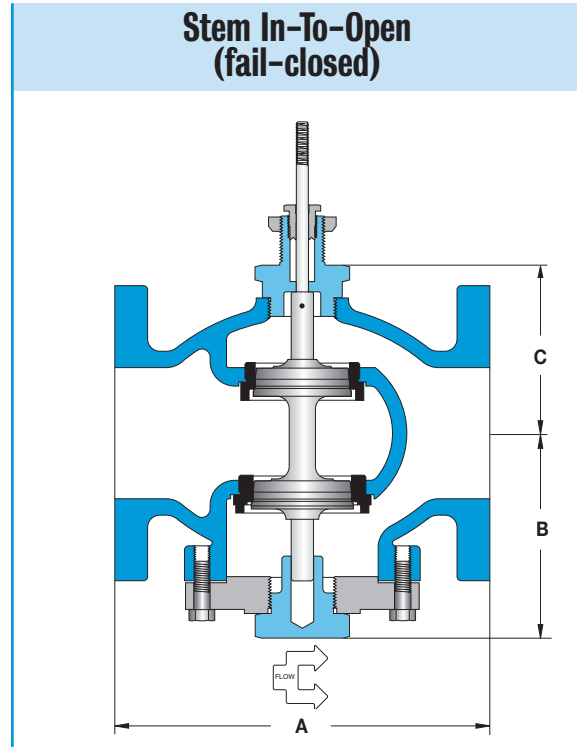
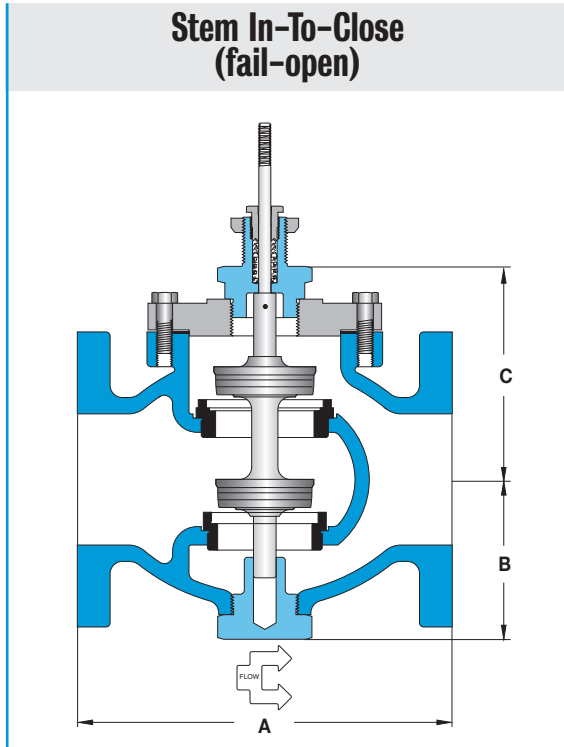
# CAST IRON

Double Seat • 2 1/2" – 4"



All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES



## Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Cast-iron	Stainless steel	Modified linear	Class 125 flanged	125 PSI @ 350°F (176°C)

## Valve Body Selection

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Connection	Size Nominal Port	C <sub>v</sub>	910A	910B	910C	A	B	C	
B73	2 1/2"	2 1/2"	69	125	x	x	7.8 [198]	4.8 [122]	5.4 [137]	45 lbs [20 kg]
B78	3"	3"	90	125	x	x	9.0 [229]	5.0 [127]	5.6 [142]	70 lbs [32 kg]
B83	4"	4"	196	125	x	x	11.4 [290]	6.3 [160]	6.5 [165]	100 lbs [45 kg]

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Connection	Size Nominal Port	C <sub>v</sub>	910A	910B	910C	A	B	C	
B74	2 1/2"	2 1/2"	69	125	x	x	7.8 [198]	4.8 [122]	5.4 [137]	45 lbs [20 kg]
B79	3"	3"	90	125	x	x	9.0 [229]	5.0 [127]	5.6 [142]	70 lbs [32 kg]
B84	4"	4"	196	125	x	x	11.4 [290]	6.3 [160]	6.5 [165]	100 lbs [45 kg]

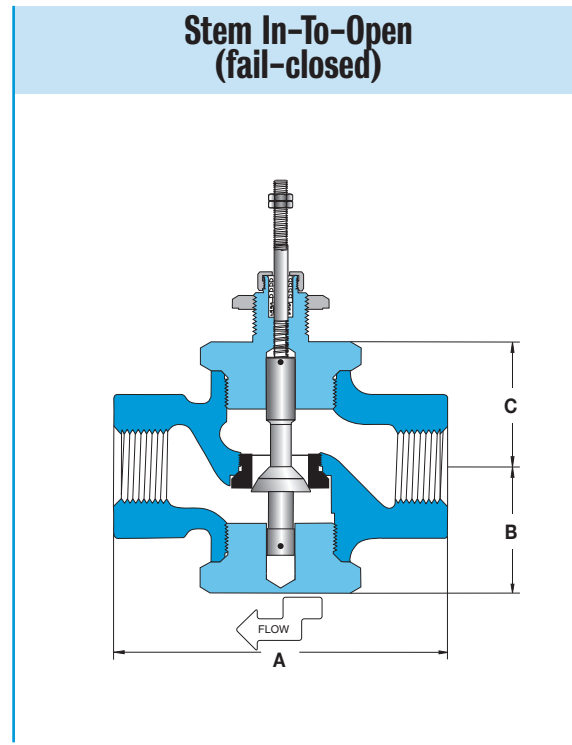
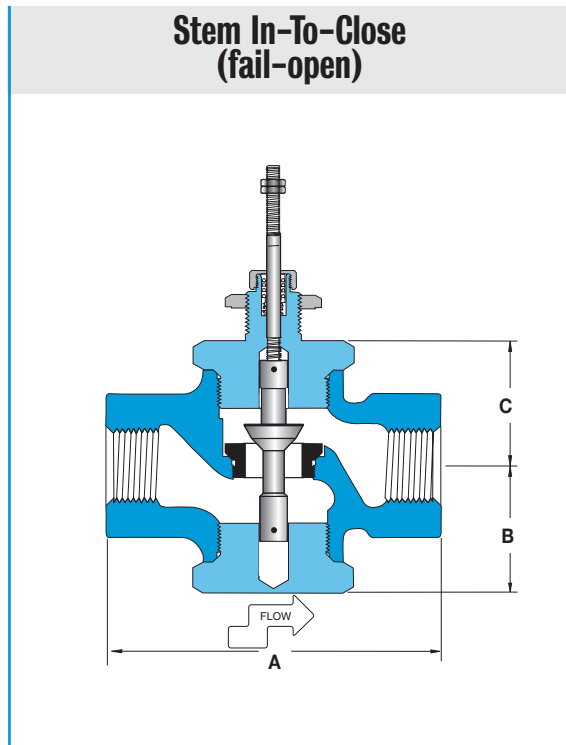
# CAST STEEL

# Valve Body Selection (for 910A, 910B & 910C Control Valves)

Single Seat • 1/2" – 1"

All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES



## Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Cast-steel	Stainless steel	Modified linear	Threaded	250 PSI @ 410°F (210°C)

## Valve Body Selection

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	910A	Actuator 910B	910C	A	B	C	
	Connection (NPT)	Nominal Port								
C05	3/4	1/2"	2.8	250	x	x	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C06	3/4	3/4"	5.6	250	x	x	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C55	1	1/2"	2.8	250	x	x	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C56	1	3/4"	5.6	250	x	x	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C57	1	1"	8.4	200	250	x	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	910A	Actuator 910B	910C	A	B	C	
	Connection (NPT)	Nominal Port								
C15	3/4	1/2"	2.8	250	x	x	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C16	3/4	3/4"	5.6	250	x	x	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C65	1	1/2"	2.8	250	x	x	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C66	1	3/4"	5.6	250	x	x	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]
C67	1	1"	8.4	200	x	x	6.0 [152]	2.3 [58]	2.3 [58]	9.2 lbs [4.18 kg]

# Valve Body Selection

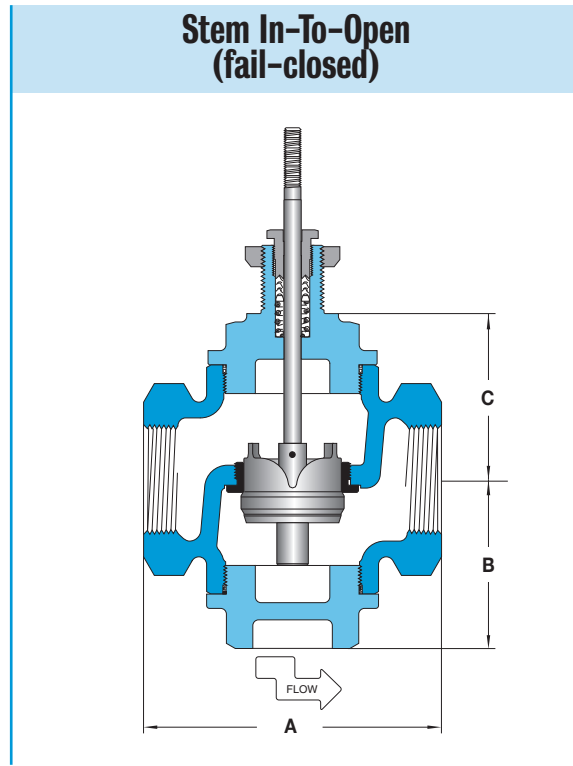
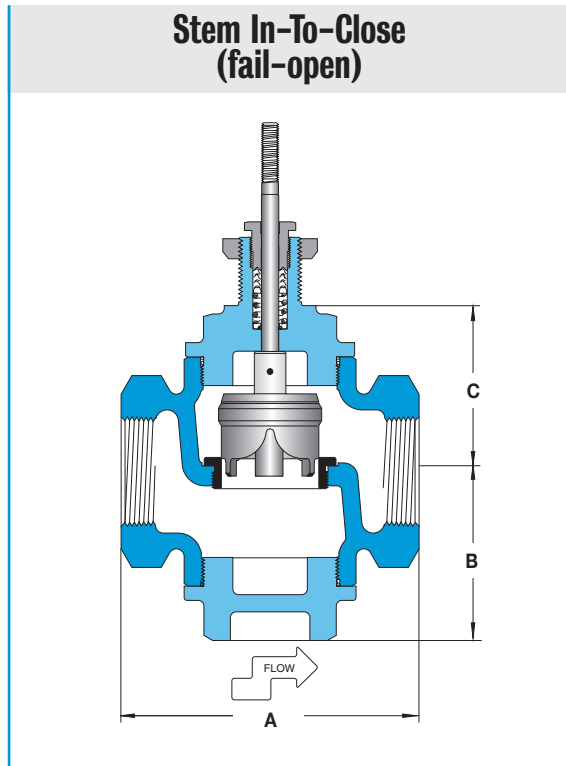
(for 910A, 910B & 910C Control Valves)

# STAINLESS STEEL

Single Seat • 1/2" – 2"

All dimensions are nominal. Dimensions in [ ] are in millimeters

CONTROL VALVES



## Specifications

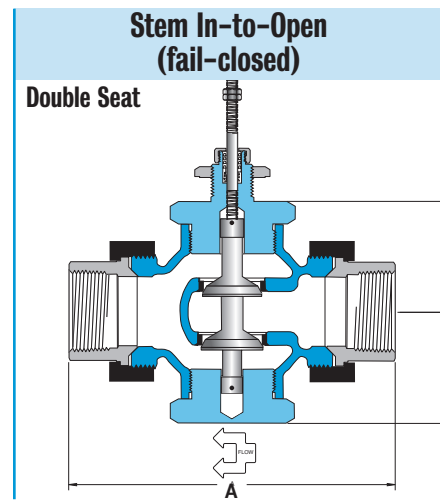
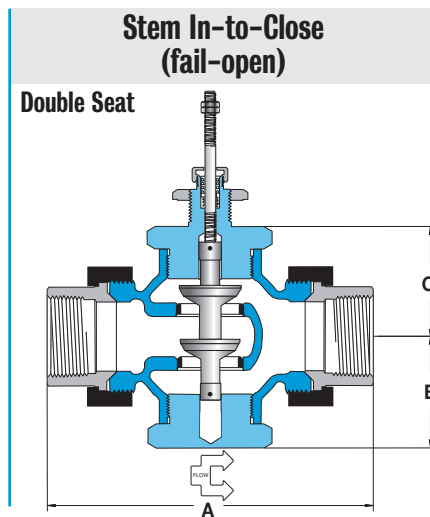
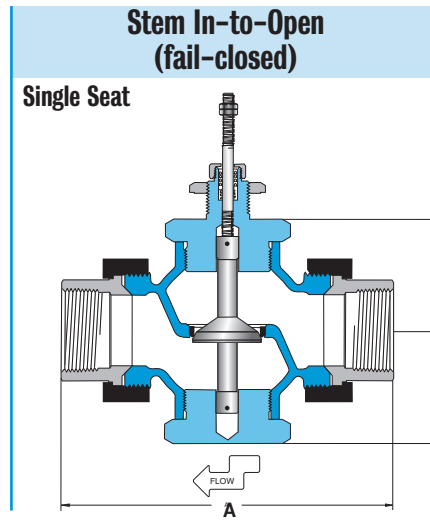
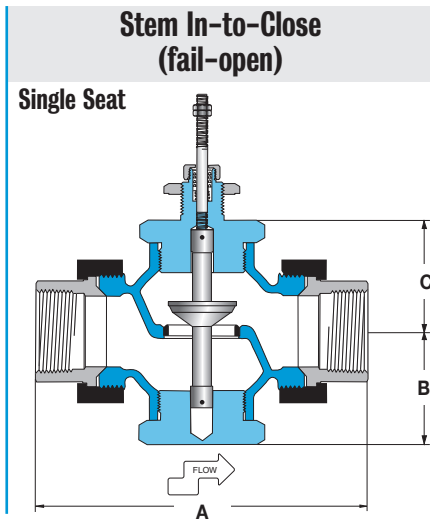
Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Stainless steel	Stainless steel	Modified linear	Threaded	250 PSI @ 410°F (210°C)

## Valve Body Selection

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Size Connection (NPT)	Nominal Port	C <sub>v</sub>	910A	910B	910C	A	B	C	
D14	1/2	1/2"	6	250	x	x	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D19	3/4	3/4"	8.6	220	250	x	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D26	1	1"	14	140	250	x	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D47	1 1/2	1 1/2"	27	40	120	250	6.1 [155]	3.5 [89]	4.0 [102]	15.5 lbs [7.05 kg]
D58	2	2"	33	25	45	225	6.5 [165]	3.9 [99]	4.2 [107]	19.0 lbs [8.64 kg]

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Size Connection (NPT)	Nominal Port	C <sub>v</sub>	910A	910B	910C	A	B	C	
D15	1/2	1/2"	6	250	x	x	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D22	3/4	3/4"	8.6	250	x	x	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D30	1	1"	14	155	x	x	5.0 [127]	2.9 [74]	3.4 [86]	8.0 lbs [3.64 kg]
D52	1 1/2	1 1/2"	27	80	x	x	6.1 [155]	3.5 [89]	4.0 [102]	15.5 lbs [7.05 kg]
D63	2	2"	33	40	x	x	6.5 [165]	3.9 [99]	4.2 [107]	19.0 lbs [8.64 kg]





### Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Bronze	Stainless steel	Modified linear	Threaded, malleable iron union ends	250 PSI @ 410°F (210°C)

### Valve Body Selection

Valve Body Number		Size		Number of Seats	C <sub>v</sub>	Maximum Close-Off Pressure (psid)	Actuator 910TB	Dimensions			Approximate Shipping Wt.
ITC Fail-Open	ITO Fail-Closed	Connection (NPT)	Nominal Port					A	B	C	
A02	A03	1/2	1/8"	1	0.17	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]	
A05	A06	1/2	3/16"	1	0.35	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]	
A08	A09	1/2	1/4"	1	0.7	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]	
A11	A12	1/2	3/8"	1	1.4	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]	
A14	A15	1/2	1/2"	1	2.8	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]	
A21	A24	3/4	3/4"	2	8	250	5.6 [142]	2.3 [58]	2.3 [58]	5.0 lbs [2.25 kg]	
A29	A33	1	1"	2	12	250	6.0 [152]	2.3 [58]	2.3 [58]	6.1 lbs [2.75 kg]	
A39	A44	1 1/4	1 1/4"	2	21	250	7.2 [183]	2.6 [66]	2.6 [66]	10.1 lbs [4.55 kg]	
A50	A55	1 1/2	1 1/2"	2	30	250	7.7 [196]	2.6 [66]	2.6 [66]	11.1 lbs [5.00 kg]	
A61	A66	2	2"	2	47	250	8.6 [218]	3.1 [79]	3.1 [79]	17.0 lbs [7.65 kg]	

# Valve Body Selection

(for 910TB Control Valve)

# BRONZE

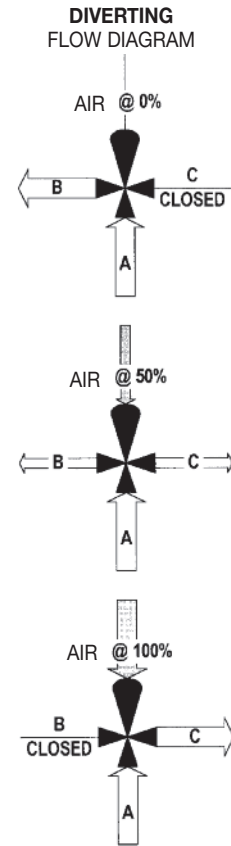
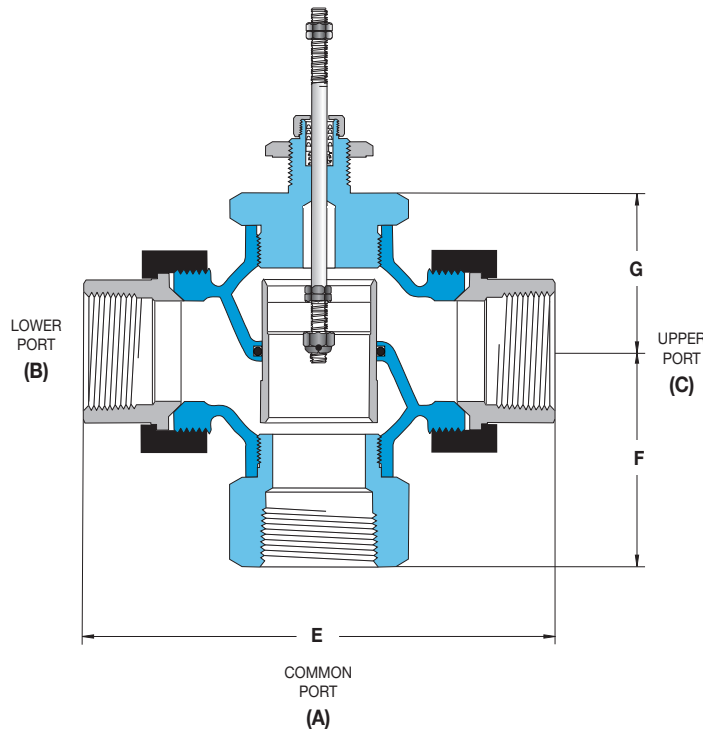
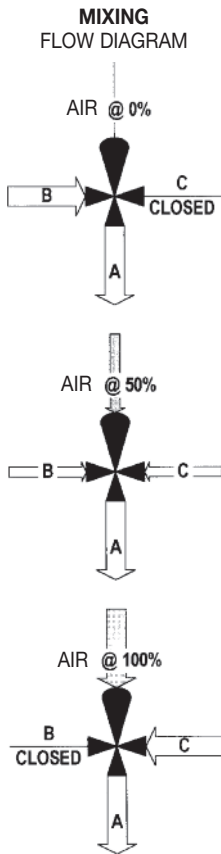
3-WAY • 1/2" - 2"



All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES

## for Mixing or Diverting



Trerice 3-Way Valves are not designed for use in steam applications. To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

### Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Bronze	Bronze	Modified linear	Threaded, malleable iron union ends	250 PSI @ 300°F (149°C)

### Valve Body Selection

Mixing or Diverting				Maximum Close-Off Pressure (psid)			Approximate Shipping Wt.	
Valve Body Number	Size Connection (NPT)	Nominal Port	C <sub>v</sub>	Actuator 910TB	Dimensions E	F		G
A18	1/2	1/2"	2.8	250	4.8 [122]	1.8 [46]	1.8 [46]	2.9 lbs [1.31 kg]
A25	3/4	3/4"	5.6	250	5.6 [142]	2.3 [58]	2.3 [58]	4.7 lbs [2.12 kg]
A34	1	1"	8.4	250	6.0 [152]	2.3 [58]	2.3 [58]	5.7 lbs [2.57 kg]
A45	1 1/4	1 1/4"	15	250	7.2 [183]	2.8 [71]	2.6 [66]	9.5 lbs [4.28 kg]
A56	1 1/2	1 1/2"	21	250	7.7 [196]	3.5 [89]	2.6 [66]	11.1 lbs [5.00 kg]
A67	2	2"	33	250	8.6 [218]	4.1 [104]	3.1 [79]	16.7 lbs [7.55 kg]

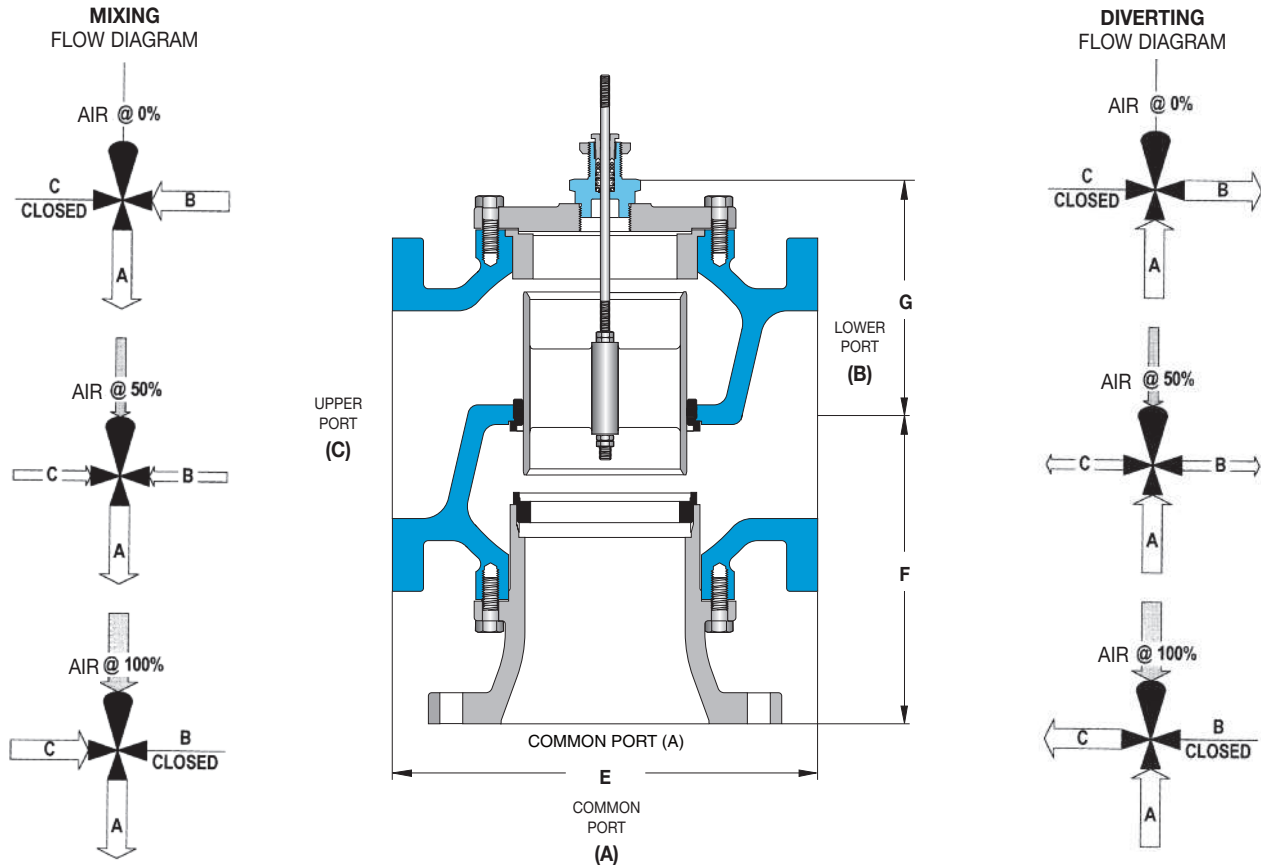
All dimensions are nominal. Dimensions in [ ] are in millimeters.



3-WAY • 2 1/2" - 4"

CONTROL VALVES

## for Mixing or Diverting



Trerice 3-Way Valves are not designed for use in steam applications. To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

### Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Cast-Iron	Bronze	Modified linear	Class 125 flanged	125 PSI @ 300°F (149°C)

### Valve Body Selection

Mixing or Diverting				Maximum Close-Off Pressure (psid)			Approximate Shipping Wt.	
Valve Body Number	Connection	Size Nominal Port	C <sub>v</sub>	Actuator 910TB	Dimensions			
					E	F	G	
B75	2 1/2"	2 1/2"	69	125	9.0 [229]	7.1 [180]	5.2 [132]	62 lbs [28 kg]
B80	3"	3"	90	125	10.0 [254]	8.0 [203]	6.0 [152]	80 lbs [36 kg]
B85	4"	4"	196	125	13.0 [330]	10.0 [254]	6.9 [175]	140 lbs [64 kg]

# Valve Body Selection (for 910TB Control Valve)

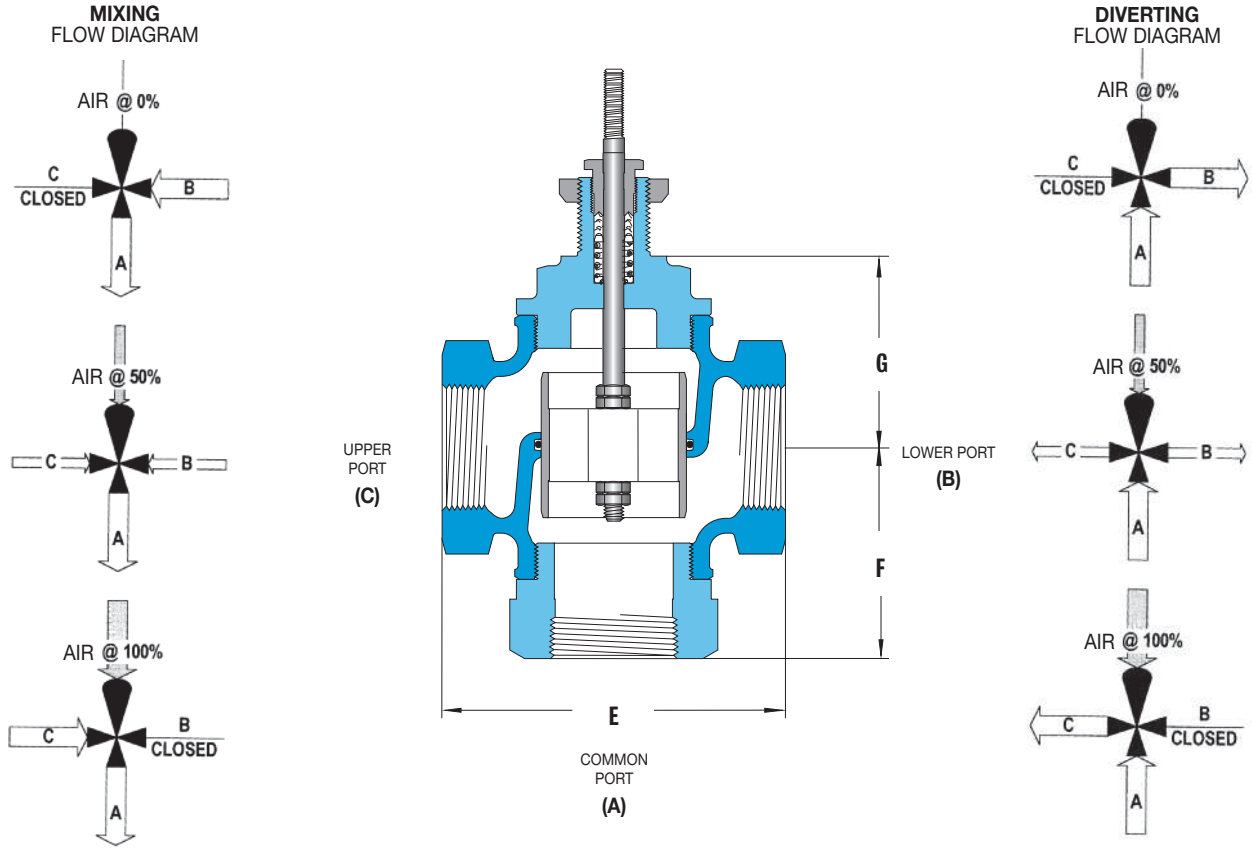
# STAINLESS STEEL

3-WAY • 1/2" - 2"

All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES

## for Mixing or Diverting



Trerice 3-Way Valves are not designed for use in steam applications. To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

### Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Stainless steel	Stainless steel	Modified linear	Threaded	250 PSI @ 300°F (149°C)

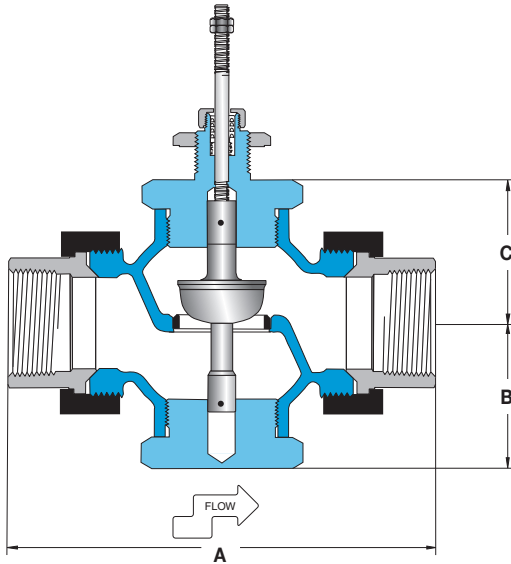
### Valve Body Selection

Mixing or Diverting				Maximum Close-Off Pressure (psid)			Approximate Shipping Wt.	
Valve Body Number	Size Connection (NPT)	Nominal Port	C <sub>v</sub>	Actuator 910TB	Dimensions E	F		G
D18	1/2	1/2"	6	250	5.0 [127]	2.9 [74]	3.4 [86]	7.5 lbs [3.41 kg]
D25	3/4	3/4"	8	250	5.0 [127]	2.9 [74]	3.4 [86]	7.5 lbs [3.41 kg]
D34	1	1"	10	250	5.0 [127]	2.9 [74]	3.4 [86]	7.5 lbs [3.41 kg]
D56	1 1/2	1 1/2"	20	250	6.1 [155]	3.4 [86]	4.0 [102]	15.0 lbs [6.82 kg]
D67	2	2"	40	250	6.5 [165]	3.8 [97]	4.2 [107]	18.5 lbs [8.41 kg]

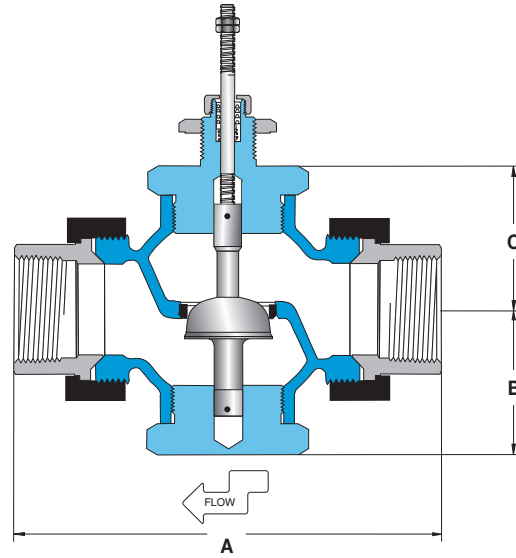
All dimensions are nominal. Dimensions in [ ] are in millimeters.



**Stem In-To-Close  
(fail-open)**



**Stem In-To-Open  
(fail-closed)**



## Specifications

Body Material	Trim Material	Trim Style	Connection Pressure & Temperature Rating	
Bronze	Stainless steel	Equal percentage	Threaded, malleable iron union ends	250 PSI @ 410°F (210°C)

## Valve Body Selection

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	Actuator		A	B	C		
	Connection (NPT)	Nominal Port		910EPA	910EPC					
E14	1/2	1/2"	2.8	x	250	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]	
E19	3/4	3/4"	5.6	x	250	5.6 [142]	2.3 [58]	2.3 [58]	4.9 lbs [2.21 kg]	
E26	1	1"	8.4	x	200	6.0 [152]	2.3 [58]	2.3 [58]	6.0 lbs [2.70 kg]	
E36	1 1/4	1 1/4"	15	x	150	7.2 [183]	2.6 [66]	2.6 [66]	9.7 lbs [4.37 kg]	
E47	1 1/2	1 1/2"	21	x	100	7.7 [196]	2.6 [66]	2.6 [66]	10.8 lbs [4.86 kg]	
E58	2	2"	33	x	50	8.6 [218]	3.1 [79]	3.1 [79]	16.3 lbs [7.34 kg]	

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)			Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	Actuator		A	B	C		
	Connection (NPT)	Nominal Port		910EPA	910EPC					
E15	1/2	1/2"	2.8	250	x	4.8 [122]	1.8 [46]	1.8 [46]	3.0 lbs [1.35 kg]	
E22	3/4	3/4"	5.6	250	x	5.6 [142]	2.3 [58]	2.3 [58]	4.9 lbs [2.21 kg]	
E30	1	1"	8.4	200	x	6.0 [152]	2.3 [58]	2.3 [58]	6.0 lbs [2.70 kg]	
E41	1 1/4	1 1/4"	15	150	x	7.2 [183]	2.6 [66]	2.6 [66]	9.7 lbs [4.37 kg]	
E52	1 1/2	1 1/2"	21	100	x	7.7 [196]	2.6 [66]	2.6 [66]	10.8 lbs [4.86 kg]	
E63	2	2"	33	50	x	8.6 [218]	3.1 [79]	3.1 [79]	16.3 lbs [7.34 kg]	

# 940 Series Heavy Duty Control Valve

CONTROL VALVES

Actuator  
(shown with  
optional  
positioner)



Valve  
Body

- ▶ Diaphragm Actuated
- ▶ 14" & 17" Actuator Sizes
- ▶ Heavy Duty Die Cast Housing and Yoke
- ▶ 1/2" - 8" Valve Sizes

The Trerice **940 Series** Pneumatic Control Valve offers extreme quality and maximum valve performance. The Series 940 is available in a variety of 2-way and 3-way valve styles for industrial, demanding HVAC and commercial process applications. The 940 Actuator can be furnished with a 14" or 17" diaphragm and includes a rugged, die cast aluminum diaphragm chamber.

For optimal performance, the service conditions (medium, flow, temperature, inlet and outlet pressures) of the application must be considered when selecting a valve. Please refer to the Valve Selection Section of this catalog. Consult the Valve Selection tables for the capabilities of a particular valve/actuator assembly. A positioner may be required to maximize the close-off capability of the valve. Improper application may cause failure of the valve, resulting in possible personal injury or property damage.

For replacement or service parts please see Accessories and Replacement Parts in the Regulators and Control Valves section of the list price sheet.

940B shown

## HOW TO ORDER

Sample Order Number: **940B-K84-760P**

Actuator Models	Valve Body Number	Positioner Model
940B 940C	Refer to pages 250-257	760P Pneumatic 760E Electropneumatic Omit if None

1. **Determine** the valve size, style and material required by the application.
2. **Consult** the Valve Selection table to determine the required Valve Model.
3. **Refer** to the maximum close-off pressure columns to determine the Actuator (with or without positioner) needed to provide the close-off pressure required by your application.
4. **Specify** the Actuator Model.
5. **Specify** the Valve Body Number.
6. **Specify** the Positioner Model (if required).

All dimensions are nominal. Dimensions in [ ] are in millimeters.

### Valve & Actuator Specifications

Actuator Models	Diaphragm Size
940B	14"
940C	17"

#### Construction

Aluminum yoke and diaphragm chamber, acrylic enamel finish

#### Pressure Plate

Aluminum

#### Diaphragm Material

Nylon reinforced Buna-N

#### Input Signal

3-15 psi  
9-15: Single Seat - Fail Closed only

#### Air Pressure to Diaphragm

30 psig maximum

#### Air Pressure Connection

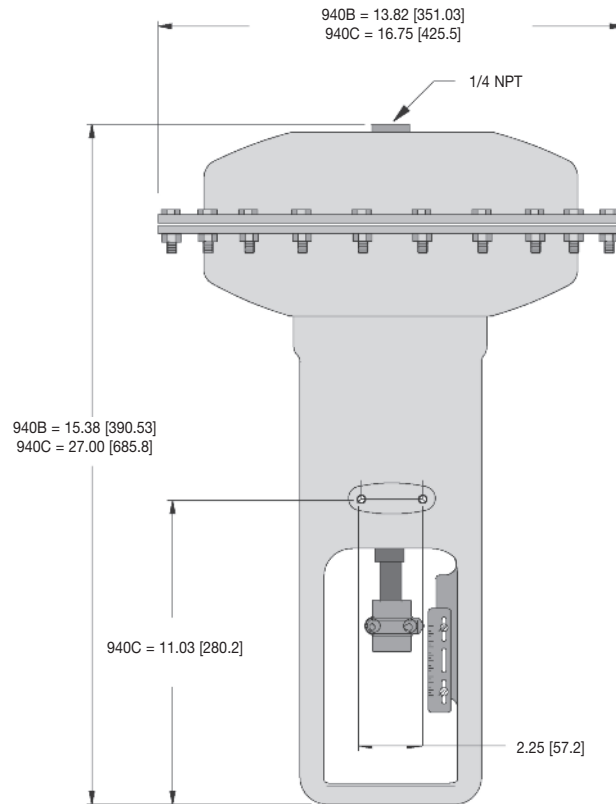
1/4 NPT Female

#### Operating Temperature

Ambient:  
-40°F (-40°C) to 180°F (82°C)  
  
Process Flow:  
-40°F (-40°C) to 410°F (210°C)

#### Approximate Shipping Weight

940B: 45 lbs [20 kg]  
940C: 86 lbs [39 kg]



The Trerice TA987 Air Filter/Regulator is recommended for filtering and regulating the pressure of plant compressed air and delivering clean, dry air at the proper pressure to pneumatic control devices.

### Positioner Specifications\*

Models	Air Requirements	Connections	Ambient Temperature
760P (Pneumatic) 760E (Electropneumatic)	Clean, oil-free, dry air  Maximum Supply Pressure: 30 psig  Air Consumption: 0.28 SCFH (760P), 0.38 SCFH (760E), typical  Flow Rate: 9.0 SCFM	Pneumatic: 1/4 NPT  Gauge: 1/8 NPT  Electrical: 3/4 NPT  Exhaust: 1/4 NPT	-40°F (-40°C) to 185°F (85°C)
<b>Action</b> Direct		<b>Enclosure</b> NEMA 4X, IP65	<b>Weight</b> 10 lbs [4.55 kg]
<b>Input Signal Ranges</b> 760P: 3 to 15 psig 760E: 4 to 20 mA			

Valves with positioners operate on a control signal of 3-15 psig or 4-20mA and utilize an internal 9-15 psig range spring.

# Valve Body Selection

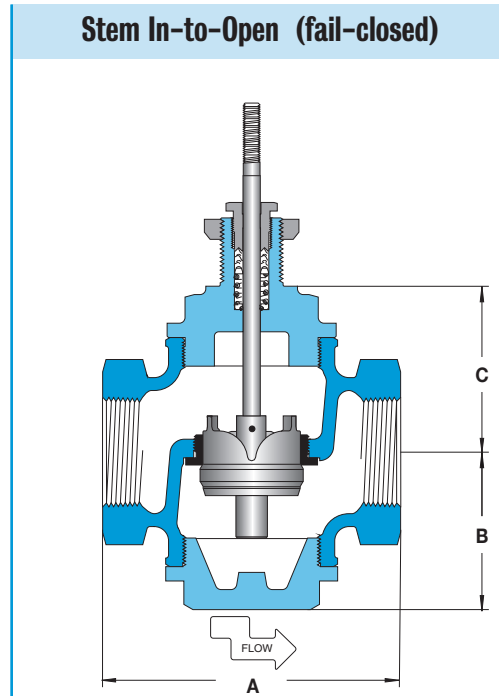
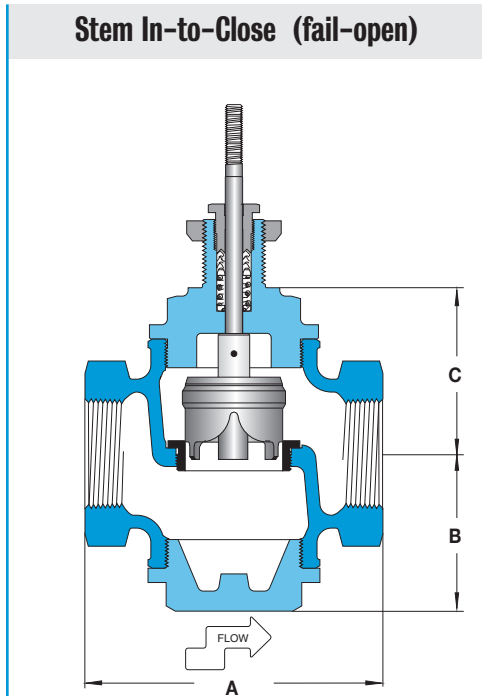
(for 940 Series Heavy Duty Control Valve)

# BRONZE

Single Seat • 1/2" – 2"

All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES



## Specifications

Body Material	Trim Material	Trim Style	Close-off	Connection	Pressure & Temperature Rating
Bronze	Stainless steel	Equal percentage	Class IV	Threaded	335 PSI @ 300°F (149°C)

## Valve Body Selection

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)		Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	Actuator		A	B	C	
	Connection (NPT)	Nominal Port		940B	940B w/Positioner				
J14	1/2	1/2"	4.9	335	335	4.9 [124]	2.6 [66]	2.8 [71]	9 lbs [4.1 kg]
J19	3/4	3/4"	7.2	154	335	4.9 [124]	2.6 [66]	2.8 [71]	9 lbs [4.1 kg]
J26	1	1"	10.0	78	335	4.9 [124]	2.6 [66]	2.8 [71]	9 lbs [4.1 kg]
J36	1 1/4	1 1/4"	22.2	35	335	5.8 [147]	3.1 [79]	3.4 [87]	15 lbs [6.8 kg]
J47	1 1/2	1 1/2"	24	19	335	5.8 [147]	3.1 [79]	3.4 [87]	15 lbs [6.8 kg]
J58	2	2"	40	4	312	6.5 [165]	3.4 [86]	3.8 [97]	19 lbs [8.6 kg]

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)		Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	Actuator		A	B	C	
	Connection (NPT)	Nominal Port		940B*	940B w/Positioner				
J15	1/2	1/2"	4.9	335	335	4.9 [124]	2.6 [66]	2.8 [71]	9 lbs [4.1 kg]
J22	3/4	3/4"	7.2	335	335	4.9 [124]	2.6 [66]	2.8 [71]	9 lbs [4.1 kg]
J30	1	1"	10.0	335	335	4.9 [124]	2.6 [66]	2.8 [71]	9 lbs [4.1 kg]
J41	1 1/4	1 1/4"	22.2	335	335	5.8 [147]	3.1 [79]	3.4 [87]	15 lbs [6.8 kg]
J52	1 1/2	1 1/2"	24	248	286	5.8 [147]	3.1 [79]	3.4 [87]	15 lbs [6.8 kg]
J63	2	2"	40	146	170	6.5 [165]	3.4 [86]	3.8 [97]	19 lbs [8.6 kg]

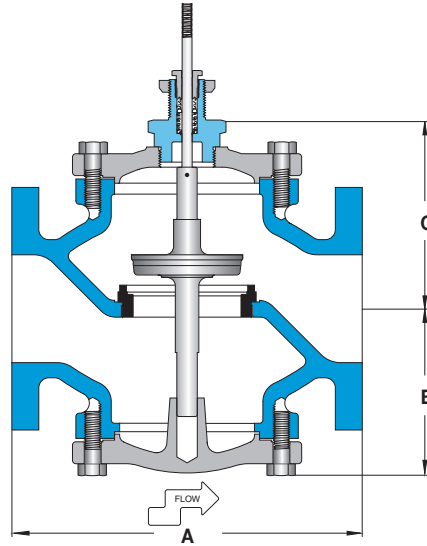
\*Requires a 9-15 psi input signal.



All dimensions are nominal. Dimensions in [ ] are in millimeters.



### Stem In-to-Close (fail-open)



Size	Class 125			Class 250		
	A	B	C	A	B	C
2 1/2"	9.0 [229]	4.6 [117]	5.5 [140]	9.6 [244]	4.6 [117]	5.5 [140]
3"	10.0 [254]	5.3 [135]	6.1 [155]	10.8 [274]	5.3 [135]	6.1 [155]
4"	13.0 [330]	6.2 [157]	7.1 [180]	13.6 [345]	6.2 [157]	7.1 [180]
5"	15.8 [401]	5.6 [142]	7.8 [198]	16.6 [422]	5.6 [142]	7.8 [198]
6"	17.8 [452]	6.4 [163]	8.4 [213]	18.6 [472]	6.4 [163]	8.4 [213]

### Specifications

Body Material	Trim Material	Trim Style	Close-off	Connection	Pressure & Temperature Rating
Cast-iron	Stainless steel	Equal percentage	Class IV	Class 125 flanged Class 250 flanged	140 PSI @ 300°F (149°C) 310 PSI @ 300°F (149°C)

### Valve Body Selection

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)				Approximate Shipping Wt.
Valve Body Number Class 125	Size Connection (Flanged)	Nominal Port	C <sub>v</sub>	Actuator				
				940B	940B w/Positioner	940C	940C w/Positioner	
K71	2 1/2"	2 1/2"	65	x	140	5	140	55 lbs [24.9 kg]
K76	3"	3"	90	x	140	x	140	72 lbs [32.7 kg]
K81	4"	4"	170	x	79	x	113	119 lbs [54.0 kg]
K86	5"	5"	280	x	47	x	71	134 lbs [60.8 kg]
K91	6"	6"	360	x	30	x	46	175 lbs [79.4 kg]

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)				Approximate Shipping Wt.
Valve Body Number Class 250	Size Connection (Flanged)	Nominal Port	C <sub>v</sub>	Actuator				
				940B	940B w/Positioner	940C	940C w/Positioner	
L71	2 1/2"	2 1/2"	65	x	220	5	309	64 lbs [29.0 kg]
L76	3"	3"	90	x	149	x	210	77 lbs [34.9 kg]
L81	4"	4"	170	x	79	x	113	131 lbs [59.4 kg]
L86	5"	5"	280	x	47	x	71	166 lbs [75.3 kg]
L91	6"	6"	360	x	30	x	46	233 lbs [105.7 kg]

# Valve Body Selection

(for 940 Series Heavy Duty Control Valve)

# CAST IRON

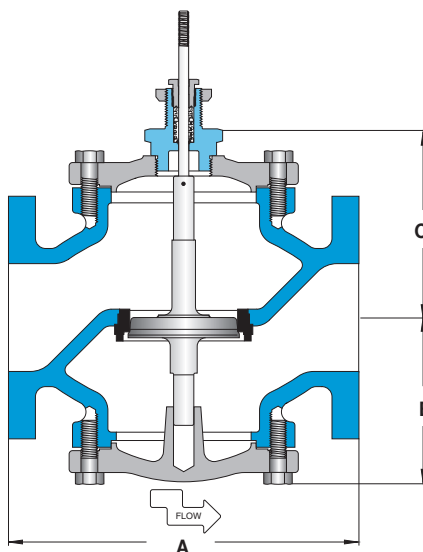
Single Seat • 2 1/2" – 6"

All dimensions are nominal. Dimensions in [ ] are in millimeters.



CONTROL VALVES

### Stem In-to-Open (fail-closed)



Size	Class 125			Class 250		
	A	B	C	A	B	C
2 1/2"	9.0 [229]	4.6 [117]	5.5 [140]	9.6 [244]	4.6 [117]	5.5 [140]
3"	10.0 [254]	5.3 [135]	6.1 [155]	10.8 [274]	5.3 [135]	6.1 [155]
4"	13.0 [330]	6.2 [157]	7.1 [180]	13.6 [345]	6.2 [157]	7.1 [180]
5"	15.8 [401]	7.4 [188]	5.9 [150]	16.6 [422]	7.4 [188]	5.9 [150]
6"	17.8 [452]	8.0 [203]	6.7 [170]	18.6 [472]	8.0 [203]	6.7 [170]

### Specifications

Body Material	Trim Material	Trim Style	Close-off	Connection	Pressure & Temperature Rating
Cast-iron	Stainless steel	Equal percentage	Class IV	Class 125 flanged Class 250 flanged	140 PSI @ 300°F (149°C) 310 PSI @ 300°F (149°C)

### Valve Body Selection

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)				Approximate Shipping Wt.
Valve Body Number Class 125	Size Connection (Flanged)	Nominal Port	C <sub>v</sub>	Actuator				
				940B*	940B w/Positioner	940C*	940 w/Positioner	
K72	2 1/2	2 1/2"	65	101	118	140	140	55 lbs [24.9 kg]
K77	3	3"	90	65	77	96	113	72 lbs [32.7 kg]
K82	4	4"	170	32	39	49	58	119 lbs [54.0 kg]
K87	5	5"	280	17	21	28	34	134 lbs [60.8 kg]
K92	6	6"	360	10	13	17	21	175 lbs [79.4 kg]

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)				Approximate Shipping Wt.
Valve Body Number Class 250	Size Connection (Flanged)	Nominal Port	C <sub>v</sub>	Actuator				
				940B*	940B w/Positioner	940C*	940C w/Positioner	
L72	2 1/2	2 1/2"	65	101	118	145	169	64 lbs [29.0 kg]
L77	3	3"	90	65	77	96	113	77 lbs [34.9 kg]
L82	4	4"	170	32	39	49	58	131 lbs [59.4 kg]
L87	5	5"	280	17	21	28	34	166 lbs [75.3 kg]
L92	6	6"	360	10	13	17	21	233 lbs [105.7kg]

\*Requires a 9-15 psi input signal.

# CAST IRON

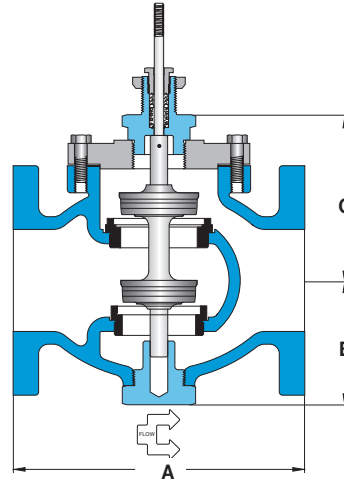
# Valve Body Selection (for 940 Series Heavy Duty Control Valve)

## Double Seat • 1½" – 8"

All dimensions are nominal. Dimensions in [ ] are in millimeters.



### Stem In-to-Close (fail-open)



Note: Drawing depicts flanged connections; 1½" & 2" valves have threaded connections.

CONTROL VALVES

Size	Class 125			Class 250		
	A	B	C	A	B	C
1½"	x	x	x	7.4 [188]	3.8 [97]	4.5 [114]
2"	x	x	x	7.4 [188]	3.8 [97]	4.5 [114]
2½"	7.8 [198]	4.0 [102]	4.9 [124]	8.4 [213]	4.0 [102]	4.9 [124]
3"	9.0 [229]	4.3 [109]	5.3 [135]	9.8 [249]	4.3 [109]	5.3 [135]
4"	11.4 [290]	4.9 [124]	6.6 [168]	12.0 [305]	4.9 [124]	6.6 [168]
5"	12.0 [305]	6.7 [170]	7.6 [193]	12.9 [328]	6.7 [170]	7.6 [193]
6"	14.1 [358]	7.4 [188]	8.5 [216]	14.5 [368]	7.4 [188]	8.5 [216]
8"	16.3 [414]	8.7 [221]	9.6 [244]	16.3 [414]	8.7 [221]	9.6 [244]

### Specifications

Body Material	Trim Material	Trim Style	Close-off	Connection	Pressure & Temperature Rating
Cast-iron	Stainless steel	Equal percentage	Class II	1½"-2": Threaded 2½"-8": Class 125 flanged 1½"-8": Class 250 flanged	280 PSI @ 350°F (177°C) 140 PSI @ 300°F (149°C) 310 PSI @ 300°F (149°C)

### Valve Body Selection

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)		Approximate Shipping Wt.
Valve Body Number Class 125	Size		C <sub>v</sub>	Actuator		
	Connection (Flanged)	Nominal Port		940B	940B w/Positioner	
K73	2½"	2½"	70	140	140	32 lbs [14.5 kg]
K78	3"	3"	100	140	140	42 lbs [19.1 kg]
K83	4"	4"	200	93	140	77 lbs [34.9 kg]
K88	5"	5"	260	49	140	124 lbs [56.2 kg]
K93	6"	6"	350	18	140	169 lbs [76.7 kg]
K98	8"	8"	680	x	140	290 lbs [131.5 kg]

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)		Approximate Shipping Wt.
Valve Body Number Class 250	Size		C <sub>v</sub>	Actuator		
	Connection (Flanged)	Nominal Port		940B	940B w/Positioner	
L50	1½" NPT	1½"	30	280	280	19 lbs [8.6 kg]
L61	2 NPT	2"	42	280	280	19 lbs [8.6 kg]
L73	2½"	2½"	70	250	310	42 lbs [19.1 kg]
L78	3"	3"	100	180	310	54 lbs [24.5 kg]
L83	4"	4"	200	93	310	96 lbs [43.5 kg]
L88	5"	5"	260	49	310	162 lbs [73.5 kg]
L93	6"	6"	350	18	310	220 lbs [99.8 kg]
L98	8"	8"	680	x	310	380 lbs [172.4 kg]

# Valve Body Selection

(for 940 Series Heavy Duty Control Valve)

# CAST IRON

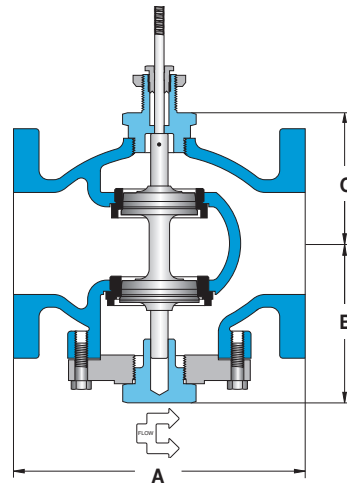
## Double Seat • 1½" – 8"

All dimensions are nominal. Dimensions in [ ] are in millimeters.



CONTROL VALVES

### Stem In-to-Open (fail-closed)



Size	Class 125			Class 250		
	A	B	C	A	B	C
1½"	x	x	x	7.4 [188]	3.8 [97]	3.9 [99]
2"	x	x	x	7.4 [188]	3.8 [97]	3.9 [99]
2½"	7.8 [198]	4.7 [119]	4.1 [104]	8.4 [213]	4.7 [119]	4.1 [104]
3"	9.0 [229]	4.9 [124]	4.4 [112]	9.8 [249]	4.9 [124]	4.4 [112]
4"	11.4 [290]	6.3 [160]	5.2 [132]	12.0 [305]	6.3 [160]	5.2 [132]
5"	12.0 [305]	6.7 [170]	7.6 [193]	12.9 [328]	6.7 [170]	7.6 [193]
6"	14.1 [358]	7.4 [188]	8.5 [216]	14.5 [368]	7.4 [188]	8.5 [216]
8"	16.3 [414]	8.7 [221]	9.6 [244]	16.3 [414]	8.7 [221]	9.6 [244]

Note: Drawing depicts flanged connections; 1½" & 2" valves have threaded connections.

### Specifications

Body Material	Trim Material	Trim Style	Close-Off	Connection	Pressure & Temperature Rating
Cast-iron	Stainless steel	Equal percentage	Class II	1½"-2": Threaded 2½"-8": Class 125 flanged 2½"-8": Class 250 flanged	280 PSI @ 350°F (177°C) 140 PSI @ 300°F (149°C) 310 PSI @ 300°F (149°C)

### Valve Body Selection

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)		Approximate Shipping Wt.
Valve Body Number Class 125	Size		C <sub>v</sub>	Actuator		
	Connection (Flanged)	Nominal Port		940B	940B w/Positioner	
K74	2½"	2½"	70	140	140	32 lbs [14.5 kg]
K79	3"	3"	100	140	140	42 lbs [19.1 kg]
K84	4"	4"	200	93	140	77 lbs [34.9 kg]
K89	5"	5"	260	49	140	124 lbs [56.2 kg]
K94	6"	6"	350	18	140	169 lbs [76.7 kg]
K99	8"	8"	680	x	140	290 lbs [131.5 kg]

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)		Approximate Shipping Wt.
Valve Body Number Class 250	Size		C <sub>v</sub>	Actuator		
	Connection (Flanged)	Nominal Port		940B	940B w/Positioner	
L55	1½" NPT	1½"	30	280	280	19 lbs [8.6 kg]
L66	2 NPT	2"	42	280	280	19 lbs [8.6 kg]
L74	2½"	2½"	70	250	310	42 lbs [19.1 kg]
L79	3"	3"	100	180	310	54 lbs [24.5 kg]
L84	4"	4"	200	93	310	96 lbs [43.5 kg]
L89	5"	5"	260	49	310	162 lbs [73.5 kg]
L94	6"	6"	350	18	310	220 lbs [99.8 kg]
L99	8"	8"	680	x	310	380 lbs [172.4 kg]

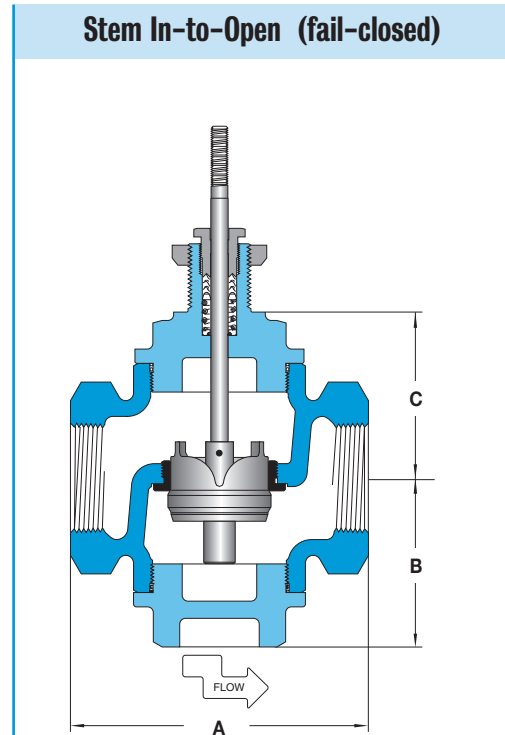
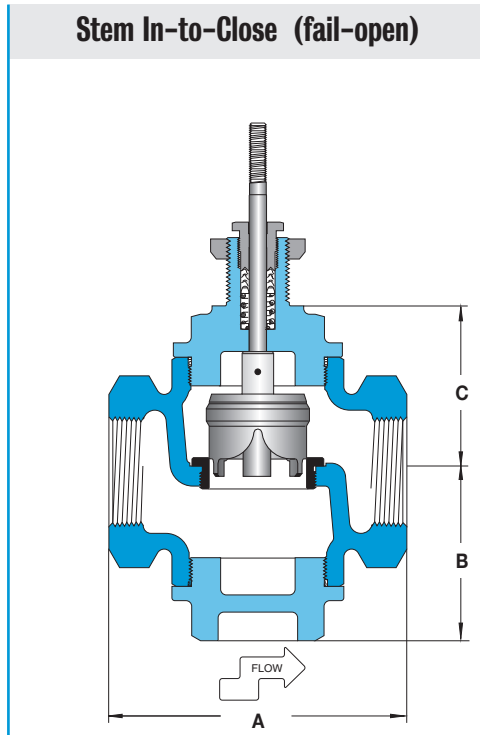
# STAINLESS STEEL

# Valve Body Selection (for 940 Series Heavy Duty Control Valve)

All dimensions are nominal. Dimensions in [ ] are in millimeters.

Single Seat • 1/2" – 2"

CONTROL VALVES



## Specifications

Body Material	Trim Material	Trim Style	Close-off	Connection	Pressure & Temperature Rating
Stainless steel	Stainless steel	Equal percentage	Class IV	Threaded	515 PSI @ 400°F (204°C)

## Valve Body Selection

In-To-Close (fail-open)				Maximum Close-Off Pressure (psid)		Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	Actuator		A	B	C	
	Connection (NPT)	Nominal Port		940B	940B w/Positioner				
M14	1/2	1/2"	4.9	353	515	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M19	3/4	3/4"	7.2	154	515	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M26	1	1"	10.0	78	515	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M47	1 1/2	1 1/2"	24	19	514	6.1 [155]	3.4 [86]	3.5 [89]	16 lbs [7.3 kg]
M58	2	2"	40	4	312	6.5 [165]	3.8 [97]	3.8 [97]	19 lbs [8.6 kg]

In-To-Open (fail-closed)				Maximum Close-Off Pressure (psid)		Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	Actuator		A	B	C	
	Connection (NPT)	Nominal Port		940B*	940B w/Positioner				
M15	1/2	1/2"	4.9	515	515	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M22	3/4	3/4"	7.2	515	515	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M30	1	1"	10	515	515	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M52	1 1/2	1 1/2"	24	248	286	6.1 [155]	3.4 [86]	3.5 [89]	16 lbs [7.3 kg]
M63	2	2"	40	146	170	6.5 [165]	3.8 [97]	3.8 [97]	19 lbs [8.6 kg]

\*Requires a 9-15 psi input signal.

# Valve Body Selection

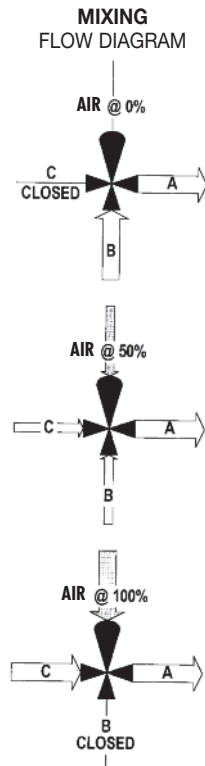
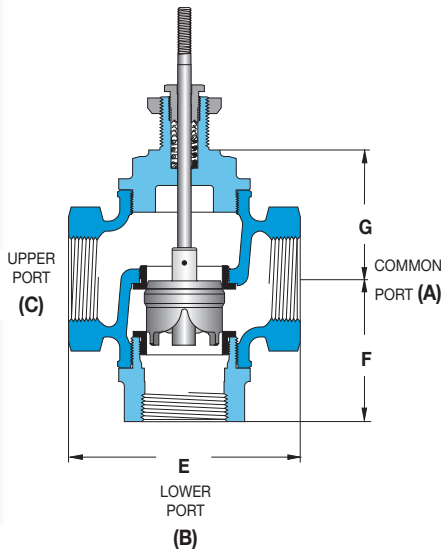
(for 940 Series Heavy Duty Control Valve)

# BRONZE

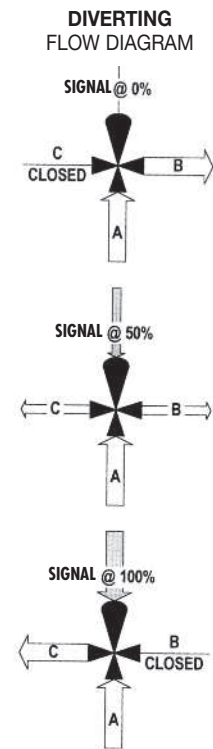
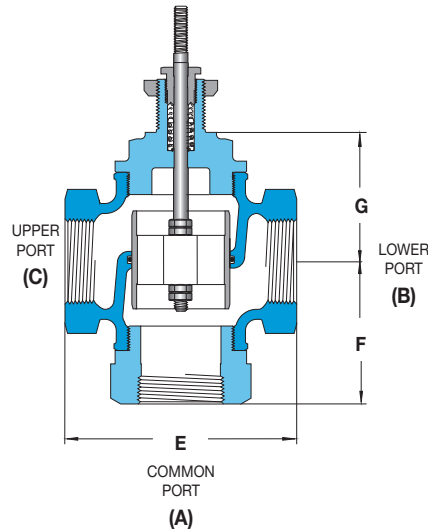
## 3-WAY • 1/2" – 2"

All dimensions are nominal. Dimensions in [ ] are in millimeters.

### Mixing



### Diverting



Trerice 3-Way Valves are not designed for use in steam applications.

To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

### Specifications

Action	Body Material	Trim Material	Trim Style	Close-off	Connection	Pressure & Temperature Rating
Mixing	Bronze	Stainless steel	Linear	Class IV	Threaded	335 PSI @ 300°F (149°C)
Diverting	Bronze	Bronze	Linear	Class II	Threaded	335 PSI @ 300°F (149°C)

### Valve Selection

Mixing				Maximum Close-Off Pressure (psid)		Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	Actuator		E	F	G	
	Connection (NPT)	Nominal Port		940B	940B w/Positioner				
N18	1/2	1/2"	6.3	201	335	4.9 [124]	2.7 [69]	2.8 [71]	9 lbs [4.1 kg]
N25	3/4	3/4"	8.2	81	335	4.9 [124]	2.7 [69]	2.8 [71]	9 lbs [4.1 kg]
N34	1	1"	10	33	335	4.9 [124]	2.7 [69]	2.8 [71]	9 lbs [4.0 kg]
N56	1 1/2	1 1/2"	20	x	286	5.8 [147]	3.8 [97]	3.4 [86]	16 lbs [7.3 kg]
N67	2	2"	40	x	170	6.5 [165]	4.0 [102]	3.8 [97]	20.0 lbs [9.1 kg]

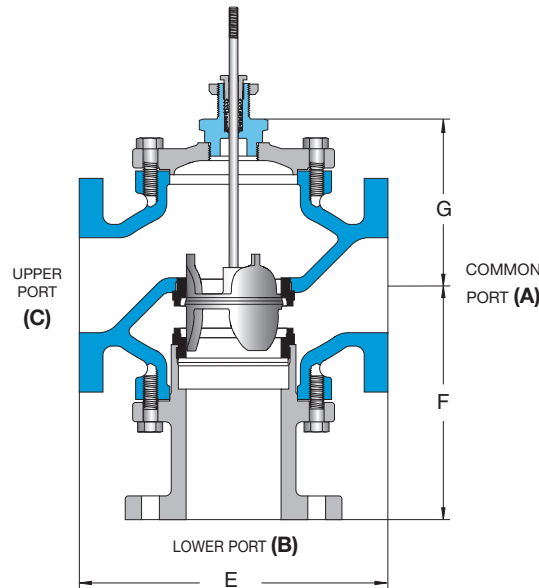
Diverting				Maximum Close-Off Pressure (psid)		Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	Actuator		E	F	G	
	Connection (NPT)	Nominal Port		940B	940B w/Positioner				
J34	1	1"	12	125	118	4.9 [124]	2.7 [69]	2.8 [72]	9 lbs [4.1 kg]
J56	1 1/2	1 1/2"	22	125	115	5.8 [147]	3.8 [97]	3.5 [89]	17 lbs [7.3 kg]
J67	2	2"	40	125	113	6.5 [165]	4.0 [102]	3.8 [97]	21 lbs [9.5 kg]

All dimensions are nominal. Dimensions in [ ] are in millimeters.

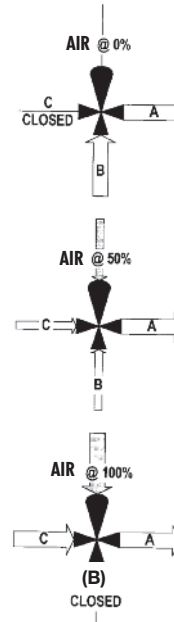


3-WAY • 2 1/2" – 8"

## Mixing



MIXING FLOW DIAGRAM



CONTROL VALVES

Mixing	Class 125			Class 250		
Size	E	F	G	E	F	G
2 1/2"	9.0 [229]	7.1 [180]	5.5 [140]	9.6 [244]	7.4 [188]	5.5 [140]
3"	10.0 [254]	7.9 [201]	6.1 [155]	10.8 [274]	8.3 [211]	6.0 [152]
4"	13.0 [330]	9.9 [251]	7.1 [180]	13.6 [345]	10.2 [259]	7.1 [180]
5"	15.8 [401]	9.3 [236]	6.0 [152]	16.6 [422]	10.4 [264]	6.0 [152]
6"	17.8 [452]	9.9 [251]	6.8 [173]	18.6 [472]	11.0 [279]	6.8 [173]
8"	21.4 [544]	14.5 [368]	8.8 [224]	22.4 [569]	14.5 [368]	8.8 [224]

Trerice 3-Way Valves are not designed for use in steam applications.

To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

## Specifications

Body Material	Trim Material	Trim Style	Close-off	Connection	Pressure & Temperature Rating
Cast-iron	Stainless steel	Linear	Class IV	Class 125 flanged Class 250 flanged	140 PSI @ 300°F (149°C) 310 PSI @ 300°F (149°C)

## Valve Body Selection

Mixing		Size			Maximum Close-Off Pressure (psid)				Approximate Shipping Wt.	
Class 125	Class 250	Connection (Flanged)	Nominal Port	C <sub>v</sub>	Actuator				Class 125	Class 250
					940B	940B w/Positioner	940C	940C w/Positioner		
P75	Q75	2 1/2	2 1/2"	69	x	118	x	169	64 lbs [29.0 kg]	73 lbs [33.1 kg]
P80	Q80	3	3"	86	x	77	x	113	83 lbs [37.6 kg]	94 lbs [42.6 kg]
P85	Q85	4	4"	156	x	39	x	58	139 lbs [63.0 kg]	157 lbs [71.2 kg]
P90	Q90	5	5"	270	x	21	x	34	157 lbs [71.2 kg]	211 lbs [95.7 kg]
P95	Q95	6	6"	347	x	13	x	21	202 lbs [91.6 kg]	283 lbs [128.4 kg]
P100	Q100	8	8"	450	Consult Factory				Consult Factory	

# Valve Body Selection

(for 940 Series Heavy Duty Control Valve)

# CAST IRON

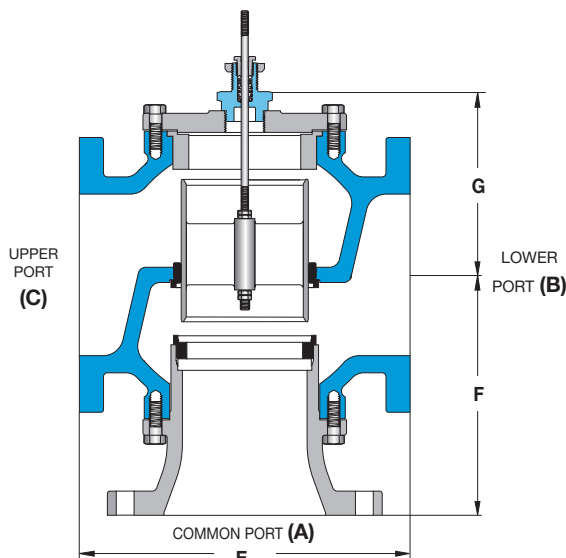
3-WAY • 2 1/2" – 8"



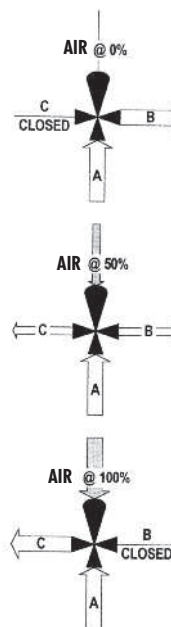
All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES

## Diverting



DIVERTING FLOW DIAGRAM



Diverting Size	Class 125			Class 250		
	E	F	G	E	F	G
2 1/2"	9.0 [229]	7.1 [180]	5.5 [140]	9.6 [244]	7.4 [188]	5.5 [140]
3"	10.0 [254]	8.0 [203]	6.1 [155]	10.8 [274]	8.4 [213]	6.1 [155]
4"	13.0 [330]	9.9 [251]	7.1 [180]	13.6 [345]	10.3 [262]	7.1 [180]
5"	12.0 [305]	10.5 [267]	7.5 [191]	12.9 [328]	11.0 [279]	7.5 [191]
6"	14.1 [358]	11.1 [282]	8.1 [206]	14.5 [368]	11.5 [292]	8.1 [206]
8"	16.3 [414]	11.8 [300]	9.2 [234]	N/A	N/A	N/A

Trerice 3-Way Valves are not designed for use in steam applications.

## Specifications

Body Material	Trim Material	Trim Style	Close-off	Connection	Pressure & Temperature Rating
Cast-iron	Bronze	Linear	Class II	Class 125 flanged Class 250 flanged	140 PSI @ 300°F (149°C) 310 PSI @ 300°F (149°C)

## Valve Body Selection

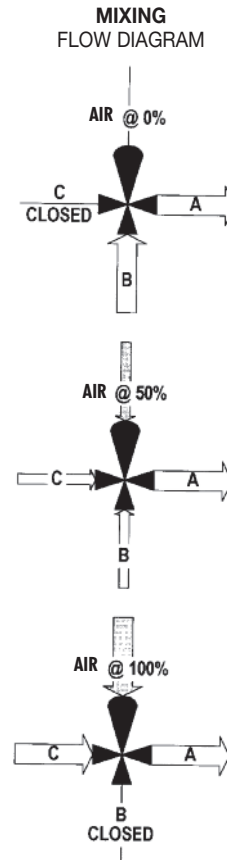
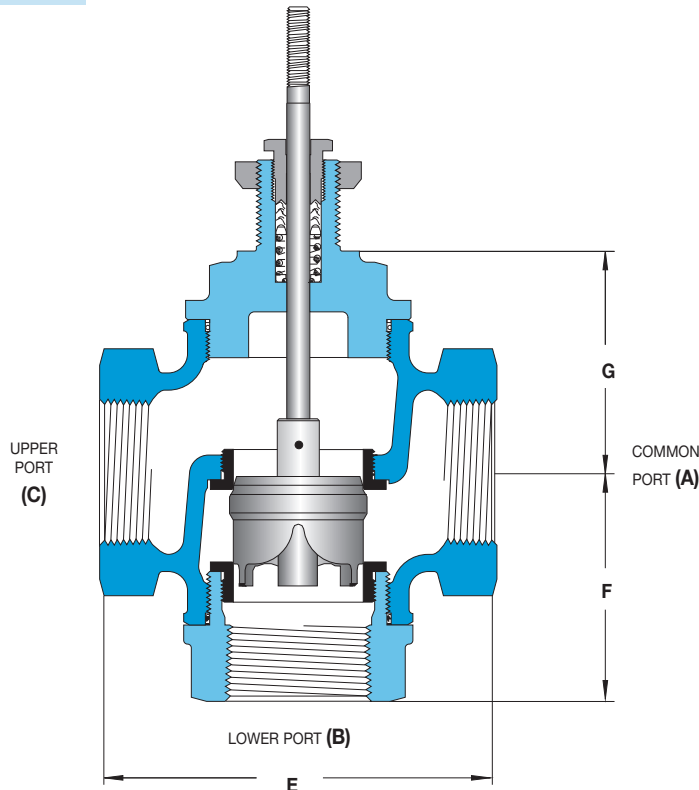
Diverting					Maximum Close-Off Pressure (psid)				Approximate Shipping Wt.	
Class 125	Class 250	Size		C <sub>v</sub>	Actuator				Class 125	Class 250
		Connection (Flanged)	Nominal Port		940B	940B w/Positioner	940C	940C w/Positioner		
K75	L75	2 1/2	2 1/2"	68	x	110	x	x	59 lbs [26.8 kg]	73 lbs [33.1 kg]
K80	L80	3	3"	85	x	108	x	x	78 lbs [35.4 kg]	94 lbs [42.6 kg]
K85	L85	4	4"	160	x	106	x	111	138 lbs [62.6 kg]	164 lbs [74.4 kg]
K90	L90	5	5"	195	x	104	x	108	152 lbs [68.9 kg]	213 lbs [96.6 kg]
K95	L95	6	6"	270	x	102	x	106	203 lbs [92.1 kg]	284 lbs [128.8 kg]
K100	N/A	8	8"	425	x	x	x	104	316 lbs [143.3 kg]	N/A



All dimensions are nominal. Dimensions in [ ] are in millimeters.

3-WAY • 1/2" – 2"

## Mixing



CONTROL VALVES

Trerice 3-Way Valves are not designed for use in steam applications. To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

## Specifications

Body Material	Trim Material	Trim Style	Close-off	Connection	Pressure & Temperature Rating
Stainless steel	Stainless steel	Linear	Class IV	Threaded	515 PSI @ 400°F (204°C)

## Valve Selection

Mixing				Maximum Close-Off Pressure (psid)		Dimensions			Approximate Shipping Wt.
Valve Body Number	Size		C <sub>v</sub>	Actuator		E	F	G	
	Connection (NPT)	Nominal Port		940B	940B w/Positioner				
M18	1/2	1/2"	6.3	210	335	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M25	3/4	3/4"	8.2	81	335	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M34	1	1"	10	33	335	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M56	1 1/2	1 1/2"	20	x	286	6.1 [155]	3.4 [86]	3.5 [89]	15 lbs [6.8 kg]
M67	2	2"	40	x	170	6.5 [165]	3.8 [97]	3.8 [97]	19 lbs [8.6 kg]

# 940E Series Electric Motor Control Valve

CONTROL VALVES



940E-25 shown

- ▶ Fail Open or Closed
- ▶ Cast Aluminum Construction
- ▶ 1/2" – 6" Valve Sizes

The Trerice **940E Series** Control Valve uses a 24 Volt power supply (AC or DC) to proportionally stroke the valve via an electric motor drive actuator. The actuator will drive the valve stem up or down (to open or close the valve) in relation to a factory set 2-10 Vdc input signal (field switchable to 4-20 mA) from a controller. These electric motors can be specified to "fail-open" or "fail-closed" should a loss of control signal or actuator supply power occur. Actuators are available in two sizes: "25" for standard applications and "26" which provides for increased close-off capabilities and is required for use on some larger size valves.

**For optimal performance, the service conditions (medium, flow, temperature, inlet and outlet pressures) of the application must be considered when selecting a valve. Please refer to the Valve Selection Section of this catalog. Consult the Valve Selection tables for the capabilities of a particular valve/actuator assembly. Improper application may cause failure of the valve, resulting in possible personal injury or property damage.**

For replacement or service parts please see Accessories and Replacement Parts in the Regulators and Control Valves section of the list price sheet.

## Specifications

**Model**  
940E

**Actuators**  
25, 26

**Construction**  
Aluminum Die-Cast Yoke,  
Plastic Housing

**Power Supply**  
24 VAC, ±20% 50/60 Hz, 21 VA or  
24 Vdc, ±10%, 21 VA

**Input Signal**  
2-10 Vdc  
(field switchable to 4-20 mA)

**Fail Position**  
Stem-Out (open),  
Stem-In (closed)  
Manual Over-ride Feature included  
with all models

**Stroke Time (no Load)**  
Controlled Stroke: 90 seconds  
Fail-Safe Stroke: 35 seconds

**Protection**  
NEMA 2 (indoor only)

**Maximum Temperature**  
Ambient: +32 to +122°F (0-50°C)  
Process Flow: See specific valve

**Humidity**  
Maximum: 95% RH

**Approximate Shipping Weight**  
**Actuator:**  
25: 4.5 lbs [2 kg]  
26: 8.5 lbs [3.9 kg]

**Valve Body:**  
see Valve Selection tables

## HOW TO ORDER

Sample Order Number: **940E-25-J36-17**

Model	Actuator Size	Valve Body Number	Power Supply	Fail Position
940E	25 26	Refer to pages 260-268	1 24 VAC/Vdc (universal)	6 Stem-Out (open) 7 Stem-In (closed)

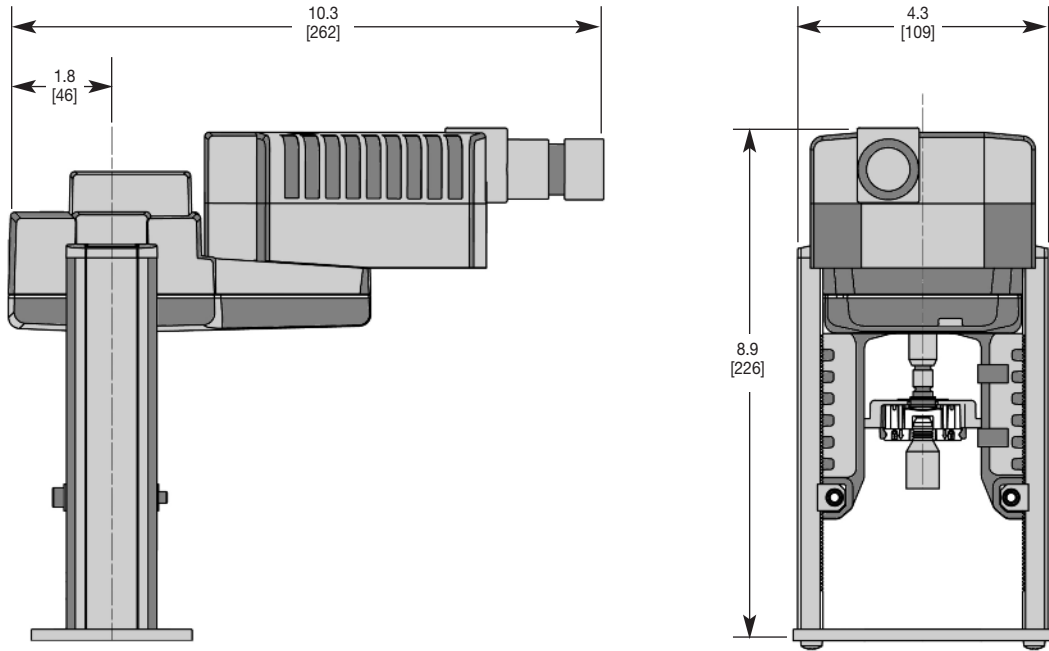
1. **Determine** the valve size, style and material required by the application.
2. **Consult** the Valve Selection table to determine the required Valve Body.
3. **Refer** to the maximum close-off pressure columns to determine the Actuator Size needed to provide the close-off pressure required by your application.
4. **Specify** the Model and Actuator Size.
5. **Specify** the Valve Body Number.
6. **Specify** the Power Supply and Fail Position codes.

# 940E Series Electric Motor Control Valve

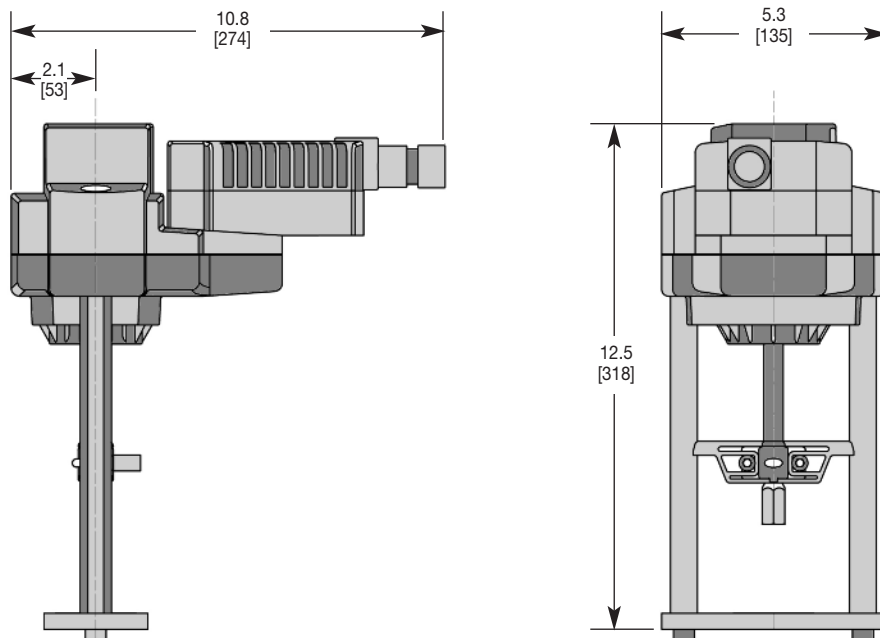
All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES

## Actuator Size 25



## Actuator Size 26



# Valve Body Selection

(for 940E Series Electric Motor Control Valve)

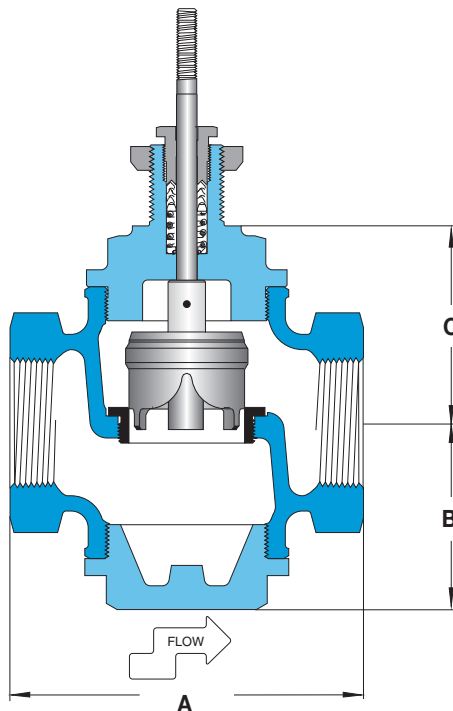
# BRONZE

Single Seat • 1/2" – 2"

All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES

## Stem In-To-Close



## Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Bronze	Stainless steel	Equal percentage	Threaded (NPT)	335 PSI @ 300°F (149°C)

## Valve Body Selection

In-To-Close											
Valve Body Number	Size		C <sub>v</sub>	Maximum Close-Off Pressure (psid)				Dimensions			Approximate Shipping Weight
	Connection (NPT)	Nominal Port		Actuator Size 25		Actuator Size 26		A	B	C	
				Class III	Class IV	Class III	Class IV				
J14	1/2	1/2"	4.9	335	335	x	x	4.9 [124]	2.6 [66]	2.8 [71]	9 lbs [4.1 kg]
J19	3/4	3/4"	7.2	335	335	x	x	4.9 [124]	2.6 [66]	2.8 [71]	9 lbs [4.1 kg]
J26	1	1"	10.0	283	247	335	335	4.9 [124]	2.6 [66]	2.8 [71]	9 lbs [4.1 kg]
J36	1 1/4	1 1/4"	22.2	120	96	171	147	5.8 [147]	3.1 [79]	3.4 [87]	15 lbs [6.8 kg]
J47	1 1/2	1 1/2"	24	120	96	171	147	5.8 [147]	3.1 [79]	3.4 [87]	15 lbs [6.8 kg]
J58	2	2"	40	70	52	102	83	6.5 [165]	3.4 [87]	3.8 [97]	19 lbs [8.6 kg]

# CAST IRON

All dimensions are nominal. Dimensions in [ ] are in millimeters.

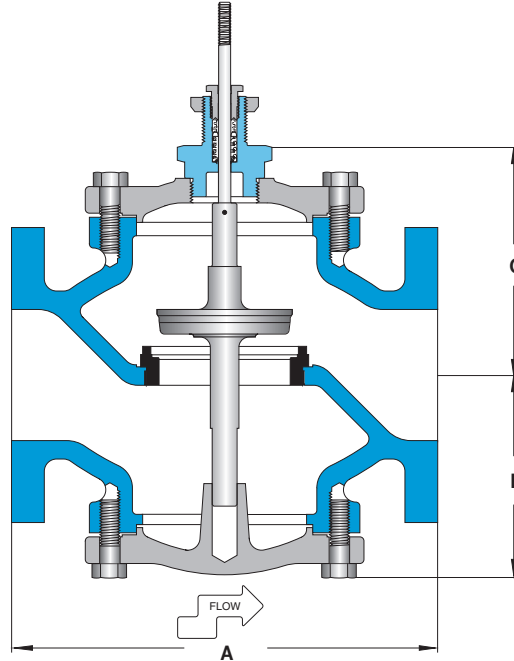


# Valve Body Selection

(for 940E Series Electric Motor Control Valve)

Single Seat • 2 1/2" – 5"

## Stem In-To-Close



CONTROL VALVES

Size	Class 125			Class 250		
	A	B	C	A	B	C
2 1/2"	9.0 [229]	4.6 [117]	5.5 [140]	9.6 [244]	4.6 [117]	5.5 [140]
3"	10.0 [254]	5.3 [135]	6.1 [155]	10.8 [274]	5.3 [135]	6.1 [155]
4"	13.0 [330]	6.2 [157]	7.1 [180]	13.6 [345]	6.2 [157]	7.1 [180]
5"	15.8 [401]	5.6 [142]	7.8 [198]	16.6 [422]	5.6 [142]	7.8 [198]

## Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Cast-iron	Stainless steel	Equal percentage	Class 125 flanged Class 250 flanged	140 PSI @ 300°F (149°C) 310 PSI @ 300°F (149°C)

## Valve Body Selection

In-To-Close					Maximum Close-Off Pressure (psid)		Approximate Shipping Wt.	
Valve Body Number		Connection (Flanged)	Size Nominal Port	C <sub>v</sub>	Actuator Size 26		Class 125	Class 250
Class 125	Class 250				Class III	Class IV		
K71	L71	2 1/2	2 1/2"	65	71	55	55 lbs [24.9 kg]	64 lbs [29.0 kg]
K76	L76	3	3"	90	47	34	72 lbs [32.7 kg]	77 lbs [34.9 kg]
K81	L81	4	4"	170	Consult Factory		119 lbs [54.0 kg]	131 lbs [59.4 kg]
K86	L86	5	5"	280	Consult Factory		134 lbs [60.8 kg]	166 lbs [75.3 kg]

# Valve Body Selection

(for 940E Series Electric Motor Control Valve)

# CAST IRON

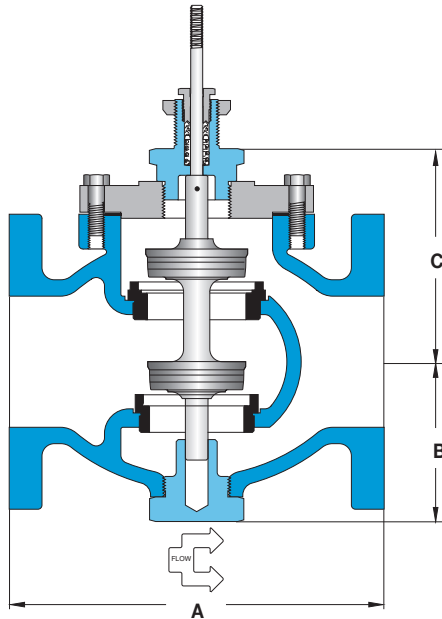
## Double Seat • 1 1/2" – 6"



All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES

### Stem In-To-Close



Note: Drawing depicts flanged connection; 1 1/2" and 2" valves have threaded connection.

Size	Class 125			Class 250		
	A	B	C	A	B	C
1 1/2"	x	x	x	7.4 [188]	3.8 [97]	4.5 [114]
2"	x	x	x	7.4 [188]	3.8 [97]	4.5 [114]
2 1/2"	7.8 [198]	4.0 [102]	4.9 [124]	8.4 [213]	4.0 [102]	4.9 [124]
3"	9.0 [229]	4.3 [109]	5.3 [135]	9.8 [249]	4.3 [109]	5.3 [135]
4"	11.4 [290]	4.9 [124]	6.6 [168]	12.0 [305]	4.9 [124]	6.6 [168]
5"	12.0 [305]	6.7 [170]	7.6 [193]	12.9 [328]	6.7 [170]	7.6 [193]
6"	14.1 [358]	7.4 [188]	8.5 [216]	14.5 [368]	7.4 [188]	8.5 [216]

### Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Cast-iron	Stainless steel	Equal percentage	1 1/2-2: Threaded 2 1/2-6: Class 125 flanged 2 1/2-6: Class 250 flanged	280 PSI @ 350°F (177°C) 140 PSI @ 300°F (149°C) 310 PSI @ 300°F (149°C)

### Valve Body Selection

In-To-Close					Maximum Close-Off Pressure (psid)*				Approximate Shipping Wt.	
Valve Body Number		Size		C <sub>v</sub>	Class 125		Class 250		Class 125	Class 250
Class 125	Class 250	Connection (Flanged)	Nominal Port		Actuator Size 25	Actuator Size 26	Actuator Size 25	Actuator Size 26		
x	L50	1 1/2 NPT	1 1/2"		30	x	x	280	x	x
x	L61	2 NPT	2"	42	x	x	280	x	x	19 lbs [8.6 kg]
K73	L73	2 1/2	2 1/2"	70	140	x	310	x	32 lbs [14.5 kg]	42 lbs [19.1 kg]
K78	L78	3	3"	100	140	x	310	x	42 lbs [19.1 kg]	54 lbs [24.5 kg]
K83	L83	4	4"	200	140	x	223	310	77 lbs [34.9 kg]	96 lbs [43.5 kg]
K88	L88	5	5"	260	x	140	x	287	124 lbs [56.2 kg]	162 lbs [73.5 kg]
K93	L93	6	6"	350	x	140	x	197	169 lbs [76.7 kg]	220 lbs [99.8 kg]

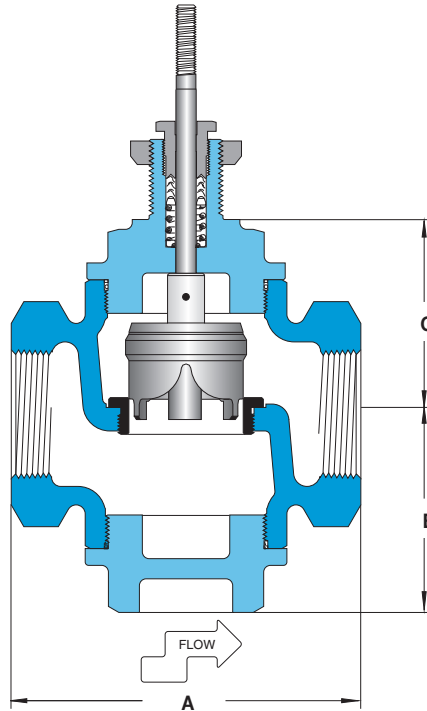
\*Close-Off is Class III

All dimensions are nominal. Dimensions in [ ] are in millimeters.

Single Seat • 1/2" – 2"

CONTROL VALVES

## Stem In-To-Close



## Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Stainless steel	Stainless steel	Equal percentage	Threaded	515 PSI @ 400°F (204°C)

## Valve Body Selection

In-To-Close											
Valve Body Number	Size		C <sub>v</sub>	Maximum Close-Off Pressure (psid)				Dimensions			Approximate Shipping Weight
	Connection (NPT)	Nominal Port		Actuator Size 25		Actuator Size 26		A	B	C	
				Class III	Class IV	Class III	Class IV				
M14	1/2	1/2"	4.9	400	400	x	x	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M19	3/4	3/4"	7.2	400	400	x	x	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M26	1	1"	10.0	283	247	395	360	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M47	1 1/2	1 1/2"	24	120	96	171	147	6.1 [155]	3.4 [86]	3.5 [89]	16 lbs [7.3 kg]
M58	2	2"	40	70	52	102	83	6.5 [165]	3.8 [97]	3.8 [97]	19 lbs [8.6 kg]

# Valve Body Selection

(for 940E Series Electric Motor Control Valve)

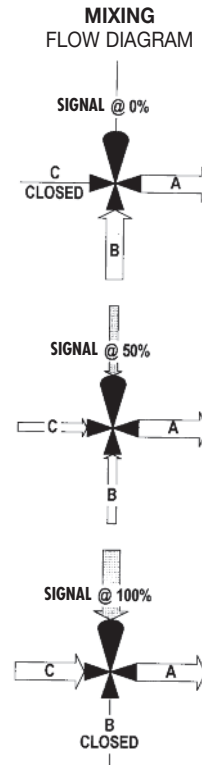
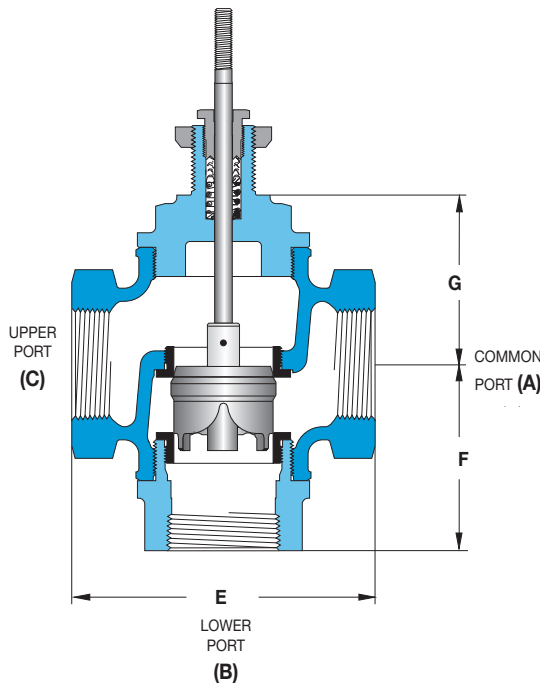
# BRONZE

## 3-WAY • 1/2" – 2"

All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES

### Mixing



Trerice 3-Way Valves are not designed for use in steam applications.

To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

### Specifications

Action	Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Mixing	Bronze	Stainless steel	Linear	Threaded	335 PSI @ 300°F (149°C)

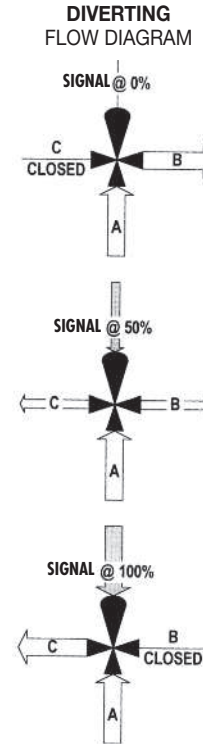
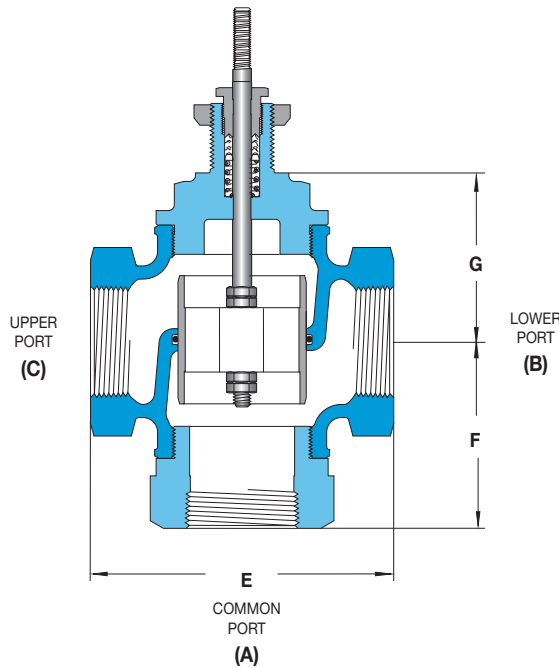
### Valve Body Selection

Valve Body Number	Size		C <sub>v</sub>	Max Close-Off Pressure (psid)				Dimensions			Approximate Shipping Weight
	Connection (NPT)	Nominal Port		Actuator Size 25		Actuator Size 26		E	F	G	
				Class III	Class IV	Class III	Class IV				
N18	1/2	1/2"	6.3	238	203	x	x	4.9 [124]	2.7 [69]	2.7 [69]	9 lbs [4.1 kg]
N25	3/4	3/4"	8.2	238	203	x	x	4.9 [124]	2.7 [69]	2.7 [69]	9 lbs [4.1 kg]
N34	1	1"	10	283	203	351	315	4.9 [124]	2.7 [69]	2.7 [69]	9 lbs [4.1 kg]
N56	1 1/2	1 1/2"	20	100	76	151	127	5.8 [147]	3.8 [97]	3.4 [86]	16 lbs [7.3 kg]
N67	2	2"	40	58	39	90	71	6.5 [165]	4.0 [102]	3.8 [97]	20 lbs [9.1 kg]



All dimensions are nominal. Dimensions in [ ] are in millimeters.

## Diverting



Terice 3-Way Valves are not designed for use in steam applications.

## Specifications

Action	Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Diverting	Bronze	Bronze	Linear	Threaded	335 PSI @ 300°F (149°C)

## Valve Body Selection

Valve Body Number	Size		C <sub>v</sub>	Maximum Close-Off Pressure (psid)*		Dimensions			Approximate Shipping Wt.
	Connection (NPT)	Nominal Port		Actuator Size		E	F	G	
				25	26				
J34	1	1"	12	125	x	4.9 [124]	2.7 [69]	2.8 [72]	9 lbs [4.1 kg]
J56	1½	1½"	22	125	x	5.8 [147]	3.8 [97]	3.5 [89]	17 lbs [7.3 kg]
J67	2	2"	40	125	x	6.5 [165]	4.0 [102]	3.8 [97]	21 lbs [9.5 kg]

\*Close-Off is Class II

# Valve Body Selection

(for 940E Series Electric Motor Control Valve)

# CAST IRON

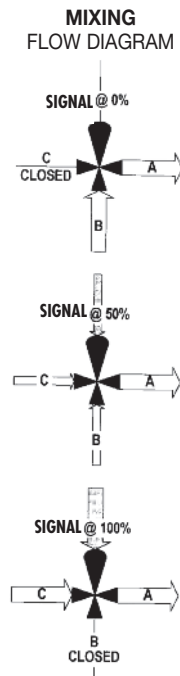
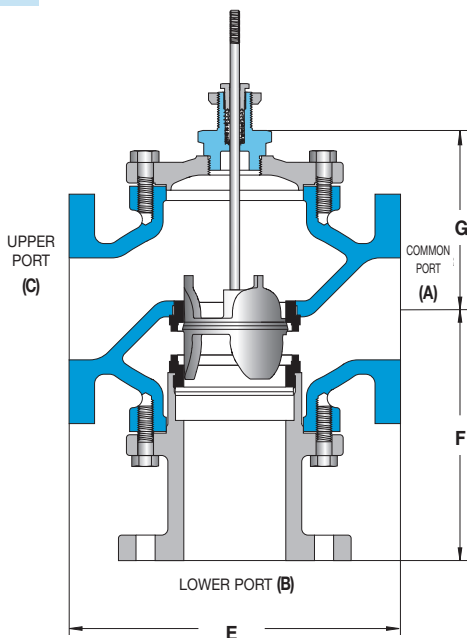
3-WAY • 2 1/2" – 6"



All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES

## Mixing



Size	Class 125			Class 250		
	E	F	G	E	F	G
2 1/2"	9.0 [229]	7.1 [180]	5.5 [140]	9.6 [244]	7.4 [188]	5.5 [140]
3"	10.0 [254]	7.9 [201]	6.1 [155]	10.8 [274]	8.3 [211]	6.0 [152]
4"	13.0 [330]	9.9 [251]	7.1 [180]	13.6 [345]	10.2 [259]	7.1 [180]
5"	15.8 [401]	9.3 [236]	6.0 [152]	16.6 [422]	10.4 [264]	6.0 [152]
6"	17.8 [452]	9.9 [251]	6.8 [173]	18.6 [472]	11.0 [279]	6.8 [173]

Trerice 3-Way Valves are not designed for use in steam applications. To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

### Specifications

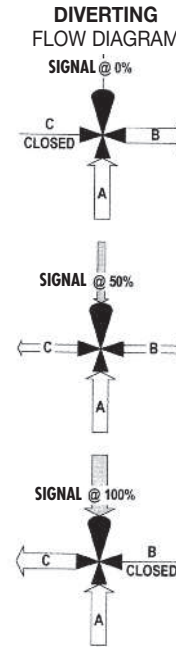
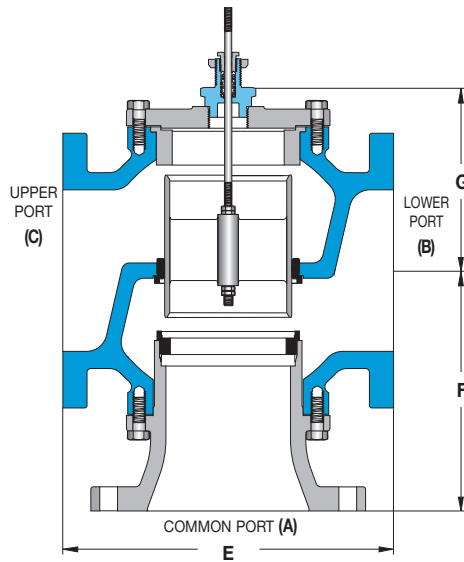
Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Cast-iron	Stainless steel	Linear	Class 125 flanged Class 250 flanged	140 PSI @ 300°F (149°C) 310 PSI @ 300°F (149°C)

### Valve Body Selection

Valve Body Number		Size			Maximum Close-Off Pressure (psid)				Approximate Shipping Wt.	
					Actuator Size 25		Actuator Size 26			
Class 125	Class 250	Connection (Flanged)	Nominal Port	C <sub>v</sub>	Class III	Class IV	Class III	Class IV	Class 125	Class 250
P75	Q75	2 1/2	2 1/2"	69	40	24	62	46	64 lbs [29.0 kg]	73 lbs [33.1 kg]
P80	Q80	3	3"	85	25	12	41	28	83 lbs [37.6 kg]	94 lbs [42.6 kg]
P85	Q85	4	4"	156	Consult Factory				139 lbs [63.0 kg]	157 lbs [71.2 kg]
P90	Q90	5	5"	270	Consult Factory				157 lbs [71.2 kg]	211 lbs [95.7 kg]
P95	Q95	6	6"	347	Consult Factory				202 lbs [91.6 kg]	283 lbs [128.4 kg]



## Diverting



Size	Class 125			Class 250		
	E	F	G	E	F	G
2 1/2"	9.0 [229]	7.1 [180]	5.5 [140]	9.6 [244]	7.4 [188]	5.5 [140]
3"	10.0 [254]	8.0 [203]	6.1 [155]	10.8 [274]	8.4 [213]	6.1 [155]
4"	13.0 [330]	9.9 [251]	7.1 [180]	13.6 [345]	10.3 [262]	7.1 [180]
5"	12.0 [305]	10.5 [267]	7.5 [191]	12.9 [328]	11.0 [279]	7.5 [191]

Trerice 3-Way Valves are not designed for use in steam applications.

## Specifications

Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Cast-iron	Bronze	Linear	Class 125 flanged Class 250 flanged	140 PSI @ 300°F (149°C) 310 PSI @ 300°F (149°C)

## Valve Body Selection

Valve Body Number					Maximum Close-Off Pressure (psid)*		Approximate Shipping Wt.	
Class 125	Class 250	Connection (Flanged)	Size Nominal Port	C <sub>v</sub>	Actuator Size 26		Class 125	Class 250
					Class III	Class IV		
K75	L75	2 1/2	2 1/2"	68	125	x	59 lbs [26.8 kg]	73 lbs [33.1 kg]
K80	L80	3	3"	85	125	x	78 lbs [35.4 kg]	94 lbs [42.6 kg]
K85	L85	4	4"	160	Consult Factory		138 lbs [62.6 kg]	157 lbs [71.2 kg]
K90	L90	5	5"	195	Consult Factory		152 lbs [68.9 kg]	213 lbs [96.6 kg]

\*Close-Off is Class II

# Valve Body Selection

(for 940E Series Electric Motor Control Valve)

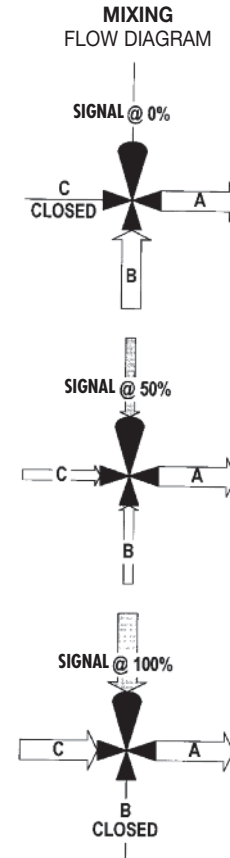
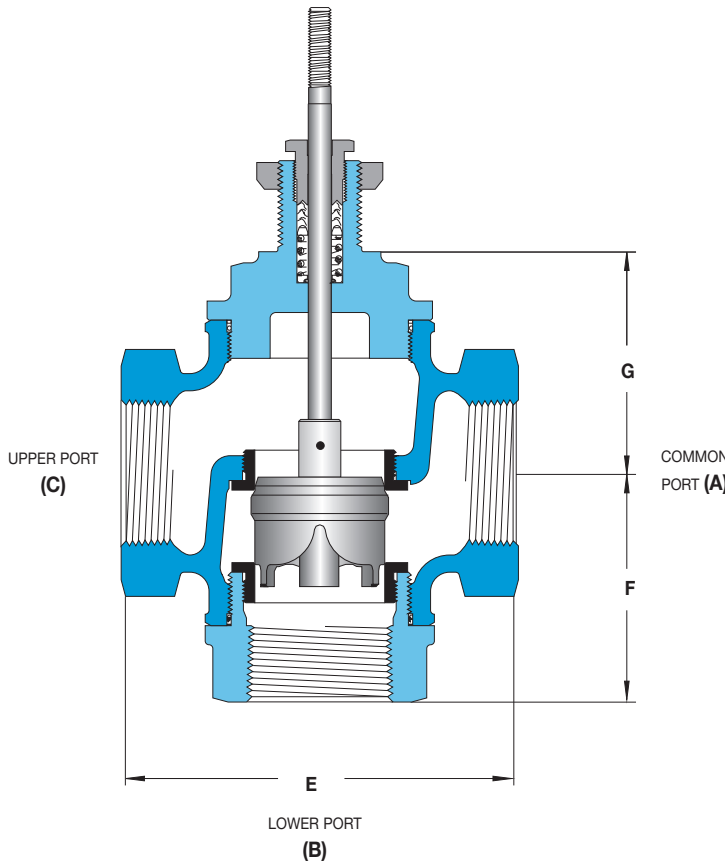
3-WAY • 1/2" - 2"

# STAINLESS STEEL

All dimensions are nominal. Dimensions in [ ] are in millimeters.

CONTROL VALVES

## Mixing



Trerice 3-Way Valves are not designed for use in steam applications.

To properly control the mixing of two flows, inlet pressures at ports B and C should be as equal as possible.

## Specifications

Action	Body Material	Trim Material	Trim Style	Connection	Pressure & Temperature Rating
Mixing	Stainless steel	Stainless steel	Linear	Threaded	515 PSI @ 400°F (204°C)

## Valve Body Selection

Valve Body Number	Size		C <sub>v</sub>	Maximum Close-Off Pressure (psid)				Dimensions			Approximate Shipping Weight
	Connection (NPT)	Nominal Port		Actuator Size 25		Actuator Size 26		E	F	G	
				Class III	Class IV	Class III	Class IV				
M18	1/2	1/2"	6.3	238	203	x	x	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M25	3/4	3/4"	8.2	238	203	x	x	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M34	1	1"	10	238	203	351	315	5.0 [127]	2.8 [71]	2.8 [71]	8 lbs [3.6 kg]
M56	1 1/2	1 1/2"	20	100	76	151	127	6.1 [155]	3.4 [86]	3.5 [89]	15 lbs [6.8 kg]
M67	2	2"	40	58	39	90	71	6.5 [165]	3.8 [97]	3.8 [97]	19 lbs [8.6 kg]

# Application Worksheet

All dimensions are nominal. Dimensions in [ ] are in millimeters.

## Service Conditions

Medium Through Valve: \_\_\_\_\_ Required Cv: \_\_\_\_\_

<b>Temperature</b>	Maximum: _____	Minimum: _____	Normal: _____
<b>Flow</b>	Maximum: _____	Minimum: _____	Normal: _____
<b>Inlet Pressure</b>	Maximum: _____	Minimum: _____	Normal: _____
<b>Outlet Pressure</b>	Maximum: _____	Minimum: _____	Normal: _____
<b>Differential Pressure</b>	Service: _____	Close-off: _____	

## Pipeline

<b>Upstream</b>	Material: _____	Size: _____	Schedule: _____
<b>Downstream</b>	Material: _____	Size: _____	Schedule: _____

## Valve Requirements

Required Fail Position: \_\_\_\_\_

**Body** Material: \_\_\_\_\_ Size: \_\_\_\_\_ End Connections: \_\_\_\_\_

**Trim** **Check one**  Modified Linear  Equal Percentage

Material: \_\_\_\_\_ Close-off Class: \_\_\_\_\_

Additional Requirements: \_\_\_\_\_

## Actuator Requirements

**Check one**  Pneumatic On/Off  Pneumatic Throttling  Electric

Power Supply: \_\_\_\_\_ Input Signal: \_\_\_\_\_

Additional Requirements: \_\_\_\_\_

## Positioner Requirements

**Check one**  Pneumatic  Electropneumatic

Input: \_\_\_\_\_ Output: \_\_\_\_\_

Additional Requirements: \_\_\_\_\_

Name: \_\_\_\_\_ Company: \_\_\_\_\_

Date: \_\_\_\_\_ P.O. Number: \_\_\_\_\_

Project Name: \_\_\_\_\_ Tag Number: \_\_\_\_\_

# Technical Information

## VALVE SELECTION

The proper sizing of a valve is one of the most important factors in the ability of a loop to maintain control. A valve that is too small is not able to provide the desired capacity during peak load conditions, while a valve that is too large will tend to overshoot the control point and operate with the valve plug too close to the seat, resulting in undue wear of the plug and seat.

### Valve Coefficient ( $C_V$ )

The valve coefficient ( $C_V$ ) is mathematically determined through an evaluation of the system service conditions. This factor can be used to select a valve body of the appropriate port size. In almost all cases, the valve should be of a smaller size than the pipeline into which it will be installed. To avoid undue wear, a valve body of the smallest possible port size should be selected; however, the valve should never be less than half the pipeline size, as this will cause extreme mechanical stress to the pipeline.

### Service Conditions

The specifier should be knowledgeable of the service conditions of the application in order to properly determine the actuator and valve requirements.

#### Medium

The composition of the fluid passing through the valve.

#### Temperature (T)

The temperature of the medium passing through the valve. This measurement is required to properly specify the materials used to manufacture the valve.

#### Flow (q or W)

The volume of fluid passed through the valve as required by the particular application. Flow is usually expressed as either gallons per minute (q), or pounds per hour (W). Water and other liquids are usually measured in gallons per minute, while steam and other gases are usually measured in pounds per hour. This measurement is required to correctly determine the valve coefficient ( $C_V$ ).

#### Inlet Pressure (Upstream Pressure or $P_1$ )

The pressure (psia) of the medium flowing into the valve body. This measurement is required to correctly determine the valve coefficient ( $C_V$ ) and valve close-off capability.

#### Outlet Pressure (Downstream Pressure or $P_2$ )

The pressure (psia) of the medium flowing through a fully opened valve to the process. The outlet pressure from the valve is determined by the process or equipment that is being fed by the valve, and is not caused by the valve itself. This measurement is required to correctly determine the valve coefficient ( $C_V$ ) and valve close-off capability.

#### Differential Pressure (Pressure Drop or $\Delta P$ )

The difference between the inlet and outlet pressures ( $P_1 - P_2$ ). This measurement is required to correctly determine the valve coefficient ( $C_V$ ) and valve close-off capability.

#### Valve Sizing Differential Pressure:

The differential pressure (psid) for **valve sizing** is determined with the valve **full open**. This pressure drop, along with the required flow rate, is used to determine the required  $C_V$  to aid in the selection of the proper control valve.

#### Close-Off Differential Pressure:

The differential pressure (psid) for **valve "close-off"** is determined with the valve **fully closed**. Usually, in most common applications, with the valve closed the outlet pressure will be zero (0) psig and as such the pressure drop will be equal to the Inlet Pressure. In some applications there may be residual back pressure in the downstream system (such as filling a pressurized tank) that will cause the Outlet Pressure to be a value greater than zero, which in turn reduces the value of the expected differential pressure.

#### Example:

Valve B73 (on page 190) has a maximum "Close-Off Pressure" allowance of 65 psid. If this valve is used to control the flow into an open tank, the closed valve outlet pressure will be zero. As such the maximum inlet pressure that the actuator can close this valve against is 65 psig. (65 psid rating + zero outlet pressure = 65 psig inlet pressure).

If however this same valve B73 is used to control the flow into a closed pressurized tank (pressurized to 25 psig) then the maximum inlet pressure that the actuator can close this valve against is 90 psig. (65 psid rating + 25 psig back pressure = 90 psig inlet pressure).

Since this 90 psig is less than the body rating of 125 psig this valve would be acceptable for this service.

### Other Considerations

- **Specific Gravity** — The ratio between the weight of the flow medium at the flow temperature and that of a defined standard substance (water or air). The specific gravity may be required to correctly determine the valve coefficient ( $C_v$ ).  
 Liquids ( $G_f$ ) water = 1.0 @ 39°F (4°C)  
 Gases ( $G_g$ ) air = 1.0 @ 60°F (18°C) and 14.7 psia
- **Viscosity** — The degree of thickness of a liquid. Extremely thick process media can create high friction as it passes through the valve. In most instances a sizing correction factor is not required. Please consult the factory when the flow medium is of a viscosity of 40 centistokes or greater.
- **Steam Superheat** — The number of degrees Fahrenheit ( $T_{sh}$ ) above the saturation temperature of steam at a given pressure. Superheated steam is created when saturated steam is further heated from another source after leaving the water from which it is formed. This measurement is required to correctly determine the valve coefficient ( $C_v$ ).

### Valve Sizing Equations

The following formulas can be used to determine the  $C_v$  requirement for a specific set of service conditions,

where:

- $C_v$  = valve coefficient
- $G_f$  = liquid specific gravity at flow temperature (water = 1.0)
- $G_g$  = gas specific gravity (air = 1.0)
- $P_1$  = inlet pressure (psia)
- $P_2$  = outlet pressure (psia)
- $\Delta P$  = inlet pressure minus outlet pressure (psi)
- $q$  = liquid flow in gallons per minute (gpm)
- $T_{sh}$  = steam superheat (°F)
- $W$  = gas flow in pounds per hour (pph)

#### Cavitation

##### Water and Other Liquids

Cavitation takes place when the pressure through a valve drops to or below the vapor pressure of a liquid, causing it to vaporize and rapidly expand in gas form. Vapor bubbles flow downstream where the fluid velocity decreases and the surrounding pressure increases. The vapor bubbles then collapse or implode, causing sudden condensation and producing shock waves that may result in excessive noise, vibration, erosion or mechanical damage to valve and/or piping. In most liquid applications, the outlet pressure (psia) should be no less than one-third the inlet pressure (psia). Where extremely large differential pressures are required, the use of multiple valves in series will reduce the possibility of cavitation.

### Water

where:

- $q$  = liquid flow in gallons per minute (gpm)
- $\Delta P$  = inlet pressure minus outlet pressure (psi)

$$C_v = \frac{q}{\sqrt{\Delta P}}$$

example:

medium = water

$q$  = 160 U.S. gallons per minute

$\Delta P$  = 25 [100 psia inlet – 75 psia outlet]

$$C_v = \frac{160}{\sqrt{25}} \quad \text{or} \quad C_v = \frac{160}{5} \quad \text{or} \quad C_v = 32$$

# Technical Information

## VALVE SELECTION

### Saturated Steam

where:

- W** = gas flow in pounds per hour (pph)
- P<sub>1</sub>** = inlet pressure (psia)
- P<sub>2</sub>** = outlet pressure (psia)
- ΔP** = inlet pressure minus outlet pressure (psi)

$$C_v = \frac{W}{2.1 \sqrt{\Delta P(P_1 + P_2)}}$$

example:

- medium = saturated steam
- W** = 4000 pph
- P<sub>1</sub>** = 100 psia
- P<sub>2</sub>** = 75 psia
- ΔP** = 25 [100 psia inlet – 75 psia outlet]

$$C_v = \frac{4000}{2.1 \sqrt{25(100 + 75)}}$$

$$C_v = \frac{4000}{138.9}$$

$$C_v = 28.8$$

### Choked Flow (Critical Drop)

#### Steam and Other Gases

When **P<sub>2</sub>** is less than 1/2 **P<sub>1</sub>**, set **P<sub>2</sub>** equal to 1/2 **P<sub>1</sub>** in the appropriate sizing equation for steam or gases.

Steam, as are all gases, is a compressible fluid. The maximum velocity of the steam or gas through the valve is limited to the speed of sound. When the outlet pressure (psia) is equal to one-half (or less) of the inlet pressure (psia), the fluid velocity through the valve reaches the speed of sound, and flow cannot be further increased by a reduced outlet pressure. This is known as a choked flow condition. The pressure drop under these conditions is known as critical drop.

example:

- medium = saturated steam
- W** = 4000 pph
- P<sub>1</sub>** = 100 psia
- P<sub>2</sub>** = 35 psia (actual)
- ΔP** = 65 psia

Since the outlet pressure is less than 1/2 of the inlet pressure, choked flow will occur. Set **P<sub>2</sub>** to equal 1/2 of **P<sub>1</sub>**. Use this revised **P<sub>2</sub>** in the normal sizing formulae.

$$P_2 = P_1 / 2 \qquad P_2 = 100 / 2 \qquad P_2 = 50$$
$$\Delta P = P_1 - P_2 \qquad \Delta P = P_1 - P_1/2 \qquad \Delta P = 100 - 50 \qquad \Delta P = 50$$

$$C_v = \frac{W}{2.1 \sqrt{\Delta P(P_1 + P_2)}}$$

$$C_v = \frac{4000}{2.1 \sqrt{50(100 + 50)}}$$

$$C_v = \frac{4000}{181.9}$$

$$C_v = 22$$



# Technical Information

## STEAM PROPERTIES

Steam is perfectly transparent, colorless, dry and invisible. When it comes in contact with air, it partially condenses and forms a visible mist, or wet steam. Wet steam has the same temperature as dry steam contained under the same pressure.

Steam in its most common state is known as saturated steam. Its temperature is the same as that of the water from which it is formed and is dependent on the pressure under which it is contained. Superheated steam is created when saturated steam is further heated from another source after leaving the water from which it is formed.

### Saturated Steam Pressure and Temperature

Vacuum in Hg	Temperature °F	Vacuum kPag	Temperature °C	Latent Heat BTU/lb
9.74	32	-100.7	0	1075.5
25	133	-85	56	1018
20	161	-68	72	1002
15	179	-51	82	991
10	192	-34	89	983
5	203	-17	95	976

Pressure psig	Temperature °F	Pressure kPag	Temperature °C	Latent Heat BTU/lb
0	212	0	100	970
5	227	34	108	961
10	239	69	115	953
15	250	103	121	946
20	259	138	126	939
25	267	172	130	934
30	274	207	134	929
35	281	241	138	924
40	287	276	142	920
45	292	310	145	916
50	298	345	148	912
60	307	414	153	905
70	316	483	158	898
80	324	552	162	892
90	331	621	166	886
100	338	689	170	881
110	344	758	173	875
120	350	827	177	871
130	356	896	180	866
140	361	965	183	861
150	366	1034	185	857
175	377	1207	192	847
200	388	1379	198	837
225	397	1551	203	828
250	406	1724	208	820

Adjusted to Sea Level – 14.696 psia (760 mm Hg)

# Technical Information

## STEAM PROPERTIES

TECHNICAL INFORMATION

- One cubic foot of water will become 1646 cubic feet of steam when evaporated at zero psi gauge pressure and a temperature of 212°F.
- One cubic foot of steam weighs 0.03732 pounds, and one pound of steam occupies 26.796 cubic feet at zero psi gauge pressure and a temperature of 212°F.
- One cubic foot of dry air weighs 0.08073 pounds, and one pound of dry air occupies 12.387 cubic feet at zero psi gauge pressure and a temperature of 0°F.
- The latent heat created from the vaporization of water to steam is:  
 970 BTU per pound @ 14.7 psia  
 889 BTU per pound @ 100 psia
- One British Thermal Unit (BTU) is the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit, usually from 39.2°F to 40.2°F.

1 Gal. (U.S.) = 0.1337 ft<sup>3</sup>  
 1 Gal. (U.S.) water = 8.337 lbs  
 1 ft<sup>3</sup> water = 62.364 lbs

### Steam Required to Heat Water According to Temperature Rise and Gallons per Hour

Temperature Rise (°F)	U.S. Gallons of Water Heated per Hour (for fuel oil — multiply pounds per hour listed by 0.5)																	
	25	50	75	100	150	200	300	400	500	750	1000	1500	2000	3000	4000	5000	7500	10000
10	—	—	—	—	—	17	25	33	42	63	83	120	167	250	330	420	620	830
20	—	—	—	—	25	33	50	67	83	125	167	250	330	500	670	830	1250	1670
30	—	—	—	25	37	50	75	100	125	190	250	370	500	750	1000	1250	1900	2500
40	—	—	25	33	50	66	100	130	170	250	330	500	660	1000	1330	1700	2500	3300
50	—	21	31	42	63	84	125	170	210	310	420	630	840	1250	1680	2100	3100	4200
60	12	25	37	50	75	100	150	200	250	370	500	750	1000	1500	2000	2500	3700	5000
80	16	33	50	67	100	130	200	270	330	500	670	1000	1340	2000	2700	3300	5000	6700
100	21	42	63	83	120	170	250	330	420	630	830	1250	1700	2500	3300	4200	6300	8300
120	25	50	75	100	150	200	300	400	500	750	1000	1500	2000	3000	4000	5000	7500	10000
140	29	58	88	117	175	230	350	470	580	880	1170	1750	2340	3500	4700	5800	8800	11700
160	33	66	100	133	200	270	400	530	660	1000	1330	2000	2700	4000	5300	6600	10000	13300
180	37	75	113	150	225	300	450	600	750	1125	1500	2200	3050	4500	5950	7500	11300	14950
200	42	84	126	165	250	330	500	660	840	1260	1660	2500	3400	5000	6600	8300	12600	16600

## Using the Table

1. Find the units you wish to convert FROM in the left hand column.
2. Find the units you wish to convert TO in the top row.
3. Insert the multiplier shown at the intersection into the following formula: FROM units x MULTIPLIER = TO units

*Example: 100 psi x 6.894757 = 689.475 kPa*

TO FROM	PSI	in H <sub>2</sub> O	mm H <sub>2</sub> O	cm H <sub>2</sub> O	oz/in <sup>2</sup>	mbar	bar	mm Hg	cm Hg	in Hg	kg/cm <sup>2</sup>	kPa	MPa	ft H <sub>2</sub> O	m H <sub>2</sub> O	atm
psi	1	27.68068	703.1	70.308927	16	68.95	0.06894757	51.71486	5.171486	2.03602	0.070306958	6.894757	0.0069	2.306723	0.70308927	0.0680460
in H <sub>2</sub> O	0.03612628	1	25.4	2.54	0.578020	2.488	0.00249	0.0735539	0.187	0.0735539	0.00254219	0.2490819	0.00025	0.08333	0.0254	0.00245825
mm H <sub>2</sub> O	0.001422	0.0394	1	0.1	0.0227	0.098	0.000098	0.0735	0.00735	0.00289	0.0001	0.0098	0.00001	0.00328084	0.001	0.000097
cm H <sub>2</sub> O	0.0142229	0.3937	10	1	0.227566	0.98	0.000980634	0.7355372	0.0735	0.0289581	0.00099997	0.980634	0.0001	0.032808	0.01	0.000967814
oz/in <sup>2</sup>	0.0625	1.73004	43.943	4.394308	1	4.31	0.004309223	3.23218	0.323	0.12725125	0.04394308	0.4309223	0.00043	0.14417	0.04394308	0.004252875
mbar	0.0145	0.4012	10.20	1.020	0.2321	1	0.001	0.75	0.075	0.0295	0.00102	0.1	0.0001	0.03345622	0.00101975	0.000987
bar	14.5038	401.8596	10,197	1019.7466	232.0608	1000	1	750.0626	75	29.53	1.019716	100	0.1	33.4833	10.197466	0.986923
mm Hg	0.0193368	0.535255	13.60	1.359554	0.3093888	1.333	0.001333225	1	0.1	0.039370079	0.00135951	0.1333225	0.000133	0.0446046	0.01359554	0.0013157895
cm Hg	0.1934	5.358	136.0	13.60	3.10	13.33	0.01333	10	1	0.394	0.0136	1.333	0.00133	0.44604625	0.13595509	0.01316
in Hg	0.4911542	13.595484	345.3	34.53253	7.85847	33.86	0.03386389	25.4	2.54	1	0.0345316	3.386389	0.00339	1.132957	0.3453253	0.0334211
kg/cm <sup>2</sup>	14.223343	393.711806	10,000.3	1000.028	227.57349	980.7	0.98066494	735.5588	73.56	28.95901	1	98.066494	0.0981	32.809312	10.00028	0.967841598
kPa	0.1450377	4.014742	101.97	10.19745	2.320603	10	0.01	7.500610	0.75	0.2952997	0.01019716	1	0.001	0.3345618	0.1019745	0.009869235
MPa	145.04	4019	101,975	10,197	2321	10,000	10	7500	750	295.3	10.2	1000	1	334.56218	101.9748043	9.869
ft H <sub>2</sub> O	0.433515	12	304.80	30.48	6.93624	29.88981	0.02988981	22.4192	2.24192	0.882646	0.03047912	2.988981	0.002988981	1	0.3048	0.02949896
m H <sub>2</sub> O	1.42229	39.370079	1000	100	22.7566	980.66494	0.98066494	73.55372	7.35537	2.89581	0.099997	9.8063439	0.0098063439	3.2808399	1	0.0967814
atm	14.696	406.794	10,333	1033.2633	235.136	1013	1.0132535	760	76	29.9213	1.033231	101.32535	0.1013	33.8995	10.332633	1

*All units of H<sub>2</sub>O at 39.2°F(4°C), all units of Hg at 32°F(0°C)*

### Hydraulic Ram Conversion

Use the formulas below to convert tons on a given diameter ram to PSI.

$$(\text{Tons on ram} \times 2000) / (0.7854 \times \text{dia.}^2) = \text{PSI}$$

$$(\text{Dia.}^2 \times 0.7854 \times \text{PSI}) / 2000 = \text{Tons on ram}$$

### Temperature Conversion

°F = Degrees Fahrenheit

°C = Degrees Celsius

°R = Degrees Reaumur

$$°F = (°C \times 1.8) + 32$$

$$°C = (°F - 32) \times 0.5555$$

$$°R = (°F - 32) \times 0.4444$$

$$°F = (°R \times 2.25) + 32$$

$$°C = (°R \times 1.25)$$

$$°R = (°C \times 0.80)$$

*At sea level:*

*Water boils at 212°F, 100°C and 80°R*

*Water freezes at 32°F, 0°C and 0°R*

# Miscellaneous Information

## Warranty

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The H.O. Trerice Co. warrants products of its manufacture to be free from defects in workmanship and material for a period of one year from the date of shipment to the original purchaser. Trerice will repair or replace such product (F.O.B. Factory) should our internal examination reveal it to be defective. Product used in conjunction with non-Trerice product, or in any way modified or altered, may not be covered under the terms of this warranty. Trerice assumes no other responsibility or liability.

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Tri-Clamp®  
Teflon®  
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## Organizations

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The H.O. Trerice Co. recognizes the following organizations: Fluid Controls Institute (FCI), Valve Manufacturers Association of America (VMA) and the International Society of Automation (ISA). These nonprofit associations work with manufacturers and other organizations to develop standards and exchange statistical and technical knowledge.

## Caution

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All Trerice products should be carefully selected to meet the demands of the particular application. The information contained in this catalog is offered only as a guide to assist in making the proper selection. Selection of the proper product, as well as its installation and use, is the sole responsibility of the user. Improper application or product misuse may cause failure of the product, resulting in possible personal injury or property damage. For correct use and application of all Trerice products, please refer to the proper standard set forth by ASME. These documents may be obtained from the American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990.

## A word about this catalog

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The information contained in this catalog was correct at the time of printing. Due to the Trerice commitment of continuous development and improvement, these specifications are subject to change without notice. Any information contained within this catalog should not be interpreted as a contractual agreement by Trerice. All orders are subject to the approval of the H.O. Trerice Co., Oak Park, Michigan.