

Bimetal Thermometers

- 5 Year Limited Warranty
- Gold Service Available



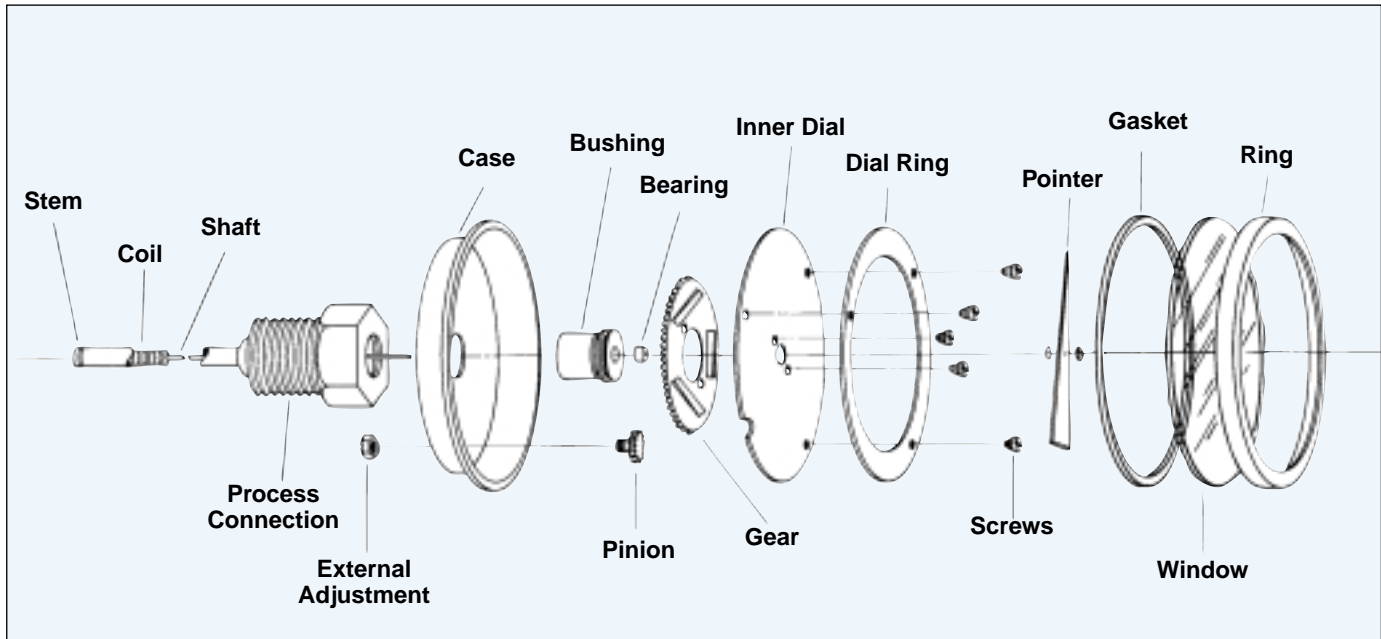
ISO 9001
REGISTERED FIRM

DRESSER INSTRUMENT

BULLETIN BM-1

A Halliburton Company

Product Selection Information



WARNING:

All bimetal thermometers should be selected considering the media and the ambient operating conditions. Improper application can be detrimental to the thermometer, cause failure and possibly personal injury or property damage. Inaccuracies resulting from improper setting of the external adjustment by the user may cause personal injury or property damage. Consult ASME B40.3 for guidance in selection and use of bimetal thermometers.

TEMPERATURE RANGES

Standard Fahrenheit and Celsius ranges have been established to encompass all normal temperature measurement requirements. A bimetal thermometer can be used at an operating temperature anywhere throughout its dial range. Provision should be made for extreme temperature conditions. No bimetal thermometer should be exposed continuously to process temperatures over 800°F (425°C).

OPERATING CONDITIONS

The temperature of the case should be no more than 200°F (95°C); liquid filled 150°F (65°C). Temperatures beyond this value may cause discoloration of the dial or result in increased pressure inside the casing which could ultimately lead to the failure of the window.

THERMOWELLS

Thermowells must be used on any application where the stem of the bimetal thermometer may be exposed to pressure, corrosive fluids or high velocity. Additionally, the use of a thermowell permits instrument interchange or calibration check without disturbing or closing down the process.

POINTERS

The pointers are balanced to close tolerances and the paint finishes are controlled to assure long-term stability under adverse ultraviolet conditions.

CASES

There are three case styles. The CI series has no adjustment but is hermetically sealed. The EI series has an external adjustment and is hermetically sealed. The EL series provides the same features as the EI plus the added benefit of liquid filling. The instruments are leak tested to ensure the integrity of the joints.

COILS

The bimetallic coils are carefully wound and inspected. Each is heat treated for optimum stability and overtemperature capability.

BEARINGS

The bearings are made of Teflon or other low friction material.

SHAFTS

Shafts are made of specially drawn stainless steel wire with a very smooth finish.

DIALS

The dials are based on computer-calculated temperature deflection data and have the Maxivision® format to minimize parallax error.

WINDOWS

The standard windows are heavy-duty glass. Plastic and shatterproof glass are optional.

Introduction

The complete line of Ashcroft industrial bimetal thermometers and accessories provides quality choices for your temperature applications. There is a long history of superior quality in engineering, manufacturing and customer service of these products. Each Ashcroft industrial bimetal thermometer is backed by a limited five year warranty.

Each instrument is manufactured to a standard accuracy of 1% of span (ASME B40.3, Grade A) traceable to the National Institute of Standards and Technology (NIST). The bimetal coils are heat treated for stability and overtemperature capability. A single helix is used to reduce lag time. The bearings are made of a low-friction long-life material. The shafts are made of specially drawn stainless steel with a very smooth finish. All joints are welded, and the weld between the stem and the outlet is located at the bottom of the threads to eliminate the possibility of crevice corrosion.

Silicone dampening is included for improved vibration resistance. The Ashcroft Maxivision® dial eliminates parallax error by placing the pointer in the same plane as the graduations. The dial can be rotated 360 degrees and can be angled 180 degrees with the Everyangle™ connection.

To meet your emergency delivery requirements, Dresser Instrument Division offers the Gold Service™ delivery program. Ashcroft industrial bimetal thermometers can be shipped in 2 to 5 working days from our Stratford, Connecticut, USA, manufacturing plant. We also have an extensive stocking distributor network throughout the United States and international locations.

Everyangle™

EL

EI Case Style

This series has a hermetically sealed case and external adjustment. Connection locations are rear, lower and Everyangle. The hermetic seal prevents entry of moisture into the casing, minimizing the possibility of icing or fogging inside the case.

CI Case Style

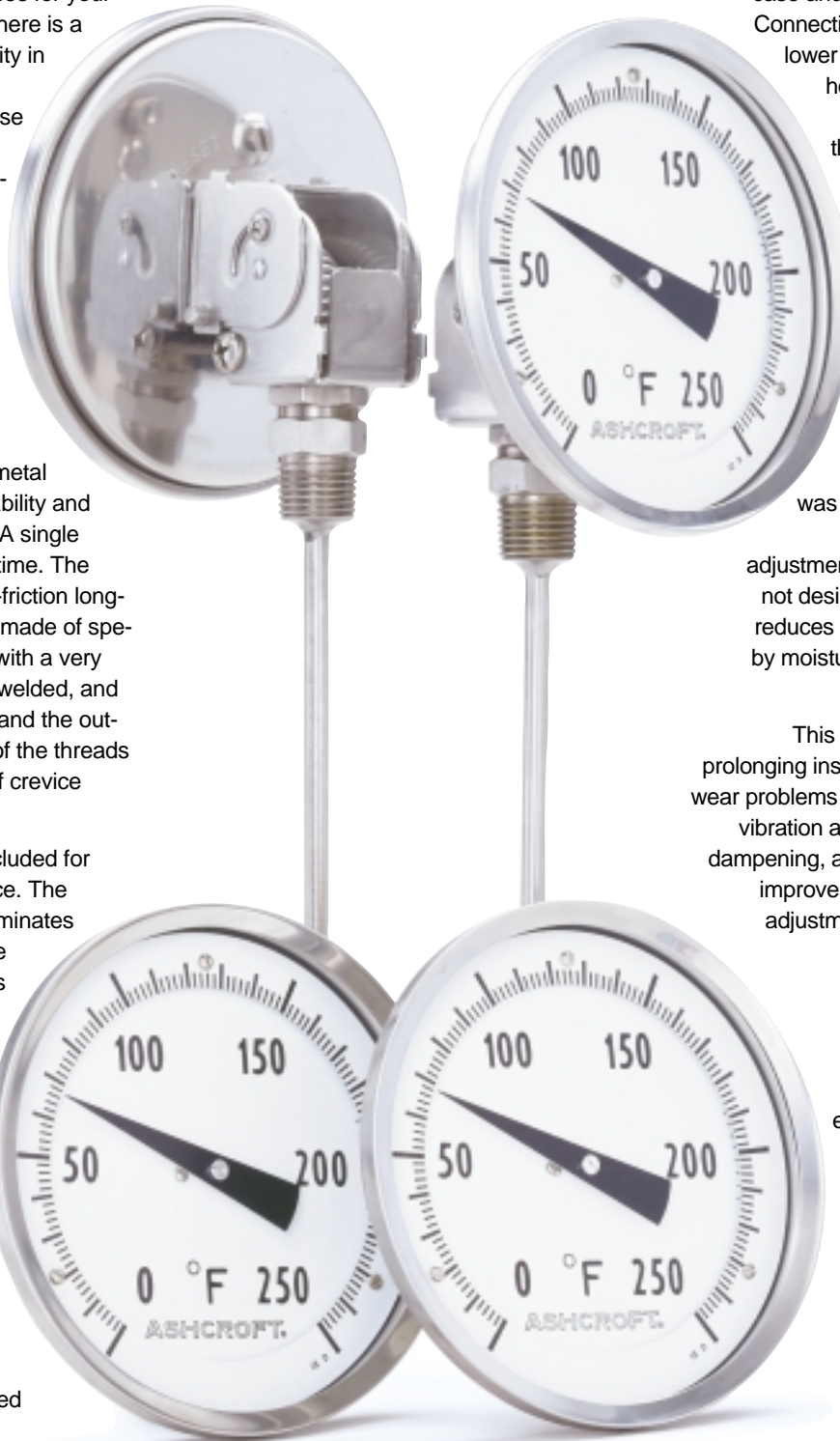
This style is tamper resistant and hermetically sealed. Connection locations are rear and lower. The CI Series was designed for applications where external adjustment or pointer reset are not desired. Hermetic sealing reduces the problems created by moisture entering the case.

EL Case Style

This series is liquid filled – prolonging instrument life. Potential wear problems caused by excessive vibration are minimized through dampening, and the liquid medium improves readability. External adjustment is standard in the rear of the case.

Everyangle Case Connection

This design provides maximum utility. The entire dial face can be rotated 360 degrees, and angled 180 degrees by positioning the harness on the back of the case. The instrument can be installed almost anywhere and can be adjusted so that the dial can be easily read.



CI

EI

How to Order

To specify the exact thermometer desired, select entries from appropriate charts as shown in the example below.

1 2 3 4 5 6 7
30 EI 60 R 040 XNH 0/200°F

1 CASE SIZE		2 STYLE		3 CONNECTION		4 CONN. LOCATION		5 STEM LENGTH		6 OPTIONS	
Dia.	Code	Code	Conn.	Code	Location	Code	"S" Length	Code	Code	Description	
2"	20	CI EI	Plain	40	Rear	R	2½"	025	XCS	Dual scale ⁴	
			Pointed Plain	50						XDM	Service marking printed on dial
			¼ NPT	60							XNH
3"	30	CI EI EL	½ NPT	60	Rear	R	6"	060	XNN	Paper tag	
				CI EI						½ NPT	60
		EI	½ NPT Union	60	Everyangle	E	12"	120	XSG	Shatterproof glass	
				42						5"	50
CI EI	½ NPT	60	Lower	L	18"	180					
EI EL	½ NPT Union	60					Everyangle	E	24"	240	
		42									

7A EI & CI SERIES TEMPERATURE RANGES, SINGLE SCALE					
°F	%Div.	Figure Interval	°C	%Div.	Figure Interval
-80/120	2	20	-50/50	1	10
-20/120 ¹	2	20	-20/120	2	20
30/130 ¹	1	10	0/50 ¹	1	5
0/200	2	20	0/100	1	10
0/250	2	50	10/150	2	20
50/300	2	50	0/200	2	20
50/400	5	50	0/300	5	50
50/550	5	50	50/450 ^{2,3}	5	50
200/700 ²	5	50	100/500 ^{2,3}	5	50
100/800 ²	10	100			
200/1000 ^{2,3}	10	100			

7B EL SERIES TEMPERATURE RANGES, SINGLE SCALE					
°F	%Div.	Figure Interval	°C	%Div.	Figure Interval
-40/160	2	20	-20/120	2	20
-20/120 ¹	2	20	-10/110	2	10
30/130 ¹	1	10	0/50 ¹	1	5
0/200	2	20	0/100	1	10
0/250	2	50	10/150	2	20
50/300	2	50	0/300	5	50
50/550	5	50			

NOTES

- 1 Minimum stem length for lower connection and Everyangle is 4".
- 2 Minimum stem length for these ranges is 4".
- 3 Satisfactory for continuous service up to 800°F or 425°C. Can be used for intermittent service from 800° to 1000°F, or 425° to 500°C.
- 4 Dual scale ranges are available on 3" and 5" case only. See table 7C.

Case Styles and Features

EI & CI SERIES OVERTEMPERATURE LIMITS

Top of Range °F	Maximum Process Overtemperature
Up to 250	100% of Span
250/550	50% of Span
550/1000	800°F ³

EL SERIES OVERTEMPERATURE LIMITS

Top of Range °F	Maximum Process Overtemperature
Up to 160	100% of Span
160/300°F	300°F
300/550°F	550°F

- Maximum ambient temperature for EI and CI Series is 200°F or 95°C.
- Maximum ambient temperature for EL Series is 150°F or 65°C.
- Use Ashcroft Duratemp® thermometer for ranges above and below those listed in the range charts.

7C DUAL SCALES

(XCS) are available in 3" and 5" dial sizes in the following ranges (where applicable):

Inner °F	Outer °F
-80/120	-60/50
-40/120	-40/50
-40/160	-40/70
-20/120 ¹	-30/50 ¹
0/200	-20/90
0/250	-20/120
30/130 ¹	0/55 ¹
50/300	10/150
50/400	10/200
50/550	10/290
100/800	50/400
200/700 ²	100/370 ²
200/1000 ^{2,3}	100/550 ^{2,3}



EI Standard Specifications

- Hermetic seal
- External adjustment
- Maxivision dial
- 1% full-span accuracy
- All-welded stainless steel construction
- Silicone on the coil provides vibration dampening and superior response time
- Heavy-duty glass is standard; plastic or shatterproof glass is optional



CI Standard Specifications

- Hermetic seal
- Tamper resistant, no adjustment
- Maxivision dial
- 1% full-span accuracy
- All-welded stainless steel construction
- Silicone on the coil provides vibration dampening and superior response time
- Heavy-duty glass is standard; plastic or shatterproof glass is optional



EL Standard Specifications

- Silicone liquid filled
- External adjustment
- Durable polycarbonate window
- Maxivision dial
- 1% full-span accuracy
- All-welded stainless steel construction

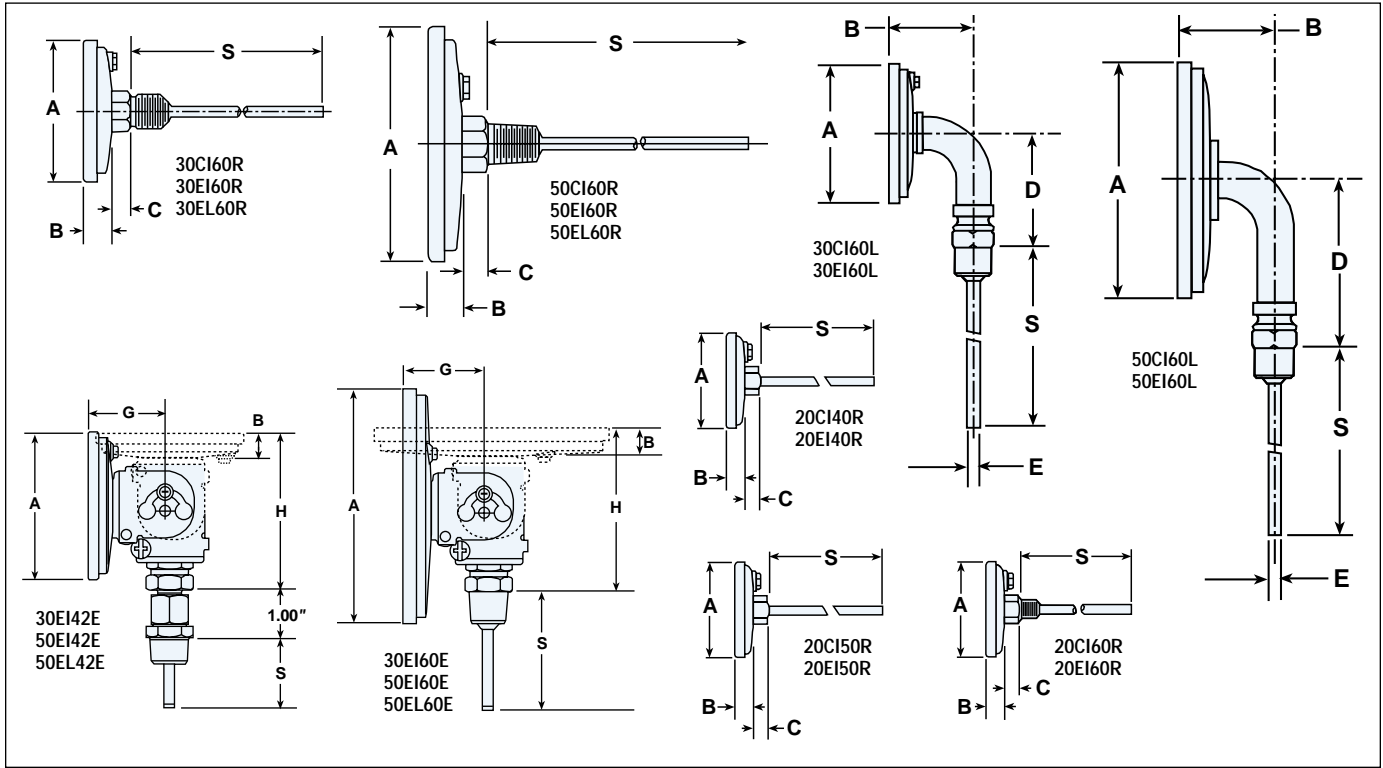


Everyangle - Case Connection

The Ashcroft Everyangle industrial bimetal thermometer dial face with Maxivision dial can be rotated 360 degrees and angled 180 degrees. It is available in the EI and EL (5" only) series with either a threaded or compression type union connection.

This design provides maximum utility. Since the entire case can be rotated and angled, the instrument can be installed almost anywhere and adjusted so that the dial face can be easily read.

Case Dimensions



Case Series	Dial Size	Connection Location	A	B	C	D	E	G	H	S	NPT	Hex	Weight in ounces ³ S – 2½" Case Series		
													CI	EI	EL
CI, EI	2"	Rear (Plain)	2 ³ / ₃₂ (53)	3/8 (10)	5/16 (8)	–	–	–	–	– ²	–	11/16	4½	4½	–
CI, EI	2"	Rear (Plain, pointed stem)	2 ³ / ₃₂ (53)	3/8 (10)	5/16 (8)	–	–	–	–	– ²	–	11/16	4½	4½	–
CI, EI	2"	Rear (Threaded)	2 ³ / ₃₂ (53)	3/8 (10)	5/16 (8)	–	–	–	–	– ²	¼	11/16	4½	4½	–
CI, EI, EL	3"	Rear	3 ⁵ / ₃₂ (80)	1 ⁹ / ₃₂ (15)	5/16 (8)	–	–	–	–	– ²	½	7/8	7	7	8
CI, EI	3"	Lower	3 ⁵ / ₃₂ (80)	1 ²⁷ / ₃₂ (47)	–	2 ⁵ / ₈ (67)	¼ (6)	–	–	– ²	½	7/8	11	11	–
EI	3"	Everyangle	3 ⁵ / ₃₂ (80)	1 ⁹ / ₃₂ (15)	–	–	–	1 ²¹ / ₃₂ (42)	3 ⁷ / ₁₆ (87)	– ²	½	7/8	–	10	–
CI, EI, EL	5"	Rear	5 ¹ / ₃₂ (128)	2 ³ / ₃₂ (18)	5/16 (8)	–	–	–	–	– ²	½	7/8	15	16	18
CI, EI	5"	Lower	5 ¹ / ₃₂ (128)	1 ¹⁵ / ₁₆ (49)	–	3 ⁵ / ₈ (92)	¼ (6)	–	–	– ²	½	7/8	24	26	–
EI, EL	5"	Everyangle	5 ¹ / ₁₆ (128)	2 ³ / ₃₂ (18)	–	–	–	1 ⁷ / ₈ (48)	3 ⁹ / ₁₆ (91)	– ²	½	7/8	–	25	28

NOTES

1 Figures in parenthesis () are in millimeters. All other dimensions are in inches.

2 Standard "S" dimensions are 2½, 4, 6, 9, 12, 15, 18 and 24 inches.

Standard stem diameter is ¼ inch.

3 Add 1 oz. for every 2 inches of stem length.

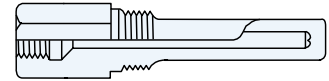
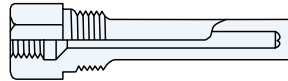
Thermowells

Thermowells must be used whenever an Ashcroft bimetal thermometer is installed on a pressurized application or where pressure, high velocity or corrosive media are present.

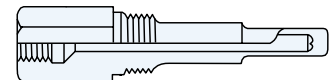
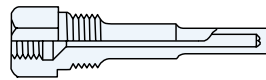
STANDARD CONFIGURATION

LAGGING EXTENSION

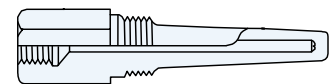
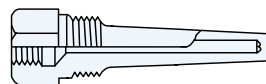
Type: Uniform (straight) shank, threaded
Bore Size: 0.385
Process
Connection: 3/4, 1 NPT
Materials: Brass, carbon steel
 304 stainless steel
 316 stainless steel



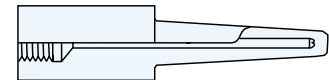
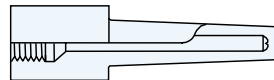
Type: Stepped shank, threaded
Bore Size: 0.260
Process
Connection: 1/2, 3/4, 1 NPT
Materials: Brass, carbon steel
 304 stainless steel
 316 stainless steel



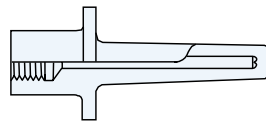
Type: Tapered shank, threaded
Bore Size: 0.260, 0.385
Process
Connection: 1/2, 3/4, 1 NPT
Materials: Brass, carbon steel
 304 stainless steel
 316 stainless steel



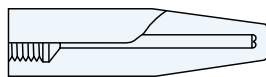
Type: Tapered shank, socket weld
Bore Size: 0.260, 0.385
Process
Connection: 3/4, 1" pipe
Materials: Carbon steel
 304 stainless steel
 316 stainless steel



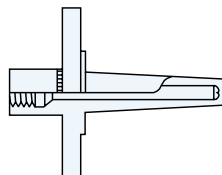
Type: Tapered shank, Van Stone
Bore Size: 0.260, 0.385
Process
Connection: 1, 1 1/2" pipe
Materials: 304 stainless steel
 316 stainless steel



Type: Tapered shank, weld-in
Bore Size: 0.260, 0.385
Process
Connection: 1 1/2" diameter
Materials: 304 stainless steel
 316 stainless steel



Type: Tapered shank, flanged
Bore Size: 0.260, 0.385
Process
Connection: 1, 1 1/2, 2" pipe
Materials: 304 stainless steel
 316 stainless steel



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20MWP 1P3/95 3P11/98

This thermometer was designed to be positioned to face the direction of easiest reading.

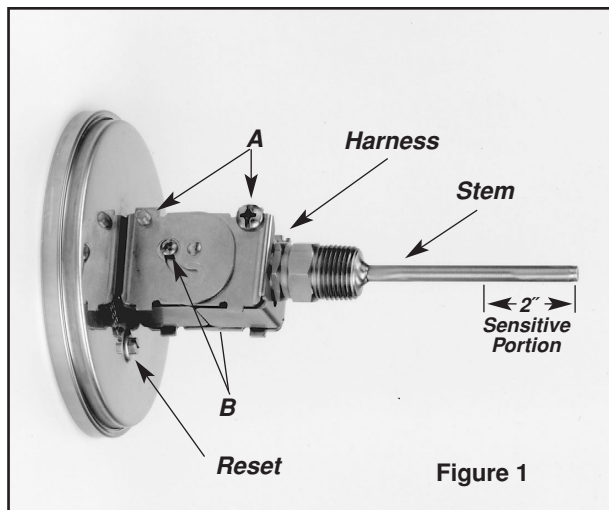


Figure 1

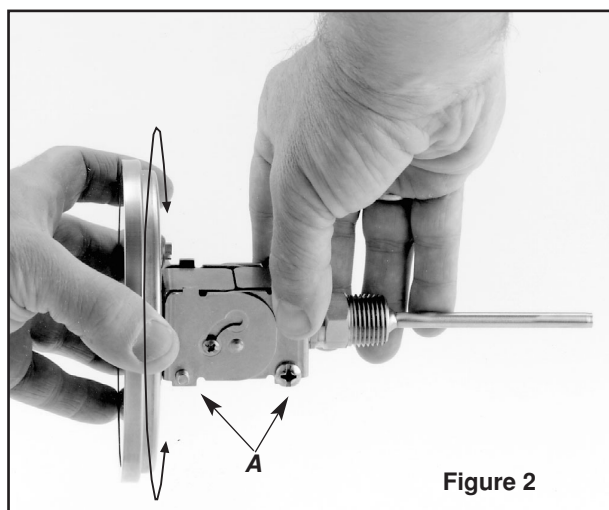


Figure 2

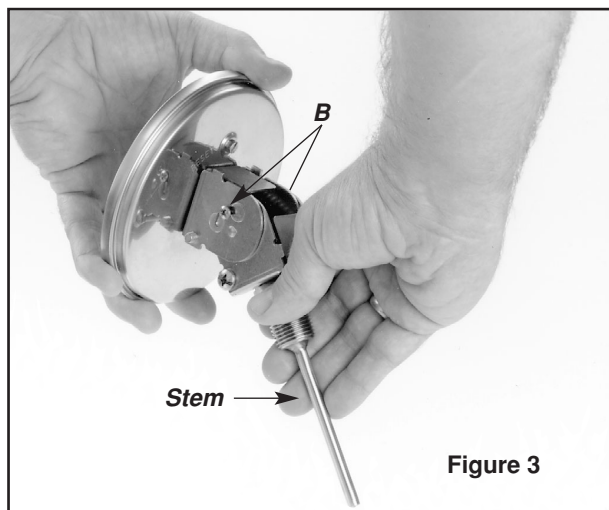


Figure 3

CAUTION: To assure longest life, the “EVERY-ANGLE” joint should be operated only when necessary during installation or removal of the thermometer.

POSITIONING THE STEM

Before installation, the stem should be set to the desired angle as follows:

Figure 1: Loosen the four screws labeled “A” and “B” in Figure 1, until the harness revolves freely without twisting the flexible housing.

Figure 2: While holding the case, revolve the harness clockwise or counterclockwise, as indicated by arrows in Figure 2, to place the harness in a position that will permit flexing the stem in the desired direction with respect to the case. Then lock the two screws labeled “A”.

Figure 3: Flex the stem to the desired angle with respect to the face of the thermometer, as shown in Figure 3, then lock the two screws labeled “B”.

INSTALLATION

The lower 2” of the stem is the sensitive portion. Be sure this part of the stem is exposed to the temperature to be measured.

Tighten the thermometer to the apparatus or into the thermometer well, using an open-end wrench applied to the hexagon head of the connection bushing. Turn until reasonably tight, then tighten further (in the same manner as a pipe fitting) until the scale is in the desired position for reading.

DO NOT TIGHTEN BY TURNING THE THERMOMETER CASE OR THE HARNESS. INSTALL THE DRY TYPE EVERYANGLE THERMOMETER SO THAT THE MAXIMUM CASE TEMPERATURE IS KEPT BELOW 200°F. INSTALL THE LIQUID-FILLED TYPE EVERYANGLE THERMOMETER, SO THAT THE MAXIMUM CASE TEMPERATURE IS KEPT BELOW 150°F.

THERMOMETER WELLS

When the thermometer is equipped with a well, the well should first be removed from the thermometer and screwed into the apparatus.

**Installation and Maintenance
Instructions for ASHCROFT® Bimetal
Thermometer with EVERYANGLE™ Conn.**



Coat the thermometer stem with a heat conducting medium, such as a mixture of graphite and glycerin. This improves the speed of response of the thermometer.

If the operating temperature does not exceed 350°F, vaseline or any heavy lubricant may be used as a substitute for the glycerin and graphite mixture.

If the operating temperature does exceed 350°F, the glycerin and graphite mixture may smoke when first subjected to the high temperature. This is caused by the glycerin vaporizing, leaving the dry graphite behind and should not be a cause for alarm. The dry graphite will act equally well as a heat conducting medium for temperatures up to 1000°F.

CAUTION: *Thermowells should be used on all pressurized applications, to protect the thermometer from corrosion or physical damage, and to facilitate removal of the thermometer without disturbing the process.*

MAINTENANCE

Aside from occasional testing, little or no maintenance is required.

If the thermometer is used for measuring the temperature of material that may harden and build up an insulating layer on the stem, the thermometer should be removed from the apparatus occasionally, and the stem cleaned. Observe this precaution to ensure the sensitivity of the instrument.

ADJUSTMENT

If it is necessary to make an adjustment to the thermometer proceed as follows:

On thermometers fitted with an "External Adjustment" – Use a small wrench, small screwdriver, or a coin to turn the slotted hexagon head in the back of the case until the pointer indicates the proper temperature on the dial.

CAUTION: *Bimetal Thermometers operating below freezing must have a perfectly tight case to prevent entrance of moisture which eventually will condense and freeze inside the stem. This condition shows up as a failure of the thermometer to read accurately below 32°F, or 0°C. For this reason it is important to avoid damage to the glass front while the stem temperature is at freezing or below.*