

# PALMER

Designed and Built in Asheville,  
North Carolina - USA

## All Star Bimetal Thermometers

### Models 3BC • 5BC Back Connected Case

### Models 3BCJ • 5BCJ Back Connected Case with Adjustable Union Fitting

### Models 3A • 5A All Angle Case

### Models 3AJ • 5AJ All Angle Case with Adjustable Union Fitting

Palmer's experience in the thermometer field enables us to offer a line of Bimetal Dial Thermometers with the design, quality and craftsmanship that make our bimetal thermometers an industry standard for rugged reliability and consistent accuracy.

**Rugged Design Features:** All 316 Stainless Steel Case with 304SS Fitting and Stem in Fixed Center Back Connected or versatile All Angle case with easy adjustability for the optimal viewing angle. Glass Lens in a quick-lock, cam-action bezel ring with heavy duty, heat-resistant hermetically sealed gasket seals out moisture to prevent lens icing or fogging and bimetal coil freeze-up in extreme conditions. Built-in over-range protection and adjustable pointer are standard.

**Easy-To-Read 3" or 5" Dial:** Specially fabricated of low-glare finished metal using a deep draw design for anti-parallax alignment of pointer to graduation marks. Dial can be seen from a greater distance and from more angles than mercury-in-glass thermometers. High-visibility numerals and graduations on a low-glare background with graduations and pointer on the same surface level help minimize reading errors.

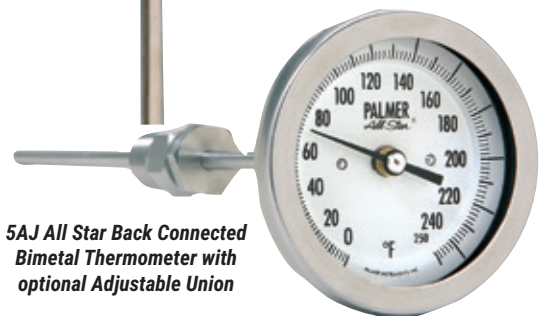
**Fast Response:** Superior heat transfer characteristics, fast response, and consistent repeatability are achieved through the use of a high-torque, low mass bimetal sensing element. Materials and design combine to convert the sensor's movement quickly and accurately into a dial reading. Ambient temperature changes at the case will not affect accuracy.

**Adjustable Union Fitting:** Optional Adjustable Union easily adjusts the stem to the full depth of your thermowell for metal to metal tip contact, giving maximum exposure to your process. Eliminates the need to stock several different stem lengths.

**Optional 316 Stainless Steel Fitting and Stem** can be chosen for deep water drillers and offshore rigs, resists the harsh environmental conditions of outdoor use.



5A All Star Adjustable Angle  
Bimetal Thermometer



5AJ All Star Back Connected  
Bimetal Thermometer with  
optional Adjustable Union

### Models 3BC • 5BC • 3A • 5A Series Specifications

<b>All Angle:</b>	3A and 5A - All Angle Connected Case 3AJ and 5AJ - All Angle Connected Case with Adjustable Union
<b>Fixed Back Connected:</b>	3BC and 5BC - Fixed Center Back Connected Case 3BCJ and 5BCJ - Fixed Center Back Connected Case with Adjustable Union
<b>Case:</b>	Polished-Type 316 Stainless Steel case and bezel in 3" (3-5/16 inch, 84 mm actual) or 5" (5-1/16 inch, 129 mm actual) Size. Hermetically sealed cases.
<b>Element:</b>	Single helix bimetallic coil sensing element (with silicone gel coated coil for ranges below 500°F), located in bottom 2-1/2 inches of thermometer stem.
<b>Dial Face:</b>	Black graduations and numerals on white background. Anti-parallax dial design linear scale with high-visibility tapered-tip black pointer.
<b>Lens:</b>	Glass, Standard. Optional Plexiglass or Shatter-Proof Safety Glass.
<b>Fitting:</b>	304 Stainless Steel 7/8" hex with 1/2" NPT threads or 304SS adjustable union compression fitting with 7/8" hex with 1/2" NPT threads. Optional 316 Stainless Steel. Other fittings available.
<b>Stem:</b>	Polished-Type 304 Stainless Steel. All welded. Optional 316 Stainless Steel.
<b>Stem Lengths:</b>	Standard lengths from 2.5 inches (63.5 mm) to 24 inches (610 mm). Special Order lengths up to 60 inches (1524 mm).
<b>Recalibration:</b>	Adjustable pointer.
<b>Over-Range:</b>	Protected design allows temporary swings of up to 50% of range without permanent damage to thermometer.
<b>Accuracy:</b>	ASME B-40.3 Grade A, ± 1% of Full Scale. Ambient temperature changes at the case will not affect accuracy.

Specifications subject to change without notice.

April  
2021

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### Applications

- Chemical and Petrochemical
- Compressor Controls
- Deep Water Drilling
- Hazardous Environments
- Offshore Rigs
- Process Engineering
- Pulp and Paper Industry
- Pneumatics
- Pump Protection
- Shipping
- Water Treatment Systems



# All Star Models 3BC • 5BC • 3A • 5A • 3BCJ • 5BCJ • 3AJ • 5AJ Ordering Guide

## Models 3BC • 5BC • 3A • 5A • 3BCJ • 5BCJ • 3AJ • 5AJ Series All Star Bimetal Thermometers

### Step 1 - Select: Bimetal Size and Case Style

Code	Bimetal Size and Case Style
<b>3BC</b>	3" Fixed Center Back Connected All Star Bimetal Thermometer
<b>3BCJ</b>	3" Fixed Center Back Connected, Adjustable Union All Star Bimetal Thermometer
<b>5BC</b>	5" Fixed Center Back Connected All Star Bimetal Thermometer
<b>5BCJ</b>	5" Fixed Center Back Connected, Adjustable Union All Star Bimetal Thermometer
<b>3A</b>	3" All Angle Connected All Star Bimetal Thermometer
<b>3AJ</b>	3" All Angle Connected, Adjustable Union All Star Bimetal Thermometer
<b>5A</b>	5" All Angle Connected All Star Bimetal Thermometer
<b>5AJ</b>	5" All Angle Connected, Adjustable Union All Star Bimetal Thermometer

### Step 2 - Select: Stem Length

Code	Length
<b>2.5</b>	2.5 inches (63.5 mm)
<b>4</b>	4 inches (102 mm)
<b>6</b>	6 inches (152 mm)
<b>9</b>	9 inches (229 mm)
<b>12</b>	12 inches (305 mm)
<b>15</b>	15 inches (381 mm)
<b>18</b>	18 inches (457 mm)
<b>24</b>	24 inches (610 mm)
<b>30*</b>	30 inches (762 mm)
<b>36*</b>	36 inches (914 mm)
<b>42*</b>	42 inches (1067 mm)
<b>48*</b>	48 inches (1219 mm)
<b>54*</b>	54 inches (1372 mm)
<b>60*</b>	60 inches (1524 mm)

Adjustable Union Option minimum stem length is 6".  
Stem lengths over 30" have a 3/8" diameter support tubing.  
\* Special order stem length.

### Step 3 - Select: Temperature Range: Single Scale or Dual Scale (below)

Code	°F Range	° Div	Code	°C Range	° Div
<b>-100/100F</b>	-100° to 100°	2°	<b>-50/50C</b>	-50° to 50°	1°
<b>-40/120F</b>	-40° to 120°	1°	<b>-50/100C</b>	-50° to 100°	1°
<b>0/200F</b>	0° to 200°	2°	<b>-20/120C</b>	-20° to 120°	1°
<b>0/250F</b>	0° to 250°	2°	<b>0/50C</b>	0° to 50° <sup>1</sup>	0.5°
<b>25/125F</b>	25° to 125° <sup>1</sup>	1°	<b>0/100C</b>	0° to 100°	1°
<b>50/300F</b>	50° to 300°	2°	<b>0/150C</b>	0° to 150°	1°
<b>50/400F</b>	50° to 400°	5°	<b>0/200C</b>	0° to 200°	2°
<b>50/500F</b>	50° to 500°	5°	<b>0/300C</b>	0° to 300°	5°
<b>150/750F</b>	150° to 750° <sup>1</sup>	5°	<b>100/400C</b>	100° to 400° <sup>1</sup>	5°
<b>200/1000F</b>	200° to 1000° <sup>1,2</sup>	10°	<b>100/500C</b>	100° to 500° <sup>1,2</sup>	5°

<sup>1</sup> Minimum stem length for these ranges is these ranges is 4" on All Angle models and 6" on Back Connected models.  
<sup>2</sup> Recommended for continuous service up to 800°F or 427°C. Can be used for intermittent service up to 1000°F or 500°C.

Dual Scale Options are available and shown in the table below for 5" Bimetals only.

### 5" Dial Dual Range Scales

Code	°F / °C Range	° Div
<b>0/200F&amp;C</b>	0° to 200° / -15° to 90°	2°F/1°C
<b>0/250F&amp;C</b>	0° to 250° / -20° to 120°	2°F/1°C
<b>50/300F&amp;C</b>	50° to 300° / 10° to 150°	2°F/1°C
<b>50/400F&amp;C</b>	50° to 400° / 10° to 200°	5°F/2°C
<b>50/500F&amp;C</b>	50° to 500° / 10° to 260°	5°F/2°C
<b>150/750F&amp;C</b>	150° to 750° / 65° to 400°	10°F/5°C
<b>200/1000F&amp;C</b>	200° to 1000° / 100° to 540° <sup>1,2</sup>	10°F/5°C

### Step 4 - Select: Options

Code	Options
<b>(FS)</b>	316 Stainless Steel Fitting and Stem*
<b>(PC)</b>	Plexiglass Cover
<b>(SPG)</b>	Shatter Proof Safety Glass
<b>(1/4NPT)</b>	1/4" NPT Fixed Thread Fitting**
<b>(3/8D)</b>	3/8" Diameter Stem with Pointed Tip**
<b>(3/8NPT)</b>	3/8" NPT Fixed Thread Fitting**
<b>(7/8SN)</b>	7/8"-22 Swivel Nut Fitting**
<b>(1/2NPS)</b>	1/2" NPSM Union Swivel Nut**

\* Chose for deep water drilling and offshore rigs  
\*\* Not available with Adjustable Union

### Model # Example:

**5BCJ24-40/120F(SPG):** 5 inch All Star Bimetal Thermometer, Fixed Center Back Connected Case with Adjustable Union, 24 inch Stem Length, -40° to 120°F Fahrenheit Temperature Range, Shatter Proof Glass.

**We build to order:  
if your process requires  
an option not shown here  
please call  
Customer Service.**

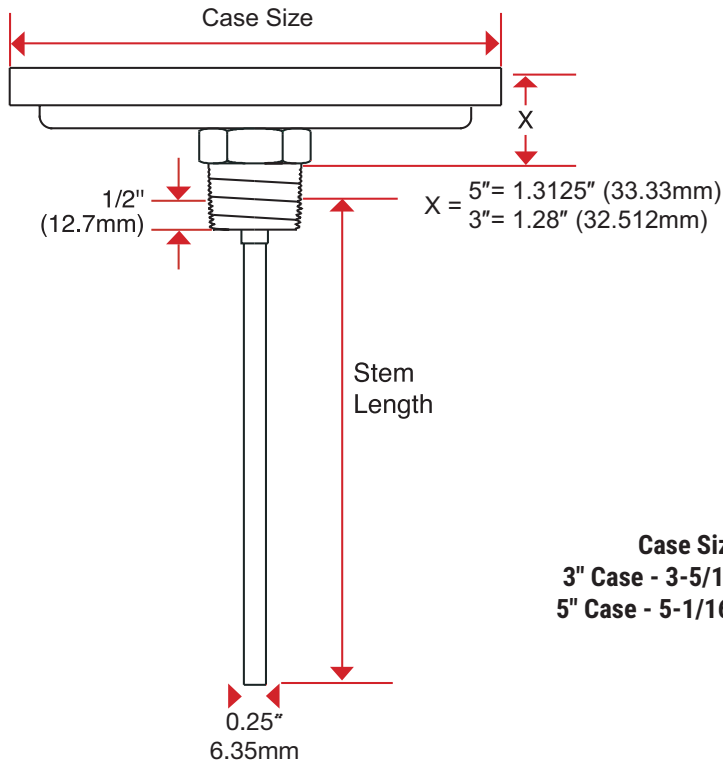
All Star Bimetal	Stem Length	Temperature Range	Options
Insert Codes in boxes above to build part number			



# All Star Models 3BC • 5BC • 3A • 5A • 3BCJ • 5BCJ • 3AJ • 5AJ Dimensional Drawings

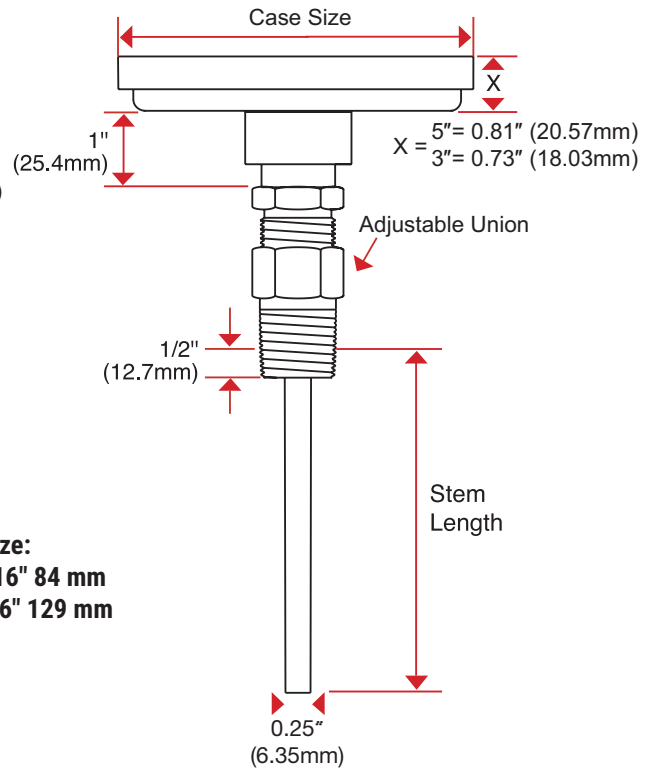
## Fixed Center Back Connected All Star Bimetal

3" Dial - Model 3BC, 5" Dial - Model 5BC



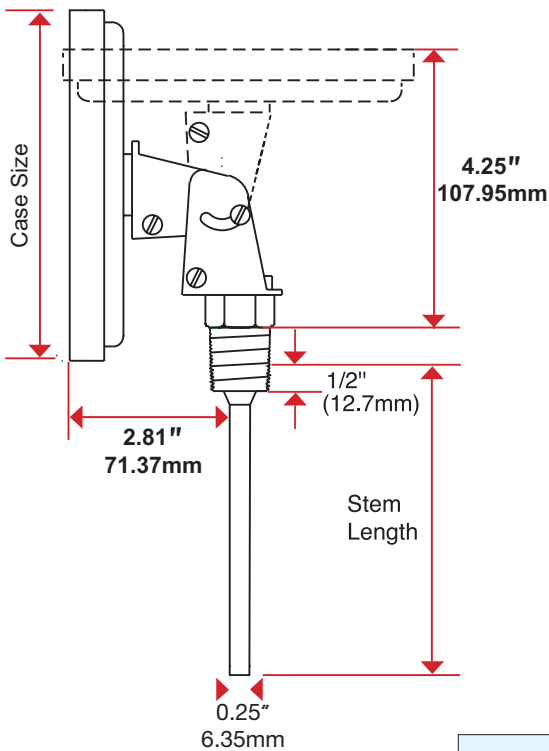
## Fixed Center Back Connected with Adjustable Union All Star Bimetal

3" Dial - Model 3BCJ, 5" Dial - Model 5BCJ



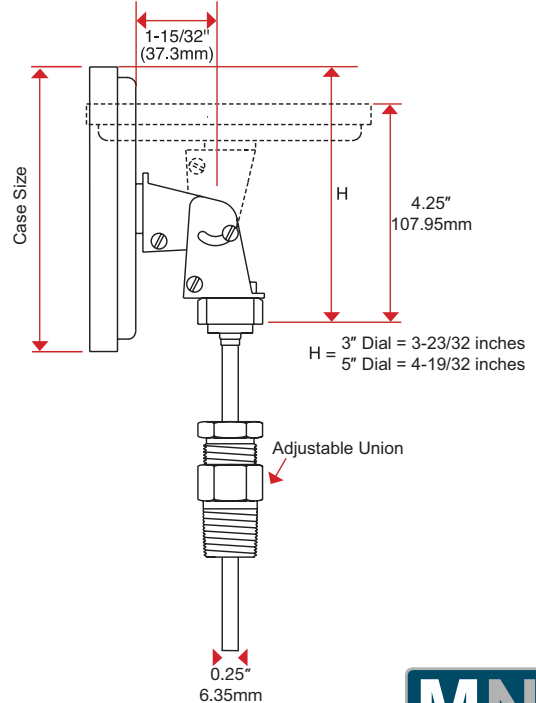
## All Angle Connected All Star Bimetal

3" Dial - Model 3A, 5" Dial - Model 5A



## All Angle Connected with Adjustable Union All Star Bimetal

3" Dial - Model 3AJ, 5" Dial - Model 5AJ



To measure stem length measure from 1/2" up on threads of fitting to tip of stem.  
Adjustable union fitting should be slid to top of stem and tightened before measuring.

Specifications subject to change without notice.

April 2021

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TRACEABLE TO NIST

THREE YEAR WARRANTY

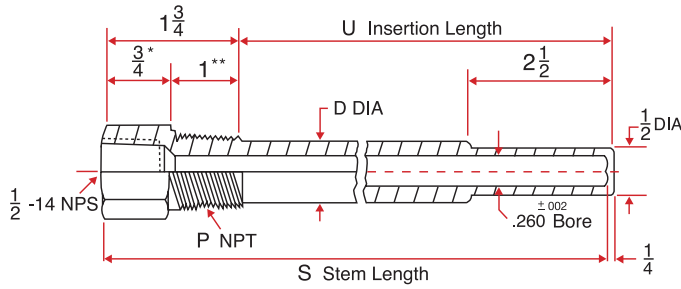
MNC  
Manufactured in North Carolina

ISO 9001:2015  
CERTIFIED QUALITY  
MANAGEMENT SYSTEM

Palmer Wahl  
BEYOND THE SCALE

# Thermowells for use with Bimetal Thermometers

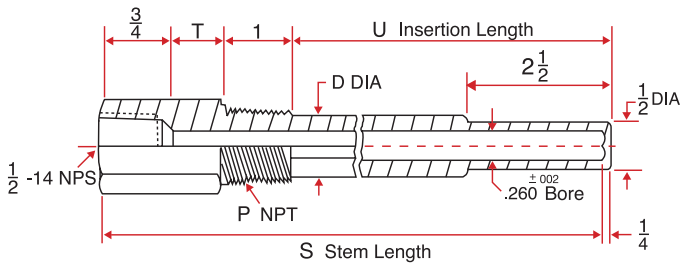
## Thermowell Series 112: 260" Diameter Bore, 1/2"-14 NPS Internal Thread



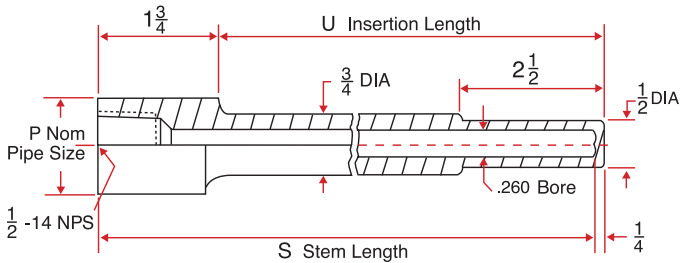
Threaded Regular: Series 1120				
"S" Stem Length	"U" Insertion Length	"P" NPT External Thread Size		
		1/2" - 14	3/4" - 14	1" - 11-1/2
2-1/2"	1-5/8"	1120-102 <sup>1</sup>	1120-202 <sup>1</sup>	1120-302 <sup>1</sup>
4"	2-1/2"	1120-104	1120-204	1120-304
6"	4-1/2"	1120-106	1120-206	1120-306
9"	7-1/2"	1120-109	1120-209	1120-309
12"	10-1/2"	1120-112	1120-212	1120-312 <sup>2</sup>
15"	13-1/2"	1120-115	1120-215	1120-315 <sup>2</sup>
18"	16-1/2"	1120-118	1120-218	1120-318 <sup>2</sup>
<b>Diameter</b>		5/8"	3/4"	3/4"

<sup>1</sup> 1" on the 1/2"-14 NPT External Thread

<sup>2</sup> 3/4" on the 1/2"-14 NPT External Thread



Threaded Regular - Lagging Extension: Series 1121					
"S" Stem Length	"U" Insertion Length	"T" Lagging Extension	"P" NPT External Thread Size		
			1/2" - 14	3/4" - 14	1" - 11-1/2
6"	2-1/2"	2"	1121-106	1121-206	1121-306
9"	4-1/2"	3"	1121-109	1121-209	1121-309
12"	7-1/2"	3"	1121-112	1121-212	1121-312 <sup>2</sup>
15"	10-1/2"	3"	1121-115	1121-215	1121-315 <sup>2</sup>
18"	13-1/2"	3"	1121-118	1121-218	1121-318 <sup>2</sup>
<b>Diameter</b>			5/8"	5/8"	5/8"



Weld-In: Series 1126			
"S" Stem Length	"U" Insertion Length	"P" Nominal Pipe Size	
		3/4" - 1.050	1" - 1.315
4"	2-1/2"	1126-204	1126-304
6"	4-1/2"	1126-206	1126-306
9"	7-1/2"	1126-209	1126-309
12"	10-1/2"	1126-212	1126-312 <sup>2</sup>
15"	13-1/2"	1126-215	1126-315 <sup>2</sup>
18"	16-1/2"	1126-218	1126-318 <sup>2</sup>
<b>Diameter</b>		3/4"	3/4"

**We build to order:  
if you require an option not  
shown here please call  
Customer Service.**

<sup>1</sup> Contact factory for prints on these series

<sup>2</sup> Contact factory for Built-up models

### How to Build a Thermowell Part Number:

Well Series	NPT / NPS and Stem Length	Material
Designates Bore Diameter, Internal Thread and Well Type	Determines External Thread and Stem Length	Determines Material such as Brass or 304SS
Insert Codes in boxes above to build part number		

#### Model Number Example:

**1120-109-01:** 1120 Series, Regular Thermowell, 1/2"-14 NPT and 9" Stem, Brass

Thermowells Material Codes			
Code	Material	Code	Material
01*	Brass* †	07	Monel R-405
02*	Carbon Steel C-1018*	08	Hastelloy C
03*	304SS*	09	Hastelloy B
04	304LSS*	10	Titanium (Special Order)
05*	316SS*	11	Tantalum Sheath** (Special Order)
06	316LSS*		

\* Standard materials in stock. All other materials available upon request.

\*\* All wells with sheaths are continuous outside diameters, regardless of any steps shown on illustrations.

† Not available in Built-up wells.

Specifications subject to change without notice.

**ISO 9001:2015**  
CERTIFIED QUALITY  
MANAGEMENT SYSTEM

**MNC**  
Manufactured in North Carolina

ONE YEAR  
**1**  
WARRANTY

**Palmer Wahl**  
BEYOND THE SCALE

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