

# Beaded Element

Base Metal and Noble Metal

Types J, K, R, S, B Thermocouples

United Electric Controls is  
ISO 9001:2015 certified



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# STYLE 80

## AVAILABLE OPTIONS and MODIFICATIONS

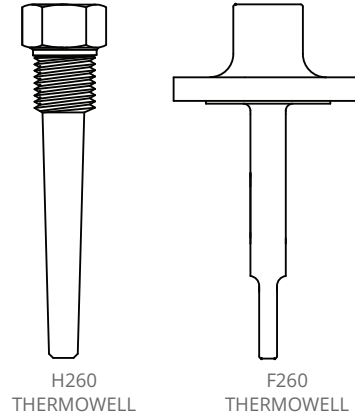
ASSEMBLY OPTIONS	
OPTION CODE	DESCRIPTION
<b>TAG1</b>	Stainless steel tag and wire
<b>CAL1</b>	NIST traceable calibration, specify point(s)
<b>CRT1</b>	Certificate of conformance
<b>WC20</b>	Wiring cable gland for 0.187-0.312 diameter cables for terminal head with 1/2" NPT conduit connection
<b>WC21</b>	Wiring cable gland for 0.125-0.187 diameter cables for terminal head with 1/2" NPT conduit connection

NEMA 4 OR 4X TERMINAL HEAD			
HEAD WITHOUT GROUND SCREW	HEAD WITH INTERNAL GROUND SCREW	PROCESS CONNECTION	CONDUIT CONNECTION
CAST ALUMINUM, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD10</b>	<b>HD11</b>	1/2"	1/2"
<b>Std.</b>	<b>HD13</b>	1/2"	3/4"
EPOXY-COATED ALUMINUM, SCREW COVER WITH CHAIN, NEMA 4X			
<b>HD50</b>	<b>HD51</b>	1/2"	1/2"
<b>HD52</b>	<b>HD53</b>	1/2"	3/4"
CAST IRON, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD20</b>	<b>HD21</b>	1/2"	1/2"
<b>HD22</b>	<b>HD23</b>	1/2"	3/4"
316 STAINLESS STEEL, SCREW COVER WITH CHAIN, NEMA 4X			
<b>HD40</b>	<b>HD41</b>	1/2"	3/4"

### THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the following datasheets:

- AST-THERMOWELLS
- AST-PROTECTB



### REPLACEMENT ELEMENT – see Style 50 (page 13)

Style 50 – Beaded replacement for base-metal thermocouple



**NOTE:** Many non-standard options, including additional sheath diameters and materials, may also be available – consult UE-AST for specific requirements.

**NOBLE METAL THERMOCOUPLE WITH TERMINAL HEAD AND PROTECTION TUBE**

**How to build a part number:**

Select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Consult UE-AST for custom solutions.

SENSOR TYPE	STYLE	PROTECTION TUBE CONFIGURATION	CALIBRATION	WIRE GAUGE	BEAD MATERIAL	PRIMARY TUBE LENGTH	OPTIONS

**SENSOR TYPE**

**BTC** - Beaded construction

**STYLE**

**81N** - Noble metal element with primary protection tube only; threaded connection between head and tube; NEMA 4 aluminum terminal head and ceramic terminal block; 3/4" NPT conduit connection; gasketed screw cover with stainless steel chain

**PROTECTION TUBE CONFIGURATION**

E.g., **00A6** = 0.375" O.D. tube with 1/2" NPT connection, carbon steel, alumina and 6" nipple

Protection tube diameter

- 0** - 0.375" O.D.
- 1** - 0.5" O.D.
- 2** - 6.88" O.D.
- 3** - 0.75" O.D.

Process thread size and material

- |                     |                            |
|---------------------|----------------------------|
| <i>Carbon Steel</i> | <i>316 stainless steel</i> |
| <b>0</b> - 1/2" NPT | <b>3</b> - 1/2" NPT        |
| <b>1</b> - 3/4" NPT | <b>4</b> - 3/4" NPT        |
| <b>2</b> - 1" NPT   | <b>5</b> - 1" NPT          |

See Table 1, page 6 for available O.D. and process thread size combinations.

Protection tube material

- A** - Alumina (98.8% aluminum oxide)
- M** - Mullite (not recommended over 1200°C)

Connection Length ("CL")

- 1** - hex fitting only
- #** - length of nipple

**CALIBRATION**

Single junction

- R** - Platinum and Platinum/13% Rhodium
- S** - Platinum and Platinum/10% Rhodium
- B** - Platinum/6% Rhodium and Platinum/30% Rhodium

Dual junctions

- RR**
- SS**
- BB**

**WIRE GAUGE**

**24** - 24 AWG

**BEAD MATERIAL**

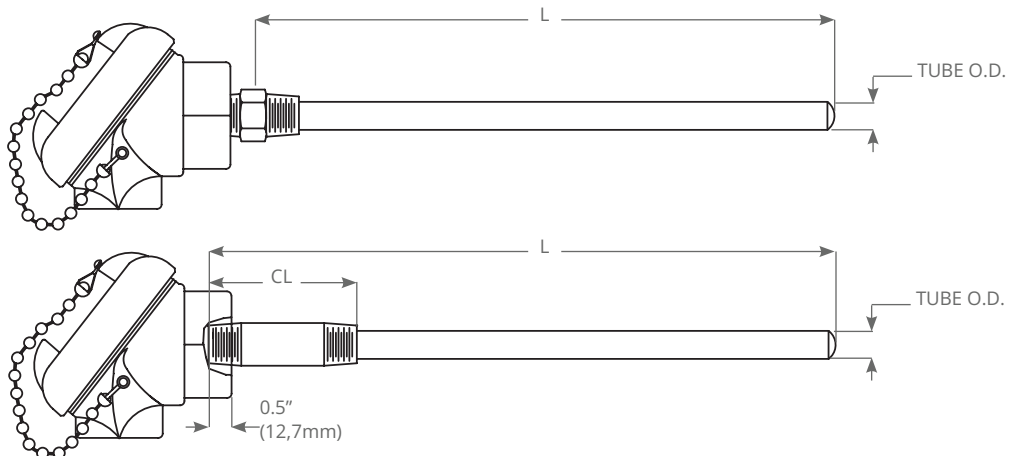
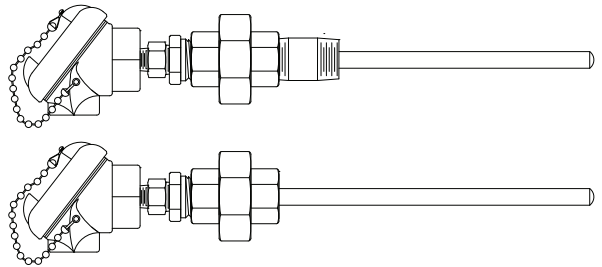
**A** - Alumina beads (0.125" O.D. for single junction, 0.188" for dual)

**PROTECTION TUBE LENGTH**

**L#** - (e.g., L12 = 12" protection tube length)

**OPTIONS** - see page 6

**Note:** union fitting or union with nipple can be added to this style (consult AST for part numbers and availabilities)



# STYLE 81N

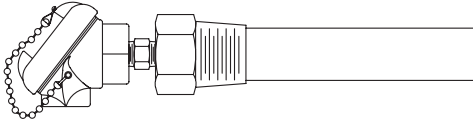
## TERMINAL HEAD OPTIONS

ASSEMBLY OPTIONS	
OPTION CODE	DESCRIPTION
<b>TAG1</b>	Stainless steel tag and wire
<b>CAL1</b>	NIST traceable calibration, specify point(s)
<b>CRT1</b>	Certificate of conformance
<b>WC20</b>	Wiring cable gland for 0.187-0.312 diameter cables for terminal head with 1/2" NPT conduit connection
<b>WC21</b>	Wiring cable gland for 0.125-0.187 diameter cables for terminal head with 1/2" NPT conduit connection

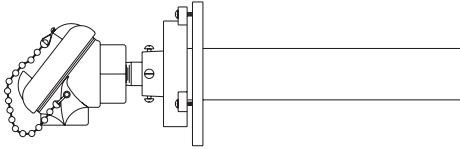
NEMA 4 OR 4X TERMINAL HEAD			
HEAD WITHOUT GROUND SCREW	HEAD WITH INTERNAL GROUND SCREW	PROCESS CONNECTION	CONDUIT CONNECTION
CAST ALUMINUM, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD10</b>	<b>HD11</b>	1/2"	1/2"
<b>Std.</b>	<b>HD13</b>	1/2"	3/4"
EPOXY-COATED ALUMINUM, SCREW COVER WITH CHAIN, NEMA 4X			
<b>HD50</b>	<b>HD51</b>	1/2"	1/2"
<b>HD52</b>	<b>HD53</b>	1/2"	3/4"
CAST IRON, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD20</b>	<b>HD21</b>	1/2"	1/2"
<b>HD22</b>	<b>HD23</b>	1/2"	3/4"
316 STAINLESS STEEL, SCREW COVER WITH CHAIN, NEMA 4X			
<b>HD40</b>	<b>HD41</b>	1/2"	3/4"
WHITE POLYPROPYLENE, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD30</b>	N/A	1/2"	3/4"
BLACK POLYPROPYLENE, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD31</b>	N/A	1/2"	3/4"
NYLON, SCREW COVER			
<b>HD32</b>	N/A	1/2"	1/2"

### ADDITIONAL NOBLE METAL THERMOCOUPLE STYLES:

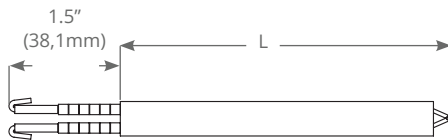
**Style 81B** - Secondary tube with mounting bushing (page 7)



**Style 81F** - Secondary tube with slip flange mounting (page 11)



**REPLACEMENT ELEMENT** - see style 51 (page 14)



### NOTES:

- Not all materials and process thread sizes are compatible with all tubing O.D.'s. Use the chart below as a guide for the possible combinations.

		PROCESS THREAD (NPT)					
		CARBON STEEL			316 STAINLESS		
CODE		0 (1/2")	1 (3/4")	2 (1")	3 (1/2")	4 (3/4")	5 (1")
TUBE O.D.	0 (3/8")	•			•		
	1 (1/2")	•	•		•	•	
	2 (1 1/16")		•			•	
	3 (3/4")		•	•		•	•

Table 1

- UE-AST recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing temperature drift.
- In many cases platinum thermocouples can be recycled, thereby reducing the long-term overall cost. Please contact UE-AST for further information.

**NOTE:** Many non-standard options, including additional sheath diameters and materials, may also be available - consult UE-AST for specific requirements.

**NOBLE METAL THERMOCOUPLE WITH SECONDARY PROTECTION TUBE & BUSHING**

**How to build a part number:**

Select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Consult UE-AST for custom solutions.

SENSOR TYPE	STYLE	SECONDARY TUBE CONFIGURATION	CALIBRATION	WIRE GAUGE	BEAD MATERIAL	SECONDARY TUBE LENGTH	OPTIONS

**SENSOR TYPE**

**BTC** – Beaded construction

**STYLE**

**81B** – Noble metal element with inner and outer protection tubes; threaded bushing process attachment; NEMA 4 aluminum terminal head and ceramic terminal block; 3/4" NPT conduit connection; gasketed screw cover with stainless steel chain

**SECONDARY TUBE CONFIGURATION**

E.g., **9C5A** = 1.75" O.D. silicon carbide tube with 2" NPT, carbon steel bushing and alumina tube

Outer protection tube diameter

- |                         |                        |
|-------------------------|------------------------|
| <b>3</b> – 0.75" O.D.   | <b>7</b> – 1-1/4" O.D. |
| <b>4</b> – 7/8" O.D.    | <b>8</b> – 1-0.5" O.D. |
| <b>5</b> – 1" O.D.      | <b>9</b> – 1.75" O.D.  |
| <b>6</b> – 1-1/10" O.D. |                        |

Outer protection tube material

- |   |                      |
|---|----------------------|
| <b>C</b> – Silicon Carbide, oxide bonded* | <b>H</b> – Hexalloy® |
| <b>S</b> – Sialon®                        | <b>L</b> – LT1       |

\* Other grades of silicon carbide available upon request. Consult UE-AST. See Table 1, page 8 for available O.D. process thread sizes and material combinations.

Bushing thread and material

- |                       |                            |
|-----------------------|----------------------------|
| <i>Carbon Steel</i>   | <i>316 Stainless steel</i> |
| <b>2</b> – 1" NPT     | <b>6</b> – 1" NPT          |
| <b>3</b> – 1-1/4" NPT | <b>7</b> – 1-1/4" NPT      |
| <b>4</b> – 1-1/2" NPT | <b>8</b> – 1-1/2" NPT      |
| <b>5</b> – 2" NPT     | <b>9</b> – 2" NPT          |

Inner protection tube material

- A** – Alumina (98.8% aluminum oxide)  
**M** – Mullite (not recommended over 1200°C)

**CALIBRATION**

- |   |                       |
|---|-----------------------|
| <b>Single junction</b>                                  | <b>Dual junctions</b> |
| <b>R</b> – Platinum and Platinum/13% Rhodium            | <b>RR</b>             |
| <b>S</b> – Platinum and Platinum/10% Rhodium            | <b>SS</b>             |
| <b>B</b> – Platinum/6% Rhodium and Platinum/30% Rhodium | <b>BB</b>             |

**WIRE GAUGE**

**24** – 24 AWG

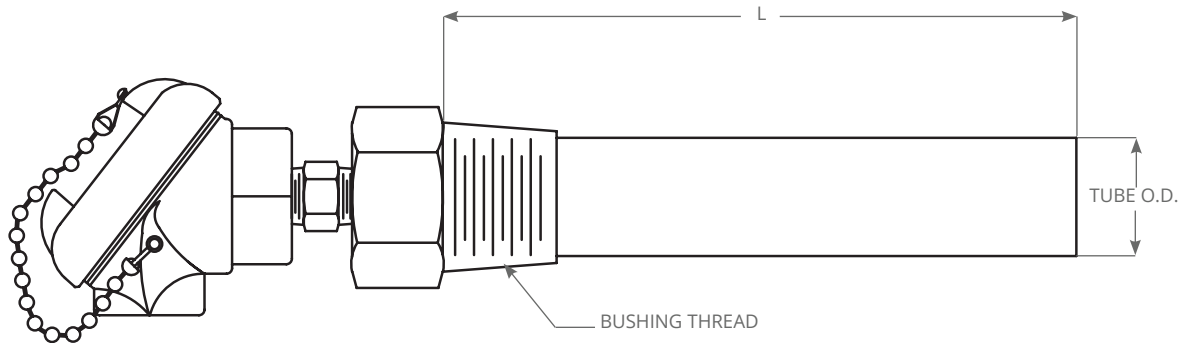
**BEAD MATERIAL**

**A** – Alumina beads (0.125" O.D. for single junction, 0.188" for dual)

**SECONDARY TUBE LENGTH**

**L#** – (e.g., L12 = 12" outer protection tube length)

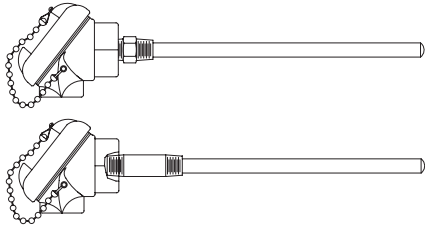
**OPTIONS** – see page 8



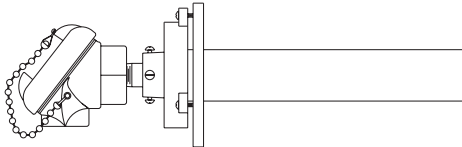
ASSEMBLY OPTIONS	
OPTION CODE	DESCRIPTION
<b>TAG1</b>	Stainless steel tag and wire
<b>CAL1</b>	NIST traceable calibration, specify point(s)
<b>CRT1</b>	Certificate of conformance
<b>WC20</b>	Wiring cable gland for 0.187-0.312 diameter cables for terminal head with ½" NPT conduit connection
<b>WC21</b>	Wiring cable gland for 0.125-0.187 diameter cables for terminal head with ½" NPT conduit connection

**ADDITIONAL NOBLE METAL THERMOCOUPLE STYLES:**

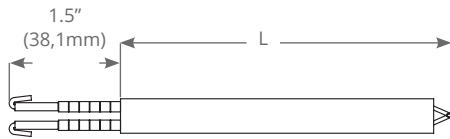
**Style 81N** – Single, primary protection tube only (page 5)



**Style 81F** – Secondary tube with slip flange mounting (page 11)



**REPLACEMENT SENSOR** - see style 51 (page 14)



**NOTES:**

1. Not all materials and process thread sizes are compatible with all tubing O.D.'s. Use the chart below as a guide for the possible combinations. For each combination of thread and O.D., available materials are noted - Silicon Carbide (C), Sialon® (S), Hexalloy® (H) and LT1 (L).

		PROCESS THREAD (NPT)							
		CARBON STEEL				316 STAINLESS			
OUTER TUBE O.D.	CODE	2 (1")	3 (1-1/4")	4 (1-1/2")	5 (2")	6 (1")	7 (1-1/4")	8 (1-1/2")	9 (2")
	<b>3 (3/4")</b>	H	H	H	H	H	H	H	H
	<b>4 (7/8")</b>	L,S	L,S	L,S	L,S	L,S	L,S	L,S	L,S
	<b>5 (1")</b>		H	H	H		H	H	H
	<b>6 (1-1/10")</b>		S	S	S		S	S	S
	<b>7 (1-1/4")</b>			H	H			H	H
	<b>8 (1-1/2")</b>			H	H			H	H
	<b>9 (1.75")</b>				C				C

**Table 1**

2. UE-AST recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing temperature drift.
3. In many cases platinum thermocouples can be recycled, thereby reducing the long-term overall cost. Please contact UE-AST for further information.

**NOTE:** Many non-standard options, including additional sheath diameters and materials, may also be available – consult UE-AST for specific requirements.

# STYLE 81B

## TERMINAL HEAD OPTIONS

NEMA 4 OR 4X TERMINAL HEAD			
HEAD WITHOUT GROUND SCREW	HEAD WITH INTERNAL GROUND SCREW	PROCESS CONNECTION	CONDUIT CONNECTION
CAST ALUMINUM, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD10</b>	<b>HD11</b>	1/2"	1/2"
<b>Std.</b>	<b>HD13</b>	1/2"	3/4"
EPOXY-COATED ALUMINUM, SCREW COVER WITH CHAIN, NEMA 4X			
<b>HD50</b>	<b>HD51</b>	1/2"	1/2"
<b>HD52</b>	<b>HD53</b>	1/2"	3/4"
CAST IRON, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD20</b>	<b>HD21</b>	1/2"	1/2"
<b>HD22</b>	<b>HD23</b>	1/2"	3/4"
316 STAINLESS STEEL, SCREW COVER WITH CHAIN, NEMA 4X			
<b>HD40</b>	<b>HD41</b>	1/2"	3/4"
WHITE POLYPROPYLENE, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD30</b>	N/A	1/2"	3/4"
BLACK POLYPROPYLENE, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD31</b>	N/A	1/2"	3/4"
NYLON, SCREW COVER			
<b>HD32</b>	N/A	1/2"	1/2"

**NOBLE METAL THERMOCOUPLE WITH SECONDARY PROTECTION TUBE & MOUNTING COLLAR**

**How to build a part number:**

Select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Consult UE-AST for custom solutions.

SENSOR TYPE	STYLE	PROTECTION TUBE CONFIGURATION	CALIBRATION	WIRE GAUGE	BEAD MATERIAL	OUTER PROTECTION TUBE LENGTH	OPTIONS

**SENSOR TYPE**

**BTC** – Beaded construction

**STYLE**

**81C** – Noble metal element with primary and secondary protection tubes; mounting collar process attachment; NEMA 4 aluminum terminal head and ceramic terminal block; 3/4" NPT conduit connection; gasketed screw cover with stainless steel chain

**PROTECTION TUBE CONFIGURATION**

E.g., **9CA** = 1.75" O.D. silicon carbide protection tube with collar and alumina inner protection tube

Outer protection tube diameter

**9** - 1.75" O.D.

Outer protection tube material

**C** - Silicon carbide, oxide bonded\*

\* Other grades of silicon carbide available upon request. Consult UE-AST.

Inner protection tube material

**A** – Alumina (98.8% aluminum oxide)

**M** – Mullite (not recommended over 1200°C)

**CALIBRATION**

Single junction

**R** – Platinum and Platinum/13% Rhodium

**S** – Platinum and Platinum/10% Rhodium

**B** – Platinum/6% Rhodium and Platinum/30% Rhodium

Dual junctions

**RR**

**SS**

**BB**

**WIRE GAUGE**

**24** – 24 AWG

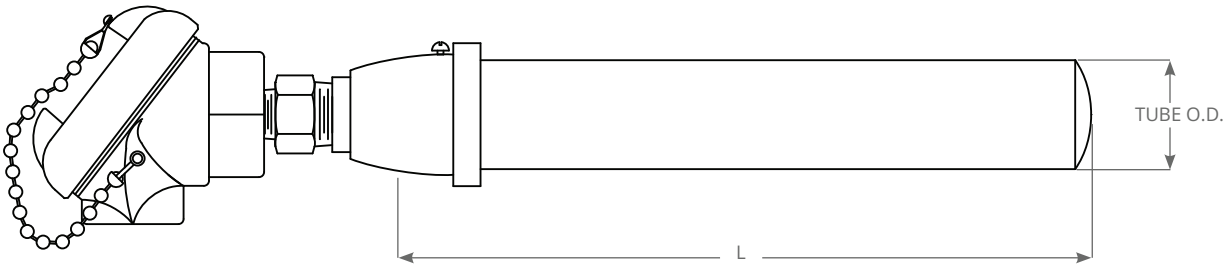
**BEAD MATERIAL**

**A** – Alumina beads (0.125" O.D. for single junction, 0.188" for dual)

**OUTER PROTECTION TUBE LENGTH**

**L#** – (e.g., L12 = 12" outer protection tube length)

**OPTIONS** – see page 10



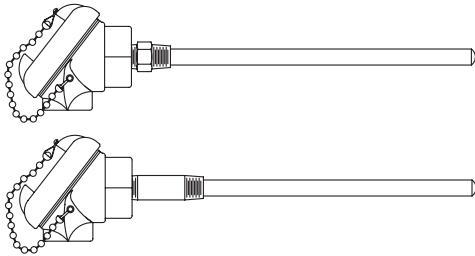
# STYLE 81C

## ASSEMBLY OPTIONS

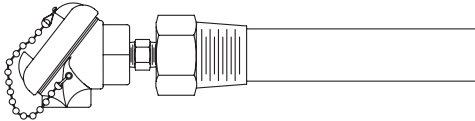
OPTION CODE	DESCRIPTION
<b>TAG1</b>	Stainless steel tag and wire
<b>CAL1</b>	NIST traceable calibration, specify point(s)
<b>CRT1</b>	Certificate of conformance
<b>WC20</b>	Wiring cable gland for $0.187 - 0.312$ diameter cables for terminal head with $1/2"$ NPT conduit connection
<b>WC21</b>	Wiring cable gland for $0.125 - 0.187$ diameter cables for terminal head with $1/2"$ NPT conduit connection
<b>HW10</b>	Split flange for mounting

### ADDITIONAL NOBLE METAL THERMOCOUPLE STYLES:

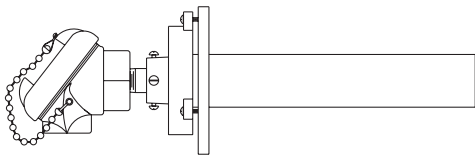
**Style 81N** - Single, primary protection tube only (page 5)



**Style 81B** - Secondary tube with mounting bushing (page 7)



**Style 81F** - Secondary tube with mounting flange (page 11)



**REPLACEMENT ELEMENT** - see Style 51 (page 14)



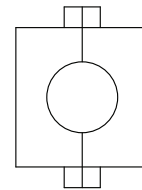
### Notes:

1. UE-AST recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing temperature drift.

2. In many cases platinum thermocouples can be recycled, thereby reducing the long-term overall cost. Please contact UE-AST for further information.

## TERMINAL HEAD OPTIONS

NEMA 4 OR 4X TERMINAL HEAD			
HEAD WITHOUT GROUND SCREW	HEAD WITH INTERNAL GROUND SCREW	PROCESS CONNECTION	CONDUIT CONNECTION
CAST ALUMINUM, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD10</b>	<b>HD11</b>	1/2"	1/2"
<b>Std.</b>	<b>HD13</b>	1/2"	3/4"
EPOXY-COATED ALUMINUM, SCREW COVER WITH CHAIN, NEMA 4X			
<b>HD50</b>	<b>HD51</b>	1/2"	1/2"
<b>HD52</b>	<b>HD53</b>	1/2"	3/4"
CAST IRON, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD20</b>	<b>HD21</b>	1/2"	1/2"
<b>HD22</b>	<b>HD23</b>	1/2"	3/4"
316 STAINLESS STEEL, SCREW COVER WITH CHAIN, NEMA 4X			
<b>HD40</b>	<b>HD41</b>	1/2"	3/4"
WHITE POLYPROPYLENE, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD30</b>	N/A	1/2"	3/4"
BLACK POLYPROPYLENE, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD31</b>	N/A	1/2"	3/4"
NYLON, SCREW COVER			
<b>HD32</b>	N/A	1/2"	1/2"



**Split Flange Option HW10**

**NOTE:** Many non-standard options, including additional sheath diameters and materials, may also be available - consult UE-AST for specific requirements.

**NOBLE METAL THERMOCOUPLE WITH SECONDARY PROTECTION TUBE & MOUNTING FLANGE**

**How to build a part number:**

Select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Consult UE-AST for custom solutions.

SENSOR TYPE	STYLE	PROTECTION TUBE CONFIGURATION	CALIBRATION	WIRE GAUGE	BEAD MATERIAL	OUTER PROTECTION TUBE LENGTH	OPTIONS
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**SENSOR TYPE**

**BTC** - Beaded construction

**STYLE**

**81F** - Noble metal element with primary and secondary protection tubes; mounting flange process attachment; NEMA 4 aluminum terminal head and ceramic terminal block; 3/4" NPT conduit connection; gasketed screw cover with stainless steel chain

**PROTECTION TUBE CONFIGURATION**

E.g., **9C5A** = 1.75" O.D. silicon carbide protection tube with 4.875" mounting flange and alumina inner protection tube

Outer protection tube diameter

**9** - 1.75" O.D.

Outer protection tube material

**C** - Silicon carbide, oxide bonded\*

\* Other grades of silicon carbide available upon request. Consult UE-AST.

Flange size

**5** - 4.875" O.D.

Inner protection tube material

**A** - Alumina (98.8% aluminum oxide)

**M** - Mullite (not recommended over 1200°C)

**CALIBRATION**

Single junction

**R** - Platinum and Platinum/13% Rhodium

**S** - Platinum and Platinum/10% Rhodium

**B** - Platinum/6% Rhodium and Platinum/30% Rhodium

Dual junctions

**RR**

**SS**

**BB**

**WIRE GAUGE**

**24** - 24 AWG

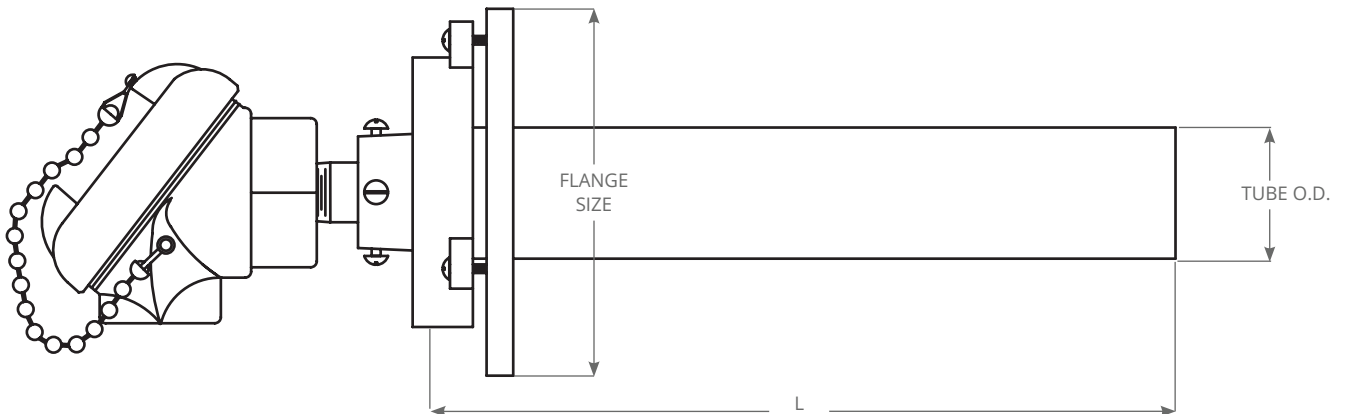
**BEAD MATERIAL**

**A** - Alumina beads (0.125" O.D. for single junction, 0.188" for dual)

**OUTER PROTECTION TUBE LENGTH**

**L#** - (e.g., L12 = 12" outer protection tube length)

**OPTIONS** - see page 12



# STYLE 81F

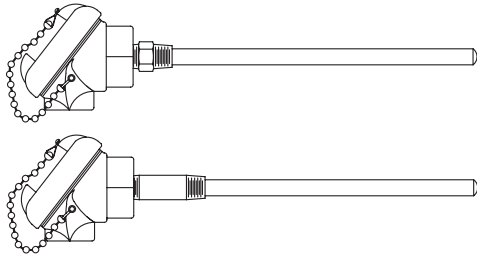
## TERMINAL HEAD OPTIONS

ASSEMBLY OPTIONS	
OPTION CODE	DESCRIPTION
<b>TAG1</b>	Stainless steel tag and wire
<b>CAL1</b>	NIST traceable calibration, specify point(s)
<b>CRT1</b>	Certificate of conformance
<b>WC20</b>	Wiring cable gland for 0.187 - 0.312 diameter cables for terminal head with 1/2" NPT conduit connection
<b>WC21</b>	Wiring cable gland for 0.125 - 0.187 diameter cables for terminal head with 1/2" NPT conduit connection

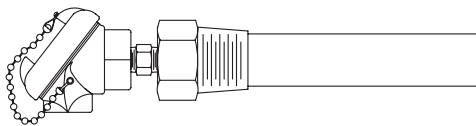
NEMA 4 OR 4X TERMINAL HEAD			
HEAD WITHOUT GROUND SCREW	HEAD WITH INTERNAL GROUND SCREW	PROCESS CONNECTION	CONDUIT CONNECTION
CAST ALUMINUM, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD10</b>	<b>HD11</b>	1/2"	1/2"
<b>Std.</b>	<b>HD13</b>	1/2"	3/4"
EPOXY-COATED ALUMINUM, SCREW COVER WITH CHAIN, NEMA 4X			
<b>HD50</b>	<b>HD51</b>	1/2"	1/2"
<b>HD52</b>	<b>HD53</b>	1/2"	3/4"
CAST IRON, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD20</b>	<b>HD21</b>	1/2"	1/2"
<b>HD22</b>	<b>HD23</b>	1/2"	3/4"
316 STAINLESS STEEL, SCREW COVER WITH CHAIN, NEMA 4X			
<b>HD40</b>	<b>HD41</b>	1/2"	3/4"
WHITE POLYPROPYLENE, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD30</b>	N/A	1/2"	3/4"
BLACK POLYPROPYLENE, SCREW COVER WITH CHAIN, NEMA 4			
<b>HD31</b>	N/A	1/2"	3/4"
NYLON, SCREW COVER			
<b>HD32</b>	N/A	1/2"	1/2"

### ADDITIONAL NOBLE METAL THERMOCOUPLE STYLES:

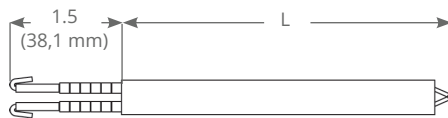
**Style 81N** – Single, primary protection tube only (page 5)



**Style 81B** – Secondary tube with mounting bushing (page 7)



**REPLACEMENT ELEMENT** – see Style 51 (page 14)



### Notes:

1. UE-AST recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing temperature drift.

2. In many cases platinum thermocouples can be recycled, thereby reducing the long-term overall cost. Please contact UE-AST for further information.

**NOTE:** Many non-standard options, including additional sheath diameters and materials, may also be available – consult UE-AST for specific requirements.

**BEADED REPLACEMENT ELEMENT FOR BASE-METAL THERMOCOUPLES**

**How to build a part number:**

Select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Consult UE-AST for custom solutions.

SENSOR TYPE	ASSEMBLY STYLE	WIRE GAUGE	BEAD SHAPE	CALIBRATION	HOT JUNCTION	INSULATOR MATERIAL	BEAD LENGTH	LEADWIRE LENGTH

**SENSOR TYPE**

**BTC** - Beaded thermocouple

**ASSEMBLY STYLE**

**50** - Replacement element for beaded base-metal thermocouple Style 80

**WIRE GAUGE**

**08** - 0.460" bead diameter for 0.500" I.D. well or tube  
**14** - 0.255" bead diameter for 0.260" bore well

**BEAD SHAPE**

**R** - Round

**CALIBRATION**

**J** - Single J                      **JJ** - Dual J  
**K** - Single K                      **KK** - Dual K

**HOT JUNCTION**

**U** - Ungrounded junction  
**E** - Exposed junction  
**TE** - Twisted, exposed junction (single calibration only)

**INSULATOR MATERIAL**

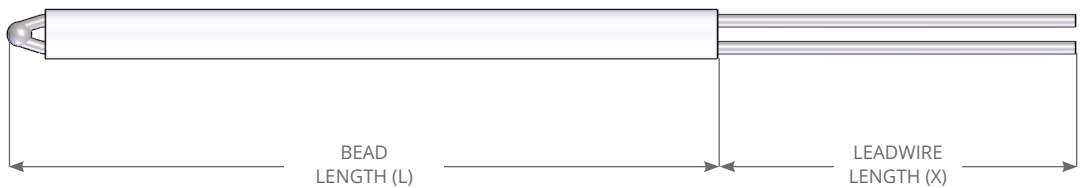
**M** - Mullite

**BEAD LENGTH** (length of insulator + junction)

**L#** - (e.g., L12=12" insulator, including junction end)

**LEADWIRE EXTENSION LENGTH** (length of wires at cold end)

**X#** - (e.g., X3=3" leadwire extension)



**BEADED REPLACEMENT ELEMENT FOR NOBLE-METAL THERMOCOUPLES**

**How to build a part number:**

Select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Consult UE-AST for custom solutions.

SENSOR TYPE	ASSEMBLY STYLE	WIRE GAUGE	BEAD SHAPE	CALIBRATION	HOT JUNCTION	INSULATOR MATERIAL	BEAD LENGTH	LEADWIRE LENGTH

**SENSOR TYPE**

**BTC** - Beaded thermocouple

**ASSEMBLY STYLE**

**51** - Replacement element for beaded noble-metal thermocouple Style 81

**WIRE GAUGE**

**24** - 0.020" diameter

**BEAD SHAPE**

**R** - Round

**CALIBRATION**

- R** - Single R      **RR** - Dual R
- S** - Single S      **SS** - Dual S
- B** - Single B      **BB** - Dual B

**HOT JUNCTION**

**E** - Exposed junction

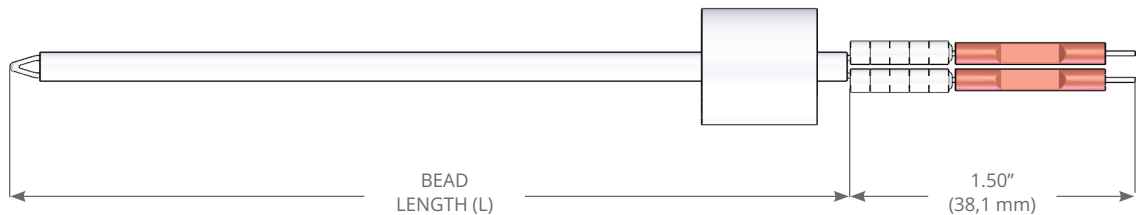
**INSULATOR MATERIAL**

**A** - Alumina

**BEAD LENGTH** (length of insulator + junction)

**L#** - (e.g., L12=12" insulator, including junction end)

**Note:** Single element has 0.125" O.D.; dual has 0.188" O.D.



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