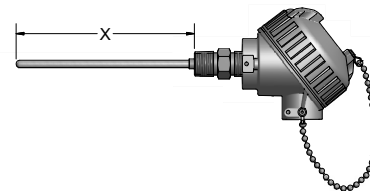
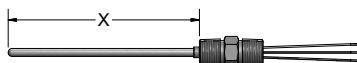
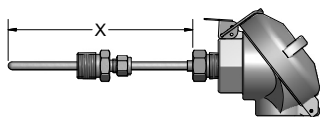


Fixed-Sheath RTD Assemblies with General-Purpose Connection Heads are provided with head mounting fittings that are welded or brazed to the sheath for direct immersion into a process. To order an assembly with an optional 4 to 20 mA transmitter, select the assembly below and the transmitter from the back of this section. The RTD assemblies are supplied with a 316 stainless steel sheath in several diameters. They are available in various tolerances and temperature ranges as noted below.



### ORDER CODES

**Example Order Number:**

1-0 1-1 1-2 2-0 3 4-0 4-1 4-2  
**RBF185L 48 3 - 006(1/2) - 00 - 8HN 31, SB, T-** Select Type and Range from back of section

**1-0 100 Ω Platinum RTD  
Elements α = 0.003 85 °C<sup>-1</sup>**

CODE		TOLERANCE <sup>[1]</sup>
LOW RANGE WIRE WOUND (-200 to 200) °C		
<b>SINGLE</b>	<b>DUPLEX</b>	
R1T185L	R1T285L	Grade B
R5T185L	R5T285L	(1/5) Class B
LOW RANGE THIN FILM (-50 to 200) °C		
RBF185L	RBF285L	Class B
RAF185L	RAF285L	Class A
HIGH RANGE WIRE WOUND (-200 to 600) °C		
R1T185H	R1T285H	Grade B
RAT185H	RAT285H	Class A

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

#### 1-1 Sheath Diameters

CODE	DIAMETERS (inches) 316 SS
28 <sup>[1]</sup>	1/8
38	3/16
48	1/4
68	3/8

[1] Not available in duplex

#### 1-2 Element Connection

CODE	DESCRIPTION
2	2-wire element
3	3-wire element
4 <sup>[1]</sup>	4-wire element

[1] Not available in duplex or with 440 Series Transmitter

#### 2-0 "X" Dimensions

Insert three digit "X" length in inches.

Sheath lengths over 72" will be shipped in a coiled configuration unless otherwise specified.

#### 3-0 No Fitting

CODE	TYPE	NPT SIZE (inches)	PRESSURE-RATED	AVAILABLE SHEATH DIAMETERS (inches)
<b>3-1 One-Time Adjustable Fittings</b>				
01A	303 SS	1/8	NO	1/8, 3/16, 1/4
05A	316 SS	1/8	YES	1/8, 3/16, 1/4
05B	316 SS	1/4	YES	1/8, 3/16, 1/4, 3/8
05C	316 SS	1/2	YES	1/8, 3/16, 1/4, 3/8
15A	Brass	1/8	NO	1/8, 3/16, 1/4
15B	Brass	1/4	NO	3/16, 1/4, 3/8
15C	Brass	1/2	NO	1/4, 3/8
14	Brass/Steel	Flange	NO	1/8, 3/16, 1/4, 3/8

#### 3-2 Re-Adjustable Compression Fittings

CODE	TYPE	NPT SIZE (inches)	AVAILABLE SHEATH DIAMETERS (inches)
10A	303 SS	1/8	1/8, 3/16
10B	303 SS	1/4	1/4, 3/8
10C	303 SS	1/2	1/4, 3/8
12A	316 SS	1/8	1/8, 3/16, 1/4
12B	316 SS	1/4	1/8, 3/16, 1/4, 3/8
12C	316 SS	1/2	1/8, 3/16, 1/4, 3/8
11A	Brass	1/8	1/8, 3/16, 1/4
11B	Brass	1/4	1/8, 3/16, 1/4, 3/8
11C	Brass	1/2	1/4, 3/8
19C	Spring-loaded SS well fitting	1/2	3/16, 1/4

FEP gland standard 204 °C [400 °F] max.

#### 3-3 Fixed Bushings<sup>[1]</sup>

CODE	MOUNTING THREAD NPT (inches)	AVAILABLE SHEATH DIAMETERS (inches)
316 SS		
8A __ <sup>[2]</sup>	1/8	1/8, 3/16, 1/4
8B __ <sup>[2]</sup>	1/4	1/8, 3/16, 1/4, 3/8
8C __ <sup>[2]</sup>	1/2	1/8, 3/16, 1/4, 3/8
8D __ <sup>[2]</sup>	3/4	1/8, 3/16, 1/4, 3/8

[1] Requires Table 4, Option 9HP Selection  
 [2] When ordering fixed bushings, specify order code above plus insert length "U", as measured from hot tip to bottom of threaded bushing.  
 EXAMPLE: order code 8A06 is 1/8" NPT, 316 SS bushing located 6" from hot tip.

#### 4-0 Head Mounting Fittings

CODE	DESCRIPTION
6HN	1/2" x 1/2" NPT steel hex nipple 1" "E" length
8HN	1/2" x 1/2" NPT stainless steel hex nipple 1" "E" length
9HP	1/2" NPT stainless steel bushing (no process threads)
8RND	3/4" x 1/2" NPT stainless steel hex nipple

#### 4-1 Head and Sheath Terminations

CODE	DESCRIPTION
22	3" Individual fluoropolymer leads with terminal pins
31	Aluminum screw-cover head
34	Cast iron screw-cover head
35T-642A	(4 to 20) mA HART® Field Transmitter with aluminum general-purpose housing
36T82-D10	(4 to 20) mA dual input HART® transmitter with digital display and general-purpose aluminum housing with glass lid
37T-662A	(4 to 20) mA HART® dual cavity field temperature transmitter with general-purpose aluminum housing
49	Flip-top aluminum head
63	White polypropylene screw-cover head
91	316 L stainless steel screw-cover head

#### 4-2 Options

CODE	DESCRIPTION
W <sup>[1]</sup>	Epoxy Coating
GS	Ground screw
I	Stainless tag
NB	1/2" NPT nylon conduit reducer bushing
SB	1/2" NPT conduit reducer bushing
T-440	(4 to 20) mA head-mounted RTD transmitter
T-441	(4 to 20) mA isolated head-mounted transmitter
T-442	(4 to 20) mA isolated HART® head-mounted transmitter
T82-00	(4 to 20) mA dual input HART® head-mounted transmitter

**See transmitter ordering information in back of section.**

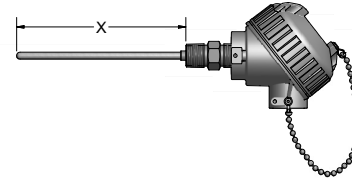
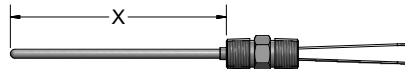
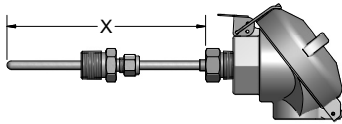
[1] Available with option 31 only.

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# SENSORS WITH CONNECTION HEADS

## Configuration Code GP02 Fixed-Sheath Thermocouple Assemblies with General-Purpose Connection Heads

Fixed-Sheath Thermocouple Assemblies with General-Purpose Connection Heads have head mounting fittings that are welded or brazed to the sheath for direct immersion into a process. To order an assembly with an optional 4 to 20 mA transmitter, select the assembly below and the transmitter from the back of this section. The MgO-insulated thermocouple assemblies are offered in a variety of calibrations, sheath diameters, and sheath materials.



### ORDER CODES

**Example Order Number:**

1-0 1-1 1-2 1-3 2-0 3 4-0 4-1 4-2  
**J 3 8 U - 012 - 01A - 9HP 49, T** Select Type and Range from back of section

#### 1-0 Thermocouple Types

CODE	SINGLE	DUPLEX	TRIPLEX
E	EE	-	-
J	JJ	JJJ	-
K	KK	KKK	-
T	TT	-	-

#### 1-1 Sheath Diameters

CODE	DIAMETER (inches)
2	1/8
3	3/16
4	1/4
6	3/8

#### 1-2 Sheath Materials

CODE	MATERIAL	STANDARD AVAILABLE TYPES
3	Alloy 600	K
4	310 SS	K
5	446 SS	K <sup>[1]</sup>
8	316 SS	E, J, K, T

[1] All sensors with 446SS sheaths must have an ungrounded measuring junction.

#### 1-3 Measuring Junctions

CODE	DESCRIPTION
G	Grounded junction
U	Ungrounded junction
E	Exposed junction

#### 2-0 'X' Dimension

Insert three digit "X" length in inches

Sheath lengths over 72" will be shipped in a coiled configuration unless otherwise specified.

#### 3-0 No Fitting

CODE	00
------	----

#### 3-1 One-Time Adjustable Fittings

CODE	TYPE	NPT SIZE (inches)	PRESSURE-RATED	AVAILABLE SHEATH DIAMETERS (inches)
01A	303 SS	1/8	NO	1/8, 3/16, 1/4
05A	316 SS	1/8	YES	1/8, 3/16, 1/4
05B	316 SS	1/4	YES	1/8, 3/16, 1/4, 3/8
05C	316 SS	1/2	YES	1/8, 3/16, 1/4, 3/8
15A	Brass	1/8	NO	1/8, 3/16, 1/4
15B	Brass	1/4	NO	3/16, 1/4, 3/8
15C	Brass	1/2	NO	1/4, 3/8
14	Brass/Steel	Flange	NO	1/8, 3/16, 1/4, 3/8

#### 3-2 Re-Adjustable Compression Fittings

CODE	TYPE	NPT SIZE (inches)	AVAILABLE SHEATH DIAMETERS (inches)
10A	303 SS	1/8	1/8, 3/16
10B	303 SS	1/4	1/4, 3/8
10C	303 SS	1/2	1/4, 3/8
12A	316 SS	1/8	1/8, 3/16, 1/4
12B	316 SS	1/4	1/8, 3/16, 1/4, 3/8
12C	316 SS	1/2	1/8, 3/16, 1/4, 3/8
11A	Brass	1/8	1/8, 3/16, 1/4
11B	Brass	1/4	1/8, 3/16, 1/4, 3/8
11C	Brass	1/2	1/4, 3/8
19C	Spring-loaded SS well fitting	1/2	3/16, 1/4

FEP gland standard 204 °C [400 °F] max.

#### 3-3 Fixed Bushings<sup>[1]</sup>

CODE	MOUNTING THREAD NPT (inches)	AVAILABLE SHEATH DIAMETERS (inches)
316 SS		
8A __ <sup>[2]</sup>	1/8	1/8, 3/16, 1/4
8B __ <sup>[2]</sup>	1/4	1/8, 3/16, 1/4, 3/8
8C __ <sup>[2]</sup>	1/2	1/8, 3/16, 1/4, 3/8
8D __ <sup>[2]</sup>	3/4	1/8, 3/16, 1/4, 3/8

[1] Requires Table 4, Option 9HP Selection

[2] When ordering fixed bushings, specify order code above plus insert length "U", as measured from hot tip to bottom of threaded bushing. EXAMPLE: order code 8A06 is 1/8" NPT, 316 SS bushing located 6" from hot tip.

#### 4-0 Head Mounting Fittings

CODE	DESCRIPTION
6HN	1/2" x 1/2" NPT steel hex nipple 1" "E" length
8HN	1/2" x 1/2" NPT stainless steel hex nipple 1" "E" length
9HP	1/2" NPT stainless steel bushing (no process threads)
8RND	3/4" x 1/2" NPT stainless steel hex nipple

#### 4-1 Head and Sheath Terminations

CODE	DESCRIPTION
22	3" Individual fluoropolymer leads with terminal pins
31	Aluminum screw-cover head
34	Cast iron screw-cover head
35T-642A	(4 to 20) mA HART® Field Transmitter with aluminum general-purpose housing
36T82-D10	(4 to 20) mA dual input HART® transmitter with digital display and general-purpose aluminum housing with glass lid
37T-662A	(4 to 20) mA HART® dual cavity field temperature transmitter with general-purpose aluminum housing
49	Flip-top aluminum head
63	White polypropylene screw-cover head
91	316 L stainless steel screw-cover head

#### 4-2 Options

CODE	DESCRIPTION
W <sup>[1]</sup>	Epoxy Coating
GS	Ground screw
I	Stainless tag
NB	1/2" NPT nylon conduit reducer bushing
SB	1/2" NPT conduit reducer bushing
T-441	(4 to 20) mA isolated head-mounted transmitter
T-442	(4 to 20) mA isolated Hart® head-mounted transmitter
T82-00	(4 to 20) mA dual input HART® head-mounted transmitter

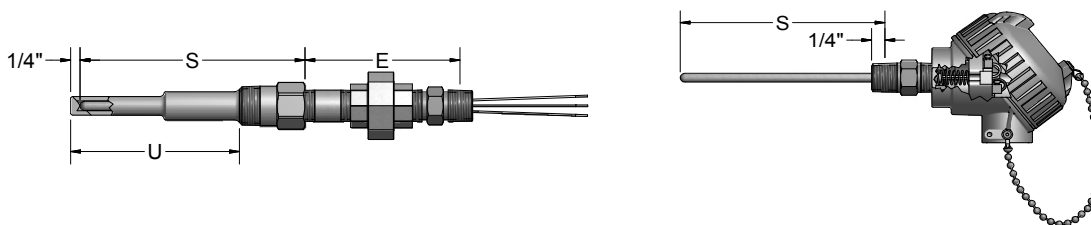
See transmitter ordering information in back of section.

[1] Available with option 31 only.

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Spring-Loaded RTD/Thermowell Assemblies with General-Purpose Connection Heads are designed for use with various thermowell types. Complete assemblies can be ordered by selecting the RTD assembly below, the thermowell from the thermowell section of this catalog, and a temperature transmitter from the back of this section. Assemblies without a thermowell can be ordered by selecting the sensor assembly from this page and inserting the "S" length in table 2-0. These sensors are supplied with a 316 stainless steel sheath and are available in various tolerances and temperature ranges as noted in the tables below.



### ORDER CODES

**Example Order Number:** **R1T185L** **48** **3** - **SL** - **8HN 31, T-**

1-0 1-1 1-2 2-0 3-0 4-0 4-1 4-2

Select Thermowell Part # or Insert 3 Digit Length Code Select Type and Range from back of section

#### 1-0 100 $\Omega$ Platinum RTD Elements $\alpha = 0.00385\ ^\circ\text{C}^{-1}$

CODE	TOLERANCE <sup>[1]</sup>
LOW RANGE WIRE WOUND (-200 to 200) $^\circ\text{C}$	
<b>SINGLE</b>	<b>DUPLEX</b>
R1T185L	R1T285L
R5T185L	R5T285L
LOW RANGE THIN FILM (-50 to 200) $^\circ\text{C}$	
RBF185L	RBF285L
RAF185L	RAF285L
HIGH RANGE WIRE WOUND (-200 to 600) $^\circ\text{C}$	
R1T185H	R1T285H
RAT185H	RAT285H

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

#### 1-1 Sheath Diameters

CODE	DIAMETERS (inches) 316 SS
38	3/16
48	1/4

#### 1-2 Element Connection

CODE	DESCRIPTION
2	2-wire element
3	3-wire element
4 <sup>[1]</sup>	4-wire element

[1] Not available in duplex or with 440 Series Transmitter

#### 3-0 Element Options

CODE	DESCRIPTION
SL <sup>[1]</sup>	Spring-loaded element
SC	Self-contained spring-loaded element
SN	Self-contained spring-loaded element with Buna-N oil seal 121 $^\circ\text{C}$ [250 $^\circ\text{F}$ ] 100 PSI Max.

[1] Not available with option 35T-642A

#### 2-0

Select thermowell part number from Thermowell Section, or specify 3 digit "S" length in inches if no thermowell is required.

#### 4-0 Head Mounting Fittings

CODE	DESCRIPTION	CODE	DESCRIPTION
STEEL FITTINGS		316SS FITTINGS	
6HN	1/2" x 1/2" NPT hex nipple 1" length	8HN	1/2" x 1/2" NPT hex nipple 1" length
6PN <sub>-</sub>	1/2" NPT pipe nipple (specify "E" length in inches)	8PN <sub>-</sub>	1/2" NPT pipe nipple (specify "E" length in inches)
6PU <sub>-</sub> <sup>[1]</sup>	1/2" NPT union/nipple (specify "E" length in inches)	8PU <sub>-</sub> <sup>[1]</sup>	1/2" NPT union/nipple (specify "E" length in inches)

[1] 4" Minimum length required

#### 4-1 Head and Sheath Terminations

CODE	DESCRIPTION
22	3" Individual fluoropolymer leads with terminal pins
31	Aluminum screw-cover head
34	Cast iron screw-cover head
35T-642A	(4 to 20) mA HART <sup>®</sup> Field Transmitter with aluminum general-purpose housing
36T82-D10	(4 to 20) mA dual input HART <sup>®</sup> transmitter with digital display and general-purpose aluminum housing with glass lid
37T-662A	(4 to 20) mA HART <sup>®</sup> dual cavity field temperature transmitter with general-purpose aluminum housing
49	Flip-top aluminum head
63	White polypropylene screw-cover head
91	316 L stainless steel screw-cover head

#### 4-2 Options

W <sup>[1]</sup>	Epoxy Coating
GS	Ground screw
I	Stainless tag
NB	1/2" NPT nylon conduit reducer bushing
SB	1/2" NPT conduit reducer bushing
T-440	(4 to 20) mA head-mounted RTD transmitter
T-441	(4 to 20) mA isolated head-mounted transmitter
T-442	(4 to 20) mA isolated HART <sup>®</sup> head-mounted transmitter
T82-00	(4 to 20) mA dual input HART <sup>®</sup> head-mounted transmitter

See transmitter ordering information in back of section.

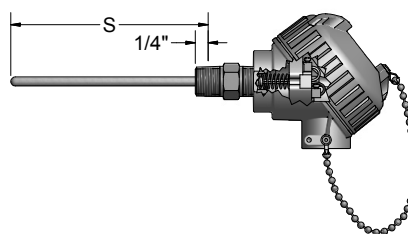
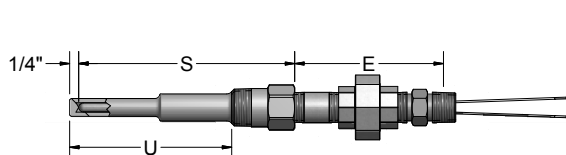
[1] Available with option 31 only.

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# SENSORS WITH CONNECTION HEADS

## Configuration Code GP04 Spring-Loaded MgO Thermocouple/Thermowell Assemblies with General-Purpose Connection Heads

Spring-Loaded MgO Thermocouple/Thermowell Assemblies with General-Purpose Connection Heads are designed for use with various thermowell types. Complete assemblies can be ordered by selecting the MgO assembly below, the thermowell from the thermowell section of this catalog, and a temperature transmitter from the back of this section. Assemblies without a thermowell can be ordered by selecting the sensor assembly from this page and inserting the "S" length in table 2-0. These sensors are supplied with a 316 stainless steel sheath and as standard limits of error.



### ORDER CODES

**Example Order Number:** **J 48 U** - **SL** - **8PU4 31, T-**

1-0 1-1 1-2      2-0      3-0      4-0 4-1 4-2

Select Thermowell Part # or Insert 3 Digit Length Code      Select Type and Range from back of section

#### 1-0 Thermocouple Types

CODE		
SINGLE	DUPLEX	TRIPLEX
E	EE	-
J	JJ	JJJ
K	KK	KKK
T	TT	-

#### 1-1 Sheath Diameters

CODE	DIAMETERS (inches) 316 SS
38	3/16
48	1/4

#### 1-2 Measuring Junction

CODE	DESCRIPTION
G	Grounded junction
U	Ungrounded junction

#### 2-0

Select thermowell part number from Thermowell Section, or specify 3 digit "S" length in inches if no thermowell is required.

#### 3-0 Element Options

CODE	DESCRIPTION
SL <sup>[1]</sup>	Spring-loaded element
SC	Self-contained spring-loaded element
SN	Self-contained spring-loaded element with Buna-N oil seal 121°C [250°F] 100 PSI Max.

[1] Not available with option 35T-642A

#### 4-0 Head Mounting Fittings

CODE	DESCRIPTION
<b>STEEL FITTINGS</b>	
6HN	1/2" x 1/2" NPT hex nipple 1" "E" length
6PN	1/2" NPT pipe nipple (specify "E" length in inches)
6PU <sup>[1]</sup>	1/2" NPT union/nipple (specify "E" length in inches)
<b>316 SS FITTINGS</b>	
8HN	1/2" x 1/2" NPT hex nipple 1" "E" length
8PN	1/2" NPT pipe nipple (specify "E" length in inches)
8PU <sup>[1]</sup>	1/2" NPT union/nipple (specify "E" length in inches)

[1] 4" Minimum length required

#### 4-1 Head and Sheath Terminations

CODE	DESCRIPTION
22	3" Individual fluoropolymer leads with terminal pins
31	Aluminum screw-cover head
34	Cast iron screw-cover head
35T-642A	(4 to 20) mA HART® Field Transmitter with aluminum general-purpose housing
36T82-D10	(4 to 20) mA dual input HART® transmitter with digital display and general-purpose aluminum housing with glass lid
37T-662A	(4 to 20) mA HART® dual cavity field temperature transmitter with general-purpose aluminum housing
49	Flip-top aluminum head
63	White polypropylene screw-cover head
91	316 L stainless steel screw-cover head

#### 4-2 Options

W <sup>[1]</sup>	Epoxy Coating
GS	Ground screw
I	Stainless tag
NB	1/2" NPT nylon conduit reducer bushing
SB	1/2" NPT conduit reducer bushing
T-441	(4 to 20) mA isolated head-mounted transmitter
T-442	(4 to 20) mA isolated HART® head-mounted transmitter
T82-00	(4 to 20) mA dual input HART® head-mounted transmitter

**See transmitter ordering information in back of section.**

[1] Available with option 31 only.

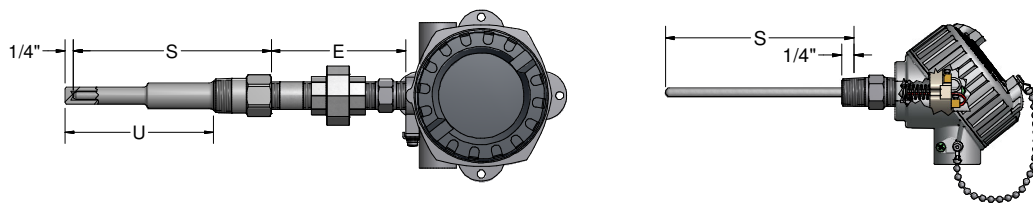
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# SENSORS WITH CONNECTION HEADS

## Configuration Code GP03 Spring-Loaded RTD/Thermowell Assemblies with Explosion-Proof Connection Heads

Spring-Loaded RTD/Thermowell Assemblies with Explosion-Proof Connection Heads are designed for use with various thermowell types. Complete assemblies can be ordered by selecting the RTD assembly below, the thermowell from the thermowell section of this catalog, and a temperature transmitter from the back of this section. Assemblies without a thermowell can be ordered by selecting the sensor assembly from this page and inserting the "S" length in table 2-0. These sensors are supplied with a 316 stainless steel sheath and are available in various tolerances and temperature ranges as noted in the tables below.



### ORDER CODES

**Example Order Number:** **RBF185L** **48** **3** - **SL** - **8HN 93, T-**

1-0 1-1 1-2 2-0 3-0 4-0 4-1 4-2

Select Thermowell Part # or Insert 3 Digit Length Code - Select Type and Range from back of section

#### 1-0 100 $\Omega$ Platinum RTD Elements $\alpha = 0.00385\ ^\circ\text{C}^{-1}$

CODE		TOLERANCE <sup>[1]</sup>
LOW RANGE WIRE WOUND (-200 to 200) $^\circ\text{C}$		
<b>SINGLE</b>	<b>DUPLEX</b>	
R1T185L	R1T285L	Grade B
R5T185L	R5T285L	(1/5) Class B
LOW RANGE THIN FILM (-50 to 200) $^\circ\text{C}$		
RBF185L	RBF285L	Class B
RAF185L	RAF285L	Class A
HIGH RANGE WIRE WOUND (-200 to 600) $^\circ\text{C}$		
R1T185H	R1T285H	Grade B
RAT185H	RAT285H	Class A

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

#### 1-1 Sheath Diameters

CODE	DIAMETERS (inches) 316 SS
38	3/16
48	1/4

#### 1-2 Element Connection

CODE	DESCRIPTION
2	2-wire element
3	3-wire element
4 <sup>[1]</sup>	4-wire element

[1] Not available in duplex or with 440 Series Transmitter

#### 2-0

Select thermowell part number from Thermowell Section, or specify 3 digit "S" length in inches if no thermowell is required.

#### 4-1 Head Terminations

CODE	DESCRIPTION
74	DIN form B aluminum explosion-proof head, Group A
75T-642C	(4 to 20) mA HART <sup>®</sup> field transmitter with aluminum explosion-proof housing, Group A
76T82-D10	(4 to 20) mA dual input HART <sup>®</sup> Field Transmitter with digital display and explosion-proof housing, Group A
77T-662C	(4 to 20) mA HART <sup>®</sup> Field Transmitter with dual cavity explosion-proof aluminum housing, Group A
93	Aluminum explosion-proof head, Group A
94	316L stainless steel explosion-proof head, Group A

#### 4-2 Options

SB	1/2" NPT conduit reducer bushing
I	Stainless tag
T-440 <sup>[1]</sup>	(4 to 20) mA head-mounted RTD transmitter
T-441	(4 to 20) mA isolated head-mounted transmitter
T-442	(4 to 20) mA isolated HART <sup>®</sup> head-mounted transmitter
T82-00	(4 to 20) mA dual input, isolated HART <sup>®</sup> head-mounted transmitter

See transmitter ordering information in back of section.

[1] Not available with option 74.

#### 4-0 Head Mounting Fittings

CODE	DESCRIPTION	CODE	DESCRIPTION
STEEL FITTINGS		316SS FITTINGS	
6HN	1/2" x 1/2" NPT hex nipple 1" length	8HN	1/2" x 1/2" NPT hex nipple 1" length
6PN <sub>-</sub>	1/2" NPT pipe nipple (specify "E" length in inches)	8PN <sub>-</sub>	1/2" NPT pipe nipple (specify "E" length in inches)
6XU <sub>-</sub> <sup>[1]</sup>	1/2" NPT union/nipple (specify "E" length in inches)	8XU <sub>-</sub> <sup>[1]</sup>	1/2" NPT union/nipple (specify "E" length in inches)

[1] 3 1/2" Minimum length required

#### 3-0 Element Options

CODE	DESCRIPTION
SL	Spring-loaded element
SC	Self-contained spring-loaded element
SN	Self-contained spring-loaded element with Buna-N oil seal 121 $^\circ\text{C}$ [250 $^\circ\text{F}$ ] 100 PSI Max.

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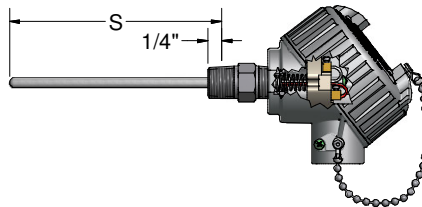
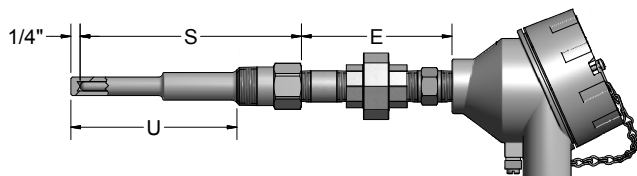




# SENSORS WITH CONNECTION HEADS

## Configuration Code GP04 Spring-Loaded MgO Thermocouple/Thermowell Assemblies with Explosion-Proof Connection Heads

Spring-Loaded MgO Thermocouple/Thermowell Assemblies with Explosion-Proof Connection Heads are designed for use with various thermowell types. Complete assemblies can be ordered by selecting the MgO assembly below, the thermowell from the thermowell section of the catalog, and a temperature transmitter from the back of this section. Assemblies without a thermowell can be ordered by selecting the sensor assembly from this page and inserting the "S" length in table 2-0. These sensors are supplied with a 316 stainless steel sheath and as standard limits or error.



### ORDER CODES

**Example Order Number:**

1-0 1-1 1-2 2-0 3-0 4-0 4-1 4-2  
**J 48 U** - Select Thermowell Part # or Insert 3 Digit Length Code - **SL** - **8XU4 93, T** - Select Type and Range from back of section

#### 1-0 Thermocouple Types

CODE		
SINGLE	DUPLEX	TRIPLEX
E	EE	-
J	JJ	JJJ
K	KK	KKK
T	TT	-

#### 1-1 Sheath Diameters

CODE	DIAMETERS (inches) 316 SS
38	3/16
48	1/4

#### 1-2 Measuring Junction

CODE	DESCRIPTION
G	Grounded junction
U	Ungrounded junction

#### 2-0

Select thermowell part number from Thermowell Section, or specify 3 digit "S" length in inches if no thermowell is required.

#### 3-0 Element Options

CODE	DESCRIPTION
SL	Spring-loaded element
SC	Self-contained spring-loaded element
SN	Self-contained spring-loaded element with Buna-N oil seal 121°C [250°F] 100 PSI Max.

#### 4-0 Head Mounting Fittings

CODE	DESCRIPTION
<b>STEEL FITTINGS</b>	
6HN	1/2" x 1/2" NPT hex nipple 1" "E" length
6PN_	1/2" NPT pipe nipple (specify "E" length in inches)
6XU_ [1]	1/2" NPT union/nipple (specify "E" length in inches)
<b>316 SS FITTINGS</b>	
8HN	1/2" x 1/2" NPT hex nipple 1" "E" length
8PN_	1/2" NPT pipe nipple (specify "E" length in inches)
8XU_ [1]	1/2" NPT union/nipple (specify "E" length in inches)
[1] 3 1/2" Minimum length required	

#### 4-1 Head Terminations

CODE	DESCRIPTION
74	DIN form B aluminum explosion-proof head, Group A
75T-642C	(4 to 20) mA HART® field transmitter with aluminum explosion-proof housing, Group A
76T82-D10	(4 to 20) mA dual input HART® Field Transmitter with digital display and explosion-proof housing, Group A
77T-662C	(4 to 20) mA HART® Field Transmitter with dual cavity explosion-proof aluminum housing, Group A
93	Aluminum explosion-proof head, Group A
94	316L stainless steel explosion-proof head, Group A

#### 4-2 Options

SB	1/2" NPT conduit reducer bushing
I	Stainless tag
T-441	(4 to 20) mA isolated head-mounted transmitter
T-442	(4 to 20) mA isolated HART® head-mounted transmitter
T82-00	(4 to 20) mA Dual input, isolated HART® head-mounted transmitter
See transmitter ordering information in back of section.	

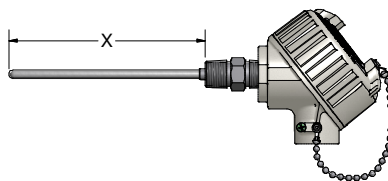
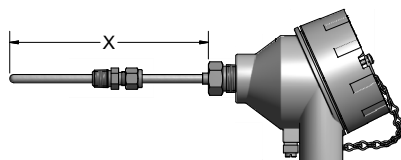
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# SENSORS WITH CONNECTION HEADS

## Configuration Code GP01 Fixed-Sheath RTD Assemblies with Explosion-Proof Connection Heads

Fixed-Sheath RTD Assemblies with Explosion-Proof Connection Heads are provided with head mounting fittings that are welded or brazed to the sheath for direct immersion into a process. To order an assembly with an option 4 to 20 mA transmitter, select the assembly below and the transmitter from the back of this section. The RTD assemblies are supplied with a 316 stainless steel sheath in several diameters. They are available in various tolerances and temperature ranges as noted below.



### ORDER CODES

**Example Order Number:** **RAF185L** **48** **3** - **012(1/2)** - **00** - **8HN 94, SB, T** Select Type and Range from back of section

#### 1-0 100 Ω Platinum RTD Elements α = 0.003 85 °C<sup>-1</sup>

CODE		TOLERANCE <sup>[1]</sup>
LOW RANGE WIRE WOUND (-200 to 200) °C		
SINGLE	DUPLEX	
R1T185L	R1T285L	Grade B
R5T185L	R5T285L	(1/5) Class B
LOW RANGE THIN FILM (-50 to 200) °C		
RBF185L	RBF285L	Class B
RAF185L	RAF285L	Class A
HIGH RANGE WIRE WOUND (-200 to 600) °C		
R1T185H	R1T285H	Grade B
RAT185H	RAT285H	Class A

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

#### 1-1 Sheath Diameters

CODE	DIAMETERS (inches) 316 SS
28 <sup>[1]</sup>	1/8
38	3/16
48	1/4
68	3/8

[1] Not available in duplex

#### 1-2 Element Connection

CODE	DESCRIPTION
2	2-wire element
3	3-wire element
4 <sup>[1]</sup>	4-wire element

[1] Not available in duplex or with 440 Series Transmitter

#### 2-0 "X" Dimensions

Insert three digit "X" length in inches.

Sheath lengths over 72" will be shipped in a coiled configuration unless otherwise specified.

#### 3-0 No Fitting

CODE 00

#### 3-1 One-Time Adjustable Fittings

CODE	TYPE	NPT SIZE (inches)	PRESSURE-RATED	AVAILABLE SHEATH DIAMETERS (inches)
01A	303 SS	1/8	NO	1/8, 3/16, 1/4
05A	316 SS	1/8	YES	1/8, 3/16, 1/4
05B	316 SS	1/4	YES	1/8, 3/16, 1/4, 3/8
05C	316 SS	1/2	YES	1/8, 1/4, 3/8
15A	Brass	1/8	NO	1/8, 3/16, 1/4
15B	Brass	1/4	NO	3/16, 1/4, 3/8
15C	Brass	1/2	NO	1/4, 3/8
14	Brass/Steel	Flange	NO	1/8, 3/16, 1/4, 3/8

#### 3-2 Re-Adjustable Compression Fittings

CODE	TYPE	NPT SIZE (inches)	AVAILABLE SHEATH DIAMETERS (inches)
10A	303 SS	1/8	1/8, 3/16
10B	303 SS	1/4	1/4, 3/8
10C	303 SS	1/2	1/4, 3/8
12A	316 SS	1/8	1/8, 3/16, 1/4
12B	316 SS	1/4	1/8, 3/16, 1/4, 3/8
12C	316 SS	1/2	1/8, 1/4, 3/8
11A	Brass	1/8	1/8, 3/16, 1/4
11B	Brass	1/4	1/8, 3/16, 1/4, 3/8
11C	Brass	1/2	1/4, 3/8
19C	Spring-loaded SS well fitting	1/2	3/16, 1/4

FEP gland standard 204 °C [400 °F] max.

#### 3-3 Fixed Bushings<sup>[1]</sup>

CODE	MOUNTING THREAD NPT (inches)	AVAILABLE SHEATH DIAMETERS (inches)
8A __ <sup>[1]</sup>	1/8	1/8, 3/16, 1/4
8B __ <sup>[1]</sup>	1/4	1/8, 3/16, 1/4, 3/8
8C __ <sup>[1]</sup>	1/2	1/8, 3/16, 1/4, 3/8
8D __ <sup>[1]</sup>	3/4	1/8, 3/16, 1/4, 3/8

[1] Requires Table 4, Option 9HP Selection

[2] When ordering fixed bushings, specify order code above plus insert length "U", as measured from hot tip to bottom of threaded bushing. EXAMPLE: order code 8A06 is 1/8" NPT, 316 SS bushing located 6" from hot tip.

#### 4-0 Head Mounting Fittings

CODE	DESCRIPTION
6HN	1/2" x 1/2" NPT steel hex nipple 1" "E" length
8HN	1/2" x 1/2" NPT stainless steel hex nipple 1" "E" length
9HP	1/2" NPT stainless steel bushing (no process threads)
8RND	3/4" x 1/2" NPT stainless steel hex nipple

#### 4-1 Head Terminations

CODE	DESCRIPTION
74	DIN form B aluminum explosion-proof head, Group A
75T-642C	(4 to 20) mA HART® field transmitter with aluminum explosion-proof housing, Group A
76T82-D10	(4 to 20) mA dual input HART® Field Transmitter with digital display and explosion-proof housing, Group A
77T-662C	(4 to 20) mA HART® Field Transmitter with dual cavity explosion-proof aluminum housing, Group A
93	Aluminum explosion-proof head, Group A
94	316L stainless steel explosion-proof head, Group A

#### 4-2 Options

SB	1/2" NPT conduit reducer bushing
I	Stainless tag
T-440 <sup>[1]</sup>	(4 to 20) mA head-mounted RTD transmitter
T-441	(4 to 20) mA isolated head-mounted transmitter
T-442	(4 to 20) mA isolated HART® head-mounted transmitter
T82-00	(4 to 20) mA dual input, isolated HART® head-mounted transmitter

See transmitter ordering information in back of section.

[1] Not available with option 74.

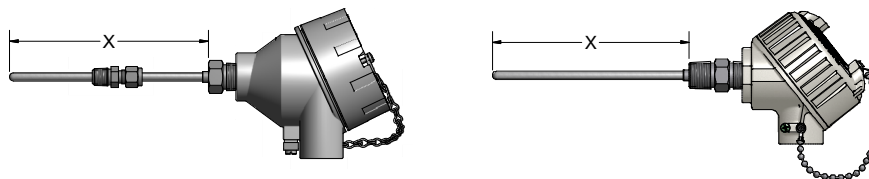
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# SENSORS WITH CONNECTION HEADS

## Configuration Code GP02 Fixed-Sheath Thermocouple Assemblies with Explosion-Proof Connection Heads

Fixed-Sheath Thermocouple Assemblies with Explosion-Proof Connection Heads are provided with head mounting fittings that are welded or brazed to the sheath for direct immersion into a process. To order an assembly with an optional 4 to 20 mA transmitter, select the assembly below and the transmitter from the back of this section. The MgO-insulated thermocouple assemblies are offered in a variety of calibrations, sheath diameters, and sheath materials.



### ORDER CODES

Example Order Number:

1-0 1-1 1-2 1-3 2-0 3 4-0 4-1 4-2  
**J 2 8 U - 012 - 01A - 9HP 74, T-** Select Type and Range from back of section

#### 1-0 Thermocouple Type

CODE	SINGLE	DUPLEX	TRIPLEX
E	EE	-	-
J	JJ	JJJ	-
K	KK	KKK	-
T	TT	-	-

#### 1-1 Sheath Diameters

CODE	DIAMETER (inches)
2	1/8
3	3/16
4	1/4
6	3/8

#### 1-2 Sheath Materials

CODE	MATERIAL	STANDARD AVAILABLE TYPES
3	Alloy 600	K
4	310 SS	K
5	446 SS	K <sup>[1]</sup>
8	316 SS	E, J, K, T

[1] All sensors with 446SS sheaths must have an ungrounded measuring junction.

#### 1-3 Measuring Junctions

CODE	DESCRIPTION
G	Grounded junction
U	Ungrounded junction
E	Exposed junction

#### 2-0 'X' Dimension

Insert three digit "X" length in inches

Sheath lengths over 72" will be shipped in a coiled configuration unless otherwise specified.

#### 3-0 No Fitting

CODE	00
------	----

#### 3-1 One-Time Adjustable Fittings

CODE	TYPE	NPT SIZE (inches)	PRESSURE-RATED	AVAILABLE SHEATH DIAMETERS (inches)
01A	303 SS	1/8	NO	1/8, 3/16, 1/4
05A	316 SS	1/8	YES	1/8, 3/16, 1/4
05B	316 SS	1/4	YES	1/8, 3/16, 1/4, 3/8
05C	316 SS	1/2	YES	1/8, 1/4, 3/8
15A	Brass	1/8	NO	1/8, 3/16, 1/4
15B	Brass	1/4	NO	3/16, 1/4, 3/8
15C	Brass	1/2	NO	1/4, 3/8
14	Brass/Steel	Flange	NO	1/8, 3/16, 1/4, 3/8

#### 3-2 Re-Adjustable Compression Fittings

CODE	TYPE	NPT SIZE (inches)	AVAILABLE SHEATH DIAMETERS (inches)
10A	303 SS	1/8	1/8, 3/16
10B	303 SS	1/4	1/4, 3/8
10C	303 SS	1/2	1/4, 3/8
12A	316 SS	1/8	1/8, 3/16, 1/4
12B	316 SS	1/4	1/8, 3/16, 1/4, 3/8
12C	316 SS	1/2	1/8, 1/4, 3/8
11A	Brass	1/8	1/8, 3/16, 1/4
11B	Brass	1/4	1/8, 3/16, 1/4, 3/8
11C	Brass	1/2	1/4, 3/8
19C	Spring-loaded SS well fitting	1/2	3/16, 1/4

FEP gland standard 204 °C [400 °F] max.

#### 3-3 Fixed Bushings<sup>[1]</sup>

CODE	MOUNTING THREAD NPT (inches)	AVAILABLE SHEATH DIAMETERS (inches)
316 SS		
8A _ _ <sup>[1]</sup>	1/8	1/8, 3/16, 1/4
8B _ _ <sup>[1]</sup>	1/4	1/8, 3/16, 1/4, 3/8
8C _ _ <sup>[1]</sup>	1/2	1/8, 3/16, 1/4, 3/8
8D _ _ <sup>[1]</sup>	3/4	1/8, 3/16, 1/4, 3/8

[1] Requires Table 4, Option 9HP Selection

[2] When ordering fixed bushings, specify order code above plus insert length "U", as measured from hot tip to bottom of threaded bushing. EXAMPLE: order code 8A06 is 1/8" NPT, 316 SS bushing located 6" from hot tip.

#### 4-0 Head Mounting Fittings

CODE	DESCRIPTION
6HN	1/2" x 1/2" NPT steel hex nipple 1" "E" length
8HN	1/2" x 1/2" NPT stainless steel hex nipple 1" "E" length
9HP	1/2" NPT stainless steel bushing (no process threads)
8RNDC	3/4" x 1/2" NPT stainless steel hex nipple

#### 4-1 Head Terminations

CODE	DESCRIPTION
74	DIN form B aluminum explosion-proof head, Group A
75T-642C	(4 to 20) mA HART® field transmitter with aluminum explosion-proof housing, Group A
76T82-D10	(4 to 20) mA dual input HART® Field Transmitter with digital display and explosion-proof housing, Group A
77T-662C	(4 to 20) mA HART® Field Transmitter with dual cavity explosion-proof aluminum housing, Group A
93	Aluminum explosion-proof head, Group A
94	316L stainless steel explosion-proof head, Group A

#### 4-2 Options

SB	1/2" NPT conduit reducer bushing
I	Stainless tag
T-441	(4 to 20) mA isolated head-mounted transmitter
T-442	(4 to 20) mA isolated HART® head-mounted transmitter
T82-00	(4 to 20) mA dual input, isolated HART® head-mounted transmitter

See transmitter ordering information in back of section.

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# SENSORS WITH CONNECTION HEADS

## Thermocouple and RTD Spring-Loaded Replacement Elements

Thermocouple and RTD spring-Loaded Replacement elements are designed for spring-loaded thermowell assemblies. The replacement elements can be ordered by selecting the sensor type below and inserting the "X" length in table 2-0. The RTD assemblies are supplied with a 316 stainless steel sheath and are available in various tolerances and temperature ranges as noted in the tables below. The MgO-insulated thermocouple assemblies are supplied with a 316 stainless steel sheath, various calibrations, and as standard limits of error.



### ORDER CODES

Configuration Code GP06

#### Thermocouple

Example Order Number:

1-0 1-1 2-0 3-0 4-0  
**J48 U - 012 - SL - 22(06)**

#### 1-0 Thermocouple Types

CODE			AVAILABLE SHEATH DIAMETERS (316 SS)	
SINGLE	DUPLEX	TRIPLEX	3/16" O.D.	1/4" O.D.
E	EE	-	38	48
J	JJ	JJJ	38	48
K	KK	KKK	38	48
T	TT	-	38	48

#### 1-1 Measuring Junction

CODE	DESCRIPTION
G	Grounded junction
U	Ungrounded junction

#### 4-0 Sheath Terminations

CODE	DESCRIPTION
22 <sup>[1]</sup>	3" Individual fluoropolymer leads with terminal pins
[1] For longer leads, insert 2 digit length in inches. Example: 22(06)	

#### 3-0 Element Style

CODE	DESCRIPTION
SL	Spring-loaded element
00	Supplied without spring

#### 2-0 Length

CODE
Insert 3 Digit "X" length in inches

### ORDER CODES

Configuration Code GP05

RTD Example Order Number:

1-0 1-1 1-2 2-0 3-0 4-0  
**R1T185L 48 3 - 012(1/2) - 00 - 22**

#### 1-0 100 Ω Platinum RTD Elements $\alpha = 0.00385\text{ }^{\circ}\text{C}^{-1}$

CODE		TOLERANCE <sup>[1]</sup>
LOW RANGE WIRE WOUND (-200 to 200) °C		
SINGLE	DUPLEX	
R1T185L	R1T285L	Grade B
R5T185L	R5T285L	(1/5) Class B
LOW RANGE THIN FILM (-50 to 200) °C		
RBF185L	RBF285L	Class B
RAF185L	RAF285L	Class A
HIGH RANGE WIRE WOUND (-200 to 600) °C		
R1T185H	R1T285H	Grade B
RAT185H	RAT285H	Class A
[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.		

#### 1-1 Sheath Diameters

CODE	DIAMETERS (inches) 316 SS
38	3/16
48	1/4

#### 4-0 Sheath Terminations

CODE	DESCRIPTION
22 <sup>[1]</sup>	3" Individual fluoropolymer leads with terminal pins
[1] For longer leads insert 2 digit length in inches. Example: 22(06)	

#### 3-0 Element Style

CODE	DESCRIPTION
SL	Spring-loaded element
00	Supplied without spring

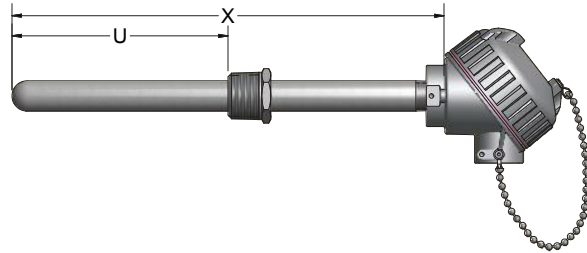
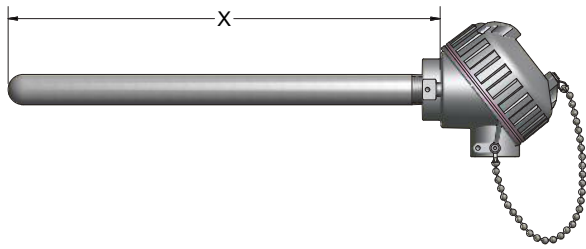
#### 2-0 Length

CODE
Insert 3 Digit "X" length in inches

#### 1-2 Element Connection

CODE	DESCRIPTION
2	2-wire element
3	3-wire element
4	4-wire element





**Example  
Order  
Number:**

1-0 1-1 1-2 1-3 1-4 2-0 3-0 4-0 5-0 6-0 6-1  
**K 4 8 U M8VS - 8-75 - 36 - SL - 815R133 - 31, I**

**1-0 Thermocouple Type**

CODE		
SINGLE	DUPLEX	TRIPLEX
J	JJ	JJJ
K	KK	KKK
E	EE	-
T	TT	-
N	NN	-

**1-1 Sheath Diameter**

CODE	DESCRIPTION
4	1/4 inch
6	3/8 inch

**1-2 Sheath Material**

CODE	DESCRIPTION
8	316 Stainless steel
3	Alloy 600

**1-3 Junction Style**

CODE	DESCRIPTION
G	Grounded junction
U	Ungrounded junction

**1-4 Element Options**

CODE	DESCRIPTION
M	Special limits of error
8VS	316 Stainless steel vibration spacers (see table on GP12)

**2-0 Pipe Material and Size**

CODE	MATERIAL	MAX TEMP	CODE (INCHES)	
			1/2 INCH NPT	3/4 INCH NPT
6	Carbon steel	538 °C [1000 °F]	50	75
8	316 Stainless steel	927 °C [1700 °F]	50	75
5	446 Stainless steel	1093 °C [2000 °F]	50	75
3	Alloy 600	1149 °C [2100 °F]	50	75
7	Alloy 601	1260 °C [2300 °F]	50	75
41	HR 160	1204 °C [2200 °F]	50	75

**6-0 Head Terminations and Options**

CODE	DESCRIPTION
31	Aluminum screw-cover head
34	Cast iron screw-cover head
91	316 L Stainless steel screw-cover head
49	Aluminum flip-top head

**6-1 OPTIONS**

SB	1/2 inch NPT conduit reducer bushing
I	Stainless steel tag
GS	Ground screw
H	Adjustable steel mounting flange

**5-0 Optional Welded Fittings**

CODE		DESCRIPTION
STEEL	316 SS	
6D(U)	8D(U)	3/4 inch NPT welded bushing (50 tubes only)
6E(U)	8E(U)	1 inch NPT welded bushing
6F(U)	8F(U)	1 (1/4) inch NPT welded bushing
6G(U)	8G(U)	1 (1/2) inch NPT welded bushing
6H(U)	8H(U)	2 inch NPT welded bushing
610R1(U)	810R1(U)	1 inch 150# class raised-face flange
615R1(U)	815R1(U)	1 (1/2) inch 150# class raised-face flange
620R1(U)	820R1(U)	2 inch 150# class raised-face flange

Other sizes and materials available - consult factory.

**4-0 Element Options**

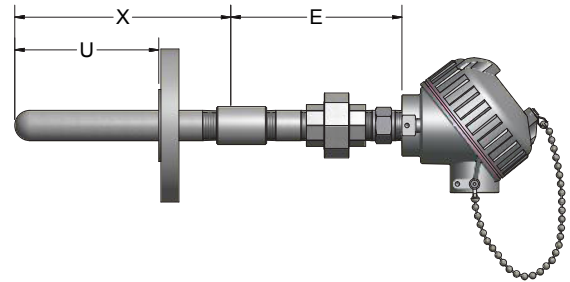
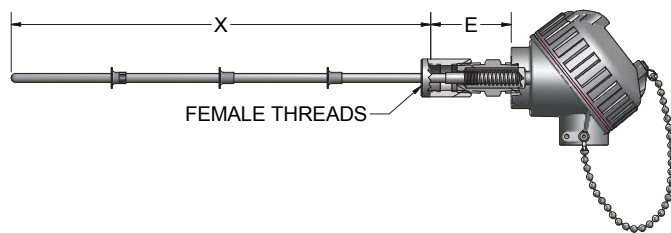
CODE	DESCRIPTION
SL	Spring-loaded element
LE	Loose element

**3-0 Protection Tube**

"X" LENGTH
Specify length in one inch increments. 4 inch minimum to 240 inch maximum.

# SENSORS WITH CONNECTION HEADS

## Configuration Code GP10 MgO Thermocouple Pipe Wells with Self-Contained, Spring-Loaded Elements and Optional Transmitters



**Example  
Order  
Number:**

1-0 1-1 1-2 1-3 1-4 2-0 3-0 4-0 5-0 6-0 7-0 7-1  
**K 4 8 U M8VS - 8-75 - 36 - 815R130 - PC - 8PU4 31, I**

### 1-0 Thermocouple Type

CODE	SINGLE	DUPLEX	TRIPLEX
J	JJ	JJJ	
K	KK	KKK	
E	EE	-	
T	TT	-	
N	NN	-	

### 1-3 Junction Style

CODE	DESCRIPTION
G	Grounded junction
U	Ungrounded junction

### 1-4 Element Options

CODE	DESCRIPTION
M	Special limits of error
8VS	316 Stainless steel vibration spacers (see table on GP11)

### 2-0 Pipe Material and Size

CODE	MATERIAL	MAX TEMP	CODE (INCHES)	
			1/2 INCH NPT	3/4 INCH NPT
6	Carbon steel	538 °C [1000 °F]	50	75
8	316 Stainless steel	927 °C [1700 °F]	50	75
5	446 Stainless steel	1093 °C [2000 °F]	50	75
3	Alloy 600	1149 °C [2100 °F]	50	75
7	Alloy 601	1260 °C [2300 °F]	50	75
41	HR 160	1204 °C [2200 °F]	50	75
00 <sup>[1]</sup>	No protection tube	N/A	50	75

[1] Supplied with a female process connection.

### 3-0 Protection Tube

#### "X" LENGTH

Specify length in one inch increments. 4 inch minimum to 240 inch maximum.

### 4-0 Optional Welded Fittings

CODE		DESCRIPTION
STEEL	316 SS	
6D(U)	8D(U)	3/4 inch NPT welded bushing (50 tubes only)
6E(U)	8E(U)	1 inch NPT welded bushing
6F(U)	8F(U)	1 (1/4) inch NPT welded bushing
6G(U)	8G(U)	1 (1/2) inch NPT welded bushing
6H(U)	8H(U)	2 inch NPT welded bushing
610R1(U)	810R1(U)	1 inch 150# class raised-face flange
615R1(U)	815R1(U)	1 (1/2) inch 150# class raised-face flange
620R1(U)	820R1(U)	2 inch 150# class raised-face flange

Other sizes and materials available - consult factory

### 7-0 Head Terminations and Options

CODE	DESCRIPTION
22	3 inch individual leads with terminal pins
31	Aluminum screw-cover head
34	Cast iron screw-cover head
91	316 L Stainless steel screw-cover head
49	Aluminum flip-top head
35T-642A	(4 to 20) mA Isolated HART® field transmitter with general-purpose aluminum housing
37T-662A	(4 to 20) mA HART® dual cavity field temperature transmitter with general-purpose aluminum housing
75T-642C	(4 to 20) mA Isolated HART® field transmitter with explosion-proof aluminum housing, Group A
77T-662C	(4 to 20) mA HART® Field Transmitter with dual cavity explosion-proof aluminum housing, Group A

### 7-1 OPTIONS AND TRANSMITTERS

SB	1/2 inch NPT conduit reducer bushing
I	Stainless steel tag
GS	Ground screw
H	Adjustable steel mounting flange
T-441 <sup>[1]</sup>	(4 to 20) mA Isolated head-mounted transmitter
T-442 <sup>[1]</sup>	(4 to 20) mA Isolated HART® head-mounted transmitter
T82-00	(4 to 20) mA dual input HART® head-mounted transmitter

[1] Not available with option 71 or 81

See Transmitter section for transmitter ordering information

### 6-0 Head Mounting Fittings

CODE		DESCRIPTION
STEEL	316 SS	
6HN	8HN	1/2 inch X 1/2 inch NPT hex nipple 2 Inch "E" length
6PU <sup>[1]</sup>	8PU <sup>[1]</sup>	1/2 inch NPT union/hex nipple (specify "E" length)
6XU <sup>[2]</sup>	8XU <sup>[2]</sup>	1/2 inch NPT explosion-proof union/hex nipple (specify "E" length)

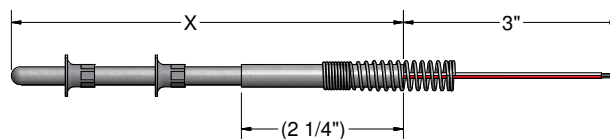
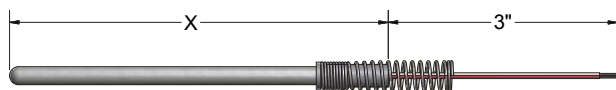
[1] 4 Inch minimum "E" length required, not available with option 71, 72, 81, or 75T

[2] 3 (1/2) Inch minimum "E" length required

### 5-0 Element Options

CODE	DESCRIPTION
PC	Self-contained spring-loaded element





**Example  
Order  
Number:**

1-0 1-1 1-2 1-3 1-4 2-0 3-0 4-0  
**K 4 8 U M8VS50 - 36 - PC - 22(06)**

**1-0 Thermocouple Type**

CODE		
SINGLE	DUPLEX	TRIPLEX
J	JJ	JJJ
K	KK	KKK
E	EE	-
T	TT	-
N	NN	-

**1-1 Sheath Diameter**

CODE	DESCRIPTION
4	1/4 inch
6 <sup>1</sup>	3/8 inch

<sup>1</sup> Not available with PC option

**1-2 Sheath Material**

CODE	DESCRIPTION
8	316 Stainless steel
3	Alloy 600

**1-3 Junction Style**

CODE	DESCRIPTION
G	Grounded junction
U	Ungrounded junction

**1-4 Element Options**

CODE	DESCRIPTION
M	Special limits of error
8VS50	316 Stainless steel vibration spacers for 1/2 inch schedule 40 pipe
8VS75	316 Stainless steel vibration spacers for 3/4 inch schedule 40 pipe

**4-0 Sheath Termination**

CODE	DESCRIPTION
22 <sup>1</sup>	3 inch individual leads with terminal pins
10 <sup>1</sup>	2 inch stripped leads

<sup>1</sup> For longer leads, insert 2 digit length in inches.  
Example: 22(06) or 10(04)

**3-0 Element Options**

CODE	DESCRIPTION
SL <sup>1</sup>	Spring-loaded element
PC <sup>1</sup>	Self contained spring-loaded element
LE <sup>2</sup>	Loose element

<sup>1</sup> Only available with option 22 sheath termination  
<sup>2</sup> Only available with option 10 sheath termination

**2-0 Element**

"X" LENGTH
Specify length in one inch increments. 4 inch minimum to 240 inch maximum.

**Replacement Element "X" Dimension Calculations**

ASSEMBLY TYPE	REPLACEMENT ELEMENT "X" DIMENSION
SL	Assembly "X" length - 1/4 inch
PC	Assembly "X" length + "E" length + 1/2 inch
LE	Same as assembly "X" length

**Standard Vibration Spacer Placement**

ASSEMBLY LENGTH	SPACER SPECIFICATIONS
4 inches to 18 inches	2 spacers equally spaced
> 18 inches to 36 inches	3 spacers equally spaced
> 36 inches	1 additional spacer for each additional 18 inches. All spacers are equally spaced.

### ORDER CODES

**Example Order Number:**

1-0 1-1 1-2 1-3 1-4 1-5 1-6  
**440** -  - **3 85 U** - **S(0-200) C**

#### 1-0 Transmitter Type

CODE	DESCRIPTION
440 <sup>[1]</sup>	(4 to 20) mA programmable head-mounted RTD Transmitter
441	(4 to 20) mA programmable head-mounted universal Transmitter
442	(4 to 20) mA HART® programmable head-mounted universal Transmitter
35T-642A	(4 to 20) mA HART® Field Transmitter with general-purpose aluminum housing
75T-642C	(4 to 20) mA HART® Field Transmitter with explosion-proof aluminum housing FM/ CSA / XP Class I Div I Groups A,B,C,D; DIP Class II Div I Groups E,F,G; Class III; NI Class I Div II Groups A,B,C,D

[1] Only available with 2- or 3-wire input connection and Pt100 sensor type

#### 1-1 Options (For 642 Series only)

CODE	DESCRIPTION
T	Solid cover
D	Glass cover with digital display
Leave blank if using 440, 441, or 442	

#### 1-2 Input Type

CODE	DESCRIPTION
00 <sup>[1]</sup>	Unconfigured
1	Thermocouple (TC)
2	RTD (2-wire)
3	RTD (3-wire)
4	RTD (4-wire)

[1] Default setting supplied as 3-wire Pt100 (0-100) °C

#### 1-6 Unit of Measure

CODE	DESCRIPTION
C	Celsius
F	Fahrenheit

#### 1-5 Range

CODE	DESCRIPTION
S	(lower limit – upper limit)

#### 1-4 Failure Mode

CODE	DESCRIPTION
U	Upscale Burnout ≥ 20.5 mA
D	Downscale Burnout ≤ 3.8 mA

#### 1-3 Sensor Type

CODE	DESCRIPTION
J	Type J thermocouple
K	Type K thermocouple
T	Type T thermocouple
N	Type N thermocouple
E	Type E thermocouple
85	100 ohm platinum ( $\alpha = 0.00385\text{ }^{\circ}\text{C}^{-1}$ )

**For complete transmitter specifications see Transmitter Section.**

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### ORDER CODES

**Example Order Number:**

1-0 1-1 1-2 1-3 1-4 1-5 1-6 1-7 1-8  
**37T-662A - D - 33 - 85 - 85 - A - U - S(0-200) C**

#### 1-0 Transmitter Type

CODE	DESCRIPTION
37T-662A	(4 to 20) mA HART® Field Transmitter, single or dual input, with general-purpose dual cavity aluminum housing
77T-662C	(4 to 20) mA HART® Field Transmitter with dual-cavity explosion-proof aluminum housing FM/CSA XP Class I Div I Groups B,C,D; DIP Class II Div I Groups E,F,G; Class III; NI Class I Div II Groups B,C,D
T82-00	(4 to 20) mA dual input, isolated HART® head-mounted Transmitter
36T82	(4 to 20) mA dual input HART® Transmitter and general-purpose aluminum housing
76T82	(4 to 20) mA dual input HART® programmable Transmitter with digital display and explosion-proof aluminum housing, FM/CSA,NI,IS,XP,DIP Class I Div I and Div II, Groups A,B,C,D

#### 1-1 Housing Cover Options

CODE	DESCRIPTION
T	Solid cover for 662 series
D	Glass cover with digital display for 662 series
D10	Glass cover with digital display for 36T82 and 76T82 series

#### 1-2 Configuration Input

CODE	DESCRIPTION
2I	Ch1: RTD 2-wire, Ch2: inactive
22	Ch1: RTD 2-wire, Ch2: RTD 2-wire
23	Ch1: RTD 2-wire, Ch2: RTD 3-wire
2T	Ch1: RTD 2-wire, Ch2: Thermocouple
3I	Ch1: RTD 3-wire, Ch2: inactive
32	Ch1: RTD 3-wire, Ch2: RTD 2-wire
33	Ch1: RTD 3-wire, Ch2: RTD 3-wire
3T	Ch1: RTD 3-wire, Ch2: Thermocouple
4I	Ch1: RTD 4-wire, Ch2: inactive
4T	Ch1: RTD 4-wire, Ch2: Thermocouple
TI	Ch1: Thermocouple, Ch2: inactive
TT	Ch1: Thermocouple, Ch2: Thermocouple

#### 1-8 Unit of Measure

CODE	DESCRIPTION
C	Celsius
F	Fahrenheit

#### 1-7 Range

CODE	DESCRIPTION
S	(lower limit – upper limit)

#### 1-6 Failure Mode

CODE	DESCRIPTION
U	Upscale Burnout $\geq 20.5$ mA
D	Downscale Burnout $\leq 3.8$ mA

#### 1-5 Input Set-ups

CODE	DESCRIPTION
0	One Input (662 only)
A	Process Variable = Ch1; CH2 = inactive
B	Process variable = CH1; secondary variable = Ch2 (T82 Only)
C	Process variable = the difference between CH1 and Ch2
D	Process variable = the average between CH1 and Ch2
E	Sensor backup; Process variable= Ch1 and Ch2

#### 1-4 Sensor Input Channel 2

CODE	DESCRIPTION
J	Type J thermocouple
K	Type K thermocouple
T	Type T thermocouple
N	Type N thermocouple
E	Type E thermocouple
85	100 ohm platinum ( $\alpha = 0.00385$ °C <sup>-1</sup> )
00	No second channel

#### 1-3 Sensor Input Channel 1

CODE	DESCRIPTION
J	Type J thermocouple
K	Type K thermocouple
T	Type T thermocouple
N	Type N thermocouple
E	Type E thermocouple
85	100 ohm platinum ( $\alpha = 0.00385$ °C <sup>-1</sup> )

**For complete transmitter specifications  
see Transmitter Section.**

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Fixed-sheath RTD assemblies with miniature heads are offered with mounting fittings that are welded or brazed to the sheath for direct immersion into a process. The miniature heads offer a compact design and are ideal for laboratory applications or applications where space is limited. The RTD assemblies are supplied with a 316 stainless steel sheath in several diameters. They are offered in various tolerances and temperature ranges as noted below.



### ORDER CODES

**Example Order Number:** **1-0** **1-1** **1-2** **2-0** **3** **4-0** **4-1**  
**RBF185L 48 3 - 006(1/2) - 00 - 8HPB 25**

#### 1-0 100 $\Omega$ Platinum RTD Elements $\alpha = 0.00385 \text{ } ^\circ\text{C}^{-1}$

CODE	TOLERANCE <sup>[1]</sup>
LOW RANGE WIRE WOUND (-200 to 200) $^\circ\text{C}$	
<b>SINGLE</b>	
R1T185L	Grade B
R5T185L	(1/5) Class B
LOW RANGE THIN FILM (-50 to 200) $^\circ\text{C}$	
RBF185L	Class B
RAF185L	Class A
HIGH RANGE WIRE WOUND (-200 to 600) $^\circ\text{C}$	
R1T185H	Grade B

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

#### 1-1 Sheath Diameters

CODE	DIAMETERS (inches) 316 SS
28	1/8
38	3/16
48	1/4
68	3/8

#### 1-2 Element Connection

CODE	DESCRIPTION
2	2 wire element
3	3 wire element
4	4 wire element

#### 2-0 "X" Dimensions

Insert three digit "X" length in inches.
Sheath lengths over 72" will be shipped in a coiled configuration unless otherwise specified.

#### 3-0 No Fitting

CODE	DESCRIPTION
00	No fitting

#### 3-1 One-Time Adjustable Fittings

CODE	TYPE	NPT SIZE (inches)	PRESSURE-RATED	AVAILABLE SHEATH DIAMETERS (inches)
01A	303 SS	1/8	NO	1/8, 3/16, 1/4
05A	316 SS	1/8	YES	1/8, 3/16, 1/4
05B	316 SS	1/4	YES	1/8, 3/16, 1/4, 3/8
05C	316 SS	1/2	YES	1/8, 3/16, 1/4, 3/8
15A	Brass	1/8	NO	1/8, 3/16, 1/4
15B	Brass	1/4	NO	3/16, 1/4, 3/8
15C	Brass	1/2	NO	1/4, 3/8

#### 3-2 Re-Adjustable Compression Fittings

CODE	TYPE	NPT SIZE (inches)	AVAILABLE SHEATH DIAMETERS (inches)
10A	303 SS	1/8	1/8, 3/16
10B	303 SS	1/4	1/4, 3/8
10C	303 SS	1/2	1/4, 3/8
12A	316 SS	1/8	1/8, 3/16, 1/4
12B	316 SS	1/4	1/8, 3/16, 1/4, 3/8
12C	316 SS	1/2	1/8, 3/16, 1/4, 3/8
11A	Brass	1/8	1/8, 3/16, 1/4
11B	Brass	1/4	1/8, 3/16, 1/4, 3/8
11C	Brass	1/2	1/4, 3/8
19C	Spring-loaded SS well fitting	1/2	3/16, 1/4

FEP gland standard 204  $^\circ\text{C}$  [400  $^\circ\text{F}$ ] max.

#### 3-3 Fixed Bushings

CODE	MOUNTING THREAD NPT (inches)	AVAILABLE SHEATH DIAMETERS (inches)
316 SS		
8A __ <sup>[1]</sup>	1/8	1/8, 3/16, 1/4
8B __ <sup>[1]</sup>	1/4	1/8, 3/16, 1/4, 3/8
8C __ <sup>[1]</sup>	1/2	1/8, 3/16, 1/4, 3/8
8D __ <sup>[1]</sup>	3/4	1/8, 3/16, 1/4, 3/8

[1] When ordering fixed bushings, specify order code above plus insert length "U", as measured from hot tip to bottom of threaded bushing. EXAMPLE: order code 8A06 is 1/8" NPT, 316 SS bushing located 6" from hot tip.

#### 4-0 Head Mounting Fittings

CODE	DESCRIPTION
9HNB	1/4" x 1/4" stainless steel hex nipple
8HPB	1/4" stainless steel hex bushing (no process threads)
8CFB	1/4" NPT 316 stainless steel compression fitting (no process threads)
22CFB	1/4" NPT brass compression fitting (no process threads)

#### 4-1 Miniature Head Terminations

CODE	DESCRIPTION
17	Miniature plastic head (3/8" NPT conduit opening)
25	Miniature nickel-plated head

# SENSORS WITH CONNECTION HEADS

## Configuration Code GP08 Fixed-Sheath Thermocouple Assemblies with Miniature Connection Heads

Fixed-Sheath Thermocouple Assemblies with miniature connection heads are offered with mounting fittings that are welded or brazed to the sheath for direct immersion into a process. The miniature heads offer a compact design and are ideal for laboratory applications or applications where space is limited. The MgO-insulated thermocouple assemblies are offered in a variety of calibrations, sheath diameters, and sheath materials.



### ORDER CODES

Example Order Number:

1-0 1-1 1-2 1-3 2-0 3 4-0 4-1  
**J 3 8 U - 012 - 01A - 8HPB 25**

#### 1-0 Thermocouple Types

CODE	
SINGLE	DUPLEX
E	EE
J	JJ
K	KK
T	TT

#### 1-1 Sheath Diameters

CODE	DIAMETER (inches)
2	1/8
3	3/16
4	1/4
6	3/8

#### 1-2 Sheath Materials

CODE	MATERIAL	STANDARD AVAILABLE TYPES
3	Alloy 600	K
4	316 SS	K
5	446 SS	K <sup>[1]</sup>
8	316 SS	E, J, K, T

[1] All sensors with 446SS sheaths must have an ungrounded measuring junction.

#### 1-3 Measuring Junctions

CODE	DESCRIPTION
G	Grounded junction
U	Ungrounded junction
E	Exposed junction

#### 2-0 'X' Dimension

Insert three digit "X" length in inches

Sheath lengths over 72" will be shipped in a coiled configuration unless otherwise specified.

#### 3-0 No Fitting

CODE	
00	

#### 3-1 One-Time Adjustable Fittings

CODE	TYPE	NPT SIZE (inches)	PRESSURE RATED	AVAILABLE SHEATH DIAMETERS (inches)
01A	303 SS	1/8	NO	1/8, 3/16, 1/4
05A	316 SS	1/8	YES	1/8, 3/16, 1/4
05B	316 SS	1/4	YES	1/8, 3/16, 1/4, 3/8
05C	316 SS	1/2	YES	1/8, 3/16, 1/4, 3/8
15A	Brass	1/8	NO	1/8, 3/16, 1/4
15B	Brass	1/4	NO	3/16, 1/4, 3/8
15C	Brass	1/2	NO	1/4, 3/8

#### 3-2 Re-Adjustable Compression Fittings

CODE	TYPE	NPT SIZE (inches)	AVAILABLE SHEATH DIAMETERS (inches)
10A	303 SS	1/8	1/8, 3/16
10B	303 SS	1/4	1/4, 3/8
10C	303 SS	1/2	1/4, 3/8
12A	316 SS	1/8	1/8, 3/16, 1/4
12B	316 SS	1/4	1/8, 3/16, 1/4, 3/8
12C	316 SS	1/2	1/8, 3/16, 1/4, 3/8
11A	Brass	1/8	1/8, 3/16, 1/4
11B	Brass	1/4	1/8, 3/16, 1/4, 3/8
11C	Brass	1/2	1/4, 3/8
19C	Spring-loaded SS well fitting	1/2	3/16, 1/4

FEP gland standard 204 °C [400 °F] max.

#### 3-3 Fixed Bushings

CODE	MOUNTING THREAD NPT (inches)	AVAILABLE SHEATH DIAMETERS (inches)
316 SS		
8A __ <sup>[1]</sup>	1/8	1/8, 3/16, 1/4
8B __ <sup>[1]</sup>	1/4	1/8, 3/16, 1/4, 3/8
8C __ <sup>[1]</sup>	1/2	1/8, 3/16, 1/4, 3/8
8D __ <sup>[1]</sup>	3/4	1/8, 3/16, 1/4, 3/8

[1] When ordering fixed bushings, specify order code above plus insert length "U", as measured from hot tip to bottom of threaded bushing. EXAMPLE: order code 8A06 is 1/8" NPT, 316 SS bushing located 6" from hot tip.

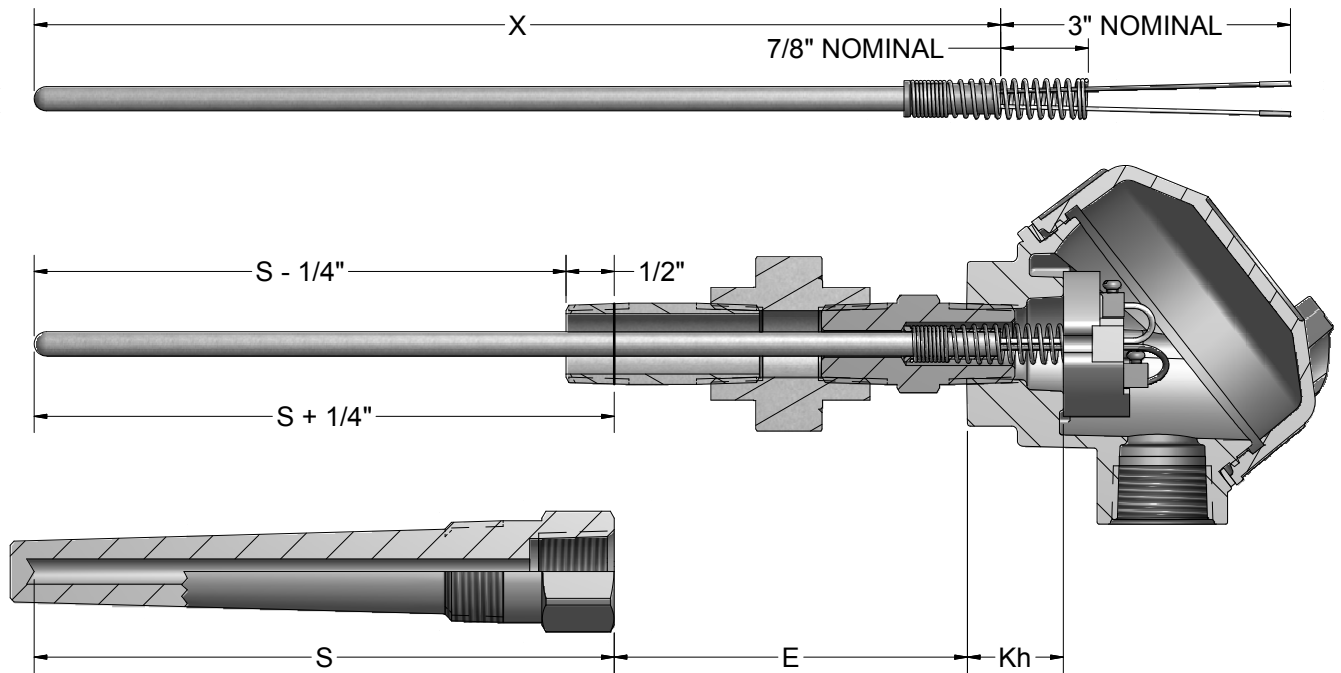
#### 4-0 Head Mounting Fittings

CODE	DESCRIPTION
9HNB	1/4" x 1/4" stainless steel hex nipple
8HPB	1/4" stainless steel hex bushing (no process threads)
8CFB	1/4" NPT 316 stainless steel compression fitting (no process threads)
22CFB	1/4" NPT brass compression fitting (no process threads)










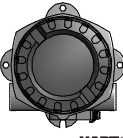


#### 4-1 Miniature Head Terminations

CODE	DESCRIPTION
17	Miniature plastic head (3/8" NPT conduit opening)
25	Miniature nickel-plated head





Pyromation Head Order Code	Kh Dimension in inches	Formula for SL option	Formula for SC option
31	1.00	$X = S + E + 5/8"$	$X = S + E$
34	1.00	$X = S + E + 5/8"$	$X = S + E$
49	1.00	$X = S + E + 5/8"$	$X = S + E$
63	1.00	$X = S + E + 5/8"$	$X = S + E$
74	1.625	$X = S + E + 1\ 1/4"$	$X = S + E$
91	1.00	$X = S + E + 5/8"$	$X = S + E$
93	1.00	$X = S + E + 5/8"$	$X = S + E$
94	1.00	$X = S + E + 5/8"$	$X = S + E$
71	1.00	$X = S + E + 5/8"$	$X = S + E$
72	1.125	$X = S + E + 3/4"$	$X = S + E$
81	1.00	$X = S + E + 5/8"$	$X = S + E$
82	1.00	$X = S + E + 5/8"$	$X = S + E$

<p><i>Complete Transmitter Specifications are located in the Transmitter Section.</i></p> <p><i>Complete Connection Head Specifications are located in the Accessories Section.</i></p>				Connection Heads				
				31	34	49	63	91
								
Temperature Transmitters				Aluminum Screw-Cover Head	Cast Iron Screw-Cover Head	Flip-Top Aluminum Head	White Polypropylene Screw-Cover Head	316L Stainless Steel Screw-Cover Head
T-440		Input: Pt100 RTD Only	Programmable head-mounted transmitter, (4 to 20) mA analog output	X	X	X	X	X
T-441		Input: Thermocouple, RTD, Other	Programmable head-mounted transmitter, isolated, (4 to 20) mA analog output	X	X	X	X	X
T-442		Input: Thermocouple, RTD, Other	Programmable head-mounted transmitter, isolated, HART® protocol, (4 to 20) mA analog output	X	X	X	X	X
T-82		Input: Thermocouple, RTD, Other	(4 to 20) mA dual input, isolated HART® head-mounted transmitter	X	X	X	X	X
T-642, T-662		Input: Thermocouple, RTD, Other	Programmable field transmitter, isolated, HART® protocol, (4 to 20) mA analog output	Unit includes housing and transmitter.				
T-642, T-662 w/ display		Input: Thermocouple, RTD, Other	Programmable field transmitter, isolated, HART® protocol, (4 to 20) mA analog output with digital display	Unit includes housing and transmitter.				
36T82-D10		Input: Thermocouple, RTD, Other	(4 to 20) mA dual input, HART® transmitter with digital display and general purpose aluminum housing, Group A	Unit includes housing and transmitter.				

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