Thermocouple Probes, RTD Probes, and Temperature Transmitters

We Can Provide What You Want

TRASK INSTRUMENTATION, INC.

#1	SERIES [6, 7]
1	Thermocouple

#2	TYPE [8, 9, 10]
–*	J, T, K, E, N, X (Other, specify)

#3	LIMITS OF ERROR [9]	ELEMENT CONSTRUCTION
1	Standard	Single
2	Standard	Dual
3	Special	Single
4	Special	Dual
X	Other, specify	

Note: For hollow tube sensors see pages 2-1 and 2-2.

#4	OUTSIDE DIAMETER [11]	CONDUCTOR SIZE (FOR BASE METALS ONLY) SINGLE (awg)	DUAL (awg)
*A	3/8"	13	16
B	1/4"	16	18
C	3/16"	19	20
D	1/8"	22	24
E	1/16"	28	30
*F	1/25"	32	34
X	Other, specify		
Z	N/A		

Note: JMS now offers sheath as small as .010 in diameter

#5	SHEATH MATERIAL [11]	MAX °F [2-8, 4-17]
H	304 Stainless Steel	1650
J	310 Stainless Steel	2100
V	STABALOY	2220
K	316 Stainless Steel	1650
M	Inconel 600	2100
C	Teflon coated SS	400
X	Other, specify	

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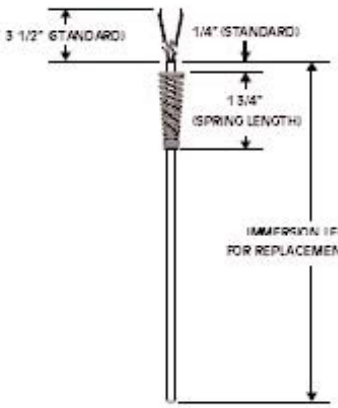
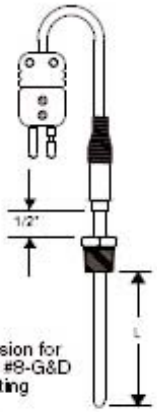
#6	MEASURING JUNCTION [12, 13, 15]		
G	Grounded	*P	Reduced tip, grounded
U	Ungrounded	*Y	Reduced tip, ungrounded
E	Exposed (Isolated on dual)	*R	Gas/Air, exposed
I	Isolated	*S	Gas/Air, grounded
*J	Pointed tip, grounded	*T	Gas/Air, ungrounded
*K	Pointed tip, ungrounded	*V	Enlarged tip, grounded
*L	Weld pad, grounded	*W	Enlarged tip, ungrounded
*M	Weld pad, ungrounded	*X	Other, specify
*N	Weld pad, removable grounded	*Note: When selecting these options, a description must be provided	
*O	Weld pad, removable ungrounded		

#7	LENGTH (See sketches on Pg. 1-1, 2, 3 & 4 for lengths)
--"	Length in inches Note: If sensors requires a bend from the factory use page 2-1 to order.



Immersion for Symbol #8-E Spring



Immersion for Symbol #8-G&D Fitting

#8	STANDARD INDUSTRIAL ATTACHING DEVICE [1-3, 6- 13]
W	Fixed NPT ss fitting - double threaded
S	Spring loaded NPT ss fitting -double threaded
C	Spring loaded NPT ss w/ oil ring - double threaded
D	Spring loaded ss fitting - single threaded
B	Bayonet spring loaded assembly for thermowells and heads
*E	Adjustable spring over .250", .188", .125" sheath
F	Reverse mounted steel plug fixed for attaching head
G	Fixed stainless steel to sheath (See drawing to left)
*H	Compression fitting ss w/ ss ferrule
*I	Compression fitting ss w/ teflon ferrule
*J	Compression fitting ss w/ lava ferrule
*K	Compression fitting ss w/ nylon ferrule
*L	Compression fitting brass w/ brass ferrule
N4	4" Nipple-Union-Nipple (NUN4G1)
N6	6" Nipple-Union-Nipple (NUN6G1)
S4	4" Spring-Loaded-Union-Nipple (NU4G1)
S6	6" Spring-Loaded-Union-Nipple (NU6G1)
X	Other, specify or if more than 1 is needed
Z	Not applicable (no fitting required)

(See pages 1-3 for more nipple options.)

* Length is calculated without consideration of these attaching device. (See dwg on pg. 1-2)

1	J	1	B	H	G	12"	S

Miniature & Industrial Thermocouples

#9	PROCESS NPT [3]
L	1/8"
M	1/4"
P	1/2" (Standard w/ symbols W, S, C, and N in symbol #8)
O	3/4"
X	Other, specify
Z	N/A

#10	LEAD WIRE TYPE & LENGTH IN INCHES [SEE SECTION 7]
Z	No lead wires
1__"	Glass braid
2__"	PVC
3__"	Teflon
4__"	Hi-temp glass braid
5__"	Kapton
7__"	Bare wire
X__"	Other, specify

Solid 20awg

8	PVC coil cord - Standard when using symbol #8-B and #13-R

Note: For non-stock stranded wire,add "S" before symbol designation in this column. 24 awg or smaller may be used to accommodate some smaller diameters and flex armor extensions.

#11	ARMOR OR HEAT SHRINK [7-7] [16]
A	3/16" ID SS flex armor
B	3/16" ID SS flex armor PVC coated white
C	3/16" ID SS flex armor PVC coated black
D	1/8" ID SS flex armor
F	SS overbraid
G	Heat shrink / sleeving
H	Jacket to match primary insulation
J	Aluminum mylar shielded and jacketed to match primary insulation
X	Other, specify
Z	N/A

Note: Bell Springs are used for most wire extensions at transition. A special armor adapter is used when armor is longer than 60".

#12	TYPE OF TRANSITION [16]
H	Heat shrink
S	Size on size
T	3/8" OD (Standard)
R	1/4" OD
X	Other,specify
Z	No transition

Note: For high humidity / moisture environments, ≤ 500°F put a "2" after your selection.

* For high temperature at the transition area use an X + type of transition and maximum temperature. >500°F

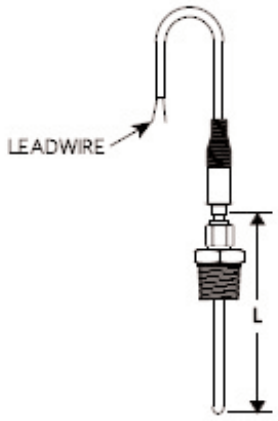
#13	COLD END TERMINATION [SEE SECTION 6] PICK AS MANY AS APPLICABLE
A	Bare ends
B	Miniature plug
C	Standard plug
D	Miniature jack
E	Standard jack
F	High temperature plug (< 800° F)
G	High Temperature jack (< 800° F)
I	Explosion proof Nema 7 head (6I / 6IA)
K	Spade lugs (6SL)
L	Aluminum head w/ hinged cover (6L / 6B4)
M	Aluminum head w/ screw cover & chain (6M / 6B4)
N	Cast iron head w/ screw cover (6N / 6B4)
O	Open terminal block (6M)

Note: For any other cold end termination, use symbol X and describe using appropriate part numbers from section 6 in place of symbol #13.

Q	Blk nylon Nema 4 head (6Q/6B4)
R	High dome head (6R)
W*	Microphone style connector (6DA) -Male
8H	Isolated Transmitter
8N	Non IsolatedTransmitter
8S	AI-1500
8I	TempIR with Hart Protocol
8E	Intrinsically Safe TempIR
8D	TempIR/ Hart/ Intrinsically Safe
X	Other, specify

*Use double symbol here for matching female connectors. i.e. B/BB (male w/matching female.

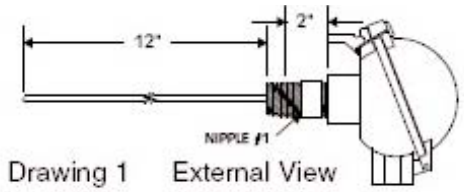
#14	OPTIONS USE ONLY IF APPLICABLE [INTRODUCTION]			
TAGGING		CALIBRATION		
1	Stainless steel tag	5		Calibrate at specified point(s). Corrections data will be provided for each point.
2	Plastic tag	6		Calibrate specified temperature range. Corrections data will be provided for all temperatures within the range. Note: You must specify increments & range Ex. 0 to 300°F, 0.1° increments
3	Paper tag	7		CE Marking [Page XV]
4	Electroetch on probe Note: You must always specify information required on tag	8		Guide 17025 calibration
		9		BAR CODE
		Z		N/A



Immersion is overall length of tube for non-fixed attaching devices

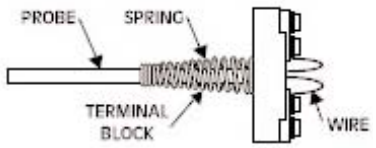
L	Z	G	Z	L	1

Nipple-Union-Nipple Assemblies

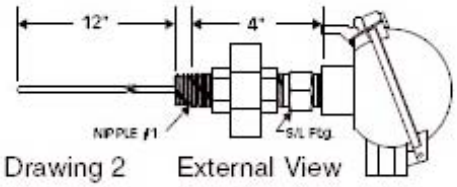


Drawing 1 External View

Drawing 1 - Nipple Only
Minimum Nipple L=1"
Ex. Part#: 1J1BHG12"EXZZZL
X = N2"G1

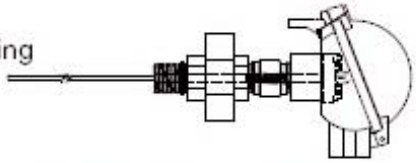


Direct Mounted Spring on Terminal Block

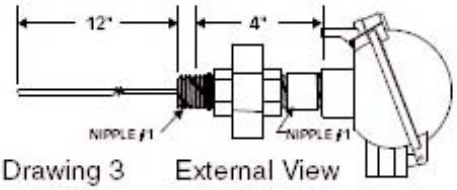


Drawing 2 External View

Drawing 2 - Nipple-Union with
Machined 1/2" x 1/2" Spring Loaded Fitting
Minimum NU L=4" (includes S/L fitting)
Ex. Part#: 1J1BHG12"SXZZZL
X = NU4"G1

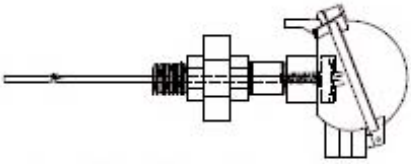


Drawing 2-A Internal View



Drawing 3 External View

Drawing 3 - Nipple-Union-Nipple with
Spring Against Terminal Block
Minimum NUN L=4"
EX. Part#: 1J1BHG12"EXZZZL
X = NUN4"G1



Drawing 3-A Internal View

An extension assembly may be needed to provide extra length for your sensor in order to extend your sensor head through insulation, or away from the heat of the process. This extension can include a pipe nipple only or a nipple-union-nipple or a nipple-union with a spring-loaded fitting.

Standard nipples and unions are 1/2" NPT and are available in galvanized or stainless steel. The union joins two nipples in an extension assembly and has a standard pressure rating of 150 pounds.

When a nipple-union-nipple or nipple only assembly is used and spring loading of the thermocouple element is required, there are two different methods of spring loading the sensor. The preferred method is to use the machined 1/2" by 1/2" NPT spring-loaded stainless steel fitting as one of the nipples (see symbol #8, S page 1-1). With this design, the probe is secured within the fitting and is mounted to the head in a rigid manner (see drawing #2 above). The appropriate part number for this assembly would be selected from symbols #8 and #9 from page 1-1 and 1-2, in addition to the symbols on this page. A cheaper method is a spring, mounted over the probe and loaded against the bottom of the terminal block in the head. With this method the probe is not supported within the nipple-union-nipple. It is secured only by the wires into the terminal block. (See drawings 1 & 3 above). We do not recommend that you use this method of spring loading if your probe is mounted horizontally.

When specifying this sensor extension, the nipple-union-nipple length tolerance is ± 1/4".

#1	EXTENSION ASSEMBLY
N NU NUN	Nipple Only (Dwg #1) Nipple-Union (Dwg #2) Nipple-Union-Nipple (Dwg #3)

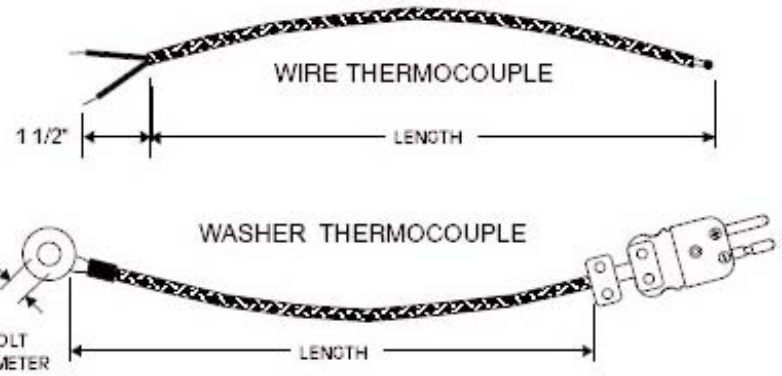
#2	LENGTH
--"	Specify length in inches

#3	MATERIAL
G	Galvanized Steel
H	304 Stainless Steel
C	Black Steel

#4	PRESSURE RATING	
1	#150 - A351 spec (Standard)	ASTM
2	#3000 - A182 spec	
3	#6000 - A182 spec	
X	Other, specify	

NUN	6"	G	1

Wire, Washer, and Lug Thermocouples



RING TERMINAL THERMOCOUPLE

#1	DESCRIPTION
1D	Wire and Washer thermocouples

#2	TYPE OF THERMOCOUPLE
G	Wire thermocouple
H	Washer thermocouple
L	Ring Terminal thermocouple
S	Spade Lug thermocouple

#3	TYPE
J	Iron/Constantan
T	Copper/Constantan
K	Chromel/Alumel
E	Chromel/Constantan
N	Nicrosil/Nisil
X	Other, specify

#4	WASHER MATERIAL
C	Copper (Standard)
P	Spark plug washer (4 cycle automotive)
S	Stainless steel
X	Other, specify
Z	N/A

#5	BOLT DIAMETER
A	#10
B	#12
C	1/4"
X	Other, specify
Z	N/A

#6	WIRE INSULATION
1	Glass braid
3	FEP teflon
4	Hi-temp glass braid
5	Kapton
8	Glass braid / stainless steel overbraid
X	Other, specify

#7	DESCRIPTION
--"	Length in inches

#8	COLD END TERMINATION
A	Bare ends (Heat shrink used with braided insulation)
B	Miniature plug
C	Standard plug
X	Other, specify (See page 1-2 more options)

1D	G	J	C	A	1	36"	C

Resistance Temperature Devices (RTD'S)

#1	SERIES
3	RTD

#2 ELEMENT TYPE [4, 9, 10, 11, 15, 18, 22] Platinum 0.00385 alpha (Ω/Ω/°C)

	Resistor Accuracy at 0°C	Thermometer Class [Table 3, page 3-18]	Resistor Class [Table 1 & 2, page 3-18]
B	± 0.3° C (Competitor's Std)	B	≥ F 0.3
E	± 0.15° C (Standard)	A	≥ F 0.15
P	± 0.06° C *	AA	≥ 1/2 F 0.1
S	± 0.01° C (Best Accuracy *)	1/4 AA	≥ 1/10 F 0.1
X	Other, specify [3-22]		

* For best results, use a 4 wire RTD for high accuracy (types P & S).

#3 ELEMENT CONSTRUCTION [4] [3-11]

S	Single	Standard construction
D	Dual	Standard construction
J	Single	Swaged construction
K	Dual	Swaged construction
X	Other, specify	

Note: Use swaged for high temperature, bendability, high vibration and/or longer than 6 ft.

#4 TUBE DIAMETER - *MUST CHOOSE 1 FROM EACH COLUMN* [5-30, 1-13]

A	3/8" (.375")	N	Normal, closed tip (Standard)
B	1/4" (.250")	*K	Pointed tip, ungrounded
C	3/16" (.188")	*M	Weld pad, ungrounded
D	1/8" (.125")	*O	Weld pad, removable ungrounded
X	Other, specify	*R	Gas/Air, exposed
Z	N/A	*W	Enlarged tip, ungrounded
		*Y	Reduced tip, ungrounded
		Q	Cuttable (**See full catalog)

*Note: When selecting these options, a description must be provided.

#5 TUBE MATERIAL [11, 12]

K	316 Stainless Steel
L	316 LSS
M	I-600 (Use if symbol #7 >500°F)
C	Teflon Coated, SS
X	Other, specify

#6 LENGTH (L) (See sketches on Pg. 3–1 and 3–2 for L")

__" Immersion length in inches

#7 MAX. TEMPERATURE AT WHICH TIP WILL BE EXPOSED

A	0°C (32°F)	=5 Kapton*
B	<200°C (392°F)	=3 Teflon*
C	<285°C (550°F)	=5 Kapton*
D	<350°C (662°F)	=1 Fiberglass*
E	<600°C (1112°F)	=4 HT Fiberglass*

*If no transition (Z) is in symbol 13, we recommend these corresponding selections for primary wire insulation in symbol 10.

#8 STANDARD INDUSTRIAL ATTACHING DEVICE

W	Fixed NPT ss fitting - double threaded
S	Spring-loaded NPT SS fitting - double threaded
C	Spring-loaded NPT SS fitting w/ oil ring - double threaded
D	Spring-loaded ss fitting - single threaded
B	Bayonet spring loaded assembly for thermowells & heads
*E	Adjustable spring over .250", .188", .125" sheath
F	Reverse mounted steel plug fixed for attaching head
G	Fixed stainless steel to sheath
*H	Compression fitting ss w/ ss ferrule
*I	Compression fitting ss w/ teflon ferrule
*J	Compression fitting ss w/ lava ferrule
*K	Compression fitting ss w/ nylon ferrule
*L	Compression fitting brass w/ brass ferrule
N4	4" Nipple-Union-Nipple (NUN4G1)
N6	6" Nipple-Union-Nipple (NUN6G1)
S4	4" Spring-Loaded-Union-Nipple (NU4G1)
S6	6" Spring-Loaded-Union-Nipple (NU6G1)
X	Other, specify or if more than 1 is needed
Z	N/A (No fitting needed)

(See page 1-3)FOR MORE NIPPLE OPTIONS.

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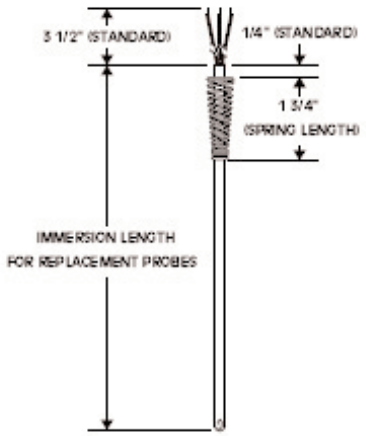
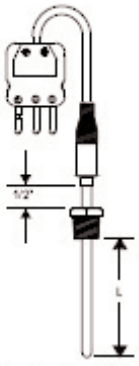


Immersion for Symbol #8-E



Immersion for Symbol #8-G & D

* Length is calculated without consideration of these attaching device. See dwg on pg. 3-2)

3	E	S	B	K	12"	B	W

Resistance Temperature Devices (RTD'S)

#9	PROCESS NPT [1-3]
L	1/8"
M	1/4"
P	1/2" (Standard w/ symbols W, S, & C above)
O	3/4"
X	Other, specify
Z	N/A

#10	LEAD WIRE TYPE & LENGTH IN INCHES [SEE SECTION 7]		
1__"	Fiberglass braid	6__	Bare wire (Standard for swaged leads under 12")
2__"	PVC	X__"	Other, specify
3__"	Teflon (Standard)	Z	N/A
4__"	Hi-temp glass braid		
5__"	Kapton		

NOTE:
All wire will be 24 awg in tubes > 1/8" OD. Smaller tubes will have a max. of 28 awg. If no transition or armor is specified, wire may be fragile. JMS standard wire tube for RTD's is Stranded Plated Copper.

#11	ARMOR OR HEAT SHRINK / JACKET [7-7]		
A	3/16" ID SS flex armor (Standard)	G	Heat shrink / sleeving
B	3/16" ID SS flex armor PVC coated white	H	Jacket to match primary insulation
C	3/16" ID SS flex armor PVC coated black	J	Alum mylar shielded and jacketed to match primary insulation
D	1/8" ID SS flex armor	Z	N/A
F	SS overbraid	X	Other, specify

#12	WIRE CONFIGURATION [17, 18]
T	2 Wire
Y	3 Wire
W	4 Wire

Note: Use a double symbol for 2 separate lead wires if dual elements. i.e. TT.

#13	TYPE OF TRANSITION [14]
H	Heat shrink
S	Size on size
T	3/8" OD
R	1/4" OD
X	Other, specify
Z	No transition

Note: For extra high humidity / moisture environments, ≤ 500° F put a "2" after your selection.

For high temperature at the transition area use an X + type of transition and maximum temperature. >500° F

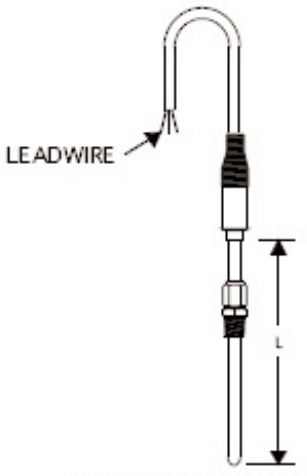
#14	COLD END TERMINATION [SEE SECTION 6] Pick as many as applicable		
A	Bare ends	8H	Isolated Transmitter
**B	Miniature plug	8N	Non Isolated Transmitter
**C	Standard plug	8S	AI-1500
**D	Miniature jack	8I	TempIR with Hart Protocol
**E	Standard jack	8E	Intrinsically Safe TempIR
F	High temperature plug (< 800° F)	8D	TempIR/Hart/Intrinsically Safe
G	High temperature jack (< 800° F)	X	Other, specify
I	Explosion proof Nema 7 head (6I / 6IA)		
K	Spade lugs (6SL)		
L	Aluminum head w/ hinged cover (6L / 6B4)		
M	Aluminum head w/ screw cover & chain (6M / 6B4)		
N	Cast iron head w/ screw cover (6N / 6B4)		
O	Open terminal block (6M)		
Q	Black nylon Nema 4 head (6Q / 6B4)		
R	High dome head (6R)		
V*	Hermetic connector (6DC) - Male		
W*	Microphone style connector (6DA) - Male		

*Use double symbol here for matching female connector. i.e. b/bb (male with matching female)

**We do not advise using these connectors for RTD's

Note: For any other cold end termination, use appropriate part numbers from section 6 in place of symbol #14.

#15	OPTIONS USE ONLY IF APPLICABLE [INTRODUCTION]			
1	Stainless steel tag	5	CALIBRATION	Calibrate at specified point(s). corrections data will be provided for each point.
2	Plastic tag	6		Calibrate specified temperature range. corrections data will be provided for all temperatures within the range. Note: You must specify increments & range. (Ex. 0 to 300°F, 0.1° increments)
3	Paper tag	7		CE Marking [PAGE XV]
4	Electroetch on probe Note: You must always specify information required on tag	8		Bar Code
TAGGING		Z		N/A



Immersion is overall length of tube for non-fixed attaching devices

P	3-36"	A	Y	T	A	

Non-Isolated Transmitters

#1	SERIES [12, 13]
8N	Transmitter, Non-Isolated

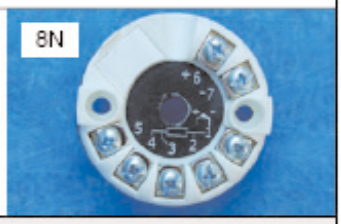
#2	INPUT		
*J	Iron/Constantan thermocouple	*B	Platinum 6% Rhodium/Platinum 30% Rhodium thermocouple
*T	Copper/Constantan thermocouple		
*K	Chromel/Alumel thermocouple	*N	Nicrosil/Nisil thermocouple
*E	Chromel/Constantan thermocouple	*C	Tungsten/Tungsten Rhenium thermocouple
*S	Platinum 10% Rhodium/Pure Platinum thermocouple	3	3 wire, 100Ω, Platinum, a=.00385, RTD (3 - Wire Standard, If 2 or 4 Wire use X)
*R	Platinum 13% Rhodium/Pure Platinum thermocouple	X	Other, specify

Although non-isolated transmitters are available for thermocouples, JMS always recommends the customer use isolated transmitters for their application. See below for isolation values to 3750 volts

#3	TEMPERATURE RANGE
– to _°C	List desired temperature span
– to _ °F	List desired temperature span
X	Other, specify

#4	OUTPUT
4	4 to 20 mA
X	Other, specify

*All non-isolated thermocouple transmitters should be used with ungrounded junctions to prevent ground loops and noise interference.



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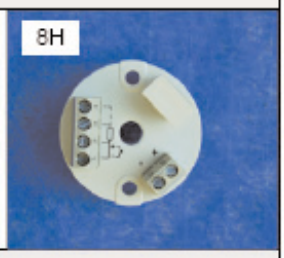
#5	MOUNTING	
A	Dual mounting bracket	} For panel mounting
B	Dual mounting bracket with 12" cuttable mounting track	
X	Other, specify	
Z	N/A	

Isolated Transmitters

#1	SERIES [14, 15, 16, 17]
8	Transmitter (Add "R" for DIN Rail Style)

#2	TYPE OF TRANSMITTER	I / O ISOLATION	HART
H	Standard TempIR	1500 VAC	No
C	CAL 9400 (See pg. 8-5, 8-6)	1000 VAC	No
A	AI-1000 (See pg. 8-8, 8-9)	500 VAC	No
S	AI-1500 (See pg. 8-10, 8-11)	500 VAC	Yes
B	AI-2000 (See pg. 8-12)	850 VAC	No
I	TempIR with Hart Protocol	1500 VAC	Yes
E	Intrinsically safe TempIR	3750 VAC	No
D	TempIR / Hart / Intrinsically safe	3750 VAC	Yes
X	Other		



#3	INPUT		
J	Iron/Constantan thermocouple	N	Nicrosil/Nisil thermocouple
T	Copper/Constantan thermocouple	C	Tungsten/Tungsten Rhenium thermocouple
K	Chromel/Alumel thermocouple	3	3 wire, 100Ω, Platinum, a=.00385, RTD (3 - Wire Standard, If 2 or 4 Wire use X)
E	Chromel/Constantan thermocouple		
S	Platinum 10% Rhodium/Pure Platinum thermocouple	X	Other, specify
R	Platinum 13% Rhodium/Pure Platinum thermocouple	Z	N/A
B	Platinum 6% Rhodium/Platinum 30% Rhodium		

#4	TEMPERATURE RANGE		
-- to --°C	List desired temperature span	X	Other, specify
-- to -- °F	List desired temperature span	Z	N/A

#5	OUTPUT		
4	4 to 20 mA	P	Profibus
X	Other, specify	F	Fieldbus

#6	SOFTWARE
A	Yes - range at factory
Z	No - range at factory

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