

PLASTICS SENSORS

BAYONET TEMPERATURE SENSORS

Bayonet style thermocouples are the most common in Plastics Processing. JMS has adapted this useful and safe design to other industrial sensors to utilize the best features of both.

Our standard design and most commonly used is the Adjustable Bayonet attachment device developed by JMS in 1982. This design incorporates a chrome plated brass cap with a 303 stainless steel spring. The spring fits like chinese handcuffs around the appropriately sized sensor and remains in position until such a time as the user adjusts it. This enables the same sensor to be used for many different applications in the same facility. It also makes for lower inventory levels which your accountant will love.

The other attachment devices we make for your sensors are standard in the industry. For those "Old Dogs" who refuse to try something innovative we still offer the fixed bayonet design. The length of this sensor cannot be changed and will only go into the hole it was specifically built to fit.

#1	DESCRIPTION	
2	Plastics Sensors	
	#2	DESIGN [8]
	M H	MgO insulated (Swaged Sheath) Hollow tube
	#3	TYPE
	J	Iron/Constantan
	K	Chromel/Alumel
	T	Copper/Constantan
	E	Chromel/Constantan
	3	100Ω Platinum RTD (.00385 alpha, 3 wire)
	X	Other, specify
		TEMP. RANGE (°F)
	J	32 to 1400
	K	32 to 2300
	T	-300 to 700
	E	-300 to 1600
	3	-200 to 1000
	X	
	#4	OUTSIDE DIAMETER
	C	3/16" (.188")
	D	1/8" (.125")
	B	1/4" (.250")
	X	Other, specify
		Notes: Hollow tube sensors should never be used to measure temperatures above 900°F. Note: 316 SS standard sheath and tube material.
	#5	LIMITS OF ERROR
	1	Standard
	2	Standard
	3	Special
	4	Special
	X	Other, specify
		ELEMENT CONSTRUCTION
	1	Single
	2	Dual
	3	Single
	4	Dual
	X	Other, specify
		Special limits RTD's are JMS Class A tolerance (page 3-1)
	#6	CONSTRUCTION
	S	Straight
	4	45° bend
	9	90° bend
	X	Specify bend and "A" length (see dwg above)
		Note: 1/2" radius bends are standard. Other radius may be specified but they may deform the diameter of the tube at the bend.
	#7	MAXIMUM TEMPERATURE AT WHICH TIP WILL BE EXPOSED
	A*	<100°C (212°F) =2 PVC
	B*	<200°C (392°F) =3 Teflon
	C*	<285°C (550°F) =5 Kapton
	D*	<482°C (900°F) =1 Fiberglass
	E*	<705°C (1300°F) =4 HT Fiberglass (swaged only)
	F*	>705°C (1300°F) =7 Bare ends (heat shrink) (swaged only)
		* If no transition (Z) is in symbol 13, we recommend these corresponding selections for primary wire insulation on hollow tube sensors.
	#8	MEASURING JUNCTION [9]
	G	Grounded
	U	Ungrounded (RTD's are always ungrounded)
	I	Isolated
	E	Exposed
	X	Other, specify
	#9	LENGTH (L)
	--"	Length in inches
		Note: See appropriate drawing on page 2-1 & 2-2 before you specify the immersion length. Use 0" for non-immersion nozzle design.

[] BRACKETS INDICATE PAGE NUMBERS IN TECHNICAL CATALOG AVAILABLE ONLINE AT WWW.JMS-SE.COM/PDF/JMS_TECHNICAL_CATALOG.PDF

2	M	K	C	1	9	D	G	3"
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PLASTICS SENSORS

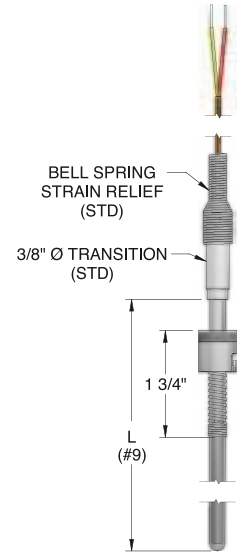
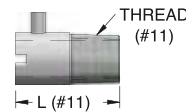
#10	ATTACHING DEVICES	
J	Adjustable bayonet (Standard)	X
F	Fixed bayonet	Other, specify
P	Brass compression fitting 1/8" NPT	
N	Non-Immersion nozzle	
M	Nozzle melt	
Z	N/A	

ADJUSTABLE BAYONET
(Top of cap is usually positioned 1/2" from transition at factory)

#11	ADAPTER TYPE	
1/8" NPT	3/8" x 24	NICKEL PLATED STEEL SLOT HEAD MOUNTING ADAPTER (FOR BAYONET ONLY)
Z	Z	No adapter required
A	E	7/8" overall length
B	F	1 1/2" overall length
C	G	2 1/2" overall length
D	J	3 1/2" overall length
X	X	Other, specify

1/4" NPT X 1 1/4" long for 1/4" bayonet

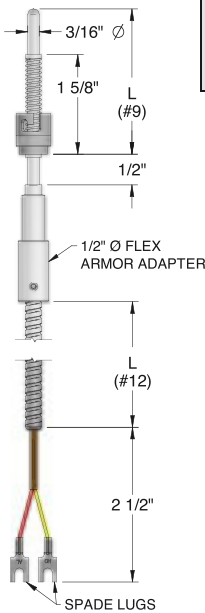
Note: More adapter options on p. 2-5.



#12	LEAD WIRE TYPE & LENGTH IN INCHES	T/C	RTD
Z	No lead wires	20 AWG	24 AWG
1	Glass braid	20 AWG	24 AWG
3	FEP teflon	20 AWG	24 AWG
6	Glass braid / flex armor overall	20 AWG	24 AWG
7	Teflon / flex armor overall	20 AWG	24 AWG
8	Glass braid / stainless steel overbraid	20 AWG	24 AWG
X	Other, specify		

Note: 24 AWG wire or smaller may be used if necessary.

FIXED BAYONET

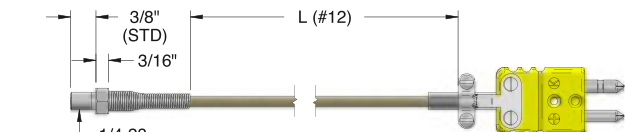


#13	TYPE OF TRANSITION [1-16]	
H	Heat shrink	Note: For high humidity / moisture environments ≤500° F put a "2" after your selection. For high temperature at the transition area use an X + type of transition and maximum temperature.
S	Size on size	
T	3/8" OD (Standard)	
R	1/4" OD	Note: When "Z" no transition is specified for a hollow tube sensor, the extension lead is crimped to the tube.
X	Other, specify	
Z	No transition	
Q	Cutttable design (No crimp at end of tube / nylon insert)	

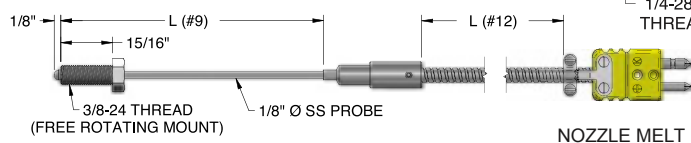
#14	COLD END TERMINATION [SECT 6] CHOOSE AS MANY AS APPLICABLE		
A	Bare ends	R	High dome head (6R)
B	Miniature plug (6A1B2)	V	Hermetic connector (6DC) - Male
C	Standard plug (6A1C2)	WM	Microphone style connector (6DA) - Male
D	Miniature jack	WF	Microphone style connector (6DA) - Female
E	Standard jack	X	Other, specify
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 & chain (6N / 6B4)		
O	Open ceramic terminal block (6N)		
Q	Black nylon Nema 4 head (6Q / 6B4)		

Note: For any other cold end terminations, use symbol X and decide using appropriate part numbers from section 6 in place of symbol #14.

#15	TAGGING AND CALIBRATION OPTIONS (USE ONLY IF APPLICABLE)
----	See page 1-2 #14 for ordering selections.



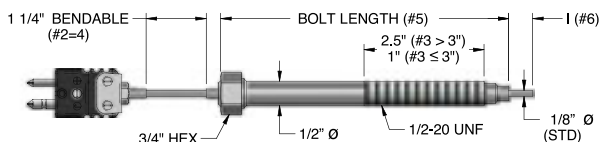
NON-IMMERSION NOZZLE



J	A	6 (72")	T	C	
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PLASTIC MELT SENSORS

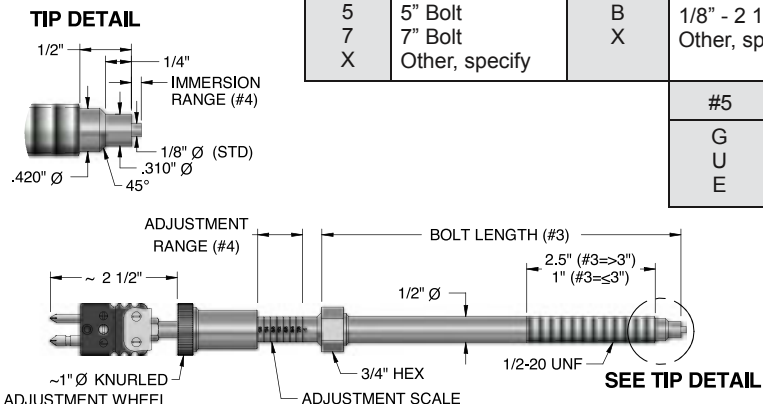
#1	DESCRIPTION	
2P	PLASTIC MELT SENSORS	
	#2	STYLE [2-6]
	4*	Bolt with 1 1/2" bendable metal extension and plug
	5	Bolt with direct mount plug
	6**	Bolt with 24" of Kapton insulated wire w/flexible armor and plug
	X	Other, specify
	* Tubular extension between bolt and plug can be formed by hand at application site to desired angle. If longer metal extension from hex to plug connection is required, use X and specify length desired. (Ex: 2PXJ13BGP; X=4-6")	
	**If a length other than 24" of flex armor is required, use X and specify length desired. (Ex: 2PXJ13BCP; X=6-36")	
	#3	SENSOR TYPE [1-1, 3-3]
	J	Iron/Constantan, standard limits of error
	A	100Ω Platinum RTD .00385 alpha (3 wire) class B (Standard)
	X	Other, specify
	#4	LIMITS OF ERROR/ELEMENT CONSTRUCTION
	1	Standard / Single
	2	Standard / Dual
	3	Special / Single
	4	Special / Dual
	X	Other, specify
	#5	BOLT LENGTH (B) [6]
	3	3"
	6	6"
	X	Other, specify
	#6	IMMERSION (I) [6]
	A	Flush
	B	1/2" Immersion
	C	1" Immersion
	X	Other, specify
	#7	MEASURING JUNCTION [9]
	G	Grounded
	U	Ungrounded (RTD's are always ungrounded)
	E	Exposed
	I	Isolated
	X	Other, specify
	For special wetted parts facing, use X + description. (i.e. X=Grounded + Hastelloy C-276 facing)	
	#8	MAXIMUM SERVICE TEMPERATURE
	P	Below 500°F
	Q	500°F - 900°F
	#9	TAGGING AND CALIBRATION OPTIONS
	----	See page 1-2 #14 for ordering selections.



(USE ONLY IF APPLICABLE)

PLASTIC MELT ADJUSTABLE SENSORS

#1	DESCRIPTION	#2	SENSOR TYPE [3-3]	
27	ADJUSTABLE PLASTIC MELT SENSOR	J 3 X	Iron/Constantan 100Ω Platinum, .00385 alpha, RTD (3 wire), Class B Other, specify	
	#3	BOLT LENGTH	#4	IMMERSION JUNCTION [9]
	3	3" Bolt	A	1/8" - 1"
	5	5" Bolt	B	1/8" - 2 1/2"
	7	7" Bolt	X	Other, specify
	X	Other, specify		
	#5	MEASURING JUNCTION		
	G	Grounded (Standard)		
	U	Ungrounded (RTD's always ungrounded)		
	E	Exposed (Recommended for profiling)		
	I	Isolated		
	X	Other, specify		
	#6	MAX SERVICE TEMPERATURE		
	P	<500°F	Q	500°F - 900°F
	#7	TAGGING/CALIBRATION OPTS		
	---	See page 1-2 #14 for ordering selections		



FLEX ARMOR ADJUSTABLE DEPTH SENSORS

#1	DESCRIPTION			
2K	FLEXIBLE ARMOR ADJUSTABLE DEPTH SENSOR			
#2	SENSOR TYPE			
J K T E 3 X	Iron/Constantan (Standard) Chromel/Alumel Copper/Constantan Chromel/Constantan 100Ω Platinum RTD, 3 wire, Class B Other, specify			
#3	DIAMETER OF FLEX			
1 2	.125 ID .188 ID (Standard)	.210" OD. .270" OD.		
#4	TUBE LENGTH			
Z	Length in inches Flush - no tube (Standard)			
#5	JUNCTION			
G U	Grounded (Standard) Ungrounded - (RTDs are always ungrounded)			
#6	LEAD WIRE LENGTH (Standard Insulation Fiberglass)			
---	Length in inches			
#7	COLD END TERMINATION			
A C E I R K T X	Bare ends (Standard) Standard plug Standard jack Explosion proof head, 3/4" x 3/4" connection with fitting High dome, general purpose head with hinged cover, 1/2" x 1/2" connection with fitting Spade lugs (compensated) Junction box connector Other, specify			
	Note: If bayonet adapter is needed for mounting, see pg. 2-5.			
#8	TAGGING AND CALIBRATION OPTIONS			
----	See page 1-2 #14 for ordering selections.			

Note: Selection 7, symbols I & R are not usually used in plastics manufacturing. These options are designed to provide a spring loaded industrial sensor that can be used through elbows and around corners.

See note to the left.

SPRING ADJUSTABLE DEPTH SENSORS

#1	DESCRIPTION			
2Q	SPRING ADJUSTABLE DEPTH BAYONET SENSOR			
#2	SENSOR TYPE			
J K T	Iron/Constantan (Standard) Chromel/Alumel Copper/Constantan	E 3 X	Chromel/Constantan 100Ω Platinum RTD (.00385 alpha, class B, 3 wire) Other, specify	
#3	LEAD WIRE LENGTH			
48" 60" X	Length in inches (Measured from front of spring to back of cable clamp.) Other, specify			
#4	JUNCTION			
G U	Grounded (Standard) Ungrounded - (RTDs are always ungrounded)			
#5	COLD END TERMINATION [6-7]			
A C E	Bare ends (Standard) Standard plug Standard jack	K T X	Spade lugs (compensated) Junction box connector Other, specify	
	Note: If bayonet adapter is required, see pg. 2-5.			
#6	TAGGING AND CALIBRATION OPTIONS (USE ONLY IF APPLICABLE)			
----	See page 1-2 #14 for ordering selections.			

MGO VS HOLLOW TUBE

Bayonet thermocouples can be constructed with magnesium oxide sheath material or hollow tube units made with lead wires inserted in tubing. Magnesium oxide (MgO) insulation is a dry, uncontaminated compacted ceramic powder. MgO gives the thermocouple high insulation resistance and dielectric strength. Also, it allows excellent insulation of the positive and negative wire conductors in relation to each other and to the outer sheath. Among the outstanding features of sheath material are: (A) flexibility to bend or form to twice the radius of the sheath diameter, (B) its rigidity to maintain size and shape after bending or straightening, (C) vibration or shock has no effect on the material, (D) sheath material withstands pressures upward to 50,000 psi, and (E) sheath material may be used in applications where temperatures may range from -400° to 3000°F depending on requirements and selection of materials.

INSULATOR	PURITY %	MELTING POINT		USABLE TEMP.	
		°C	°F	°C	°F
MAGNESIA (MGO)	96.4% (std)	2790	5050	1650	3000
	99.4% (must specify)				
	99.8% (must specify)				

New insulation materials are being developed. Use an X and describe to specify.

The hollow-tube design is used for disposable thermocouples that can be replaced easily. Their life is about half of that of a magnesium oxide insulated thermocouple. The advantage of a hollow-tube design is the cost. It is the least expensive design, for the short run.

BAYONETT ACCESSORIES

STAINLESS STEEL PIPE CLAMP ADAPTERS

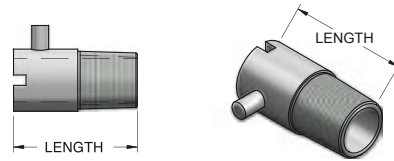
#1	DESCRIPTION		
2C	Pipe clamp bayonet adapter		
#2	"L" LENGTH OF STEM IN INCHES		
R	1 3/4"		
S	3 3/4"		
T	8 3/4"		
X	Other, specify		
#3	BAND CLAMP MIN.	DIAMETER (INCHES) MAX.	STANDARD PIPE SIZE (INCHES)
1	7/16	25/32	1/4 to 3/8
2	1 1/16	1 1/4	1/2 to 3/4
3	1 1/6	2	1 to 1 1/2
4	2 1/16	3	2 to 2 1/2
5	3 15/16	4 1/4	3 to 3 1/2
6	3 9/16	4 1/2	4
7	5 1/8	6	5
8	6 1/8	7	6

Note: "L" = Length of stem. Should be equal to the maximum insulation thickness + 3/4". The bayonet sensor length should be "L" + 3/4".

2C S 3

NICKEL PLATED SLOT HEAD ADAPTERS

THREAD LENGTH			
1/8" NPT	3/8"-24	1/4" NPT	
2A	2E	—	7/8" overall length
2A1	—	6BA	1 1/4" overall length
2B	2F	—	1 1/2" overall length
2C	2G	—	2 1/2" overall length
2D	2J	—	3 1/2" overall length



NOTE: To order adapters of different lengths, use 2A + X for 1/8" NPT and 2E + X for 3/8"-24 threads. You must specify length. Standard slot head adapters are nickel plated brass. Other materials are available upon request.