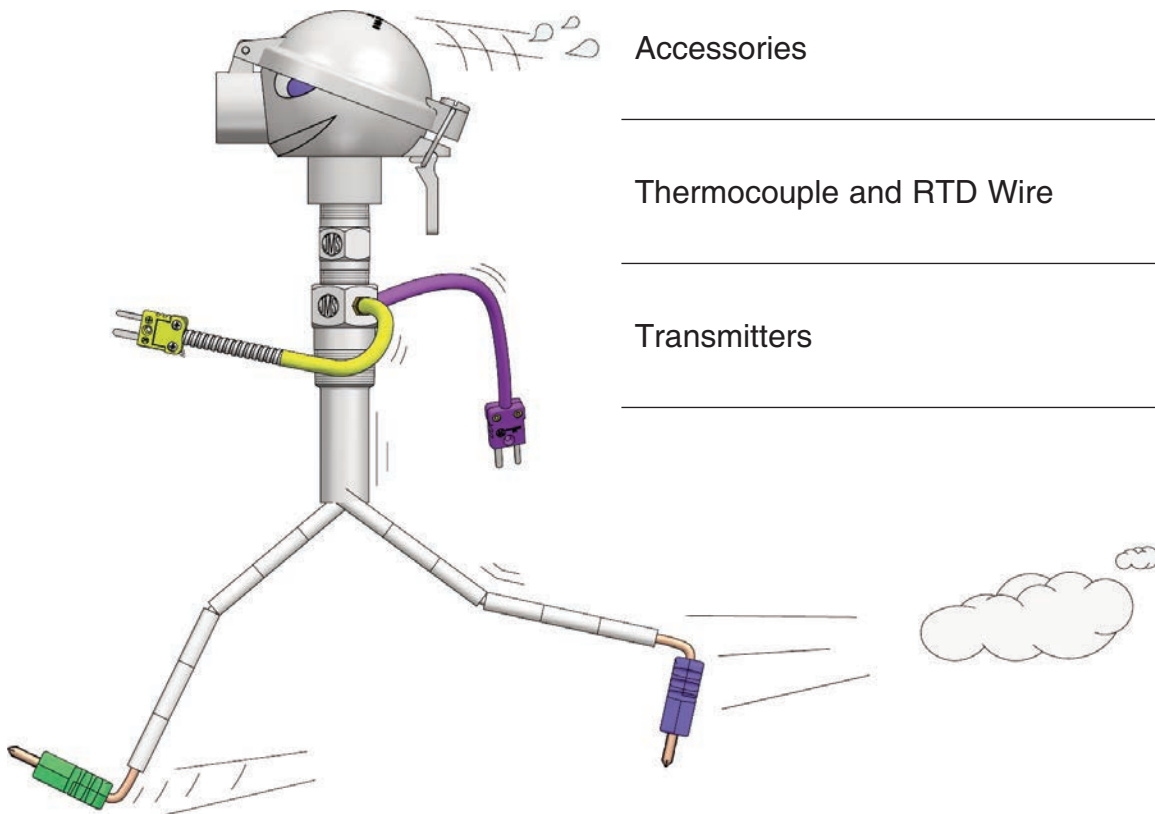


# PLASTICS SENSORS

## *Swiftly Sensor*



Miniature and Industrial Thermocouples

1

Plastics Sensors

2

Resistance Temperature Devices (RTDs)

3

Sanitary Sensors, Sanitary Thermowells  
and Specialty Sensors

4

Thermowells, Protection Tubes, and  
Coatings

5

Accessories

6

Thermocouple and RTD Wire

7

Transmitters

8

Due to space limitations we have excluded some part number selections from publication. Additional selections are available via JMS catalog cut sheets posted at [www.JMS-SE.com](http://www.JMS-SE.com). It is the final reference for JMS part numbers. Custom products are also available with drawings to suit your application. Call 1-800-873-1835 or email [Sensors@JMS-SE.com](mailto:Sensors@JMS-SE.com) for more information.

# 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 stainless steel spring. The spring fits 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 in the hole it was specifically built to fit.

#1	DESCRIPTION			
2	Plastics sensors			
	#2	DESIGN [8]		
	M	MgO insulated (swaged sheath)		
	H	Hollow tube		
	#3	TYPE	TEMP. RANGE (°F)	
	J	Iron/Constantan	32 to 1400	
	K	Chromel/Alumel	32 to 2300	
	T	Copper/Constantan	-300 to 700	
	E	Chromel/Constantan	-300 to 1600	
	3	100Ω Platinum RTD (.00385 alpha, 3 wire)	-200 to 1000	
	X	Other, specify		
	#4	OUTSIDE DIAMETER		
	C	3/16" (.188")	X	Other, specify
	D	1/8" (.125")	Z	N/A
	B	1/4" (.250")		
	R	6mm (.236")		
	#5	LIMITS OF ERROR	ELEMENT CONSTRUCTION	
	1	Standard	Single	
	2	Standard	Dual	
	3	Special	Single	
	4	Special	Dual	
	X	Other, specify		
	#6	CONSTRUCTION		
	S	Straight	Note: 1/2" radius bends are standard. Other radii may be specified but they may deform the diameter of the tube at the bend.	
	4	45° bend		
	9	90° bend		
	X	Specify angle of bend and "A" length (see illustrations above)		
	#7	MAXIMUM TEMPERATURE AT WHICH TIP WILL BE EXPOSED		
	A	<0°C (32°F)	Cryogenic =5 Kapton*	
	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)		
	F	>705°C (1300°F)		
	#8	MEASURING JUNCTION [9]		
	G	Grounded		
	U	Ungrounded common (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.		

Note: When LENGTH (Option #9) exceeds 90", the probe may be coiled for shipment.

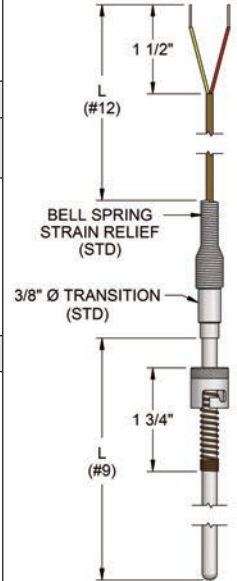
[ ] Brackets indicate page numbers where additional helpful information can be found in technical catalog. Now available online at [www.JMS-SE.com/TechnicalCatalog](http://www.JMS-SE.com/TechnicalCatalog)

2 M K C 1 9 D G 3"

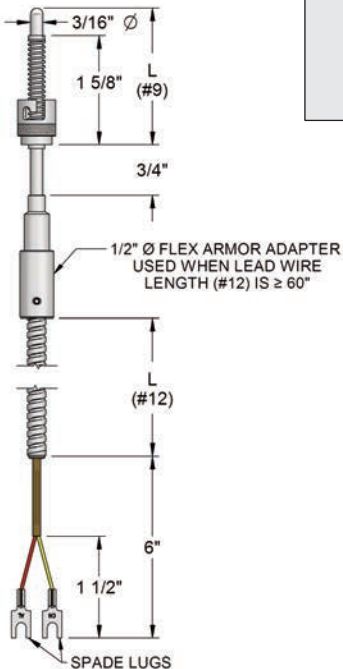
# PLASTICS SENSORS

#10	ATTACHING DEVICES (see illustrations below)	
J*	Adjustable bayonet (Standard)	X Other, specify
F	Fixed bayonet	
P*	Brass compression fitting (1/8" NPT)	
N	Non-Immersion nozzle (1/4-28 x 3/8" long, <b>fixed</b> thread)	
M*	Nozzle melt (3/8-24 x 5/16" long, <b>rotating</b> thread)	
Z	N/A	*Non-fixed fittings do not affect the immersion length(#9).
#11	ADAPTER TYPE *1/8" NPT adapters are used with .125" Ø and .188" Ø sensors.	
1/8" NPT	3/8" x 24	NICKEL PLATED STEEL SLOT HEAD MOUNTING ADAPTER (FOR BAYONET ONLY)
Z	Z	No adapter required K 1/4" NPT X 1 1/4" long for 1/4" bayonet
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 <b>Note: More adapter options on page 2-5.</b>
#12	LEAD WIRE TYPE & LENGTH IN INCHES	
Z	No lead wires	
1	Fiberglass braid	
3	FEP Teflon	
5	Kapton	
6	Fiberglass braid/flex armor overall	
7	Teflon/flex armor overall	
8	Fiberglass braid/stainless steel overbraid	
X	Other, specify <b>Note: 20 AWG solid wire is standard for thermocouples and 24 AWG stranded wire is standard for RTDs. Note: 24 AWG wire or smaller may be used if necessary.</b>	

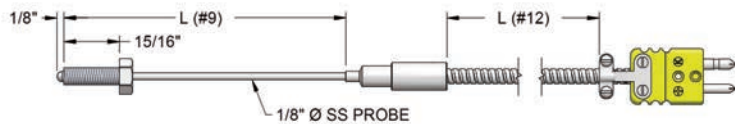
**ADJUSTABLE BAYONET**  
(Top of cap is usually positioned 3/4" from transition at factory)



## FIXED BAYONET

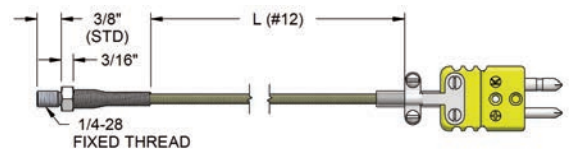
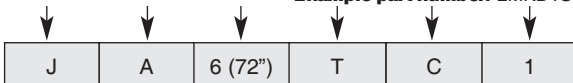


#13	TYPE OF TRANSITION [ 1-16 ]		
H	Heat shrink	<b>Note: For high humidity/moisture environments (≤500° F), put a 2 after your selection.</b>	
S	Size on size		
T	3/8" OD (Standard)	<b>Note: For high temperature at the transition area (&gt;500° F), put a 3 after your selection. (May not comply with ASTM Insulation Resistance (IR) test)</b>	
R	1/4" OD		
X	Other,specify	<b>Note: When Z (no transition) is specified for a hollow tube sensor, the extension lead is crimped to the tube.</b>	
Z	No transition		
Q	Cutttable design (No crimp at end of tube/Nylon insert)		
#14	COLD END TERMINATION [Add'l options see Pg 1-7] CHOOSE AS MANY AS APPLICABLE		
Connectors		Heads	
B	Miniature plug (6A1B2)	I	Explosion proof Aluminum, NEMA 4X, FM, CSA, IP66 (6IA/6B4)
C	Standard plug (6A1C2)	L	Aluminum w/ hinged cover (6L/6B4)
F	High temperature plug ( < 800° F )	M	Aluminum w/ screw cover & chain(6M/6B4)
WM	Microphone style plug (6DA)	N	Cast ron w/ screw cover (6N/6B4)
V	Hermetic connector plug (6DC)	Q	Black Noryl plastic (6Q/6B4)
D	Miniature jack	R	Aluminum high dome, hinged cover (6R/6B4)
E	Standard jack	Other	
G	High temperature jack ( < 800° F )	A	Bare ends
WF	Microphone style jack (6DA)	K	Spade lugs (6SL)
		O	Open terminal block (6B4)
		X	Other, specify
#15	TAGGING AND CALIBRATION OPTIONS (USE ONLY IF APPLICABLE)		
	See page 1-2 #14 for ordering selections.		



## NOZZLE MELT

Example part number: 2MKD1SDG12"MZ6(60")TC

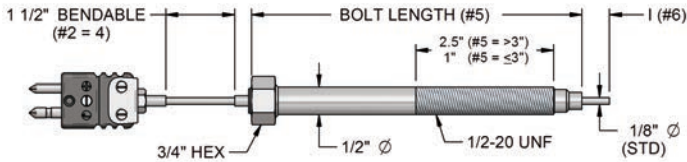


## NON-IMMERSION NOZZLE

Example part number: 2HKZ1SDU0"NZ1(60")ZC

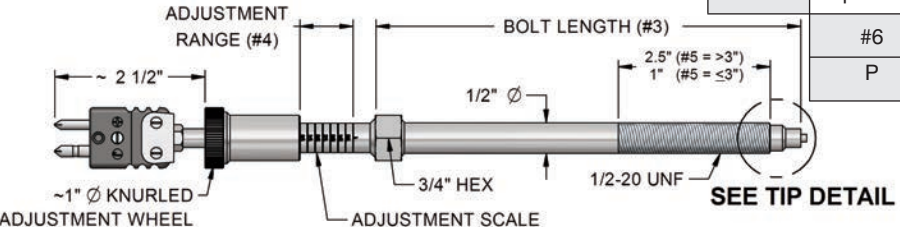
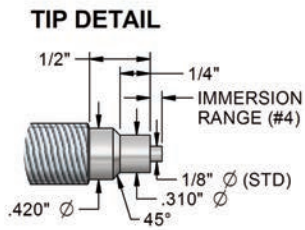
# PLASTIC MELT EXTRUSION SENSORS

#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. (Example: 2PXJ13BGP; X=4-6")			
	**If a length other than 24" of flex armor is required, use X and specify length desired. (Example: 2PXJ13BCP; X=6-36")			
	#3	SENSOR TYPE [1-1, 3-3] (Hollow tube design)		
	J	Iron/Constantan		
	A	100Ω Platinum RTD .00385 alpha (3 wire) (Standard)		
	X	Other, specify		
	#4	LIMITS OF ERROR/ELEMENT CONSTRUCTION		
	1	Standard/Single	4	Special/Dual
	2	Standard/Dual	X	Other, specify
	3	Special/Single	Special limits RTDs are JMS Class A tolerance (page 3-1)	
	#5	BOLT LENGTH (B) [6]		
	3	3"	6"	6"
	X	Other, specify		
	#6	IMMERSION (I) [6]		
	A	Flush	C	1"
	B	1/2"	X	Other, specify
	#7	MEASURING JUNCTION [9]		
	G	Grounded		
	U	Ungrounded common (RTD's are always ungrounded)		
	E	Exposed		
	I	Isolated		
	X	Other, specify (For special wetted parts facing, use X + description. Example: X=Grounded + Hastelloy C-276 facing)		
	#8	MAXIMUM SERVICE TEMPERATURE		
	P	<500°F (Standard)		
	Q	500°F - 900°F		
	#9	TAGGING/CALIBRATION OPTIONS (Use only if applicable)		
	---	See page 1-2 #14 for ordering selections.		



# PLASTIC MELT EXTRUSION ADJUSTABLE SENSORS

#1	DESCRIPTION	#2	SENSOR TYPE [3-3] (Hollow Tube Design)		
27	Adjustable plastic melt sensor	J	Iron/Constantan		
		3	100Ω Platinum RTD, .00385 alpha (3 wire) Class B		
		X	Other, specify		
	#3	BOLT LENGTH	#4	IMMERSION RANGE [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)		I	Isolated
	U	Ungrounded (RTD's always ungrounded)		X	Other, specify
	E	Exposed (Recommended for profiling)			
	#6	MAX SERVICE TEMPERATURE			
	P	<500°F (Standard)		Q	500°F - 900°F
	#7	TAGGING/CALIBRATION OPTIONS (use only if applicable)			
	---	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	Iron/Constantan (Standard)	<b>Note: Add a 2 for dual element. (Example: 2J)</b>	
K	Chromel/Alumel		
T	Copper/Constantan		
E	Chromel/Constantan		
3	100Ω Platinum RTD .00385 alpha (3 wire) Class B		
X	Other, specify		
#3	DIMENSIONS OF FLEX		
1	.125" ID X .210" OD		
2	.188" ID X .270" OD (Standard)		
#4	TUBE LENGTH		
—	Length in inches		
Z	Flush - no tube (Standard)		
#5	JUNCTION		
G	Grounded (Standard)		
U	Ungrounded - (RTDs are always ungrounded)		
#6	LEAD WIRE LENGTH (Standard Insulation Fiberglass)		
—	Length in inches		
#7	COLD END TERMINATION [Add'l options see Pg 1-7]		
C	Standard plug		
E	Standard jack		
K	Spade lugs		
I*	Explosion proof head, 1/2" x 3/4" connection with fitting		
R*	High dome, general purpose head w/ hinged cover, 1/2" x 1/2" fitting		
T	Junction box connector		
A	Bare ends (Standard)		
X	Other, specify		
<b>Note: If bayonet adapter is needed for mounting, see page 2-5.</b>			
#8	TAGGING AND CALIBRATION OPTIONS (Use only if applicable)		
—	See page 1-2 #14 for ordering selections.		

\* 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. Also an excellent solution when spring-loading is needed for a protection tube or thermowell that has become warped or bent.

# SPRING ADJUSTABLE DEPTH SENSORS

#1	DESCRIPTION		
2Q	Spring adjustable depth bayonet sensor		
#2	SENSOR TYPE		
J	Iron/Constantan (Standard)	E	Chromel/Constantan
K	Chromel/Alumel	3	100Ω Platinum RTD .00385 alpha (3 wire) Class B
T	Copper/Constantan	X	Other, specify
#3	LEAD WIRE LENGTH		
48"	Length in inches <b>Note: Length measured from front of spring to back of cable clamp.</b>		
60"	Length in inches		
X	Other, specify		
#4	JUNCTION		
G	Grounded (Standard)		
U	Ungrounded common (RTDs are always ungrounded)		
#5	COLD END TERMINATION [Add'l options see Pg 1-7]		
A	Bare ends (Standard)	K	Spade lugs (compensated)
C	Standard plug	T	Junction box connector
E	Standard jack	X	Other, specify
<b>Note: If bayonet adapter is required, see page 2-5.</b>			
#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
Magnesium Oxide(MgO)	96.4% (STD)	2790	5050	1650	3000
	99.4% (must specify)				
	99.8% (must specify)				

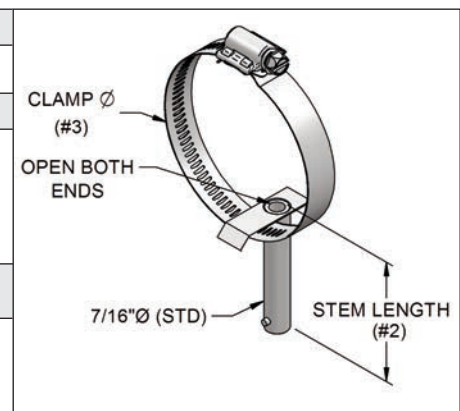
New insulation materials are being developed. Use an X and describe to specify.

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.

# BAYONET ACCESSORIES

## STAINLESS STEEL PIPE CLAMP ADAPTERS

#1	DESCRIPTION	
2C	Pipe clamp bayonet adapter (For .125" Ø and .188" Ø sensors)	
#2	"L" LENGTH OF STEM IN INCHES	
R	1-3/4"	
S	3-3/4"	
T	8-3/4"	
X	Other, specify	
Z	N/A, hose clamp only	
#3	STANDARD PIPE SIZE (INCHES)	BAND CLAMP DIAMETER (INCHES)
		MIN. MAX.
1	1/4 to 3/8	7/16 25/32
2	1/2 to 3/4	11/16 1-1/4
3	1 to 1-1/2	1-1/16 2
4	2 to 2-1/2	2-1/16 3
5	3 to 3-1/2	3-5/16 4-1/4
6	4	3-9/16 4-1/2
7	5	5-1/8 6
8	6	6-1/8 7
X	Other Specify	

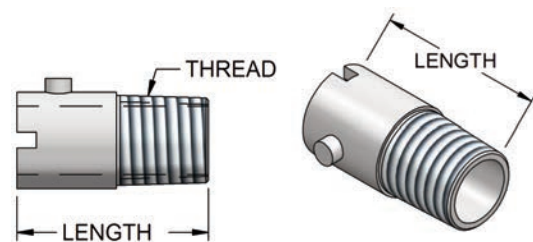


**Note:** L = Length of stem. Should be equal to the maximum insulation thickness + 3/4". The bayonet sensor length for adjustable should be L + 1-1/4". For fixed, it should be L + 1/2".

2C	S	3
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## NICKEL PLATED SLOT HEAD ADAPTERS

THREAD			LENGTH
1/8" NPT	3/8"-24	1/4"NPT	
2A	2E	6BA78	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.