

## Overview

In MISUMI's Temperature Sensor line, we offer Thermocouples (K Thermocouple and J Thermocouple) and Temperature Measuring Resistors by shape and application. Refer to the following abridged temperature sensor selection list when selecting your heater.

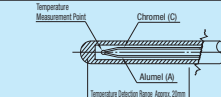
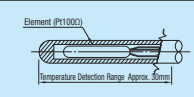
[Abridged Table for Temperature Sensor Selection]

Shape, Application	Type	Usage	Type
Sheath, Protective Tube	Standard (P.1654)	For limited space	L-Shaped (P.1656), Screw Mount (P.1661)
	Compact, Tapered Thread (P.1657)		Ring Terminal, Spade Terminal (P.1660)
	Flange (P.1658)	For specific environments	Heat Resistant (P.1656), Chemical Resistant (P.1659)
	Sheath, Protective Tube Configurable (P.1655)		For easy replacing at the time of wire breakage
Use for a moving part	Lead Wire Protection (P.1656)	To take 2 temperature signals from temperature measuring point	Double Element (P.1659)
	Sheath Type for Moving Parts (P.1658)	For measuring cylindrical workpieces	Band Type (P.1661)
	Ring Terminal for Moving Parts (P.1660)	For close contact to a temperature measuring part	Spring Contact Type (P.1662)
	Screw Mount for Moving Parts (P.1661)	For measuring temperature of workpiece surface	Surface Temperature Measurement Type, Magnet Type (P.1662)

## Precautions for Use

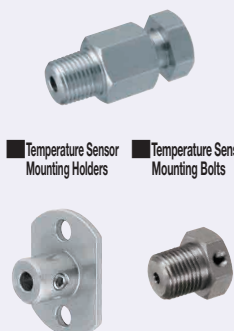
- ⚠ (Bending of Sheath / Protective Tube) Sheath type can be bent (min. bending radius: sheath dia. x5). However, temperature detecting part (20mm from the tip) cannot be bent. Protective Tube cannot be bent. Bending prevents it from accurate temperature measurement.
- ⚠ Compensation Lead Wires (P.1663) must be used to extend lead wires of thermocouple. For Temperature Measuring Resistor, use the same three lead wires in diameter, length and material.
- ⚠ Be sure to use each part within its heat resisting temperature listed on product pages. Note that the wire might be broken if the temperature exceeds its heat resisting temperature even if it has higher maximum measurement temperature.
- ⚠ Do not apply large external forces and vibrations.
- ⚠ Be sure to use sleeve, silicon tube and connector within respective allowable temperatures.

## Comparison of Thermocouple and Temperature Measuring Resistor

	K Thermocouple (J Thermocouple)	Temperature Measuring Resistor
Advantages	<ul style="list-style-type: none"> <li>Excellent in heat reaction</li> <li>Strong against vibrations and impacts</li> <li>A wide range of measurable temperature</li> </ul>	<ul style="list-style-type: none"> <li>High accuracy of temperature measuring</li> <li>Connectable to regular wires</li> </ul>
Disadvantages	<ul style="list-style-type: none"> <li>Accuracy of measurement temperature is slightly lower compared to Temperature Measuring Resistor</li> <li>Compensation Lead Wires must be used to extend the lead length</li> </ul>	<ul style="list-style-type: none"> <li>Expensive</li> <li>Weak against vibrations and impacts</li> </ul>
Precision	(For Class 2 (JIS)) -40°C ~ Less than 333°C : ±2.5°C 333°C or More : ±0.0075 · t (Actual Temperature) (Refer to each product page for the range of temperature measurement.)	±0.3°C or ±0.5%
Structure Diagram		

(Schematic is for Sheath / Protection Tube.)

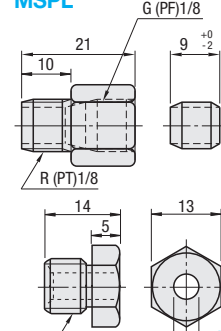
### Plugs for Mounting Temperature Sensors



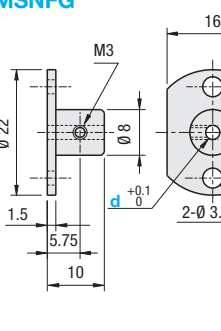
Temperature Sensor Mounting Holders  
Temperature Sensor Mounting Bolts

### Plugs for Mounting Temperature Sensors

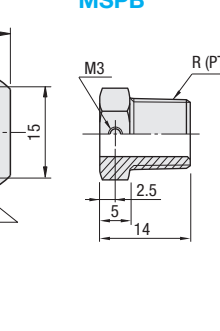
**MSPL**



**MSNFG**



**MSPB**

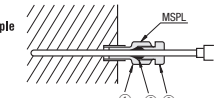


6.3

Material: MSPL (SUS304), MSNFG (SUS303), MSPB (SUS303). Accessory: Hex Socket Set Screw (SUS304).

Part Number	Type	Unit Price		
		d	MSPL	MSNFG
MSPL MSNFG MSPB	1.0			
	1.6			
	2.3			
	3.2			
4.8				

**Example**



Cut the 1/4 R(PT) thread in the heated object, fix the sensor after tightening the ② and ③ temporarily. Tighten ③ and secure ② and ③.  
 \*Because ② and ③ are unified after fixing, they cannot be removed and reused after tightening. The temperature sensor cannot be removed, either.  
 \*When air-tightness is necessary, use Tapered Screw Type on P.1657.

Highly suitable for changing the position of sensor according to the situation.

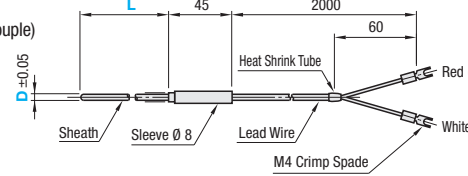
Ordering Example

Part Number
MSPL1.6
MSNFG2.3
MSPB3.2

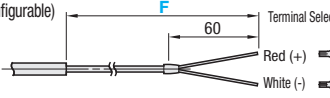
⚠ Be sure to refer to "Precautions for Use" in the Temperature Sensor Overview on P.1653.

### Temperature Sensors

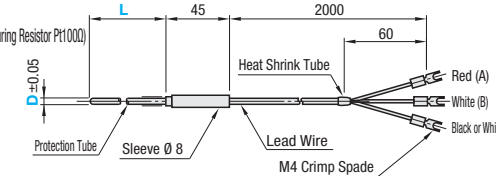
**MSND** (K Thermocouple)



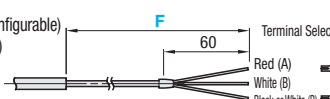
**MSNDFL** (Length of Lead Wire (F) Configurable) (K Thermocouple)



**MSPT** (Temperature Measuring Resistor Pt1000)



**MSPTFL** (Length of Lead Wire (F) Configurable) (Temperature Measuring Resistor Pt1000)



MSND, MSNDFL		K Thermocouple	
Type of Thermocouple	Precision	JIS Class 2	Isolated Neutral Type
Temperature Measurement Contact Point			
Temperature Measurement Range	Ø0.5	0~600°C	
	Ø1.0, 1.6	0~650°C	
	Ø2.3	0~650°C	
	Ø3.2	0~750°C	
	Ø4.8	0~800°C	
Material	Sheath	SUS316	
	Sleeve	SUS304	
Heat Resistance Temperature of Sleeve		80°C	
Lead Wire (Operating Temp. Range)		Glass Wool Coating (0~150°C)	

Terminal Selection:  
 N (No Crimp Terminal)  
 M (With Round Crimp Terminal)  
 Y (With Crimp Spade)

MSPT, MSPTFL		Pt1000	
Type of Device	Precision	JIS Class B	3-lead Type
Temperature Measurement Range			
Lead Type			
Temperature Measurement Range			
Material	Protection Tubes	SUS316	
	Sleeve	SUS304	
Heat Resistance Temperature of Sleeve		80°C	
Lead Wire (Operating Temp. Range)		Vinyl Coating (0~60°C)	

Terminal Selection:  
 N (No Crimp Terminal)  
 M (With Round Crimp Terminal)  
 Y (With Crimp Spade)

Part Number	Type	D	L Selection	MSNDFL only Lead Wire Length F: 0.1m Increment	Terminal	Unit Price	Sensor Body Price					Additional Terminal Price		
							MSNDFL					N	M	Y
MSND	MSND	0.5	30, 50	-	-	-	F0.3-1.0	F1.1-2.0	F2.1-3.0	F3.1-4.0	F4.1-5.0	N	M	Y
			100, 150											
			200, 300											
			30, 50, 100											
			150, 200											
			300											
MSND MSNDFL	MSND MSNDFL	1.0	30, 50, 100	0.3-5.0	N M Y	-								
			150, 200											
			300											
			30, 50, 100											
			150, 200											
			300											
MSND	MSND	1.6	30, 50, 100	-	-	-								
			150, 200											
			300											
			30, 50, 100											
			150, 200											
			300											
MSND	MSND	2.3	30, 50, 100	-	-	-								
			150, 200											
			300											
			30, 50, 100											
			150, 200											
			300											
MSND	MSND	3.2	30, 50, 100	-	-	-								
			150, 200											
			300											
			30, 50, 100											
			150, 200											
			300											
MSND	MSND	4.8	50, 100	-	-	-								
			150, 200											
			300											

Part Number	Type	D	L Selection	MSPTFL only Lead Wire Length F: 0.1m Increment	Terminal	Unit Price	Sensor Body Price					Additional Terminal Price		
							MSPTFL					N	M	Y
MSPT MSPTFL	MSPT MSPTFL	1.6	50, 100	0.3-5.0	N M Y	-								
			150											
			50, 100											
			150											
MSPT MSPTFL	MSPT MSPTFL	2.3	50, 100	-	-	-								
			150											
			50, 100											
			150											
MSPT MSPTFL	MSPT MSPTFL	3.2	50, 100	-	-	-								
			150											
			50, 100											
			150											

Ordering Example

Part Number - L - F - Terminal

MSND3.2 - 100  
 MSPT2.3 - 50  
 MSNDFL2.3 - 300 - F2.5 - M

⚠ The upper limit of temperature measurement is at the measurement point (the tip of sheath). When measuring, keep the sleeve temperature at or below the heat resistance temperature (80°C). The wire may break due to heat expansion of the sleeve. Especially when a heated object temperature exceeds 100°C, a long type of sheath L length is recommended, which is used to put maximum distance between the sleeve and the heated object, or Temperature Sensors, Heat Resistant Type (P.1656) is recommended.