

# Temperature Sensor - Overview / Connecting Parts for Temperature Sensors

## 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	Connector Type (P.1659)
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: $\pm 2.5^{\circ}\text{C}$ 333°C or More: $\pm 0.0075 \cdot t$ (Actual Temperature) (Refer to each product page for the range of temperature measurement.)	$\pm 0.3^{\circ}\text{C}$ or $\pm 0.5\%$
Structure Diagram		

(Schematic is for Sheath / Protection Tube.)

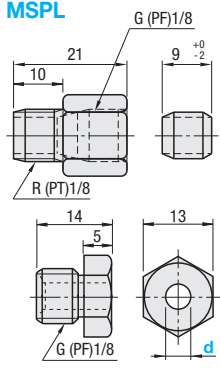
### Plugs for Mounting Temperature Sensors

**RoHS10**

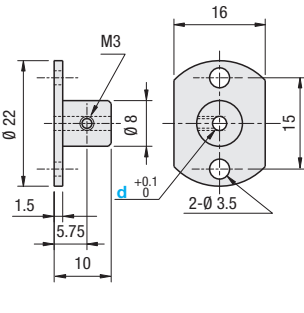
### Plugs for Mounting Temperature Sensors

**MSPL**



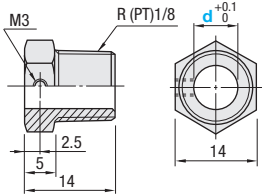
**Temperature Sensor Mounting Holders**

**MSNFG**



**Temperature Sensor Mounting Bolts**

**MSPB**



6.3

MSPL Material: EN 1.4301 Equiv.

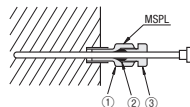
MSNFG Material: EN 1.4305 Equiv. Accessory: Hex Socket Set Screw (EN 1.4301 Equiv.)

MSPB Material: EN 1.4305 Equiv.

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



Example

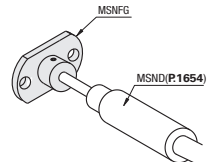


Cut the 1/8 (PT) thread in the heated object, fix the ①, and insert the sensor after tightening the ② and ③ temporarily.

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