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]

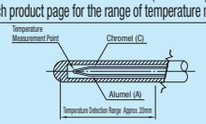
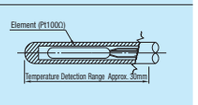
Shape, Application	Type
Sheath, Protective Tube	Standard (**P.1654**)
	Compact, Tapered Thread (**P.1657**)
	Flange (**P.1658**)
	Sheath, Protective Tube Configurable (**P.1655**)
Use for a moving part	Lead Wire Protection (**P.1656**)
	Sheath Type for Moving Parts (**P.1658**)
	Ring Terminal for Moving Parts (**P.1660**)
	Screw Mount for Moving Parts (**P.1661**)

Usage	Type
For limited space	L-Shaped (**P.1656**), Screw Mount (**P.1661**)
	Ring Terminal, Spade Terminal (**P.1660**)
For specific environments	Heat Resistant (**P.1656**), Chemical Resistant (**P.1659**)
For easy replacing at the time of wire breakage	Connector Type (**P.1659**)
To take 2 temperature signals from temperature measuring point	Double Element (**P.1659**)
For measuring cylindrical workpieces	Band Type (**P.1661**)
For close contact to a temperature measuring part	Spring Contact Type (**P.1662**)
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.

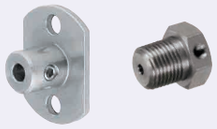
· Comparison of Thermocouple and Temperature Measuring Resistor

	K Thermocouple (J Thermocouple)	Temperature Measuring Resistor
Advantages	· Excellent in heat reaction · Strong against vibrations and impacts · A wide range of measurable temperature	· High accuracy of temperature measuring · Connectable to regular wires
Disadvantages	· Accuracy of measurement temperature is slightly lower compared to Temperature Measuring Resistor · Compensation Lead Wires must be used to extend the lead length	· Expensive · Weak against vibrations and impacts
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.)

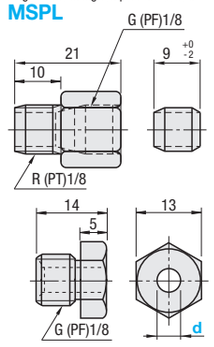
■Plugs for Mounting Temperature Sensors

■Temperature Sensor Mounting Holders ■Temperature Sensor Mounting Bolts



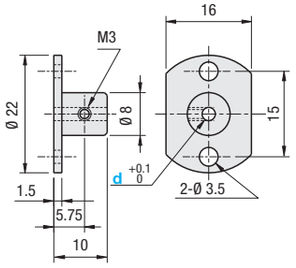
RoHS10

Plugs for Mounting Temperature Sensors
MSPL



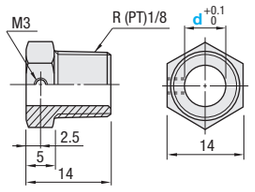
MSPL Ⓜ Material: EN 1.4301 Equiv.

Temperature Sensor Mounting Holders
MSNFG



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

Temperature Sensor Mounting Bolts
MSPB

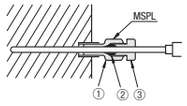


MSPB Ⓜ Material: EN 1.4305 Equiv.

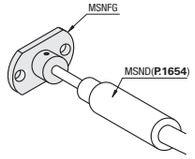
Part Number Type	d	Unit Price MSPL	MSNFG	MSPB
MSPL MSNFG MSPB	1.0			
	1.6			
	2.3			
	3.2			
	4.8		-	

Ordering Example — Part Number
MSPL1.6
MSNFG2.3
MSPB3.2

Example



Cut the ⅛ R(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.

Temperature Sensors

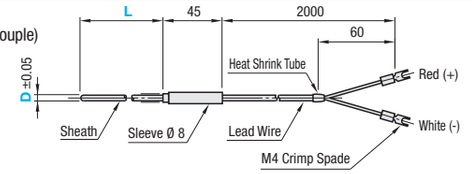
Standard Type

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

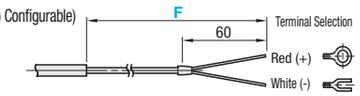
■Temperature Sensors

RoHS10

MSND (K Thermocouple)

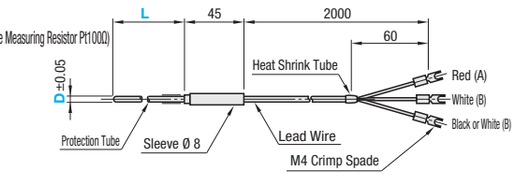


MSNDFL (Length of Lead Wire (F) Configurable) (K Thermocouple)

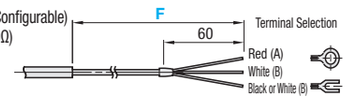


N (No Crimp Terminal)
M (With Round Crimp Terminal)
Y (With Crimp Spade)

MSPT (Temperature Measuring Resistor Pt100Ω)



MSPTFL (Length of Lead Wire (F) Configurable) (Temperature Measuring Resistor Pt100Ω)



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

MSND, MSNDFL

Type of Thermocouple		K Thermocouple
Precision		JIS Class 2
Temperature Measurement Contact Point		Isolated Neutral Type
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	EN 1.4401 Equiv.
	Sleeve	EN 1.4301 Equiv.
Heat Resistance Temperature of Sleeve		80°C
Lead Wire (Operating Temp. Range)		Glass Wool Coating (0 ~ 150°C)

MSPT, MSPTFL

Type of Device		Pt100Ω
Precision		JIS Class B
Lead Type		3-lead Type
Temperature Measurement Range		0~300°C
Ⓜ Material	Protection Tubes	EN 1.4401 Equiv.
	Sleeve	EN 1.4301 Equiv.
Heat Resistance Temperature of Sleeve		80°C
Lead Wire (Operating Temp. Range)		Vinyl Coating (0~60°C)

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