

Weld-On Sockets for Heater, Float Switches

Horizontal, Vertical

Far Infrared Ceramic Plate Heaters, Far Infrared Plate Heaters

Weld-On Sockets for Heater

MSHTS (PF Thread)

Material: SUS304

Weld-On Sockets

Part Number	Unit Price
MSHTS	

Ordering Example

Part Number: MSHTS

Example

Insert the projection part of the socket into the mounting hole, and weld the * marked part.

* Welding

Mounting Hole (Ø0.7)

Float Switches

FLOSK (Horizontal)

Specifications FLOSK

Usage	Water, Oil, General Liquid
Operating Range (Specific Gravity)	0.8 or More
Pressure Resistance	0.49MPa
Heat Resistance Temperature	-20°C~80°C
Contact Capacity	10W DC/AC
Contact Type	Contact Point

FLOST (Vertical)

Specifications FLOST

Usage	liquid such as water, oil and other
Operating Range (Specific Gravity)	0.8 or More
Pressure Resistance	1MPa
Heat Resistance Temperature	0°C~120°C
Contact Capacity	50W DC/AC
Contact Type	Contact Point

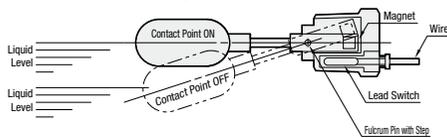
Material: Rod - Stem - Float Portion: SUS304

Part Number	No.	R (PT) / G (PF)	Lead Wire Length	L	L ₁	Mass (g)	Unit Price
FLOSK	80	R1 1/4	300	-	-	500	1 ~ 3 pc (s)
FLOST	2	G1/8		200	170	65	
	3		300	270	85		
	4		400	370	105		

For orders larger than indicated quantity, please request a quotation.

Principle of Operation (FLOSK)

The float moves according to changes in the liquid level. When the magnet comes close to the reed switch (high liquid level), the reed switch will be activated. When the liquid level falls, the contact point will be off again.

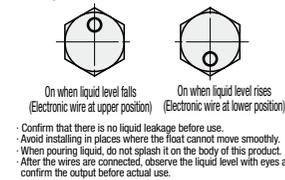


Features

These switches are designed as alarm or signal of water-level for liquids such as water and oil. By combining with a power supply interrupt circuit, it can be used as safety circuit to prevent liquid heaters from dry-running.

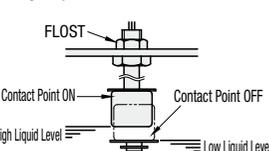
Cautions on Installation (FLOSK)

Install horizontally. The electrical wire should exit vertically.



Cautions on Installation (FLOST)

Float may not move properly when mounted diagonally.



Far Infrared Ceramic Plate Heaters

Far Infrared Plate Heaters

Material: SUS304

Type	Material			Accessory
	Heater	Element	Lead Wire	
MCHN (Standard)	Ceramics			Bracket (SUS304)
MCHNN (Heat Insulating Highly-efficient Type)	Ceramic Heat Insulation Material	NCHW2	Glass Wool Coating	
MCHNNS (Heat Insulating Highly-efficiency Type with Built-in Temperature Sensor)				

MCHNP

Material: Plate Frame : SUS304
Plate Surface : Aluminum + Far Infrared Coating
Thermocouple: K Thermocouple (4030S only)
Terminal: Terminal for Power Supply

Sensor is attached to the center of the heater.

Far Infrared Ceramic Plate Heaters

Part Number	Type	No.	A	B	C	(a)	(b)	(c)	W (Electric Power)	V (Voltage)	Max. Surface Temperature (°C)	Emission Wavelength (µm)	Unit Price		
													MCHN	MCHNN	MCHNNS
MCHN MCHNN MCHNNS	1	60	245	45 (48)	20 (18)	25 (21)	35 (32)	400	200	Single-phase	600	2~20			
	2	122 (125)	122 (125)										23 (8)	25 (14)	38 (25)
	3						400	600							
	4						600	680							

Values in () are for MCHN.

Far Infrared Plate Heaters

Part Number	Type	No.	A	B	a	b	W (Electric Power)	V (Voltage)	Max. Surface Temperature (°C)	Thermocouple Used	Weight (kg)	Unit Price
MCHNP	4030	400	300	368	268	1000	200	Single-phase	250	K Thermocouple	6.0	
	4030S											

Example: MCHNN

Features

- MISUMI's ceramic plate heaters are highly-efficient far infrared heaters.
- The far infrared ray uniformly heats the surface and interior of the object.
- This is little affected by aging, and retains high efficiency for a long time.
- Lightweight, clean with no particle generation, and excels in thermal response.

Heat Insulating Highly-efficient Type

Heat insulating material is embedded in conventional ceramic plate heaters. Heat insulation effect by air and heat insulating material enables less heat transfer and conduction to the backside of the heater, which enhances heat emission from heater surface. (Refer to Increased Temperature Properties Graph)

Heat Insulating Highly-efficient Type with Built-in Temperature Sensor

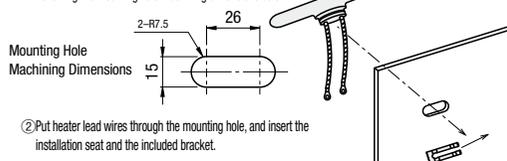
K Thermocouple is attached to measure the heater surface temperature. Suitable when the heater temperature control is required.

Far Infrared Plate Heaters

Large plate heater of 400x300 enables uniform heating of large area surfaces. Temperature unevenness will be smaller compared to combining conventional ceramic plate heaters.

How to Mount (Far Infrared Ceramic Plate Heaters)

- Decide the location of mounting the heater, and drill a hole following the mounting hole machining dimensions below.



Mounting plate thickness should be within 1 ~ 2mm.

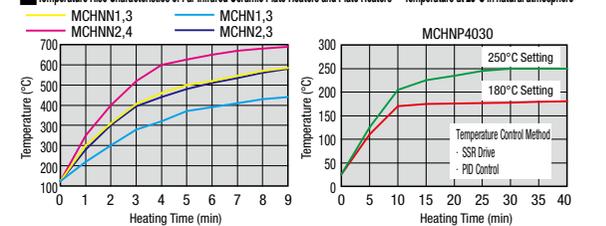
Precautions for Use

Do not use in places with high humidity. Short may result from such high humidity.

Usage

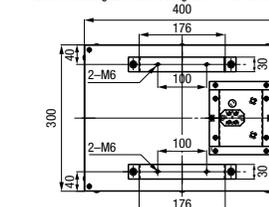
Suitable for clean heating as follows: LED industry, semiconductor industry, food industry, biotechnology industry and heating, drying, softening, preheating, hardening, aging, heat retention of the plastic molding process.

Temperature Rise Characteristics of Far Infrared Ceramic Plate Heaters and Plate Heaters *Temperature at 25°C in natural atmosphere



Mounting Method (Far Infrared Plate Heaters)

Back Mounting Dimension Diagram for Far Infrared Plate Heaters



Decide the heater mounting location, and drill a hole for M6. (Decide the exit for the heater power supply wires and drill a hole if necessary.)

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"> Excellent in heat reaction Strong against vibrations and impacts A wide range of measurable temperature 	<ul style="list-style-type: none"> High accuracy of temperature measuring Connectable to regular wires
Disadvantages	<ul style="list-style-type: none"> Accuracy of measurement temperature is slightly lower compared to Temperature Measuring Resistor Compensation Lead Wires must be used to extend the lead length 	<ul style="list-style-type: none"> 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

Plugs for Mounting Temperature Sensors

MSPL

MSNFG

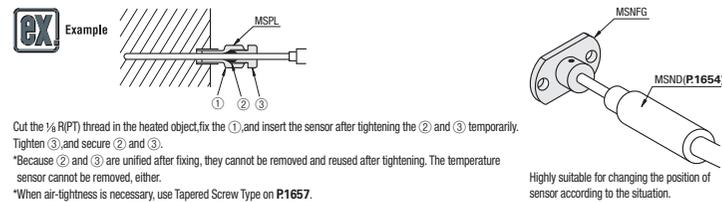
MSPB

6.3

Material: SUS304 (MSPL, MSNFG), SUS303 (MSPB)

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				



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)	

MSPT, MSPTFL		Pt1000	
Type of Device	Precision	JIS Class B	3-lead Type
Temperature Measurement Range			0~300°C
Material	Protection Tubes	SUS316	
	Sleeve	SUS304	
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					Additional Terminal Price				
							MSNDFL					N	M	Y		
							F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0					
MSND	MSND MSNDFL	0.5	30, 50	-	-	-										
			100, 150													
			200, 300													
			30, 50, 100				0.3~5.0	N	M	Y						
			150, 200													
			300													
30, 50, 100																
150, 200																
2.3	30, 50, 100															
3.2	30, 50, 100															
MSND		4.8	50, 100													

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

Temperature Sensors

Sheath and Wire Length Configurable

Be sure to refer to "Precautions for Use" in the Temperature Sensor Overview on P1653.

MSFK (K Thermocouple)
MSFJ (J Thermocouple)

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

MSFK, MSFJ	MSFK	MSFJ
Type of Thermocouple	K Thermocouple	J Thermocouple
Precision	JIS Class 2	
Temperature Measurement Contact Point	Isolated Neutral Type	
Temperature Measurement Range	Ø1.0, 1.6	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)	

MSFP (Temperature Measuring Resistor (Pt100Ω))

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

MSFP	Pt100Ω	
Type of Device	Pt100Ω	
Precision	JIS Class B	
Lead Type	3-lead Type	
Temperature Measurement Range	0 ~ 300°C	
	0 ~ 300°C	
	0 ~ 300°C	
Material	Protection Tubes	SUS316
	Sleeve	SUS304
Heat Resistance Temperature of Sleeve	80°C	
Lead Wire (Operating Temp. Range)	Vinyl Coating (-20 ~ 70°C)	

K Thermocouple, J Thermocouple				
Part Number	D	L 10mm Increment	Lead Wire Length F 0.1m Increment	Terminal
(K Thermocouple) MSFK	1.0	50~200	0.3~5.0	N M Y
	1.6	50~500		
(J Thermocouple) MSFJ	3.2	50~1000		
	4.8	50~1500		

Temperature Measuring Resistor (Pt100Ω)				
Part Number	D	L 10mm Increment	Lead Wire Length F 0.1m Increment	Terminal
(Temperature Measuring Resistor) MSFP	1.6	50~500	0.3~5.0	N M Y
	3.2			
	4.8			

Ordering Example: Part Number - L - F - Terminal
MSFK1.6 - 170 - 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 (P1656) is recommended.

D	L	MSFK - MSFJ Sensor Body Price				Additional Terminal Price (Body Price +)			
		F0.3-1.0	F1.1-2.0	F2.1-3.0	F3.1-4.0	F4.1-5.0	N	M	Y
1.0	50-100								
	110-200								
1.6	50-100								
	110-200								
	210-300								
	310-400								
3.2	410-500								
	50-100								
	110-200								
	210-300								
4.8	310-400								
	410-500								
	510-750								
	760-1000								

D	L	MSFP Sensor Body Price				Additional Terminal Price (Body Price +)			
		F0.3-1.0	F1.1-2.0	F2.1-3.0	F3.1-4.0	F4.1-5.0	N	M	Y
1.0	50-100								
	110-200								
1.6	210-300								
	310-400								
	410-500								
	50-100								
3.2	110-200								
	210-300								
	310-400								
	410-500								
4.8	50-100								
	110-200								
	210-300								
	310-400								

Temperature Sensors

L-Shaped / Lead Wire Protection / Heat Resistant

Be sure to refer to "Precautions for Use" in the Temperature Sensor Overview on P1653.

L-Shaped (RoHS)

MSNDL (K Thermocouple) Features: For narrow spaces

Overall length of sheath L-L1 is bent formed and will be +5.

Part Number	D	Overall Length of Sheath L	L1 1mm Increment	R	Unit Price		
Type					L100	L150	L300
MSNDL	1.6	100	20~270	5			
	2.3	150	40~260	7			
	3.2	200	50~250	9			

MSNDL	K Thermocouple	
Type of Thermocouple	JIS Class 2	
Precision	Isolated Neutral Type	
Temperature Measurement Contact Point	Ø1.6	
	Ø2.3	
	Ø3.2	
Material	Sheath	SUS316
	Sleeve	SUS304
Heat Resistance Temperature of Sleeve	80°C	
Lead Wire (Operating Temp. Range)	Glass Wool Coating (0 ~ 150°C)	

Ordering Example: Part Number - L - L1
MSNDL2.3 - 150 - 70

Lead Wire Protection (RoHS)

MSNDFC (K Thermocouple)

Features: Flexible tube covers lead wires and protects them from damage.

Heat Resistant (RoHS)

MSNDHG (K Thermocouple)

Features: Temperature Sensor heat resistance temperature of sleeve is 180°C (generally 80°C).

Lead Wire Protection				
Part Number	D	L Selection	Unit Price	
Type			L100	L300
MSNDFC	3.2	100		
		150		
		200		

Heat Resistant						
Part Number	D	L Selection	Unit Price			
Type			L30	L50	L100	L150
MSNDHG	3.2	30				
		50				
		100				
		150				

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 is recommended.

D	L	MSFK - MSFJ Sensor Body Price	Additional Terminal Price (Body Price +)						
		F0.3-1.0	F1.1-2.0	F2.1-3.0	F3.1-4.0	F4.1-5.0	N	M	Y
1.0	50-100								
	110-200								
1.6	50-100								
	110-200								
	210-300								
	310-400								
3.2	410-500								
	50-100								
	110-200								
	210-300								
4.8	310-400								
	410-500								
	510-750								
	760-1000								

Temperature Sensors

Compact, Taper Screw, Flange, Sheath Type for Moving Parts

Be sure to refer to "Precautions for Use" in the Temperature Sensor Overview on P1653.

Compact

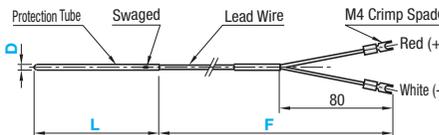


RoHS

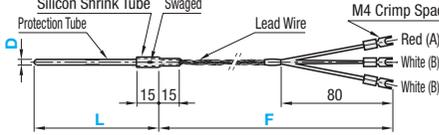
Type	Type of Temperature Sensor
TCKC	K Thermocouple
TCPC	Temperature Measuring Resistor (Pt100)

Features: Protective Tube cannot be bent. Lead wire is directly pulled out of protection tube. Does not have a sleeve, which shortens the distance between the heater and heated object and saves space for installation.

TCKC (K Thermocouple)



TCPC, TCPCF (Temperature Measuring Resistor Pt100)



TCKC

Type of Thermocouple	K Thermocouple
Precision	JIS Class 2
Temperature Measurement Contact Point	Isolated Neutral Type
Temperature Measurement Range	0 ~ 250°C
Material	SUS304
Lead Wire (Operating Temp. Range)	Glass Wool Coating (0 ~ 150°C)

TCPC, TCPCF

Type of Device	Pt100Ω
Precision	JIS Class B
Lead Type	3-lead Type
Temperature Measurement Range	-50 ~ 250°C
Material	SUS304
Silicon Shrink Tube Heat Resistance Temperature	150°C
Lead Wire (Operating Temp. Range)	Teflon Coating (-50 ~ 150°C)

Lead Wire Fixed Type

Part Number	D	L Fixed	F Fixed (Unit: m)	Type of Terminal	Unit Price	
					TCKC	TCPC
(K Thermocouple) TCKC (Temperature Measuring Resistor) TCPC	3.2	100	2	Y (M4 Crimp Spade)		

Lead Wire Configurable Type

Part Number	D	L Fixed	F 0.1m Increment	Terminal	Sensor Body Price					Additional Terminal Price (Body Price +)				
					F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0	N	M	Y		
(Temperature Measuring Resistor) TCPCF	3.2	100	0.3~5.0	N, M, Y										

Taper Screw

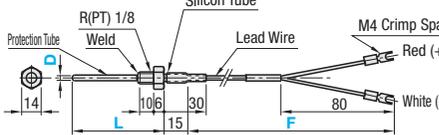


RoHS

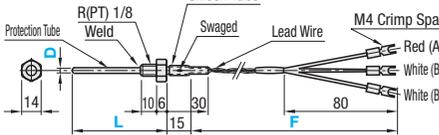
Type	Type of Temperature Sensor
TCKT	K Thermocouple
TCPT	Temperature Measuring Resistor (Pt100)

Features: Protective Tube cannot be bent. Taper Screw is welded to Compact Type. Best suited for the temperature measurement where the air-tightness for liquid is required.

TCKT, TCKTF (K Thermocouple)



TCPT, TCPTF (Temperature Measuring Resistor Pt100)



TCKT, TCKTF

Type of Thermocouple	K Thermocouple
Precision	JIS Class 2
Temperature Measurement Contact Point	Isolated Neutral Type
Temperature Measurement Range	0 ~ 250°C
Material	SUS304
Heat Resistance Temperature of Silicon Tube	150°C
Lead Wire (Operating Temp. Range)	Glass Wool Coating (0~150°C)

TCPT, TCPTF

Type of Device	Pt100Ω
Precision	JIS Class B
Lead Type	3-lead Type
Temperature Measurement Range	-50 ~ 250°C
Material	SUS304
Heat Resistance Temperature of Silicon Tube	150°C
Lead Wire (Operating Temp. Range)	Teflon Coating (-50~150°C)

Lead Wire Fixed Type

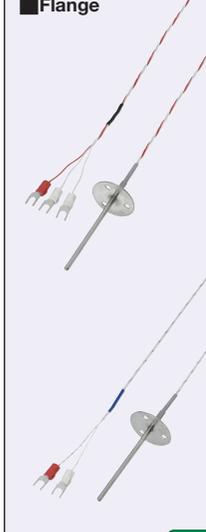
Part Number	D	L Fixed	F Fixed (Unit: m)	Type of Terminal	Unit Price	
					TCKT	TCPT
(K Thermocouple) TCKT (Temperature Measuring Resistor) TCPT	3.2	65	2	Y (M4 Crimp Spade)		

Lead Wire Configurable Type

Part Number	D	L Fixed	F 0.1m Increment	Terminal	Sensor Body Price					Additional Terminal Price (Body Price +)			
					F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0	N	M	Y	
(K Thermocouple) TCKTF (Temperature Measuring Resistor) TCPTF	3.2	65	0.3~5.0	N, M, Y									

Be sure to refer to "Precautions for Use" in the Temperature Sensor Overview on P1653.

Flange

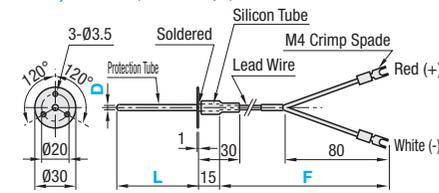


RoHS

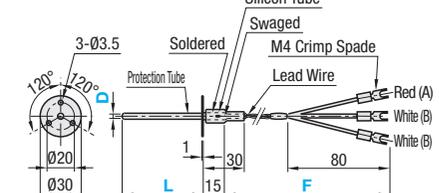
Type	Type of Temperature Sensor
TCKF	K Thermocouple
TCKFF	Temperature Measuring Resistor (Pt100)

Features: Protective Tube cannot be bent. It is a Flanged Compact Type having the flange soldered to itself and easy to attach to a device.

TCKF, TCKFF (K Thermocouple)



TCKCF, TCKCF (Temperature Measuring Resistor Pt100)



TCKF, TCKFF

Type of Thermocouple	K Thermocouple
Precision	JIS Class 2
Temperature Measurement Contact Point	Isolated Neutral Type
Temperature Measurement Range	0 ~ 250°C
Material	SUS304
Heat Resistance Temperature of Silicon Tube	150°C
Lead Wire (Operating Temp. Range)	Glass Wool Coating (0~150°C)

TCKCF, TCKCF

Type of Device	Pt100Ω
Precision	JIS Class B
Lead Type	3-lead Type
Temperature Measurement Range	-50 ~ 250°C
Material	SUS304
Heat Resistance Temperature of Silicon Tube	150°C
Lead Wire (Operating Temp. Range)	Teflon Coating (-50~150°C)

Lead Wire Fixed Type

Part Number	D	L Fixed	F Fixed (Unit: m)	Type of Terminal	Unit Price	
					TCKF	TCPCF
(K Thermocouple) TCKF (Temperature Measuring Resistor) TCPCF	3.2	65	2	Y (M4 Crimp Spade)		

Lead Wire Configurable Type

Part Number	D	L Fixed	F 0.1m Increment	Terminal	Sensor Body Price					Additional Terminal Price (Body Price +)			
					F0.3~1.0	F1.1~2.0	F2.1~3.0	F3.1~4.0	F4.1~5.0	N	M	Y	
(K Thermocouple) TCKFF	3.2	65	0.3~5.0	N, M, Y									

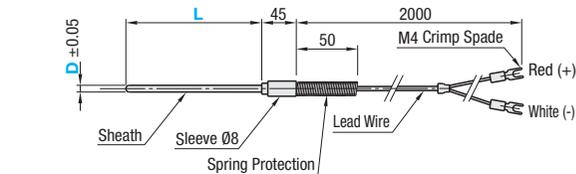
Sheath Type for Moving Parts



RoHS

MFSK (K Thermocouple)

Features: Highly flexible silicon covered lead wire is usable in bending applications. (Avoid excessive bending.)



MFSK

Type of Thermocouple	K Thermocouple
Precision	JIS Class 2
Temperature Measurement Contact Point	Isolated Neutral Type
Temperature Measurement Range	0 ~ 650°C
Material	SUS316
Heat Resistance Temperature of Sleeve	80°C
Lead Wire (Operating Temp. Range)	Silicon Coating (0~150°C)
Lead Wire Minimum Bending R	20

Lead Wire Fixed Type

Part Number	D	L Selection	Unit Price		
			L50	L100	L150
MFSK	1.6	50, 100, 150			

Ordering Example

Part Number	L	F	Terminal
TCKC3.2	100		
TCKTF3.2	65	F2.5	M
TCPCF3.2	65		
MFSK3.2	100		

Sheathed Thermocouples

MSEN (K Thermocouple)

In the cut state at the time of shipment.

MSEW (K Thermocouple)

Operating Temperature Range: 20°C ~ 200°C
 • The tip of sheathed thermocouples MSEN is welded.

Material
 Sheath, Insulator: Glass Wool

Part Number	Dia. of Element Wire d	L 1mm Increment	Unit Price					
			MSEN		MSEW			
Type			L200~1000	L1001~2000	L2001~3000	L200~1000	L1001~2000	L2001~3000
MSEN	0.32	200~3000						
MSEW								

Ordering Example

Part Number - L
 MSEN0.32 - 500
 MSEW0.32 - 300

Features

- Since the temperature measuring point is exposed, the reaction speed is faster than that of the sheathed type.
- Temperature measurement can be conducted based on the above measuring point of the tested object.

Temperature Measuring Point

Before using MSEN, expose alumel and chromel and twist/weld them to create the temperature measuring point.

Compensation Lead Wires

DSEN

Operating Temperature Range: 0°C ~ 150°C
 • In the cut state at the time of shipment.

Material
 Sheath, Insulator: Glass Wool
 +Side Element Wire: Iron
 -Side Element Wire: Alloy containing copper and nickel as main components

Part Number	Dia. of Element Wire d	L 0.1m Increment	Unit Price		
			L1.0~3.9	L4.0~6.9	L7.0~10.0
Type					
DSEN	0.32	1.0~10.0			

Ordering Example

Part Number - L
 DSEN0.32 - 2.5

Features

- It can be used as a lead wire of sheathed thermocouples.
- Also can be used to extend temperature sensor (K thermocouple) on P1654~1663.

K Thermocouple Connectors

MSNDC

Operating Temperature Range: 0°C ~ 130°C

Material
 Case: PP (Polypropylene)

Part Number	Type	No.	Unit Price

Ordering Example

Part Number
 MSNDC12.7

Features

The compensation lead wires can easily be attached and detached by connecting them with plug and jack of the connector respectively.

*No.8 and No.12.7 are same except for the size.

How to Use

- Peel off the sheath of compensation lead wires. (Approx. 7mm)
- Loosen the screw on connector by the screwdriver, and remove the cover.
- Loosen the screw in the connector and connect the + (Red) and - (White) of compensation lead wires to the + and - terminals of the connector, respectively.
- Confirm the screws are securely tightened, then install the cover.

Bimetal Thermostats

MBMS

Material
 Body: Ceramic (Steatite Type)
 Cap: Aluminum
 Bimetal: Disk Bimetal

Part Number	Rated Operating Temperature (°C)	Unit Price
080	80±5	
100	100±5	
120	120±5	
140	140±5	
160	160±5	
180	180±5	
200	200±5	

Features

- Bimetal of automatic return type.
- It energizes (NC) when the power is turned on and the contact point shuts off when it reaches to the operation temperature rate (OFF) and electricity is turned off. It automatically recovers when it is below the rated operating temperature.

Ordering Example

Part Number
 MBMS080

(Structure)
 Principle of Operation: Bimetal Non-energizing Type, Single Pole Single Throw,
 Operating Temperature One Point Fixed Type
 Operating Method: OFF when temperature rises, and ON when temperature drops (Electric Rating)
 Resistive Load AC125V/15A AC250V/7.5A (Minimum Current: 0.1A)
 (Contact Resistance)
 50mΩ or less according to minute current ohmmeter (DC6V/0.1A) (Initial Value)
 (Insulation Resistance)
 100MΩ or more in DC500V mega in the charge part and non-charge part
 (Insulation Resistance)
 AC1500V/min or AC1800V/sec in the charge part and non-charge part
 (Leakage current: 10mA)
 (ON/OFF Life Span Test)
 The thermal ON/OFF operation is done 10,000 times at the load of rated current and voltage.
 Insulation Resistance: 50MΩ; Contact resistance: 100mΩ or less

Thermostats

THRM

Material Capillary Tube, Heat Sensor: SUS316
 Bushing, Nipple: BS + Nickel Plating
 Maximum Temperature around Body: 120°C
 *When the temperature is below the set temperature, 1 and 2 are connected and the sensor turns "ON".
 When the temperature is over the above temperature, 1 and 4 are connected and the sensor turns "OFF".

RoHS

Part Number Type	No.	d	L	L1	Measurement Temperature Range	ON/OFF Temperature Difference	Sensor Min. Temp.	Sensor Max. Temp.	Unit Price 1 ~ 4 pc(s).
THRM	L	6	78	113	30 ~ 110°C	±4.5°C	120°C	330°C	
	H	4	57	91	50 ~ 320°C	±10°C	-10°C		

Features
 Temperature control is performed by turning on and off the contact with the liquid, which has a high thermal expansion coefficient, sealed in the heat sensor section.

Specification
 • Indicated Temperature: OFF value (between terminals 1 and 2)
 • Contact Capacity: 1-2 Resistive Load 16A Inductive Load 2.6A Voltage 250V
 1-4 Resistive Load 8A Inductive Load 0.6A Voltage 250V

Minimum bending radius of capillary tube is 5mm.
 For orders larger than indicated quantity, please check with WOS.
 Please use a thermostat for overheat protection, not for temperature control.

Thermostat Enclosures

THRMB

Material : SPC
S Surface Treatment : Zinc Plating (Trivalent Chromate)

RoHS

Protection Tubes

THRMP

Material : SUS304

RoHS

Thermostat Enclosures

Part Number Type	No.	Unit Price 1 ~ 4 pc(s).
THRMB	1	

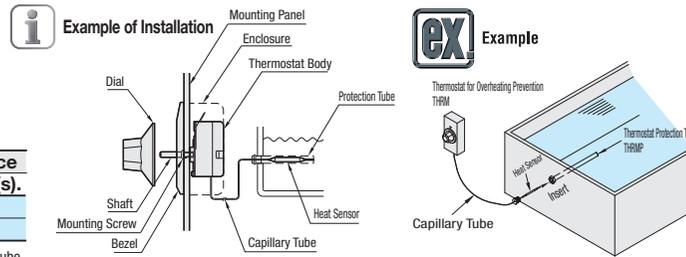
Protection Tubes

Part Number Type	No.	D	d	L	Applicable Thermostat	Unit Price 1 ~ 4 pc(s).
THRMP	H	9.5	7.5	150	THRML	
	L	8	6	120	THRMH	

Please be careful of the combination of thermostat and No. L/H of protection tube.

Ordering Example

Part Number
THRML
THRMB1
THRMPH



Features: Combination use of this equipment with the temperature controller (MTCS P.1674), float switch (FLOST P.1641), thermostat (THRM P.1665), etc. can prevent overheating and idle running.

Electromagnetic Contactor

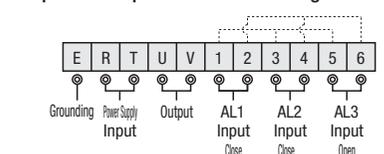
THRME (Single-phase)

RoHS

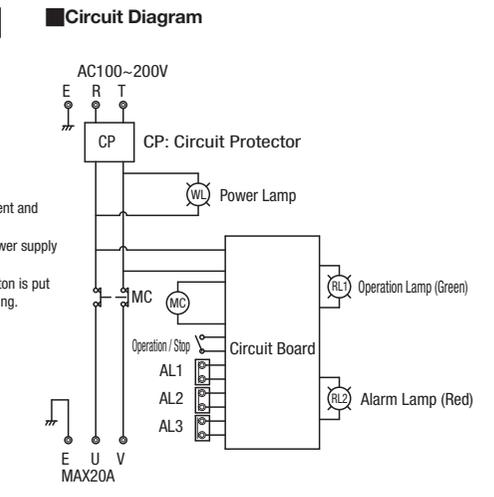
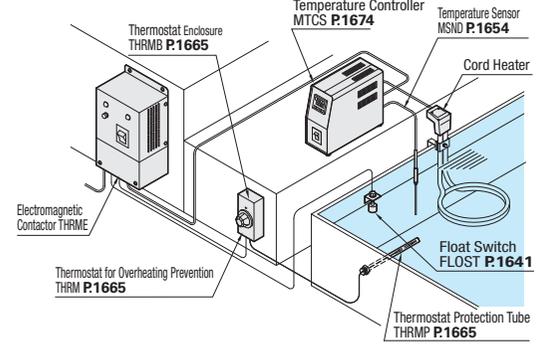
Part Number Type	No.	Unit Price Qty. 1 ~ 2
THRME	1	

For orders larger than indicated quantity, please check with WOS.

* Input and Output Terminal Connecting Method



Safety Circuit Signals: Contact Input 3 systems
 (Use non-voltage contact of "Open" and "Close" all the time.)
 Be careful when connecting wires as voltage is applied to between each terminal.



Ordering Example

Part Number	Unit Price
THRME1	

Features

- The built-in breaker can prevent over current and short.
- When overheating signal comes in, the power supply is retained in the Power "OFF" state.
- The function recovers when the re-set button is put after confirming the cause of the overheating.

