OMRON

Temperature Sensor | E52

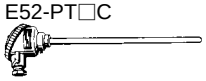
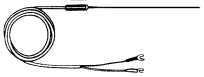
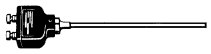
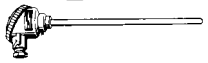
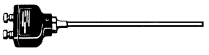
A Wide Variety of High-precision Temperature Sensors

- Ideal for the thermal input devices of Temperature Controllers.
- Select from a wide variety of Temperature Sensors according to the temperature to be measured, location, and environment, and also according to the shape and length of the terminal.
- General-purpose, low-cost, and exclusive models are available.

Contents

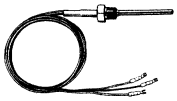
Ordering Information

General-purpose Models

Description	Model and appearance	Temperature range (see note)	Element type	Conductor type	Class	Protective tube material	Terminal type
Sheathed platinum resistance thermometer	E52-PT□A 	–200°C to 450°C	JPt100 Pt100	3-conductor system	B	SUS316	Exposed lead wires
	E52-PT□C 						Enclosed terminals
Standard platinum resistance thermometer	E52-PT□B 	0°C to 450°C				SUS316	Exposed terminals
	E52-PT□C 						Enclosed terminals
Sheathed thermocouple	E52-CA□A E52-IC□A 	0°C to 1,050°C	K (CA) J (IC)	Non-grounded type	0.75	SUS316 Inconel	Exposed lead wires
	E52-CA□B E52-IC□B 						Exposed terminals
	E52-CA□C E52-IC□C 						Enclosed terminals
Standard thermocouple	E52-CA□B E52-IC□B 	0°C to 1,000°C				SUS316 SUS310S SUS304	Exposed terminals
	E52-CA□C E52-IC□C 						Enclosed terminals
	E52-PR□C 	0°C to 1,400°C	R (PR)		0.25	JIS ceramic JIS special ceramic	Enclosed terminals

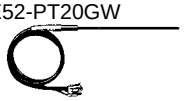
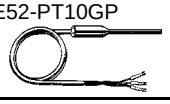
Note: The temperature range varies with the material, thickness, and construction of the protective tubing.

Low-cost Models

Description	Model and appearance	Temperature range (see note)	Element type	Conductor type	Class	Protective tube material	Terminal type
Low-cost platinum resistance thermometer	E52-PT10AE E52-PT6D E52-PT6F 	–50°C to 250°C	JPt100 Pt100	3-conductor system	B	SUS304	Exposed lead wires
Low-cost thermocouple	E52-CA□AS E52-IC□AS 	0°C to 400°C	K (CA) J (IC)	Non-grounded type	0.75		
	E52-CA1D E52-IC1D E52-CA6F E52-IC6F 			Grounded type			
	E52-CA10AE E52-IC10AE 			Non-grounded type			

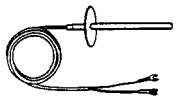
Note: The temperature range varies with the material, thickness, and construction of the protective tubing.

Exclusive Models

Description	Model and appearance	Temperature range (see note)	Element type	Conductor type	Class	Protective tube material	Terminal type
Used for pressure molding machines	E52-CA2GV E52-IC2GV 	0°C to 350°C	K (CA) J (IC)	Grounded type	0.75	SUS304	Exposed lead wires
Incorporates solderless terminals	E52-CA1GT E52-IC1GT 	0°C to 300°C	K (CA) J (IC)				
Used for measuring surface temperatures	E52-PT2GS 	–50°C to 250°C	JPt100 Pt100	3-conductor system	B		
Used for room temperature measurement	E52-PT10GR 	–50°C to 60°C	JPt100 Pt100				
Double-element model	E52-PT20GW 	–50°C to 250°C	Double elements JPt100 Pt100	Two 3-conductor systems			
Waterproof model	E52-PT10GP 	0°C to 70°C	JPt100 Pt100	3-conductor system			

Note: The temperature range varies with the material, thickness, and construction of the protective tubing.

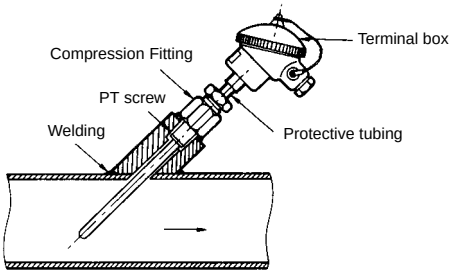
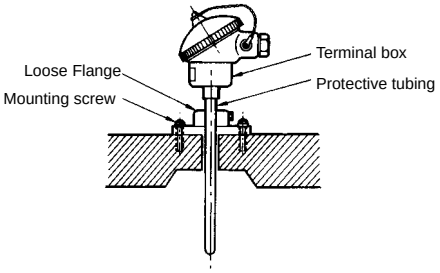
Thermistors

Description	Model and appearance	Temperature range (see note)	Element type	Conductor type	Class	Protective tube material	Terminal type
Thermistors	E52-THE5A E52-THE6F E52-THE6D 	–50°C to 300°C	Thermistor	Element-interchangeable thermistor	1	SUS304	Exposed lead wires

Note: The temperature range varies with the material, thickness, and construction of the protective tubing.

■ Accessories

It is recommended that the following accessories be used for mounting Temperature Sensors.

Accessory	Temperature range	Mounting example
Compression Fitting	600°C max.	Mounting with Compression Fitting 
Loose Flange	400°C max.	Mounting with Loose Flange 

■ Lead Wires

Accessory		Specification	Temperature range
For resistance thermometers	Standard	Fully vinyl-covered with twelve 0.18-dia. conductors (0.3 mm thick) and 4.8 mm in outer dia.	–20°C to 70°C
	Heat resistive	Fully glass-wool-covered with twenty 0.18-dia. conductors (0.5 mm thick) externally shielded with braided stainless steel wire, 5.2 mm in outer dia.	0°C to 180°C Sleeve: 0°C to 100°C
For thermocouples (compensating conductor)	Standard	Fully vinyl-covered with seven 0.3-dia. conductors (0.5 mm thick) and 3.2 x 5.0 mm in outer dia.	–20°C to 70°C
	Heat resistive	Fully vinyl-covered with seven 0.3-dia. conductors (0.5 mm thick) externally shielded with braided stainless steel wire, 2.9 x 4.6 mm in outer dia.	0°C to 150°C Sleeve: 0°C to 100°C

Temperature Sensors

General-purpose Models

Sheathed Platinum Resistance Thermometers

The following provides information on the JPt100. Refer to *Model Number Legend* for the Pt100.

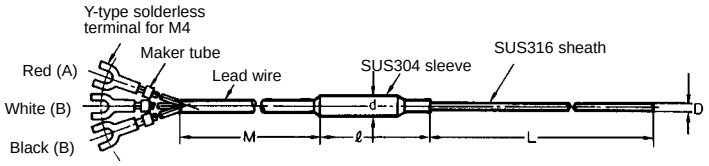
Specifications

Element type	JPt100
Class	JIS class B
Sheath material	SUS316
Sheath outer diameter	3.2 dia., 4.8 dia., 6.4 dia.
Conductor type	3-conductor system
Temperature range	–200°C to 450°C (in dry air)

■ Exposed-lead Models

- **E52-PT□A**

Dimensions



L: Protective tubing length
M: Lead wire length
D: Protective tubing diameter

Unit (mm)

D	d	ℓ
3.2 dia.	8	60
4.8 dia.	8	60
6.4 dia.	8	60

Lead Wire

Standard (–20°C to 70°C):
Fully vinyl-covered with twelve 0.18-dia conductors (0.3 mm thick) and 4.8 mm in outer dia.

Heat Resistive (0°C to 180°C):
Fully glass-wool-covered with twenty 0.18-dia. conductors (0.5 mm thick) externally shielded with braided stainless steel wire, 5.2 mm in outer dia. The sleeve resists a temperature range between 0°C and 180°C.

Lead Wire Length M: 1, 2, 4, or 8 m

Model Information

Custom-made models are available on request.

Exposed-lead Models

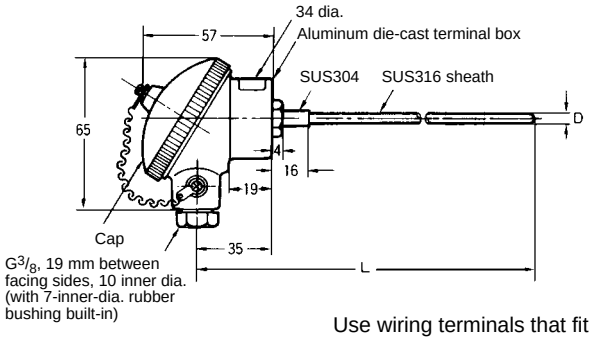
Protective tubing diameter (mm)	Protective tubing length (mm)	Lead wire type	Lead wire length (m)			
			1	2	4	8
			Model			
3.2 dia.	150	Standard	E52-PT15A D=3.2 1M	E52-PT15A D=3.2 2M	E52-PT15A D=3.2 4M	E52-PT15A D=3.2 8M
		Heat resistive	E52-PT15A D=3.2 NETU 1M	E52-PT15A D=3.2 NETU 2M	E52-PT15A D=3.2 NETU 4M	E52-PT15A D=3.2 NETU 8M
	200	Standard	E52-PT20A D=3.2 1M	E52-PT20A D=3.2 2M	E52-PT20A D=3.2 4M	E52-PT20A D=3.2 8M
		Heat resistive	E52-PT20A D=3.2 NETU 1M	E52-PT20A D=3.2 NETU 2M	E52-PT20A D=3.2 NETU 4M	E52-PT20A D=3.2 NETU 8M
	350	Standard	E52-PT35A D=3.2 1M	E52-PT35A D=3.2 2M	E52-PT35A D=3.2 4M	E52-PT35A D=3.2 8M
		Heat resistive	E52-PT35A D=3.2 NETU 1M	E52-PT35A D=3.2 NETU 2M	E52-PT35A D=3.2 NETU 4M	E52-PT35A D=3.2 NETU 8M

Protective tubing diameter (mm)	Protective tubing length (mm)	Lead wire type	Lead wire length (m)			
			1	2	4	8
			Model			
4.8 dia.	200	Standard	E52-PT20A D=4.8 1M	E52-PT20A D=4.8 2M	E52-PT20A D=4.8 4M	E52-PT20A D=4.8 8M
		Heat resistive	E52-PT20A D=4.8 NETU 1M	E52-PT20A D=4.8 NETU 2M	E52-PT20A D=4.8 NETU 4M	E52-PT20A D=4.8 NETU 8M
	350	Standard	E52-PT35A D=4.8 1M	E52-PT35A D=4.8 2M	E52-PT35A D=4.8 4M	E52-PT35A D=4.8 8M
		Heat resistive	E52-PT35A D=4.8 NETU 1M	E52-PT35A D=4.8 NETU 2M	E52-PT35A D=4.8 NETU 4M	E52-PT35A D=4.8 NETU 8M
	500	Standard	E52-PT50A D=4.8 1M	E52-PT50A D=4.8 2M	E52-PT50A D=4.8 4M	E52-PT50A D=4.8 8M
		Heat resistive	E52-PT50A D=4.8 NETU 1M	E52-PT50A D=4.8 NETU 2M	E52-PT50A D=4.8 NETU 4M	E52-PT50A D=4.8 NETU 8M
6.4 dia.	200	Standard	E52-PT20A D=6.4 1M	E52-PT20A D=6.4 2M	E52-PT20A D=6.4 4M	E52-PT20A D=6.4 8M
		Heat resistive	E52-PT20A D=6.4 NETU 1M	E52-PT20A D=6.4 NETU 2M	E52-PT20A D=6.4 NETU 4M	E52-PT20A D=6.4 NETU 8M
	350	Standard	E52-PT35A D=6.4 1M	E52-PT35A D=6.4 2M	E52-PT35A D=6.4 4M	E52-PT35A D=6.4 8M
		Heat resistive	E52-PT35A D=6.4 NETU 1M	E52-PT35A D=6.4 NETU 2M	E52-PT35A D=6.4 NETU 4M	E52-PT35A D=6.4 NETU 8M
	500	Standard	E52-PT50A D=6.4 1M	E52-PT50A D=6.4 2M	E52-PT50A D=6.4 4M	E52-PT50A D=6.4 8M
		Heat resistive	E52-PT50A D=6.4 NETU 1M	E52-PT50A D=6.4 NETU 2M	E52-PT50A D=6.4 NETU 4M	E52-PT50A D=6.4 NETU 8M

■ Enclosed-terminal Models

- **E52-PT□C**

Dimensions



L: Protective tubing length
D: Protective tubing diameter

Use wiring terminals that fit M3 screws.

Model Information

Custom-made models are available on request.

Enclosed-terminal Models

Protective tubing length (mm)	Protective tubing diameter (mm)		
	3.2 dia.	4.8 dia.	6.4 dia.
	Model		
200	E52-PT20C D=3.2	E52-PT20C D=4.8	E52-PT20C D=6.4
350	E52-PT35C D=3.2	E52-PT35C D=4.8	E52-PT35C D=6.4
500	E52-PT50C D=3.2	E52-PT50C D=4.8	E52-PT50C D=6.4
750	---	E52-PT75C D=4.8	E52-PT75C D=6.4

Standard Platinum Resistance Thermometers

The following provides information on the JPt100. Refer to *Model Number Legend* for the Pt100.

Specifications

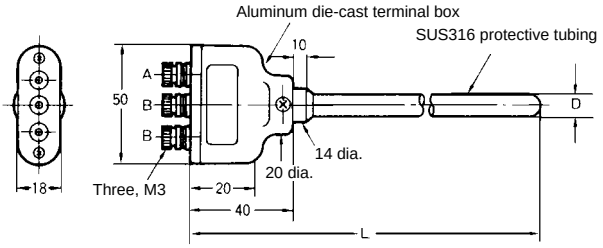
Element type	JPt100
Class	JIS class B (see note 2)
Protective tubing material	SUS316
Conductor type	3-conductor system
Temperature range	0°C to 450°C (in dry air)

Note: 1. Use the sheathed platinum resistance thermometer if condensation is likely to result.
2. Be sure that the thermometer is free of vibration or shock if high temperatures are measured.

■ Exposed-terminal Models

- **E52-PT□B**

Dimensions



L: Protective tubing length
D: Protective tubing diameter

Model Information

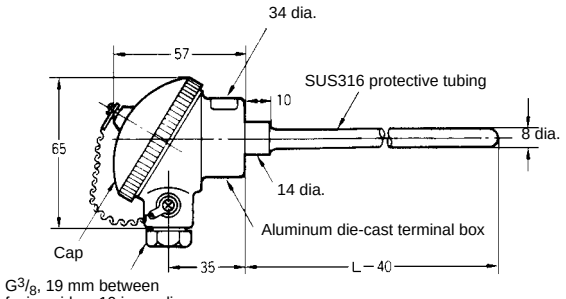
Exposed-terminal Models

Protective tubing length (mm)	Lead wire type	
	8 dia.	10 dia.
	Model	
200	E52-PT20B D=8	---
350	E52-PT35B D=8	E52-PT35B D=10
500	E52-PT50B D=8	E52-PT50B D=10
750	---	E52-PT75B D=10
1,000	---	E52-PT100B D=10

■ Enclosed-terminal Models

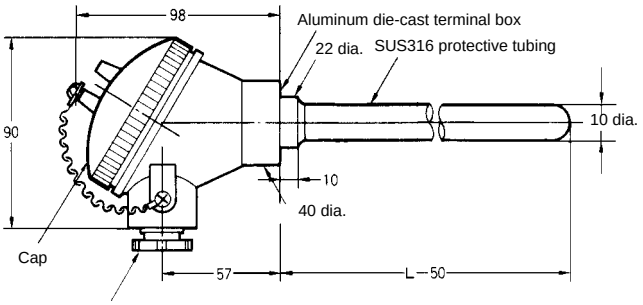
- **E52-PT□C**

Dimensions



$G^3/_8$, 19 mm between facing sides, 10 inner dia. (with 7-inner-dia. rubber bushing built-in)

Use wiring terminals that fit M3 screws.



$G^2/_1$, 15-A ground (with 11-inner-dia. rubber bushing built-in)

Use wiring terminals that fit M4 screws.

L: Protective tubing length
D: Protective tubing diameter

Model Information

Enclosed-terminal Models

Protective tubing length (mm)	Protective tubing diameter (mm)	
	8 dia.	10 dia.
	Model	
200	E52-PT20C D=8	---
350	E52-PT35C D=8	E52-PT35C D=10
500	E52-PT50C D=8	E52-PT50C D=10
750	---	E52-PT75C D=10
1,000	---	E52-PT100C D=10

■ Model Number Legend

The type of resistance thermometer, protective tubing length, and lead length can be specified as shown below.

Platinum Resistance Thermometers

E52-□□□ D=□□□M
1 2 3 4 5 6

1. Element type

PT: JPt100
P: Pt100

2. Protective tubing length (L)

Specify the length in centimeters within the following range:
Unit (cm)

E52-□□A

Diameter	Length (L)
3.2	7 to 100
4.8	10 to 600
6.4	13 to 1,300

E52-□□B

Diameter	Length (L)
8	21 to 100
10	25 to 100

E52-□□C

Diameter	Length (L)
3.2	12 to 100
4.8	15 to 600
6.4	18 to 1,300
8	21 to 100
10	26 to 100

3. Terminal

A: Exposed lead wires
B: Exposed terminals
C: Enclosed terminals

4. Diameter

3.2: 3.2-mm dia. (Protective tubing construction: Sheathed)
E52-□□A and E52-□□C only

4.8: 4.8-mm dia. (Protective tubing construction: Sheathed)
E52-□□A and E52-□□C only

6.4: 6.4-mm dia. (Protective tubing construction: Sheathed)
E52-□□A and E52-□□C only

8: 8-mm dia. (Protective tubing construction: Standard)
E52-□□B and E52-□□C only

10: 10-mm dia. (Protective tubing construction: Standard)
E52-□□B and E52-□□C only

5. Heat resistance

Code	Temperature range	Lead type
---	–20°C to 70°C	Fully vinyl-covered
NETU	0°C to 180°C Sleeve: 0°C to 100°C	Fully glass-wool-covered shielded with braided stainless steel wire

Specify for E52□□-A model only

6. Lead length (M)

Specify the length in meters within the following range for the E52-□□A only:
Range: 1 to 100 m

Examples

Element wire: Pt100; protective tubing length: 420 mm; exposed leads; protective tubing dia.: 4.8 mm; heat resistive; lead length: 10 m
E52-P42A D=4.8 NETU 10M

Element wire: JPt100; protective tubing length: 360 mm; enclosed terminals; protective tubing dia.: 3.2
E52-PT36C D=3.2

Sheathed Thermocouples

Specifications

Element type	K (CA), J(IC)
Class	JIS class 0.75
Thermal contact	Non-grounded type
Sheath material	CA: SUS316
	IC: SUS316

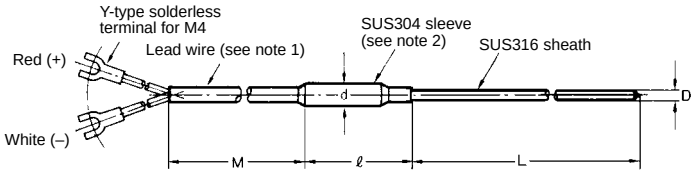
Permissible Temperature in Dry Air

D	Element wire	
	K (CA) SUS316	J (IC) SUS316
1 dia.	650°C	450°C
1.6 dia.	650°C	450°C
3.2 dia.	750°C	650°C
4.8 dia.	800°C	750°C
6.4 dia.	800°C	750°C
8.0 dia.	900°C	750°C

■ Exposed-lead Models

- **E52-CA□A**

Dimensions



L: Protective tubing length
M: Lead wire length
D: Protective tubing diameter

Unit (mm)

D	d	ℓ
1 dia.	7	40
1.6 dia.	7	40
3.2 dia.	7	40
4.8 dia.	7	40
6.4 dia.	10	45
8 dia.	10	45

Note: 1. **Lead Wire (Compensating Conductor)**

Standard (–20°C to 70°C):
Fully vinyl-covered with seven 0.3-dia. conductors (0.5 mm thick) and external dimensions of 3.2 x 5.0.

Heat Resistive (0°C to 150°C):
Fully glass-wool-covered with seven 0.3-dia. conductors (0.5 mm thick) externally shielded with braided stainless steel wire and external dimensions of 2.9 x 4.6
Lead Wire Length (M): 1, 2, 4 and 8 (m)

2. The sleeve resists temperatures ranging between 0°C and 100°C.

K (CA) Model Information (E52-CA□A)

Exposed-lead Models

Protective tubing diameter (mm)	Protective tubing length (mm)	Lead wire type	Lead wire length (m)			
			1	2	4	8
			Model			
1 dia.	150	Standard	E52-CA15A D=1 1M	E52-CA15A D=1 2M	E52-CA15A D=1 4M	E52-CA15A D=1 8M
		Heat resistive	E52-CA15A D=1 NETU 1M	E52-CA15A D=1 NETU 2M	E52-CA15A D=1 NETU 4M	E52-CA15A D=1 NETU 8M
	200	Standard	E52-CA20A D=1 1M	E52-CA20A D=1 2M	E52-CA20A D=1 4M	E52-CA20A D=1 8M
		Heat resistive	E52-CA20A D=1 NETU 1M	E52-CA20A D=1 NETU 2M	E52-CA20A D=1 NETU 4M	E52-CA20A D=1 NETU 8M
	350	Standard	E52-CA35A D=1 1M	E52-CA35A D=1 2M	E52-CA35A D=1 4M	E52-CA35A D=1 8M
		Heat resistive	E52-CA35A D=1 NETU 1M	E52-CA35A D=1 NETU 2M	E52-CA35A D=1 NETU 4M	E52-CA35A D=1 NETU 8M

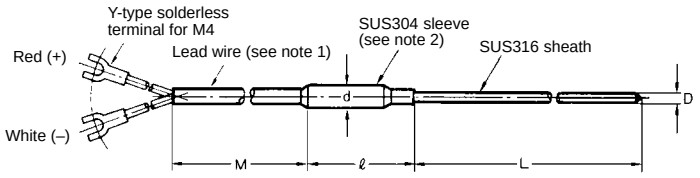
Protective tubing diameter (mm)	Protective tubing length (mm)	Lead wire type	Lead wire length (m)			
			1	2	4	8
			Model			
1.6 dia.	150	Standard	E52-CA15A D=1.6 1M	E52-CA15A D=1.6 2M	E52-CA15A D=1.6 4M	E52-CA15A D=1.6 8M
		Heat resistive	E52-CA15A D=1.6 NETU 1M	E52-CA15A D=1.6 NETU 2M	E52-CA15A D=1.6 NETU 4M	E52-CA15A D=1.6 NETU 8M
	200	Standard	E52-CA20A D=1.6 1M	E52-CA20A D=1.6 2M	E52-CA20A D=1.6 4M	E52-CA20A D=1.6 8M
		Heat resistive	E52-CA20A D=1.6 NETU 1M	E52-CA20A D=1.6 NETU 2M	E52-CA20A D=1.6 NETU 4M	E52-CA20A D=1.6 NETU 8M
	350	Standard	E52-CA35A D=1.6 1M	E52-CA35A D=1.6 2M	E52-CA35A D=1.6 4M	E52-CA35A D=1.6 8M
		Heat resistive	E52-CA35A D=1.6 NETU 1M	E52-CA35A D=1.6 NETU 2M	E52-CA35A D=1.6 NETU 4M	E52-CA35A D=1.6 NETU 8M
3.2 dia.	150	Standard	E52-CA15A D=3.2 1M	E52-CA15A D=3.2 2M	E52-CA15A D=3.2 4M	E52-CA15A D=3.2 8M
		Heat resistive	E52-CA15A D=3.2 NETU 1M	E52-CA15A D=3.2 NETU 2M	E52-CA15A D=3.2 NETU 4M	E52-CA15A D=3.2 NETU 8M
	200	Standard	E52-CA20A D=3.2 1M	E52-CA20A D=3.2 2M	E52-CA20A D=3.2 4M	E52-CA20A D=3.2 8M
		Heat resistive	E52-CA20A D=3.2 NETU 1M	E52-CA20A D=3.2 NETU 2M	E52-CA20A D=3.2 NETU 4M	E52-CA20A D=3.2 NETU 8M
	350	Standard	E52-CA35A D=3.2 1M	E52-CA35A D=3.2 2M	E52-CA35A D=3.2 4M	E52-CA35A D=3.2 8M
		Heat resistive	E52-CA35A D=3.2 NETU 1M	E52-CA35A D=3.2 NETU 2M	E52-CA35A D=3.2 NETU 4M	E52-CA35A D=3.2 NETU 8M
	500	Standard	E52-CA50A D=3.2 1M	E52-CA50A D=3.2 2M	E52-CA50A D=3.2 4M	E52-CA50A D=3.2 8M
		Heat resistive	E52-CA50A D=3.2 NETU 1M	E52-CA50A D=3.2 NETU 2M	E52-CA50A D=3.2 NETU 4M	E52-CA50A D=3.2 NETU 8M
4.8 dia.	200	Standard	E52-CA20A D=4.8 1M	E52-CA20A D=4.8 2M	E52-CA20A D=4.8 4M	E52-CA20A D=4.8 8M
		Heat resistive	E52-CA20A D=4.8 NETU 1M	E52-CA20A D=4.8 NETU 2M	E52-CA20A D=4.8 NETU 4M	E52-CA20A D=4.8 NETU 8M
	350	Standard	E52-CA35A D=4.8 1M	E52-CA35A D=4.8 2M	E52-CA35A D=4.8 4M	E52-CA35A D=4.8 8M
		Heat resistive	E52-CA35A D=4.8 NETU 1M	E52-CA35A D=4.8 NETU 2M	E52-CA35A D=4.8 NETU 4M	E52-CA35A D=4.8 NETU 8M
	500	Standard	E52-CA50A D=4.8 1M	E52-CA50A D=4.8 2M	E52-CA50A D=4.8 4M	E52-CA50A D=4.8 8M
		Heat resistive	E52-CA50A D=4.8 NETU 1M	E52-CA50A D=4.8 NETU 2M	E52-CA50A D=4.8 NETU 4M	E52-CA50A D=4.8 NETU 8M
6.4 dia.	200	Standard	E52-CA20A D=6.4 1M	E52-CA20A D=6.4 2M	E52-CA20A D=6.4 4M	E52-CA20A D=6.4 8M
		Heat resistive	E52-CA20A D=6.4 NETU 1M	E52-CA20A D=6.4 NETU 2M	E52-CA20A D=6.4 NETU 4M	E52-CA20A D=6.4 NETU 8M
	350	Standard	E52-CA35A D=6.4 1M	E52-CA35A D=6.4 2M	E52-CA35A D=6.4 4M	E52-CA35A D=6.4 8M
		Heat resistive	E52-CA35A D=6.4 NETU 1M	E52-CA35A D=6.4 NETU 2M	E52-CA35A D=6.4 NETU 4M	E52-CA35A D=6.4 NETU 8M
	500	Standard	E52-CA50A D=6.4 1M	E52-CA50A D=6.4 2M	E52-CA50A D=6.4 4M	E52-CA50A D=6.4 8M
		Heat resistive	E52-CA50A D=6.4 NETU 1M	E52-CA50A D=6.4 NETU 2M	E52-CA50A D=6.4 NETU 4M	E52-CA50A D=6.4 NETU 8M

Protective tubing diameter (mm)	Protective tubing length (mm)	Lead wire type	Lead wire length (m)			
			1	2	4	8
			Model			
8 dia.	200	Standard	E52-CA20A D=8 1M	E52-CA20A D=8 2M	E52-CA20A D=8 4M	E52-CA20A D=8 8M
		Heat resistive	E52-CA20A D=8 NETU 1M	E52-CA20A D=8 NETU 2M	E52-CA20A D=8 NETU 4M	E52-CA20A D=8 NETU 8M
	350	Standard	E52-CA35A D=8 1M	E52-CA35A D=8 2M	E52-CA35A D=8 4M	E52-CA35A D=8 8M
		Heat resistive	E52-CA35A D=8 NETU 1M	E52-CA35A D=8 NETU 2M	E52-CA35A D=8 NETU 4M	E52-CA35A D=8 NETU 8M
	500	Standard	E52-CA50A D=8 1M	E52-CA50A D=8 2M	E52-CA50A D=8 4M	E52-CA50A D=8 8M
		Heat resistive	E52-CA50A D=8 NETU 1M	E52-CA50A D=8 NETU 2M	E52-CA50A D=8 NETU 4M	E52-CA50A D=8 NETU 8M

- **E52-IC□A**

Dimensions

F19



L: Protective tubing length
M: Lead wire length
D: Protective tubing diameter

Unit (mm)

D	d	ℓ
1 dia.	7	40
1.6 dia.	7	40
3.2 dia.	7	40
4.8 dia.	7	40
6.4 dia.	10	45
8 dia.	10	45

Note: 1. **Lead Wire (Compensating Conductor)**

Standard (–20°C to 70°C):
Fully vinyl-covered with seven 0.3-dia. conductors (0.5 mm thick) and external dimensions of 3.2 x 5.0.

Heat Resistive (0°C to 150°C):
Fully glass-wool-covered with seven 0.3-dia. conductors (0.5 mm thick) externally shielded with braided stainless steel wire and external dimensions of 2.9 x 4.6
Lead Wire Length (M): 1, 2, 4 and 8 (m)

2. The sleeve resists temperatures ranging between 0°C and 100°C.

J (IC) Model Information (E52-IC□A)

Exposed-lead Models

Protective tubing diameter (mm)	Protective tubing length (mm)	Lead wire type	Lead wire length (m)			
			1	2	4	8
			Model			
1 dia.	150	Standard	E52-IC15A D=1 1M	E52-IC15A D=1 2M	E52-IC15A D=1 4M	E52-IC15A D=1 8M
		Heat resistive	E52-IC15A D=1 NETU 1M	E52-IC15A D=1 NETU 2M	E52-IC15A D=1 NETU 4M	E52-IC15A D=1 NETU 8M
	200	Standard	E52-IC20A D=1 1M	E52-IC20A D=1 2M	E52-IC20A D=1 4M	E52-IC20A D=1 8M
		Heat resistive	E52-IC20A D=1 NETU 1M	E52-IC20A D=1 NETU 2M	E52-IC20A D=1 NETU 4M	E52-IC20A D=1 NETU 8M
	350	Standard	E52-IC35A D=1 1M	E52-IC35A D=1 2M	E52-IC35A D=1 4M	E52-IC35A D=1 8M
		Heat resistive	E52-IC35A D=1 NETU 1M	E52-IC35A D=1 NETU 2M	E52-IC35A D=1 NETU 4M	E52-IC35A D=1 NETU 8M

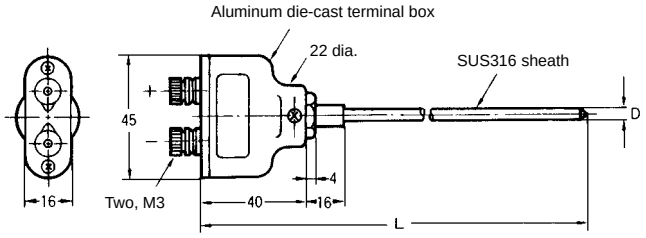
Protective tubing diameter (mm)	Protective tubing length (mm)	Lead wire type	Lead wire length (m)			
			1	2	4	8
			Model			
1.6 dia.	150	Standard	E52-IC15A D=1.6 1M	E52-IC15A D=1.6 2M	E52-IC15A D=1.6 4M	E52-IC15A D=1.6 8M
		Heat resistive	E52-IC15A D=1.6 NETU 1M	E52-IC15A D=1.6 NETU 2M	E52-IC15A D=1.6 NETU 4M	E52-IC15A D=1.6 NETU 8M
	200	Standard	E52-IC20A D=1.6 1M	E52-IC20A D=1.6 2M	E52-IC20A D=1.6 4M	E52-IC20A D=1.6 8M
		Heat resistive	E52-IC20A D=1.6 NETU 1M	E52-IC20A D=1.6 NETU 2M	E52-IC20A D=1.6 NETU 4M	E52-IC20A D=1.6 NETU 8M
	350	Standard	E52-IC35A D=1.6 1M	E52-IC35A D=1.6 2M	E52-IC35A D=1.6 4M	E52-IC35A D=1.6 8M
		Heat resistive	E52-IC35A D=1.6 NETU 1M	E52-IC35A D=1.6 NETU 2M	E52-IC35A D=1.6 NETU 4M	E52-IC35A D=1.6 NETU 8M
3.2 dia.	150	Standard	E52-IC15A D=3.2 1M	E52-IC15A D=3.2 2M	E52-IC15A D=3.2 4M	E52-IC15A D=3.2 8M
		Heat resistive	E52-IC15A D=3.2 NETU 1M	E52-IC15A D=3.2 NETU 2M	E52-IC15A D=3.2 NETU 4M	E52-IC15A D=3.2 NETU 8M
	200	Standard	E52-IC20A D=3.2 1M	E52-IC20A D=3.2 2M	E52-IC20A D=3.2 4M	E52-IC20A D=3.2 8M
		Heat resistive	E52-IC20A D=3.2 NETU 1M	E52-IC20A D=3.2 NETU 2M	E52-IC20A D=3.2 NETU 4M	E52-IC20A D=3.2 NETU 8M
	350	Standard	E52-IC35A D=3.2 1M	E52-IC35A D=3.2 2M	E52-IC35A D=3.2 4M	E52-IC35A D=3.2 8M
		Heat resistive	E52-IC35A D=3.2 NETU 1M	E52-IC35A D=3.2 NETU 2M	E52-IC35A D=3.2 NETU 4M	E52-IC35A D=3.2 NETU 8M
	500	Standard	E52-IC50A D=3.2 1M	E52-IC50A D=3.2 2M	E52-IC50A D=3.2 4M	E52-IC50A D=3.2 8M
		Heat resistive	E52-IC50A D=3.2 NETU 1M	E52-IC50A D=3.2 NETU 2M	E52-IC50A D=3.2 NETU 4M	E52-IC50A D=3.2 NETU 8M
4.8 dia.	200	Standard	E52-IC20A D=4.8 1M	E52-IC20A D=4.8 2M	E52-IC20A D=4.8 4M	E52-IC20A D=4.8 8M
		Heat resistive	E52-IC20A D=4.8 NETU 1M	E52-IC20A D=4.8 NETU 2M	E52-IC20A D=4.8 NETU 4M	E52-IC20A D=4.8 NETU 8M
	350	Standard	E52-IC35A D=4.8 1M	E52-IC35A D=4.8 2M	E52-IC35A D=4.8 4M	E52-IC35A D=4.8 8M
		Heat resistive	E52-IC35A D=4.8 NETU 1M	E52-IC35A D=4.8 NETU 2M	E52-IC35A D=4.8 NETU 4M	E52-IC35A D=4.8 NETU 8M
	500	Standard	E52-IC50A D=4.8 1M	E52-IC50A D=4.8 2M	E52-IC50A D=4.8 4M	E52-IC50A D=4.8 8M
		Heat resistive	E52-IC50A D=4.8 NETU 1M	E52-IC50A D=4.8 NETU 2M	E52-IC50A D=4.8 NETU 4M	E52-IC50A D=4.8 NETU 8M
6.4 dia.	200	Standard	E52-IC20A D=6.4 1M	E52-IC20A D=6.4 2M	E52-IC20A D=6.4 4M	E52-IC20A D=6.4 8M
		Heat resistive	E52-IC20A D=6.4 NETU 1M	E52-IC20A D=6.4 NETU 2M	E52-IC20A D=6.4 NETU 4M	E52-IC20A D=6.4 NETU 8M
	350	Standard	E52-IC35A D=6.4 1M	E52-IC35A D=6.4 2M	E52-IC35A D=6.4 4M	E52-IC35A D=6.4 8M
		Heat resistive	E52-IC35A D=6.4 NETU 1M	E52-IC35A D=6.4 NETU 2M	E52-IC35A D=6.4 NETU 4M	E52-IC35A D=6.4 NETU 8M
	500	Standard	E52-IC50A D=6.4 1M	E52-IC50A D=6.4 2M	E52-IC50A D=6.4 4M	E52-IC50A D=6.4 8M
		Heat resistive	E52-IC50A D=6.4 NETU 1M	E52-IC50A D=6.4 NETU 2M	E52-IC50A D=6.4 NETU 4M	E52-IC50A D=6.4 NETU 8M

Protective tubing diameter (mm)	Protective tubing length (mm)	Lead wire type	Lead wire length (m)			
			1	2	4	8
			Model			
8 dia.	200	Standard	E52-IC20A D=8 1M	E52-IC20A D=8 2M	E52-IC20A D=8 4M	E52-IC20A D=8 8M
		Heat resistive	E52-IC20A D=8 NETU 1M	E52-IC20A D=8 NETU 2M	E52-IC20A D=8 NETU 4M	E52-IC20A D=8 NETU 8M
	350	Standard	E52-IC35A D=8 1M	E52-IC35A D=8 2M	E52-IC35A D=8 4M	E52-IC35A D=8 8M
		Heat resistive	E52-IC35A D=8 NETU 1M	E52-IC35A D=8 NETU 2M	E52-IC35A D=8 NETU 4M	E52-IC35A D=8 NETU 8M
	500	Standard	E52-IC50A D=8 1M	E52-IC50A D=8 2M	E52-IC50A D=8 4M	E52-IC50A D=8 8M
		Heat resistive	E52-IC50A D=8 NETU 1M	E52-IC50A D=8 NETU 2M	E52-IC50A D=8 NETU 4M	E52-IC50A D=8 NETU 8M

■ Exposed-terminal Models

- **E52-CA□B**
- **E52-IC□B**

Dimensions



Unit (mm)

L: Protective tubing length
D: Protective tubing diameter

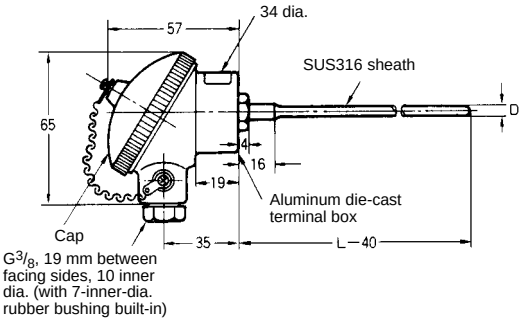
Model Information

Exposed-terminal Models

Element type	Protective tubing length (mm)	Protective tubing diameter (mm)			
		3.2 dia.	4.8 dia.	6.4 dia.	8 dia.
		Model			
K (CA)	200	E52-CA20B D=3.2	E52-CA20B D=4.8	E52-CA20B D=6.4	---
	350	E52-CA35B D=3.2	E52-CA35B D=4.8	E52-CA35B D=6.4	E52-CA35B D=8
	500	E52-CA50B D=3.2	E52-CA50B D=4.8	E52-CA50B D=6.4	E52-CA50B D=8
	750	---	E52-CA75B D=4.8	E52-CA75B D=6.4	E52-CA75B D=8
J (IC)	200	E52-IC20B D=3.2	E52-IC20B D=4.8	E52-IC20B D=6.4	---
	350	E52-IC35B D=3.2	E52-IC35B D=4.8	E52-IC35B D=6.4	E52-IC35B D=8
	500	E52-IC50B D=3.2	E52-IC50B D=4.8	E52-IC50B D=6.4	E52-IC50B D=8
	750	---	E52-IC75B D=4.8	E52-IC75B D=6.4	E52-IC75B D=8

- **E52-CA□C**
- **E52-IC□C**

Dimensions



Unit (mm)

L: Protective tubing length
D: Protective tubing diameter

Use wiring terminals that fit M3 screws.

Note: The terminals in the cap indicate polarity (+ or –).

Model Information

Enclosed-terminal Models

Element type	Protective tubing length (mm)	Protective tubing diameter (mm)			
		3.2 dia.	4.8 dia.	6.4 dia.	8 dia.
		Model			
K (CA)	200	E52-CA20C D=3.2	E52-CA20C D=4.8	E52-CA20C D=6.4	---
	350	E52-CA35C D=3.2	E52-CA35C D=4.8	E52-CA35C D=6.4	E52-CA35C D=8
	500	E52-CA50C D=3.2	E52-CA50C D=4.8	E52-CA50C D=6.4	E52-CA50C D=8
	750	---	E52-CA75C D=4.8	E52-CA75C D=6.4	E52-CA75C D=8
J (IC)	200	E52-IC20C D=3.2	E52-IC20C D=4.8	E52-IC20C D=6.4	---
	350	E52-IC35C D=3.2	E52-IC35C D=4.8	E52-IC35C D=6.4	E52-IC35C D=8
	500	E52-IC50C D=3.2	E52-IC50C D=4.8	E52-IC50C D=6.4	E52-IC50C D=8
	750	---	E52-IC75C D=4.8	E52-IC75C D=6.4	E52-IC75C D=8

Standard Thermocouples

Specifications

Element wire	K (CA), J(IC), R
Class	K (CA), J (IC) JIS class 0.75
	R, JIS class 0.25
Protective tubing material	K (CA): SUS316
	J (IC): SUS316
	R (see note): JIS ceramic cat. 1 (PT1) JIS special ceramic (PT0)
Thermal contact	Non-grounded type

Note: Specify PT1 or PT0 if the element is R.

Permissible Temperature in Dry Air

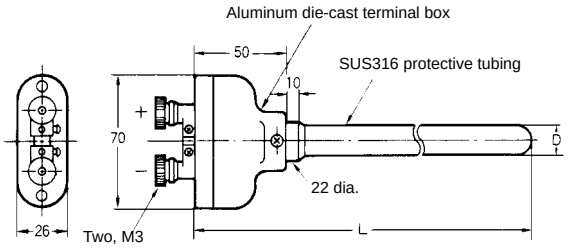
D	Element wire	
	K (CA) SUS316	J (IC) SUS316
10 dia.	750°C	450°C
12 dia.	850°C	500°C
15 dia.	850°C	550°C
22 dia.	900°C	600°C

D	Element wire: R
17 dia.	0°C to 1,400°C

■ Exposed-terminal Models

- **E52-CA□B**
- **E52-IC□B**

Dimensions



L: Protective tubing length
D: Protective tubing diameter

Model Information

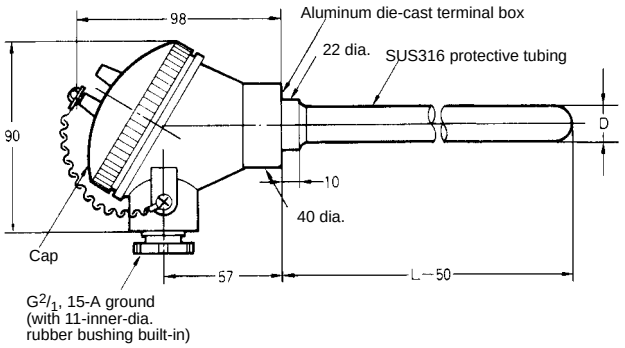
Exposed-terminal Models

Element type	Protective tubing length (mm)	Protective tubing diameter (mm)			
		10 dia.	12 dia.	15 dia.	22 dia.
		Model			
K (CA)	350	E52-CA35B D=10	E52-CA35B D=12	E52-CA35B D=15	---
	500	E52-CA50B D=10	E52-CA50B D=12	E52-CA50B D=15	E52-CA50B D=22
	750	E52-CA75B D=10	E52-CA75B D=12	E52-CA75B D=15	E52-CA75B D=22
	1,000	E52-CA100B D=10	E52-CA100B D=12	E52-CA100B D=15	E52-CA100B D=22
J (IC)	350	E52-IC35B D=10	E52-IC35B D=12	E52-IC35B D=15	---
	500	E52-IC50B D=10	E52-IC50B D=12	E52-IC50B D=15	E52-IC50B D=22
	750	E52-IC75B D=10	E52-IC75B D=12	E52-IC75B D=15	E52-IC75B D=22
	1,000	E52-IC100B D=10	E52-IC100B D=12	E52-IC100B D=15	E52-IC100B D=22

■ Enclosed-terminal Models

- **E52-CA□C**
- **E52-IC□C**

Dimensions



L: Protective tubing length
D: Protective tubing diameter

Use wiring terminals that fit M4 screws.

Note: The terminals in the cap indicate polarity (+ or –).

Model Information

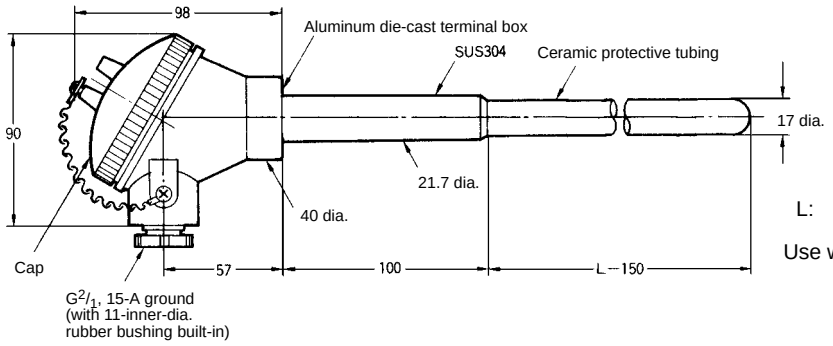
Enclosed-terminal Models

Element type	Protective tubing length (mm)	Protective tubing diameter (mm)			
		10 dia.	12 dia.	15 dia.	22 dia.
		Model			
K (CA)	350	E52-CA35C D=10	E52-CA35C D=12	E52-CA35C D=15	---
	500	E52-CA50C D=10	E52-CA50C D=12	E52-CA50C D=15	E52-CA50C D=22
	750	E52-CA75C D=10	E52-CA75C D=12	E52-CA75C D=15	E52-CA75C D=22
	1,000	E52-CA100C D=10	E52-CA100C D=12	E52-CA100C D=15	E52-CA100C D=22
J (IC)	350	E52-IC35C D=10	E52-IC35C D=12	E52-IC35C D=15	---
	500	E52-IC50C D=10	E52-IC50C D=12	E52-IC50C D=15	E52-IC50C D=2
	750	E52-IC75C D=10	E52-IC75C D=12	E52-IC75C D=15	E52-IC75C D=22
	1,000	E52-IC100C D=10	E52-IC100C D=12	E52-IC100C D=15	E52-IC100C D=22

■ Enclosed-terminal Models (High-temperature Use)

- **E52-PR□C**

Dimensions



L: Protective tubing length

Use wiring terminals that fit M4 screws.

Note: The terminals in the cap indicate polarity (+ or –).

Model Information

Enclosed-terminal Models

Element type	Protective tubing length (mm)	Protective tubing diameter: 17 mm dia.
		Model
R (see note 1)	500	E52-PR50C D=17 PT1
	750	E52-PR75C D=17 PT1
	1,000	E52-PR100C D=17 PT1
R (see note 2)	500	E52-PR50C D=17 PT0
	750	E52-PR75C D=17 PT0
	1,000	E52-PR100C D=17 PT0

Note: 1. The protective tubing material is made of JIS ceramic cat. 1.
2. The protective tubing is made of special ceramics.

■ Model Number Legend

The type of resistance thermometer, protective tubing length, and lead length can be specified as shown below.

Thermocouples

E52-□□□ D=□□□M□
1 2 3 4 5 6 7

1. Element type

CA: K
IC: J
PR: R

2. Protective tubing length (L)

Specify the length in centimeters in the following range:
Unit (cm)

E52-□□A (Exposed-lead Model)

Diameter	Length (L)
1	2 to 200
1.6	3 to 500
3.2	5 to 2,000
4.8	8 to 2,300
6.4	10 to 1,200
8	12 to 1,000

E52-□□B and E52-□□C (except E52-PR□C)

Diameter	Length (L)
3.2	11 to 2,000
4.8	14 to 2,300
6.4	16 to 1,200
8.0	18 to 1,000
10	21 to 120
12	24 to 120
15	29 to 150
22	39 to 200

E52-PR□C

Diameter	Length (L)
17	50, 75, 100

3. Terminal

A: Exposed lead wires (element type: K, J)
B: Exposed terminals (element type: K, J)
C: Enclosed terminals (element type: K, J, R)

4. Diameter

Specify the protective tubing material according to the table.

Code	Diameter	Protective tubing construction	Protective tubing material
1	1 mm	Sheathed	SUS316, Inconel
1.6	1.6 mm	Sheathed	SUS316, Inconel
3.2	3.2 mm	Sheathed	SUS316, Inconel
4.8	4.8 mm	Sheathed	SUS316, Inconel
6.4	6.4 mm	Sheathed	SUS316, Inconel
8	8 mm	Sheathed	SUS316, Inconel
10	10 mm	Standard	SUS316, SUS310S, SUS304
12	12 mm	Standard	SUS316, SUS310S, SUS304
15	15 mm	Standard	SUS316, SUS310S, SUS304
22	22 mm	Standard	SUS316, SUS310S, SUS304
17	17 mm	Standard	PT1, PT0

5. Heat resistance

Specify this item for the exposed-lead models only.

Code	Temperature range	Lead type
---	–20°C to 70°C	Fully vinyl-covered
NETU	0°C to 150°C Sleeve: 0°C to 100°C	Fully glass-wool-covered with braided stainless steel shield

6. Lead length (M)

Specify the length in meters in the following range for the E52-□□A only.

Range: 1 to 100 m

7. Protective tubing material

Code	Protective tubing material	Element type
---	SUS316	K, J
Inconel	Inconel	K, D=1 to 8
SUS310S	SUS310S	K, D=10 to 22
SUS304	SUS304	K, D=10 to 22
PT1	JIS ceramic Cat.1	R
PT0	JIS special ceramic	R

Examples

Element wire: K; protective tubing length: 420 mm; exposed leads; protective tubing dia.: 4.8 mm; heat resistive; lead length: 10 m
E52-CA42A D=4.8 NETU 10M

Element wire: J; protective tubing length: 360 mm; enclosed terminals; protective tubing dia.: 3.2
E52-IC36C D=3.2

Low-cost Models
Low-cost Platinum Resistance Thermometers

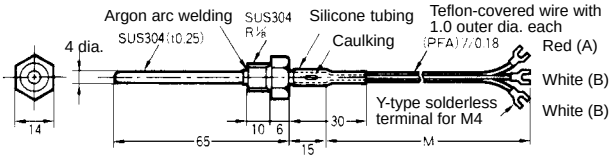
■ Exposed-lead Models with Screws

Specifications

Element type	JPt100
Conductor type	3-conductor system
Class	Class B
Protective tubing material	SUS304
Sensor length	30 mm
Max. detectable temperature	250°C
Temperature range	–50°C to 250°C
Lead wire	–50°C to 150°C

- **E52-PT6D**

Dimensions



Lead wire length (m)	Model
1	E52-PT6D 1M
2	E52-PT6D 2M
4	E52-PT6D 4M

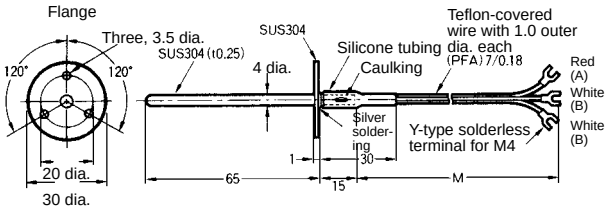
■ Exposed-lead Models with Flange

Specifications

Element wire	JPt100
Conductor type	3-conductor system
Class	Class B
Protective tubing material	SUS304
Sensor length	30 mm
Max. detectable temperature	250°C
Temperature range	–50°C to 250°C
Lead wire	–50°C to 150°C

- **E52-PT6F**

Dimensions



Lead wire length (m)	Model
1	E52-PT6F 1M
2	E52-PT6F 2M
4	E52-PT6F 4M

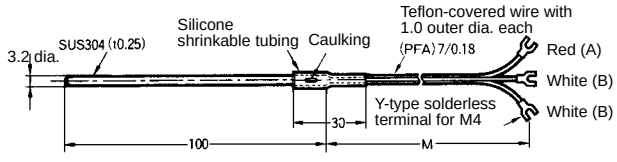
■ Exposed-lead Models

Specifications

Element type	JPt100
Conductor type	3-conductor system
Class	Class B
Protective tubing material	SUS304
Sensor length	20 mm
Max. detectable temperature	250°C
Temperature range	–50°C to 250°C
Lead wire	–50°C to 150°C

- **E52-PT10AE**

Dimensions



The protective tubing is of pipe construction, which must not be bent.

Lead wire length (m)	Model
1	E52-PT10AE 1M
2	E52-PT10AE 2M
4	E52-PT10AE 4M

Low-cost Thermocouples

■ Exposed-lead Models with Spring

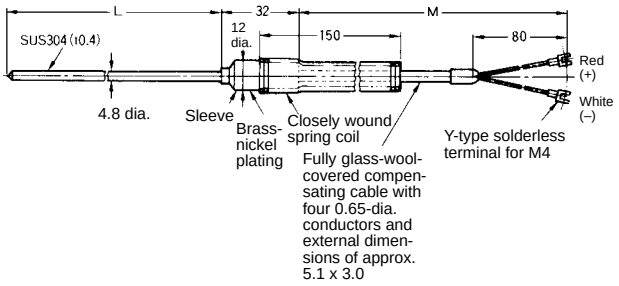
Specifications

Element type	K (CA), J (IC)
Element dia.	0.65 mm
Class	Class 0.75
Protective tubing material	SUS304
Thermal contact	Non-grounded type
Temperature range	0°C to 400°C: K (CA) 0°C to 350°C: J (IC)
Lead wire	0°C to 180°C

Note: The sleeve resists temperatures ranging between 0°C and 100°C.

- **E52-CA□AS, E52-IC□AS**

Dimensions



L: Protective tubing length
M: Lead wire length

Protective tubing length (mm)	Lead wire length (m)	Element type: K (CA)	Element type: J (IC)
		Model	
65	1	E52-CA6AS 1M	E52-IC6AS 1M
	2	E52-CA6AS 2M	E52-IC6AS 2M
	4	E52-CA6AS 4M	E52-IC6AS 4M
100	1	E52-CA10AS 1M	E52-IC10AS 1M
	2	E52-CA10AS 2M	E52-IC10AS 2M
	4	E52-CA10AS 4M	E52-IC10AS 4M
150	1	E52-CA15AS 1M	E52-IC15AS 1M
	2	E52-CA15AS 2M	E52-IC15AS 2M
	4	E52-CA15AS 4M	E52-IC15AS 4M
200	1	E52-CA20AS 1M	E52-IC20AS 1M
	2	E52-CA20AS 2M	E52-IC20AS 2M
	4	E52-CA20AS 4M	E52-IC20AS 4M

■ Exposed-lead Models with Screw

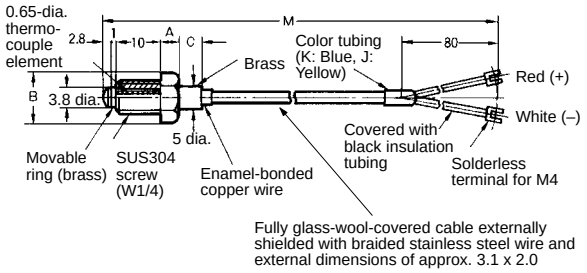
Specifications

Element type	K (CA), J (IC)
Element dia.	0.65 mm
Class	Class 0.75
Protective tubing material	SUS304
Thermal contact	Grounded system
Temperature range	0°C to 400°C: K (CA) 0°C to 350°C: J (IC)
Lead wire	0°C to 180°C

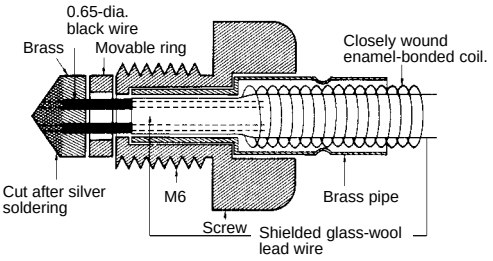
Note:
1. The thermocouple is a single wire from the tip to the terminal.
2. Specify the type of screw (i.e., M6, M8, or W2/4) when ordering.
3. The thermocouple is not of airtight construction.

- **E52-CA1D, E52-IC1D**

Dimensions



Internal Construction (E52-CA1D)



Lead wire length (m)	Screw		
	W 1/4	M6	M8
A (mm)	5	4	5.3
B (mm)	11.5	11	14
C (mm)	3	4	2.5

Protective tubing diameter (mm)	Lead wire length (m)	Element type: K (CA)	Element type: J (IC)
		Model	
M6 screw	1	E52-CA1D M6 1M	E52-IC1D M6 1M
	2	E52-CA1D M6 2M	E52-IC1D M6 2M
	4	E52-CA1D M6 4M	E52-IC1D M6 4M
M8 screw	1	E52-CA1D M8 1M	E52-IC1D M8 1M
	2	E52-CA1D M8 2M	E52-IC1D M8 2M
	4	E52-CA1D M8 4M	E52-IC1D M8 4M
W1/4 screw	1	E52-CA1D W1/4 1M	E52-IC1D W1/4 1M
	2	E52-CA1D W1/4 2M	E52-IC1D W1/4 2M
	4	E52-CA1D W1/4 4M	E52-IC1D W1/4 4M

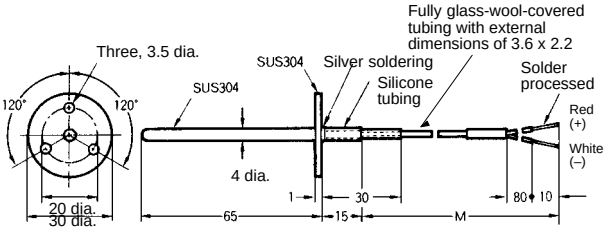
■ Exposed-lead Models with Flange

Specifications

Element type	K (CA), J (IC)
Element diameter	0.65 mm
Class	Class 0.75
Protective tubing material	SUS304
Thermal contact	Grounded system
Temperature range	0°C to 350°C: K (CA) 0°C to 350°C: J (IC)
Lead wire	0°C to 150°C

- **E52-CA6F, E52-IC6F**

Dimensions



Lead wire length (M): 1, 2, or 4 m

Note: The thermocouple is a single wire from the tip to the terminal. The tip is processed with solder, which ensures ease of welding.

Lead wire length (m)	Element type: K (CA)	Element type: J (IC)
	Model	
1	E52-CA6F 1M	E52-IC6F 1M
2	E52-CA6F 2M	E52-IC6F 2M
4	E52-CA6F 4M	E52-IC6F 4M

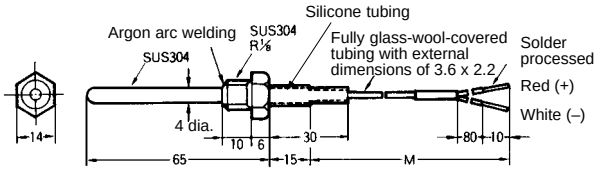
■ Exposed-lead Models with Screws

Specifications

Element type	K (CA), J (IC)
Element diameter	0.65 mm
Class	Class 0.75
Protective tubing material	SUS304
Thermal contact	Grounded system
Temperature range	0°C to 350°C: K (CA) 0°C to 350°C: J (IC)
Lead wire	0°C to 150°C

• E52-CA6D, E52-IC6D

Dimensions



Lead wire length (M): 1, 2, or 4 m

Note: The thermocouple is a single wire from the tip to the terminal. The tip is processed with solder, which ensures ease of welding.

Lead wire length (m)	Element type: K (CA)	Element type: J (IC)
	Model	
1	E52-CA6D 1M	E52-IC6D 1M
2	E52-CA6D 2M	E52-IC6D 2M
4	E52-CA6D 4M	E52-IC6D 4M

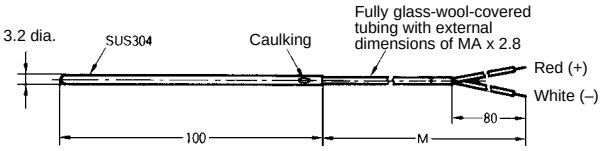
■ Exposed-lead Models

Specifications

Element type	K (CA), J (IC)
Element diameter	0.32 mm
Class	Class 0.75
Protective tubing material	SUS304
Thermal contact	Non-grounded type
Temperature range	0°C to 350°C: K (CA) 0°C to 200°C: J (IC)
Lead wire	0°C to 180°C

• E52-CA10AE, E52-IC10AE

Dimensions



Note: 1. The thermocouple is a single wire from the tip to the terminal.

2. Lead wire length M: 1, 2, or 4 m

Lead wire length (m)	Element type: K (CA)	Element type: J (IC)
	Model	
1	E52-CA10AE 1M	E52-IC10AE 1M
2	E52-CA10AE 2M	E52-IC10AE 2M
4	E52-CA10AE 4M	E52-IC10AE 4M

Exclusive Models
Thermocouples

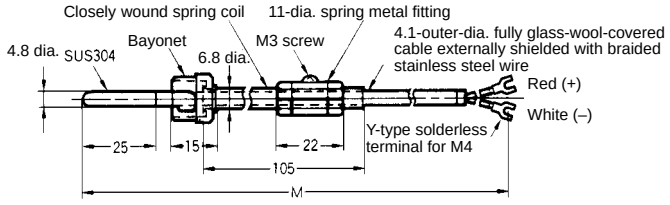
■ Thermocouples for Pressure Molding Machines

Specifications

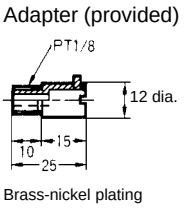
Element type	K (CA) J (IC)
Element diameter	1.0 mm
Class	Class 0.75
Protective tubing material	SUS304
Thermal contact	Grounded system
Temperature range	0°C to 350°C
Lead wire	0°C to 180°C

- **E52-CA2GV, E52-IC2GV**

Dimensions



Lead wire length (M): 1 or 2 m



Lead wire length (m)	Element type: K (CA)	Element type: J (IC)
	Model	
1	E52-CA2GV 1M	E52-IC2GV 1M
2	E52-CA2GV 2M	E52-IC2GV 2M

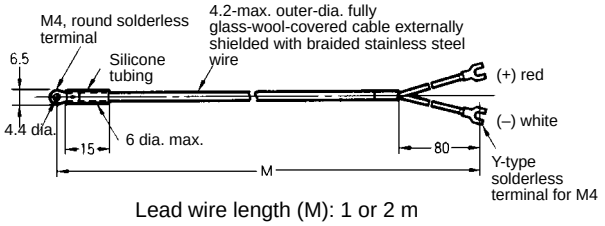
■ Thermocouples with Solderless Terminals

Specifications

Element type	K (CA) J (IC)
Element diameter	0.65 mm
Class	Class 0.75
Thermal contact	Grounded system
Temperature range	0°C to 300°C
Lead wire	0°C to 150°C

- **E52-CA1GT, E52-IC1GT**

Dimensions



Lead wire length (M): 1 or 2 m

Lead wire length (m)	Element type: K (CA)	Element type: J (IC)
	Model	
1	E52-CA1GT 1M	E52-IC1GT 1M
2	E52-CA1GT 2M	E52-IC1GT 2M

Platinum Resistance Thermometers

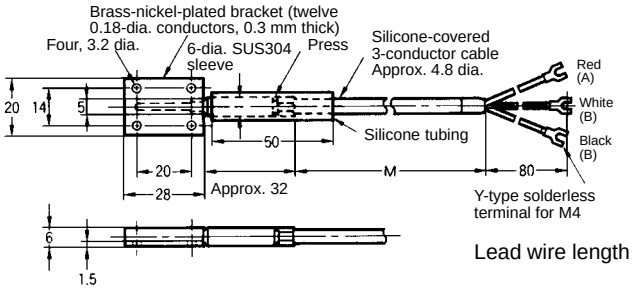
■ Platinum Resistance Thermometers for Surface Temperature Measurement

Specifications

Element type	JPt100
Class	Class B
Protective tubing material	SUS304 With brass-nickel-plated bracket
Conductor type	3-conductor system
Temperature range	–50°C to 250°C
Lead wire	–50°C to 150°C

- **E52-PT2GS**

Dimensions



Lead wire length (M): 1 or 2 m

Lead wire length (m)	Model
1	E52-PT2GS 1M
2	E52-PT2GS 2M

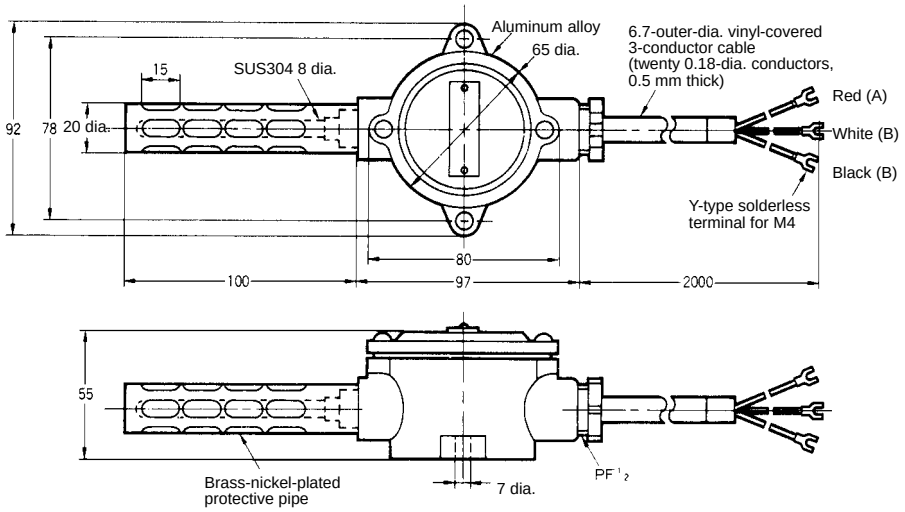
■ Platinum Resistance Thermometers for Room Temperature Measurement

Specifications

Element type	JPt100
Class	Class B
Protective tubing material	SUS304
Conductor type	3-conductor system
Temperature range	–50°C to 60°C
Lead wire	–20°C to 70°C

- **E52-PT10GR**

Dimensions



Lead wire length (m)	Model
2	E52-PT10GR 2M

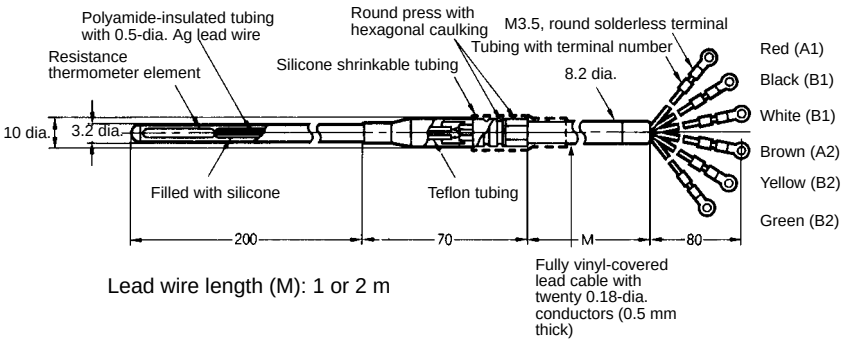
■ Double-element Platinum Resistance Thermometers

Specifications

Element type	JPt100
Class	Class B
Protective tubing material	SUS304
Conductor type	Double-element, 3-conductor system
Temperature range	–50°C to 250°C
Lead wire	–20°C to 70°C

- **E52-PT20GW**

Dimensions



Lead wire length (M): 1 or 2 m

Lead wire length (m)	Model
1	E52-PT20GW 1M
2	E52-PT20GW 2M

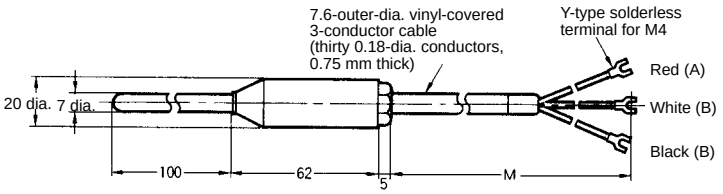
■ Waterproof Platinum Resistance Thermometers

Specifications

Element wire	JPt100
Class	Class B
Protective tubing material	SUS304
Conductor type	3-conductor system
Temperature range	0°C to 70°C (underwater) –20°C to 70°C (in the air)
Lead wire	0°C to 70°C
Resistive pressure	10 kg/cm^2 max.

- **E52-PT10GP**

Dimensions



Lead wire length (M): 2 or 4 m

Lead wire length (m)	Model
2	E52-PT10GP 2M
4	E52-PT10GP 4M

Thermistors

■ Element Interchangeable Thermistor

Temperature Ranges

Temperature range	Color code	Nominal resistance	Thermistor constant	Lead wire
–50°C to 50°C	Blue	6 kΩ (0°C)	3390K	A pair of 0.12 dia. 7 Teflon-insulated stranded wires with 0.86 outer dia. each
0°C to 100°C	Black	6 kΩ (0°C)	3390K	
50°C to 150°C	Red	30 kΩ (0°C)	3450K	
100°C to 200°C	Yellow	0.55 kΩ (200°C)	4300K	
150°C to 300°C	Green	4 kΩ (200°C)	5133K	Flat glass-wool-shielded lead cable with 0.12 dia. 10 conductors and external dimensions of 2.28 x 1.44

Waterproof Construction

This Thermistor is of waterproof construction, as specified in JIS C0920, except for the model with glass-wool-insulated lead wires that is used at a temperature range between 150°C and 300°C. The Thermistor ensures an insulation resistance of 100 MΩ minimum at 500 VDC after the thermistor has been dipped five times each in water at room temperature and in boiling water for a duration of five minutes each time. This must be checked before installing the protective tubes.

Specifications

Item	Model
Coupling method	Element interchangeable thermistor
Class	JIS class 1
Protective tubing material	SUS304
Time constant	8 to 15 s in still water
Dissipation factor	2.4 to 2.8 mW/°C
Lead wire heat resistive temperature	180°C

Error

Detectable temperature	Error
–50°C to 100°C	±1°C max.
100°C to 350°C	±1% max. of detectable temperature

Permissible Temperature

Detectable temperature	Operating temperature
–50°C to 50°C	100°C
0°C to 100°C	150°C
50°C to 150°C	200°C
100°C to 200°C	250°C
150°C to 300°C	350°C

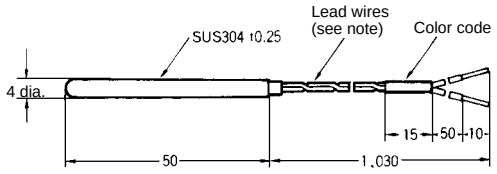
Note: Models with non-standard lead wire length and protective tubing length are available on request.

This Thermistor is a dedicated Thermistor for the E5C2 and E5CS.

■ Exposed-lead Models

- **E52-THE5A**

Dimensions



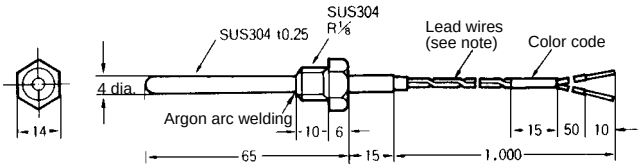
Note: The lead wires have no polarity

Temperature range	Model
–50°C to 50°C	E52-THE5A –50-50°C 1M
0°C to 100°C	E52-THE5A 0-100°C 1M
50°C to 150°C	E52-THE5A 50-150°C 1M
100°C to 200°C	E52-THE5A 100-200°C 1M
150°C to 300°C	E52-THE5A 150-300°C 1M

■ Exposed-lead Models with Screws

- **E52-THE6D**

Dimensions



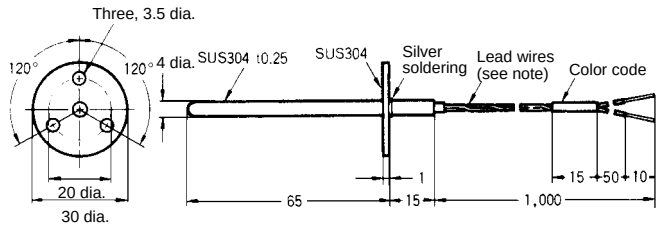
Note: The lead wires have no polarity.

Temperature range	Model
–50°C to 50°C	E52-THE6D –50-50°C 1M
0°C to 100°C	E52-THE6D 0-100°C 1M
50°C to 150°C	E52-THE6D 50-150°C 1M
100°C to 200°C	E52-THE6D 100-200°C 1M
150°C to 300°C	E52-THE6D 150-300°C 1M

■ Exposed-lead Models with Flange

- **E52-THE6F**

Dimensions



Note: The lead wires have no polarity.

Temperature range	Model
–50°C to 50°C	E52-THE6F –50-50°C 1M
0°C to 100°C	E52-THE6F 0-100°C 1M
50°C to 150°C	E52-THE6F 50-150°C 1M
100°C to 200°C	E52-THE6F 100-200°C 1M
150°C to 300°C	E52-THE6F 150-300°C 1M

Note:
1. The Thermistor lead cable can be extended, but do not use a standard lead wire for extension. If waterproof performance is required, be sure that the lead cable joint is of waterproof construction as well.
2. Be sure to specify the model and temperature range when ordering the Thermistor. The Thermistor has a color code according to the temperature range.

Accessories

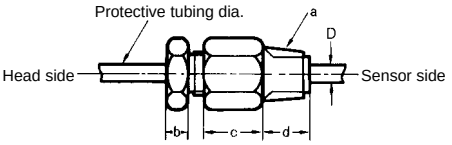
■ Compression Fittings

Model Information

Model	Screw of part a	Applicable protective tubing diameter	Dimension				
			b	c	d	Flat diameter	
						Part c	Part b
PT 1/8 D=1.0	R 1/8	1.0 dia.	5	13	10	14	14
PT 1/8 D=1.6		1.6 dia.					
PT 1/8 D=3.2		3.2 dia.					
PT 1/8 D=4.8		4.8 dia.					
PT 1/4 D=3.2	R 1/4	3.2 dia.	5	15	12	17	14
PT 1/4 D=4.8		4.8 dia.					
PT 1/4 D=6.4		6.4 dia.					
PT 3/8 D=8	R 3/8	8 dia.	5	19	15	21	17
PT 1/2 D=10	R 1/2	10 dia.	8	23.5	19.5	26	21
M 12 D=4.8	M 12	4.8 dia.	5	15	12	17	14

Note: The Compression Fitting is not of airtight construction. Do not use the Compression Fitting for applications in which the exposure of the sensing object will cause problems.

The compression fitting is a screw that adjusts and secures the insertion length of Temperature Sensors with the above protective tubing diameters.
The material of the Compression Fitting is SUS304 with internal fixing beads made of brass.



■ Loose Flanges

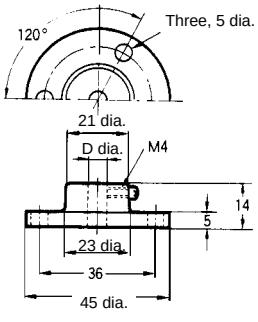
Model Information

Applicable protective tubing diameter	Model
3.2 dia.	MF-1 D=3.2
4.8 dia.	MF-1 D=4.8
6.4 dia.	MF-1 D=6.4
8 dia.	MF-1 D=8
10 dia.	MF-2 D=10
12 dia.	MF-2 D=12
15 dia.	MF-2 D=15
22 dia.	MF-2 D=22

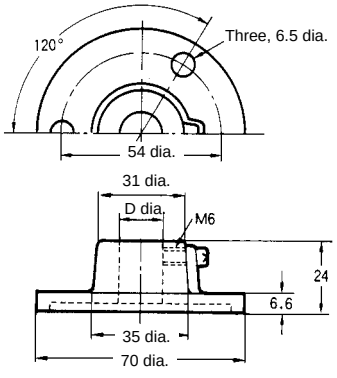
Note: 1. Use the Loose Flange in atmospheric pressure. The Loose Flange is not of airtight construction.
2. Use the Loose Flange at 400°C maximum.
3. Do not apply the Loose Flange to protective tubing diameters other than the applicable ones.

Material: Aluminum

MF-1



MF-2



Compensating Conductors

The material of the Compensating Conductor is the same as or similar to that of the Thermocouple. Therefore, the Thermocouple can be connected to the Compensating Conductor just as if the length of the Thermocouple is to be extended. A standard model for a temperature range between –20°C and 90°C and two types of heat-resistive models for a temperature range between 0°C and 150°C are available.

Be sure to use the compensating conductor for the extension of the length of the thermocouple.

Model Information

Thermocouple	Heat resistance	Exterior	Compensating conductor length (m)			
			1	2	4	8
R	Standard	Vinyl covered (waterproof)	WPRG 1M	WPRG 2M	WPRG 4M	WPRG 8M
	Heat resistive	Glass-wool covered	WPRH 1M	WPRH 2M	WPRH 4M	WPRH 8M
		Glass-wool-covered shielded with stainless steel wire	WPRH6 1M	WPRH6 2M	WPRH6 4M	WPRH6 8M
K (CA)	Standard	Vinyl-covered (waterproof)	WCAG 1M	WCAG 2M	WCAG 4M	WCAG 8M
	Heat resistive	Glass-wool covered	WCAH 1M	WCAH 2M	WCAH 4M	WCAH 8M
		Glass-wool-covered shielded with stainless steel wire	WCAH6 1M	WCAH6 2M	WCAH6 4M	WCAH6 8M
J (IC)	Standard	Vinyl covered (waterproof)	WICG 1M	WICG 2M	WICG 4M	WICG 8M
	Heat resistive	Glass-wool covered	WICH 1M	WICH 2M	WICH 4M	WICH 8M
		Glass-wool-covered shielded with stainless steel wire	WICH6 1M	WICH6 2M	WICH6 4M	WICH6 8M

Note: Compensating Conductors with lengths, increased in units of a meter, up to 100 meters are available on request.

Specifications (JIS C1610-1981)

Model	Type of thermocouple	Use	Code	Exterior	Number of wires/wire diameter	Operating temperature range (°C)	Error (°C)	Exterior color	Resistance of both lines (Ω/m)
WPRG	R	Standard	RX-G	Vinyl covered (waterproof)	4/0.65	0 to 90	$^{+3}/_{-7}$	Black	0.055
WPRH		Heat resistive	RX-H	Glass-wool covered	7/0.3	0 to 150			0.140
WPRH6			RX-H6	Glass-wool-covered shielded with stainless steel wire					
WCAG	K (CA)	Standard	VX-G	Vinyl covered (waterproof)	4/0.65	–20 to 90	±2.5	Blue	0.39
WCAH		Heat resistive	WX-H	Glass-wool covered	7/0.3	0 to 150	±3.0		1.07
WCAH6			WX-H6	Glass-wool-covered shielded with stainless steel wire					
WICG	J (IC)	Standard	JX-G	Vinyl covered (waterproof)	4/0.65	–20 to 90	±2.5	Yellow	0.47
WICH		Heat resistive	JX-H	Glass-wool covered	7/0.3	0 to 150			1.27
WICH6			JX-H6	Glass-wool-covered shielded with stainless steel wire					

Technical Information

■ Types and Characteristics of Temperature Sensors

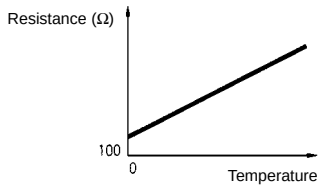
Platinum Resistance Thermometer

Principles and Characteristics

The platinum resistance thermometer makes use of the fact that the resistance of platinum increases in proportion to the temperature.

The purity of the platinum wire incorporated by the platinum resistance thermometer is extremely high.

Temperature Characteristics



Advantage

Highly precise.

Disadvantages

- Expensive.
- Easily influenced by lead wire resistance. (OMRON's models are all 3-conductor platinum resistance thermometers in order to reduce the influence of lead wire resistance as much as possible.)
- Slow in thermal response.
- Easily damaged by vibration or shock.

Element type

JPt100, Pt100

Japanese Industrial Standards (JIS)

Class	Error
Class A	±(0.15 + 0.002 |t|)°C
Class B	±(0.3 + 0.005 |t|)°C

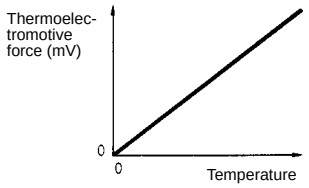
Note: |t|: Absolute value of measured temperature

Thermocouple

Principles and Characteristics

The thermocouple consists of two types of metals connected to each other. The junctions of the two metals are called a thermal contact and a reference contact respectively. The reference contact connects to output terminals. If there is a difference in temperature between these two contacts, thermoelectromotive force will be generated in proportion to the temperature. Therefore, if the temperature of the reference contact remains unchanged, the temperature of the thermal contact is known from the thermoelectromotive force. The thermocouple is a contact-type temperature sensor that can measure temperatures higher than any other contact-type temperature sensor.

Reference Electromotive Force



Advantages

- Wide temperature range.
- Measures high temperatures.
- Withstands vibration and shock.
- Quick thermal response.

Disadvantage

Sensor wire extension requires compensating conductors.

Element Type

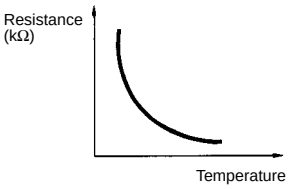
K (CA), J (IC), R (PR)

Japanese Industrial Standards (JIS)

Material code	Type	Temperature range	Class	Error
R	PR	0°C min. and less than 1,600°C	Class 0.25	±1.5°C or ±0.25% of measured temperature
K	CA	0°C min. and less than 1,200°C	Class 0.75	±2.5°C or ±0.75% of measured temperature
J	IC	0°C min. and less than 750°C	Class 0.75	±2.5°C or ±0.75% of measured temperature

Thermistor

Temperature Characteristics



Advantages

- Quick thermal response
- Error caused by lead wire resistance is small.

Disadvantages

- Narrow temperature range.
- Easily damaged by vibration or shock.

Element Type

Thermistor

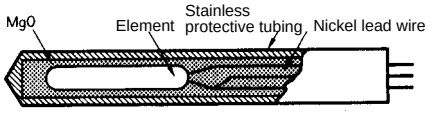
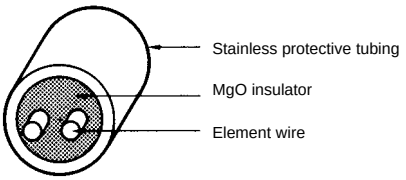
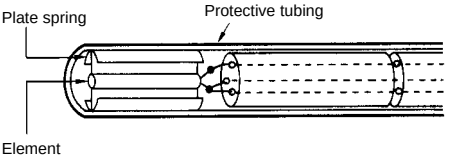
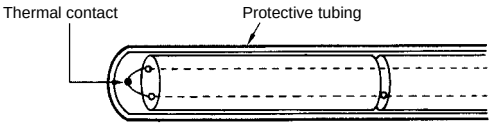
Japanese Industrial Standards (Class 1)

Detectable temperature	Error
–50°C to 100°C	±1°C max.
100°C to 350°C	±1% max. of measured temperature

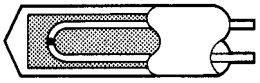
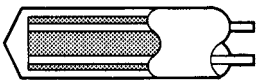
- **Pt100 and JPt100**

Japanese Industrial Standards (JIS) applicable to Pt100 resistance thermometers were revised on January 1, 1989, to conform to IEC standards, and came into effect on April 1, 1989. Resistance thermometers approved by the old Japanese Industrial Standards are called JPt100 and are distinguished from Pt100 resistance thermometers. For the standard temperature characteristics of resistance thermometers, refer to the tables on page 34, *Reference*.

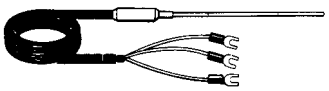
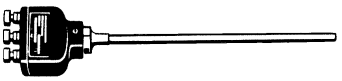
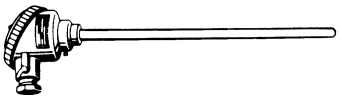
■ Construction of the Temperature Sensor

Item	Sheathed model	Standard model
Features	• Withstands vibration or shock. • The outer diameter is so thin that the platinum resistance thermometer of this type can be easily inserted into small objects. Furthermore, it has a quick response to small temperature changes due to its small heat capacity. • The platinum resistance thermometer of this type is so flexible that it can be inserted into complex mechanisms for temperature measurement. • The platinum resistance thermometer of this type is of airtight construction, which ensures high sensitivity while maintaining a high heat resistivity and toughness.	• The platinum resistance thermometer of this type is built into a tube that is thicker compared with the sheathed model, thus ensuring a longer life. • The platinum resistance thermometer of this type is slow in response.
Internal construction	**Sheathed Platinum Resistance Thermometer**  **Sheathed Thermocouple** 	**Standard Platinum Resistance Thermometer**  **Standard Thermocouple** 

■ Construction of the Thermal Contact of Thermocouple

Item	Non-grounded type	Grounded type
Features	• The thermal contact and protective tubing are perfectly insulated from each other. • The thermocouple of this type is not easily affected by noise, although it has a slow response compared with the grounded type. • The thermocouple of this type is more popular than the grounded type.	• The thermal contact is welded to the tip of the protective tubing. • The thermocouple of this type has a fast response but is also easily affected by noise. • The thermocouple of this type can be produced efficiently at low cost.
Internal construction	 Non-grounded type The sheath and thermocouple are insulated from each other.	 Grounded type The sheath and thermocouple are not insulated from each other.

■ Configuration of Terminals

Item	Exposed lead wire	Exposed terminal	Enclosed terminal
Appearance			
Features	The lead wires are exposed directly from the protective tubing. This method does not require high cost and is used for Temperature Sensors that are built into devices.	The terminal screws are exposed, which ensure easy maintenance, and is generally used indoors.	The terminal screws are enclosed, which are ideal for a wide environmental range, and used for industrial installations.

■ Thermal Response of Temperature Sensors

When a Temperature Sensor comes into contact with a sensing object, the temperature of the Temperature Sensor coincides with that of the sensing object with a time lag. This time lag is called response time. The response characteristics of a Temperature Sensor are specified by Japanese industrial standards as the time that the temperature of the Temperature Sensor reaches 63.2% of that of a sensing object after the Temperature Sensor comes into contact with the sensing object.

Refer to the results of the following tests.

Thermal Response of Sheathed Temperature Sensors

Protective tubing SUS316

Test condition	In still water with temperature change from room temperature to 100°C							
Protective tubing diameter (mm)	1.0 dia.	1.6 dia.	3.2 dia.		4.8 dia.		6.4 dia.	
	Thermo-couple	Thermo-couple	Thermo-couple	Platinum resistance thermome-ter	Thermo-couple	Platinum resistance thermome-ter	Thermo-couple	Platinum resistance thermome-ter
Value indication	63.2% value							
Response time	0.08 s	0.15 s	1 s	2.5 s	1.8 s	4.2 s	4 s	9.9 s

Thermal Response of Standard Temperature Sensors

Standard Thermocouples

Protective tubing: SUS316

Test condition	In still water		In air with temperature change from room temperature to 100°C		
Protective tubing diameter (mm)	12 dia. (with 1.6-dia. thermocouple element)				
	Room temperature to 100°C	100°C to room temperature	In still air	Ventilation at 1.5 m/s	Ventilation at 3 m/s
Value indication	63.2% value				
Response time	55 s	56 s	6 min. 50 s	2 min. 2 s	1 min. 43 s

Platinum Resistance Thermometers

Protective tubing: SUS316

Test condition	In still water with temperature change from room temperature to 100°C	
Protective tubing diameter (mm)	8 dia.	10 dia.
Value indication	63.2% value	
Response time	21.9 s	23.6 s

■ Normal Limit

The normal limit of a thermocouple is the upper limit of temperature that will not make a change in thermoelectromotive force generated from the thermocouple beyond a specified rate provided that the thermocouple is used in clean air continuously for a specified time. The normal limit is determined by the diameter of the thermocouple element and the material and diameter of the protective tubing as shown in the following table.

The life of a thermocouple will be prolonged if the measured temperature is low. Therefore, be sure that the measured temperature is low enough in comparison with the normal limit.

Type of element	Continuos operating time	Change rate in thermoelectromotive force vs. temperature
R	2,000	±0.5
K, J	10,000	±0.75

Sheathed Thermocouples

Normal Limit in Dry Air

D	Element		
	K (CA) Inconel	K (CA) SUS316	J (IC) SUS316
1 dia.	650°C	650°C	450°C
1.6 dia.	650°C	650°C	450°C
3.2 dia.	750°C	750°C	650°C
4.8 dia.	900°C	800°C	750°C
6.4 dia.	1,000°C	800°C	750°C
8.0 dia.	1,050°C	900°C	750°C

Note: M: Protective tubing material
D: Protective tubing dia. (mm)

Standard Thermocouples

Normal Limit in Dry Air

D	Element			
	K (CA) SUS310S	K (CA) SUS304	K (CA) SUS316	J (IC) SUS316
10 dia.	750°C	700°C	750°C	450°C
12 dia.	850°C	800°C	850°C	500°C
15 dia.	900°C	800°C	850°C	550°C
22 dia.	1,000°C	850°C	900°C	600°C

Note: M: Protective tubing material
D: Protective tubing dia. (mm)

Normal Limit in Dry Air

D	Element	
	R PT0	R PT1
17 dia.	1,400°C	1,400°C

Code	Type
PT0	Special ceramic
PT1	JIS ceramic cat. 1

Reference

Reference Temperature Characteristics of JPt100 Platinum Resistance Thermometer

JIS C 1604-1989

Temperature (°C)	–100	–0	Temperature (°C)	0	100	200	300	400	500	600
0	59.57	100.00	0	100.00	139.16	177.13	213.93	249.56	284.02	317.28
–10	55.44	96.02	10	103.97	143.01	180.86	217.54	253.06	287.40	320.54
–20	51.29	92.02	20	107.93	146.85	184.58	221.15	256.55	290.77	323.78
–30	47.11	88.01	30	111.88	150.67	188.29	224.74	260.02	294.12	327.02
–40	42.91	83.99	40	115.81	154.49	191.99	228.32	263.49	297.47	330.24
–50	38.68	79.96	50	119.73	158.29	195.67	231.89	266.94	300.80	
–60	34.42	75.91	60	123.64	162.08	199.35	235.45	270.38	304.12	
–70	30.12	71.85	70	127.54	165.86	203.01	238.99	273.80	307.43	
–80	25.80	67.77	80	131.42	169.63	206.66	242.53	273.22	310.72	
–90	21.46	63.68	90	135.30	173.38	210.30	246.05	280.63	314.01	
–100	17.14	59.57	100	139.16	177.13	213.93	249.56	284.02	317.28	

Reference Temperature Characteristics of Pt100 Platinum Resistance Thermometer

JIS C 1604-1989

Temperature (°C)	–100	–0	Temperature (°C)	0	100	200	300	400	500	600
0	60.25	100.00	0	100.00	138.50	175.84	212.02	247.04	280.90	313.59
–10	56.19	96.09	10	103.90	142.29	179.51	215.57	250.48	284.22	316.80
–20	52.11	92.16	20	107.79	146.06	183.17	219.12	253.90	287.53	319.99
–30	48.00	88.22	30	111.67	149.82	186.82	222.65	257.32	290.83	323.18
–40	43.87	84.27	40	115.54	153.58	190.45	226.17	260.72	294.11	326.35
–50	39.71	80.31	50	119.40	157.31	194.07	229.67	264.11	297.39	329.51
–60	35.53	76.33	60	123.24	161.04	197.69	233.17	267.49	300.65	---
–70	31.32	72.33	70	127.07	164.76	201.29	236.65	270.86	303.91	---
–80	27.08	68.33	80	130.89	168.46	204.88	240.13	274.22	307.15	---
–90	22.80	64.30	90	134.70	172.16	208.45	243.59	277.56	310.38	---
–100	18.49	60.25	100	138.50	175.84	212.02	247.04	280.90	313.59	---

Precautions

The protective tubing may corrode with some sensing objects, thus disabling the detection of temperature. Be sure that the material of the protective tubing will not be affected by the sensing object.

Be sure that the protective tubing is free of excessive vibration, shock, or loads.

Correct Use

Select places where there is no temperature distribution of the sensing object.

Be sure that the Temperature Sensor with the protective tubing is well inserted into or fully comes into contact with the sensing object. The insertion length must be 20 times larger than the diameter of the protective tubing if the protective tubing is made of metal and 15 times larger if the protective tubing is made of a non-metal material.

The minimum bending radius of a sheathed temperature thermometer is approximately five times larger than the diameter of the protective tubing. Do not repeatedly bend the same part of the protective tubing.

The flexibility of the protective tubing is lost at low temperature, in which case, do not bend the protective tubing.

The sheathed Temperature Sensor must not be bent within the 100-mm portion of the tip in order to protect the sensing component.

If the Temperature Sensor is an exposed-lead model, be sure that the temperature of the junction between the protective tubing and lead wire is 70°C maximum unless the model is a heat-resistive Temperature Sensor, in which case the temperature of the junction must be 100°C maximum.

If the Temperature Sensor is an exposed or enclosed terminal model, be sure that the temperature of the terminal block is 80°C maximum.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. H097-E1-1A **In the interest of product improvement, specifications are subject to change without notice.**

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