# Temperature Sensor
# E52

CSM_E52_DS_E_7_1

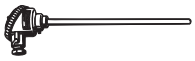
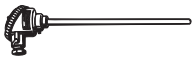
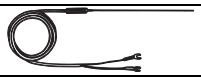
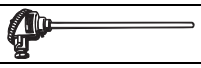
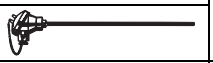
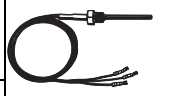
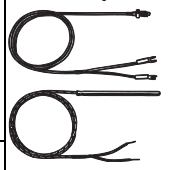
## A Wide Variety of High-precision Temperature Sensors

- 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 type and shape of the terminal.
- General-purpose, low-cost, and exclusive models are available.

⚠ Refer to *Safety Precautions for All Temperature Controllers.*

# Ordering Information

## ■ List of Models

| Classification | Description | Model and appearance | | Temperature range (See note 3.) | Element type | Conductor type | Class | Protective tubing material | Terminal type | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| General-purpose Models | Sheathed platinum resistance thermometer | E52-P□A | | –200°C to 450°C | Pt100 | 3-conductor system | B | SUS316 | Exposed lead wires | 5 |
| | | E52-P□C |  | | | | | | Enclosed terminals | 6 |
| | Standard platinum resistance thermometer | E52-P□B | | 0°C to 450°C | | | | | Exposed terminals | 6 |
| | | E52-P□C |  | | | | | | Enclosed terminals | 7 |
| | Sheathed thermocouple | E52-CA□A<br>E52-IC□A |  | 0°C to 1,050°C | K (CA)<br>J (IC) | Non-grounded type | 2 (0.75) | SUS316 | Exposed lead wires | 9 |
| | | E52-CA□B<br>E52-IC□B | | | | | | | Exposed terminals | 13 |
| | | E52-CA□C<br>E52-IC□C |  | | | | | | Enclosed terminals | 13 |
| | Standard thermocouple | E52-CA□B<br>E52-IC□B | | 0°C to 1,000°C | | | | SUS316<br>SUS310S | Exposed terminals | 14 |
| | | E52-CA□C<br>E52-IC□C |  | | | | | | Enclosed terminals | 15 |
| | | E52-PR□C | | 0°C to 1,400°C | R (PR) | | 2 (0.25) | JIS ceramic<br>JIS special ceramic | Enclosed terminals | 16 |
| Low-cost Models | Low-cost platinum resistance thermometer | E52-P10AE<br>E52-P6D<br>E52-P6F |  | –50°C to 250°C | Pt100 | 3-conductor system | B | SUS304 | Exposed lead wires | 17 |
| | Low-cost thermocouple | E52-CA□AS<br>E52-IC□AS | | 0°C to 400°C | K (CA)<br>J (IC) | Non-grounded type | 2 (0.75) | | | 18 |
| | | E52-CA1D<br>E52-IC1D<br>E52-CA6F<br>E52-IC6F<br>E52-CA6D<br>E52-IC6D |  | | | Grounded type | | | | 19 |
| | | E52-CA10AE<br>E52-IC10AE | | | | Non-grounded type | | | | 21 |

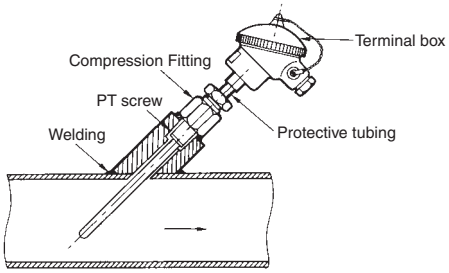
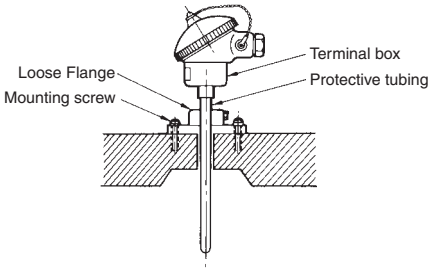
**Note: 1.** Exclusive models are provided on the following page.
**2.** These tables provide general specifications only. Be sure to read the detailed specifications and precautions before use.
**3.** The temperature range varies with the material, thickness, and construction of the protective tubing.

| Classification | Description | Model and appearance | Temperature range (See note 3.) | Element type | Conductor type | Class | Protective tubing material | Terminal type | Page |
|---|---|---|---|---|---|---|---|---|---|
| Exclusive Models | Bayonet spring for molding machines | E52-CA2GV<br>E52-IC2GV | 0°C to 350°C | K (CA)<br>J (IC) | Grounded type | 2 (0.75) | SUS304 | Exposed lead wires | 21 |
| | Crimping terminals | E52-CA1GT<br>E52-IC1GT | 0°C to 300°C | | | | | | 22 |
| | Used for measuring surface temperatures | E52-P2GS | –50°C to 250°C | Pt100 | 3-conductor system | B | | | 22 |
| | Used for room temperature measurement | E52-P10GR | –50°C to 60°C | | | | | | 22 |
| | Double-element model | E52-P20GW | –50°C to 250°C | | Two 3-conductor systems | | | | 23 |
| | Waterproof model | E52-P10GP | 0°C to 70°C | | 3-conductor system | | | | 23 |
| | | E52-P5A-40 | –50°C to 180°C | | | | Fluororesin molding | | 24 |
| | Corrosion-resistant model | E52-□□A-1 | –80°C to 180°C | Pt100 | 3-conductor system | B | Fluororesin tubing | | 24 |
| | | | | K (CA) | Non-grounded type | 2 (0.75) | | | |
| | Silicone-covered lead wires | E52-CA1D-40 | 0°C to 300°C | K (CA) | Grounded type | 2 (0.75) | --- | | 27 |
| | Explosion-proof model | E52-□□C-6 | –100°C to 500°C | Pt100 | 3-conductor system | B | SUS316 | Enclosed terminals | 25 |
| | | | –100°C to 900°C | K (CA) | Non-grounded type | 2 (0.75) | | | |
| Thermistors | | E52-THE5A<br>E52-THE6F<br>E52-THE6D | –50°C to 300°C | Thermistor | Element-interchangeable thermistor | 1 | SUS304 | Exposed lead wires | 29 |

**Note: 1.** General-purpose models and low-cost models are provided on the previous page.
**2.** These tables provide general specifications only. Be sure to read the detailed specifications and precautions before use.
**3.** 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 | Page |
|---|---|---|---|
| Compression Fitting | 600°C max. | Mounting with Compression Fitting   **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. | 30 |
| Loose Flange | 400°C max. | Mounting with Loose Flange   **Note: 1.** Use the Loose Flange in normal atmospheric pressure. The Loose Flange is not of airtight construction.<br>**2.** Use the Loose Flange at 400°C max.<br>**3.** Do not apply the Loose Flange to protective tubing diameters other than the applicable ones. | |

## ■ Lead Wires

| Accessory | | Specification | Temperature range | Page |
|---|---|---|---|---|
| For resistance thermometers | Standard | 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 | Glass-wool-covered with twenty 0.18-dia. conductors (0.5 mm thick) externally shielded with stainless steel, 5.2 mm in outer dia. | 0°C to 180°C<br>Sleeve: 0°C to 100°C | |
| For thermocouples (compensating conductor) | Standard | 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 | 32 |
| | Heat resistive | Glass-wool-covered with seven 0.3-dia. conductors (0.5 mm thick) externally shielded with stainless steel, 2.9 x 4.6 mm in outer dia. | 0°C to 150°C<br>Sleeve: 0°C to 100°C | |

# Model Number Structure

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

## ■ Model Number Legend

### Platinum Resistance Thermometers

E52-□□□ D=□□□M
1 2 3 4 5 6

**1. Element type**

P: Pt100

**2. Protective tubing length (L)**

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

**E52-□□A**

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

**E52-□□B**

| Diameter (D) | Length (L) |
|---|---|
| 8 | 20 to 100 |

**E52-□□C**

| Diameter (D) | 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-□□C only

**5. Heat resistance**

| Code | Temperature range | Lead type |
|---|---|---|
| --- | –20°C to 70°C<br>Sleeve: 0°C to 70°C | Vinyl-covered |
| NETU | 0°C to 180°C<br>Sleeve: 0°C to 100°C | Glass-wool-covered, externally shielded |

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: 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

# General-purpose Models

## ■ Sheathed Platinum Resistance Thermometers

Refer to *Model Number Legend* above for the Pt100.

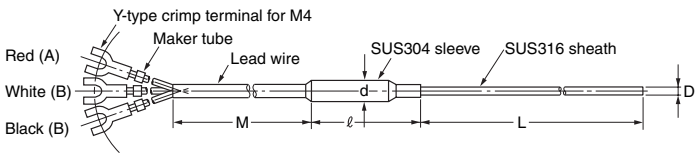
### Specifications

| | |
|---|---|
| **Element type** | Pt100 |
| **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-P□A

### Dimensions




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. The sleeve resists a temperature range between 0°C and 70°C.
- Heat Resistive (0°C to 180°C): Fully glass-wool-covered with twenty 0.18-dia. conductors (0.5 mm thick) externally shielded with stainless steel, 5.2 mm in outer dia. The sleeve resists a temperature range between 0°C and 100°C.
- Lead Wire Length (M): 1, 2, 4, or 8 m

### Model Information

Custom-made models are available on request. Refer to page 4 for details.

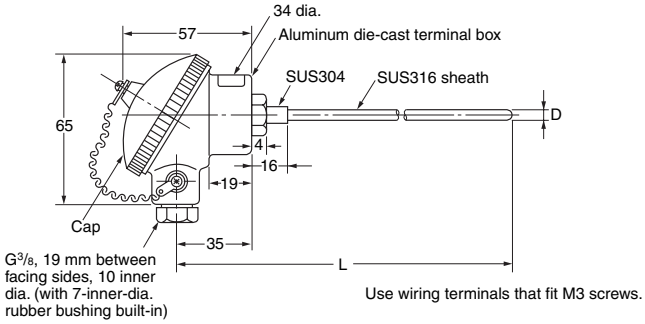
| Terminal type | Protective tubing diameter D (mm) | Protective tubing length L (cm) | Lead wire type | Lead wire length M (m) | | | |
|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 4 | 8 |
| | | | | Model | | | |
| Exposed-lead Models | 3.2 dia. | 15 | Standard | E52-P15A D=3.2 1M | E52-P15A D=3.2 2M | E52-P15A D=3.2 4M | E52-P15A D=3.2 8M |
| | | | Heat resistive | E52-P15A D=3.2 NETU 1M | E52-P15A D=3.2 NETU 2M | E52-P15A D=3.2 NETU 4M | E52-P15A D=3.2 NETU 8M |
| | | 20 | Standard | E52-P20A D=3.2 1M | E52-P20A D=3.2 2M | E52-P20A D=3.2 4M | E52-P20A D=3.2 8M |
| | | | Heat resistive | E52-P20A D=3.2 NETU 1M | E52-P20A D=3.2 NETU 2M | E52-P20A D=3.2 NETU 4M | E52-P20A D=3.2 NETU 8M |
| | | 35 | Standard | E52-P35A D=3.2 1M | E52-P35A D=3.2 2M | E52-P35A D=3.2 4M | E52-P35A D=3.2 8M |
| | | | Heat resistive | E52-P35A D=3.2 NETU 1M | E52-P35A D=3.2 NETU 2M | E52-P35A D=3.2 NETU 4M | E52-P35A D=3.2 NETU 8M |
| | 4.8 dia. | 20 | Standard | E52-P20A D=4.8 1M | E52-P20A D=4.8 2M | E52-P20A D=4.8 4M | E52-P20A D=4.8 8M |
| | | | Heat resistive | E52-P20A D=4.8 NETU 1M | E52-P20A D=4.8 NETU 2M | E52-P20A D=4.8 NETU 4M | E52-P20A D=4.8 NETU 8M |
| | | 35 | Standard | E52-P35A D=4.8 1M | E52-P35A D=4.8 2M | E52-P35A D=4.8 4M | E52-P35A D=4.8 8M |
| | | | Heat resistive | E52-P35A D=4.8 NETU 1M | E52-P35A D=4.8 NETU 2M | E52-P35A D=4.8 NETU 4M | E52-P35A D=4.8 NETU 8M |
| | | 50 | Standard | E52-P50A D=4.8 1M | E52-P50A D=4.8 2M | E52-P50A D=4.8 4M | E52-P50A D=4.8 8M |
| | | | Heat resistive | E52-P50A D=4.8 NETU 1M | E52-P50A D=4.8 NETU 2M | E52-P50A D=4.8 NETU 4M | E52-P50A D=4.8 NETU 8M |
| | 6.4 dia. | 20 | Standard | E52-P20A D=6.4 1M | E52-P20A D=6.4 2M | E52-P20A D=6.4 4M | E52-P20A D=6.4 8M |
| | | | Heat resistive | E52-P20A D=6.4 NETU 1M | E52-P20A D=6.4 NETU 2M | E52-P20A D=6.4 NETU 4M | E52-P20A D=6.4 NETU 8M |
| | | 35 | Standard | E52-P35A D=6.4 1M | E52-P35A D=6.4 2M | E52-P35A D=6.4 4M | E52-P35A D=6.4 8M |
| | | | Heat resistive | E52-P35A D=6.4 NETU 1M | E52-P35A D=6.4 NETU 2M | E52-P35A D=6.4 NETU 4M | E52-P35A D=6.4 NETU 8M |
| | | 50 | Standard | E52-P50A D=6.4 1M | E52-P50A D=6.4 2M | E52-P50A D=6.4 4M | E52-P50A D=6.4 8M |
| | | | Heat resistive | E52-P50A D=6.4 NETU 1M | E52-P50A D=6.4 NETU 2M | E52-P50A D=6.4 NETU 4M | E52-P50A D=6.4 NETU 8M |

## Enclosed-terminal Models

### E52-P□C

#### Dimensions

Dimensions are given in millimeters, except for the length (L), which is provided in centimeters.




Terminal box: The permissible temperature is 0°C to 80°C.

**Note:** The terminals in the cap indicate polarity (A, B, b).

#### Model Information

Custom-made models are available on request. Refer to page 4 for details.

| Terminal type | Protective tubing length L (cm) | Protective tubing diameter D (mm) | | |
|---|---|---|---|---|
| | | 3.2 dia. | 4.8 dia. | 6.4 dia. |
| | | Model | | |
| Enclosed-terminal Models | 20 | E52-P20C D=3.2 | E52-P20C D=4.8 | E52-P20C D=6.4 |
| | 35 | E52-P35C D=3.2 | E52-P35C D=4.8 | E52-P35C D=6.4 |
| | 50 | E52-P50C D=3.2 | E52-P50C D=4.8 | E52-P50C D=6.4 |
| | 75 | --- | E52-P75C D=4.8 | E52-P75C D=6.4 |

# ■ Standard Platinum Resistance Thermometers

Refer to *Model Number Legend* on page 4 for the Pt100.

## Specifications

| | |
|---|---|
| **Element type** | Pt100 |
| **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) |

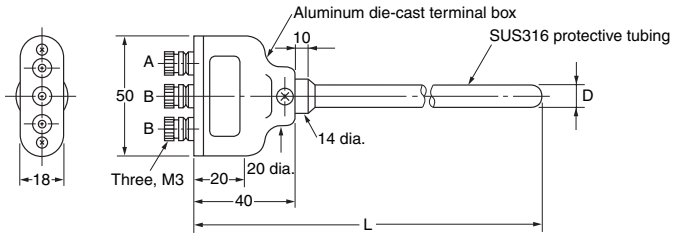
**Note: 1.** Use the sheathed platinum resistance thermometer if condensation is likely to result.
**2.** Be sure that the thermometer is free of vibration or shock if high temperatures are measured.

## Exposed-terminal Models

### E52-P□B

#### Dimensions

Dimensions are given in millimeters, except for the length (L), which is provided in centimeters.




Terminal box:
The permissible temperature is 0°C to 100°C.

#### Model Information

Custom-made models are available on request. Refer to page 4 for details

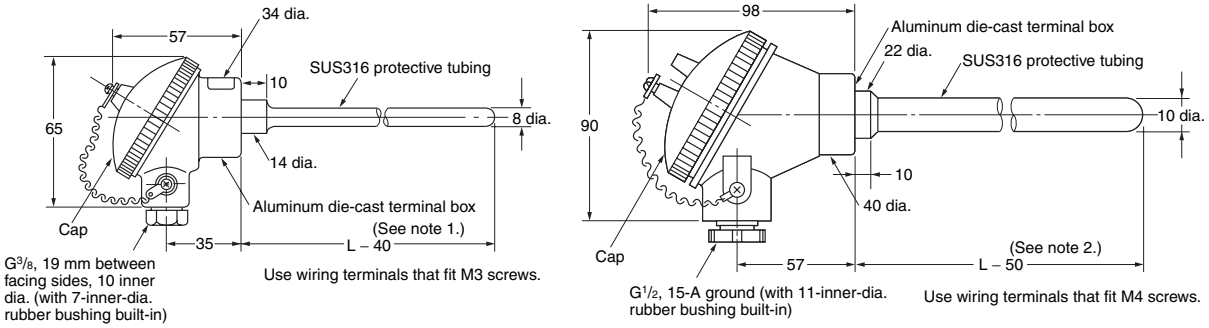
| Terminal type | Protective tubing length L (cm) | Protective tubing diameter D (mm) |
|---|---|---|
| | | 8 dia. |
| | | Model |
| Exposed-terminal Models | 20 | E52-P20B D=8 |
| | 35 | E52-P35B D=8 |
| | 50 | E52-P50B D=8 |

# Enclosed-terminal Models

## E52-P□C

### Dimensions

Dimensions are given in millimeters, except for the length (L), which is provided in centimeters.




**Note: 1.** The length L is in centimeters, but “40” is 40 millimeters.
Therefore, for the E52-P20C, L = 20 (cm), the protective tubing length L – 40 = 200 – 40 = 160 mm.

**2.** The length L is in centimeters, but “50” is 50 millimeters.
Therefore, for the E52-P75C: L = 75 (cm), the protective tubing length L – 50 = 750 – 50 = 700 mm.

**3.** Terminal box: The permissible temperature is 0°C to 80°C.

### Model Information

Custom-made models are available on request. Refer to page 4 for details.

| Terminal type | Protective tubing length L (cm) | Protective tubing diameter D (mm) | |
|---|---|---|---|
| | | 8 dia. | 10 dia. |
| | | Model | |
| Enclosed-terminal Models | 20 | E52-P20C D=8 | --- |
| | 35 | E52-P35C D=8 | E52-P35C D=10 |
| | 50 | E52-P50C D=8 | E52-P50C D=10 |
| | 75 | --- | E52-P75C D=10 |
| | 100 | --- | E52-P100C D=10 |

**Note:** The terminals in the cap indicate polarity (A, B, b).

# ■ 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 (D) | 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 (D) | 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 126 |
| 12 | 24 to 126 |
| 15 | 29 to 156 |
| 22 | 39 to 206 |

**E52-PR□C**

| Diameter (D) | 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 (D) | Protective tubing construction | Protective tubing material |
|---|---|---|---|
| 1 | 1 mm | Sheathed | SUS316 |
| 1.6 | 1.6 mm | Sheathed | SUS316 |
| 3.2 | 3.2 mm | Sheathed | SUS316 |
| 4.8 | 4.8 mm | Sheathed | SUS316 |
| 6.4 | 6.4 mm | Sheathed | SUS316 |
| 8 | 8 mm | Sheathed | SUS316 |
| 10 | 10 mm | Standard | SUS316, SUS310S |
| 12 | 12 mm | Standard | SUS316, SUS310S |
| 15 | 15 mm | Standard | SUS316, SUS310S |
| 22 | 22 mm | Standard | SUS316, SUS310S |
| 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<br>Sleeve: 0°C to 70°C | Vinyl-covered |
| NETU | 0°C to 150°C<br>Sleeve: 0°C to 100°C | Glass-wool-covered with external 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 |
| SUS310S | SUS310S | K, D = 10 to 22 |
| PT1 | JIS ceramic Cat.1 | R |
| PT0 | JIS special ceramic | R |

### Examples

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

# ■ Sheathed Thermocouples

## Specifications

| | |
|---|---|
| **Element type** | K (CA), J(IC) |
| **Class** | JIS class 2 (0.75) |
| **Thermal contact** | Non-grounded type |
| **Sheath material** | CA: SUS316 |
| | IC: SUS316 |

**Permissible Temperature in Dry Air**

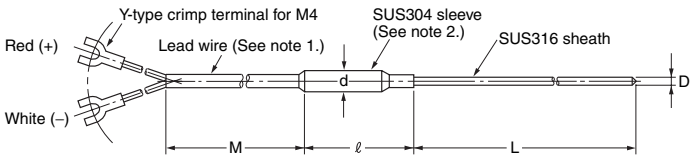
| D | Element wire | |
|---|---|---|
| | K (CA) SUS316 | J (IC) SUS316 |
| 1 dia. | 650°C | 450°C |
| 1.6 dia. | 650°C | 450°C |
| 3.2 dia. | 750°C | 650°C |
| 4.8 dia. | 800°C | 750°C |
| 6.4 dia. | 800°C | 750°C |
| 8.0 dia. | 900°C | 750°C |

**Note:** For details on the permissible temperature, refer to page D-5 of Introduction of Temperature Controllers (Cat. No. H900).

## Exposed-lead Models

### E52-CA□A

#### Dimensions




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 |

**Permissible Temperature in Dry Air**

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

**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 × 5.0.
- Heat Resistive (0°C to 150°C):
  Fully glass-wool-covered with seven 0.3-dia. conductors (0.5 mm thick) with external shield of stainless steel and external dimensions of 2.9 × 4.6
  The heat-resistive lead wires cannot be used in locations exposed to water or other liquids.
- Lead Wire Length (M): 1, 2, 4, or 8 m

**2.** The sleeve resists temperatures ranging between –20°C and 70°C for standard models and 0°C and 100°C for heat-resistive models.

## K (CA) Model Information (E52-CA□A)

### Model Information

Custom-made models are available on request. Refer to *Model Number Legend* on page 8 for details.

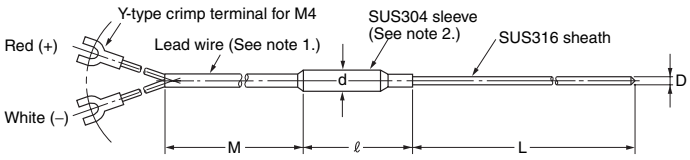
| Terminal type | Protective tubing diameter D (mm) | Protective tubing length L (cm) | Lead wire type | Lead wire length M (m) | | | |
|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 4 | 8 |
| | | | | Model | | | |
| Exposed-lead Models | 1 dia. | 15 | Standard | E52-CA15A D=1 1M | E52-CA15A D=1 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 |
| | | 20 | 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 |
| | | 35 | 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 |
| | 1.6 dia. | 15 | 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 |
| | | 20 | 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 |
| | | 35 | 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 |

| Terminal type | Protective tubing diameter D (mm) | Protective tubing length L (cm) | Lead wire type | Lead wire length M (m) | | | |
|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 4 | 8 |
| | | | | Model | | | |
| Exposed-lead Models | 3.2 dia. | 15 | 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 |
| | | 20 | 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 |
| | | 35 | 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 |
| | | 50 | 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. | 20 | 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 |
| | | 35 | 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 |
| | | 50 | 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. | 20 | 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 |
| | | 35 | 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 |
| | | 50 | 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 |
| | 8 dia. | 20 | 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 |
| | | 35 | 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 |
| | | 50 | 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 |

# Exposed-lead Models

## E52-IC□A

### Dimensions




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 |

**Permissible Temperature in Dry Air**

| D | Element wire |
|---|---|
| | J (IC) SUS316 |
| 1 dia. | 450°C |
| 1.6 dia. | 450°C |
| 3.2 dia. | 650°C |
| 4.8 dia. | 750°C |
| 6.4 dia. | 750°C |
| 8.0 dia. | 750°C |

**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 × 5.0.
- Heat Resistive (0°C to 150°C):
  Fully glass-wool-covered with seven 0.3-dia. conductors (0.5 mm thick) with external shield of stainless steel and external dimensions of 2.9 × 4.6
  The heat-resistive lead wires cannot be used in locations exposed to water or other liquids.
- Lead Wire Length (M): 1, 2, 4, or 8 m

**2.** The sleeve resists temperatures ranging between –20°C and 70°C for standard models and 0°C and 100°C for heat-resistive models.

## J (IC) Model Information (E52-IC□A)

### Model Information

Custom-made models are available on request. Refer to *Model Number Legend* on page 8 for details

| Terminal type | Protective tubing diameter D (mm) | Protective tubing length L (cm) | Lead wire type | Lead wire length M (m) | | | |
|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 4 | 8 |
| | | | | Model | | | |
| Exposed-lead Models | 1 dia. | 15 | 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 |
| | | 20 | 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 |
| | | 35 | 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 |
| | 1.6 dia. | 15 | 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 |
| | | 20 | 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 |
| | | 35 | 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 |

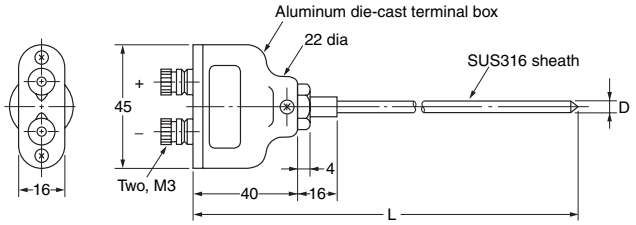
| Terminal type | Protective tubing diameter D (mm) | Protective tubing length L (cm) | Lead wire type | Lead wire length M (m) | | | |
|---|---|---|---|---|---|---|---|
| | | | | 1 | 2 | 4 | 8 |
| | | | | Model | | | |
| Exposed-lead Models | 3.2 dia. | 15 | Standard | E52-IC15A D=3.2 1M | E52-IC15A 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 |
| | | 20 | 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 |
| | | 35 | 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 |
| | | 50 | 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. | 20 | 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 |
| | | 35 | 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 |
| | | 50 | 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. | 20 | 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 |
| | | 35 | 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 |
| | | 50 | 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 |
| | 8 dia. | 20 | 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 |
| | | 35 | 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 |
| | | 50 | 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

Dimensions are given in millimeters, except for the length (L), which is provided in centimeters.




**Permissible Temperature in Dry Air**

| D | Element wire | |
|---|---|---|
| | K (CA) SUS316 | J (IC) SUS316 |
| 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 |

Terminal box: The permissible temperature is 0°C to 100°C.

### Model Information

Custom-made models are available on request. Refer to *Model Number Legend* on page 8 for details.

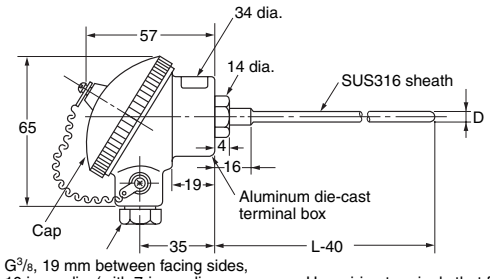
| Element type | Terminal type | Protective tubing length L (cm) | Protective tubing diameter D (mm) | | | |
|---|---|---|---|---|---|---|
| | | | 3.2 dia. | 4.8 dia. | 6.4 dia. | 8 dia. |
| | | | Model | | | |
| K (CA) | Exposed-terminal Models | 20 | E52-CA20B D=3.2 | E52-CA20B D=4.8 | E52-CA20B D=6.4 | --- |
| | | 35 | E52-CA35B D=3.2 | E52-CA35B D=4.8 | E52-CA35B D=6.4 | E52-CA35B D=8 |
| | | 50 | E52-CA50B D=3.2 | E52-CA50B D=4.8 | E52-CA50B D=6.4 | E52-CA50B D=8 |
| | | 75 | --- | E52-CA75B D=4.8 | E52-CA75B D=6.4 | E52-CA75B D=8 |
| J (IC) | Exposed-terminal Models | 20 | E52-IC20B D=3.2 | E52-IC20B D=4.8 | E52-IC20B D=6.4 | --- |
| | | 35 | E52-IC35B D=3.2 | E52-IC35B D=4.8 | E52-IC35B D=6.4 | E52-IC35B D=8 |
| | | 50 | E52-IC50B D=3.2 | E52-IC50B D=4.8 | E52-IC50B D=6.4 | E52-IC50B D=8 |
| | | 75 | --- | E52-IC75B D=4.8 | E52-IC75B D=6.4 | E52-IC75B D=8 |

# Enclosed-terminal Models

## E52-CA□C
## E52-IC□C

### Dimensions

Dimensions are given in millimeters, except for the length (L), which is provided in centimeters.




G3/8, 19 mm between facing sides, 10 inner dia. (with 7-inner-dia. rubber bushing built-in)

Use wiring terminals that fit M3 screws.

**Permissible Temperature in Dry Air**

| D | Element wire | |
|---|---|---|
| | K (CA) SUS316 | J (IC) SUS316 |
| 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 |

Terminal box: The permissible temperature is 0°C to 80°C.

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

### Model Information

Custom-made models are available on request. Refer to *Model Number Legend* on page 8 for details.

| Element type | Terminal type | Protective tubing length L (cm) | Protective tubing diameter D (mm) | | | |
|---|---|---|---|---|---|---|
| | | | 3.2 dia. | 4.8 dia. | 6.4 dia. | 8 dia. |
| | | | Model | | | |
| K (CA) | Enclosed-terminal Models | 20 | E52-CA20C D=3.2 | E52-CA20C D=4.8 | E52-CA20C D=6.4 | --- |
| | | 35 | E52-CA35C D=3.2 | E52-CA35C D=4.8 | E52-CA35C D=6.4 | E52-CA35C D=8 |
| | | 50 | E52-CA50C D=3.2 | E52-CA50C D=4.8 | E52-CA50C D=6.4 | E52-CA50C D=8 |
| | | 75 | --- | E52-CA75C D=4.8 | E52-CA75C D=6.4 | E52-CA75C D=8 |
| J (IC) | Enclosed-terminal Models | 20 | E52-IC20C D=3.2 | E52-IC20C D=4.8 | E52-IC20C D=6.4 | --- |
| | | 35 | E52-IC35C D=3.2 | E52-IC35C D=4.8 | E52-IC35C D=6.4 | E52-IC35C D=8 |
| | | 50 | E52-IC50C D=3.2 | E52-IC50C D=4.8 | E52-IC50C D=6.4 | E52-IC50C D=8 |
| | | 75 | --- | 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 2 (0.75) | |
| | R, JIS class 2 (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 (See note.)

| 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 |

**Note:** For details on the permissible temperature, refer to *Technical Guide for Temperature Sensors*.

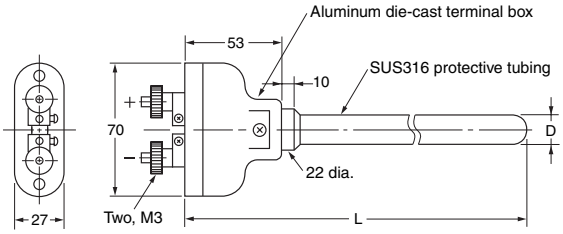
| D | Element wire |
|---|---|
| | R |
| 17 dia. | 0°C to 1,400°C |

## Exposed-terminal Models

### E52-CA□B
### E52-IC□B

#### Dimensions

Dimensions are given in millimeters, except for the length (L), which is provided in centimeters.




Terminal box: The permissible temperature is 0°C to 100°C.

**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 |

#### Model Information

Custom-made models are available on request. Refer to *Model Number Legend* on page 8 for details.

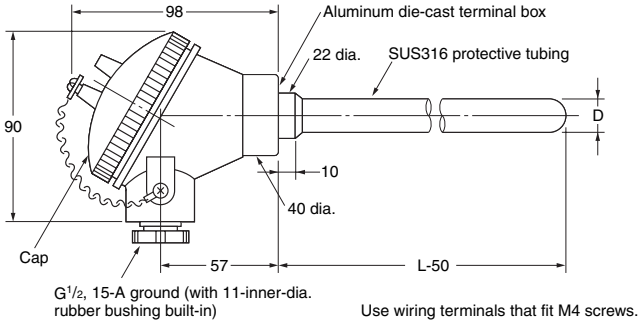
| Element type | Terminal type | Protective tubing length L (cm) | Protective tubing diameter D (mm) | | | |
|---|---|---|---|---|---|---|
| | | | 10 dia. | 12 dia. | 15 dia. | 22 dia. |
| | | | Model | | | |
| K (CA) | Exposed-terminal Models | 35 | E52-CA35B D=10 | E52-CA35B D=12 | E52-CA35B D=15 | --- |
| | | 50 | E52-CA50B D=10 | E52-CA50B D=12 | E52-CA50B D=15 | E52-CA50B D=22 |
| | | 75 | E52-CA75B D=10 | E52-CA75B D=12 | E52-CA75B D=15 | E52-CA75B D=22 |
| | | 100 | E52-CA100B D=10 | E52-CA100B D=12 | E52-CA100B D=15 | E52-CA100B D=22 |
| J (IC) | Exposed-terminal Models | 35 | E52-IC35B D=10 | E52-IC35B D=12 | E52-IC35B D=15 | --- |
| | | 50 | E52-IC50B D=10 | E52-IC50B D=12 | E52-IC50B D=15 | E52-IC50B D=22 |
| | | 75 | E52-IC75B D=10 | E52-IC75B D=12 | E52-IC75B D=15 | E52-IC75B D=22 |
| | | 100 | 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

Dimensions are given in millimeters, except for the length (L), which is provided in centimeters.




**Permissible Temperature in Dry Air**

| D | Element wire | |
|---|---|---|
| | K (CA) SUS316 | J (IC) SUS316 |
| 10 dia. | 0 to 750°C | 0 to 450°C |
| 12 dia. | 0 to 850°C | 0 to 500°C |
| 15 dia. | 0 to 850°C | 0 to 550°C |
| 22 dia. | 0 to 900°C | 0 to 600°C |

Terminal box: The permissible temperature is 0°C to 80°C.

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

### Model Information

Custom-made models are available on request. Refer to *Model Number Legend* on page 8 for details

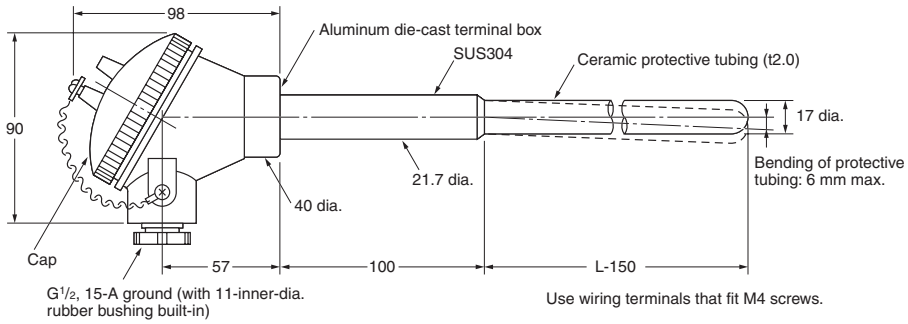
| Element type | Terminal type | Protective tubing length L (cm) | Protective tubing diameter D (mm) | | | |
|---|---|---|---|---|---|---|
| | | | 10 dia. | 12 dia. | 15 dia. | 22 dia. |
| | | | Model | | | |
| K (CA) | Enclosed-terminal Models | 35 | E52-CA35C D=10 | E52-CA35C D=12 | E52-CA35C D=15 | --- |
| | | 50 | E52-CA50C D=10 | E52-CA50C D=12 | E52-CA50C D=15 | E52-CA50C D=22 |
| | | 75 | E52-CA75C D=10 | E52-CA75C D=12 | E52-CA75C D=15 | E52-CA75C D=22 |
| | | 100 | E52-CA100C D=10 | E52-CA100C D=12 | E52-CA100C D=15 | E52-CA100C D=22 |
| J (IC) | Enclosed-terminal Models | 35 | E52-IC35C D=10 | E52-IC35C D=12 | E52-IC35C D=15 | --- |
| | | 50 | E52-IC50C D=10 | E52-IC50C D=12 | E52-IC50C D=15 | E52-IC50C D=22 |
| | | 75 | E52-IC75C D=10 | E52-IC75C D=12 | E52-IC75C D=15 | --- |
| | | 100 | 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

Dimensions are given in millimeters, except for the length (L), which is provided in centimeters.




**Permissible Temperature in Dry Air**

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

Terminal box: The permissible temperature is 0°C to 80°C.

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

### Model Information

| Element type | Terminal type | Protective tubing length L (cm) | Protective tubing diameter D (mm) |
|---|---|---|---|
| | | | 17 dia. |
| | | | Model |
| R (See note 1.) | Enclosed-terminal Models | 50 | E52-PR50C D=17 PT1 |
| | | 75 | E52-PR75C D=17 PT1 |
| | | 100 | E52-PR100C D=17 PT1 |
| R (See note 2.) | Enclosed-terminal Models | 50 | E52-PR50C D=17 PT0 |
| | | 75 | E52-PR75C D=17 PT0 |
| | | 100 | E52-PR100C D=17 PT0 |

| Standard | Protective tubing material | Permissible temperature in dry air |
|---|---|---|
| Note 1: JIS ceramic Cat.1 (PT1) | Mullite, high alumina, etc. | 1,500°C (See note.) |
| Note 2: JIS special ceramic (PT0) | Recrystallized alumina, fused alumina, etc. | 1,700°C (See note.) |

**Note:** The permissible temperature given for the protective tubing is higher than 1,400°C, but the permissible temperature of the thermocouple element wire is only 1,400°C. Therefore, the protective tubing of the E52-PR□C can withstand high temperatures momentarily to the levels given in the table as exceptions, but the element wire will deteriorate quickly if the thermocouple is used regularly at temperatures that exceed the permissible temperature for the element wire.

# Low-cost Models

## ■ Low-cost Platinum Resistance Thermometers

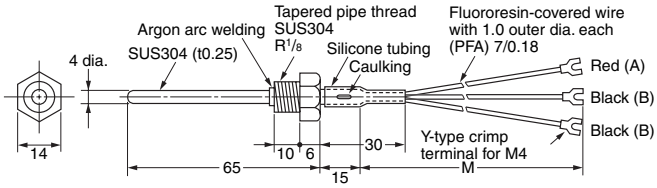
### Exposed-lead Models with Screws

#### Specifications

| | |
|---|---|
| **Element type** | Pt100 |
| **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-P6D

**Dimensions**




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

| Lead wire length (m) | Model |
|---|---|
| 1 | E52-P6D 1M |
| 2 | E52-P6D 2M |
| 4 | E52-P6D 4M |

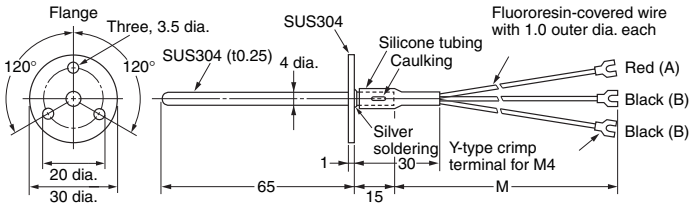
### Exposed-lead Models with Flange

#### Specifications

| | |
|---|---|
| **Element wire** | Pt100 |
| **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-P6F

**Dimensions**




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

| Lead wire length (m) | Model |
|---|---|
| 1 | E52-P6F 1M |
| 2 | E52-P6F 2M |
| 4 | E52-P6F 4M |

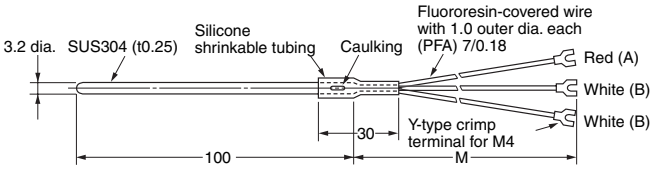
### Exposed-lead Models

#### Specifications

| | |
|---|---|
| **Element type** | Pt100 |
| **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-P10AE

**Dimensions**




**Note: 1.** The protective tubing is of pipe construction, which must not be bent.

**2.** A Compression Fitting (PT□) cannot be used for mounting.

| Lead wire length (m) | Model |
|---|---|
| 1 | E52-P10AE 1M |
| 2 | E52-P10AE 2M |
| 4 | E52-P10AE 4M |

# ■ Low-cost Thermocouples

## Exposed-lead Models with Spring

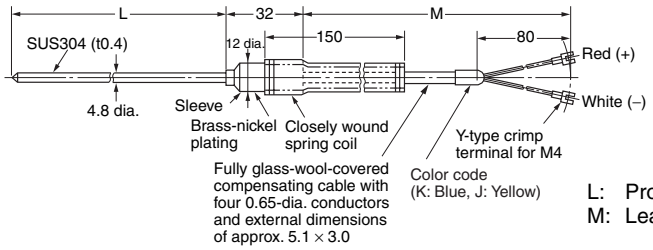
### Specifications

| | |
|---|---|
| **Element type** | K (CA), J (IC) |
| **Element dia.** | 0.65 mm (single wire) |
| **Class** | Class 2 (0.75) |
| **Protective tubing material** | SUS304 |
| **Thermal contact** | Non-grounded type |
| **Temperature range** | 0°C to 400°C: K (CA)<br>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

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

| 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

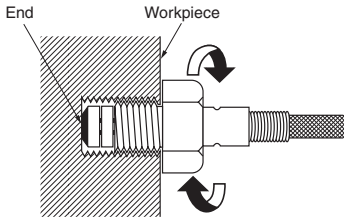
## Specifications

| | |
|---|---|
| **Element type** | K (CA), J (IC) |
| **Element dia.** | 0.65 mm (single wire) |
| **Class** | Class 2 (0.75) |
| **Protective tubing material** | SUS304 |
| **Thermal contact** | Grounded type |
| **Temperature range** | 0°C to 400°C: K (CA)<br>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 W1/4) when ordering.
**3.** The thermocouple is not of airtight construction.
**4.** OMRON recommends that the tip of the thermocouple is touching the sensing object.

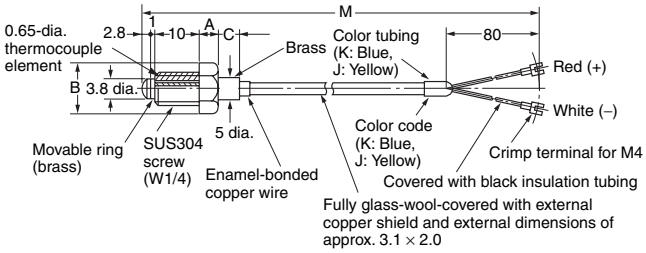
### Installation Example

Cut a thread into the workpiece, and screw in the thermocouple while pushing in so that the tip makes complete contact.

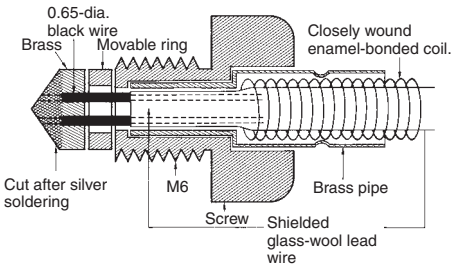



## E52-CA1D, E52-IC1D

### Dimensions




### Internal Construction (E52-CA1D)




| Lead wire length (m) | Screw | | |
|---|---|---|---|
| | M1/4 | M6 | M8 |
| A (mm) | 5 | 4 | 5.3 |
| B (mm) | 11.5 | 11 | 14 |
| C (mm) | 3 | 4 | 2.5 |

**Note:** E52-CA1D with the same shape and multiple element wires are also available (E52-CA1D-40). Refer to page 27 for details.

| Protective tubing length (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 |

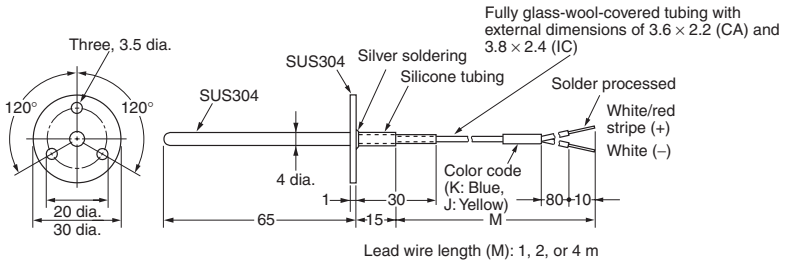
## Exposed-lead Models with Flange

### Specifications

| | |
|---|---|
| **Element type** | K (CA), J (IC) |
| **Element diameter** | 0.65 mm (single wire) |
| **Class** | Class 2 (0.75) |
| **Protective tubing material** | SUS304 |
| **Thermal contact** | Grounded type |
| **Temperature range** | 0°C to 350°C: K (CA)<br>0°C to 350°C: J (IC) |
| **Lead wire** | 0°C to 150°C |

### E52-CA6F, E52-IC6F

**Dimensions**




**Note: 1.** The thermocouple is a single wire from the tip to the terminal.
**2.** The tip is processed with solder, which ensures ease of welding.
**3.** The protective tubing is of pipe construction, which must not be bent.

| 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 |

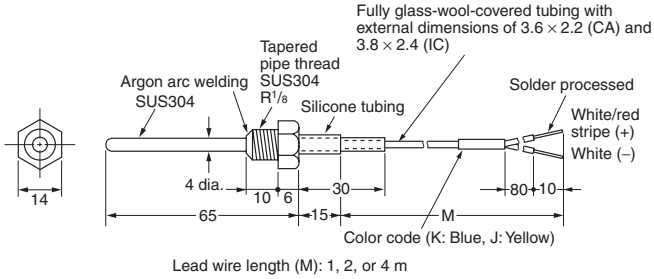
## Exposed-lead Models with Screws

### Specifications

| | |
|---|---|
| **Element type** | K (CA), J (IC) |
| **Element diameter** | 0.65 mm (single wire) |
| **Class** | Class 2 (0.75) |
| **Protective tubing material** | SUS304 |
| **Thermal contact** | Grounded type |
| **Temperature range** | 0°C to 350°C: K (CA)<br>0°C to 350°C: J (IC) |
| **Lead wire** | 0°C to 150°C |

### E52-CA6D, E52-IC6D

**Dimensions**




**Note: 1.** The thermocouple is a single wire from the tip to the terminal.
**2.** The tip is processed with solder, which ensures ease of welding.
**3.** The protective tubing is of pipe construction, which must not be bent.

| 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 |

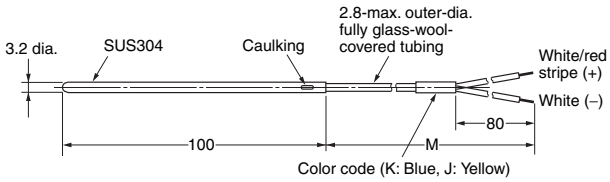
## Exposed-lead Models

### Specifications

| | |
|---|---|
| **Element type** | K (CA), J (IC) |
| **Element diameter** | 0.32 mm (single wire) |
| **Class** | Class 2 (0.75) |
| **Protective tubing material** | SUS304 |
| **Thermal contact** | Non-grounded type |
| **Temperature range** | 0°C to 350°C: K (CA)<br>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
**3.** The protective tubing is of pipe construction, which must not be bent.
**4.** The thermocouple cannot be mounted using a PT□ Compression Fitting.

| 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

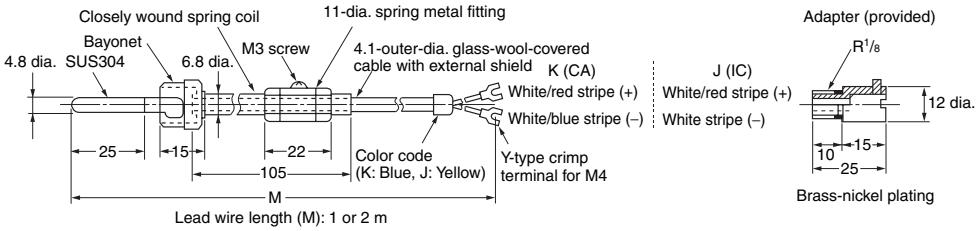
## Thermocouples for Molding Machines

### Specifications

| | |
|---|---|
| **Element type** | K (CA), J (IC) |
| **Element diameter** | 1.0 mm (single wire) |
| **Class** | Class 2 (0.75) |
| **Protective tubing material** | SUS304 |
| **Thermal contact** | Grounded type |
| **Temperature range** | 0°C to 350°C |
| **Lead wire** | 0°C to 180°C |

### E52-CA2GV, E52-IC2GV

**Dimensions**




| 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 Crimp Terminals

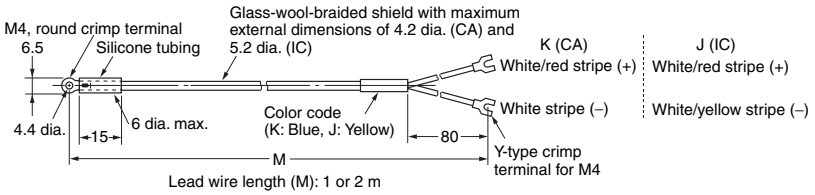
### Specifications

| | |
|---|---|
| **Element type** | K (CA), J (IC) |
| **Element diameter** | 0.65 mm (single wire) |
| **Class** | Class 2 (0.75) |
| **Thermal contact** | Grounded type |
| **Temperature range** | 0°C to 300°C |
| **Lead wire** | 0°C to 150°C |

**Note:** The E52-CA1GT is also available with double elements. Refer to page 23 for details.

### E52-CA1GT, E52-IC1GT

**Dimensions**




| 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

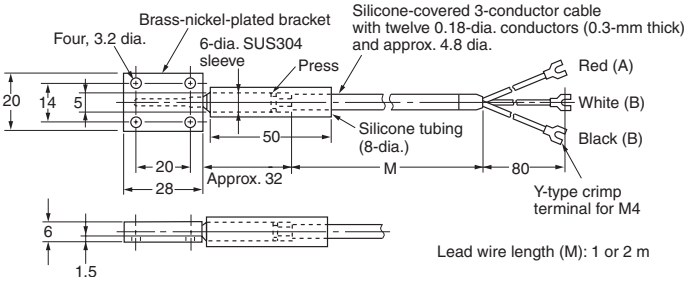
## Platinum Resistance Thermometers for Surface Temperature Measurement

### Specifications

| | |
|---|---|
| **Element type** | Pt100 |
| **Class** | Class B |
| **Protective tubing material** | SUS304<br>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-P2GS

**Dimensions**




| Lead wire length (m) | Model |
|---|---|
| 1 | E52-P2GS 1M |
| 2 | E52-P2GS 2M |

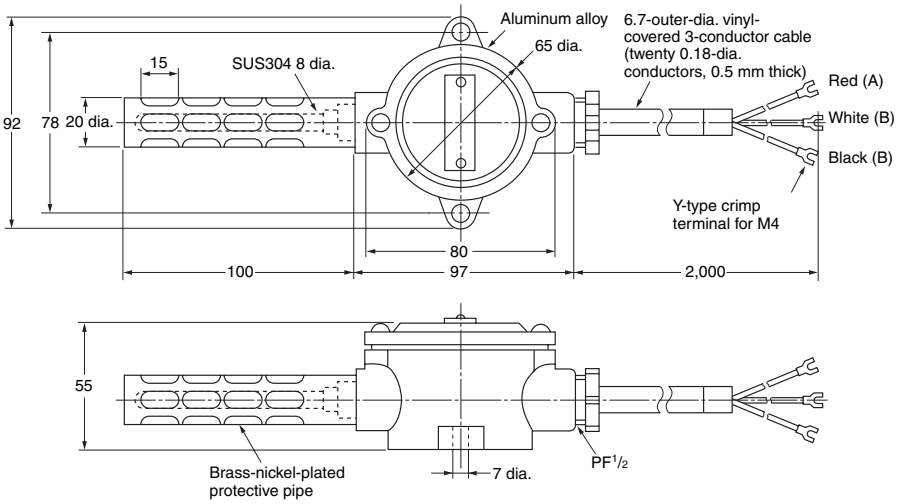
## Platinum Resistance Thermometers for Room Temperature Measurement

### Specifications

| | |
|---|---|
| **Element type** | Pt100 |
| **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-P10GR

**Dimensions**




| Lead wire length (m) | Model |
|---|---|
| 2 | E52-P10GR 2M |

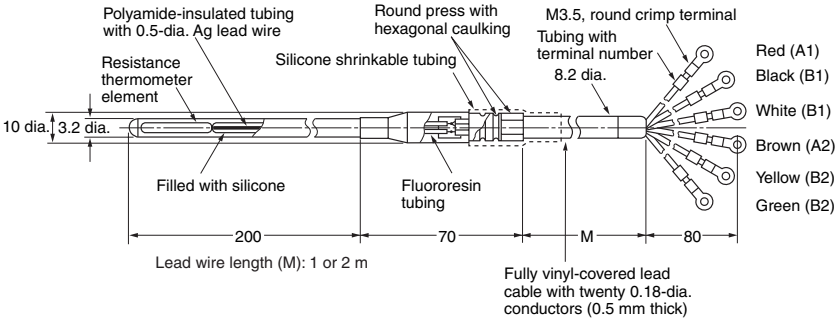
# Double-element Platinum Resistance Thermometers

## Specifications

| | |
|---|---|
| **Element type** | Pt100 |
| **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-P20GW

### Dimensions




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

| Lead wire length (m) | Model |
|---|---|
| 1 | E52-P20GW 1M |
| 2 | E52-P20GW 2M |

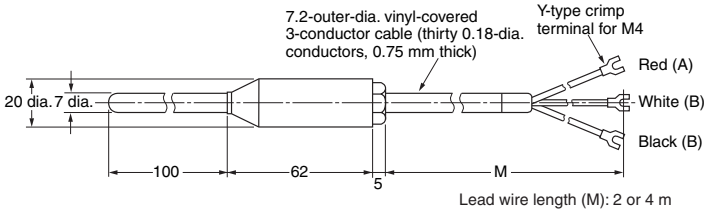
# Waterproof Platinum Resistance Thermometers

## Specifications

| | |
|---|---|
| **Element wire** | Pt100 |
| **Class** | Class B |
| **Protective tubing material** | SUS304 |
| **Conductor type** | 3-conductor system |
| **Temperature range** | 0°C to 70°C (underwater)<br>–20°C to 70°C (in the air) |
| **Lead wire** | 0°C to 70°C |

## E52-P10GP

### Dimensions




**Note:** The lead wires are vinyl-covered, and cannot be used underwater. Use the E52-P5A-40 if waterproof lead wires are required for use underwater. Refer to page 24 for details.

| Lead wire length (m) | Model |
|---|---|
| 2 | E52-P10GP 2M |
| 4 | E52-P10GP 4M |

# Corrosion-resistant Models with Fluororesin-covered Protective Tubing

## ■ Thermocouples

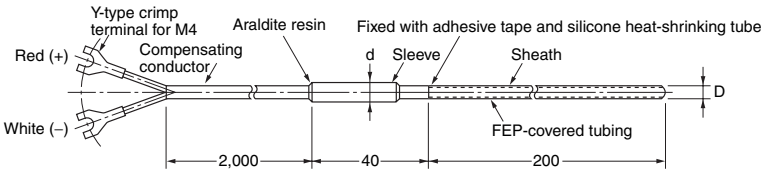
### Exposed-lead Models

#### Specifications

| | |
|---|---|
| **Element type** | K (CA) |
| **Class** | Class 2 (0.75) |
| **Protective tubing material** | SUS316 with Fluororesin-covered (FEP) tube |
| **Thermal contact** | Non-grounded type |
| **Temperature range** | 0°C to 180°C |
| **Lead wire** | Vinyl-covered: –20°C to 70°C |

#### E52-CA20A-1

**Dimensions**




| Model | Protective tubing diameter | Sleeve diameter (mm) Sleeve length (mm) | Covering thickness (mm) | Lead wire length (m) |
|---|---|---|---|---|
| E52-CA20A-1 D=4.6 2M | D = 4.6 | d = 7<br>ℓ = 40 | 0.7 | 2 |
| E52-CA20A-1 D=6 2M | D = 6.0 | | 0.6 | |
| E52-CA20A-1 D=8 2M | D = 8.0 | d = 10<br>ℓ = 45 | 0.8 | |

## ■ Platinum Measurement

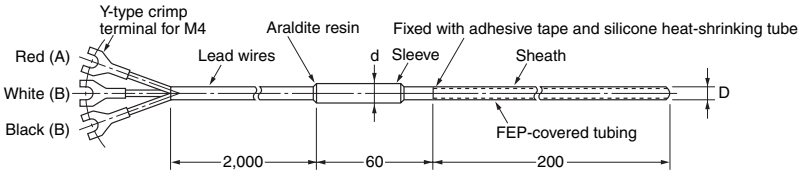
### Exposed-lead Models

#### Specifications

| | |
|---|---|
| **Element type** | Pt100 |
| **Class** | Class B |
| **Protective tubing material** | SUS316 with Fluororesin-covered (FEP) tube |
| **Conductor type** | 3-conductor system |
| **Temperature range** | –80°C to 180°C |
| **Lead wire** | Vinyl-covered: –20°C to 70°C |

#### E52-P20A-1

**Dimensions**




| Model | Protective tubing diameter | Sleeve diameter (mm) | Coating thickness (mm) | Lead wire length (m) |
|---|---|---|---|---|
| E52-P20A-1 D=4.6 2M | D = 4.6 | d = 8 | 0.7 | 2 |
| E52-P20A-1 D=6 2M | D = 6.0 | d = 8 | 0.6 | |
| E52-P20A-1 D=8 2M | D = 8.0 | d = 8 | 0.8 | |

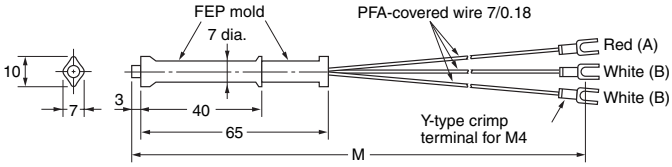
### FEP-molded Models (Completely Waterproof)

#### Specifications

| | |
|---|---|
| **Element type** | Pt100 |
| **Class** | Class B |
| **Protective tubing material** | Fluororesin-molded (FEP) covering |
| **Conductor type** | 3-conductor system |
| **Temperature range** | –50°C to 180°C |
| **Lead wire** | Fluororesin-covered (PFA): –50°C to 180°C |

#### E52-P5A-40

**Dimensions**




| Model | Protective tubing diameter | Lead wire length (m) |
|---|---|---|
| E52-P5A-40 2M | D = 10 (elliptical) | 2 |
| E52-P5A-40 4M | D = 10 (elliptical) | 4 |
| E52-P5A-40 6M | D = 10 (elliptical) | 6 |
| E52-P5A-40 8M | D = 10 (elliptical) | 8 |

# Pressure-resistant Explosion-proof (d2G4) Models

## ■ Thermocouples

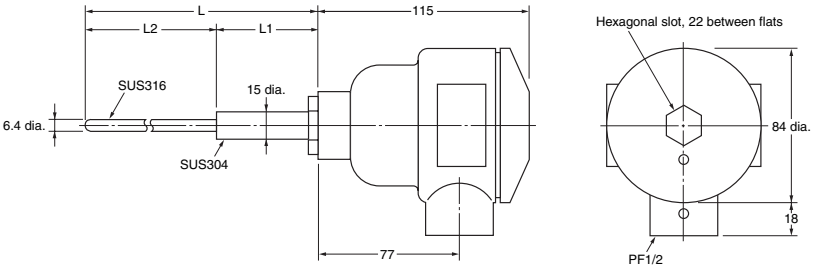
### Enclosed-terminal Models

#### Specifications

| | | |
|---|---|---|
| **Element type** | | K (CA) |
| **Class** | | Class 2 (0.75) |
| **Protective tubing material** | | L2 section: SUS316<br>L1 section: SUS304 |
| **Operating temperature range (in dry air)** | | Sensor: –100°C to 900°C<br>Terminal: 0°C to 70°C |
| **Explosion-proof specifications** | **Construction** | Pressure-resistant explosion-proof structure |
| | **Explosion-protected class and ignitability** | d2G4 |
| | **Lead wire wiring method** | Metal conduit connected with screws to terminal box |
| | **Conduit thread** | PF1/2 |
| | **Installation method** | Conforms to Technical Recommendations of the Research Institute of Industrial Safety (Japan) |

#### E52-CA□□C-6

**Dimensions**




| Model | Protective tubing length L (cm) | Protective tubing diameter | L2 (mm) |
|---|---|---|---|
| E52-CA20C-6 D=6.4 L2=150 | 20 | D = 6.4 | 150 |
| E52-CA35C-6 D=6.4 L2=300 | 35 | D = 6.4 | 300 |
| E52-CA50C-6 D=6.4 L2=450 | 50 | D = 6.4 | 450 |
| E52-CA75C-6 D=6.4 L2=700 | 75 | D = 6.4 | 700 |

## ■ Platinum Resistance Thermometers for Surface Temperature Measurement

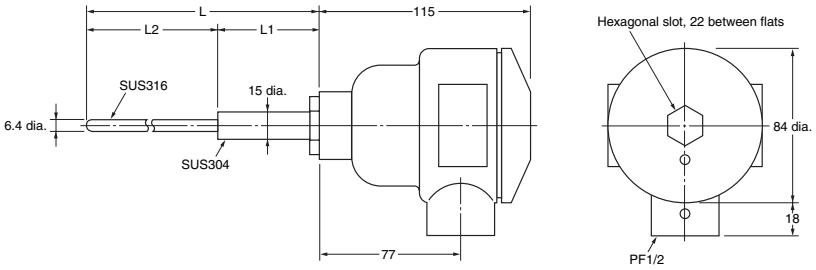
### Enclosed-terminal Models

#### Specifications

| | | |
|---|---|---|
| **Element type** | | Pt100 |
| **Class** | | Class B |
| **Protective tubing material** | | L2 section: SUS316<br>L1 section: SUS304 |
| **Operating temperature range (in dry air)** | | Sensor: –100°C to 500°C<br>Terminal: 0°C to 70°C |
| **Explosion-proof specifications** | **Construction** | Pressure-resistant explosion-proof structure |
| | **Explosion-protected class and ignitability** | d2G4 |
| | **Lead wire wiring method** | Metal conduit connected with screws to terminal box |
| | **Conduit thread** | PF1/2 |
| | **Installation method** | Conforms to Technical Recommendations of the Research Institute of Industrial Safety (Japan) |

#### E52-P□□C-6

**Dimensions**




| Model | Protective tubing length L (cm) | Protective tubing diameter | L2 (mm) |
|---|---|---|---|
| E52-P20C-6 D=6.4 L2=150 | 20 | D = 6.4 | 150 |
| E52-P35C-6 D=6.4 L2=300 | 35 | D = 6.4 | 300 |
| E52-P50C-6 D=6.4 L2=450 | 50 | D = 6.4 | 450 |
| E52-P75C-6 D=6.4 L2=700 | 75 | D = 6.4 | 700 |

# Double-element Models

## ■ Thermocouple

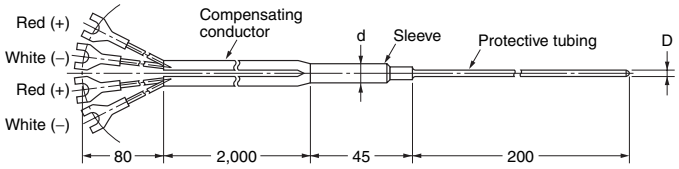
### Exposed-lead Models

#### Specifications

| | |
|---|---|
| **Element type** | K (CA) |
| **Class** | Class 2 (0.75) |
| **Protective tubing material** | SUS316 (with sheath) |
| **Thermal contact** | Non-grounded type |
| **Temperature range** | 0°C to permissible temperature limit |
| **Lead wire** | Vinyl-covered: –20°C to 70°C |

#### E52-CA20A-7

**Dimensions**




**Permissible Temperature in Dry Air**

| D | Element wire |
|---|---|
| | K (CA) SUS316 |
| 3.2 dia. | 750°C |
| 4.8 dia. | 800°C |
| 6.4 dia. | 850°C |
| 8.0 dia. | 900°C |

| Model | Protective tubing diameter | Sleeve diameter (mm) | Permissible Temperature (°C) | Lead wire length (m) |
|---|---|---|---|---|
| E52-CA20A-7 D=3.2 2M | D = 3.2 | d = 10 | 750 | 2 |
| E52-CA20A-7 D=4.8 2M | D = 4.8 | d = 10 | 800 | 2 |
| E52-CA20A-7 D=6.4 2M | D = 6.4 | d = 10 | 800 | 2 |
| E52-CA20A-7 D=8.0 2M | D = 8.0 | d = 10 | 900 | 2 |

## ■ Platinum Resistance Thermometers

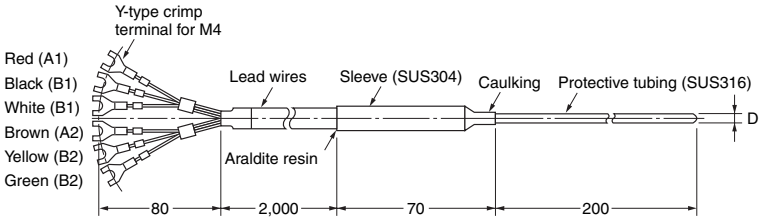
### Exposed-lead Models

#### Specifications

| | |
|---|---|
| **Element type** | Pt100 |
| **Class** | Class B |
| **Protective tubing material** | SUS316 (with sheath) |
| **Conductor type** | 3-conductor system |
| **Temperature range** | –200°C to 450°C |
| **Lead wire** | Vinyl-covered: –20°C to 70°C |

#### E52-P20A-7

**Dimensions**




| Model | Protective tubing diameter | Lead wire length (m) |
|---|---|---|
| E52-P20A-7 D=4.8 2M | D = 4.8 | 2 |
| E52-P20A-7 D=6.4 2M | D = 6.4 | 2 |

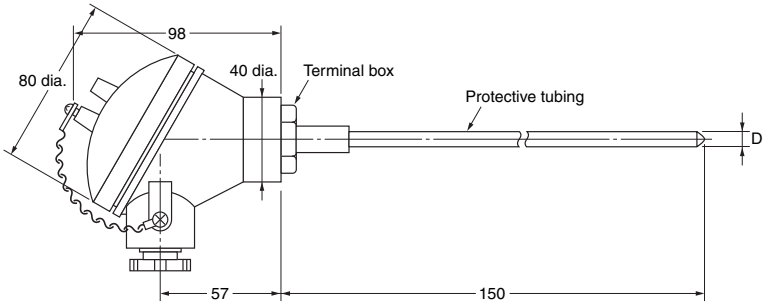
## Enclosed-terminal Models

### Specifications

| | |
|---|---|
| **Element type** | Pt100 |
| **Class** | Class B |
| **Protective tubing material** | SUS316 (with sheath) |
| **Conductor type** | 3-conductor system |
| **Temperature range** | –200°C to 450°C |

### E52-P20C-7

**Dimensions**




| Model | Protective tubing length L (cm) | Protective tubing diameter |
|---|---|---|
| E52-P20C-7 D=4.8 | 20 | D = 4.8 |
| E52-P20C-7 D=6.4 | 20 | D = 6.4 |

# Silicone-covered Lead Wires Models

## ■ Thermocouples

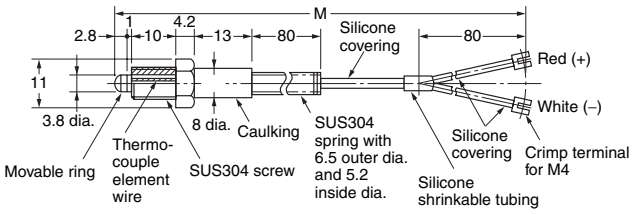
## Exposed-lead Models with Screws

### Specifications

| | |
|---|---|
| **Element type** | K (CA) |
| **Class** | Class 2 (0.75) |
| **Screw material** | SUS304 |
| **Thermal contact** | Grounded type |
| **Temperature range** | 0°C to 300°C |
| **Lead wire** | Silicone-covered (0.1/30): 0°C to 150°C |

### E52-CA1D-40

**Dimensions**




| Model | Screw pitch | Lead wire length (m) |
|---|---|---|
| E52-CA1D-40 M6 1M | M6 | 1 |
| E52-CA1D-40 M6 2M | M6 | 2 |
| E52-CA1D-40 M6 4M | M6 | 4 |

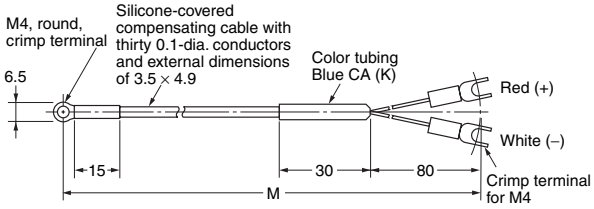
## Thermocouples with Crimp Terminals

### Specifications

| | |
|---|---|
| **Element type** | K (CA) |
| **Class** | Class 2 (0.75) |
| **Thermal contact** | Grounded type |
| **Temperature range** | 0°C to 300°C |
| **Lead wire** | Silicone-covered (0.1/30): 0°C to 150°C |

### E52-CA1GT-14

**Dimensions**




Lead wire length (M): 1 or 2 m

| Model | Lead wire length (m) |
|---|---|
| E52-CA1GT-14 1M | 1 |
| E52-CA1GT-14 2M | 2 |

# Thermistors

## Element Interchangeable Thermistor for E5CS and E5C2

### 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 Fluororesin-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 2.5 × 1.55 |

### Specifications

| Item | E52-THE□□ |
|---|---|
| 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 in still air |
| 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 |

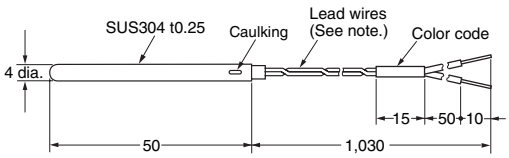
**Note:** Models with non-standard lead wire length and protective tubing length are available on request.

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

## Exposed-lead Models

### E52-THE5A

**Dimensions**



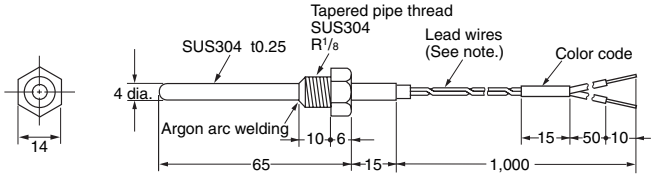

**Note:** The lead wires have no polarity

| 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**



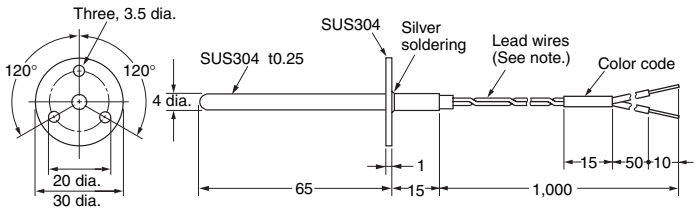

**Note:** The lead wires have no polarity

| 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 with 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

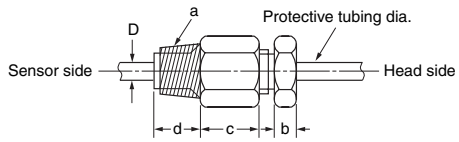
## Compression Fittings

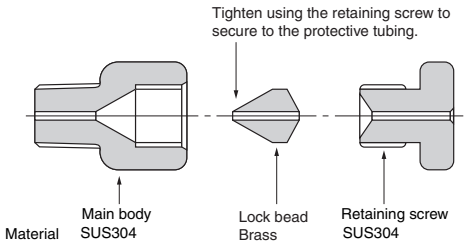
### Model Information

| 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.

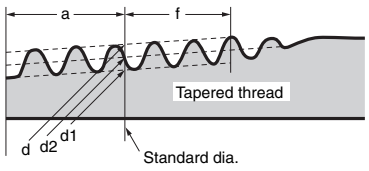
The compression fitting is a screw that adjusts and secures the insertion length of Temperature Sensors with the above protective tubing diameters.
The material of the Compression Fitting is SUS304 with internal fixing beads made of brass.




**Source: JIS B 0203 (Unit: mm)**

| Nominal thread size | T.P.I. (No. of threads /inch) | Outer diameter: d | Effective diameter: d2 | Root diameter: d1 | Standard diameter position a (from pipe end) | Minimum effective screw length: f |
|---|---|---|---|---|---|---|
| PT 1/8 | 28 | 9.728 | 9.147 | 8.566 | 3.97 ±0.91 | 2.5 |
| PT 1/4 | 19 | 13.157 | 12.301 | 11.445 | 6.01 ±1.34 | 3.7 |
| PT 3/8 | 19 | 16.662 | 15.806 | 14.950 | 6.35 ±1.34 | 3.7 |
| PT 1/2 | 14 | 20.955 | 19.793 | 18.631 | 8.16 ±1.81 | 5.0 |



# 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 |

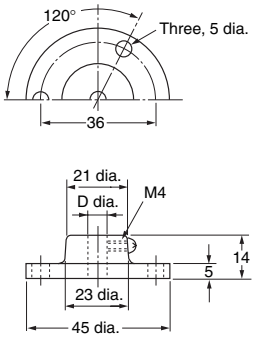
**Note: 1.** Use the Loose Flange in atmospheric pressure. The Loose Flange is not of airtight construction.

**2.** Use the Loose Flange at 400°C maximum.

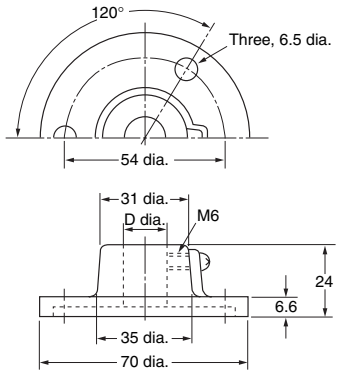
**3.** Do not apply the Loose Flange to protective tubing diameters other than the applicable ones.

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 70°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 (Length) | Model | | | |
|---|---|---|---|---|---|---|
| | | | 1 m | 2 m | 4 m | 8 m |
| R | Standard | Fully vinyl-covered (waterproof) | WPRG 1M | WPRG 2M | WPRG 4M | WPRG 8M |
| | Heat resistive | Fully glass-wool-covered | WPRH 1M | WPRH 2M | WPRH 4M | WPRH 8M |
| | | Fully glass-wool-covered with external shield of stainless steel | WPRH6 1M | WPRH6 2M | WPRH6 4M | WPRH6 8M |
| K (CA) | Standard | Fully vinyl-covered (waterproof) | WCAG 1M | WCAG 2M | WCAG 4M | WCAG 8M |
| | Heat resistive | Fully glass-wool-covered | WCAH 1M | WCAH 2M | WCAH 4M | WCAH 8M |
| | | Fully glass-wool-covered with external shield of stainless steel | WCAH6 1M | WCAH6 2M | WCAH6 4M | WCAH6 8M |
| | | Silicone-covered (See note 2.) | WCAG-40 1M | WCAG-40 2M | WCAG-40 4M | WCAG-40 8M |
| J (IC) | Standard | Vinyl covered (waterproof) | WICG 1M | WICG 2M | WICG 4M | WICG 8M |
| | Heat resistive | Fully glass-wool-covered | WICH 1M | WICH 2M | WICH 4M | WICH 8M |
| | | Fully glass-wool-covered with external shield of stainless steel | WICH6 1M | WICH6 2M | WICH6 4M | WICH6 8M |

**Note: 1.** Compensating Conductors with lengths, increased in units of a meter, up to 100 meters are available on request. Specify lengths above 100 meters in units of 100 meters. The maximum length depends on the product. Contact your OMRON representative for details.

**2.** It has the same waterproof characteristics as the standard model (fully vinyl-covered) and can be used at high temperatures.

## Specifications (JIS C1610-1981)

| Model | Type of thermo-couple | 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 | Fully vinyl-covered (waterproof) | 4/0.65 | 0 to 70 | +3/–7 | Black | 0.055 |
| WPRH | | Heat resis-tive | RX-H | Fully glass-wool-cov-ered | 7/0.3 | 0 to 150 | | | 0.140 |
| WPRH6 | | | RX-H6 | Fully glass-wool-cov-ered with external shield of stainless steel | | | | | |
| WCAG | K (CA) | Standard | VX-G | Fully vinyl-covered (waterproof) | 4/0.65 | –20 to 70 | ±2.5 | Blue | 0.39 |
| WCAH | | Heat resis-tive | WX-H | Fully glass-wool-cov-ered | 7/0.3 | 0 to 150 | ±3.0 | | 1.07 |
| WCAH6 | | | WX-H6 | Fully glass-wool-cov-ered with external shield of stainless steel | | | | | |
| WCAG-40 | | Heat resis-tive for moving parts | KX-G | Silicone-covered | 30/0.1 | –20 to 150 | ±2.5 | | 4.18 |
| WICG | J (IC) | Standard | JX-G | Fully vinyl-covered (waterproof) | 4/0.65 | –20 to 70 | ±2.5 | Yellow | 0.47 |
| WICH | | Heat resis-tive | JX-H | Fully glass-wool-cov-ered | 7/0.3 | 0 to 150 | | | 1.27 |
| WICH6 | | | JX-H6 | Fully glass-wool-cov-ered with external shield of stainless steel | | | | | |

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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2011.5

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**OMRON Corporation**
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