

Temperature sensor (NTC)  
NTC sensor assembly / systems



# NTCGP, NTCRP, NTCDP series



## PRODUCT LINEUP

### NTCGP series Resin dipping multilayer element

Resin dipping type

Lug terminal type



### NTCRP series Glass-encapsulated radial lead

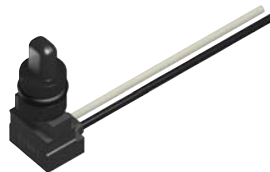
PPS resin case type / 200°C heat resistance



### NTCDP series Glass-encapsulated axial lead

PPS resin molding type oil temperature sensor with bracket

PPS resin molding type oil temperature sensor with O-ring



### NTCDP series Glass-encapsulated axial lead / for home appliances and industrial machinery

Epoxy resin case type

Epoxy resin case fasten screw type

ABS resin case type



## Temperature sensor (NTC)

## NTC sensor assembly / systems

## NTCGP, NTCRP, NTCDP series

## PART NUMBER CONSTRUCTION

| NTC                       | ○                                             | P                | □□             | ○                                                 | □□□                                             | ○                                                 | ○                             | ○                           | ○                                                                                    | ○                                | ○                   | □□□           |  |
|---------------------------|-----------------------------------------------|------------------|----------------|---------------------------------------------------|-------------------------------------------------|---------------------------------------------------|-------------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------------------------------|---------------------|---------------|--|
| Series name               | Structural classification                     | Assembly product | B constant (K) | B constant tolerance (%)                          | Nominal resistance (W)                          | Resistance tolerance (%)                          | Standard temperature (°C)     | Envelope structural         | Dimension of length                                                                  | Insulation material of lead wire | Wire tip processing | Internal code |  |
| NTC sensor                |                                               |                  |                | F ±1<br>G ±2<br>H ±3<br>J ±5<br>K ±10<br>X Others | 2 significant digits + power of 10              | F ±1<br>G ±2<br>H ±3<br>J ±5<br>K ±10<br>X Others | A -20<br>B 0<br>C 25<br>D 100 |                             |                                                                                      |                                  |                     |               |  |
| Structural classification |                                               |                  |                | Envelope structural                               |                                                 |                                                   |                               |                             | Wire tip processing                                                                  |                                  |                     |               |  |
| G                         | Multilayer element NTC thermistor             |                  |                | A                                                 | ABS resin case type ø8.0mm                      |                                                   |                               | A                           | Strip wire                                                                           |                                  |                     |               |  |
| D                         | Glass-encapsulated axial lead NTC thermistor  |                  |                | B                                                 | ABS resin case type ø6.8mm                      |                                                   |                               | B                           | With terminal                                                                        |                                  |                     |               |  |
| R                         | Glass-encapsulated radial lead NTC thermistor |                  |                | C                                                 | ABS resin case type ø6.0mm                      |                                                   |                               | C                           | With connector                                                                       |                                  |                     |               |  |
|                           |                                               |                  |                | D                                                 | Epoxy resin case type ø5.5mm                    |                                                   |                               | Z                           | Others                                                                               |                                  |                     |               |  |
|                           |                                               |                  |                | E                                                 | Epoxy resin case type ø6.0mm                    |                                                   |                               | Insulation material of wire |                                                                                      |                                  |                     |               |  |
|                           |                                               |                  |                | F                                                 | Epoxy resin case fasten screw type              |                                                   |                               | A                           | Vinyl chloride (Heat resistance 105°C)                                               |                                  |                     |               |  |
|                           |                                               |                  |                | G                                                 | PPS resin case type                             |                                                   |                               | B                           | Cross-link vinyl chloride (Heat resistance 105°C)                                    |                                  |                     |               |  |
|                           |                                               |                  |                | H                                                 | PPS resin molding type / oil temperature sensor |                                                   |                               | C                           | Polyethylene (Heat resistance 125°C)                                                 |                                  |                     |               |  |
|                           |                                               |                  |                | J                                                 | Resin dipping type                              |                                                   |                               | D                           | Silicone                                                                             |                                  |                     |               |  |
|                           |                                               |                  |                | N                                                 | Composite type                                  |                                                   |                               | E                           | Fluorocarbon polymer                                                                 |                                  |                     |               |  |
|                           |                                               |                  |                | Z                                                 | Lug terminal type                               |                                                   |                               | F                           | Polyethylene (Heat resistance 150°C)                                                 |                                  |                     |               |  |
|                           |                                               |                  |                | X                                                 | Others                                          |                                                   |                               | Z                           | Others                                                                               |                                  |                     |               |  |
|                           |                                               |                  |                |                                                   |                                                 |                                                   |                               |                             | Dimension of length                                                                  |                                  |                     |               |  |
|                           |                                               |                  |                |                                                   |                                                 |                                                   |                               |                             | A                                                                                    | 150mm max.                       |                     |               |  |
|                           |                                               |                  |                |                                                   |                                                 |                                                   |                               |                             | B                                                                                    | 151 to 300mm                     |                     |               |  |
|                           |                                               |                  |                |                                                   |                                                 |                                                   |                               |                             | C                                                                                    | 301 to 500mm                     |                     |               |  |
|                           |                                               |                  |                |                                                   |                                                 |                                                   |                               |                             | D                                                                                    | 501 to 800mm                     |                     |               |  |
|                           |                                               |                  |                |                                                   |                                                 |                                                   |                               |                             | E                                                                                    | 801 to 1000mm                    |                     |               |  |
|                           |                                               |                  |                |                                                   |                                                 |                                                   |                               |                             | F                                                                                    | 1000mm min.                      |                     |               |  |
|                           |                                               |                  |                |                                                   |                                                 |                                                   |                               |                             | Resin dipping type is the full length of the product. Others are length of lead wire |                                  |                     |               |  |
| B constant                |                                               |                  |                |                                                   |                                                 |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3A                        | 3000 to 3050                                  |                  |                | 4A                                                | 4000 to 4050                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3B                        | 3051 to 3100                                  |                  |                | 4B                                                | 4051 to 4100                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3C                        | 3101 to 3150                                  |                  |                | 4C                                                | 4101 to 4150                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3D                        | 3151 to 3200                                  |                  |                | 4D                                                | 4151 to 4200                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3E                        | 3201 to 3250                                  |                  |                | 4E                                                | 4201 to 4250                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3F                        | 3251 to 3300                                  |                  |                | 4F                                                | 4251 to 4300                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3G                        | 3301 to 3350                                  |                  |                | 4G                                                | 4301 to 4350                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3H                        | 3351 to 3400                                  |                  |                | 4H                                                | 4351 to 4400                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3J                        | 3401 to 3450                                  |                  |                | 4J                                                | 4401 to 4450                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3K                        | 3451 to 3500                                  |                  |                | 4K                                                | 4451 to 4500                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3L                        | 3501 to 3550                                  |                  |                | 4L                                                | 4501 to 4550                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3M                        | 3551 to 3600                                  |                  |                | 4M                                                | 4551 to 4600                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3N                        | 3601 to 3650                                  |                  |                | 4N                                                | 4601 to 4650                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3P                        | 3651 to 3700                                  |                  |                | 4P                                                | 4651 to 4700                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3Q                        | 3701 to 3750                                  |                  |                | 4Q                                                | 4701 to 4750                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3R                        | 3751 to 3800                                  |                  |                | 4R                                                | 4751 to 4800                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3S                        | 3801 to 3850                                  |                  |                | 4S                                                | 4801 to 4850                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3T                        | 3851 to 3900                                  |                  |                | 4T                                                | 4851 to 4900                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3U                        | 3901 to 3950                                  |                  |                | 4U                                                | 4901 to 4950                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |
| 3V                        | 3951 to 3999                                  |                  |                | 4V                                                | 4951 to 4999                                    |                                                   |                               |                             |                                                                                      |                                  |                     |               |  |

## Temperature sensor (NTC)

## NTC sensor assembly / systems

## NTCGP series(Resin dipping multilayer element)

## Resin dipping type

## FEATURES

- Adopts a multilayer element type NTC thermistor.
- Fast heat responsiveness due to its small size.
- Lead-free product.

## APPLICATION

- Room temperature detection (air conditioners, fan heaters etc.)
- Temperature control (surface of toilet seats with warm water washing feature, etc.)
- Water temperature detection (hot water pots etc.)
- Temperature detection (refrigerator compartments, heated carpets etc.)



## SPECIFICATIONS

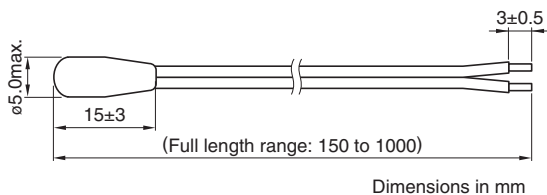
|                             |                                                                                         |
|-----------------------------|-----------------------------------------------------------------------------------------|
| Thermistor                  | Resin dipping multilayer element type                                                   |
| Wires                       | AWG26 (Sn-plated 0.16mmx7) parallel cable with vinyl chloride sheath (heat proof 105°C) |
| Wire tip                    | Wire strips, crimp terminals, and connectors are available.                             |
| Operating temperature range | -40 to +105°C                                                                           |
| Heating time constant       | 6s max. (in still oil)                                                                  |
| Heat dissipation constant   | 2.8mW/°C (in still air)                                                                 |

## CHARACTERISTICS SPECIFICATION

| Part No.                          | B constant B25/50 | Resistance R25 | Overall length dimensions | Wire tip   |
|-----------------------------------|-------------------|----------------|---------------------------|------------|
| <a href="#">NTCGP3HH103HCJBAA</a> | B25/50 : 3395K±3% | R25 : 10kΩ ±3% | 300±10mm                  | Strip wire |
| <a href="#">NTCGP3UH153HCJBAA</a> | B25/50 : 3950K±3% | R25 : 15kΩ ±3% | 300±10mm                  | Strip wire |
| <a href="#">NTCGP3UH503HCJBAA</a> | B25/50 : 3950K±3% | R25 : 50kΩ ±3% | 300±10mm                  | Strip wire |

- Contact us for other nominal resistance values and B constants.
- Contact us for other overall length dimensions and tolerances. (Full length range: 150 to 1000 mm)
- Contact us for other tip processing.

## SHAPE &amp; DIMENSIONS



## Temperature sensor (NTC)

## NTC sensor assembly / systems

## NTCGP series(Resin dipping multilayer element)

## Lug terminal type

## FEATURES

- Possible to affix using a fasten screw and to perform stable temperature detection of the mounting surface.
- Can be used for a wide temperature range ( $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ ).
- Can be installed in vehicles.

## APPLICATION

- Temperature detection (inverters for solar power generation and projectors)
- Substrate temperature detection (converters for HEVs and EVs)



## SPECIFICATIONS

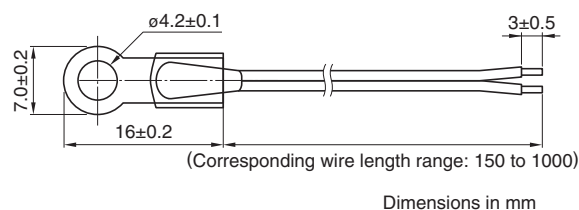
|                             |                                                                                |
|-----------------------------|--------------------------------------------------------------------------------|
| Thermistor                  | Resin dipping multilayer element type                                          |
| Wires                       | AWG26 (Sn-plated 0.16mmx7) parallel cable with polyethylene (heat proof 125°C) |
| Wire tip                    | Wire strips, crimp terminals, and connectors are available.                    |
| Operating temperature range | $-40$ to $+125^{\circ}\text{C}$                                                |
| Heating time constant       | 6s max. (in still oil)                                                         |
| Heat dissipation constant   | 3mW/ $^{\circ}\text{C}$ (in still air)                                         |

## CHARACTERISTICS SPECIFICATION

| Part No.                          | B constant B25/50       | Resistance R25              | Overall length dimensions | Wire tip   |
|-----------------------------------|-------------------------|-----------------------------|---------------------------|------------|
| <a href="#">NTCGP3HH103HCZCCA</a> | B25/50 : 3395K $\pm$ 3% | R25 : 10k $\Omega$ $\pm$ 3% | 400 $\pm$ 10mm            | Strip wire |
| <a href="#">NTCGP3UH153HCZCCA</a> | B25/50 : 3950K $\pm$ 3% | R25 : 15k $\Omega$ $\pm$ 3% | 400 $\pm$ 10mm            | Strip wire |
| <a href="#">NTCGP3UH503HCZCCA</a> | B25/50 : 3950K $\pm$ 3% | R25 : 50k $\Omega$ $\pm$ 3% | 400 $\pm$ 10mm            | Strip wire |

- Contact us for other nominal resistance values and B constants.
- Contact us for other wire length dimensions and tolerances. (Corresponding wire length range: 150 to 1000 mm)
- Contact us for other tip processing.

## SHAPE &amp; DIMENSIONS



## Temperature sensor (NTC)

## NTC sensor assembly / systems

**NTCRP series**(Glass-encapsulated radial lead)**PPS resin case type / 200°C heat resistance****FEATURES**

- Excellent ATF resistance.
- Operating temperature range:  $-40^{\circ}\text{C}$  to  $+200^{\circ}\text{C}$
- Fast heat responsiveness due to its small size.

**APPLICATION**

Coil temperature detection for EV, HEV and PHEV drive motor

Inner temperature detection for the servomotor used for various industries

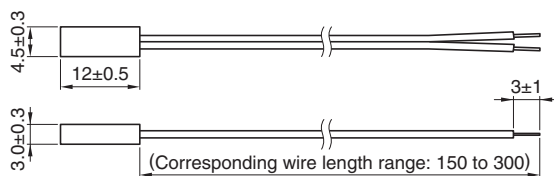
**SPECIFICATIONS**

|                                    |                                                             |
|------------------------------------|-------------------------------------------------------------|
| <b>Thermistor</b>                  | Glass-encapsulated radial lead                              |
| <b>Wires</b>                       | Fluorinated wire                                            |
| <b>Wire tip</b>                    | Wire strips, crimp terminals, and connectors are available. |
| <b>Operating temperature range</b> | $-40$ to $+200^{\circ}\text{C}$                             |
| <b>Heating time constant</b>       | 10s max. (in still oil)                                     |
| <b>Heat dissipation constant</b>   | 1.9mW/ $^{\circ}\text{C}$ (in still air)                    |

**CHARACTERISTICS SPECIFICATION**

| Part No.                          | B constant                      | Resistance                         | Wire length dimension | Wire tip   |
|-----------------------------------|---------------------------------|------------------------------------|-----------------------|------------|
| <a href="#">NTCRP3VG332JDGBEA</a> | B0/100 : $3970\text{K} \pm 2\%$ | R100 : $3.3\text{k}\Omega \pm 5\%$ | $300 \pm 10\text{mm}$ | Strip wire |

- Contact us for other nominal resistance values and B constants.
- Contact us for other wire length dimensions and tolerances. (Corresponding wire length range: 150 to 300 mm)
- Contact us for other tip processing.

**SHAPE & DIMENSIONS**

Dimensions in mm

## Temperature sensor (NTC)

## NTC sensor assembly / systems

**NTCDP series(Glass-encapsulated axial lead)****PPS resin molding type oil temperature sensor with brackets****FEATURES**

- High heat resistance.
- Excellent oil resistance and ATF resistance.

**APPLICATION**

Oil temperature detection for ATF, transmission oil, oil heaters, etc.

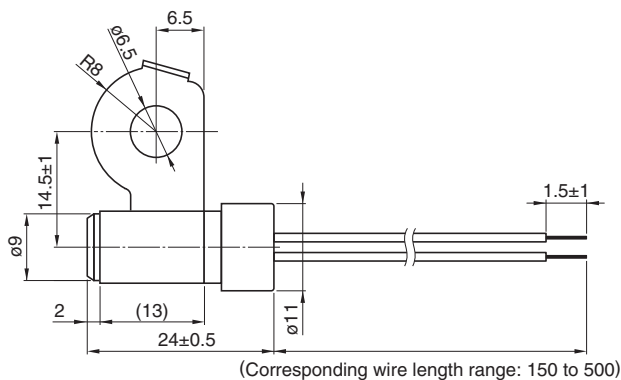
**SPECIFICATIONS**

|                                    |                                                             |
|------------------------------------|-------------------------------------------------------------|
| <b>Thermistor</b>                  | Glass-encapsulated axial lead                               |
| <b>Wires</b>                       | Fluorinated wire                                            |
| <b>Wire tip</b>                    | Wire strips, crimp terminals, and connectors are available. |
| <b>Operating temperature range</b> | -40 to +150°C                                               |
| <b>Heating time constant</b>       | 30s max. (in still oil)                                     |
| <b>Heat dissipation constant</b>   | 5mW/°C (in still air)                                       |

**CHARACTERISTICS SPECIFICATION**

| Part No.                          | B constant        | Resistance         | Wire length dimension | Wire tip   |
|-----------------------------------|-------------------|--------------------|-----------------------|------------|
| <a href="#">NTCDP3LG720JXHCEA</a> | B20/80 : 3520K±2% | R140 : 0.072kΩ ±5% | 445±10mm              | Strip wire |

- Contact us for other nominal resistance values and B constants.
- Contact us for other wire length dimensions and tolerances. (Corresponding wire length range: 150 to 500 mm)
- Contact us for other tip processing.
- Consult with you when you request a change in the dimensions of the bracket to which the sensor is fixed.

**SHAPE & DIMENSIONS**

Dimensions in mm

## Temperature sensor (NTC)

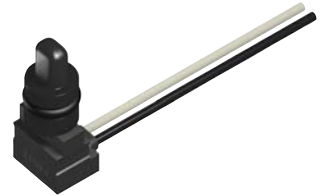
## NTC sensor assembly / systems

**NTCDP series(Glass-encapsulated axial lead)****PPS resin molding type oil temperature sensor with O-ring****FEATURES**

- High heat resistance.
- Excellent oil resistance and ATF resistance.
- Detection portion is sealed by an O-ring allowing for direct detection of oil temperature.

**APPLICATION**

Oil temperature detection for ATF, transmission oil, oil heaters, etc.

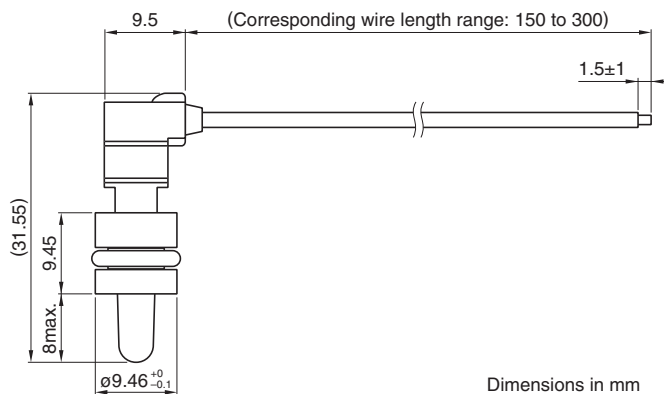
**SPECIFICATIONS**

|                                    |                                                             |
|------------------------------------|-------------------------------------------------------------|
| <b>Thermistor</b>                  | Glass-encapsulated axial lead                               |
| <b>Wires</b>                       | Fluorinated wire                                            |
| <b>Wire tip</b>                    | Wire strips, crimp terminals, and connectors are available. |
| <b>Operating temperature range</b> | −40 to +150°C                                               |
| <b>Heating time constant</b>       | 15s max. (in still oil)                                     |
| <b>Heat dissipation constant</b>   | 3.5mW/°C (in still air)                                     |

**CHARACTERISTICS SPECIFICATION**

| Part No.                          | B constant        | Resistance           | Wire length dimension | Wire tip   |
|-----------------------------------|-------------------|----------------------|-----------------------|------------|
| <a href="#">NTCDP3LG111XXHBEA</a> | B25/85 : 3528K±2% | R145 : 0.111kΩ ±2.5% | 210±10mm              | Strip wire |

- Contact us for other nominal resistance values and B constants.
- Contact us for other wire length dimensions and tolerances. (Corresponding wire length range: 150 to 300 mm)
- Contact us for other tip processing.

**SHAPE & DIMENSIONS**

## Temperature sensor (NTC)

## NTC sensor assembly / systems

## NTCDP series(Glass-encapsulated axial lead)

## Resin case type for home appliances and industrial machinery

## FEATURES

- Excellent in high responsiveness, high heat resistance.
- High reliability with glass-sealed axial lead thermistors.



## APPLICATION

Temperature detection of refrigerator and vending machine compartments(air conditioners, refrigerators, vending machines, dishwashers, etc.)

## SPECIFICATIONS

|                                    | Thermistor                    | Wires                                             | Wire tip       | Operating temperature range | Heating time constant   | Heat dissipation constant |
|------------------------------------|-------------------------------|---------------------------------------------------|----------------|-----------------------------|-------------------------|---------------------------|
| Epoxy resin case type              | Glass-encapsulated axial lead | Cross-link vinyl chloride (Heat resistance 105°C) | Strip wire(*1) | -40 to 105°C (*2)           | 15s max. (in still oil) | 3.3mW/°C (in still air)   |
| Epoxy resin case fasten screw type |                               |                                                   |                |                             |                         |                           |
| ABS resin case type                | Glass-encapsulated axial lead | Vinyl chloride (Heat resistance 105°C)            | Strip wire(*1) | -40 to 85°C                 | 30s max. (in still oil) | 2.5mW/°C (in still air)   |

(\*1) Compatible with crimp terminal and connector.

(\*2) Up to 150°C can be supported by changing the wire material.

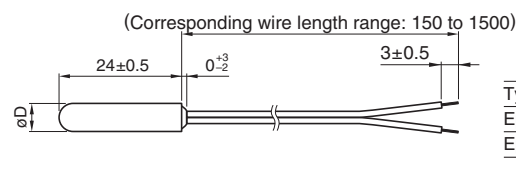
## CHARACTERISTICS SPECIFICATION

|                                    | Part No.                          | B constant B25/85 | Resistance R20 | Wire length dimension | Wire tip   |
|------------------------------------|-----------------------------------|-------------------|----------------|-----------------------|------------|
| Epoxy resin case type (ø5.5)       | <a href="#">NTCDP4AG103JCDBBA</a> | B25/85 : 4000K±2% | R25 : 10kΩ±5%  | 300±10mm              | Strip wire |
| Epoxy resin case fasten screw type | <a href="#">NTCDP4AG103HCFCBA</a> | B25/85 : 4000K±2% | R25 : 10kΩ±3%  | 400±10mm              | Strip wire |
| ABS resin case type (ø6.8)         | <a href="#">NTCDP3SG562HXBBAA</a> | B3/50 : 3850K±2%  | R3 : 5.6kΩ±3%  | 300±10mm              | Strip wire |

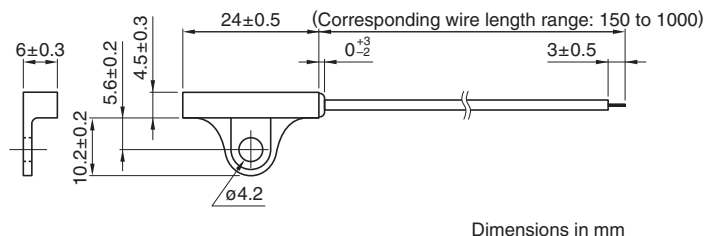
- Contact us for other nominal resistance values and B constants.
- Contact us for other wire length dimensions and tolerances. (Corresponding wire length range: 150 to 1500 mm (Epoxy resin case fasten screw type is 150 to 1000 mm))
- Contact us for other tip processing.

## SHAPE &amp; DIMENSIONS

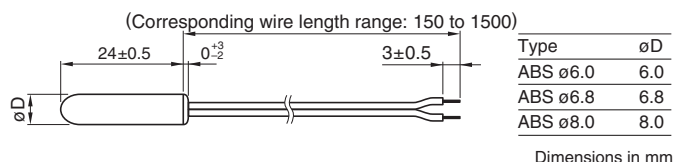
## Epoxy resin case type



## Epoxy resin case fasten screw type



## ABS resin case type



## REMINDER FOR USING

Be sure to request specification sheet before using.

## SAFETY WARNING

Pay careful attention to all warnings and operate only in accordance with safety specifications.  
Incorrect usage may lead to destroyed NTC thermistors and damages or malfunctions with the devices used.

### CAUTION

- Ensure to use thermistors under proper operating and mounting condition and only as specified in a product catalogue or final specification.
- This thermistor is designed for the intended purpose. Do not use for any other purposes.
- Use thermistors only within the specified operating temperature range.
- Use thermistors only within the specified power range.
- The specified dissipation factor of the thermistor must not be exceeded. Exceeding this limit may cause fire through temperature increase with the resistance change of the NTC thermistor.
- Alert consumers that the thermistor in the application must not be touched by bare hands directly.
- The thermistor should be stored in original packaging under the following environment : Temperature:  $-10^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$   
Relative humidity: less than 75%  
Avoid rapid temperature change, direct sunshine, corrosive gas, dust, mechanical stress or pressure.
- During design process, be sure to test the application reliability after the thermistor assembly to confirm there is no abnormality.
- Be sure to design safety circuit or prepare same functional sensor to prevent accident when the thermistor is used as sensor.
- Avoid to apply vibration, mechanical shock (drop), or pressure more than specified.
- Avoid to repeat bending the thermistor more than specified.
- Avoid to apply force more than specified.
- Avoid to bend strongly or make external force for outlet of the thermistor of the product is with terminal.
- Fix thermistor head side to bend or cut the lead wire.
- Contacts on lead wire surface should be clean without any stain and rust to avoid contact failure.
- Prepare following countermeasure to prevent the influence of noise.
  - Protection circuit
  - Shield of thermistor (include lead wire).
- Pay attention following items to install the thermistor to prevent malfunction caused by incorrect measurement of thermistor.
  - Prevent the influence of heating element or cooling device so that the thermistor element part
  - When detecting object surface, fix between thermistor and the object by high conductive
- Please take consideration an appropriate fail-safe function in customer application which requires a very high level of operational safety and reliability or could endanger society or human life. Please contact us before using the NTC thermistor assembled for the following application if those malfunction of failure might have serious damage to human life, health or one's property and severe influence on society. Application : cars, aerospace/aviation equipment, medical equipment, nuclear power plant equipment