

Thermistor Temperature Sensors

Type: **ERTW**
ERTS
ERTA



This is used as a temperature detector for temperature control or temperature indication of heating parts for automobiles and industrial equipment. Owing to its sealed construction and high vibration resistance, it has high precision in temperature detection. Various types are available in accordance with application.

■ Features

- Superiorly high precision in temperature detecting
- Highly reliable sealed construction
- High vibration resistance and easy installation

■ Recommended Applications

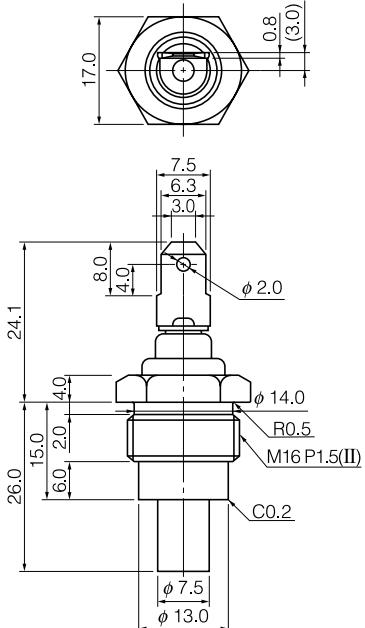
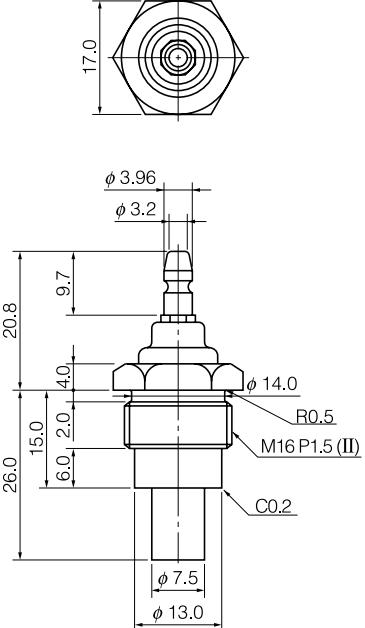
- Automobiles
- Boats
- Agricultural machines
- Boilers

■ Explanation of Part Numbers

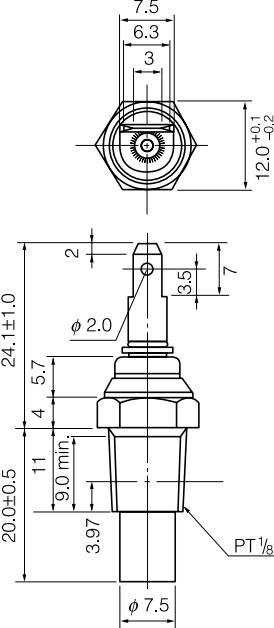
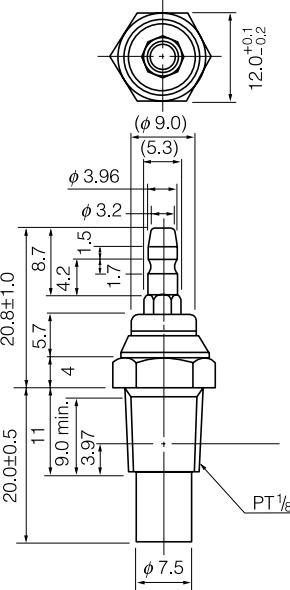
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----------|----------|----------|---|---|---|---|---|---|----|----|----|
| E | R | T | | | | | | | | | |

Product Code Product Type Shape/
Construction Terminal Resistance $R_{25} (\Omega)$ Option

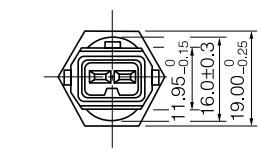
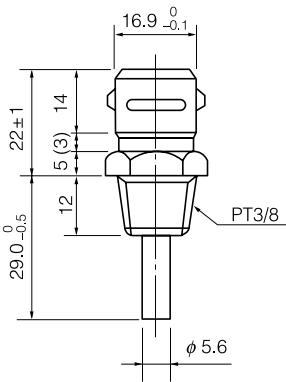
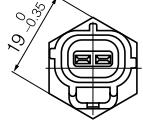
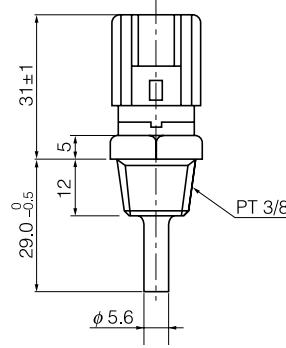
■ Ratings and Characteristics

| Item | Type | W208P Series | W208G Series | | | | | | | | | | | | |
|------------------------------------|----------------|--|--|----------------|----------|-------|-----------|----------|--|------------------|----------------|----------|-------|-----------|----------|
| | ERTW208P Type | ERTW208G Type | | | | | | | | | | | | | |
| Appearance | |  |  | | | | | | | | | | | | |
| Dimensions in mm (not to scale) | |  <p>Technical drawing showing dimensions for the ERTW208P Type thermistor. The drawing includes a top view of the housing with a diameter of 17.0 mm and a height of 0.8 mm (3.0 mm total). The side view shows a total height of 24.1 mm, a base height of 15.0 mm, and a neck height of 6.0 mm. The neck has a diameter of 14.0 mm, a shoulder height of 2.0 mm, and a shoulder diameter of 13.0 mm. The neck is labeled with a C0.2 clearance. The top part has a height of 8.0 mm, a shoulder height of 4.0 mm, and a shoulder diameter of 7.5 mm. The top view also shows a height of 3.0 mm and a shoulder diameter of 6.3 mm.</p> |  <p>Technical drawing showing dimensions for the ERTW208G Type thermistor. The drawing includes a top view of the housing with a diameter of 17.0 mm and a height of 0.8 mm (3.0 mm total). The side view shows a total height of 26.0 mm, a base height of 15.0 mm, and a neck height of 6.0 mm. The neck has a diameter of 14.0 mm, a shoulder height of 2.0 mm, and a shoulder diameter of 13.0 mm. The top part has a height of 9.7 mm, a shoulder height of 4.0 mm, and a shoulder diameter of 7.5 mm. The top view also shows a height of 3.0 mm and a shoulder diameter of 3.96 mm.</p> | | | | | | | | | | | | |
| Resistance | | <table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (Ω)</th> </tr> </thead> <tbody> <tr> <td>80.0±0.2</td> <td>118±6</td> </tr> <tr> <td>105.0±0.3</td> <td>42.0±2.5</td> </tr> </tbody> </table> | Temperature (°C) | Resistance (Ω) | 80.0±0.2 | 118±6 | 105.0±0.3 | 42.0±2.5 | <table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (Ω)</th> </tr> </thead> <tbody> <tr> <td>80.0±0.2</td> <td>118±6</td> </tr> <tr> <td>105.0±0.3</td> <td>42.0±2.5</td> </tr> </tbody> </table> | Temperature (°C) | Resistance (Ω) | 80.0±0.2 | 118±6 | 105.0±0.3 | 42.0±2.5 |
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| 105.0±0.3 | 42.0±2.5 | | | | | | | | | | | | | | |
| Heat Dissipation Constant | | 60 mW/°C | 60 mW/°C | | | | | | | | | | | | |
| Maximum Permissible Power | | 300 mW | 300 mW | | | | | | | | | | | | |
| Operating Temperature Range | | -30 to +130 °C | -30 to +130 °C | | | | | | | | | | | | |

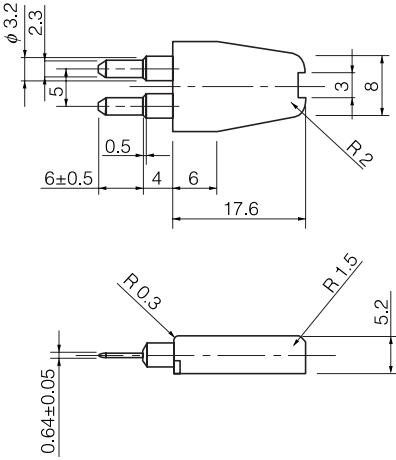
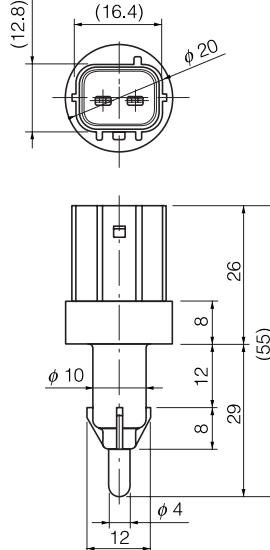
■ Ratings and Characteristics

| Item | Type | W101 Series | | | | | | | | | | | | |
|------------------------------------|---|---|---|----------------|------------------|-----------------|------------------|------------------|----------------|----------------|----------------|-----------------|----------------|--|
| | | ERTW101P Type | ERTW101G Type | | | | | | | | | | | |
| Appearance | |  |  | | | | | | | | | | | |
| Dimensions in mm (not to scale) | |  <p>ERTW101P Type Dimensions:</p> <ul style="list-style-type: none"> Overall height: 24.1 ± 1.0 mm Shaft diameter: $\phi 7.5$ mm Shaft length: 20.0 ± 0.5 mm Shaft shoulder diameter: $\phi 2.0$ mm Shaft shoulder height: 9.0 min. mm Shaft shoulder width: 3.97 mm Shaft shoulder thickness: 4 mm Shaft shoulder height: 11 mm Shaft shoulder width: 5.7 mm Shaft shoulder thickness: 4 mm Shaft shoulder height: 2 mm Shaft shoulder width: 3.5 mm Shaft shoulder thickness: 7 mm Shaft shoulder height: 12.0 ± 0.2 mm Shaft shoulder width: 6.3 mm Shaft shoulder thickness: 3 mm Shaft shoulder height: 7.5 mm Shaft shoulder width: 2 mm Shaft shoulder thickness: 1 mm |  <p>ERTW101G Type Dimensions:</p> <ul style="list-style-type: none"> Overall height: 20.8 ± 1.0 mm Shaft diameter: $\phi 7.5$ mm Shaft length: 20.0 ± 0.5 mm Shaft shoulder diameter: $\phi 9.0$ mm Shaft shoulder height: 9.0 min. mm Shaft shoulder width: 3.97 mm Shaft shoulder thickness: 4 mm Shaft shoulder height: 5.7 mm Shaft shoulder width: 4.2 mm Shaft shoulder thickness: 1.5 mm Shaft shoulder height: 8.7 mm Shaft shoulder width: 5.3 mm Shaft shoulder thickness: 1.7 mm Shaft shoulder height: 11 mm Shaft shoulder width: 3.2 mm Shaft shoulder thickness: 1.7 mm Shaft shoulder height: 3.97 mm Shaft shoulder width: 3.96 mm Shaft shoulder thickness: 1.7 mm Shaft shoulder height: 12.0 ± 0.2 mm Shaft shoulder width: 9.0 mm Shaft shoulder thickness: 1.7 mm | | | | | | | | | | | |
| Resistance | <p>ERTW101P801</p> <table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (Ω)</th> </tr> </thead> <tbody> <tr> <td>50.0 ± 0.2</td> <td>226.0 ± 33.6</td> </tr> <tr> <td>115.0 ± 0.3</td> <td>26.40 ± 1.71</td> </tr> </tbody> </table> <p>ERTW101G461</p> <table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (Ω)</th> </tr> </thead> <tbody> <tr> <td>80.0 ± 0.2</td> <td>51.9 ± 4.9</td> </tr> <tr> <td>100.0 ± 0.3</td> <td>27.4 ± 1.9</td> </tr> </tbody> </table> | Temperature (°C) | Resistance (Ω) | 50.0 ± 0.2 | 226.0 ± 33.6 | 115.0 ± 0.3 | 26.40 ± 1.71 | Temperature (°C) | Resistance (Ω) | 80.0 ± 0.2 | 51.9 ± 4.9 | 100.0 ± 0.3 | 27.4 ± 1.9 | |
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| Heat Dissipation Constant | 60 mW/°C | 60 mW/°C | | | | | | | | | | | | |
| Maximum Permissible Power | 300 mW | 300 mW | | | | | | | | | | | | |
| Operating Temperature Range | -30 to +130 °C | -30 to +130 °C | | | | | | | | | | | | |

■ Ratings and Characteristics

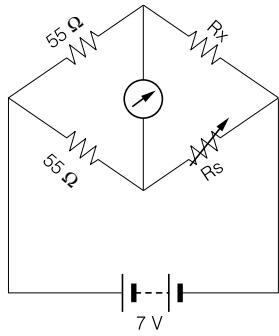
| Item | Type | S07 Series | S08 Series | | | | | | | | | | | | | | | | |
|------------------------------------|-----------------|---|--|-----------------|-----------|----------|----------|-----------|----------|-------------|---|------------------|-----------------|-----------|------------|----------|-----------|-----------|--------------|
| | ERTS07D202C | ERTS08D202B | | | | | | | | | | | | | | | | | |
| Appearance | |  |  | | | | | | | | | | | | | | | | |
| Dimensions in mm (not to scale) | |   |   | | | | | | | | | | | | | | | | |
| Resistance | | <table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (kΩ)</th> </tr> </thead> <tbody> <tr> <td>-20.0±0.2</td> <td>16.1±1.6</td> </tr> <tr> <td>20.0±0.2</td> <td>2.37±0.24</td> </tr> <tr> <td>80.0±0.2</td> <td>0.290±0.032</td> </tr> </tbody> </table> | Temperature (°C) | Resistance (kΩ) | -20.0±0.2 | 16.1±1.6 | 20.0±0.2 | 2.37±0.24 | 80.0±0.2 | 0.290±0.032 | <table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (kΩ)</th> </tr> </thead> <tbody> <tr> <td>-20.0±0.2</td> <td>15.48±1.35</td> </tr> <tr> <td>20.0±0.2</td> <td>2.45±0.14</td> </tr> <tr> <td>110.0±0.2</td> <td>0.1471±0.002</td> </tr> </tbody> </table> | Temperature (°C) | Resistance (kΩ) | -20.0±0.2 | 15.48±1.35 | 20.0±0.2 | 2.45±0.14 | 110.0±0.2 | 0.1471±0.002 |
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| 110.0±0.2 | 0.1471±0.002 | | | | | | | | | | | | | | | | | | |
| Heat Dissipation Constant | | — | — | | | | | | | | | | | | | | | | |
| Maximum Permissible Power | | 10 mW | 10 mW | | | | | | | | | | | | | | | | |
| Operating Temperature Range | | -30 to +120 °C | -30 to +120 °C | | | | | | | | | | | | | | | | |

■ Ratings and Characteristics

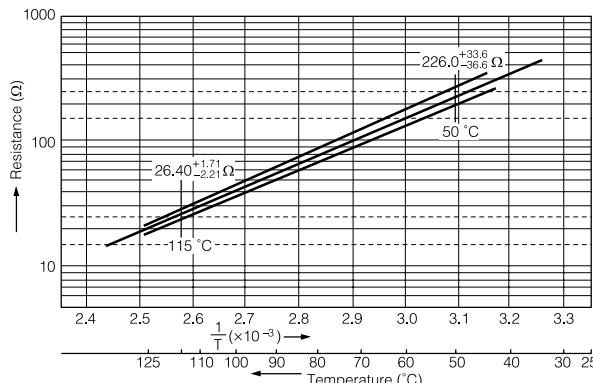
| Item | Type | A57 Series | A59 Series | | | | | | | | | | | | | | |
|------------------------------------|---|---|--|-----------------|----------|-----------|----------|---|--|------------------|-----------------|-----------|----------|----------|-----------|-----------|-------------|
| | ERTA57D202 | ERTA59D202 | | | | | | | | | | | | | | | |
| Appearance | |  |  | | | | | | | | | | | | | | |
| Dimensions in mm (not to scale) | |  |  | | | | | | | | | | | | | | |
| Resistance | | <table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (kΩ)</th> </tr> </thead> <tbody> <tr> <td>20.0±0.2</td> <td>2.5±0.075</td> </tr> <tr> <td>80.0±0.2</td> <td>0.325^{+0.023}_{-0.022}</td> </tr> </tbody> </table> | Temperature (°C) | Resistance (kΩ) | 20.0±0.2 | 2.5±0.075 | 80.0±0.2 | 0.325 ^{+0.023} _{-0.022} | <table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>Resistance (kΩ)</th> </tr> </thead> <tbody> <tr> <td>-20.0±0.2</td> <td>17.9±2.7</td> </tr> <tr> <td>40.0±0.2</td> <td>1.16±0.12</td> </tr> <tr> <td>100.0±0.2</td> <td>0.156±0.008</td> </tr> </tbody> </table> | Temperature (°C) | Resistance (kΩ) | -20.0±0.2 | 17.9±2.7 | 40.0±0.2 | 1.16±0.12 | 100.0±0.2 | 0.156±0.008 |
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| 100.0±0.2 | 0.156±0.008 | | | | | | | | | | | | | | | | |
| Heat Dissipation Constant | | — | — | | | | | | | | | | | | | | |
| Maximum Permissible Power | | 10 mW | 10 mW | | | | | | | | | | | | | | |
| Operating Temperature Range | | -30 to +150 °C | -30 to +120 °C | | | | | | | | | | | | | | |

■ Test Circuit Diagram and Resistance vs. Temperature

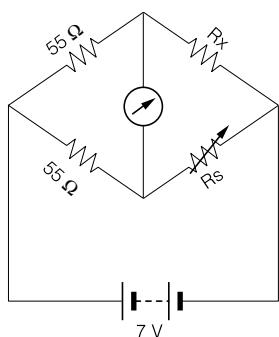
ERTW101P801



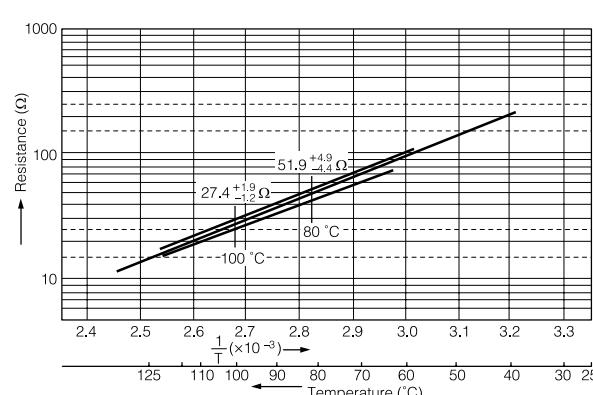
Test Circuit Diagram



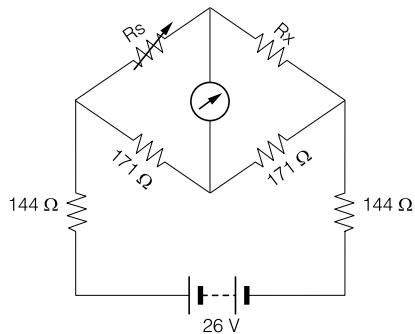
ERTW101G461



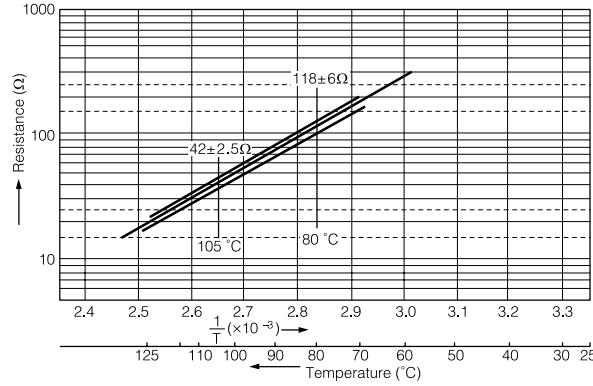
Test Circuit Diagram



ERTW208P(G)112



Test Circuit Diagram



■ Application Notes

- Operate the sensor under the specified maximum permissible electric power. Otherwise, it generates heat, which may cause malfunction and deterioration in the characteristics.
- Resistance values of the sensor shall be measured by the specified measuring circuit, described in the individual specification.
- Do not operate the sensor above the Operating Temperature Range.

- When attaching the sensor with a screw, do not touch the terminal area. Do not apply excessive torque and pressure when screwing, otherwise they will damage the product and malfunction.
- The sensor may be damaged or deteriorated when dropped or exposed to a large impact. Excessive shock and impact shall not be applied.