TR50 - Surface RTD Sensor

Features:

- The assembly can be supplied with or without a transmitter. Transmitters convert the resistance signal from the TR50 to a linear analogue or digital output (commonly 4–20 mA). This signal can then be monitored remotely or used to control the process.
- The assembly has electrical approvals for explosion proof applications in locations, rigorous protection and general purpose areas.
- Electrical authorities that have registered these approvals include CSA, FM, and ATEX/IEC.
- Note: CSA and FM approvals apply only when configured with a certified connection head.

Options:

- Lengths and diameters intended for customer specific applications
- Transmitter mounted electric actuator connection head
- Calibration, single point, multiple points, and to Calibration Lab
- Ducer coefficients
- Material traceability of the conductors, metal sheath and mineral insulation
- Selectable accuracy tolerance
- Special designs
- Explosion protection: CSA, FM (class II, division I, area 0)
- Intrinsically safe version: ATEX (Ex ia IId"T6)
- Non-exploding version: ATEX (Ex e IId)
- RTD transmitter matching

Wiring configuration:

- 2, 3, or 4 wire (single or dual)
- Class B to DIN EN 60073
- Class A to DIN EN 60074
- Less than class B

Classification tolerance:

- Class A to DIN EN 60074
- Class B to DIN EN 60073
- Less than class B

Electrical approvals:

- CSA, FM, ATEX/IEC
- CSA and FM approvals apply only when configured with a certified connection head.

Process connection:

- Sheet or worm drive hose
- Copper, or Nickel
- Matching

Measurement:

- Measuring range: -200 °C to +1000 °C
- Sensor Element: Pt100, Pt1000, Pt10, Cu10, or Ni120 sheet or worm drive hose
- ATEX (EEx-n)
- Intrinsically safe (EEx-i)
- Tolerances of the conductors, Dusen coefficients, termination accessories include cord grip, cable or wire clamps, and braze, interlocking flexible armour, braided stainless steel sheath and braze, or connection head complete with cord grip.
- Terminations include stripped leads, 3-pin plugs, Tegam/Keithley plugs, spade lugs, Lemosa plugs or 0.250 also 3 or 6 mm.
TR50 Surface RTD Sensor

TR50 series RTD sensors are designed to typically measure the surface temperature of pipes, tubing, plates, ducts, or vessel walls. Five styles of attachment are available including magnet, metal contact block, washer, weld-on sheet and worm drive hose clamp:

- **Magnet Style** - spring loaded for magnetic attachment to ferromagnetic materials. It is designed to maintain a positive contact on regular and irregular surfaces and provides fast and accurate temperature measurement.
- **Metal Contact Block** - primarily designed to be welded or screwed to the measurement surface. The junction is located inside the contact block and gives a degree of insulation resistance from the influence of ambient temperatures.
- **Washer Style** - designed to be mounted over a threaded shaft that has been welded to the measuring surface. It is held in place with a matching threaded stud that has been welded to the measuring surface. The junction is located inside the contact block when welded in place, offers repeatable temperature measurement.
- **Worm drive hose clamp** - non-welded attachment. Once the clamp is secured by pressure on the worm driven across there is a positive contact between the sensor and the measurement surface.

Due to ambient-humidity temperature influences, the accuracy of these sensors is primarily dependent upon the amount of insulation surrounding the RTD element. RTDs in this series can be supplied as a complete assembly including connection head (enclosure) with a terminal block or transmitter; or as a sensor only design.

### Applications:

1000 series sensors are suitable for:
- Chemical and petrochemical industries
- Energy and power plant technology
- Heating, ventilation, air-conditioning and refrigeration systems
- Oils and brokers
- Machine, plant and tank measurement
- Oil and gas industries
- Pipeline control
- Power and utilities
- Pulp and paper
- Turbines
- Water and wastewater treatment

### Connection Heads

<table>
<thead>
<tr>
<th>Imperial Grid 1” x 1”</th>
</tr>
</thead>
</table>

### Specifications

#### Sensor Design

- **Design**:
  - A: Ceramic terminal block
  - B: Ceramic terminal block
  - C: Ceramic terminal block
  - D: Metal contact block
  - E: Metal contact block
  - F: Metal contact block

#### Unit of Measure

- **Unit**:
  - A: Metric
  - B: Imperial

#### Electrical Approval

- **Code**:
  - A: EEx-i (ATEX) gas, acc. to directive 94/9/EC
  - B: EEx-n (ATEX) acc. to directive 94/9/EC
  - C: CSA Ex-proof Class 1 Division II
  - D: UL Approv. Code
  - E: Mexican Approv. Code

#### Lead Wire Insulation

- **Insulation**:
  - A: PVC
  - B: PVC, heat shrinkable
  - C: PVC, heat shrinkable
  - D: Silicone
  - E: Silicone, heat shrinkable

#### Lead Wire Material

- **Material**:
  - A: Copper 120, class B
  - B: Copper 10, class B
  - C: Nickel 120, class B
  - D: Pt100, accuracy less than class B
  - E: Pt100, class B

#### Terminal Block / Transmitter

- **Type**:
  - A: Ceramic terminal block
  - B: Ceramic terminal block

#### Terminal Accessory

- **Accessory**:
  - A: Compression adapter and weatherproof boot
  - B: Compression adapter and weatherproof boot
  - C: Cable clamp
  - D: BSZ-H (Aluminum)

#### Connection Head

- **Head**:
  - A: DIH10 (set to transmitter range)
  - B: DIH10 (set to transmitter range)

#### Temperature Range

- **Range**:
  - A: -200...+600 °C
  - B: -200...+450 °C
  - C: -200...+250 °C
  - D: -50...+450 °C
  - E: -50...+250 °C
  - F: -50...+1000 °C
  - G: -50...+850 °C

#### Certifications

- **Certification**:
  - A: CE
  - B: CE
  - C: CE

#### Additional Order Details

- **Details**:
  - A: Order code P for Process connection design (Field 1)
  - B: Order code O for Process connection design (Field 1)
  - C: Order code Q for Process connection design (Field 1)
  - D: Order code T for Process connection design (Field 1)

### Notes

- **Additional notes**:
  - A: Please specify (e.g. 84 mm = 0084)
  - B: Please specify (e.g. 9.5 inch = 00950)

---

**Part of Your Business**

Create your product part number by selecting the appropriate assembly items from each of the images above.
Resistance Temperature Detectors

TR50 - Surface RTD Sensor

Features:
- The assembly can be supplied with or without a transmitter. Transmitters convert the resistance signal from the RTD to a linear analogue or digital output (commonly 0 to 5 V, 4 to 20 mA). This signal makes process parameters easier to monitor, ensuring safety and improving process control.
- The assembly has electrical approvals for explosion proof (hazardous locations), intrinsic and general purpose sensors.
- Electrical authorities that have registered these approvals include CSA, FM, and ATEX/IEC.

Notes:
- CSA and FM approvals apply only when configured with a certified connection head together with flexible armour and cord grip.
- The assembly has electrical approvals for Class I, II, and III sites.
- CSA and FM approvals are based on temperature levels of 200°C or 300°C.
- The assembly has electrical approvals for the ATEX directive (Equipment). The assembly has electrical approvals for the ATEX directive (Instrument).

Options:
- Lengths and diameters are standard to suit customer-specific requirements.
- Transmitter mounted directly onto the sensor head.
- Calibration - single point/multi-point, and to C-tolerance tolerance (2% of span).
- Material traceability (current and historical) is available.
- Selectable accuracy.
- Minimum insulation thickness of 6 mm.
- Interchangeable connection heads are available for various applications, such as electrical, pneumatic, and hydraulic connections.
- ATEX and IECEx compliance for explosion protection.
- Non-sparking version: ATEX (EEx-i).

Note: CSA and FM approvals apply only when configured with a certified connection head together with flexible armour and cord grip.
TR50 Surface RTD Sensor

TR50 series RTD sensors are designed to typically measure the surface temperature of pipes, tubing, plates, ducts, or vessel walls.

Five styles of attachment are available including magnet, metal contact block, washer, weld-on stem and worm drive hose clamp:

- **Magnet Style** - spring loaded for magnetic attachment to ferrous materials. It is designed to maintain a positive contact on regular and irregular surfaces and provides fast and accurate temperature measurement.
- **Metal Contact Block** - primarily designed to be welded or screwed to the measurement surface. The junction is located inside the contact block and gives a degree of insulation resistance from the influence of ambient temperatures.
- **Washer Style** - designed to be mounted over a threaded stud that has been welded to the measuring surface. This design has the sensor construction of this sensor, when welded in place, welded to the pad and the pad is in turn welded to a 90 degree bend surface measurement. This design provides the sensor or enclosure with a degree of flexibility and a means of attachment for difficult to weld surfaces.

Applications:
- TR50 series sensors are suitable for:
  - Chemical and petrochemical industries
  - Energy and power plant technology
  - Heating, ventilation, air-conditioning and refrigeration systems
  - Oils and gas industries
  - Power and utilities
  - Pulp and paper
  - Tubing
  - Water and wastewater treatment

Due to ambient/radiant temperature influences, the accuracy of these sensors is primarily dependent upon the amount of insulation surrounding the RTD element.

RTDs in this series can be supplied as a complete assembly, including connection head, junction box with a terminal block or transmitter, or as a sensor only design.

Connection Heads

<table>
<thead>
<tr>
<th>Imperial Grid</th>
<th>” X ”</th>
<th>” Y ”</th>
<th>” Z ”</th>
<th>” A ”</th>
<th>” B ”</th>
<th>” C ”</th>
<th>” D ”</th>
</tr>
</thead>
</table>

- **Process connection design**
- **Process fitting material**
- **Growth factor**
- **Sensor design**
- **Unit of measure**
- **Electrical approach**

**Applications:**

1. Water and wastewater treatment
2. Pipeline control
3. Ovens and boilers
4. Energy and power plant technology

**Notes:**

- Some configurations are available. Your WIKA salesperson will notify you if you have made an incorrect selection.

**Part of Your Business**

TR50 Surface RTD Sensor creates a compact, yet flexible solution by selecting the appropriate assembly from one of the following categories. Enter the item code into the applicable box to generate the part number. Note: Some configurations are unavailable. Your WIKA salesperson will notify you if you have made an incorrect selection.

**Part numbers:**

- **BSS-H4000F**
- **BSZ-H**
- **BSBVA BSZ**

**Contact block / Transmitter**

<table>
<thead>
<tr>
<th>Conection type</th>
<th>Code</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Single 2-wire</td>
<td>2</td>
<td>Use only with code O for Process connection design (Field 1)</td>
</tr>
<tr>
<td>2 Single 3-wire</td>
<td>3</td>
<td>Use only with code Q for Process connection design (Field 1)</td>
</tr>
<tr>
<td>3 Contact lead</td>
<td>4</td>
<td>Use only with code U for Process connection design (Field 1)</td>
</tr>
<tr>
<td>4 Dual compression adapter</td>
<td>5</td>
<td>Use only with code Z for Process connection design (Field 1)</td>
</tr>
<tr>
<td>5 Electrical cord grip</td>
<td>6</td>
<td>Use only with code E for Process connection design (Field 1)</td>
</tr>
<tr>
<td>6 MI-cable conductor wire</td>
<td>7</td>
<td>Use only with code P for Process connection design (Field 1)</td>
</tr>
<tr>
<td>7 Individual Teflon® leads</td>
<td>8</td>
<td>Use only with code F for Process connection design (Field 1)</td>
</tr>
<tr>
<td>8 Teflon® jacket</td>
<td>9</td>
<td>Use only with code T for Process connection design (Field 1)</td>
</tr>
<tr>
<td>9 JIS cable</td>
<td>10</td>
<td>Use only with code J for Process connection design (Field 1)</td>
</tr>
<tr>
<td>10 Connectors (1980)</td>
<td>11</td>
<td>Use only with code D for Process connection design (Field 1)</td>
</tr>
<tr>
<td>11 BSS-H (Aluminum)</td>
<td>12</td>
<td>Use only with code A for Process connection design (Field 1)</td>
</tr>
<tr>
<td>12 BSS (Aluminum)</td>
<td>13</td>
<td>Use only with code B for Process connection design (Field 1)</td>
</tr>
<tr>
<td>13 BSS-H7000W4000F</td>
<td>14</td>
<td>Use only with code H for Process connection design (Field 1)</td>
</tr>
<tr>
<td>14 Metal Contact Block</td>
<td>15</td>
<td>Use only with code O for Process connection design (Field 1)</td>
</tr>
<tr>
<td>15 Cleaning Block</td>
<td>16</td>
<td>Use only with code E for Process connection design (Field 1)</td>
</tr>
</tbody>
</table>

**Connection head**

- **Process connection**
- **Process fitting material**
- **Growth factor**
- **Sensor design**
- **Unit of measure**
- **Electrical approach**

**Applications:**

1. Water and wastewater treatment
2. Pipeline control
3. Ovens and boilers
4. Energy and power plant technology

**Notes:**

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TR50 series RTD sensors are designed to typically measure the surface temperature of pipes, tubing, plates, ducts, or vessel walls.

Five styles of attachment are available including magnetic, metal contact block, washer, weld-on sheet and worm drive hose clamp.

- **Magnet Style** - spring loaded for magnetic attachment to Ferro Magnetic material.
- **Metal Contact Block** - primarily used in conjunction with a metal contact block, washer, weld-on sheet and worm drive surface temperature of pipe, tubing, plate, ducts, or vessel walls.
- **Worm drive hose clamp** offers repeatable temperature measurement.
- **Spring loaded for magnetic contact design (Field 1)**

**TR50**

**Applications:**
- 1000 series sensors are suitable for:
  - Chemical and petrochemical industries
  - Energy and power plant technology
  - Heating, ventilation, air-conditioning and refrigeration systems
  - Oil and gas industries
  - Pipeline control
  - Power and utilities
  - Pulp and paper
  - Turbines
  - Water and wastewater treatment

Connection Heads

Connection Heads

| Imperial Grid 1” x 1” |

| Part of Your Business |

**TR50-XX-X-X-XXXX-XXXXXX-XXX-94/9/EC**

**Applications**:

- **Pipeline control**
- **Machinery, plant and tank measurement**
- **Ovens and boilers**
- **Heating, ventilation, air-conditioning**
- **Energy and power plant technology**
- **Chemical and petrochemical industries**

<table>
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<th>Part of Your Business</th>
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<tr>
<td><strong>Sensor design</strong></td>
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<tr>
<td><strong>Electrical appraisal</strong></td>
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</tr>
<tr>
<td><strong>Lead wire insulation</strong></td>
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</tr>
<tr>
<td><strong>Terminal block / Transducer</strong></td>
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<tr>
<td><strong>Certification</strong></td>
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<td><strong>Note</strong></td>
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