

# Analogue temperature transmitter

## Model T91.10, head mounting version DIN form B

## Model T91.20, head mounting version form J

WIKA data sheet TE 91.01



for further approvals  
see page 4

### Applications

- Plant construction
- Power engineering
- Heating, air-conditioning, ventilation, refrigeration

### Special features

- Versions for Pt100 / Pt1000 or thermocouples
- Output 0 ... 10 V, 3-wire (T91.10) or 4 ... 20 mA, 2-wire (T91.20)
- Error signalling in the event of sensor break
- High accuracy
- Compact and value for money



Fig. left: Analogue temperature transmitter model T91.10  
Fig. right: Analogue temperature transmitter model T91.20

### Description

The analogue temperature transmitters of the T91 model series are matched to the specific requirements of industry. Depending on the output signal, they are particularly suitable for direct connection to evaluation instruments with voltage or current inputs such as PLC's or AD conversion cards in PC's.

The temperature transmitters convert the temperature-dependent change in resistance of resistance thermometers or the temperature-dependent voltage change in thermocouples into a 0 ... 10 V or 4 ... 20 mA output signal. With these standardised signals, the measured temperature values can be transmitted simply and safely.

The temperature transmitters of the T91 model series are fixed-range transmitters which are supplied with the required measuring ranges in line with the customer's requirements. A later fine adjustment of the zero point and the span can be made with potentiometers once fitted.

The T91.10 head-mounted transmitters can be located in any form B DIN connection head, while the T91.20 head-mounted transmitters also use form J connection heads.

## Specifications

| Specifications   | Model T91.10  |                                  |                               | Model T91.20  |                               |
|--|---|----------------------------------|-------------------------------|---|-------------------------------|
|  | 102   | 104                              | 424                           | 141   | 143                           |
| <b>Input</b>   | Thermocouples IEC 60751 K, J (L), T (U)   | Pt100/Pt1000 IEC 60751 2-/3-wire | Pt100/Pt1000 IEC 60751 2-wire | Thermocouples IEC 60751 K, J (L), T (U)                 | Pt100/Pt1000 IEC 60751 2-wire |
| <b>Minimum span</b>  | 200 K   | 20 K                             | 50 K                          | 200 K   | 20 K                          |
| <b>Maximum span</b>  | -   | 850 K                            | -                             | -   | 850 K                         |
| <b>Measuring ranges</b>  | On request ("Possible measuring ranges" see page 3)                                     |                                  |                               | On request ("Possible measuring ranges" see page 3)     |                               |
| <b>Measuring current</b>   | -   | 0.8 ... 1 mA <sup>1)</sup>       |                               | -   | 0.8 ... 1 mA <sup>1)</sup>    |
| <b>Setting range</b><br>■ Zero point potentiometer (Z)<br>■ Span potentiometer (S) | ±5 K<br>±5 K  |                                  |                               | ±5 K<br>±5 K  |                               |
| <b>Cold junction compensation</b>  | yes   | -                                | -                             | yes   | -                             |
| <b>Analogue output</b>   | 0 ... 10 V, short-circuit proof, 3-wire <sup>2)</sup>                                   |                                  |                               | 4 ... 20 mA, protected against reverse polarity, 2-wire |                               |
| <b>Linearisation</b>   | Linear to temperature per IEC 60751   |                                  |                               | Linear to voltage                                       |                               |
| <b>Measuring deviation</b>   | < 1 % FS  | < 0.1 % FS                       | < 1 % FS                      | < 1 % FS  | < 0.1 % FS                    |
| <b>Temperature coefficient</b><br>■ Zero point<br>■ Span                           | < 100 ppm/°C<br>< 100 ppm/°C  |                                  |                               | < 100 ppm/°C<br>< 100 ppm/°C                            |                               |
| <b>Error influence of the cold junction compensation</b>                           | < 0.5 °C  | -                                | -                             | < 0.5 °C  | -                             |
| <b>Rise time (response time)</b>   | < 0.1 s   |                                  |                               | < 0.1 s   |                               |
| <b>Signalling of sensor break</b>  | > 10 V  |                                  |                               | > 20 mA   |                               |
| <b>Sensor short circuit</b>  | Voltage value for ambient temperature   | 0 V                              |                               | Current value for ambient temperature                   | < 4 mA                        |
| <b>Minimal load resistance</b>   | 3 kΩ  |                                  |                               | 3 kΩ  |                               |
| <b>Maximum current supply</b>  | 10 mA   | 40 mA                            | 10 mA                         | -   |                               |
| <b>Power supply</b>  | DC 15 ... 35 V  |                                  |                               | DC 10 ... 35 V  |                               |
| <b>Input of power supply</b>   | Protected against reverse polarity  |                                  |                               | Protected against reverse polarity                      |                               |
| <b>Maximum permissible residual ripple</b>   | < 10 %  |                                  |                               | < 10 %  |                               |
| <b>Electromagnetic compatibility</b>   | EN 61326 emission (group 1, class B) and interference immunity (industrial application) |                                  |                               |   |                               |
| <b>Storage temperature</b>   | -25 ... +85 °C  |                                  |                               | -25 ... +85 °C  |                               |
| <b>Operating temperature</b>   | -25 ... +85 °C  |                                  |                               | -25 ... +85 °C  |                               |
| <b>Maximum permissible humidity</b>  | < 95 %  |                                  |                               | < 95 %  |                               |
| <b>Vibration</b>   | 5 g / 10 ... 200 Hz   |                                  |                               | 5 g / 10 ... 200 Hz                                     |                               |
| <b>Case material</b>   | Polycarbonate   |                                  |                               | Polycarbonate   |                               |
| <b>Potting material</b>  | Polyurethane  |                                  |                               | -   |                               |
| <b>Ingress protection</b><br>■ Case<br>■ Connection terminals                      | IP30 per IEC/EN 60529<br>IP10 per IEC/EN 60529  |                                  |                               | IP30 per IEC/EN 60529<br>IP10 per IEC/EN 60529          |                               |
| <b>Connection terminals</b>  | Screw terminals   |                                  |                               | Screw terminals   |                               |
| <b>Connection cross-section of terminals</b>                                       | 0.13 ... 1.5 mm <sup>2</sup>  |                                  |                               | 0.13 ... 0.75 mm <sup>2</sup>                           |                               |
| <b>Weight</b>  | approx. 30 g  |                                  |                               | approx. 10 g  |                               |
| <b>Dimensions</b>  | 44 x 26.5 mm (D x H)  |                                  |                               | 25 x 15 mm (D x H)                                      |                               |

1) Depending on sensor resistance

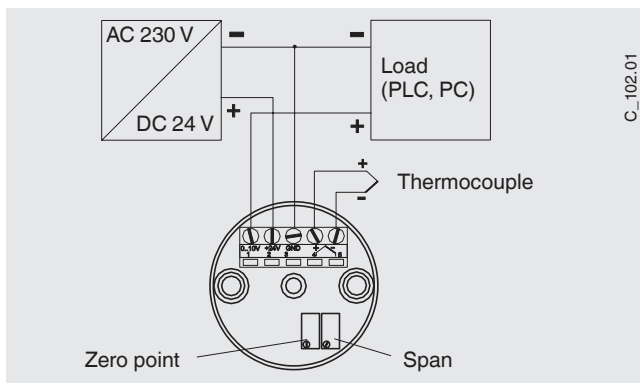
2) Output signal e.g. 0 ... 2.5 V, 0 ... 5 V or 1 ... 5 V on request

### Possible measuring ranges

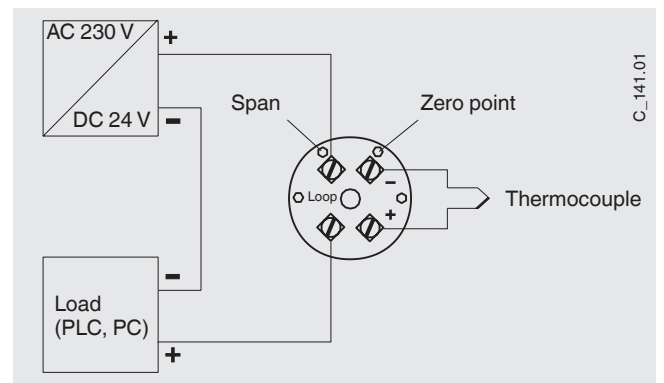
| Input     | Maximum range in °C |             | Span in K |         |
|-----------|---------------------|-------------|-----------|---------|
|           | Minimum beginning   | Maximum end | Minimum   | Maximum |
| Pt100     | -200 °C             | +850 °C     | 20 K      | 850 K   |
| Pt1000    | -200 °C             | +380 °C     | 20 K      | 400 K   |
| TC type T | -200 °C             | +400 °C     | 200 K     | 600 K   |
| TC type J | -100 °C             | +1,200 °C   | 200 K     | 1,300 K |
| TC type L | -200 °C             | +900 °C     | 200 K     | 1,100 K |
| TC type K | -200 °C             | +1,320 °C   | 200 K     | 1,520 K |
| TC type U | -200 °C             | +600 °C     | 200 K     | 600 K   |

### Designation of connection terminals

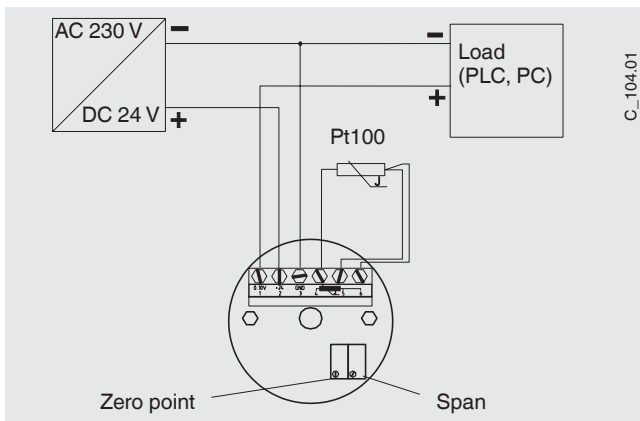
Model T91.10.102



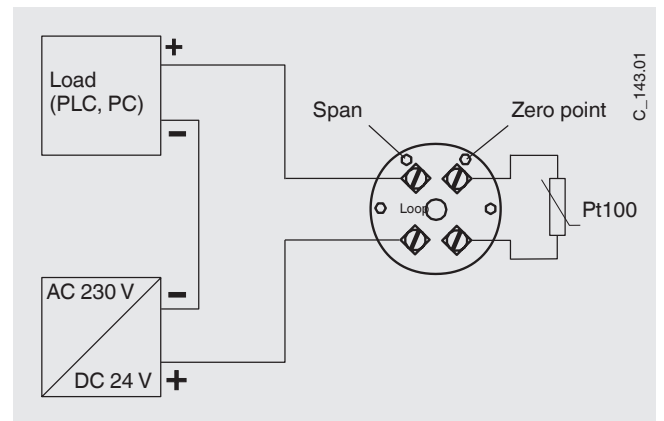
Model T91.20.141



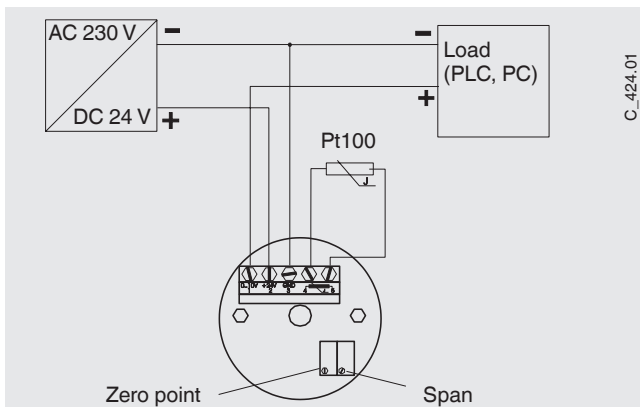
Model T91.10.104



Model T91.20.143

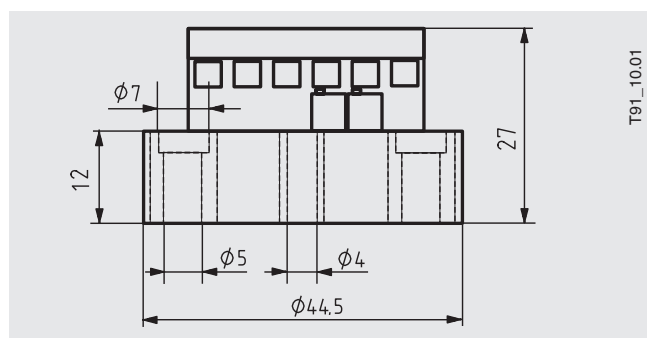


Model T91.10.424

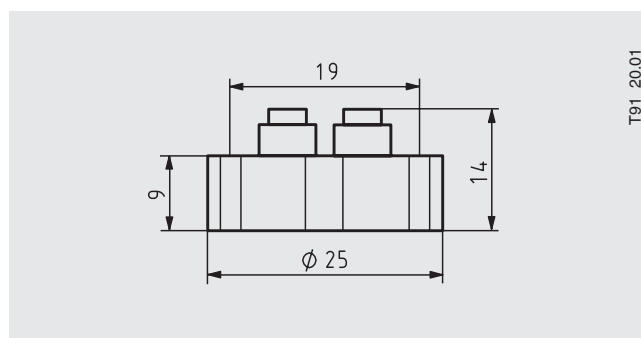


## Dimensions in mm

Models T91.10.102, T91.10.104, T91.10.424



Models T91.20.141, T91.20.143



## Accessories

| Model      | Version                   | Description   | Dimensions        | Order no. |
|------------|---------------------------|---|-------------------|-----------|
| Field case | Plastic (ABS)             | <ul style="list-style-type: none"> <li>■ For mounting of a head mounting transmitter</li> <li>■ Ingress protection: IP65</li> <li>■ Permissible ambient temperature range: -40 ... +80 °C</li> <li>■ With two cable glands M16 x 1.5</li> </ul> | 82 x 80 x 55 mm   | 3301732   |
| Adapter    | Plastic / stainless steel | Suitable for TS 35 per DIN EN 60715 (DIN EN 50022) or TS 32 per DIN EN 50035  | 60 x 20 x 41.6 mm | 3593789   |
| Adapter    | Steel, tin-plated         | Suitable for TS 35 per DIN EN 60715 (DIN EN 50022)  | 49 x 8 x 14 mm    | 3619851   |

## Approvals

| Logo | Description   | Country                     |
|------|---|-----------------------------|
|      | <b>EU declaration of conformity</b><br>EMC directive            | European Union              |
|      | <b>EAC (option)</b><br>Electromagnetic compatibility            | Eurasian Economic Community |
|      | <b>GOST (option)</b><br>Metrology, measurement technology       | Russia                      |
|      | <b>KazInMetr (option)</b><br>Metrology, measurement technology  | Kazakhstan                  |
| -    | <b>MTSCHS (option)</b><br>Permission for commissioning          | Kazakhstan                  |
|      | <b>BelGIM (option)</b><br>Metrology, measurement technology     | Belarus                     |
|      | <b>Uzstandard (option)</b><br>Metrology, measurement technology | Uzbekistan                  |

## Certificates (option)

- 2.2 test report
- 3.1 inspection certificate

Approvals and certificates, see website

## Ordering information

Model / Design / Input / Output signal / Measuring range / Options

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