

Analogue Temperature Transmitters

Model T91.10, Fixed Measuring Range, Head Mounting DIN Form B

Model T91.20, Fixed Measuring Range, Head Mounting Form J

WIKA Data Sheet TE 91.01

Applications

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

Special Features

- Designs for Pt100 / Pt1000 or thermocouples
- Output 0 ... 10 V, 3-wire design (T91.10) resp. 4 ... 20 mA, 2-wire design (T91.20)
- Fault signal for sensor burnout
- High accuracy
- Compact and cost-effective



Fig. left: Analogue Temperature Transmitter Model T91.10
Fig. right: Analogue Temperature Transmitter Model T91.20

Description

The analogue temperature transmitters of the T91 family are geared to the special requirements of industrial applications. Depending on their output signal they are ideally suited for direct connection to processors such as PLCs or PC-A/D converters with voltage or current inputs.

The transmitters convert the temperature-dependent change in resistance (for resistance thermometers) or the temperature-dependent change in voltage (for thermocouples) into a 0 ... 10 V or 4 ... 20 mA output signal. These standard signals allow an easy and reliable transmission of temperature measurement values.

These temperature transmitters are characterised by fixed measuring ranges configured according to customer specifications, combined with zero and span potentiometers, which enable the fine adjustment of small corrections on site. Industry-compliant accuracy, interference resistance and sensor monitoring are further features of these compact signal converters.

The T91.10 head mounting transmitters can be mounted inside any DIN Form B connection head. In addition the T91.20 head mounting version is also suitable for Form J connection heads.

Specifications	Model T91.10			Model T91.20	
	102	104	424	141	143
Sensors/Input					
Input	Thermocouples DIN EN 60 584 K, J (L), T (U)	Pt100/Pt1000 DIN EN 60 751 2- / 3-wire	Pt100/Pt1000 DIN EN 60 751 2-wire	Thermocouples DIN EN 60 584 K, J (L), T (U)	Pt100/Pt1000 DIN EN 60 751 2-wire
Minimum span	200 K	20 K	50 K	200 K	20 K
Maximum span	-	850 K		-	850 K
Standard measuring ranges	see page 4			see page 4	
Sensor current	-	0.8 ... 1 mA ¹⁾		-	0.8 ... 1 mA ¹⁾
Adjustable range					
■ Zero potentiometer (Z)	±5 K			±5 K	
■ Span potentiometer (S)	±5 K			±5 K	
Cold-junction compensation	yes	-		yes	-
Analogue output					
Linearisation	0 ... 10 V, short-circuit-proof, 3-wire design ²⁾			4 ... 20 mA, reverse polarity safe, 2-wire design	
Linearisation	Linear to temperature per DIN EN 60 751			Linear to voltage	
Accuracy	< 1 % FS	< 0.1 % FS	< 1 % FS	< 1 % FS	< 0.1 % FS
Temperature coefficient					
■ Zero	< 100 ppm/°C			< 100 ppm/°C	
■ Span	< 100 ppm/°C			< 100 ppm/°C	
Error effect of cold-junction compensation	< 0.5 °C	-		< 0.5 °C	-
Rise time (response time)	< 0.1 s			< 0.1 s	
Signalling sensor burnout	> 10 V			> 20 mA	
Sensor short circuit	Voltage value for ambient temperature	0 V		Current value for ambient temperature	< 4 mA
Minimum load resistance	3 kOhm			3 kOhm	
Maximum current consumption	10 mA	40 mA	10 mA	-	
Power supply					
Input power supply	15 ... 35 VDC			10 ... 35 VDC	
Input power supply	Protected against reverse polarity			Protected against reverse polarity	
Maximum permissible ripple	< 10 %			< 10 %	
Electromagnetic compatibility	2004/108/EC, EN 61 326 Emission (Group 1, Class B) and Immunity (industrial locations)				
Storage temperature	-25 ... +85 °C			-25 ... +85 °C	
Operating temperature	-25 ... +85 °C			-25 ... +85 °C	
Maximum permissible humidity	< 95 %			< 95 %	
Vibration	5 g / 10 ... 200 Hz			5 g / 10 ... 200 Hz	
Case					
Case material	Polycarbonate			Polycarbonate	
Sealing compound material	Polyurethane			-	
Ingress protection					
■ Case	IP 30 IEC 529 / DIN EN 60 529			IP 30 IEC 529 / DIN EN 60 529	
■ Terminal	IP 10 IEC 529 / DIN EN 60 529			IP 10 IEC 529 / DIN EN 60 529	
Terminals	Screw terminals			Screw terminals	
Cross section of terminal connectors	0.13 ... 1.5 mm ²			0.13 ... 0.75 mm ²	
Weight	approx. 30 g			approx. 10 g	
Dimensions	44 x 26.5 mm (D x H)			25 x 15 mm (D x H)	

1) Depending on the sensor resistance

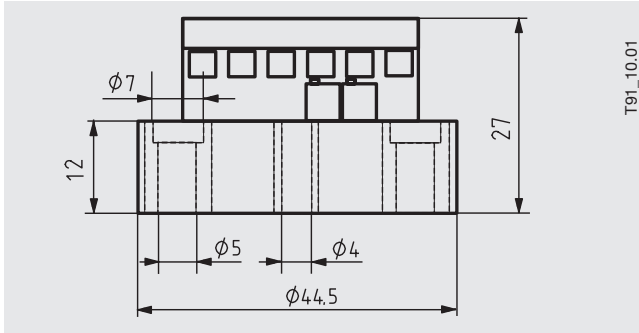
2) Output signal e.g. 0 ... 2.5 V, 0 ... 5 V or 1 ... 5 V on request

Possible measuring ranges

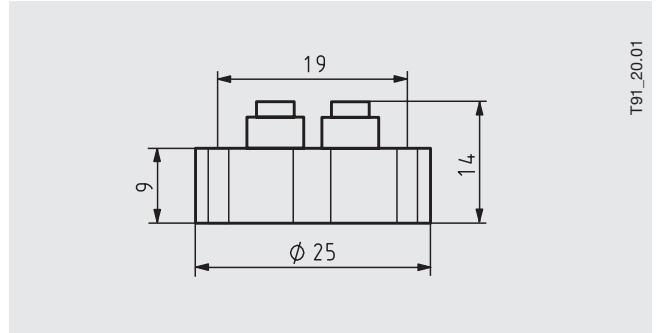
Input	Maximum range in Celsius		Span in Kelvin	
	Minimum (lower limit)	Maximum (upper limit)	Minimum	Maximum
Pt100	-200 °C	+850 °C	20 K	850 K
Pt1000	-200 °C	+380 °C	20 K	400 K
TC Type T	-200 °C	+400 °C	200 K	600 K
TC Type J	-100 °C	+1200 °C	200 K	1300 K
TC Type L	-200 °C	+900 °C	200 K	1100 K
TC Type K	-200 °C	+1320 °C	200 K	1520 K
TC Type U	-200 °C	+600 °C	200 K	600 K

Dimensions in mm

Model T91.10.102 / T91.10.104 / T91.10.424

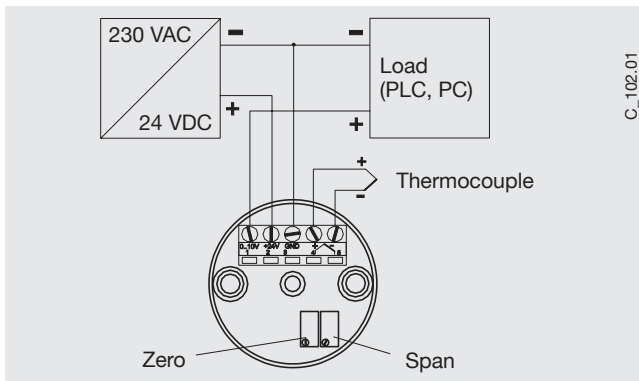


Model T91.20.141 / T91.20.143

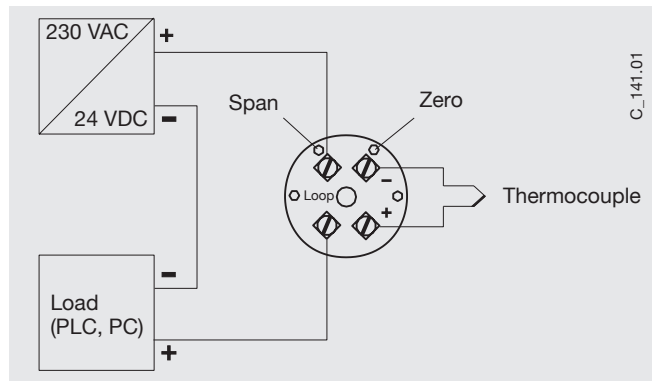


Designation of terminal connectors

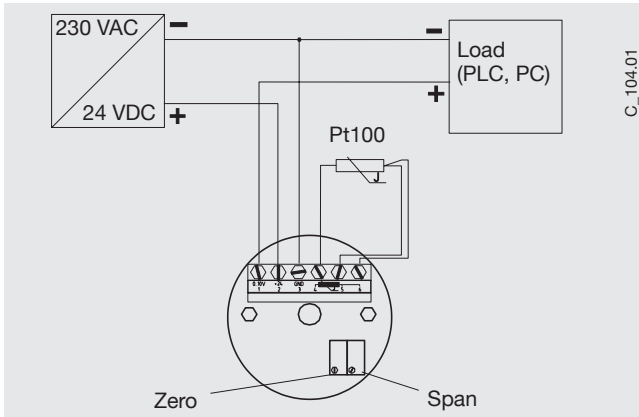
Model T91.10.102



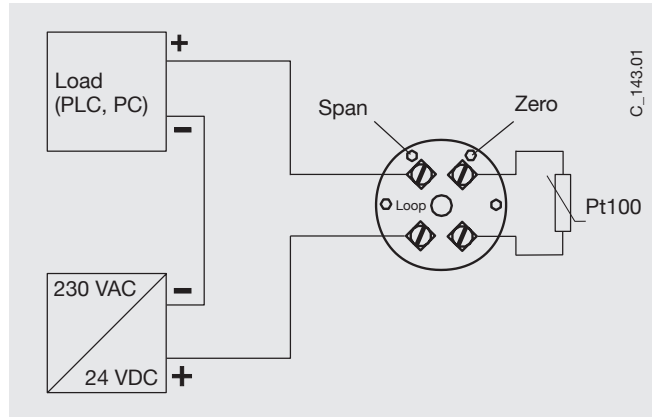
Model T91.20.141



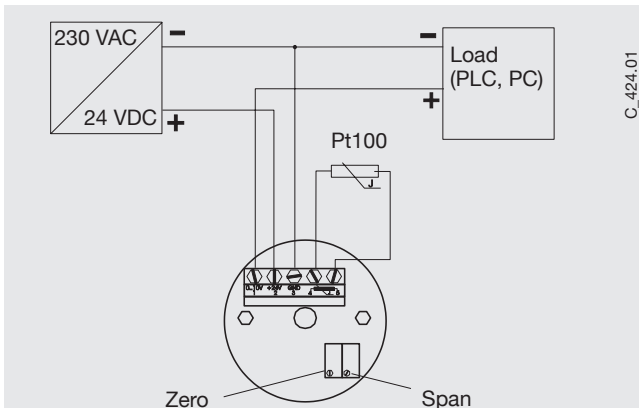
Model T91.10.104



Model T91.20.143



Model T91.10.424



Accessories (please order separately)	Order No.
Field case, plastic (ABS), IP 65, for mounting of a head mounting transmitter, permissible ambient temperature range: -40 °C ... +80 °C, 82 x 80 x 55 mm (BxLxH), with two cable glands M16 x 1.5	3301732
Mounting kit for mounting on a measuring insert	3168281
Mounting kit for mounting in the top of a connection head	3187633
Adapter for mounting on a DIN rail, plastic/stainless steel	3593789
Adapter for mounting on a DIN rail, steel tin galvanised	3619851

Ordering information for Temperature Transmitter

Model T91.10 (B-head)

Field No.	Code	Features	
		Operating range	
	102	Thermocouple	
	104	Pt100; 2- / 3-wire; accuracy 0.1 %	
1	424	Pt100; 2-wire; accuracy 1 %	
		Input	
	1P	Resistance thermometer Pt100	
	1T	Resistance thermometer Pt1000	
	3J	Thermocouple type J (Fe-CuNi)	
	3K	Thermocouple type K (NiCr-Ni)	
	3L	Thermocouple type L (Fe-CuNi)	
	3T	Thermocouple type T (Cu-CuNi)	
2	3U	Thermocouple type U (Cu-CuNi)	
		Output signal	
3	F	0 ... 10 V, 3-wire design	
		Measuring range	
	CND	-200 °C ... +100 °C	
	CEL	-50 °C ... +200 °C	
	CEQ	-50 °C ... +400 °C	
	CEA	-50 °C ... +50 °C standard (Pt100)	
	CCB	-30 °C ... +50 °C	
	CCC	-30 °C ... +60 °C	
	CCD	-30 °C ... +70 °C	
	C1A	0 °C ... +50 °C	
	C1H	0 °C ... +150 °C standard Pt100	
	C1L	0 °C ... +200 °C	
	C1M	0 °C ... +250 °C	
	C1N	0 °C ... +300 °C standard (Pt100)	
	C1P	0 °C ... +350 °C standard (thermocouple)	
	C1Q	0 °C ... +400 °C	
	C1S	0 °C ... +500 °C	
	C1U	0 °C ... +600 °C standard (thermocouple)	
	C1W	0 °C ... +700 °C	
4	???	others	
		Additional order information	
	YES	NO	
5	T	Z	Additional text

Model T91.20 (J-head)

Field No.	Code	Features	
		Operating range	
	141	Thermocouple	
1	143	Pt100; 2-wire	
		Input	
	1P	Resistance thermometer Pt100	
	1T	Resistance thermometer Pt1000	
	3J	Thermocouple type J (Fe-CuNi)	
	3K	Thermocouple type K (NiCr-Ni)	
	3L	Thermocouple type L (Fe-CuNi)	
	3T	Thermocouple type T (Cu-CuNi)	
2	3U	Thermocouple type U (Cu-CuNi)	
		Output signal	
3	A	4 ... 20 mA, 2-wire design	
		Measuring range	
	CND	-200 °C ... +100 °C	
	CEL	-50 °C ... +200 °C	
	CEQ	-50 °C ... +400 °C	
	CEA	-50 °C ... +50 °C standard (Pt100)	
	CCB	-30 °C ... +50 °C	
	CCC	-30 °C ... +60 °C	
	CCD	-30 °C ... +70 °C	
	C1A	0 °C ... +50 °C	
	C1H	0 °C ... +150 °C standard Pt100	
	C1L	0 °C ... +200 °C	
	C1M	0 °C ... +250 °C	
	C1N	0 °C ... +300 °C standard (Pt100)	
	C1P	0 °C ... +350 °C standard (thermocouple)	
	C1Q	0 °C ... +400 °C	
	C1S	0 °C ... +500 °C	
	C1U	0 °C ... +600 °C standard (thermocouple)	
	C1W	0 °C ... +700 °C	
	C11	0 °C ... +1000 °C	
4	???	others	
		Additional order information	
	YES	NO	
5	T	Z	Additional text

Order code:

T91.10.	1	2	3	4	5
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Order code:

T91.20.	1	2	3	4	5
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Additional text: _____

Additional text: _____

Modifications may take place and materials specified may be replaced by others without prior notice. Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing.



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