

Analogue Temperature Transmitter

Configurable Ranges, Head Mounting

for Pt 100 Resistance Thermometers for Thermocouples Model T19

Electronic Temperature Measurement

Applications

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

Features

- Input
 - for Pt 100
 - for thermocouples
- Configurable ranges
- Output 4 ... 20 mA, 2 wire design
- Fault signal for sensor burnout and sensor short circuiting
- Large ambient temperature range
- Compact and reasonably priced
- 5 years guarantee



General features

The transmitters in the T19 series are provided with configurable ranges. One of several available measuring ranges can be selected simply by setting solder bridges. Therefore, these transmitters are especially suitable for applications where frequently changing requirements have to be taken into account.

These temperature transmitters serve to convert temperature-dependent changes in resistance in the case of resistance thermometers or temperature-dependent changes in voltage in the case of thermocouples into a 4...20 mA-loop signal. This method guarantees an easy and reliable transmission of the temperature values measured.

Accuracy, sensor monitoring and the permissible ambient conditions are matched to the requirements of industrial applications. A guarantee of 5 years on the function of these transmitters gives evidence of the high reliability of these instruments.

The case is designed as a head-mounted transmitter for direct installation into the temperature probe and can be mounted into any DIN connection head of form B with no problem.

Specification

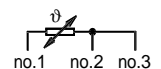
		Model T19			
Input		Pt 100 DIN IEC 751 2- or 3-lead		thermocouples DIN IEC 584	
possible measuring ranges, configurable		measuring ranges small from - 50 °C up to +200 °C	measuring ranges large from - 50 °C up to +400 °C	measuring ranges for HVAC from - 30 °C up to + 120 °C	type T, J, K, S dependent upon type of thermocouple, see last page from - 100 °C up to + 1500 °C
selection of measuring range		via solder bridges			
standard measuring ranges		see last page			
special measuring ranges		on request (special measuring ranges cannot be reconfigured)			
adjustment range					
zero potentiometer (Z)		approx. ± 10 °C	approx. ± 25 °C	approx. ± 30 °C	approx. ± 40 °C
span potentiometer (SP)		approx. 10 %			
sensor current		approx. 0.8 mA			—
cold junction compensation		—			yes
input connection leads					
effect		± 0.2 K / 10 Ω ¹⁾			± 0.2 K / 10 Ω
permissible load resistance		30 Ω each lead, 3-lead symmetric			500 Ω total resistance
Analogue output		4 ... 20 mA 2 wire design			
linearization		proportional to temperature per DIN IEC 751		proportional to voltage	
measuring deviation per DIN IEC 770		± 0.5 % ²⁾			
linearity error		± 0.1 % ³⁾			—
amplification error		—			± 0.1 %
temperature coefficient T_C	zero span	± 0.1 % / 10 K _{Tamb} or ⁴⁾ ± 0.2 K / 10 K _{Tamb}		± 0.1 % / 10 K _{Tamb} or ⁴⁾ ± 25 µV / 10 K _{Tamb}	
error effect of cold junction compensation		—			0.2 % / 10 K _{Tamb}
rising time t_{90}		< 1 ms			
switch-on delay, electric		< 10 ms			
signalling with sensor burnout		down scale, < 3 mA ⁵⁾		up scale, > 23.5 mA	
with sensor short circuit		down scale, < 3 mA ⁶⁾		—	
load R_A		$R_A \leq (U_B - 10 V) / 0.02 A$ with R_A in Ω and U_B in V			
load effect		± 0.05 % / 100 Ω			
power supply effect		± 0.025 % / V			
Power supply U_B		DC 10 ... 30 V by 4 ... 20 mA-loop			
input power supply protection		reverse polarity			
Electromagnetic compatibility (EMC)		CE - Conformity per EN 50082-2 (March 95)			
Special features					
ambient and storage temperature		-40 ... +85 °C			
climate application class		GPF DIN 40040			
maximum permissible humidity		95 % relative humidity, noncondensing DIN IEC 68-2-30 Var. 2			
vibration		10 ... 2000 Hz 5 g DIN IEC 68-2-6			
shock		DIN IEC 68-2-27 $g_N = 15$			
guarantee		5 years for performance			
Case		head mounting design			
material		polyamide, glass fibre reinforced			
degree of protection	case	IP 50 IEC 529 / EN 60 529			
	terminal con.	IP 00 IEC 529 / EN 60 529			
cross section of terminal connectors		0.14 ... 1.5 mm ²			
weight		approx. 0.03 kg			
dimensions		see drawings			

Specifications in % refers to the measuring span

R_A load
 T_{amb} ambient temperature
 T_C temperature coefficient
 U_B loop power supply voltage, see power supply

- 1) for Pt 100 in 3-lead connection, for Pt 100 in 2-lead connection lead resistance counts fully towards error
- 2) with factory configured measuring range, value is valid at ambient temperature 23 °C ± 5 K
- 3) ± 0.15% with measuring range 0...50°C, 0...300°C, 0...350°C
- 4) whichever is greater
- 5) up scale, in case only lead no. 1 open
- 6) temperature value, in case of short between leads no. 2 and no. 3 (operation of Pt 100 in 2-lead connection)

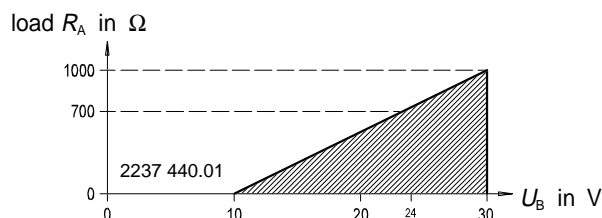
legend of lead number:



1375 890

Load diagram

The permissible load is dependent upon the loop power supply voltage.



Transmitter configuration

- ① Remove case bottom
- ② Set solder bridges for desired measuring range in accordance with the tables
- ③ Snapfit bottom to the case again
- ④ Adjust zero and span by means of potentiometer

Pt 100 measuring ranges small	
measuring range	bridge
- 50 ... + 50 °C	1 ● ● 2 5 0 ● 6 3 ● 0 4 7 0 ● 8
0 ... 50 °C	1 ● ● 2 5 0 0 6 3 ● ● 4 7 0 ● 8
0 ... 100 °C	1 ● ● 2 5 0 0 6 3 ● 0 4 7 0 ● 8
0 ... 120 °C	1 ● ● 2 5 0 0 6 3 0 0 4 7 0 ● 8
0 ... 150 °C	1 ● 0 2 5 0 0 6 3 0 0 4 7 ● ● 8
0 ... 200 °C	1 0 0 2 5 0 0 6 3 0 0 4 7 ● ● 8

Pt 100 measuring ranges large	
measuring range	bridge
- 50 ... + 200 °C	1 ● ● 2 5 ● ● 6 3 ● 0 4 7 ● ● 8
0 ... 200 °C	1 ● ● 2 5 0 0 6 3 ● ● 4 7 0 ● 8
0 ... 250 °C	1 ● ● 2 5 0 0 6 3 ● 0 4 7 0 ● 8
0 ... 300 °C	1 ● ● 2 5 0 0 6 3 0 0 4 7 0 ● 8
0 ... 350 °C	1 ● 0 2 5 0 0 6 3 0 0 4 7 0 ● 8
0 ... 400 °C	1 0 0 2 5 0 0 6 3 0 0 4 7 ● ● 8

Pt 100 measuring ranges for HVAC	
measuring range	bridge
- 30 ... + 30 °C	1 ● ● 2 5 ● ● 6 3 ● 0 4 7 ● ● 8
- 30 ... + 50 °C	1 ● ● 2 5 0 ● 6 3 0 0 4 7 ● ● 8
0 ... 60 °C	1 ● ● 2 5 0 0 6 3 ● 0 4 7 ● ● 8
0 ... 80 °C	1 ● ● 2 5 0 0 6 3 0 0 4 7 ● ● 8
0 ... 100 °C	1 ● 0 2 5 0 0 6 3 0 0 4 7 0 ● 8
0 ... 120 °C	1 0 0 2 5 0 0 6 3 0 0 4 7 ● ● 8

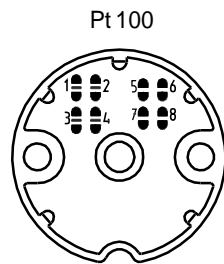
Thermocouple type T	
measuring range	bridge
- 100 ... + 200 °C	1 ● 0 0 3
- 100 ... + 300 °C	1 0 0 0 3
0 ... 400 °C	1 0 0 ● 3

Thermocouple type J	
measuring range	bridge
0 ... 350 °C	1 ● ● 0 3
0 ... 550 °C	1 ● 0 0 3
0 ... 700 °C	1 0 0 0 3

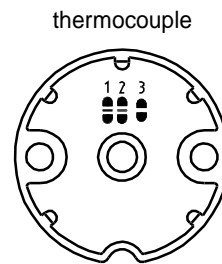
Thermocouple type K	
measuring range	bridge
0 ... 300 °C	1 ● ● 0 3
0 ... 600 °C	1 ● 0 0 3
0 ... 1200 °C	1 0 0 0 3

Thermocouple type S	
measuring range	bridge
0 ... 1500 °C	1 0 0 0 3

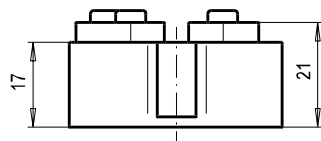
Bridge positions



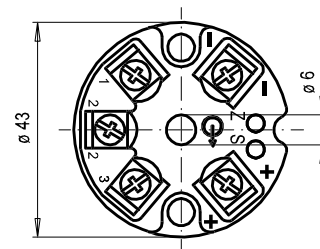
2225 328.01



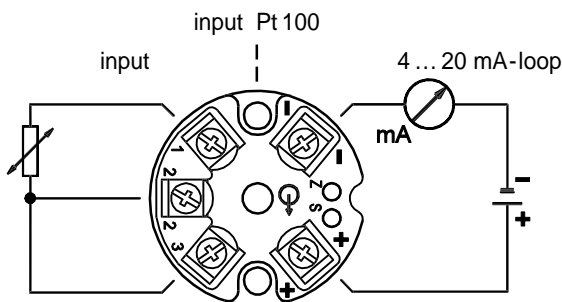
Dimensions in mm



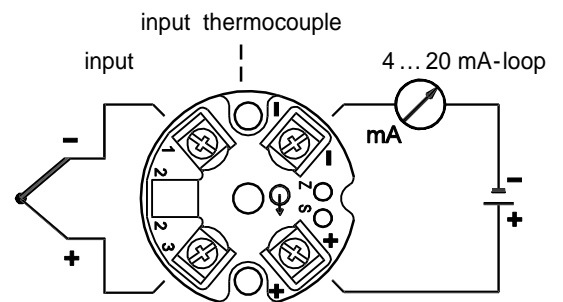
2226 120.01



Designation of terminal connectors



2225 352.01



Order code for temperature transmitter Model T19

Field No.	Code	Instrument design
		Input
	1P	resistance thermometer Pt 100
	3T	thermocouple type T (Cu-CuNi)
	3J	thermocouple type J (Fe-CuNi)
	3K	thermocouple type K (NiCr-Ni)
	3S	thermocouple type S (PtRh-Pt)
1	<input type="text"/>	?? other
		Application
	1	Pt 100 measuring ranges small up to 200 °C (configurable through solder bridges)
	2	Pt 100 measuring ranges large up to 200 °C (configurable through solder bridges)
	3	Pt 100 measuring ranges for HVAC up to 120 °C (configurable through solder bridges)
	4	thermocouple measuring ranges (configurable through solder bridges)
2	<input type="text"/>	9 special measuring ranges (not reconfigurable)
		Measuring range
	NK	not configured
		configured (standard measuring range) <i>codes see below</i>
3	<input type="text"/>	?? configured (special measuring range) <i>please state as additional text</i>
		Additional order details
	YES	NO
4	<input type="text"/>	T Z additional text <i>Please state in clearly understandable text !</i>

Order code for Model T19

T19.10	-	<input type="text"/>	0	-	<input type="text"/>	<input type="text"/>	-	<input type="text"/>
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Additional text: _____

Mounting accessory <i>(please order separately)</i>	Order No.
mounting kit for mounting on a measuring insert	31 68281
mounting kit for mounting in the top of a connection head	31 87633
adapter for mounting on a DIN rail, plastic	35 93789
adapter for mounting on a DIN rail, metal	36 19851

Codes of the configurable standard measuring ranges, special measuring ranges and other thermocouples on request

Pt 100 meas. ranges small Model T19.10.1P0-1	
Measuring range	Code
- 50 ... + 50 °C	EA
0 ... 50 °C	1A
0 ... 100 °C	1E
0 ... 120 °C	1F
0 ... 150 °C	1H
0 ... 200 °C	1L

Pt 100 meas. ranges large Model T19.10.1P0-2	
Measuring range	Code
- 50 ... + 200 °C	EL
0 ... 200 °C	1L
0 ... 250 °C	1M
0 ... 300 °C	1N
0 ... 350 °C	1P
0 ... 400 °C	1Q

Pt 100 meas. ranges for HVAC Model T19.10.1P0-3	
Measuring range	Code
- 30 ... + 30 °C	CA
- 30 ... + 50 °C	CB
0 ... 60 °C	1C
0 ... 80 °C	1D
0 ... 100 °C	1E
0 ... 120 °C	1F

Thermocouple type T Model T19.10.3T0-4	
Measuring range	Code
- 100 ... + 200 °C	KA
- 100 ... + 300 °C	KB
0 ... 400 °C	1Q

Thermocouple type J Model T19.10.3J0-4	
Measuring range	Code
0 ... 350 °C	1P
0 ... 550 °C	1T
0 ... 700 °C	1W

Thermocouple type K Model T19.10.3K0-4	
Measuring range	Code
0 ... 300 °C	1N
0 ... 600 °C	1U
0 ... 1200 °C	12

Thermocouple type S Model T19.10.3S0-4	
Measuring range	Code
0 ... 1500 °C	15



INGENIEROS ASOCIADOS DE CONTROL S.L.

Tel.: 913831390
comercial@iac-sl.es