

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.



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Specification

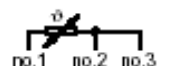
Specification			Model T19		
Input			Pt 100 DIN IEC 751	2- or 3-lead	thermocouples DIN IEC 584
possible measuring ranges, configurable			measuring ranges small from - 50 °C up to +200 °C	measuring ranges large from - 50 °C up to +400 °C	measuring ranges for HVAC from - 30 °C up to + 120 °C
selection of 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
span potentiometer (SP)			approx. ± 40 °C		
sensor current			approx. 10 %		
cold junction compensation			approx. 0.8 mA		
input connection leads			—		
effect			± 0.2 K / 10 Ω		
permissible load resistance			30 Ω each lead, 3-lead symmetric		
Analogue output			500 Ω total resistance		
linearization			4 ... 20 mA 2 wire design		
measuring deviation per DIN IEC 770			proportional to temperature per DIN IEC 751		
linearity error			proportional to voltage		
amplification error			± 0.5 % ²⁾		
temperature T_C zero			± 0.1 % ³⁾		
coefficient span			—		
error effect of cold junction compensation			± 0.1 %		
rising time t_{90}			at T_{amb} -20 ... +60 °C ± 1.0 K		
switch-on delay, electric			at T_{amb} -40 ... +85 °C ± 2.0 K		
signalling with sensor burnout			< 1 ms		
with sensor short circuit			< 10 ms		
load R_A			down scale, < 3 mA ⁵⁾		
load effect			down scale, < 3 mA ⁶⁾		
power supply effect			up scale, > 23.5 mA		
Power supply U_B			$R_A \leq (U_B - 10V) / 0.02A$ with R_A in Ω and U_B in V		
input power supply protection			± 0.05 % / 100 Ω		
Electromagnetic compatibility (EMC)			± 0.025 % / V		
Special features			DC 10 ... 30 V by 4 ... 20 mA-loop		
ambient and storage temperature			reverse polarity		
climate application class			CE - Conformity per EN 50082-2 (March 95)		
maximum permissible humidity					
vibration			-40 ... +85 °C		
shock			GPF DIN 40040		
guarantee			95 % relative humidity, noncondensing DIN IEC 68-2-30 Var. 2		
Case			10 ... 2000 Hz 5 g DIN IEC 68-2-6		
material			DIN IEC 68-2-27 $g_N = 15$		
degree of protection case			5 years for performance		
terminal con.			head mounting design		
cross section of terminal connectors			polyamide, glass fibre reinforced		
weight			IP 50 IEC 529 / EN 60 529		
dimensions			IP 00 IEC 529 / EN 60 529		

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 Pt100 in 3-lead connection, for Pt100 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 Pt100 in 2-lead connection)

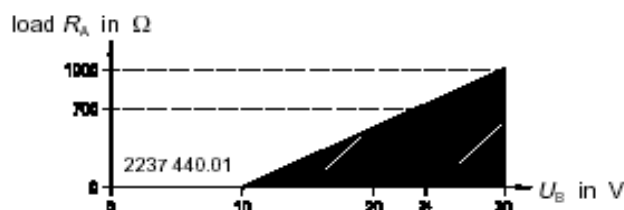
legend of lead number:



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●●6 3●●4 7●●8
0 ... 50 °C	1●●2 5●●6 3●●4 7●●8
0 ... 100 °C	1●●2 5●●6 3●●4 7●●8
0 ... 120 °C	1●●2 5●●6 3●●4 7●●8
0 ... 150 °C	1●●2 5●●6 3●●4 7●●8
0 ... 200 °C	1●●2 5●●6 3●●4 7●●8

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

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

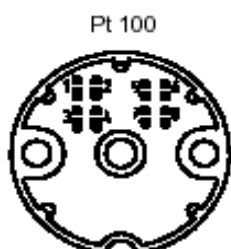
Thermocouple type T	bridge
measuring range	bridge
- 100 ... + 200 °C	1●●●3
- 100 ... + 300 °C	1●●●3
0 ... 400 °C	1●●●3

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

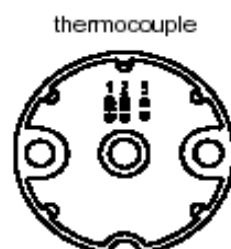
Thermocouple type K	bridge
measuring range	bridge
0 ... 300 °C	1●●●3
0 ... 600 °C	1●●●3
0 ... 1200 °C	1●●●3

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

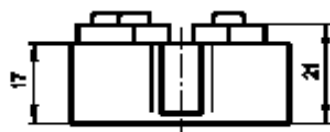
Bridge positions



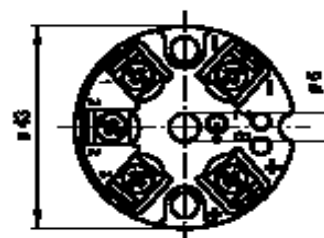
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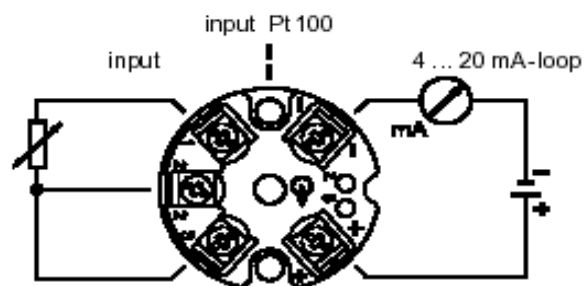
Dimensions in mm



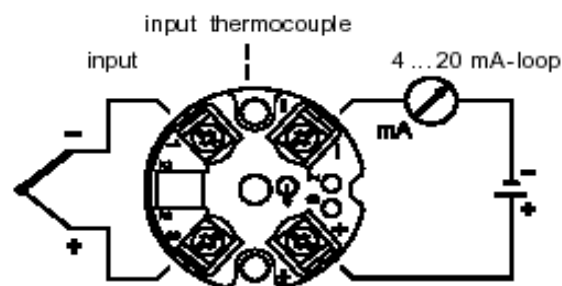
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Designation of terminal connectors



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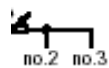
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T19

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[illegible]

d of
number:



375 890

or HVAC					
ridge					
2	5	●	●	6	
1	7	●	●	8	
2	5	●	●	6	
1	7	●	●	8	
2	5	●	○	6	
1	7	●	●	8	
2	5	●	○	6	
1	7	●	●	8	
2	5	●	○	6	
1	7	○	○	8	
2	5	●	○	6	
1	7	●	○	8	

type S				
bridge				
1	○	○	○	3

mA-loop

