Overview

SITRANS TH100 Slim is particularly suited for the production of compact thermometers with integrated transmitter.

Its cylindrical stainless steel enclosure is simply welded to the basic body of the compact thermometer.

Its compact design makes the SITRANS TH100 Slim the ideal solution for manufacturers from a wide variety of industries.

For the parameterization, the SIPROM T software is used in combination with the modem for SITRANS TH100/TH200.

Benefits

- Transmitter in two-wire technology with M12 device plug for installation on compact thermometer.
- Solution for easy and space-saving temperature measurements in a variety of industries.
- Programmable; as a result, the sensor connection, measuring range and much more is programmable.

Application

The SITRANS TH100 Slim transmitter can be used in combination with Pt100 compact resistance thermometers for temperature measurement in all industries. Thanks to its compact design, it can be attached to all kinds of designs.

The output signal is a load-independent direct current of 4 to 20 mA which is proportional to the temperature.

Parameterization is implemented over the PC using the parameterization software SIPROM T and the modem for SITRANS TH100/TH200. If you already have a "Modem for SITRANS TK" (article number 7NG3190-6KB), you can continue to use this for parameterization of the SITRANS TH100.
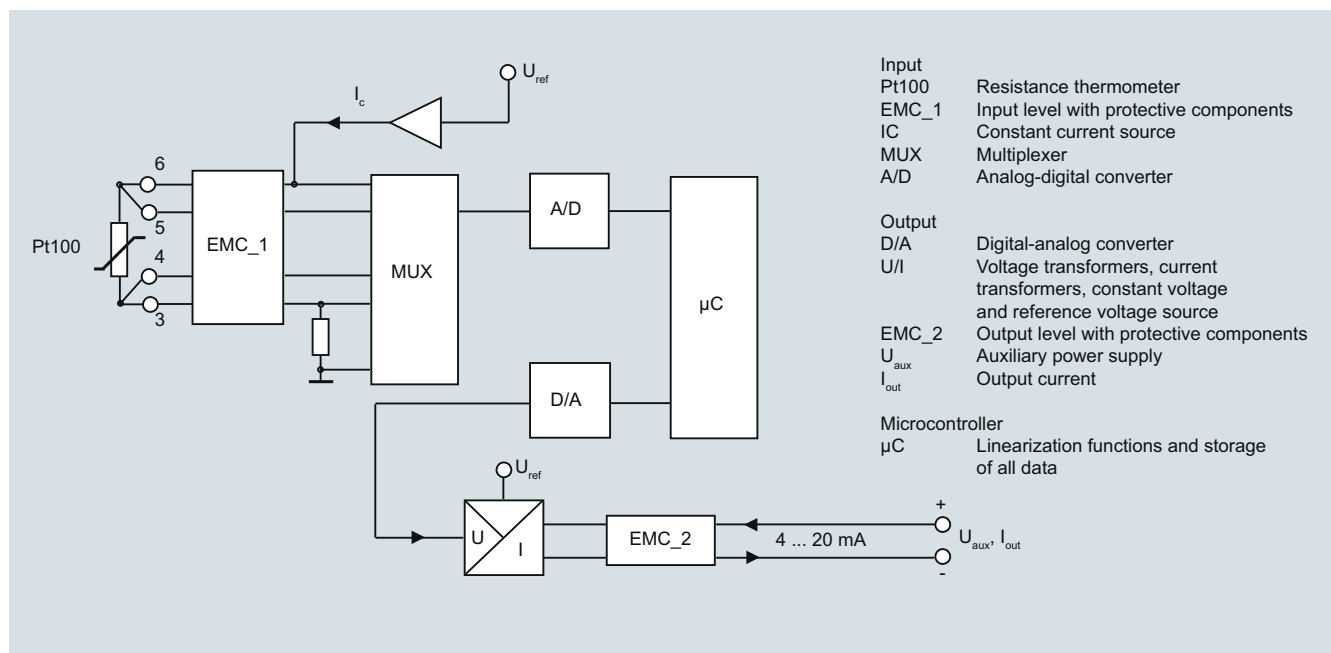
Function

Mode of operation

The measured signal supplied by a Pt100 resistance thermometer (2, 3 or 4-wire system) is amplified in the input stage. The voltage, which is proportional to the input variable, is then converted into digital signals by a multiplexer in an analog-to-digital converter. They are converted in the microcontroller in accordance with the sensor characteristics and further parameters (measuring range, damping, ambient temperature, etc.).

The signal prepared in this way is converted in an analog-to-digital converter into a load-independent direct current of 4 to 20 mA.

An EMC filter protects the input and output circuits against electromagnetic interferences.

Input	
Pt100	Resistance thermometer
EMC_1	Input level with protective components
IC	Constant current source
MUX	Multiplexer
A/D	Analog-digital converter

Output	
D/A	Digital-analog converter
U/I	Voltage transformers, current transformers, constant voltage and reference voltage source
EMC_2	Output level with protective components
U_{aux}	Auxiliary power supply
I_{out}	Output current

Microcontroller	
μC	Linearization functions and storage of all data

SITRANS TH100 Slim, function block diagram

Temperature Measurement
Transmitters in a compact design

SITRANS TH100 Slim (Pt100)

■ Technical specifications

SITRANS TH100 Slim	
Input	
Resistance thermometer	
Measured variable	Temperature
Sensor type	PT100 to IEC 60751
Characteristic curve	Temperature-linear
Type of connection	2-, 3- or 4-wire circuit
Resolution	14 bit
Measuring accuracy	< 0.25 °C (0.45 °F)
Repeatability	< 0.1 °C (0.18 °F)
Measuring current	Approx. 0.4 mA
Measuring cycle	< 0.7 s
Measuring range	-60 ... +160 °C (-76 ... +320 °F)
Measuring span	25 ... 220 °C (45 ... 396 °F)
Unit	°C or °F
Offset	Programmable: -100 ... +100 °C (-180 ... +180 °F)
Line resistance	Max. 20 Ω (total from feeder and return conductor)
Noise rejection	50 and 60 Hz
Output	
Output signal	4 ... 20 mA, two-wire
Auxiliary power	8.5 ... 36 V DC (30 V for Ex)
Max. load	$(U_{aux} - 8.5 \text{ V})/0.023 \text{ A}$
Overrange	3.6 ... 23 mA, infinitely adjustable (factory setting: 3.84 ... 20.5 mA)
Error signal (in the event of sensor breakage)	3.6 ... 23 mA, infinitely adjustable (factory setting: 3.6 mA or 22.8 mA)
Damping time	0 ... 30 s
Protection	Against reverse polarity
Resolution	12 bit
Accuracy at 23 °C (73.4 °F)	< 0.1 % of span
Temperature effect	< 0.13 %/10 °C (0.13 %/18 °F)
Effect of auxiliary power	< 0.02 % of span/V
Effect of load impedance	< 0.055 % of max. span/100 Ω
Long-term drift	• < 0.025 % of max. span in the first month
	• < 0.035 % of max. span after one year
	• < 0.05 % of max. span after 5 years
Ambient conditions	
Ambient temperature range	-40 ... +85 °C (-40 ... +185 °F)
Storage temperature range	-40 ... +85 °C (-40 ... +185 °F)
Relative humidity	98 %, with condensation
Electromagnetic compatibility	According to EN 61326 and NAMUR NE21
Design	
Weight	42 g
Dimensions	See dimensional drawing
Material	316L stainless steel
Degree of protection according to IEC 60529	
• Enclosure	IP67

Software requirements for SIPROM T	
PC operating system	Windows ME, 2000 and XP; also Windows 95, 98 and 98SE, but only in connection with RS232 modem

Factory setting:
- Pt100 (IEC 751) with 3-wire system
- Measuring range: 0 ... 100 °C (32 ... 212 °F)
- Error signal in the event of sensor breakage: 22.8 mA
- Sensor offset: 0 °C (0 °F)
- Damping 0.0 s

■ Selection and Ordering data   Article No.

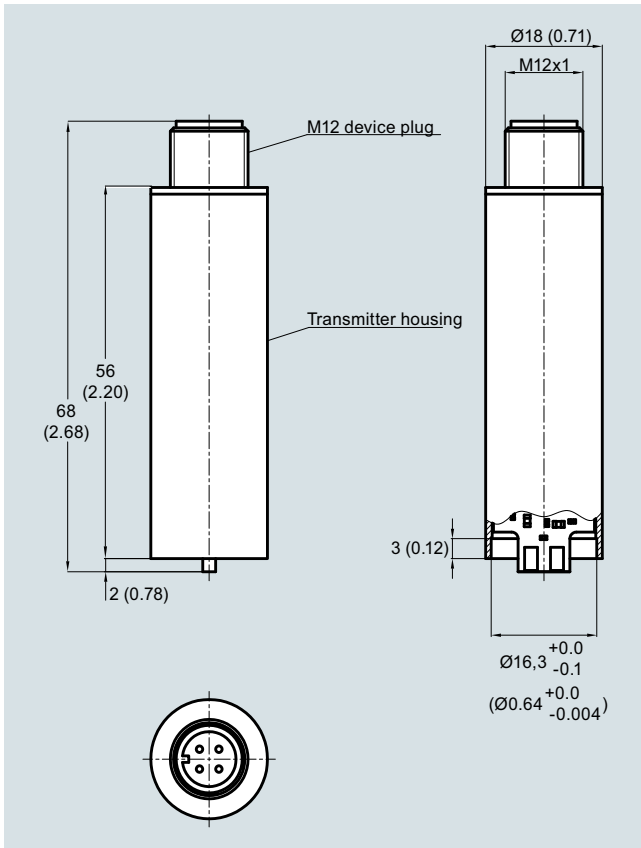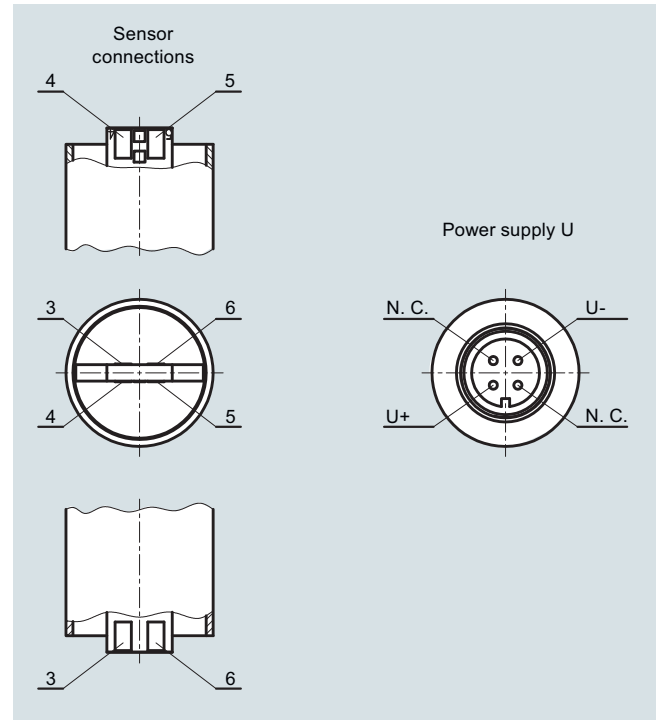| SITRANS TH100 Slim temperature transmitters for Pt100	
For welding to compact thermometers Two-wire system, 4 ... 20 mA, programmable, without electrical isolation	
• Without explosion protection	**7NG3150-0NN00**
Accessories	
Modem for SITRANS TH100 and TH200 incl. SIPROM T parameterization software With USB connection	**7NG3092-8KN**

Dimensional drawings

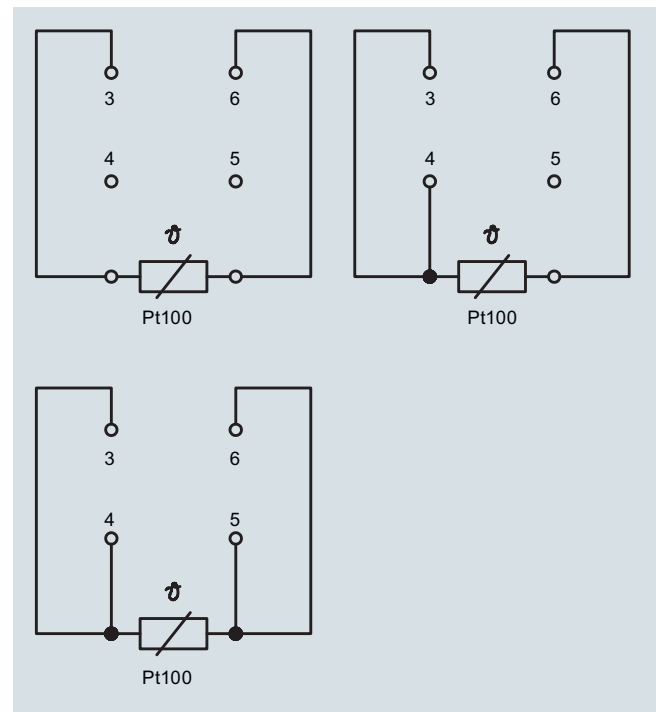Ø18 (0.71)
M12x1

M12 device plug

Transmitter housing

56 (2.20)
68 (2.68)

2 (0.78)

3 (0.12)

Ø16,3 $^{+0.0}_{-0.1}$
(Ø0.64 $^{+0.0}_{-0.004}$)

SITRANS TH100 Slim, dimensions in mm (inch)

Schematics

Sensor connections

4   5

3   6

4   5

Power supply U

N. C.   U-

U+   N. C.

3   6

SITRANS TH100 Slim, auxiliary power and sensor connection

3   6
4   5
Pt100

3   6
4   5
Pt100

3   6
4   5
Pt100

SITRANS TH100 Slim, sensor connection assignment