SITRANS TK-L
Two-wire system (Pt100)

Overview

The economical transmitter for Pt100 measurements

The SITRANS TK-L dispenses with electrical isolation and universal sensor connection to provide a low-cost alternative for Pt100 measurements.

SIPROM TK software is used in combination with the modem for SITRANS TK for the parameterization.

A very compact design makes the SITRANS TK-L ideal for the retrofitting of measuring points or for the use of analog transmitters.

The transmitter is available as a non-Ex version as well as for use in potentially explosive atmospheres.
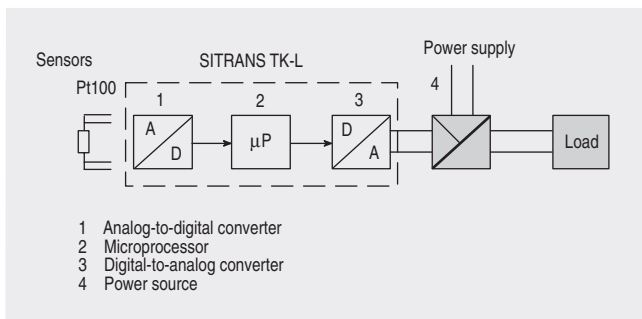
Application

SITRANS TK-L temperature transmitters with "Non incendive" type protection can be mounted within potentially explosive atmospheres (zone 2).

SITRANS TK-L temperature transmitters with "Flame-proof enclosure" type protection can be mounted within potentially explosive atmospheres (zone 1).

Function

The SITRANS TK-L transmitter converts the signals from Pt100 resistance thermometers into a load-independent direct current corresponding to the sensor characteristic. As a result of its compact design, the transmitter fits in the sensor head type B (DIN 43729). Parameterization is carried out using a PC for the programmable SITRANS TK-L.

Mode of operation

1 Analog-to-digital converter
2 Microprocessor
3 Digital-to-analog converter
4 Power source

The signal supplied by a Pt100 (two, three or four-wire circuit) is amplified in the input stage. The voltage proportional to the input variable is then converted into digital signals in the analog/digital converter (1). They are converted in the microprocessor (2) in

accordance with the sensor characteristic and further parameters (damping, ambient temperature etc.).

The signal prepared in this way is converted in the digital/analog converter (3) into a load-independent direct current of 4 to 20 mA. The power supply (4) is located in the output signal circuit.

Technical specifications

Input

Resistance thermometer

Measured variable	Temperature
Sensor type	Pt100 (DIN IEC 751)
Voltage measurement	Temperature-linear
Type of connection	Two, three or four-wire system
Resolution	14 bit
Measuring accuracy	
• Span < 250 °C (450°F)	< 0.25 °C (0.45 °F)
• Span > 250 °C (450°F)	< 0.1% of span
Repeatability	< 0.1 °C (0.18 °F)
Measuring current	0.3 mA
Measuring cycle	< 0.7 s
Measured range	-200 ... 850 °C (-328 ... +1562 °F)
Measured span	> 25 °C (45 °F)
Unit	°C or °F
Offset	Programmable, max. 10 °C (18 °F)
Line resistance	Max. 20 Ω/line
Overload capability	DC ± 35 V
Noise rejection	50 and 60 Hz

Output

Output signal

Output signal	4 ... 20 mA, 2-wire
Power supply	DC 8 to 35 V (28 V with Ex)
Underrange/overrange limits	3.5/23 mA (programmable)
Filter time	0 ... 30 s
Protection	Against reversed polarity
Resolution	12 bit
Accuracy	< 0.1% of span
• Power supply effect	< 0.01% of span/V
• Temperature drift	typ. 0,003%/°C (0,0016%/°F) max. 0,01%/°C (0,0056%/°F)

Rated conditions

Ambient conditions

Ambient temperature	-40 ... +85 °C (-40 ... +185 °F)
Relative humidity	< 98%, with condensation
Electromagnetic compatibility	
• Interference immunity	According to EN 50082-2
• Emitted interference	According to EN 50081-1

Design

Weight	50 g (0.11 lb)
Dimensions	see "Dimension drawings"
Material	Moulded plastic
Degree of protection	
• Housing	IP40
• Terminals	IP00

Certificate and approvals

Explosion protection ATEX

• "Intrinsic. safe" type of protection	ATEX II 1 G EEx ia IIC T4
- EC-Type Examination Certificate	DEMKO 01 ATEX 129483 X
• "Non incendive" type of protection	ATEX II 3G EEx nA IIC T4
- EC-Type Examination Certificate	DEMKO 01 ATEX 129482 X

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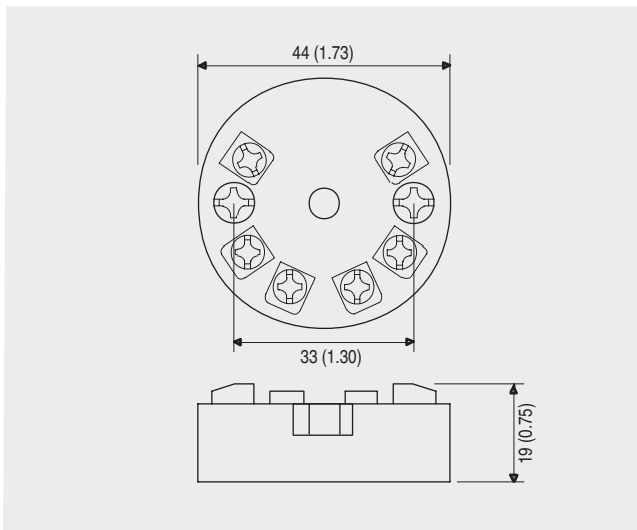
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Technical specifications (continued)

Hardware and software requirements for the parameterization software SIPROM TK for SITRANS TK and TK-L

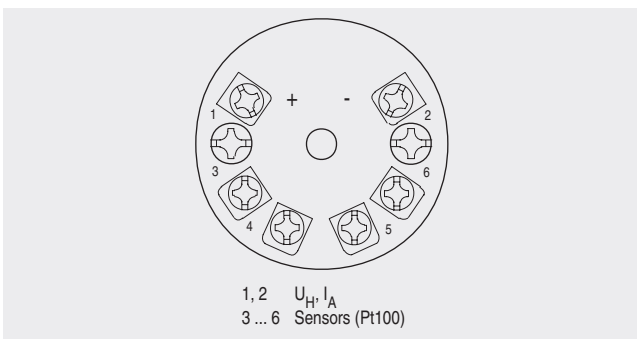|	
Personal computer	• CPU of type 486 upwards, compatible with industrial standard • 3.5" diskette drive • Hard disk with 5 MB vacant space • min. 4 MB RAM • VGA graphics adapter (or compatible) with at least 16 colors • One vacant serial port • Mouse or compatible pointing device and printer (recommended)
PC operating system	MS-DOS V 5.0 upwards, MS-Windows V 3.1 upwards

Factory setting:
• Pt100 (IEC 751) with three-wire circuit
• Measuring range: 0 ... 100 °C (32 ° ... 212 °F)
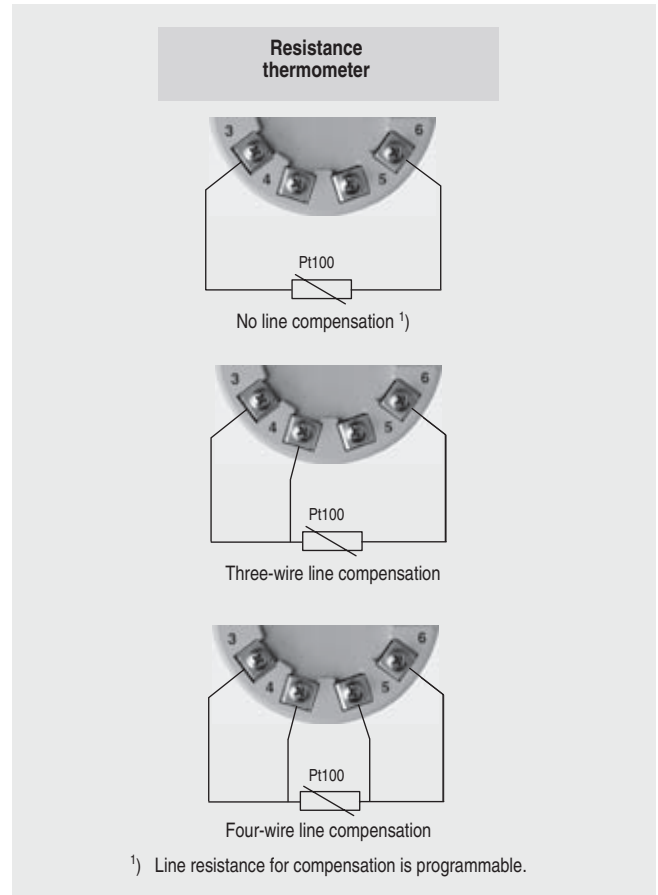• Output with sensor breakage: 23 mA

Dimensional drawings

SITRANS TK-L, dimensions in mm (inches)

Schematics

1, 2 U_H, I_A
3 ... 6 Sensors (Pt100)

Pin assignment

Resistance thermometer

No line compensation [1]

Three-wire line compensation

Four-wire line compensation

[1] Line resistance for compensation is programmable.

Sensor connection assignment

Selection and ordering data	Order No.
Temperature transmitter SITRANS TK-L for Pt100 for installation in sensor head type B (DIN 43729); two-wire system 4 ... 20 mA; programmable	
• without explosion protection ▶	**7NG3120-0JN00**
• with explosion protection EEx ia for zone 1 and Ex n for zone 2 ▶	**7NG3122-0JN00**

Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s) and plain text.	
• Customer-specific setting of operating data	**Y01**

▶ Available ex stock.

Accessories	Order No.
SIPROM TK parameterization software ▶ for SITRANS TK and TK-L German/English/French	**7NG3190-8KB**
Modem for SITRANS TK and TK-L ▶	**7NG3190-6KB**
Instruction manual for SITRANS TK-L ▶ German/English (not included in delivery of the device)	**A5E00095604**

▶ Available ex stock.