

P5102 LT

Spatial Resistance Temperature Sensors with Two-wire Programmable Transmitter

- Measuring resistor Pt100.
- Measuring range:
with cable sensor -40 to +180 °C,
with local sensor -40 to +70 °C (without display),
-10 to +55 °C (with display).
- Accuracy class A, B according to EN 60751.
- Converts of Pt100 resistance signal to current output signal 4 to 20 mA of the temperature.
- Built-in LCD display indicates the temperature in the whole input range with readability 0,1 °C.
- Allows to directly change the analog output range using buttons.
- Indicates break of temperature sensor or line using either high (>20 mA) or low (<4 mA) output current.

Application

Spatial resistance temperature sensors with programmable transmitter are designed for remote temperature measurement of space (ambient air) in non-hazardous locations without potentially explosive atmosphere of gases or dusts, where the local indication of measured temperature is needed.

Description

A sensor of the thermometer is one measuring resistor Pt100 which is placed in the measuring insert stem and connected through 3-wire to programmable transmitter P5102. For temperature measurement is used resistance-temperature dependence of Pt sensor. Resistance signal from a sensor is converted in the transmitter to a linearized current signal 4 to 20 mA. Built-in LCD display indicates actual ambient temperature. Sensors with transmitter are mounted using mounting brackets on the wall in production or sports halls etc.

Communication with the transmitter through the RS232C interface requires a KA-01 communication cable with a galvanic isolation. For the interface description see the separate data sheet. The configuration can be done by a PC and by NPT-02 set-up program. Changing of range and calibration can be also done by a easy set-up unit NJ-14 or with optional display by push-buttons on the transmitter directly in the field. Changing of parameters can be disabled by the set-up unit.



Technical specifications

Measuring resistor:	1x Pt100, 3-wire
Measuring range:	
with cable sensor	-40 to +180 °C,
with local sensor	-40 to +70 °C (without display) 10 to +55 °C (with display)
Measuring current:	< 0,15 mA
Output signal:	2-wire current 4 to 20 mA or 20 to 4 mA
D/A conversion error:	≤ ±0,05 % span of set range
Current output total error:	$\leq \pm \left(\frac{\text{digital accuracy}}{\text{span of set range}} \times 100 + 0,05 \right) [\%]$
Transfer function:	linear with temperature
Supply voltage:	11 to 36 VDC
Recommended power supply:	ZS-010, ZS-011, ZS-020
Load resistance:	$R_L [\text{Ohm}] \leq (U_N [\text{V}] - 11) / 0,022$
Sensor break or other fault indication:	
display	indication of error code
output	>20 mA or >4 mA

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Supplementary parameters

Output current limit:

signal approximately 3,8 to 20,5 mA
error current limit approx. 23 mA

Display:

4-digit LCD with sign

Effect of supply voltage:

$\leq \pm 0,002$ % of span / V

Effect of ambient temperature:

$\leq \pm 0,05$ % span of set range / 10 °C

Effect of sensor inner resistance for voltage input:

$\leq 0,004$ mA / 1 k Ω

Long-term stability:

$\leq \pm 0,1$ % span of set range / 2 years

EMC (Electromagnetic compatibility):

according to EN 61326-1

Operating conditions

Transmitters must be powered by safe power supplies. They are protected against reversing of polarity and peak voltage overload. Their input and output circuits are not galvanic isolated, therefore with powering of more transmitters from a common power supply it is necessary that connected sensors and cables have a high insulation resistance. However, with this type of connection it is recommended to insert a galvanic isolation into supply circuits. If the power supply is designed for a higher load current (>100 mA) it is recommended to insert F 50mA fuse or a current-limiting resistor into supply circuits.

Operating temperature: -10 to +55 °C

Humidity:

S2x 0 to 100 % RH with condensation

Elevation:

up to 2000 m above the sea level

Other specifications

Sensor measuring stem:

length 60 mm
diameter 8 mm
material nickel brass

Sensor cable:

length 2 and 4 m
isolation silicone

Housing:

IP 55

Weight:

275 g (including sensor)

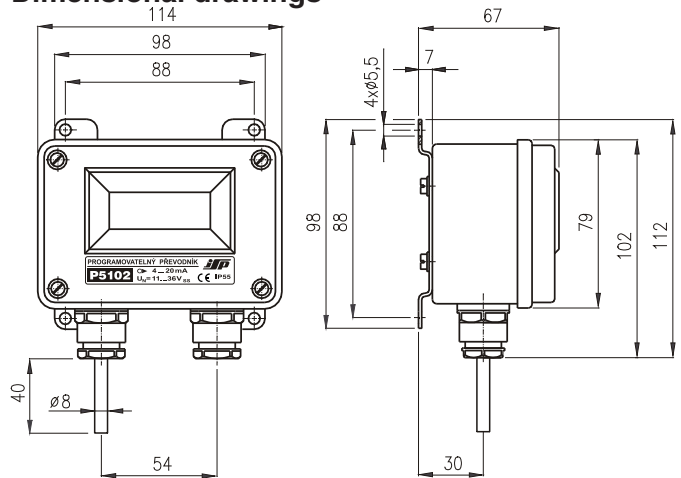
Box material:

PVC

Warranty:

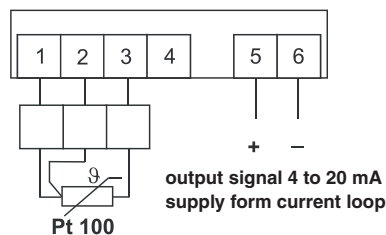
24 months

Dimensional drawings



Electrical connection

Three-wire connection of resistance sensor



Ordering table

Type	Description
◦ P5102 LT	Spatial resistance temperature sensor with programmable transmitter P5102
Code	Version Ambient temperature of electronic box
◦ S11	Without display -40 to +70 °C
◦ S21	With display -10 to +55 °C
Code	Temperature sensor Input range
◦ 0	Local -40 to +70 °C without display, -10 to +55 °C with display
◦ 1	With cable 2 m -40 to +180 °C
◦ 2	With cable 4 m -40 to +180 °C
Code	Setting range of transmitter
◦ RL	Start of range (4 mA) (fill in value and units)
◦ RH	End of range (20 mA) (fill in value and units)
Code	Measuring resistance
A	Measuring resistance with accuracy A according to EN 60751
Code	Calibration in customer's given temperature points, including calibration certificate
◦ KTE31A	Single sensor calibration in three temperature points in range -40 to +180 °C
KTE9	Other
Code	Optional accessories
◦ NJ-14	Set-up unit (to set range, damping time constant and hysteresis)
◦ V	Mounting bracket for temperature sensor with cable
Example of order: P5102 LT S21 0 RL 0 °C RH 50 °C KTE31A (-10, 30, 50)	

◦ ... Marked version can be dispatched up to 5 working days

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