

## 5331D 2-wire programmable transmitter

### Application

- Linearized temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.

### Technical characteristics

- Within a few seconds the user can program PR5331D to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- Continuous check of vital stored data for safety reasons.

### Mounting / installation

- For DIN form B sensor head mounting.

### Specification

#### Environmental Conditions

Operating temperature	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree (encl./terminal)	IP68 / IP00

#### Mechanical specifications

Dimensions	Ø 44 x 20.2 mm
Weight approx.	50 g
Wire size	1 x 1.5 mm <sup>2</sup> stranded wire
Screw terminal torque	0.4 Nm
Vibration	IEC 60068-2-6

2...25 Hz	$\pm 1.6$ mm
25...100 Hz	$\pm 4$ g

## Common specifications

### Supply

Supply voltage	7.2...30 VDC
Internal power dissipation	25 mW...0.7 W

### Isolation voltage

Isolation voltage, test / working	1.5 kVAC / 50 VAC
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### Response time

Response time (programmable)	1...60 s
Voltage drop	7.2 VDC
Warm-up time	5 min.
Power on to stable output	4.5 s
Programming	Loop Link
Signal / noise ratio	Min. 60 dB
EEprom error check	< 3.5 s
Accuracy	Better than 0.05% of selected range
Signal dynamics, input	20 bit
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC
EMC immunity influence	< $\pm 0.5\%$ of span
Extended EMC immunity: NAMUR NE21, A criterion, burst	< $\pm 1\%$ of span

## Input specifications

### Common input specifications

Max. offset	50% of selected max. value
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### RTD input

RTD type	Pt100, Ni100, lin. R
Cable resistance per wire	5 $\Omega$ (max.)
Sensor current	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire)	< 0.002 $\Omega$ / $\Omega$
Sensor error detection	Yes

### Linear resistance input

Linear resistance min....max.	0 $\Omega$ ...5000 $\Omega$
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### TC input

Thermocouple type	B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC)	< $\pm 1.0^\circ\text{C}$
Sensor error detection	Yes

Sensor error current: When detecting / else      Nom. 33 µA / 0 µA

#### Voltage input

Measurement range	-12...800 mV
Min. measurement range (span)	5 mV
Input resistance	10 MΩ

## Output specifications

#### Current output

Signal range	4...20 mA
Min. signal range	16 mA
Load (@ current output)	$\leq (V_{\text{supply}} - 7.2) / 0.023 [\Omega]$
Load stability	$\leq 0.01\% \text{ of span} / 100 \Omega$
Sensor error indication	Programmable 3.5...23 mA
NAMUR NE43 Upscale/Downscale	23 mA / 3.5 mA

#### Common output specifications

Updating time of span	440 ms = of the presently selected range
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## I.S. / Ex marking

ATEX      II 1 G Ex ia IIC T6...T4 Ga, II 2 D Ex ia IIIC Db, I M1 Ex ia I Ma

IECEx      Ex ia IIC T6...T4 Ga, Ex ia IIIC Db, Ex ia I Ma

FM, US      Cl. I, Div. 1, Gp. A, B, C, D T4/T6; Cl. I Zone 0, AEx ia IIC T4/T6; Cl. 1, Div. 2, Gp. A, B, C, D, T4/T6

CSA      Cl. I, Div. 1, Gp. A, B, C, D Ex ia IIC, Ga

INMETRO Ex ia IIC T6...T4 Ga, Ex ia IIIC Da, Ex ia I Ma

## Observed authority requirements

EMC      2014/30/EU & UK SI 2016/1091

ATEX      2014/34/EU & UK SI 2016/1107

RoHS      2011/65/EU & UK SI 2012/3032

EAC      TR-CU 020/2011

EAC Ex      TR-CU 012/2011

## Approvals

ATEX	DEKRA 20ATEX0095X
IECEx	DEK 20.0059X
FM	FM17US0013X
CSA	1125003
INMETRO	DEKRA 16.0013 X
DNV Marine	TAA0000101
EAC Ex	RU C-DK.HA65.B.00355/19