



## 2-wire programmable transmitter

### 5331D

- RTD, TC, Ohm, or mV input
- Extremely high measurement accuracy
- 1.5 kVAC galvanic isolation
- Programmable sensor error value
- For DIN form B sensor head mounting



#### 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.

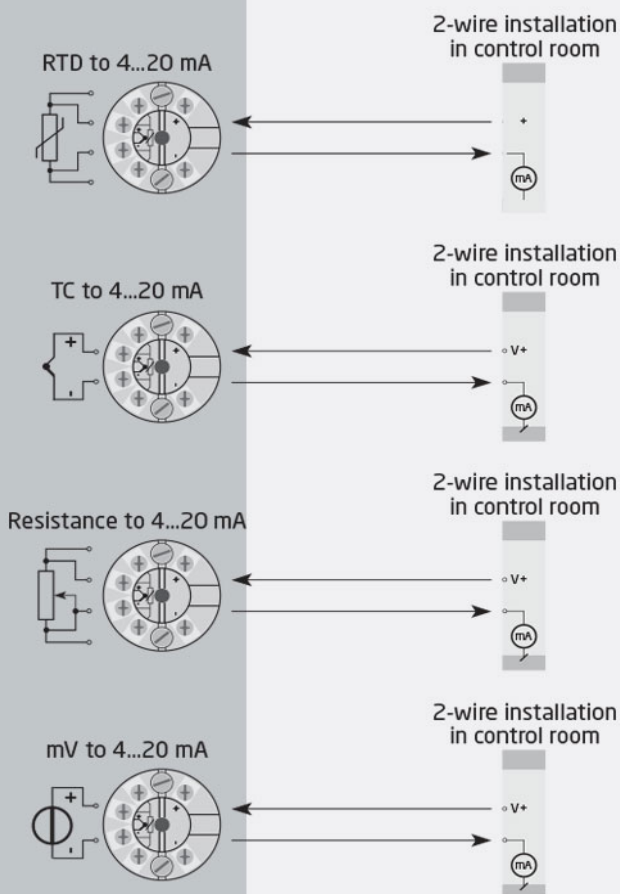
#### Technical characteristics

- 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.

#### Applications



## Order

| Type | Version                                       | Ambient temperature | Galvanic isolation |
|------|-----------------------------------------------|---------------------|--------------------|
| 5331 | Zone 0, 1, 2, 21, 22, M1 / DIV. 1, DIV. 2 : D | -40°C...+85°C : 3   | 1500 VAC : B       |

## 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.....             | ±1.6 mm                               |
| 25...100 Hz.....           | ±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 |
|----------------------------------------|-------------------|

### 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.....                                | < ±0.5% of span                     |
| Extended EMC immunity: NAMUR NE21, A criterion, burst..... | < ±1% of span                       |

## Input specifications

### Common input specifications

|                  |                            |
|------------------|----------------------------|
| Max. offset..... | 50% of selected max. value |
|------------------|----------------------------|

### RTD input

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

### Linear resistance input

|                                  |              |
|----------------------------------|--------------|
| Linear resistance min...max..... | 0 Ω...5000 Ω |
|----------------------------------|--------------|

### TC input

|                                                  |                                          |
|--------------------------------------------------|------------------------------------------|
| Thermocouple type.....                           | B, E, J, K, L, N, R, S, T, U, W3, W5, LR |
| Cold junction compensation (CJC).....            | < ±1.0°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).....      | ≤ (Vsupply - 7.2) / 0.023 [Ω] |
| Load stability.....               | ≤ 0.01% of span / 100 Ω       |
| Sensor error indication.....      | Programmable 3.5...23 mA      |
| NAMUR NE43 Upscale/Downscale..... | 23 mA / 3.5 mA                |

### Common output specifications

|                    |                                   |
|--------------------|-----------------------------------|
| Updating time..... | 440 ms                            |
| of span.....       | = of the presently selected range |

## 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 Db, 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 23.0009X          |
| DNV Marine..... | TAA0000101              |
| EAC Ex.....     | RU C-DK.HA65.B.00355/19 |