



## 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.

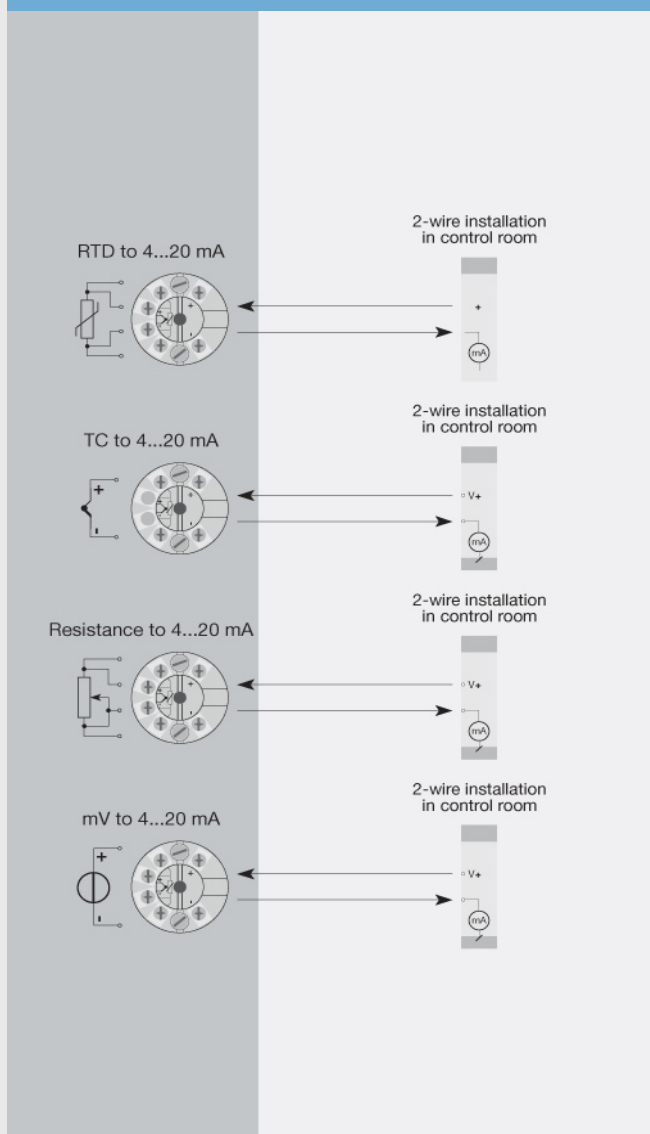
#### Technical characteristics

- 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  | Ambient temperature | Galvanic isolation |
|-------|---------------------|--------------------|
| 5331D | -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.                              |
| 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 (max.).....              | 5 Ω                  |
| 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 T4...T6 Ga, II 1 D Ex ia IIIC Da, I M1 Ex ia Ma   |
| IECEx.....   | Ex ia IIC T4...T6 Ga, Ex ia IIIC Da, Ex ia I Ma FMus.<br>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  |

### Observed authority requirements

|           |                |
|-----------|----------------|
| EMC.....  | 2014/30/EU     |
| RoHS..... | 2011/65/EU     |
| EAC.....  | TR-CU 020/2011 |

### Approvals

|                            |                             |
|----------------------------|-----------------------------|
| DNV-GL Marine.....         | Stand. f. Certific. No. 2.4 |
| ATEX 2014/34/EU.....       | KEMA 06ATEX0062X            |
| IECEx.....                 | DEK 13.0035X                |
| FM.....                    | FM17US0013X                 |
| CSA.....                   | 1125003                     |
| INMETRO.....               | DEKRA 13.0001 X             |
| CCOE.....                  | P337392/2                   |
| EAC Ex TR-CU 012/2011..... | RU C-DK.GB08.V.00410        |

