

## TEMPERATURE TRANSMITTER

Type: HART 5 protocol or HART 7 protocol

Input: RTD, TC, Ohm, mV

Type:  
**TT-5337A**

Sheet No.

6-2 V2.1

10122-E010818V2.1



### Application

- Linearized temperature measurement with TC and RTD sensors e.g. Pt100 and Ni100.
- HART communication and 4...20 mA analog PV output for individual, difference or average temperature measurement of up to two RTD or TC input sensors.
- Conversion of linear resistance to a standard analog current signal, e.g. from valves or Ohmic level sensors.
- Amplification of bipolar mV signals to standard 4...20 mA current signals.
- Up to 63 transmitters (HART 7) can be connected in a multidrop communication setup.

### Technical characteristics

- HART protocol revision can be changed by user configuration to either HART 5 or HART 7 protocol.  
The HART 7 protocol offers: · Long Tag numbers of up to 32 characters. · Enhanced Burst Mode and Event notification with time stamping. Device variable and status mapping to any dynamic variable PV, SV, TV or QV. Process signal trend measurement with logs and summary data. · Automatic event notification with time stamps. Command aggregation for higher communication efficiency.
- 5337A is designed according to strict safety requirements and is therefore suitable for applications in SIL installations.
- Continuous check of vital stored data.
- Meeting the NAMUR NE21 recommendations, the 5337 HART transmitter ensures top measurement performance in harsh EMC environments.
- Additionally, the 5337 meets NAMUR NE43 and NE89 recommendations.



### TECHNICAL DATA:

#### INPUT:

| Type   | Min temp. | Max temp. | Min span | Norm         |
|--------|-----------|-----------|----------|--------------|
| Pt100  | -200°C    | +850°C    | 25°C     | DIN IEC 751  |
| Ni100  | -60°C     | +250°C    | 25°C     |              |
| Lin. R | 0Ω        | 10000ohm  | 30ohm    |              |
| B      | +400°C    | +1820°C   | 200°C    | IEC584       |
| E      | -100°C    | +1000°C   | 50°C     | IEC584       |
| J      | -100°C    | +1200°C   | 50°C     | IEC584       |
| K      | -180°C    | +1372°C   | 50°C     | IEC584       |
| L      | -100°C    | +900°C    | 50°C     | DIN43710     |
| N      | -180°C    | +1300°C   | 100°C    | IEC584       |
| R      | -50°C     | +1760°C   | 200°C    | IEC584       |
| S      | -50°C     | +1760°C   | 200°C    | IEC584       |
| T      | -200°C    | +400°C    | 50°C     | IEC584       |
| U      | -200°C    | +600°C    | 75°C     | DIN4370      |
| W3     | 0°C       | +2300°C   | 200°C    | ASTM E988-90 |
| W5     | 0°C       | +2300°C   | 200°C    | ASTM E988-90 |

#### COMMUNICATION INTERFACE:

Loop link 5905

#### MECHANICAL DATA:

Measurements: Ø 44 x 20,2 mm

Degree of protection (case/clamp): IP68/ IP100

#### ENVIRONMENTAL CONDITIONS:

Operating temperature: -40°C to +85°C

Humidity: < 95% RH (non-cond.)

### TECHNICAL DATA:

#### OUTPUT:

Signal range: ..... 4 - 20 mA

#### ACCURACY:

| Type:                         | Basic accuracy:                | Temperature coefficient:                         |
|-------------------------------|--------------------------------|--------------------------------------------------|
| RTD                           | $\leq \pm 0,2^{\circ}\text{C}$ | $\leq \pm 0,01^{\circ}\text{C}/^{\circ}\text{C}$ |
| LIN R                         | $\leq \pm 0,1\text{ohm}$       | $\leq \pm 10\text{mohm}/^{\circ}\text{C}$        |
| Volt                          | $\leq \pm 10\mu\text{V}$       | $\leq \pm 1\mu\text{V}/^{\circ}\text{C}$         |
| TC Type: E, J, K, L, N, T, UB | $\leq \pm 1^{\circ}\text{C}$   | $\leq \pm 0,05^{\circ}\text{C}/^{\circ}\text{C}$ |
| TC Type: B, R, S, W3, W5E     | $\leq \pm 2^{\circ}\text{C}$   | $\leq \pm 0,2^{\circ}\text{C}/^{\circ}\text{C}$  |

#### COMMON SPECIFICATIONS:

Supply voltage: DC: 8,0...35 V

Voltage drop: 7,2 VDC

Reaction time (programmable): 0,33...60 s

#### SENSOR TROUBLE SHOOTING:

Programmable: 3,5...23 mA

NAMUR NE43 Upscale: 23 mA

NAMUR NE43 Downscale: 3,5 mA

Ordering details: Please state if the transmitter should be programmed

| Transmitter Input Type: |    |         |    |
|-------------------------|----|---------|----|
| 4 mA =                  | C° | 20 mA = | C° |



## 2-wire transmitter with HART protocol

### 5337A

- RTD, TC, Ohm, and bipolar mV input
- 2 analog inputs and 5 device variables with status available
- HART protocol revision selectable from HART 5 or HART 7
- Hardware assessed for use in SIL applications
- Mounting in Safe area or Zone 2/22



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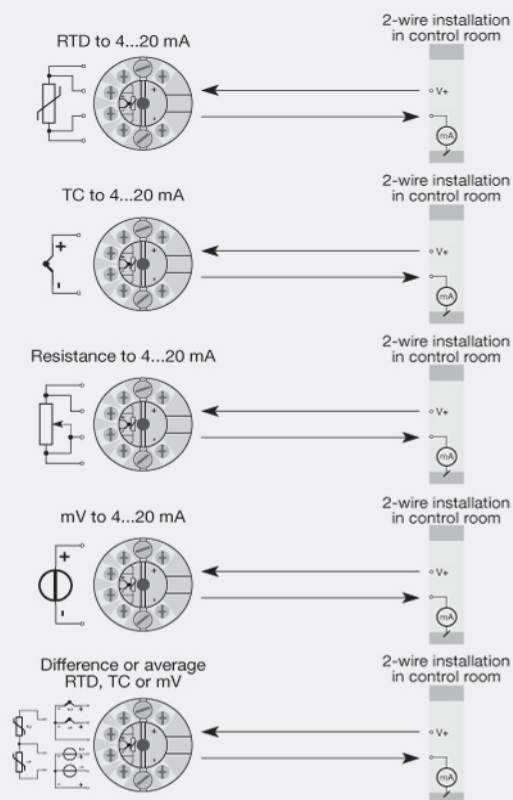
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  - Command aggregation for higher communication efficiency.
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- Continuous check of vital stored data.
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#### Mounting / installation

- For DIN form B sensor head or DIN rail mounting via the PR fitting type 8421.
- Configuration via standard HART communication interfaces or by PR 5909 Loop Link.

#### Applications



**Order:**

| Type  |
|-------|
| 5337A |

**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..... | 8.0...35 VDC |
|---------------------|--------------|

**Isolation voltage**

|                                        |                   |
|----------------------------------------|-------------------|
| Isolation voltage, test / working..... | 1.5 kVAC / 50 VAC |
|----------------------------------------|-------------------|

**Response time**

|                                                            |                                     |
|------------------------------------------------------------|-------------------------------------|
| Response time (programmable).....                          | 1...60 s                            |
| Voltage drop.....                                          | 8.0 VDC                             |
| Signal / noise ratio.....                                  | > 60 dB                             |
| Programming.....                                           | Loop Link & HART                    |
| Accuracy.....                                              | Better than 0.05% of selected range |
| Signal dynamics, input.....                                | 22 bit                              |
| Signal dynamics, output.....                               | 16 bit                              |
| EMC immunity influence.....                                | < ±0.1% 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.....                  | Pt50/100/200/500/1000;<br>Ni50/100/120/1000                             |
| Cable resistance per wire..... | 5 Ω (up to 50 Ω per wire is possible with reduced measurement accuracy) |
| Sensor current.....            | Nom. 0.2 mA                                                             |

**TC input**

|                                       |                                                            |
|---------------------------------------|------------------------------------------------------------|
| Thermocouple type.....                | B, E, J, K, L, N, R, S, T, U, W3, W5, LR                   |
| Cold junction compensation (CJC)..... | Constant, internal or external via a Pt100 or Ni100 sensor |

**Voltage input**

|                                    |                |
|------------------------------------|----------------|
| Measurement range.....             | -800...+800 mV |
| Min. measurement range (span)..... | 2.5 mV         |
| Input resistance.....              | 10 MΩ          |

**Output specifications****Current output**

|                                   |                             |
|-----------------------------------|-----------------------------|
| Signal range.....                 | 4...20 mA                   |
| Min. signal range.....            | 16 mA                       |
| Load (@ current output).....      | ≤ (Vsupply - 8) / 0.023 [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            |
| HART protocol revisions..... | HART 7 and HART 5 |

**Observed authority requirements**

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

**Approvals**

|                      |                                               |
|----------------------|-----------------------------------------------|
| ATEX 2014/34/EU..... | KEMA 03ATEX1508 X                             |
| IECEx.....           | KEM 10.0083X                                  |
| INMETRO.....         | NCC 12.0844 X                                 |
| DNV-GL Marine.....   | Stand. f. Certific. No. 2.4                   |
| SIL.....             | Hardware assessed for use in SIL applications |