

## HART 7 temperature converter, loop-powered

### 3337

- High accuracy, better than 0.05% of span
- Slimline housing of 6 mm
- Excellent EMC performance
- Selectable 60 ms / 60 s response time
- Pre-calibrated temperature ranges selectable via DIP-switches



#### Application

- The 3337 temperature converter measures a standard Pt100, TC J and K temperature sensor, and provides an isolated passive analog current and HART signal output.
- High 2 port isolation provides surge suppression and protects the control system from transients and noise.
- The 3337 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

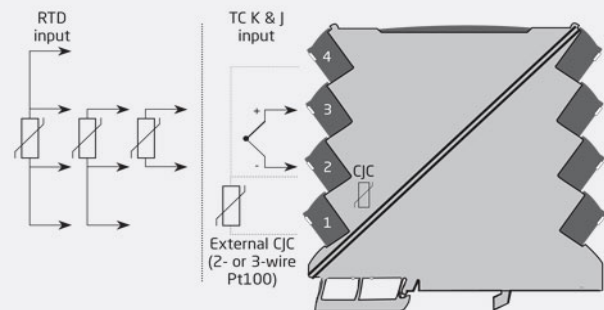
#### Technical characteristics

- Flexibly loop powered by 6.2...35 VDC via connectors.
- A 60 ms fast response time with simultaneous sensor error detection when selected.
- Selectable internal/external CJC.
- Excellent conversion accuracy in all available ranges, better than 0.05% of span.
- Meeting the NAMUR NE21 recommendations, the 3337 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- All terminals are protected against overvoltage and polarity error.
- High galvanic isolation of 2.5 kVAC.
- Excellent signal/noise ratio of > 60 dB.

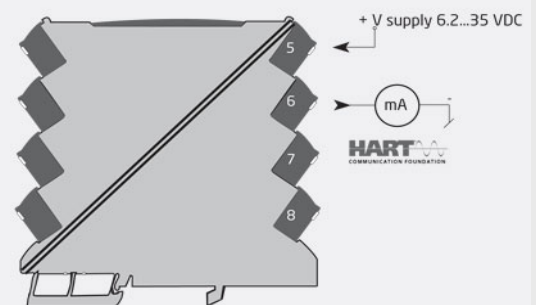
#### Mounting / installation / programming

- Selectable HART mode with HART 7 revision protocol enables extended device programming.
- Selectable DIP-mode for easy configuration of more than 1000 factory calibrated measurement ranges with HART read only feature.
- The narrow 6 mm housing allows up to 165 units to be mounted per meter of DIN rail, without any air gap between units.
- Wide ambient temperature range of -25...+70°C.

#### Applications



Safe Area or  
Zone 2 & Cl. 1, Div. 2, gr. A-D



Order:

| Type |
|------|
| 3337 |

## Environmental Conditions

|                              |   |
|------------------------------|---|
| Operating temperature.....   | -25°C to +70°C                                      |
| Storage temperature.....     | -40°C to +85°C                                      |
| Calibration temperature..... | 20...28°C   |
| Relative humidity.....       | < 95% RH (non-cond.)                                |
| Protection degree.....       | IP20  |
| Installation in.....         | Pollution degree 2 & meas. /<br>overvoltage cat. II |

## Mechanical specifications

|                            |   |
|----------------------------|---|
| Dimensions (HxWxD).....    | 113 x 6.1 x 115 mm  |
| Weight approx.....         | 70 g  |
| DIN rail type.....         | DIN EN 60715/35 mm  |
| Wire size.....             | 0.13...2.5 mm <sup>2</sup> / AWG 26...12<br>stranded wire |
| Screw terminal torque..... | 0.5 Nm  |
| Vibration.....             | IEC 60068-2-6   |
| 2...25 Hz.....             | ±1.6 mm   |
| 25...100 Hz.....           | ±4 g  |

## Common specifications

### Supply

|                                 |               |
|---------------------------------|---------------|
| Supply voltage.....             | 6.2...35 VDC  |
| Max. required power.....        | 0.80 W        |
| Internal power dissipation..... | 22 mW...0.8 W |

### Isolation voltage

|   |                                    |
|---|------------------------------------|
| Isolation voltage, test /<br>working..... | 2.5 kVAC / 300 VAC<br>(reinforced) |
| Zone 2 / Div. 2.....                      | 250 VAC                            |

### Response time

|                                      |                            |
|--------------------------------------|----------------------------|
| HART mode, (0...90%, 100...10%)..... | 60 ms...60 s, programmable |
| DIP mode, (0...90%, 100...10%).....  | < 60 ms                    |

|   |                 |
|---|-----------------|
| Voltage drop.....   | 6.2 VDC         |
| Signal / noise ratio.....                                     | Min. 60 dB      |
| Programming.....  | DIP-switches    |
| Signal dynamics, input.....                                   | 23 bit          |
| Signal dynamics, output.....                                  | 18 bit          |
| EMC immunity influence.....                                   | < ±0.5% of span |
| Extended EMC immunity: NAMUR<br>NE21, A criterion, burst..... | < ±1% of span   |
| Incorrect DIP-switch setting<br>identification.....           | 3.5 mA          |

## Input specifications

### RTD input

|   |                                       |
|---|---------------------------------------|
| Temperature range, Pt100.....                         | -200...+850°C                         |
| Accuracy: the greater of.....                         | Better than 0.05% of span or<br>0.1°C |
| Temperature coefficient: the<br>greater of.....       | 0.02°C/°C or ≤ ±0.01%/°C              |
| Sensor current.....                                   | < 150 µA                              |
| Sensor cable resistance.....                          | < 50 Ω per wire                       |
| Effect of sensor cable resistance<br>(3-/4-wire)..... | < 0.002 Ω / Ω                         |
| Sensor error detection.....                           | Yes - selectable via DIP-<br>switch   |
| Broken sensor detection.....                          | > 800 Ω                               |
| Shorted sensor detection.....                         | < 18 Ω                                |

### TC input

|                              |                |
|------------------------------|----------------|
| Temperature range, TC J..... | -100...+1200°C |
| Temperature range, TC K..... | -180...+1372°C |

Accuracy: the greater of..... Better than 0.05% of span or  
0.5°C

|  |                                     |
|--|-------------------------------------|
| Temperature coefficient: the<br>greater of.....                              | 0.1°C/°C or ≤ ±0.01%/°C             |
| Sensor cable resistance.....   | < 5 kΩ per wire                     |
| Cold junction compensation<br>(CJC): Accuracy @ external<br>Pt100 input..... | Better than ±0.15°C                 |
| Cold junction compensation<br>(CJC): Accuracy @ internal<br>CJC.....         | Better than ±2.5°C                  |
| Internal CJC error detection.....  | Yes                                 |
| External CJC error detection.....  | Yes - selectable via DIP-<br>switch |
| Open Thermocouple detection.....   | Yes - selectable via DIP-<br>switch |

## Output specifications

### Common output specifications

|                    |       |
|--------------------|-------|
| Updating time..... | 10 ms |
|--------------------|-------|

### Current output

|                                 |  |
|---------------------------------|--|
| Programmable signal ranges..... | 4...20 and 20...4 mA                           |
| Load (@ current output).....    | ≤ (Vsupply - 6.2) / 0.023 [Ω]                  |
| Load stability.....             | ≤ 0.01% of span / 100 Ω                        |
| Sensor error indication.....    | 3.5 mA or 23 mA / acc. to<br>NAMUR NE43 or OFF |
| HART protocol revisions.....    | HART 7   |

## I.S. / Ex marking

|             |   |
|-------------|---|
| ATEX.....   | II 3 G Ex nA IIC T4 Gc  |
| IECEX.....  | Ex nA IIC T4 Gc   |
| FM, US..... | Cl. I, Div. 2, Gp. A, B, C, D T4<br>or Cl. I, Zone 2, AEx nA IIC T4 |
| FM, CA..... | Cl. I, Div. 2, Gp. A, B, C, D T4<br>or Cl. I, Zone 2, Ex nA IIC T4  |

## Observed authority requirements

|           |                |
|-----------|----------------|
| EMC.....  | 2014/30/EU     |
| LVD.....  | 2014/35/EU     |
| RoHS..... | 2011/65/EU     |
| EAC.....  | TR-CU 020/2011 |

## Approvals

|                      |                              |
|----------------------|------------------------------|
| ATEX 2014/34/EU..... | KEMA 10ATEX0147 X            |
| IECEX.....           | KEM 10.0068X                 |
| FM.....              | FM17US0004X /<br>FM17CA0003X |
| DNV-GL Marine.....   | Stand. f. Certific. No. 2.4  |
| UL.....              | UL 61010-1                   |