

HART 7 temperature converter, loop-powered

3337

- Excellent accuracy, better than 0.05% of span
- Excellent EMC performance
- Selectable 60 ms / 60 s response time
- Pre-calibrated temperature ranges selectable via DIP switches
- Slimline 6.1 mm housing



Functional highlights

- Temperature converter which 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 that protects the control system from transients and noise and eliminates ground loops.
- All terminals are over-voltage protected, polarity protected and short-circuit protected.
- The device can be mounted in Safe area or in Zone 2 / Division 2 areas and is approved for marine applications.

Technical highlights

- Flexibly loop-powered by 6.2...35 VDC via connectors.
- Excellent conversion accuracy in all available ranges, better than 0.05% of span.
- Selectable internal / external CJC.
- 60 ms fast response time with simultaneous sensor error detection when selected.
- Meeting the NAMUR NE21 recommendations, this device ensures top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- Excellent signal / noise ratio > 60 dB.
- High galvanic isolation of 2.5 kVAC.
- Wide ambient temperature range: -25...+70°C.

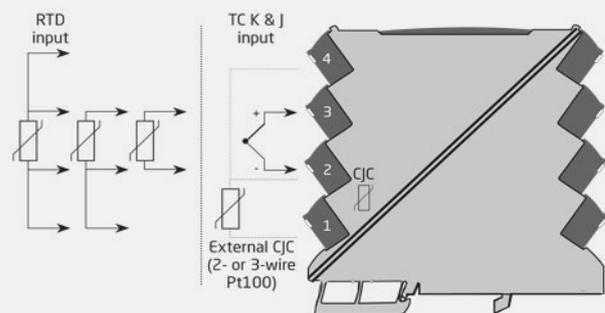
Programming

- Selectable DIP-mode for easy configuration of more than 1000 factory calibrated measurement ranges with HART read only feature.
- Selectable HART mode with HART 7 revision protocol enables extended device programming.
- Selectable HART-mode to enable full HART read-write capability.

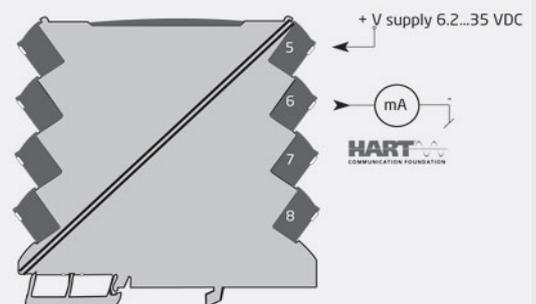
Mounting / installation

- The narrow 6.1 mm housing allows up to 163 units per meter.
- Units can be mounted side by side, horizontally and vertically, without air gap on a standard DIN rail, even at 70°C ambient temperature. 10

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. / 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 ² / AWG 26...12 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 / working..... | 2.5 kVAC / 300 VAC (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 NE21, A criterion, burst..... | < ±1% of span |
| Incorrect DIP-switch setting 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 0.1°C |

| | |
|---|---------------------------------|
| Temperature coefficient: the 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 (3-/4-wire)..... | < 0.002 Ω / Ω |
| Sensor error detection..... | Yes - selectable via DIP-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 greater of..... | 0.1°C/°C or ≤ ±0.01%/°C |
| Sensor cable resistance..... | < 5 kΩ per wire |

Cold junction compensation

| | |
|--|---------------------|
| (CJC): Accuracy @ external Pt100 input..... | Better than ±0.15°C |
|--|---------------------|

Cold junction compensation

| | |
|--|--------------------|
| (CJC): Accuracy @ internal CJC..... | Better than ±2.5°C |
|--|--------------------|

| | |
|-----------------------------------|---------------------------------|
| Internal CJC error detection..... | Yes |
| External CJC error detection..... | Yes - selectable via DIP-switch |
| Open Thermocouple detection..... | Yes - selectable via DIP-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 NAMUR NE43 or OFF |
| HART protocol revisions..... | HART 7 |

I.S. / Ex marking

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

Observed authority requirements

| | |
|-------------|------------------------------|
| EMC..... | 2014/30/EU & UK SI 2016/1091 |
| LVD..... | 2014/35/EU & UK SI 2016/1101 |
| 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..... | KEMA 10ATEX0147 X |
| IECEX..... | KEM 10.0068X |
| UKEX..... | DEKRA 21UKEX0055X |
| c FM us..... | FM17US0004X / FM17CA0003X |
| c UL us, UL 61010-1..... | E314307 |
| EAC Ex..... | EAEU KZ 7500361.01.01.08756 |
| DNV Marine..... | TAA00001RW |