

## HART 7 temperature converter - isolated

### 3113

- 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 3113 temperature converter measures a standard Pt100, TC J and K temperature sensor, and provides an isolated active analog current and HART signal output.
- High 3 port isolation provides surge suppression and protects the control system from transients and noise.
- The 3113 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

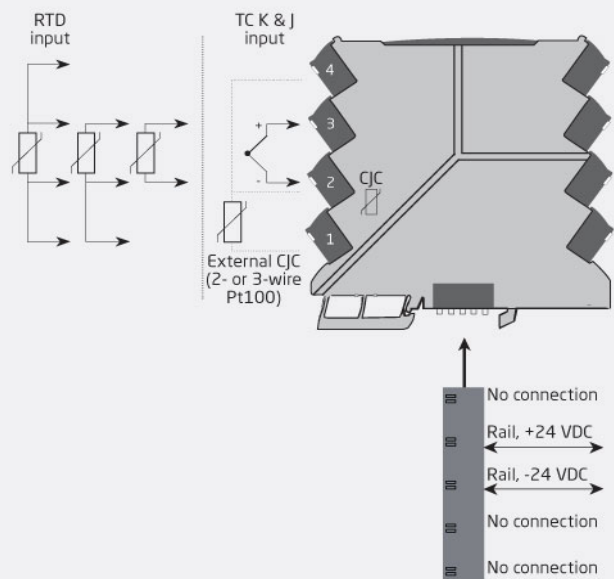
#### Technical characteristics

- Flexibly powered by 24 VDC ( $\pm 30\%$ ) via power rail or 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 3113 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- A visible green LED indicates operational status of the unit and the input sensor.
- All terminals are protected against overvoltage and polarity error.
- High galvanic isolation of 2.5 kVAC.
- Excellent signal/noise ratio of  $> 60$  dB.

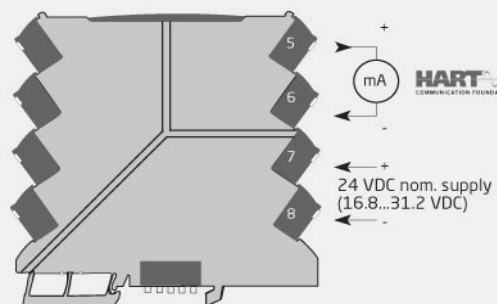
#### Mounting / installation / programming

- 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  $-25...+70^{\circ}\text{C}$ .

#### Applications



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



Order:

| Type |
|------|
| 3113 |

## 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 & measurement / 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 x 2.5 mm <sup>2</sup> / 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.....      | 16.8...31.2 VDC |
| Max. required power..... | 0.7 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                    |

|               |                                     |
|---------------|-------------------------------------|
| Accuracy..... | Better than 0.05% of selected range |
|---------------|-------------------------------------|

|   |                                 |
|---|---------------------------------|
| Signal / noise ratio.....                                   | > 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 NE 21, A criterion, burst..... | < ±1% of span                   |
| Incorrect DIP-switch setting identification.....            | 3.5 mA output; LED 0.5 s / 1 Hz |

## Input specifications

### RTD input

|                                    |                                    |
|------------------------------------|------------------------------------|
| Temperature range, Pt100.....      | -200...+850°C                      |
| Min. measurement range (span)..... | 10°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                     |
| Min. measurement range (span) - TC J & K..... | 50°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

|                                 |                         |
|---------------------------------|-------------------------|
| Signal range.....               | 0...23 mA               |
| Programmable signal ranges..... | 4...20 and 20...4 mA    |
| Load (@ current output).....    | ≤ 600 Ω                 |
| Load stability.....             | ≤ 0.01% of span / 100 Ω |

|                              |   |
|------------------------------|---|
| Sensor error indication..... | 3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF |
| Open output.....             | < 20 V                                      |
| HART protocol revisions..... | HART 7                                      |

## Observed authority requirements

|           |            |
|-----------|------------|
| EMC.....  | 2014/30/EU |
| LVD.....  | 2014/35/EU |
| RoHS..... | 2011/65/EU |

## Approvals

|                      |                             |
|----------------------|-----------------------------|
| ATEX 2014/34/EU..... | KEMA 10ATEX0147 X           |
| IECEx.....           | KEM 10.0068X                |
| FM.....              | FM17US0004X / FM17CA0003X   |
| DNV-GL Marine.....   | Stand. f. Certific. No. 2.4 |
| DNV-GL Marine.....   | V1-7-2                      |
| EAC.....             | TR-CU 020/2011              |
| UL.....              | UL 61010-1                  |