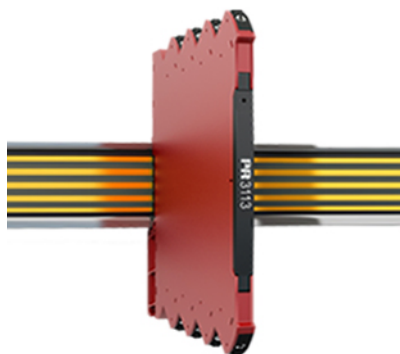




## HART 7 temperature converter - isolated

### 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.

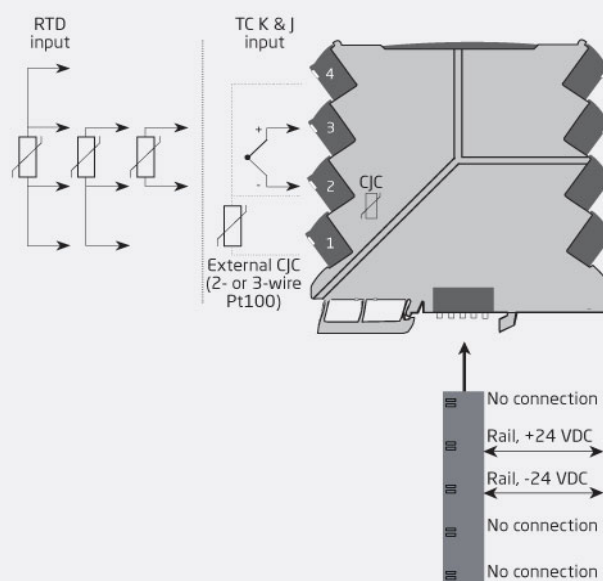
#### Technical characteristics

- 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.

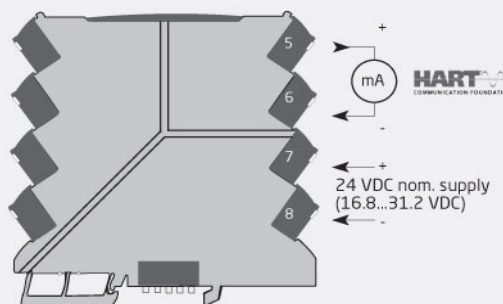
#### Mounting / installation / programming

- 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 | Version                                                                  |
|------|--------------------------------------------------------------------------|
| 3113 | With power rail connector / terminals : -<br>Supplied via terminals : -N |

Example: 3113-N

## 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

|                                                               |                                                   |
|---------------------------------------------------------------|---------------------------------------------------|
| <b>Supply</b>                                                 |                                                   |
| Supply voltage.....                                           | 16.8...31.2 VDC                                   |
| Max. required power.....                                      | 0.70 W                                            |
| Max. power dissipation.....                                   | 0.70 W                                            |
| <b>Isolation voltage</b>                                      |                                                   |
| Isolation voltage, test /<br>working.....                     | 2.5 kVAC / 300 VAC<br>(reinforced)                |
| Zone 2 / Div. 2.....                                          | 250 VAC                                           |
| <b>Response time</b>                                          |                                                   |
| 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<br>range            |
| Signal / noise ratio.....                                     | Min. 60 dB                                        |
| Long-term stability, better<br>than.....                      | ±0.1% of span / year (±0.3%<br>of span / 5 years) |
| 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 output; LED 0.5 s / 1<br>Hz                |

## Input specifications

|                                                       |                                       |
|-------------------------------------------------------|---------------------------------------|
| <b>RTD input</b>                                      |                                       |
| Temperature range, Pt100.....                         | -200...+850°C                         |
| Min. measurement range (span).....                    | 10°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                        |
| Min. measurement range (span)<br>- TC J & K.....                             | 50°C                                  |
| Accuracy: the greater of.....                                                | Better than 0.05% of span or<br>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

|                                     |                                                |
|-------------------------------------|------------------------------------------------|
| <b>Common output specifications</b> |                                                |
| Updating time.....                  | 10 ms                                          |
| <b>Current output</b>               |                                                |
| 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<br>NAMUR NE43 or OFF |
| Open output.....                    | < 20 V                                         |
| 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  |
| EAC Ex..... | 2Ex nA IIC T4 Gc X                                                  |

## Observed authority requirements

|             |                |
|-------------|----------------|
| EMC.....    | 2014/30/EU     |
| LVD.....    | 2014/35/EU     |
| RoHS.....   | 2011/65/EU     |
| EAC.....    | TR-CU 020/2011 |
| EAC Ex..... | TR-CU 012/2011 |

## Approvals

|                    |                              |
|--------------------|------------------------------|
| ATEX.....          | KEMA 10ATEX0147 X            |
| IECEX.....         | KEM 10.0068X                 |
| FM.....            | FM17US0004X /<br>FM17CA0003X |
| UL.....            | UL 61010-1                   |
| DNV-GL Marine..... | TAA00001RW                   |
| EAC Ex.....        | RU C-DK.HA65.B.00355/19      |