



## Temperature / mA converter, EMPHASIS assessed

### 9113A-EMP

- Input for RTD, TC and mA
- Active / passive mA output via the same two terminals
- 1 or 2 channels
- EMPHASIS assessed instrument for nuclear industry
- SIL 2-certified via Full Assessment



#### Advanced features

- Configuration and monitoring by way of detachable display front (PR 4511/4501); process calibration and signal simulation.
- Copying of the configuration from one device to others of the same type via the display front.
- TC inputs can use either the internal CJC or a terminal with a built-in Pt100 sensor (PR 5910, channel 1 / PR 5913, channel 2) for higher accuracy.
- Advanced monitoring of internal communication and stored data.
- SIL 2 functionality is optional and must be activated in a menu point.

#### Application

- The device can be mounted in and receive signals from non-classified area and zone 2.
- Conversion and scaling of temperature (Pt, Ni and TC) and active current signals.
- 9113A-EMP has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.
- Suitable for the use in systems up to Performance Level "d" according to ISO-13849.

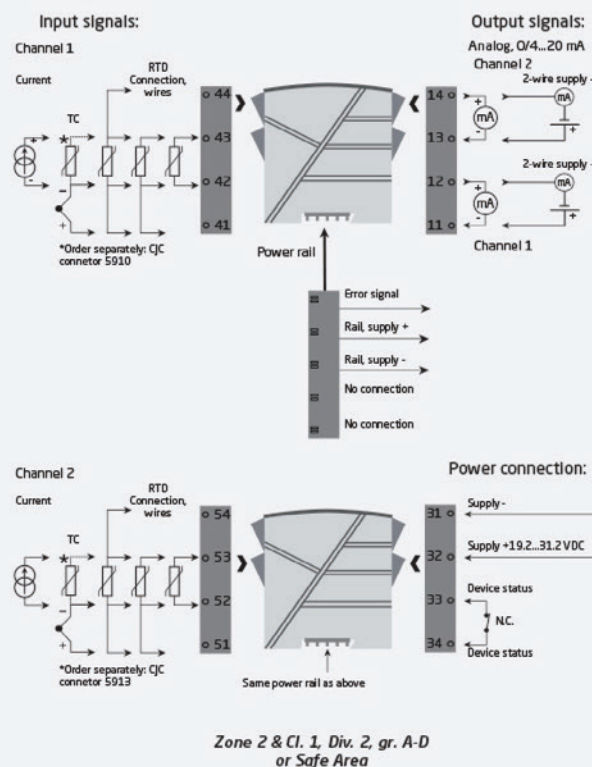
#### Technical characteristics

- 1 green and 2 red front LEDs indicate operation status and malfunction.
- 2.6 kVAC galvanic isolation between input, output and supply.
- Can be supplied separately or installed on power rail, PR type 9400.

#### Mounting

- The devices can be mounted vertically or horizontally without distance between neighbouring units.

#### Applications



## Order

| Type  | Channels                 | EMPHASIS-<br>assessed |
|-------|--------------------------|-----------------------|
| 9113A | Single : A<br>Double : B | -EMP                  |

Example: 9113AB-EMP

## Environmental Conditions

|                              |                                                     |
|------------------------------|-----------------------------------------------------|
| Operating temperature.....   | -20°C to +60°C                                      |
| Storage temperature.....     | -20°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).....                 | 109 x 23.5 x 104 mm                                      |
| Dimensions (HxWxD) w/ 4501/451x.....    | 109 x 23.5 x 116 / 131 mm                                |
| Weight approx.....                      | 250 g                                                    |
| Weight incl. 4501 / 451x (approx.)..... | 265 g / 280 g                                            |
| DIN rail type.....                      | DIN EN 60715/35 mm                                       |
| Wire size.....                          | 0.13...2.08 mm <sup>2</sup> AWG 26...14<br>stranded wire |
| Screw terminal torque.....              | 0.5 Nm                                                   |
| Vibration.....                          | IEC 60068-2-6                                            |
| 2...13.2 Hz.....                        | ±1 mm                                                    |
| 13.2...100 Hz.....                      | ±0.7 g                                                   |

## Common specifications

### Supply

|                                       |                               |
|---------------------------------------|-------------------------------|
| Supply voltage.....                   | 19.2...31.2 VDC               |
| Max. required power.....              | ≤ 0.8 W/≤ 1.4 W (1 ch./2 ch.) |
| Max. power dissipation, 1 / 2 ch..... | ≤ 0.8 W / ≤ 1.4 W             |
| Fuse.....                             | 400 mA SB / 250 VAC           |

### Isolation voltage

|                                   |                                            |
|-----------------------------------|--------------------------------------------|
| Test (working: Input to any.....) | 2.6 kVAC / 300 VAC<br>reinforced isolation |
| Analog output to supply.....      | 2.6 kVAC / 300 VAC<br>reinforced isolation |
| Status relay to supply.....       | 1.5 kVAC / 150 VAC<br>reinforced isolation |

### Response time

|                                                            |                                |
|------------------------------------------------------------|--------------------------------|
| Temperature input, programmable (0...90%, 100...10%).....  | 1...60 s                       |
| mA / V input (programmable).....                           | 0.4...60 s                     |
| Programming.....                                           | PR 45xx                        |
| Signal / noise ratio.....                                  | Min. 60 dB (0...100 kHz)       |
| Signal dynamics, input.....                                | 24 bit                         |
| Signal dynamics, output.....                               | 16 bit                         |
| Accuracy.....                                              | Better than 0.1% of sel. range |
| EMC immunity influence.....                                | < ±0.5% of span                |
| Extended EMC immunity: NAMUR NE21, A criterion, burst..... | < ±1% of span                  |

## Input specifications

### RTD input

|                                                    |                                                                     |
|----------------------------------------------------|---------------------------------------------------------------------|
| RTD type.....                                      | Pt10/20/50/100/200/250/300/P<br>t400/500/1000;<br>Ni50/100/120/1000 |
| Cable resistance per wire.....                     | 50 Ω (max.)                                                         |
| Sensor current.....                                | Nom. 0.2 mA                                                         |
| Effect of sensor cable resistance (3-/4-wire)..... | < 0.002 Ω / Ω                                                       |
| Sensor error detection.....                        | Programmable ON / OFF                                               |

### TC input

|                        |                                             |
|------------------------|---------------------------------------------|
| Thermocouple type..... | B, E, J, K, L, N, R, S, T, U,<br>W3, W5, LR |
|------------------------|---------------------------------------------|

Cold junction compensation (CJC) via ext. sensor in 5910.....

20...28°C ≤ ±1°C, -20...20°C / 28...70°C ≤ 2°C

CJC via int. mounted sensor..... ±(2.0°C + 0.4°C \* Δt)

Δt = ..... Internal temp.-ambient temp.

Sensor error detection..... Programmable ON or OFF (only wire breakage)

Sensor error current: When detecting / else.....

Nom. 2 μA / 0 μA

### Current input

|                                      |                       |
|--------------------------------------|-----------------------|
| Measurement range.....               | 0...23 mA             |
| Programmable measurement ranges..... | 0...20 and 4...20 mA  |
| Input resistance.....                | Nom. 20 Ω + PTC 50 Ω  |
| Sensor error detection.....          | Programmable ON / OFF |

## Output specifications

### Current output

|                                                         |                                |
|---------------------------------------------------------|--------------------------------|
| Signal range.....                                       | 0...23 mA                      |
| Programmable signal ranges.....                         | 0...20/4...20/20...0/20...4 mA |
| Load (@ current output).....                            | ≤ 600 Ω                        |
| Load stability.....                                     | ≤ 0.01% of span / 100 Ω        |
| Sensor error indication.....                            | 0 / 3.5 / 23 mA / none         |
| NAMUR NE43 Upscale/Downscale.....                       | 23 mA / 3.5 mA                 |
| Output limitation, on 4...20 and 20...4 mA signals..... | 3.8...20.5 mA                  |
| Output limitation, on 0...20 and 20...0 mA signals..... | 0...20.5 mA                    |
| Current limit.....                                      | ≤ 28 mA                        |

### Passive 2-wire mA output

|                                                         |                       |
|---------------------------------------------------------|-----------------------|
| Max. external 2-wire supply.....                        | 26 VDC                |
| Max. load resistance [Ω].....                           | (Vsupply-3.5)/0.023 A |
| Effect of external 2-wire supply voltage variation..... | < 0.005% of span / V  |

### Status relay

|                    |                   |
|--------------------|-------------------|
| Max. voltage.....  | 125 VAC / 110 VDC |
| Max. current.....  | 0.5 AAC / 0.3 ADC |
| Max. AC power..... | 62.5 VA / 32 W    |

of span..... = of the currently selected measurement range

## Observed authority requirements

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

## Approvals

|                    |                                                    |
|--------------------|----------------------------------------------------|
| ATEX.....          | KEMA 07ATEX0148 X                                  |
| IECEx.....         | KEM 09.0052X                                       |
| UL.....            | UL 61010-1                                         |
| DNV-GL Marine..... | Stand. f. Certific. No. 2.4                        |
| ClassNK.....       | TA18527M                                           |
| SIL.....           | SIL 2 certified & fully assessed acc. to IEC 61508 |