Temperature / mA converter, EMPHASIS assessed

9113B-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 5910Ex, channel 1 / PR 5913Ex, 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.

Applications

Input signals:
Channel 1
- Current
- TC
- RTD
- Connection: wires

Output signals:
Channel 2
- Analog: 0/4...20 mA

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Application
- The device can be mounted in the safe area and in zone 2 / cl. 1 div. 2 and receive signals from zone 0, 1, 2 and zone 20, 21, 22 including M1 / Class III/III, Div. 1, Gr. A-G.
- Conversion and scaling of temperature (Pt, Ni and TC) and active current signals.
- The 9113B-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.

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Environmental Conditions
- Operating temperature: -20°C to +60°C
- Storage temperature: -20°C to +85°C
- Calibration temperature: 20° ± 20°C
- Relative humidity: < 95% RH (non-cond.)
- Protection degree: IP20

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: 265 g / 280 g
- DIN rail type: DIN EN 60715/35 mm
- Wire size: 0.13...2.00 mm² AWG 26...14 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 voltage: 19.2...31.2 VDC
- Fuse: 400 mA SB / 250 VAC
- Max. power dissipation, 1 ch.: ≤ 0.8 W /≤ 1.4 W (1 ch./2 ch.)
- Max. power dissipation: 0.8 W /≤ 1.4 W
- Isolation voltage:
  - Test /working: Input to any: 2.6 kVAC / 300 VAC
  - Analog output to supply: 2.6 kVAC / 300 VAC
  - Status relay to supply: 1.5 kVAC / 150 VAC
- Response time:
  - Temperature input, programmable: 0.9...10.0% ........................................ 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/Pt100/500/1000;
  - Nom. 2 μA / 0 μA
- 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

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°C ± ±0.4°C * ΔT
- Sensor error detection: Programmable ON / OFF
- 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...20/0...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
- 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

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
- FM: .................................................. 3038279-C
- INMETRO: .................................................. DEKRA 16.0003 X
- UL: .................................................. UL 61010-1
- EAC Ex: .................................................. RU C-DK.HA65.B.00355/19
- DNV-GL Marine: .................................................. Stand. 1, Certific. No. 2.4
- ClassNK: .................................................. TA18527M
- SIL: .................................................. SIL 2 certified & fully assessed acc. to IEC 61508