Temperature / mA converter

9113A

– Input for RTD, TC and mA
– Active / passive mA output via the same two terminals
– 1 or 2 channels
– Can be supplied separately or installed on power rail, PR type 9400
– SIL 2-certified via Full Assessment

Advanced features

• Configuration and monitoring by way of detachable display front (PR 45xx); 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

• 9113Axx can be mounted in the safe area or in zone 2 / Class I, Division 2, Groups A, B, C, D.
• Conversion and scaling of temperature (Pt, Ni and TC) and active current signals.
• 9113A 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.

Mounting

• The devices can be mounted vertically or horizontally without distance between neighbouring units.
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: Pollution degree 2 & meas. / overvoltage cat. II

Mechanical specifications

Dimensions (HxWxD): 109 x 23.5 x 104 mm
Dimensions (HxWxD) w/ 450/451x: 109 x 23.5 x 116 / 131 mm
Weight approx.: 250 g
Weight incl. 4501 / 451x (approx.): 265 g / 350 g
DIN rail type: DIN EN 60715/35 mm
Wire size: 0.13...2.06 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
Supply voltage: 19.2...31.2 VDC
Fuse: 400 mA SB / 250 VAC
Max. power dissipation: ≤ 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 reinforced isolation

Analog output to supply: 2.6 kVAC / 300 VAC reinforced isolation

Status relay to supply: 1.5 kVAC / 150 VAC 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 t400/500/1000; 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

Cold junction compensation
(CJC) via ext. sensor in
9110... 20...28°C ± ±1°C, -20...20°C / 28...70°C ± 2°C
CJC via int. mounted sensor: ± (2°C ± 0.4°C * Δ)
Sensor error detection: Programmable ON or 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...20 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: ≤ 7.2 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
of span: = of the currently selected measurement range

Observed authority requirements

EMC: 2014/30/EU
LVD: 2014/35/EU
ATEX: 2014/34/EU
RoHS: 2011/65/EU
EAC: TR-CU 020/2011
EAC Ex: TR-CU 020/2011
EAC LVD: TR-CU 004/2011

Approvals

ATEX: KEMA 07ATEX0148 X
IECEx: FM 09.0052X
c FM us: FM19US0059X / FM19CA0032X
c UL us, UL 61010-1: ES14307
c UL us, UL 61010-1: E233111 (only 9113xx-U9)
EAC Ex: RU-CR-05/05.200.40015/19
DIN-GL Marine: TAA00000J
ClassNK: TA18527M
SIL: SIL2 certified & fully assessed acc. to IEC 61508

Example: 9113AB