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 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 has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.

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.

Applications
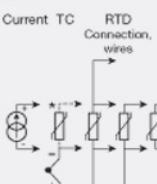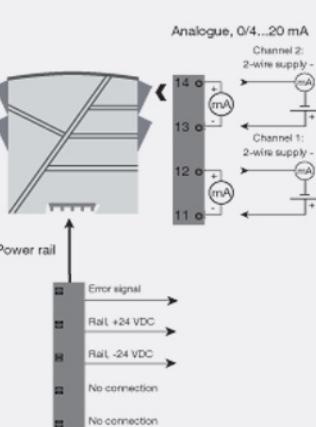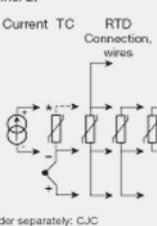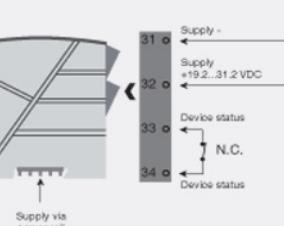
Order:

Type	Unit channels	
9113A	Single	: A
	Double	: B

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. / overvoltage cat. II

Mechanical specifications

Dimensions (HxWxD).....................................	109 x 23.5 x 104 mm
Dimensions (HxWxD) w/ 4501/4511.............	109 x 23.5 x 116 / 131 mm
Weight approx...	250 g
Weight incl. 4501 / 4511 (approx.).................	265 g / 280 g
DIN rail type..	DIN EN 60715/35 mm
Wire size...	0.13...2.08 mm^2 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
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 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..	Communication enabler 4511 / Programming front 4501
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/Pt400/500/1000; 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

Thermocouple type.......................................	B, E, J, K, L, N, R, S, T, U, 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...	110 VDC / 125 VAC
Max. current...	0.3 ADC / 0.5 AAC
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 2014/34/EU...	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