PERFORMANCE MADE SMARTER

Universal converter

9116A

– Input for RTD, TC, Ohm, potentiometer, mA and V
– Supply for 2-wire transmitters
– Active / passive mA output and relay output
– 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, signal and relay simulation.
- Advanced relay configuration, e.g. setpoint, window, delay, sensor error indication and power monitoring.
- Copying of the configuration from one device to others of the same type via the display front.
- TC inputs with internal CJC or external CJC for higher accuracy.
- The device automatically detects whether it must supply an active or a passive current signal.

Application

- The device can be mounted in and receive signals from non-classified area and zone 2.
- Conversion and scaling of temperature, voltage, potentiometer and linear resistance signals.
- Power supply and signal isolator for 2-wire transmitters.
- Monitoring of error events and cable breakage via the individual status relay and/or a collective electronic signal via the power rail.
- 9116A has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.

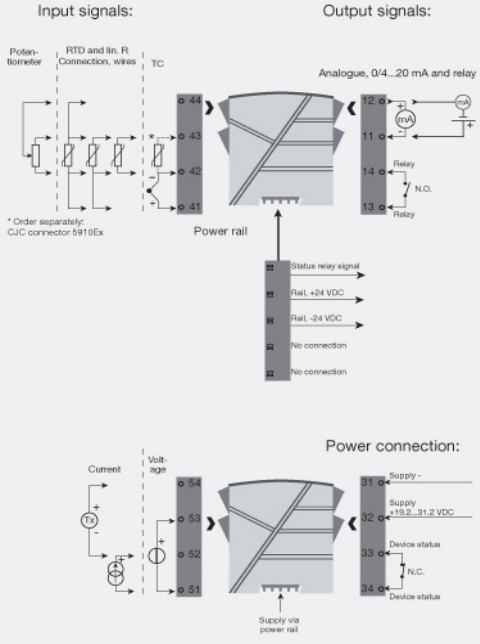
Technical characteristics

- 1 green and 1 red front LED indicate operation status and malfunction. 1 yellow LED indicates relay status.
- 2.6 kVAC galvanic isolation between input, output and supply.

Mounting

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

Connections



Order:

Type	Max. loop voltage	
9116A	Uo 28 VDC	: 1
	Uo 21.4 VDC	: 2

Environmental Conditions

Specifications range	-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 & measurement / 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	185 g
Weight incl. 4501 / 4511 (approx.)	200 g / 285 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 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

Common specifications

Supply voltage	19.2...31.2 VDC
Fuse	1.25 A SB / 250 VAC
Max. power consumption	≤ 3.5 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
Communications interface	Communication enabler 4511 / Programming front 4501
Signal / noise ratio	Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%): Temperature input (programmable)	1...60 s
mA / V input (programmable)	0.4...60 s
Accuracy	Better than 0.1% of selected range
Auxiliary supplies for 9116B1: 2-wire supply (terminal 54...52)	28...16.5 VDC / 0...20 mA
Auxiliary supplies for 9116B2: 2-wire supply (terminal 54...52)	22...16.5 VDC / 0...20 mA

Input specifications

RTD input	Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000
Cable resistance per wire (max.), RTD	50 Ω
Sensor current, RTD	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Programmable ON / OFF
Short circuit detection, RTD	Yes
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 connector 5910	20...28°C ≤ ±1°C, -20...20°C / 28...70°C ≤ 2°C
CJC via internally mounted sensor	±(2.0°C + 0.4°C * Δt)
Δt =	Internal temperature-ambient temperature
Sensor error detection, TC	Programmable ON or OFF (only wire breakage)
Current input: Measurement range	0...20 mA
Current input: Programmable measurement ranges	0...20 and 4...20 mA
Input resistance, current input	Nom. 20 Ω + PTC 50 Ω
Sensor error detection, current input	Loop break 4...20 mA
Voltage input: Measurement range	0...10 VDC
Programmable measurement ranges, VDC	0/0.2...1, 0/1...5, 0/2...10 VDC
Input resistance, voltage input	Nom. >10 MΩ

Output specifications

Current output: Signal range	0...20 mA
Programmable current ranges	0...20 / 4...20 / 20...0 and 20...4 mA
Load (max.)	20 mA/600 Ω/12 VDC
Load stability, current output	≤0.01% of span / 100 Ω
Sensor error indication, current output	0 / 3.5 / 23 mA / none
NAMUR NE 43 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
2-wire 4…20 mA output: External 2-wire supply range	3.5...26 VDC
Signal range	4…20 mA
Max. load resistance [Ω]	(Vsupply - 3.5) / 0.023 A
Load stability, 4…20 mA output	≤ 0.01% of span / 100 Ω
Effect of external 2-wire supply voltage variation	< 0.005% of span / V
Relay output: Relay functions	Setpoint, Window, Sensor error, Power and Off
Hysteresis, in % of span/display range	0.1...25 / 1...25
ON and OFF delay	0...3600 s
Sensor error reaction	Break / Make / Hold
Max. voltage	250 VAC / 30 VDC
Max. current	2 AAC / 2 ADC
Max. AC power	500 VA / 60 W
Max. voltage, status relay	110 VDC / 125 VAC
Max. current, status relay	0.3 ADC / 0.5 AAC
Max. AC power, status relay	62.5 VA / 32 W
*of span	= of the currently selected measurement range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
SIL	SIL 2 certified & fully assessed acc. to IEC 61508