

## Universal converter

### 9116B

- 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 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 PR4501.
- Reduced Uo Ex data < 8.3 V for active input signals.
- 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

- 9116B 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 I/II/III, Div. 1, Gr. A-G.
- 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.
- The 9116 has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.

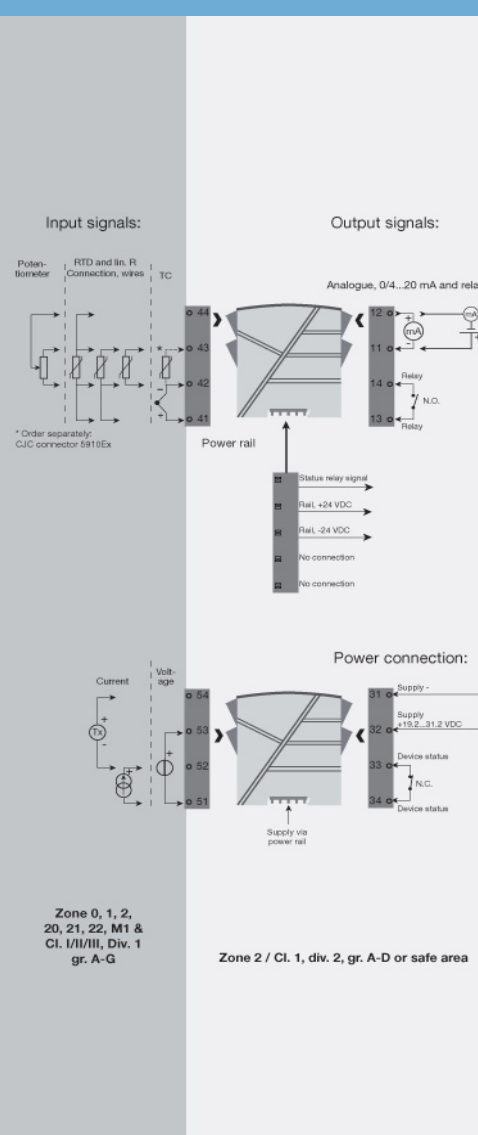
#### Technical characteristics

- 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
9116B	U <sub>0</sub> 28 VDC : 1
	U <sub>0</sub> 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 <sup>2</sup> AWG 26...14 stranded wire
Screw terminal torque.....	0.5 Nm

**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.....	EN 61010-1
ATEX.....	KEMA 10ATEX0053 X
IECEx.....	KEM 10.0022X
FM.....	3038267-C
INMETRO.....	NCC 12.1309 X
UL.....	UL 61010-1
GOST R.....	Yes
GOST Ex.....	Yes
DNV Marine.....	Stand. f. Certific. No. 2.4
SIL.....	SIL 2 certified & fully assessed acc. to IEC 61508