



## 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 4500); 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 PR 4500.
- Reduced Uo Ex data < 8.3 V for active input signals.
- TC inputs with internal CJC or external CJC for higher accuracy.
- Active / passive mA output via the same two terminals.

#### 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.
- Suitable for the use in systems up to Performance Level "d" according to ISO-13849.

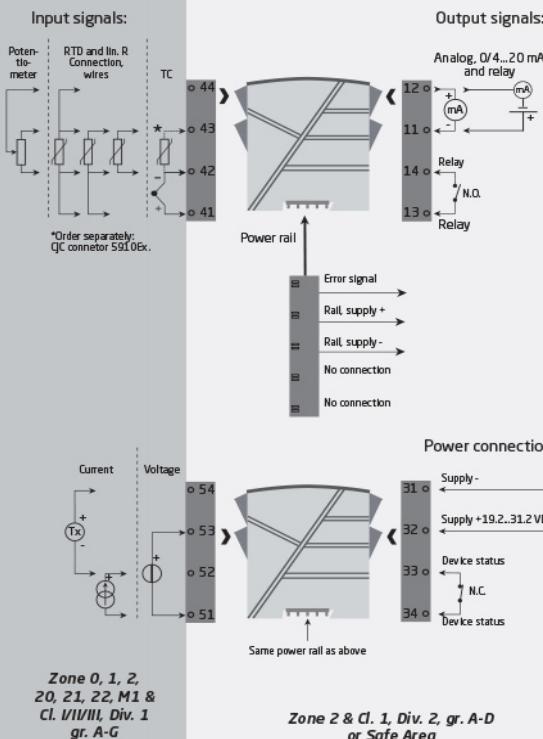
#### Technical characteristics

- 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.

#### Applications



## Order

Type	Max. loop voltage	I.S. / Ex approvals
9116B	Uo 28 VDC : 1	ATEX, IECEx, FM, INMETRO, EAC-Ex, UKEX :-
	Uo 21.4 VDC : 2	UL 913, ATEX, IECEx, FM, INMETRO, EAC-Ex, UKEX :-U9 KCs, ATEX, IECEx, FM, INMETRO, EAC-Ex, UKEX :- KCs

Example: 9116B2

## 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/ PR 4500.....	109 x 23.5 x 131 mm
Weight approx.....	185 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
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.....	1.25 A SB / 250 VAC
Max. required power.....	≤ 2.1 W
Max. power dissipation.....	≤ 1.7 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

## Auxiliary supplies

9116x1x: 2-w. sup. (term. 54...52).....	28...16.5 VDC / 0...20 mA
9116x2x: 2-w. sup. (term. 54...52).....	21.4...16.5 VDC / 0...20 mA
Programming.....	PR 4500 communication interfaces
Signal dynamics, input.....	24 bit
Signal dynamics, output.....	16 bit
Signal / noise ratio.....	Min. 60 dB (0...100 kHz)
Accuracy.....	Better than 0.1% of sel. range

## Input specifications

### RTD input

RTD type.....	Pt10/20/50/100/200/250; Pt300/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

Short circuit detection..... Yes

### Potentiometer input

Potentiometer min....max..... 10 Ω...10 kΩ

### 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)

### 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..... Loop break 4...20 mA

### Voltage input

Measurement range..... 0...12 VDC

Programmable measurement ranges..... 0/0.2...1, 0/1...5, 0/2...10 VDC

Input resistance..... Nom. >10 MΩ

## Output specifications

### Current output

Signal range..... 0...23 mA

Programmable signal ranges..... 0...20/4...20/20/0...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

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

### Relay output

Relay functions..... Setpoint, Window, Sensor error, Power and Off

Max. voltage..... 250 VAC / VDC

Max. current..... 2 A

Max. AC power..... 500 VA

Max. DC current, resistive load > 30 VDC..... See manual for details

### 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 & UK SI 2016/1091
LVD.....	2014/35/EU & UK SI 2016/1101
RoHS.....	2011/65/EU & UK SI 2012/3032
ATEX.....	2014/34/EU & UK SI 2016/1107
EAC.....	TR-CU 020/2011
EAC Ex.....	TR-CU 012/2011
EAC LVD.....	TR-CU 004/2011

## **Approvals**

ATEX.....	KEMA 10ATEX0053 X
IECEx.....	KEM 10.0022X
UKEX.....	DEKRA 21UKEX0177X
UKEX.....	DEKRA 23UKEX0104X
c FM us.....	FM19US0058X / FM19CA0031X
INMETRO.....	DEKRA 23.0006X
c UL us, UL 61010-1.....	E314307
c UL us, UL 913.....	E233311 (only 9116xx-U9)
KCs.....	21_AV4BO_0176X / 21_AV4BO_0177X (only 9116Bx-KCs)
EAC Ex.....	RU C-DK.HA65.B.00355/19
DNV Marine.....	TAA00000JD
ClassNK.....	TA24034M
SIL.....	SIL 2 certified & fully assessed acc. to IEC 61508