

## 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 45xx); 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 45xx.
- 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.

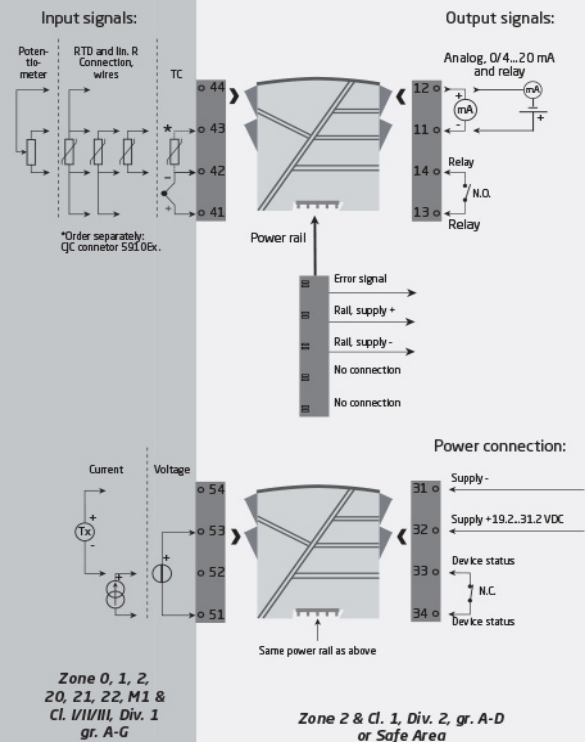
#### Technical characteristics

- 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	Associated apparatus	Max. loop voltage	I.S. / Ex approvals
9116	Yes	: B U <sub>0</sub> 28 VDC : 1 U <sub>0</sub> 21.4 VDC : 2	ATEX, IECEx, FM, INMETRO, EAC-Ex : -
			cULus, ATEX, IECEx, FM, INMETRO, EAC-Ex : U9

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/ 4501/451x.....	109 x 23.5 x 116 / 131 mm
Weight approx.....	185 g
Weight incl. 4501 / 451x (approx.).....	200 g / 215 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

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.....	Pt10/20/50/100/200/250/300/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
Short circuit detection.....	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 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.

### 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...0/20...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
Max. load resistance [Ω].....	(V <sub>supply</sub> -3.5)/0.023 A
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.....	2 ADC
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
LVD.....	2014/35/EU
ATEX.....	2014/34/EU
RoHS.....	2011/65/EU
EAC.....	TR-CU 020/2011
EAC Ex.....	TR-CU 012/2011

## Approvals

ATEX.....	KEMA 10ATEX0053 X
IECEx.....	KEM 10.0022X
c FM us.....	FM19US0058X / FM19CA0031X
INMETRO.....	DEKRA 16.0004 X
c UL us, UL 61010-1.....	E314307

c UL us, UL 913..... E233311 (only 9116xx-U9)  
EAC Ex..... RU C-DK.HA65.B.00355/19  
DNV-GL Marine..... TAA00000JD  
ClassNK..... TA18527M  
SIL..... SIL 2 certified & fully assessed  
acc. to IEC 61508