PERFORMANCE MADE SMARTER

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.

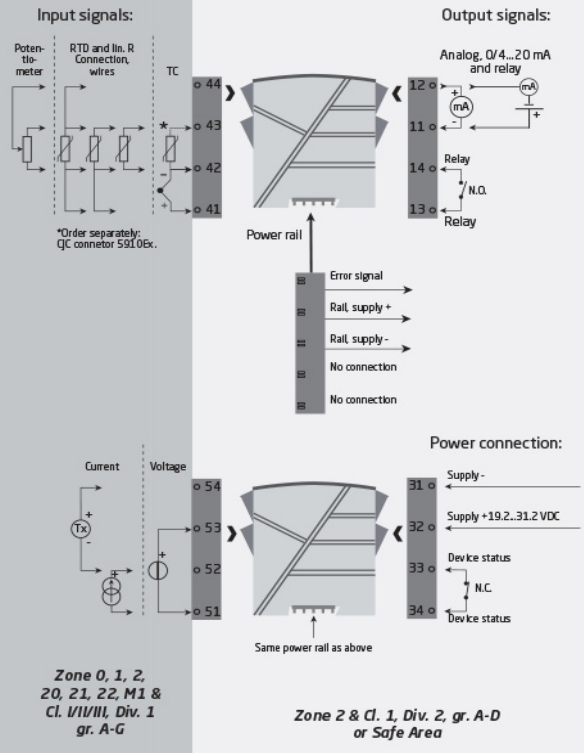
Technical characteristics

- 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



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Order

Type	Max. loop voltage	I.S. / Ex approvals
9116B	Uo 28 VDC : 1	ATEX, IECEx, FM, INMETRO, CCC, EAC-Ex, UKEX : -
	Uo 21.4 VDC : 2	UL 913, ATEX, IECEx, FM, INMETRO, CCC, EAC-Ex, UKEX : -U9
		KCs, ATEX, IECEx, FM, INMETRO, CCC, 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^2 AWG 26...14 stranded wire
Stripping length	5 mm
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...0/20...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)
CCC	2024322316005917
KCs	21_AV4BO_0176X / 21_AV4BO_0177X (only 9116Bx-KCs)
EAC Ex	EAEU KZ 7500361.01.01.08756
DNV Marine	TAA00000JD
ClassNK	TA24034M
SIL	SIL 2 certified & fully assessed acc. to IEC 61508