



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

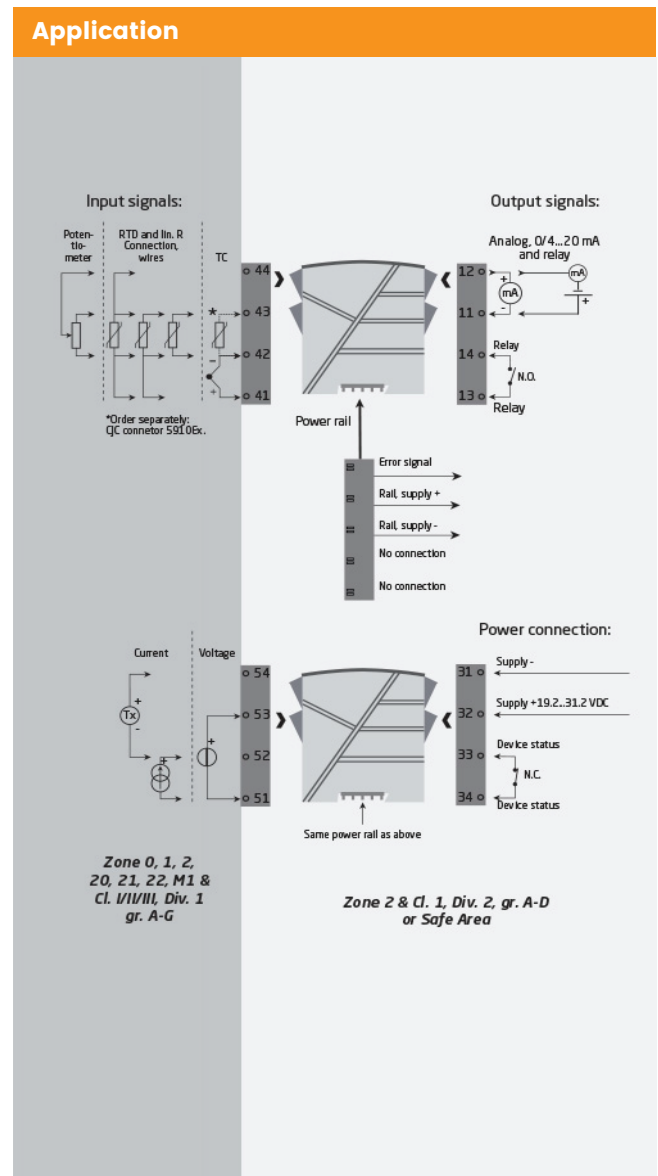
- 9116B can be mounted in the safe area and in zone 2 / cl. 1 div. 2 and receive signals from zone 0, 1, 2 and zone 20, 21, 22 including M1 / Class I/II/III, Div. 1, Gr. A-G.
- Conversion and scaling of temperature, voltage, potentiometer and linear resistance signals.
- Power supply and signal isolator 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.



Order

Type	Channels	I.S. / Ex approvals
9116B	U _o 28VDC :1	ATEX, IECEX, FM INMETRO, EAC-EX, UKEX : -
	U _o 21.4VDC :2	UL 913, ATEX, IECEX, FM INMETRO, EAC-EX, UKEX : -U9
		KSC, ATE, IECEX, FM INMETRO, EAC-EX, UKEX : -KSC

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
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	: Pt10/20/50/100/200/250/300/ 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

Potentiometer input

Potentiometer min....max.	: 10 Ω...10 kΩ
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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 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 indicatio	: 0 / 3.5 / 23 mA / none
NAMUR NE43 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

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 error, Power and Off	: Setpoint, Window, Sensor
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

Approvals

ATEX	: KEMA 10ATEX0053 X
IECEX	: KEM 10.0022X
UKEX	: DEKRA 21UKEX0177X
UKEX	: DEKRA 22UKEXYYYY X - PENDING
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)
KCs	: 21_AV4BO_0176X / 21_AV4BO_0177X (only 9116Bx-KCs)
EAC Ex	: RU C-DK.HA65.B.00355/19
DNV Marine	: TAA00000JD
ClassNK	: TA18527M
SIL	: SIL 2 certified & fully assessed acc. to IEC 61508