

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.

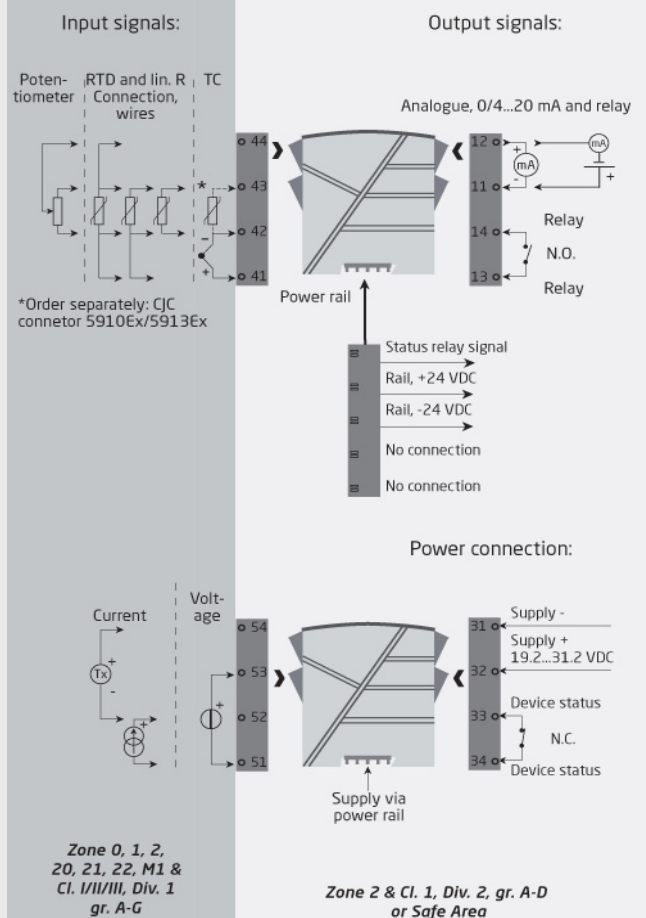
Technical characteristics

- 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 ₀ 28 VDC : 1 |
| | U ₀ 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 |
| 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 : 2007 |
| Vibration: 2...13.2 Hz..... | ±1 mm |
| Vibration: 13.2...100 Hz..... | ±0.7 g |

Common specifications**Supply**

| | |
|---------------------|-----------------|
| Supply voltage..... | 19.2...31.2 VDC |
|---------------------|-----------------|

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

| | |
|--|------------------------------------|
| 9116B1: 2-w. sup. (term. 54...52)..... | 28...16.5 VDC / 0...20 mA |
| 9116B2: 2-w. sup. (term. 54...52)..... | 22...16.5 VDC / 0...20 mA |
| Fuse..... | 1.25 A SB / 250 VAC |
| Max. power consumption..... | ≤ 3.5 W |
| Signal / noise ratio..... | Min. 60 dB (0...100 kHz) |
| Accuracy..... | Better than 0.1% of selected range |

Input specifications**RTD input**

| | |
|--|--|
| RTD type..... | Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000 |
| Cable resistance per wire (max.)..... | 50 Ω |
| 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 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 |

Current input

| | |
|--------------------------------------|----------------------|
| Measurement range..... | 0...20 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...10 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...20 mA |
| Programmable signal ranges..... | 0...20 / 4...20 / 20...0 and 20...4 mA |
| Load (max.)..... | 20 mA/600 Ω/12 VDC |
| Load stability..... | ≤0.01% of span / 100 Ω |
| Sensor error indication..... | 0 / 3.5 / 23 mA / none |
| NAMUR NE 43 Upscale/Downscale..... | 23 mA / 3.5 mA |
| Current limit..... | ≤ 28 mA |

Relay output

| | |
|----------------------|---|
| Relay functions..... | Setpoint, Window, Sensor error, Power and Off |
| Max. voltage..... | 250 VAC / 30 VDC |
| Max. current..... | 2 AAC / 2 ADC |
| Max. AC power..... | 500 VA / 60 W |

Status relay

| | |
|--------------------|-------------------|
| Max. voltage..... | 110 VDC / 125 VAC |
| Max. current..... | 0.3 ADC / 0.5 AAC |
| Max. AC power..... | 62.5 VA / 32 W |

2-wire 4...20 mA output: External

| | |
|-------------------------------|---------------------------------------|
| 2-wire supply range..... | 3.5...26 VDC |
| Signal range..... | 4...20 mA |
| Max. load resistance [Ω]..... | (V _{supply} - 3.5) / 0.023 A |

Approvals

| | |
|----------------------------|--|
| EMC..... | 2004/108/EC |
| LVD..... | 2006/95/EC |
| ATEX 94/9/EC..... | KEMA 10ATEX0053 X |
| IECEX..... | KEM 10.0022X |
| FM..... | 3038267-C |
| INMETRO..... | NCC 12.1309 X |
| UL..... | UL 61010-1 |
| EAC..... | TR-CU 020/2011 |
| EAC Ex TR-CU 012/2011..... | RU C-DK.GB08.V.00410 |
| CCOE..... | P337349/4 |
| DNV Marine..... | Stand. f. Certific. No. 2.4 |
| SIL..... | SIL 2 certified & fully assessed acc. to IEC 61508 |