



Universal converter

9116A

- 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 the display front.
- TC inputs with internal CJC or external CJC for higher accuracy.
- Active / passive mA output via the same two terminals.

Application

- 9116A can be mounted in the safe area or in zone 2 / Class I, Division 2, Groups A, B, C, D.
- 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.
- 9116A 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.

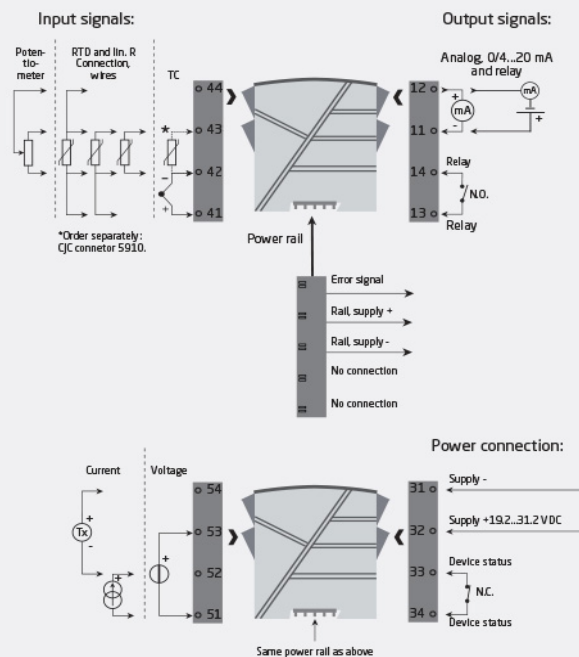
Technical characteristics

- 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



Zone 2 & Cl. 1, Div. 2, gr. A-D or Safe Area

Order

| Type | Max. loop voltage | I.S. / Ex approvals |
|-------|-----------------------------|---|
| 9116A | U ₀ 28 VDC : 1 | ATEX, IECEx, FM, INMETRO, EAC-Ex |
| | U ₀ 21.4 VDC : 2 | cULus, ATEX, IECEx, FM, INMETRO, EAC-Ex |

Example: 9116A2

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 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 |

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) |
| Sensor error detection..... | Programmable ON or OFF (only wire breakage) |

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 |
| LVD..... | 2014/35/EU |
| ATEX..... | 2014/34/EU |
| RoHS..... | 2011/65/EU |
| 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 |
| c FM us..... | FM19US0058X / FM19CA0031X |
| 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 Marine..... TAA00000JD
ClassNK..... TA18527M
SIL..... SIL 2 certified & fully assessed
acc. to IEC 61508