PERFORMANCE MADE SMARTER

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.

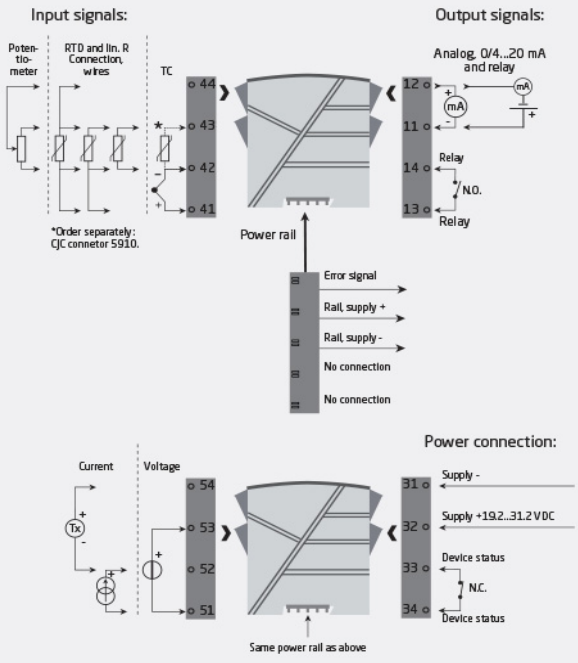
Technical characteristics

- 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	Associated apparatus		Max. loop voltage		I.S. / Ex approvals	
9116	No	: A	Uo 28 VDC	: 1	ATEX, IECEx, FM, INMETRO, EAC-Ex	: -
			Uo 21.4 VDC	: 2	cULus, ATEX, IECEx, FM, INMETRO, EAC-Ex	: U9

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 45xx
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.
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
Max. load resistance [Ω]..... (Vsupply-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
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-GL Marine	TAA00000JD
ClassNK	TA18527M
SIL	SIL 2 certified & fully assessed acc. to IEC 61508