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

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### 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
- **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...2.06 mm² AWG 26...14 stranded wire
- **Screw terminal torque**
  - 0.5 Nm
- **Vibration**
  - IEC 60068-2-6
- **Response time**
  - ≤ 1 ms
- **Stability**
  - 13.2...100 Hz ±0.7 %

### 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...50°C, 10%...100%) 1...60 s
  - mA / V input (programmable) 0.4...60 s
- **Auxiliary supplies**
  - 116x1x: 2-w. sup. (term. 54...52) 28...16.5 VDC / 0...20 mA
  - 116x2x: 2-w. sup. (term. 54...52) 21.4...16.5 VDC / 0...20 mA
  - **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/P
  - **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**

### Output specifications
- **Current output**
  - 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
- **Passive 2-wire m/A 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 A AC / 0.3 ADC
  - **Max. AC power**
    - 62.5 VA / 32 W

### Observed authority requirements
- **EMC**
  - 2014/30/EU
  - 2014/35/EU
- **LVD**
  - 2011/65/EU
- **ATEX**
  - 2014/34/EU
- **RoHS**
  - 2011/65/EU
- **EAC LVD**
  - TR-CU 004/2011
- **EAC Ex**
  - TR-CU 012/2011
- **EAC LVD**
  - TR-CU 004/2011

### Approvals
- **ATEX**
  - KEMA 10ATEX0053 X
  - TR-CU 004/2011
- **IECEx**
  - KEMA 10.0022X
  - FM19US0058X / FM19IC0031X
- **UL us, UL 61010-1**
  - E314307
- **UL us, UL 913**
  - E233311 (only 9116ex-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