Universal converter, EMPHASIS assessed

9116B-EMP

- Input for RTD, TC, Ohm, potentiometer, mA and V
- Supply for 2-wire transmitters
- Active / passive mA output and relay output
- EMPHASIS assessed instrument for nuclear industry
- SIL 2-certified via Full Assessment

Advanced features

- Configuration and monitoring by way of detachable display front (PR4511/4501); 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 PR4511/4501.
- 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-EMP 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 III/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 9116B-EMP 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.
- Can be supplied separately or installed on power rail, PR type 9400.

Mounting

- The devices can be mounted vertically or horizontally without distance between neighbouring units.

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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
Dimensions (HxWxD) w/ 4501/4511x (approx.).... 109 x 23.5 x 116 / 131 mm
Weight approx........................................ 185 g
Weight incl. 4501 / 4511x (approx.)................. 200 g / 215 g
DIN rail type............................................ DIN EN 60715/35 mm
Wire size.................................................. 0.13...2.00 mm² AWG 26...14 stranded wire
Screw terminal torque............................... 0.5 Nm
Vibration................................................ IEC 60068-2-6
Freq. Hz.................................................. 2...13.2 Hz
Vibration Hz........................................... 13.2...100 Hz
Disp. ±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
Analog output to supply.............................. 2.6 kVAC / 300 VAC
Status relay to supply............................... 1.5 kVAC / 150 VAC
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
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
4501/500/1000; N50/100/120/1000
Cable resistance per wire........................... 50 Ω (max.)
Sensor current........................................... Nom. 0.2 mA
Effect of sensor cable resistance (3-wire)......... ≤ 0.002 Ω / Ω
Sensor error detection............................... Programmable ON / OFF
Short circuit detection............................... Yes
TC input..................................................

Output specifications
Current output
Signal range........................................... 0...23 mA
Programmable signal ranges......................... 0...20mA / 20mA / 20mA / 20mA
Load (@ current output)............................... ≤ 600 Ω
Load stability.......................................... ≤ 0.01% of span / 100 Ω
Sensor error indication.............................. 0 / 3 / 0.25 / 20 mA / none
NAMUR NE43 Upscale/Downscale.................. 23 mA / 35 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
RoHS....................................................... 2011/65/EU
EAC........................................................ TR-CU 020/2011

Approvals
ATEX........................................................ KEMA 10ATEX0053 X
IECEx...................................................... KEMA 10.0022X
FM.......................................................... 3035627-C
INMETRO............................................... DEKRA 16.0004 X
UL.......................................................... UL 61010-1
EAC......................................................... RU C-DK.GB08.V.00410
DNV-GL.................................................. Stand. 1 Certific. No. 2.4
ClassNK.................................................. TA18527M
SIL........................................................ SII 2 certified & fully assessed acc. to IEC 61508