PERFORMANCE MADE SMARTER



Universal transmitter

4116

– Input for RTD, TC, Ohm, potentiometer, mA and V
– 2-wire supply > 16 V
– FM-approved for installation in Div. 2
– Output for current, voltage and 2 relays
– Universal AC or DC supply

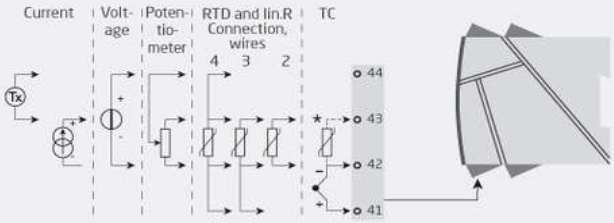
Application
- Linearized, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analog current / voltage signal, i.e. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire transmitters.
- Process control with 2 pairs of potential-free relay contacts and analog output.
- Galvanic separation of analog signals and measurement of floating signals.
- The 4116 is designed according to strict safety requirements and is therefore suitable for application in SIL 2 installations.
- Suitable for the use in systems up to Performance Level “d” according to ISO-13849.

Technical characteristics
- When 4116 is used in combination with the PR 4500 display series, all operational parameters can be modified to suit any application. As the 4116 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green / red front LED indicates normal operation and malfunction. A yellow LED is ON for each active output relay.
- Continuous check of vital stored data for safety reasons.
- 4-port 2.3 kVAC galvanic isolation.

Mounting / installation / programming
- Very low power consumption means units can be mounted side by side without an air gap – even at 60°C ambient temperature.
- Configuration, monitoring, 2-point process calibration and more are accomplished using PR's 4500 series of detachable displays.
- All programming can be password-protected.

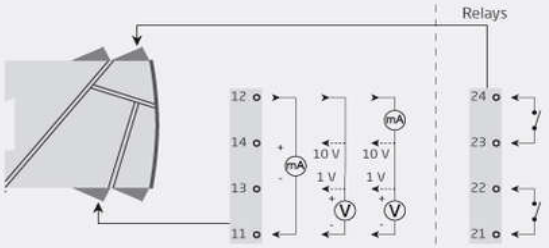
Applications

Input signals:



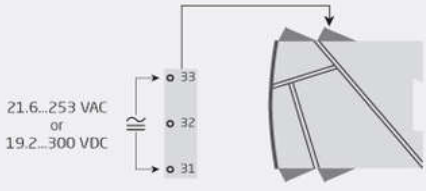
*Order separately: CJC connector 5910.

Output signals:



Analog, 0/4...20 mA and voltage

Supply:



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Order:

Type
4116

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

Mechanical specifications

Dimensions (HxWxD)	109 x 23.5 x 104 mm
Dimensions (HxWxD) w/ PR 4500	109 x 23.5 x 131 mm
Weight approx.	175 g
Weight incl. 4501 / 451x (approx.)	190 g / 205 g
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, universal	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Fuse	400 mA SB / 250 VAC
Max. required power	≤ 2.5 W
Max. power dissipation	≤ 2.5 W

Isolation voltage

Test voltage	2.3 kVAC
Working voltage	250 VAC (reinforced) / 500 VAC (basic)

Response time

Temperature input (0...90%, 100...10%)	≤ 1 s
mA / V input (0...90%, 100...10%)	≤ 400 ms

Auxiliary supplies

2-w. supply (term. 44...43)	25...16 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
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE21, A criterion, burst	< ±1% of span

Input specifications

RTD input

RTD type	Pt10/20/50/100/200/250; Pt300/400/500/1000; Ni50/100/120/1000; Cu10/20/50/100
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	Yes
Short circuit detection	< 15 Ω

Linear resistance input

Linear resistance min....max	0 Ω...10000 Ω

Potentiometer input

Potentiometer min....max	10 Ω...100 kΩ

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	Yes
Sensor error current: When detecting / else	Nom. 2 µA / 0 µA

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	Yes

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)	≤ 800 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
Output limitation, on 4...20 and 20...4 mA signals	3.8...20.5 mA
Output limitation, on 0...20 and 20...0 mA signals	0...20.5 mA
Current limit	≤ 28 mA

Voltage output

Signal range	0...10 VDC
Programmable signal ranges	0/0.2...1; 0/1...5 ; 0/2...10; 1...0.2/0; 5...1/0; 10...2/0 V
Load (@ voltage output)	≥ 500 kΩ

Relay output

Relay functions	Setpoint, Window, Sensor error, Latch, 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

Observed authority requirements

EMC	2014/30/EU & UK SI 2016/1091
LVD	2014/35/EU & UK SI 2016/1101
RoHS	2011/65/EU & UK SI 2012/3032
EAC	TR-CU 020/2011

Approvals

c UL us, UL 508	E231911
FM	3025177
DNV Marine	TAA0000101
EU RO MR Type Approval	MRA000000Z
SIL	Hardware assessed for use in SIL applications