

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.

Technical characteristics

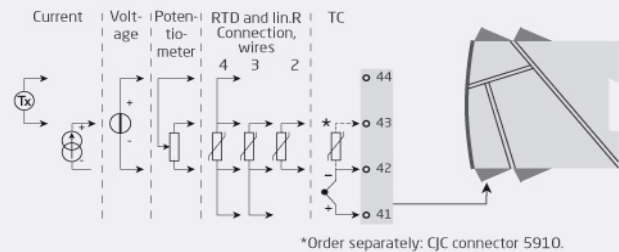
- When 4116 is used in combination with the 45xx display / programming units, all operational parameters can be modified to suit any application. As the 4116 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green / red front LED indicates 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.
- Suitable for the use in systems up to Performance Level "d" according to ISO-13849.

Mounting / installation / programming

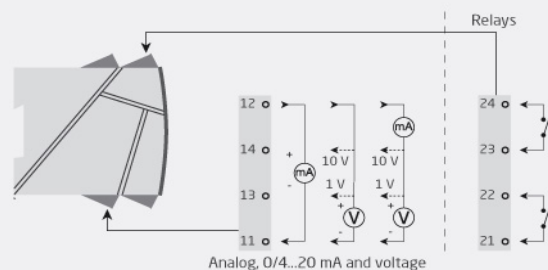
- Very low power consumption means units can be mounted side by side without an air gap – even at 60°C ambient temperature.
- Configuration, monitoring, 2-point process calibration and more are accomplished using PR's 45xx detachable displays.
- All programming can be password-protected.

Applications

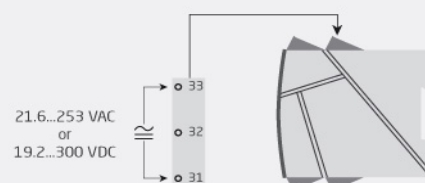
Input signals:



Output signals:



Supply:



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/ 4501/451x.....	109 x 23.5 x 116 / 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 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
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
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Potentiometer input

Potentiometer min...max.....	10 Ω...100 kΩ
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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.....	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.....	2 ADC
Max. DC current, resistive load > 30 VDC.....	See manual for details

Observed authority requirements

EMC.....	2014/30/EU
LVD.....	2014/35/EU
RoHS.....	2011/65/EU
EAC.....	TR-CU 020/2011

Approvals

c UL us, UL 508 / C22.2 No. 14.....	E231911
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FM..... 3025177
DNV-GL Marine..... TAA0000101
EU RO Mutual Recognition Type
Approval..... MRA000000Z
SIL..... Hardware assessed for use in
SIL applications