

Signal conditioning & Communication *Product catalog*

PERFORMANCE
MADE
SMARTER



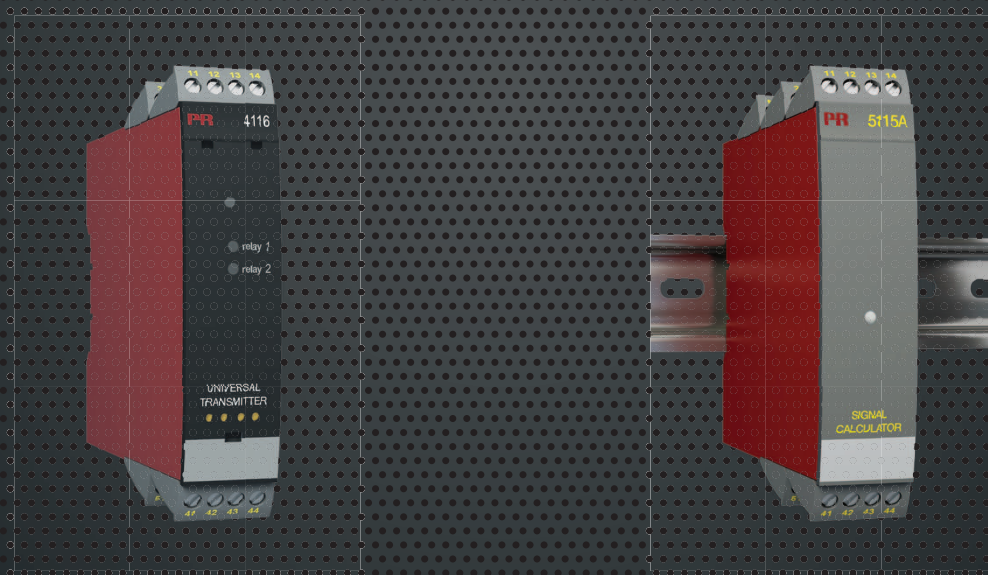
TEMPERATURE | I.S. INTERFACES | COMMUNICATION INTERFACES | **MULTIFUNCTIONAL** | ISOLATION | DISPLAY

PR
electronics

Our multifunctional devices are easily deployable as your site standard

Our unique range of single devices accepts a wide range of inputs and provides a wide range of outputs. These multifunctional devices cover isolation, conversion, scaling, amplification, alarming, control and more.

Having one variant that applies to a broad range of applications can reduce your installation time and training and greatly simplify spare-parts management at your facilities. Our devices are designed for long-term signal accuracy, low power consumption, simple programming and immunity to electrical noise.



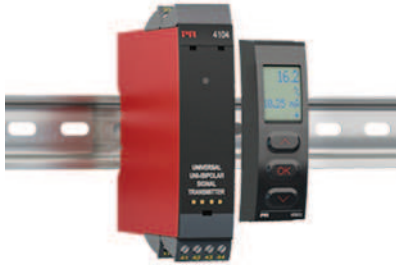


Multifunctional

4104 - Universal uni-/bipolar signal transmitter	D.2
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4131 - Universal trip amplifier	D.8
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Universal uni-/bipolar signal transmitter

4104



- Measures and outputs uni-/bipolar voltage and current signals
- Works with both passive and active inputs and outputs
- Uses the 4501 display for programming and process monitoring
- Fast < 20 ms response time and excellent < 0.05% accuracy
- Universally powered by 21.6...253 VAC / 19.2...300 VDC



Application

- Fast < 20 ms response time for measuring signals produced by torque, position, current & acceleration sensors.
- User configurable bipolar or unipolar I/O means the 4104 is suitable for nearly any voltage or current conversion.
- The excitation source enables measurement of two or three wire transmitters.
- The active or passive I/O makes the 4104 perfect for power matching current loops.
- Converts narrow bipolar inputs to wide bipolar or unipolar outputs, e.g., ± 1 volt input = ± 10 volt or 4...20 mA output.
- Selectable direct or inverse I/O makes the 4104 suitable for proportional control applications.
- The "V-curve" function outputs 100% - 0 - 100% when a 0 - 100% input signal is present.

Technical characteristics

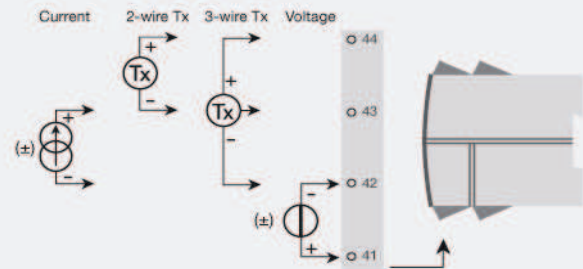
- The latest analog and digital techniques are used to obtain maximum accuracy and immunity to interference.
- The current output can drive up to 800 Ohms, with an adjustable response time of 0.0...60.0 seconds.
- Exceptional mA output load stability of < 0.001% of span/100 Ohm.
- Meets the NAMUR NE21 recommendations, ensuring high accuracy in harsh EMC environments.
- Meets the NAMUR NE43 recommendations, allowing the control system to easily detect a sensor error.
- Each unit is tested to a high 2.3 kVAC, 3-port galvanic isolation level.
- Excellent signal to noise ratio of > 60 dB.

Mounting / installation / programming

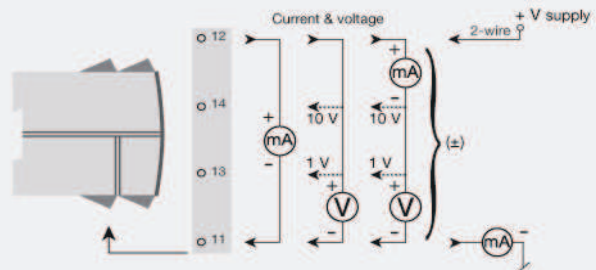
- Very low power consumption means units can be mounted side by side without an air gap - even at 60°C ambient temperature.
- Approved for marine applications.
- Programming, monitoring, and 2-point process calibration is accomplished with the 4501 detachable display.
- All programming can be password protected.

Connections

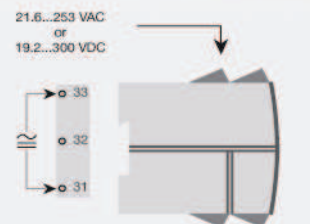
Input signals



Output signals



Supply



Safe Area or
Zone 2 / Cl. 1, Div. 2, gr. A-D

Order:

Type
4104

Environmental Conditions

Specifications range.....	-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 & measurement / overvoltage cat. II

Mechanical specifications

Dimensions (HxWxD).....	109 x 23.5 x 104 mm
Dimensions (HxWxD) w/ 4501 / 4511.....	109 x 23.5 x 116 / 131 mm
Weight approx.....	250 g
Weight incl. 4501 / 4511 (approx.).....	265 g / 350 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

Common specifications

Supply voltage, universal.....	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Max. power consumption.....	≤ 2.5 W
Internal consumption.....	≤ 2.0 W
Isolation voltage, test / working.....	2.3 kVAC / 250 VAC
Communications interface.....	Communication enabler 4511 / Programming front 4501
Signal / noise ratio.....	> 60 dB
Response time (0...90%, 100...10%).....	< 20 ms
Accuracy.....	Better than 0.05% of selected range
Cut-off frequency (3 dB).....	> 40 Hz
EMC immunity influence.....	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< ±1% of span

Input specifications

Current input: Signal range.....	±23 mA
Current input: Programmable measurement ranges.....	0...20 and 4...20 mA
Current input: Programmable measurement ranges.....	± 10 and ± 20 mA
Input voltage drop.....	1.4 V @ 20 mA
Loop error detection, 4...20 mA: Low.....	< 3.6 mA
Loop error detection, 4...20 mA: High.....	> 21 mA
2-wire loop supply, (terminal 43 & 44).....	> 16 V / 20 mA
3-wire loop supply, (terminal 42 & 44).....	> 18 V / 20 mA
Loop supply limitation, terminal 44, nom.....	30 mA
Voltage input: Signal range.....	±12 V
Programmable measurement ranges, VDC.....	0/0.2...1, 0/1...5, 0/2...10 VDC
Programmable measurement ranges, VDC.....	±1, ±5 and ±10 V
Input resistance, voltage input.....	> 2 MΩ

Output specifications

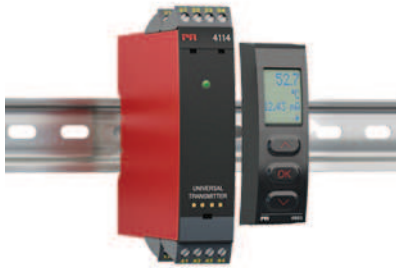
Current output: Signal range.....	0...23 mA (unipolar)
Current output: Signal range.....	-23...+23 mA (bipolar)
Load stability, current output.....	≤ 0.001% of span / 100 Ω
Current limit.....	≤ 28 mA (unipolar)
Current limit.....	± 28 mA (bipolar)
Programmable damping, current signals.....	0.0...60.0 s
Output limitation, on 4...20 and 20...4 mA signals.....	3.8...20.5 mA
Output limitation, on other unipolar mA signals.....	0 and 115% of max. value
Output limitation, on bipolar mA signals.....	±115% of min. & max. values
Current output: Active unipolar and bipolar programmable ranges.....	0...20 and 4...20 mA
Current output: Active unipolar and bipolar programmable ranges.....	±10 and ±20 mA
Current output: Active unipolar and bipolar programmable ranges.....	Direct or Inverted Action
V-curve function, active signals, 100-0-100%.....	20-0-20 mA
Load (max.).....	800 Ω / ±16 V @ ±20 mA
Passive 2-wire mA output: Programmable ranges.....	0...20 and 4...20 mA
Passive 2-wire mA output: Programmable ranges.....	Direct or Inverted action
V-curve function, passive signals, 100-0-100%.....	20-0-20 mA
External loop supply.....	3.5 - 26 V
Programmable voltage ranges.....	0/0.2...1; 0/1...5; 0/2...10 V
Programmable voltage ranges.....	±1, ±5 and ±10 V
Programmable voltage ranges.....	Direct or Inverted action
V-curve function, voltage output, 100-0-100%.....	1-0-1, 5-0-5 and 10-0-10 V
Load (min.).....	> 500 kΩ
Programmable damping, voltage signals.....	0.0...60.0 s
Output limitation - outside range: on unipolar V signals starting from 0.....	0 and 115% of max. value
Output limitation - outside range: on unipolar V signals with offset.....	-5% of min. value and 115% of max. value
Output limitation - outside range: on bipolar V signals.....	±115% of min. & max. values
Sensor error indication, at 4...20 mA input: selectable.....	Low, High, Zero, None

Approvals

EMC.....	EN 61326-1
LVD.....	EN 61010-1
UL.....	UL 508
FM.....	3025177
GOST R.....	Yes
DNV Marine.....	Stand. f. Certific. No. 2.4



Universal transmitter



4114

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



Advanced features

- Programmable by way of detachable display front (4501), process calibration, signal simulation, password protection, error diagnostics and help text available in several languages.

Application

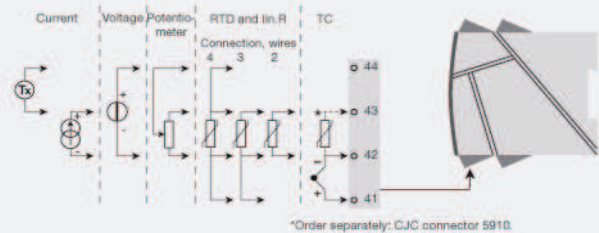
- Linearized, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analog current / voltage signal, i.e. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire transmitters.
- Process control with standard analog output.
- Galvanic separation of analog signals and measurement of floating signals.
- The 4114 is designed according to strict safety requirements and is therefore suitable for application in SIL 2 installations.

Technical characteristics

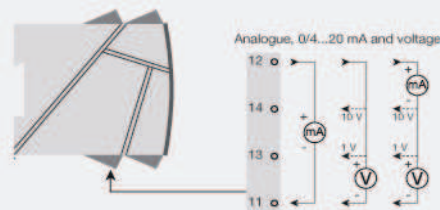
- When 4114 is used with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4114 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green / red front LED indicates normal operation and malfunction.
- Continuous check of vital stored data for safety reasons.
- 3-port 2.3 kVAC galvanic isolation.

Connections

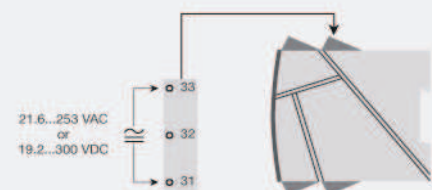
Input signals:



Output signals:



Supply:



Order:

Type
4114

Environmental Conditions

Specifications range.....	-20°C to +60°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 / 4511.....	109 x 23.5 x 116 / 131 mm
Weight approx.....	145 g
Weight incl. 4501 / 4511 (approx.).....	160 g / 245 g
Wire size.....	1 x 2.5 mm ² stranded wire
Screw terminal torque.....	0.5 Nm

Common specifications

Supply voltage, universal.....	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Fuse.....	400 mA SB / 250 VAC
Max. power consumption.....	≤ 2.0 W
Isolation voltage, test / working.....	2.3 kVAC / 250 VAC
Communications interface.....	Communication enabler 4511 / Programming front 4501
Signal / noise ratio.....	Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%): Temperature input.....	≤ 1 s
Response time (0...90%, 100...10%): mA / V input.....	≤ 400 ms
Auxiliary supplies: 2-wire supply (terminal 44...43).....	25...16 VDC / 0...20 mA
Accuracy.....	Better than 0.1% of selected range
EMC immunity influence.....	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< ±1% of span

Input specifications

RTD input.....	Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000 Ni50, Ni100, Ni120, Ni1000, Cu10, Cu20, Cu50, Cu100
RTD input.....	Linear resistance
RTD input.....	Potentiometer
Cable resistance per wire (max.), RTD.....	50 Ω
Sensor current, RTD.....	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire), RTD.....	< 0.002 Ω / Ω
Sensor error detection, RTD.....	Yes
Short circuit detection, RTD.....	< 15 Ω
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 connector 5910.....	20...28°C ≤ ±1°C, -20...20°C / 28...70°C ≤ 2°C
CJC via internally mounted sensor.....	±(2.0°C + 0.4°C * Δt)
Δt =.....	Internal temperature-ambient temperature
Sensor error detection, TC.....	Yes
Sensor error current: When detecting / else.....	Nom. 2 μA / 0 μA
Current input: Measurement range.....	0...20 mA

Current input: Programmable measurement ranges.....	0...20 and 4...20 mA
Input resistance, current input.....	Nom. 20 Ω + PTC 50 Ω
Voltage input: Measurement range.....	0...12 VDC
Programmable measurement ranges, VDC.....	0/0.2...1, 0/1...5, 0/2...10 VDC
Input resistance, voltage input.....	Nom. 10 MΩ

Output specifications

Current output: Signal range.....	0...20 mA
Programmable current ranges.....	0...20 / 4...20 / 20...0 and 20...4 mA
Load (max.).....	20 mA/800 Ω/16 VDC
Load stability, current output.....	≤0.01% of span / 100 Ω
Sensor error indication, current output.....	0 / 3.5 / 23 mA / none
NAMUR NE 43 Upscale/Downscale.....	23 mA / 3.5 mA
Current limit.....	≤ 28 mA
Voltage output: signal range.....	0...10 VDC
Programmable voltage ranges.....	0/0.2...1; 0/1...5; 0/2...10; 1...0.2/0; 5...1/0; 10...2/0 V
Load (min.).....	500 kΩ
*of span.....	= of the currently selected measurement range

Approvals

EMC.....	EN 61326-1
LVD.....	EN 61010-1
FM.....	3025177
UL.....	UL 508
GOST R.....	Yes
DNV Marine.....	Stand. f. Certific. No. 2.4
SIL.....	Hardware assessed for use in SIL applications

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



Advanced features

- Programmable via detachable display front (4501), process calibration, signal and relay simulation, password protection, error diagnostics and selection of help text in several languages.

Application

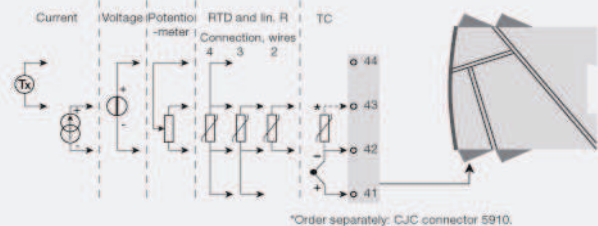
- Linearized, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analog current / voltage signal, i.e. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire transmitters.
- 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

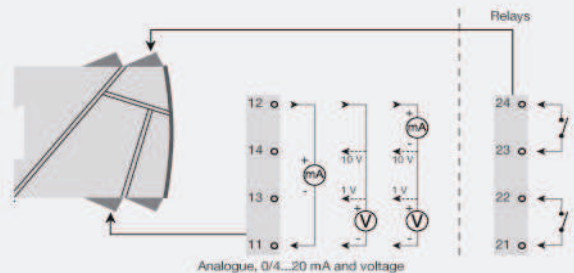
- When 4116 is used in combination with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4116 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green / red front LED indicates 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.

Connections

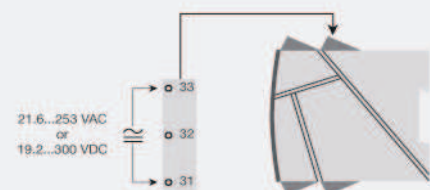
Input signals:



Output signals:



Supply:



Order:

Type
4116

Environmental Conditions

Specifications range.....	-20°C to +60°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 / 4511.....	109 x 23.5 x 116 / 131 mm
Weight approx.....	170 g
Weight incl. 4501 / 4511 (approx.).....	185 g / 270 g
Wire size.....	1 x 2.5 mm ² stranded wire
Screw terminal torque.....	0.5 Nm

Common specifications

Supply voltage, universal.....	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Fuse.....	400 mA SB / 250 VAC
Max. power consumption.....	≤ 2.5 W
Isolation voltage, test / working.....	2.3 kVAC / 250 VAC
Communications interface.....	Communication enabler 4511 / Programming front 4501
Signal / noise ratio.....	Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%): Temperature input.....	≤ 1 s
Response time (0...90%, 100...10%): mA / V input.....	≤ 400 ms
Accuracy.....	Better than 0.1% of selected range
Auxiliary supplies: 2-wire supply (terminal 44...43).....	25...16 VDC / 0...20 mA
EMC immunity influence.....	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< ±1% of span

Input specifications

RTD input.....	Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000 Ni50, Ni100, Ni120, Ni1000, Cu10, Cu20, Cu50, Cu100
RTD input.....	Linear resistance
RTD input.....	Potentiometer
Cable resistance per wire (max.), RTD.....	50 Ω
Sensor current, RTD.....	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire), RTD.....	< 0.002 Ω / Ω
Sensor error detection, RTD.....	Yes
Short circuit detection, RTD.....	< 15 Ω
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 connector 5910.....	20...28°C ≤ ±1°C, -20...20°C / 28...70°C ≤ 2°C
CJC via internally mounted sensor.....	±(2.0°C + 0.4°C * Δt)
Δt =.....	Internal temperature-ambient temperature
Sensor error detection, TC.....	Yes
Sensor error current: When detecting / else.....	Nom. 2 μA / 0 μA
Current input: Measurement range.....	0...20 mA

Current input: Programmable measurement ranges.....	0...20 and 4...20 mA
Input resistance, current input.....	Nom. 20 Ω + PTC 50 Ω
Voltage input: Measurement range.....	0...12 VDC
Programmable measurement ranges, VDC.....	0/0.2...1, 0/1...5, 0/2...10 VDC
Input resistance, voltage input.....	Nom. 10 MΩ

Output specifications

Current output: Signal range.....	0...20 mA
Programmable current ranges.....	0...20 / 4...20 / 20...0 and 20...4 mA
Load (max.).....	20 mA/800 Ω/16 VDC
Load stability, current output.....	≤0.01% of span / 100 Ω
Sensor error indication, current output.....	0 / 3.5 / 23 mA / none
NAMUR NE 43 Upscale/Downscale.....	23 mA / 3.5 mA
Current limit.....	≤ 28 mA
Voltage output: signal range.....	0...10 VDC
Programmable voltage ranges.....	0/0.2...1; 0/1...5; 0/2...10; 1...0.2/0; 5...1/0; 10...2/0 V
Load (min.).....	500 kΩ
Relay output: Relay functions.....	Setpoint, Window, Sensor error, Latch, Power and Off
Hysteresis.....	0...100%
ON and OFF delay.....	0...3600 s
Max. voltage.....	250 VRMS
Max. current.....	2 AAC or 1 ADC
Max. AC power.....	500 VA
Sensor error reaction.....	Break / Make / Hold
*of span.....	= of the currently selected measurement range

Approvals

EMC.....	EN 61326-1
LVD.....	EN 61010-1
FM.....	3025177
UL.....	UL 508
GOST R.....	Yes
DNV Marine.....	Stand. f. Certific. No. 2.4
SIL.....	Hardware assessed for use in SIL applications

Universal trip amplifier



4131

- Input for RTD, TC, Ohm, potentiometer, mA and V
- 2 adjustable alarm limits
- FM-approved for installation in Div. 2
- 2 relay outputs
- Universal AC or DC supply



Advanced features

- Programmable via detachable display front (4501), process calibration, relay simulation, password protection, error diagnostics and selection of help text in several languages.

Application

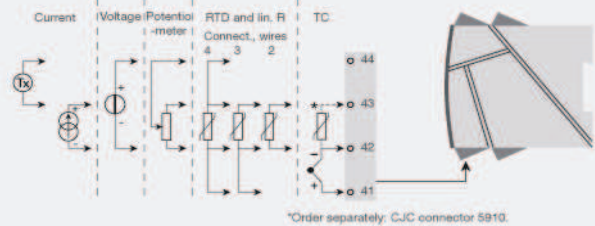
- Process control with 2 pairs of potential-free relay contacts which can be configured to suit any application.
- Trip amplifier with window function defined by a high and a low setpoint. The relay changes state outside the window.
- Relay latch function, where the relay is activated and can only be reset manually.
- Sophisticated sensor error surveillance, where one relay holds the state immediately prior to the sensor error, while allowing the process to continue. The other relay can be set for sensor error alarm so that the defect sensor can be replaced immediately.

Technical characteristics

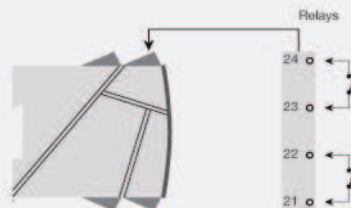
- When 4131 is used with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4131 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green front LED indicates normal operation and malfunction. A yellow LED is ON for each active output relay.
- Continuous check of vital stored data for safety reasons.
- 3-port 2.3 kVAC galvanic isolation.

Connections

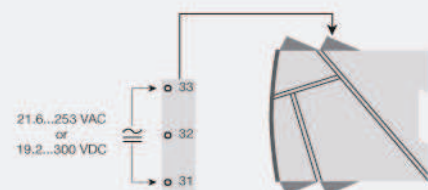
Input signals:



Output signals:



Supply:



Order:

Type
4131

Environmental Conditions

Specifications range.....	-20°C to +60°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 / 4511.....	109 x 23.5 x 116 / 131 mm
Weight approx.....	170 g
Weight incl. 4501 / 4511 (approx.).....	185 g / 270 g
Wire size.....	1 x 2.5 mm ² stranded wire
Screw terminal torque.....	0.5 Nm

Common specifications

Supply voltage, universal.....	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Fuse.....	400 mA SB / 250 VAC
Max. power consumption.....	≤ 2.0 W
Isolation voltage, test / working.....	2.3 kVAC / 250 VAC
Communications interface.....	Communication enabler 4511 / Programming front 4501
Signal / noise ratio.....	Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%): Temperature input.....	≤ 1 s
Response time (0...90%, 100...10%): mA / V input.....	≤ 400 ms
Accuracy.....	Better than 0.1% of selected range
Auxiliary supplies: 2-wire supply (terminal 44...43).....	25...16 VDC / 0...20 mA
EMC immunity influence.....	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< ±1% of span

Input specifications

RTD input.....	Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000 Ni50, Ni100, Ni120, Ni1000, Cu10, Cu20, Cu50, Cu100
RTD input.....	Linear resistance
RTD input.....	Potentiometer
Cable resistance per wire (max.), RTD.....	50 Ω
Sensor current, RTD.....	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire), RTD.....	< 0.002 Ω / Ω
Sensor error detection, RTD.....	Yes
Short circuit detection, RTD.....	< 15 Ω
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 connector 5910.....	20...28°C ≤ ±1°C, -20...20°C / 28...70°C ≤ 2°C
CJC via internally mounted sensor.....	±(2.0°C + 0.4°C * Δt)
Δt =.....	Internal temperature-ambient temperature
Sensor error detection, TC.....	Yes
Sensor error current: When detecting / else.....	Nom. 2 μA / 0 μA
Current input: Measurement range.....	0...20 mA

Current input: Programmable measurement ranges.....	0...20 and 4...20 mA
Input resistance, current input.....	Nom. 20 Ω + PTC 50 Ω
Voltage input: Measurement range.....	0...12 VDC
Programmable measurement ranges, VDC.....	0/0.2...1, 0/1...5, 0/2...10 VDC
Input resistance, voltage input.....	Nom. 10 MΩ

Output specifications

Relay output: Relay functions.....	Setpoint, Window, Sensor error, Latch, Power and Off
Hysteresis.....	0...100%
ON and OFF delay.....	0...3600 s
Max. voltage.....	250 VRMS
Max. current.....	2 AAC or 1 ADC
Max. AC power.....	500 VA
Sensor error reaction.....	Break / Make / Hold
*of span.....	= of the currently selected measurement range

Approvals

EMC.....	EN 61326-1
LVD.....	EN 61010-1
FM.....	3025177
UL.....	UL 508
GOST R.....	Yes
DNV Marine.....	Stand. f. Certific. No. 2.4

Universal I/f converter



4222

- Input for RTD, TC, Ohm, potentiometer, mA and V
- Frequency output NPN, PNP and TTL
- Generates frequencies from 0.001...25000 Hz
- 2-wire supply > 16 V
- Universal AC or DC supply



Advanced features

- Programmable via detachable display front (4501), process calibration, signal simulation, password protection, error diagnostics and selection of help text in several languages.

Application

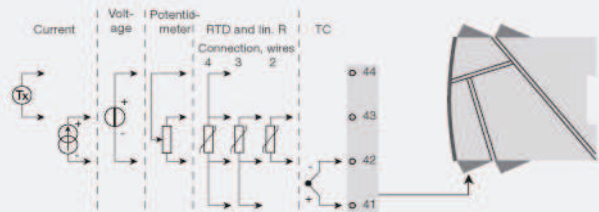
- Linearized, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a frequency signal, e.g. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire transmitters.
- Process control by way of a frequency signal transmitted to e.g. a PLC or a process computer.
- Galvanic separation and conversion of analog signals to frequency signals.

Technical characteristics

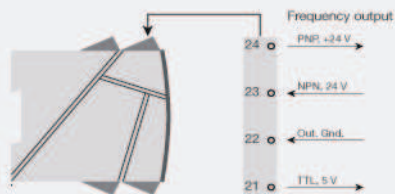
- When 4222 is used in combination with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4222 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP switches.
- A green front LED indicates normal operation.
- Continuous check of vital stored data for safety reasons.
- 3-port 2.3 kVAC galvanic isolation.

Connections

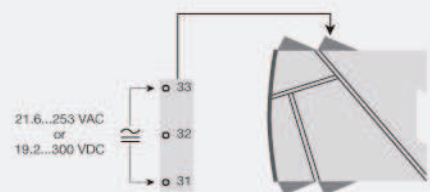
Input signals:



Output signals:



Supply:



Order:

Type
4222

Environmental Conditions

Specifications range.....	-20°C to +60°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 / 4511.....	109 x 23.5 x 116 / 131 mm
Weight approx.....	155 g
Weight incl. 4501 / 4511 (approx.).....	170 g / 255 g
Wire size.....	1 x 2.5 mm ² stranded wire
Screw terminal torque.....	0.5 Nm

Common specifications

Supply voltage, universal.....	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Fuse.....	400 mA SB / 250 VAC
Max. power consumption.....	≤ 2.5 W
Isolation voltage, test / working.....	2.3 kVAC / 250 VAC
Communications interface.....	Communication enabler 4511 / Programming front 4501
Signal / noise ratio.....	Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%): Temperature input (programmable).....	1...60 s
mA / V input (programmable).....	0.4...60 s
Accuracy.....	Better than 0.1% of selected range
Auxiliary supplies: 2-wire supply (terminal 44...43).....	25...16 VDC / 0...20 mA
EMC immunity influence.....	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< ±1% of span

Input specifications

RTD input.....	Pt100, Ni100, lin. R
RTD input.....	Potentiometer
Cable resistance per wire (max.), RTD.....	50 Ω
Sensor current, RTD.....	Nom. 0.2 mA
Sensor error detection, RTD.....	Yes
Short circuit detection, RTD.....	< 15 Ω
TC input: Thermocouple type.....	B, E, J, K, L, N, R, S, T, U, W3, W5, LR
CJC via internally mounted sensor.....	< ±1.0°C
Sensor error detection, TC.....	Yes
Sensor error current: When detecting / else.....	Nom. 2 μA / 0 μA
Current input: Measurement range.....	0...20 mA
Current input: Programmable measurement ranges.....	0...20 and 4...20 mA
Input resistance, current input.....	Nom. 20 Ω + PTC 50 Ω
Voltage input: Measurement range.....	0...12 VDC
Programmable measurement ranges, VDC.....	0/0.2...1, 0/0.5...2.5, 0/1...5, 0/2...10 VDC
Input resistance, voltage input.....	Nom. 10 MΩ

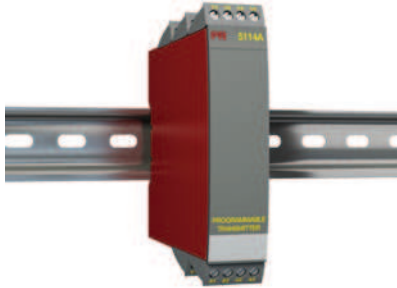
Output specifications

Frequency output range.....	0...25000 Hz
Min. frequency (span).....	0.001 Hz
Other output types.....	PNP, NPN and TTL
Sensor error indication, programmable.....	0...26250 Hz
*of span.....	= of the currently selected measurement range

Approvals

EMC.....	EN 61326-1
LVD.....	EN 61010-1
UL.....	UL 508





Programmable transmitter

5114A

- Input for RTD, TC, mV, linear resistance, mA, and V
- 3-port 3.75 kVAC galvanic isolation
- Current and voltage output
- Universal voltage supply
- 1- and 2-channel versions
- Loop supply > 17.1 V



Advanced features

- The 5114 transmitter can be configured, with or without a power supply, using the PReset software and the Loop Link communications unit.

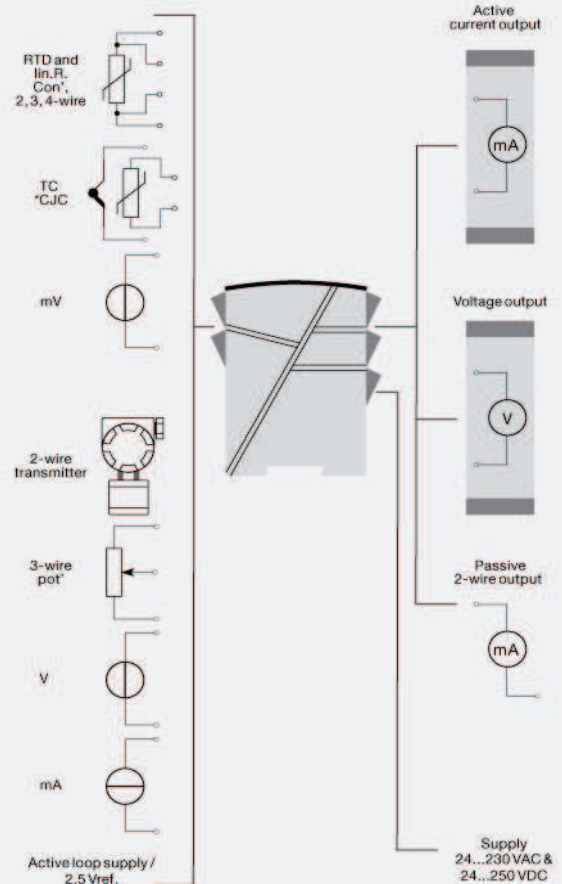
Application

- Jumper selectable inputs for current/voltage or temperature.
- Programmable current (0...100 mA) and voltage (0...250 VDC) inputs.
- Linearized, electronic temperature measurement.
- Conversion of linear resistance variation e.g. from solenoids and butterfly valves or linear movements with attached potentiometer.
- 17.1 VDC loop and 2.5 VDC potentiometer supplies.
- Automatic 4- / 3-wire or programmable 2-wire cable compensation.
- Configurable sensor error detection including NAMUR NE43.

Technical characteristics

- Active or Passive current output and selectable voltage output.
- Separation of circuits in PELV/SELV installations.

Connections



Order:

Type	Version	Input	Channels
5114 A	Standard : A	RTD / TC / R / mA / V / mV :-	Single : A Double : B

Note! For TC inputs with internal CJC, remember to order the CJC connectors type 5910 / 5910 Ex (ch. 1) and 5913 / 5913 Ex (ch. 2).

Environmental Conditions

Specifications range.....	-20°C to +60°C
Calibration temperature.....	20...28°C
Relative humidity.....	< 95% RH (non-cond.)
Protection degree.....	IP20

Mechanical specifications

Dimensions (HxWxD).....	109 x 23.5 x 130 mm
Weight approx.....	225 g
DIN rail type.....	DIN 46277
Wire size.....	1 x 2.5 mm ² stranded wire
Screw terminal torque.....	0.5 Nm

Common specifications

Supply voltage, universal.....	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Fuse.....	400 mA SB / 250 VAC
Max. power consumption.....	≤ 3 W (2 channels)
Internal consumption.....	≤ 2 W (2 channels)
Isolation voltage, test / working.....	3.75 kVAC / 250 VAC
Communications interface.....	Loop Link
Signal / noise ratio.....	Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%): Temperature input (programmable).....	400 ms...60 s
mA / V input (programmable).....	250 ms...60 s
Updating time.....	115 ms (temperature input)
Updating time.....	75 ms (mA / V / mV input)
Signal dynamics, input.....	22 bit
Signal dynamics, output.....	16 bit
Auxiliary voltages: Reference voltage.....	2.5 VDC ±0.5% / 15 mA
Auxiliary supply: 2-wire supply (pin 44...42 and 54...52).....	28...17.1 VDC / 0...20 mA
EMC immunity influence.....	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< ±1% of span

Input specifications

Max. offset.....	50% of selected max. value
RTD input.....	Pt100, Ni100, lin. R
Cable resistance per wire (max.), RTD.....	10 Ω
Sensor current, RTD.....	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire), RTD.....	< 0.002 Ω / Ω
Sensor error detection, RTD.....	Yes
TC input: Thermocouple type.....	B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC).....	< ±1.0°C
Sensor error current, TC.....	Nom. 30 µA
Sensor error detection, TC.....	Yes
Current input: Measurement range.....	0...100 mA
Min. measurement range (span), current input.....	4 mA
Input resistance: Supplied unit.....	Nom. 10 Ω + PTC 10 Ω
Input resistance: Non-supplied unit.....	RSHUNT = ∞, VDROPP < 6 V
Voltage input: Measurement range.....	0...250 VDC
Voltage input: Measurement range.....	-150...+150 mV

Min. measurement range (span), voltage input.....	5 mV
Input resistance, voltage input.....	Nom. 10 MΩ (≤ 2.5 VDC)
Input resistance, voltage input.....	Nom. 5 MΩ (> 2.5 VDC)
Input resistance, voltage input.....	Nom. 10 MΩ (mV input)

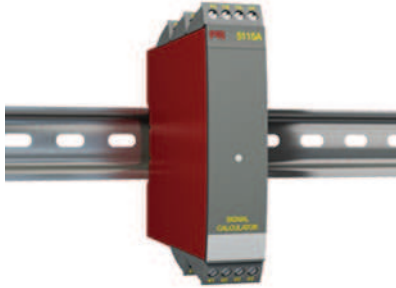
Output specifications

Max. offset.....	50% of selected max. value
Current output: Signal range.....	0...20 mA
Min. signal range.....	10 mA
Load (max.).....	20 mA/600 Ω/12 VDC
Load stability, current output.....	≤ 0.01% of span / 100 Ω
Current limit.....	≤ 28 mA
2-wire 4...20 mA output: Signal range.....	4...20 mA
Load stability, 4...20 mA output.....	≤ 0.01% of span / 100 Ω
Max. load resistance [Ω].....	(Vsupply - 3.5) / 0.023 A
Max. external 2-wire supply.....	29 VDC
Effect of external 2-wire supply voltage variation.....	< 0.005% of span / V
Voltage output: signal range.....	0...10 VDC
Voltage output, min. signal range.....	500 mV
Load (min.).....	500 kΩ
Sensor error indication, current output.....	Programmable 0...23 mA
NAMUR NE 43 Upscale/Downscale.....	23 mA / 3.5 mA
*of span.....	= of the presently selected range

Approvals

EMC.....	EN 61326-1
LVD.....	EN 61010-1
PELV/SELV.....	IEC 364-4-41 and EN 60742
GOST R.....	Yes
DNV Marine.....	Stand. f. Certific. No. 2.4

D



Signal calculator

5115A

- Redundancy measurement with 2 input signals
- Signal calculator with the four arithmetical operations
- Duplication of the input signal
- Input for RTD, Ohm, TC, mV, mA, and V
- Universal supply by AC or DC



Application

- Redundancy measurement of temperature by means of two sensors, where the secondary sensor takes over the measurement when a sensor error occurs on the primary sensor.
- Duplication of the input signal, e.g. from a temperature sensor or an analog process signal to two separate analog outputs.
- Signal calculator with four arithmetical operations: Addition, subtraction, multiplication and division.
- Example: Differential measurement: $(\text{Input 1} * K1) - (\text{Input 2} * K2) + K4$
- Example: Average measurement: $(\text{Input 1} * 0.5) + (\text{Input 2} * 0.5) + K4$
- Example: Different functions on the outputs: Output 1 = input 1 - input 2, and Output 2 = input 1 + input 2
- Power supply for 2-wire transmitters.

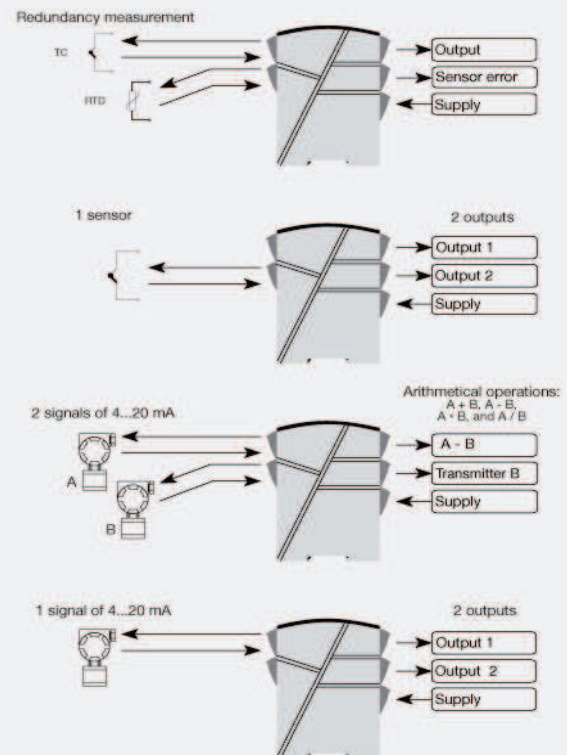
Technical characteristics

- Within a few seconds the user can program PR5115A to a selected application using the configuration program PReset.
- A green front LED indicates normal operation, sensor error on each sensor, and functional error.
- Continuous check of vital stored data for safety reasons.
- 5-port 3.75 kVAC galvanic isolation.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. As the devices can be mounted without any distance between neighboring units, up to 42 devices can be mounted per meter.

Connections



Order:

Type	Input
5115A	RTD / TC / mV / R / mA / V

***NB!** Please remember to order CJC connectors type 5910 (input 1) and 5913 (input 2) for TC inputs with an internal CJC.

Environmental Conditions

Specifications range.....	-20°C to +60°C
Calibration temperature.....	20...28°C
Relative humidity.....	< 95% RH (non-cond.)
Protection degree.....	IP20

Mechanical specifications

Dimensions (HxWxD).....	109 x 23.5 x 130 mm
Weight approx.....	225 g
Wire size.....	1 x 2.5 mm ² stranded wire
Screw terminal torque.....	0.5 Nm

Common specifications

Supply voltage, universal.....	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Fuse.....	400 mA SB / 250 VAC
Max. power consumption.....	≤ 3 W
Isolation voltage, test / working.....	3.75 kVAC / 250 VAC
Communications interface.....	Loop Link
Signal / noise ratio.....	Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%): Temperature input (programmable).....	400 ms...60 s
mA / V input (programmable).....	250 ms...60 s
Redundancy switch-over time.....	≤ 400 ms
Signal dynamics, input.....	22 bit
Signal dynamics, output.....	16 bit
Auxiliary voltages: Reference voltage.....	2.5 VDC ±0.5% / 15 mA
EMC immunity influence.....	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< ±1% of span

Input specifications

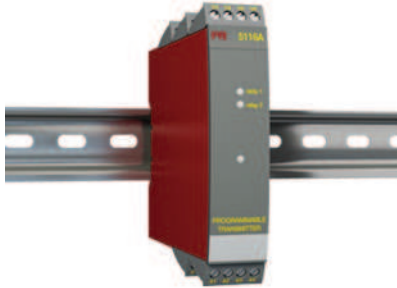
Max. offset.....	50% of selected max. value
RTD input.....	Pt100, Ni100, lin. R
Cable resistance per wire (max.), RTD.....	10 Ω
Sensor current, RTD.....	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire), RTD.....	< 0.002 Ω / Ω
Sensor error detection, RTD.....	Yes
TC input: Thermocouple type.....	B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC).....	< ±1.0°C
Sensor error current, TC.....	Nom. 30 µA
Current input: Measurement range.....	0...100 mA
Min. measurement range (span), current input.....	4 mA
Input resistance: Supplied unit.....	Nom. 10 Ω + PTC 10 Ω
Input resistance: Non-supplied unit.....	RSHUNT = ∞, VDROPP < 6 V
Voltage input: Measurement range.....	0...250 VDC
mV input: Measurement range.....	-150...+150 mV
Min. measurement range (span), voltage input.....	5 mV
Input resistance, voltage input.....	Nom. 10 MΩ (≤ 2.5 VDC)
Input resistance, voltage input.....	Nom. 5 MΩ (> 2.5 VDC)

Output specifications

Max. offset.....	50% of selected max. value
Current output: Signal range.....	0...20 mA
Min. signal range.....	10 mA
Load (max.).....	20 mA/600 Ω/12 VDC
Load stability, current output.....	≤0.01% of span / 100 Ω
Current limit.....	≤ 28 mA
Voltage output: signal range.....	0...10 VDC
Voltage output, min. signal range.....	500 mV
Load (min.).....	500 kΩ
2-wire 4...20 mA output: Signal range.....	4...20 mA
Load stability, 4...20 mA output.....	≤ 0.01% of span / 100 Ω
Effect of external 2-wire supply voltage variation.....	< 0.005% of span / V
Max. external 2-wire supply.....	29 VDC
Sensor error indication, current output.....	Programmable 0...23 mA
NAMUR NE 43 Upscale/Downscale.....	23 mA / 3.5 mA
*of span.....	= of the presently selected range

Approvals

EMC.....	EN 61326-1
LVD.....	EN 61010-1
PELV/SELV.....	IEC 364-4-41 and EN 60742
DNV Marine.....	Stand. f. Certific. No. 2.4
GOST R.....	Yes



Programmable transmitter

5116A

- Input for RTD, TC, mV, Ohm, potentiometer, mA and V
- 2-wire supply > 16.5 V
- Bipolar voltage input
- Output for current, voltage and 2 relays
- Universal supply by AC or DC



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 potential-free relay contacts which can be configured for advanced functions.
- Galvanic separation of analog signals and measurement of floating signals.

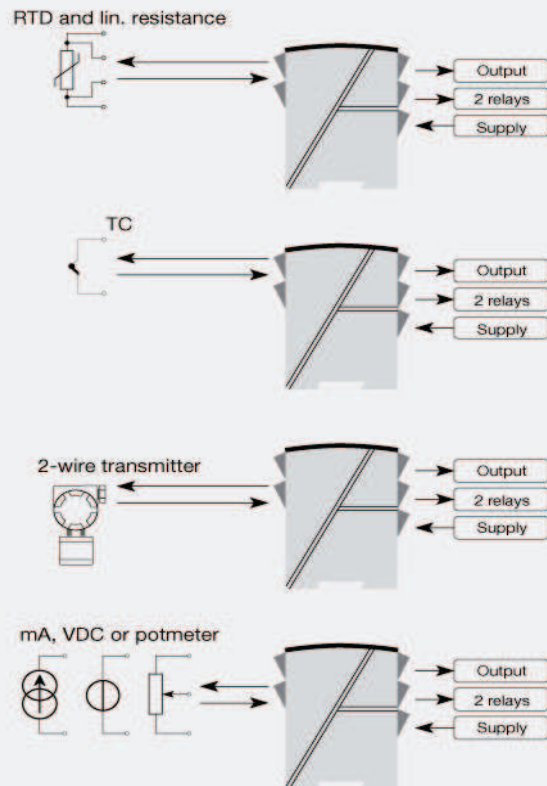
Technical characteristics

- Within a few seconds the user can program PR5116A to suit the specific application.
- By way of the front push-button the input can be calibrated to the exact span of the process. Zero drift on the process signal can be adjusted by a single press of the front button.
- A green 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.
- 3-port 3.75 kVAC galvanic isolation.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. As the devices can be mounted without any distance between neighboring units, up to 42 devices can be mounted per meter.

Connections



Order:

Type
5116A

*NB! Please remember to order CJC connectors type 5910 for TC inputs with internal CJC

Environmental Conditions

Specifications range.....	-20°C to +60°C
Calibration temperature.....	20...28°C
Relative humidity.....	< 95% RH (non-cond.)
Protection degree.....	IP20

Mechanical specifications

Dimensions (HxWxD).....	109 x 23.5 x 130 mm
Weight approx.....	225 g
DIN rail type.....	DIN 46277
Wire size.....	1 x 2.5 mm ² stranded wire
Screw terminal torque.....	0.5 Nm

Common specifications

Supply voltage, universal.....	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Fuse.....	400 mA SB / 250 VAC
Max. power consumption.....	≤ 3 W
Internal consumption.....	≤ 2.0 W
Isolation voltage, test / working.....	3.75 kVAC / 250 VAC
Communications interface.....	Loop Link
Signal / noise ratio.....	Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%): Temperature input (programmable).....	400 ms...60 s
mA / V input (programmable).....	250 ms...60 s
Updating time.....	115 ms (temperature input)
Updating time.....	75 ms (mA / V / mV input)
Signal dynamics, input.....	22 bit
Signal dynamics, output.....	16 bit
Auxiliary voltages: Reference voltage.....	2.5 VDC ±0.5% / 15 mA
Auxiliary supplies: 2-wire supply (pin 54...52).....	28...16.5 VDC / 0...20 mA
EMC immunity influence.....	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< ±1% of span

Input specifications

Max. offset.....	50% of selected max. value
RTD input.....	Pt100, Ni100, lin. R
Cable resistance per wire (max.), RTD.....	10 Ω (max. 50 Ω)
Sensor current, RTD.....	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire), RTD.....	< 0.002 Ω / Ω
Sensor error detection, RTD.....	Yes
TC input: Thermocouple type.....	B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC).....	< ±1.0°C
Sensor error current, TC.....	Nom. 30 µA
Sensor error detection, TC.....	Yes
Current input: Measurement range.....	0...100 mA
Min. measurement range (span), current input.....	4 mA
Input resistance: Supplied unit.....	Nom. 10 Ω + PTC 10 Ω
Input resistance: Non-supplied unit.....	RSHUNT = ∞, VDROPP < 6 V
Sensor error detection, current input.....	Loop break 4...20 mA
Voltage input: Measurement range.....	0...250 VDC

Voltage input: Measurement range.....	-2500...+2500 mV
Min. measurement range (span), voltage input.....	5 mV
Input resistance, voltage input.....	Nom. 10 MΩ (≤ 2.5 VDC)
Input resistance, voltage input.....	Nom. 5 MΩ (> 2.5 VDC)
Input resistance, voltage input.....	> 5 MΩ (mV input)
Potentiometer via 2.5 V ref.....	170 Ω

Output specifications

Max. offset.....	50% of selected max. value
Current output: Signal range.....	0...20 mA
Min. signal range.....	10 mA
Load (max.).....	20 mA/600 Ω/12 VDC
Load stability, current output.....	≤0.01% of span / 100 Ω
Current limit.....	≤ 28 mA
2-wire 4...20 mA output: Signal range.....	4...20 mA
Load stability, 4...20 mA output.....	≤ 0.01% of span / 100 Ω
Max. external 2-wire supply.....	29 VDC
Effect of external 2-wire supply voltage variation.....	< 0.005% of span / V
Sensor error indication, current output.....	Programmable 0...23 mA
NAMUR NE 43 Upscale/Downscale.....	23 mA / 3.5 mA
Relay output: Relay functions.....	Increasing / decreasing
Relay output: Relay functions.....	Window
Max. voltage.....	250 VRMS
Max. current.....	2 AAC
Max. AC power.....	500 VA
Max. load at 24 VDC.....	1 A
Sensor error reaction.....	Break / Make / Hold / None
*of span.....	= of the currently selected measurement range

Approvals

EMC.....	EN 61326-1
LVD.....	EN 61010-1
PELV/SELV.....	IEC 364-4-41 and EN 60742
UL.....	UL 508
GOST R.....	Yes
DNV Marine.....	Stand. f. Certific. No. 2.4