Signal Conditioning *& Communication* *Product Catalog*

PERFORMANCE MADE SMARTER

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

PR electronics

Our purpose

is to create market-leading site standard solutions with high signal integrity and simplicity for our customers, concentrating on innovation in six core business areas: Temperature, I.S. Interfaces, Communication Interfaces, Multifunctional, Isolation and Display.

Our products are individually outstanding, but when our point-to-point temperature measurement devices, I.S. interfaces, backplanes, multifunctional signal devices and future-proof communication interfaces are combined, our solutions are truly unrivalled.

We will be

our customer's trusted partner for the best and most innovative signal conditioning solutions in the process and factory automation industries.

We provide

a wide range of benefits to our customers through innovative solutions and close collaboration:

- The highest signal integrity from your measurement point to control system
- Maximum uptime based on our Install and Forget® philosophy
- Easy and cost-effective deployment and monitoring with intuitive communication interfaces
- Site standard devices that are easily programmable to suit your specific application
- Day-to-day delivery

Since 1974 we have been dedicated to perfecting our core competence of innovating high precision technology with low power consumption. With a dedicated R&D center that is integrated with our lean production facility at our headquarters in Denmark, we are today one of the leading companies within signal conditioning.

6 Product Pillars

to meet your every need

+ devices for special applications

TEMPERATURE
Transmitters and sensors - analog, bus or digital

I.S. INTERFACES
Intrinsically safe isolation barriers and backplanes

COMMUNICATION INTERFACES
Detachable local or remote operator interfaces

MULTIFUNCTIONAL
Wide range of input/output - multiple applications

ISOLATION
Compact and fast isolators with exceptional performance

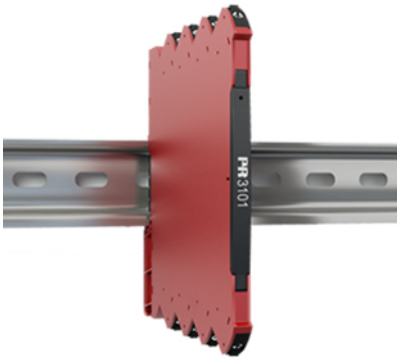
DISPLAYS
Complete range of panel meters

SPECIAL DEVICES
Devices for special applications

Transmitters and sensors converting industrial process temperature signals to analog, bus or digital communication

Our range of temperature transmitters and sensors provides the highest level of signal integrity from the measurement point to your control system. You can convert industrial process temperature signals to analog, bus or digital communication using a highly reliable point-to-point solution with a fast response time, automatic self-calibration, sensor error detection, low drift, and top EMC performance in any environment.

Temperature



TC converter

3101

- High accuracy, better than 0.1% of span
- Slimline housing of 6 mm
- Excellent EMC performance and 50/60 Hz noise suppression
- Selectable < 30 ms / 300 ms response time
- Pre-calibrated temperature ranges selectable via DIP-switches

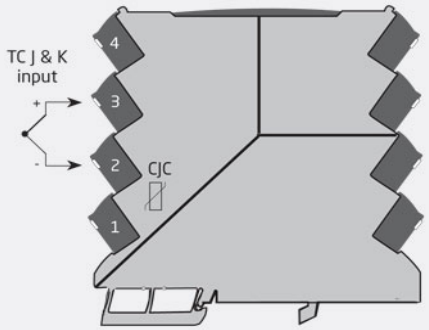
A

Application
- The 3101 temperature converter measures standard TC J and K temperature sensors, and provides an analog voltage or current output.
- The 3101 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

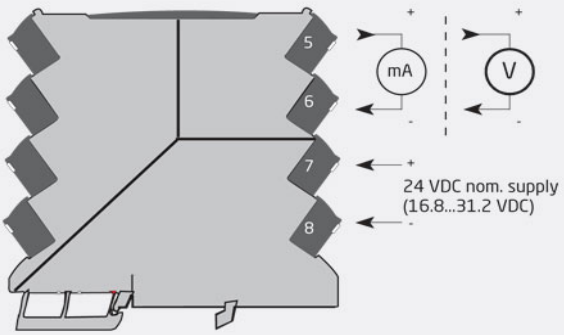
Technical characteristics
- Flexibly powered by 24 VDC (±30%) via connectors.
- < 30 ms fast response time with simultaneous sensor error detection when selected.
- Selectable 300 ms response time when signal dampening is needed.
- High conversion accuracy in all available ranges, better than 0.1% of span.
- Meeting the NAMUR NE21 recommendations, the 3101 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- A visible green LED indicates operational status of the unit and the input sensor.
- All terminals are protected against overvoltage and polarity error.
- Excellent signal/noise ratio of > 60 dB.

Mounting / installation / programming
- Selectable DIP-settings for easy configuration of more than 1000 factory calibrated measurement ranges.
- The narrow 6 mm housing allows up to 165 units to be mounted per meter of DIN rail, without any air gap between units.
- Wide ambient temperature range of -25...+70°C.

Connections



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



Order:

Type
3101

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	0.7 W
Signal / noise ratio	> 60 dB
Signal dynamics, input	23 bit
Signal dynamics, output	18 bit
Response time (0...90%, 100...10%)	< 30 ms / 300 ms (selectable)
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
Incorrect DIP-switch setting identification	0 V / 0 mA output; LED 0.5 s / 1 Hz

Input specifications

Temperature range, TC J	-100...+1200°C
Temperature range, TC K	-180...+1372°C
Accuracy, TC: the greater of	Better than 0.1% of span or 1°C
Temperature coefficient, TC: the greater of	0.1°C/°C or ≤ ±0.01%/°C
Sensor cable resistance, TC	< 5 kΩ per wire
Cold junction compensation (CJC): Accuracy @ internal CJC	Better than ±2.5°C
Open Thermocouple detection	Yes - selectable via DIP-switch
Internal CJC error detection	Yes

Output specifications

Programmable current ranges	0 / 4...20 mA
Range limits (0...20 mA)	0...20.5 mA
Sensor error indication (0...20 mA)	0 mA or 23 mA / OFF
Range limits (4...20 mA)	3.8...20.5 mA acc. to NAMUR NE43
Sensor error indication (4...20 mA)	3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load (@ current output)	≤ 600 Ω (12.6 V / 21 mA)
Open output	< 18 V
Updating time	10 ms
Load stability, current output	≤0.01% of span / 100 Ω
Programmable voltage ranges	0/1...5 and 0/2...10 V
Low range	0/1...5 V
Limits, low range	0/0.875...5.125 V
High range	0/2...10 V
Limits, high range	0/1.75...10.25 V
Sensor error indication, voltage output	0 V / 10% above the max. / none
Load (@ voltage output)	≥ 10 kΩ
Current limitation @ low output load	< 60 mA peak / < 4 mA average

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
EAC TR-CU 020/2011	EN 61326-1
UL	UL 61010-1

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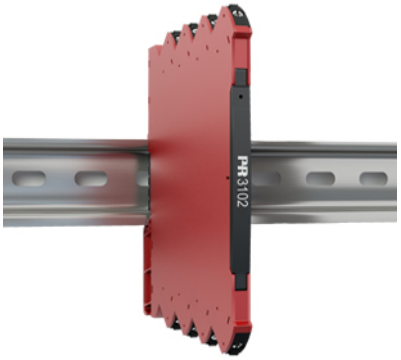


Pt100 converter

3102

– High accuracy, better than 0.1% of span
– Slimline housing of 6 mm
– Excellent EMC performance and 50/60 Hz noise suppression
– Selectable < 30 ms / 300 ms response time
– Pre-calibrated temperature ranges are selectable via DIP-switches

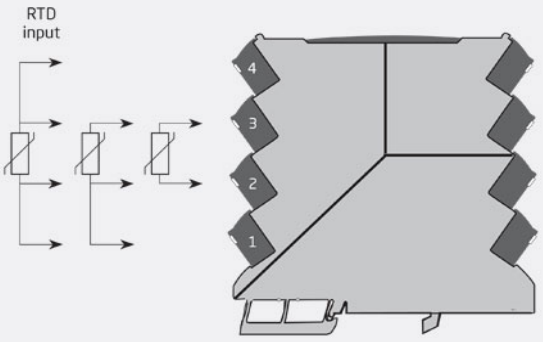
A

Application
- The 3102 temperature converter measures a standard 2-, 3- or 4-wire Pt100 temperature sensor, and provides an analog voltage or current output.
- The 3102 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

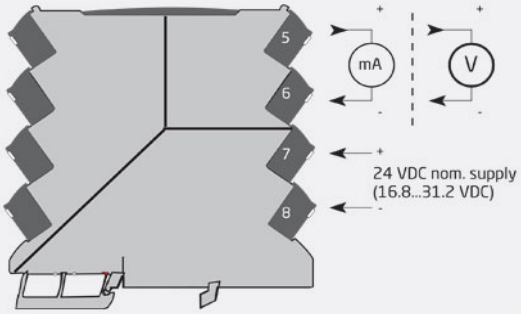
Technical characteristics
- Flexibly powered by 24 VDC (±30%) via connectors.
- < 30 ms fast response time with simultaneous sensor error detection when selected.
- Selectable 300 ms response time when signal dampening is needed.
- High conversion accuracy in all available ranges, better than 0.1% of span.
- Meeting the NAMUR NE21 recommendations, the 3102 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- A visible green LED indicates operational status of the unit and the input sensor.
- All terminals are protected against overvoltage and polarity error.
- Excellent signal/noise ratio of > 60 dB.

Mounting / installation / programming
- Selectable DIP-settings for easy configuration of more than 1000 factory calibrated measurement ranges.
- The narrow 6 mm housing allows up to 165 units to be mounted per meter of DIN rail, without any air gap between units.
- Wide ambient temperature range of -25...+70°C.

Connections



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



Order:

Type
3102

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	0.7 W
Signal / noise ratio	> 60 dB
Signal dynamics, input	23 bit
Signal dynamics, output	18 bit
Response time (0...90%, 100...10%)	< 30 ms / 300 ms (selectable)
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
Incorrect DIP-switch setting identification	0 V / 0 mA output; LED 0.5 s / 1 Hz

Input specifications

Temperature range, Pt100	-200...+850°C
Accuracy, RTD: the greater of	Better than 0.1% of span or 0.2°C
Temperature coefficient, RTD: the greater of	0.02°C/°C or ≤ ±0.01%/°C
Sensor current, RTD	< 150 µA
Sensor cable resistance, RTD	< 50 Ω per wire
Effect of sensor cable resistance (3-/4-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Yes - selectable via DIP-switch
Broken sensor detection	> 800 Ω
Shorted sensor detection	< 18 Ω

Output specifications

Programmable current ranges	0 / 4...20 mA
Range limits (0...20 mA)	0...20.5 mA
Sensor error indication (0...20 mA)	0 mA or 23 mA / OFF
Range limits (4...20 mA)	3.8...20.5 mA acc. to NAMUR NE43
Sensor error indication (4...20 mA)	3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load (@ current output)	≤ 600 Ω (12.6 V / 21 mA)
Open output	< 18 V
Updating time	10 ms
Load stability, current output	≤0.01% of span / 100 Ω
Programmable voltage ranges	0/1...5 and 0/2...10 V
Low range	0/1...5 V
Limits, low range	0/0.875...5.125 V
High range	0/2...10 V
Limits, high range	0/1.75...10.25 V
Sensor error indication, voltage output	0 V / 10% above the max. / none
Load (@ voltage output)	≥ 10 kΩ
Current limitation @ low output load	< 60 mA peak / < 4 mA average

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
EAC TR-CU 020/2011	EN 61326-1
UL	UL 61010-1

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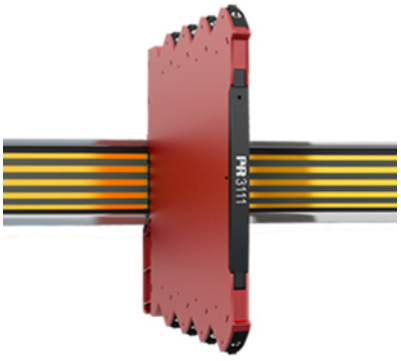


TC converter - isolated

3111

- Excellent accuracy, better than 0.05% of span
- Slimline housing of 6 mm
- Excellent EMC performance and 50/60 Hz noise suppression
- Selectable < 30 ms / 300 ms response time
- Pre-calibrated temperature ranges are selectable via DIP-switches

Application

- The 3111 temperature converter measures standard TC J and K temperature sensors, and provides an isolated analog voltage or current output.
- High 3 port isolation provides surge suppression and protects the control system from transients and noise.
- The 3111 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

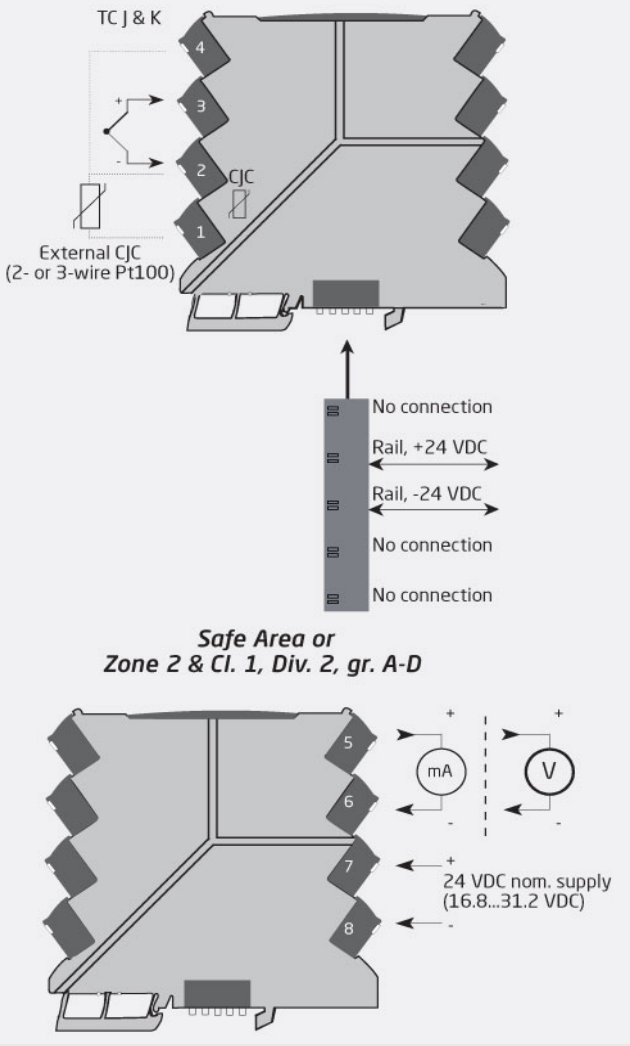
Technical characteristics

- Flexibly powered by 24 VDC (±30%) via power rail or connectors.
- < 30 ms fast response time with simultaneous sensor error detection when selected.
- Selectable 300 ms response time when signal dampening is needed.
- Selectable internal/external CJC.
- Excellent conversion accuracy in all available ranges, better than 0.05% of span.
- Meeting the NAMUR NE21 recommendations, the 3111 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- A visible green LED indicates operational status of the unit and the input sensor.
- All terminals are protected against overvoltage and polarity error.
- High galvanic isolation of 2.5 kVAC.
- Excellent signal/noise ratio of > 60 dB.

Mounting / installation / programming

- Selectable DIP-settings for easy configuration of more than 1000 factory calibrated measurement ranges.
- The narrow 6 mm housing allows up to 165 units to be mounted per meter of DIN rail, without any air gap between units.
- Wide ambient temperature range of -25...+70°C.

Connections



Order:

Type
3111

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	0.7 W
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
Signal dynamics, input	23 bit
Signal dynamics, output	18 bit
Response time (0...90%, 100...10%)	< 30 ms / 300 ms (selectable)
Accuracy	Better than 0.05% of selected range
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span
Incorrect DIP-switch setting identification	0 V / 0 mA output; LED 0.5 s / 1 Hz

Input specifications

Temperature range, TC J	-100...+1200°C
Temperature range, TC K	-180...+1372°C
Accuracy, TC: the greater of	Better than 0.05% of span or 0.5°C
Temperature coefficient, TC: the greater of	0.1°C/°C or ≤ ±0.01%/°C
Sensor cable resistance, TC	< 5 kΩ per wire
Cold junction compensation (CJC): Accuracy @ external Pt100 intput	Better than ±0.15°C
Cold junction compensation (CJC): Accuracy @ internal CJC	Better than ±2.5°C
Open Thermocouple detection	Yes - selectable via DIP-switch
Internal CJC error detection	Yes
External CJC error detection	Yes - selectable via DIP-switch

Output specifications

Programmable current ranges	0 / 4...20 mA
Range limits (0...20 mA)	0...20.5 mA
Sensor error indication (0...20 mA)	0 mA or 23 mA / OFF
Range limits (4...20 mA)	3.8...20.5 mA acc. to NAMUR NE43
Sensor error indication (4...20 mA)	3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load (@ current output)	≤ 600 Ω (12.6 V / 21 mA)
Open output	< 18 V
Updating time	10 ms
Load stability, current output	≤0.01% of span / 100 Ω
Programmable voltage ranges	0/1...5 and 0/2...10 V
Low range	0/1...5 V
Limits, low range	0/0.875...5.125 V
High range	0/2...10 V
Limits, high range	0/1.75...10.25 V
Sensor error indication, voltage output	0 V / 10% above the max. / none
Load (@ voltage output)	≥ 10 kΩ
Current limitation @ low output load	< 60 mA peak / < 4 mA average

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
EAC TR-CU 020/2011	EN 61326-1
UL	UL 61010-1

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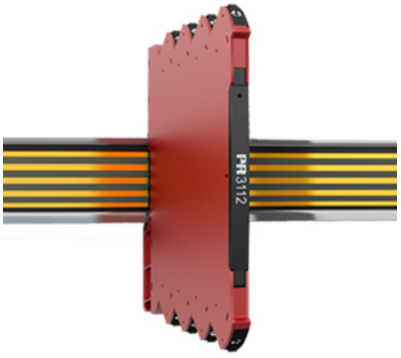


Pt100 converter - isolated

3112

– Excellent accuracy, better than 0.05% of span
– Slimline housing of 6 mm
– Excellent EMC performance and 50/60 Hz noise suppression
– Selectable < 30 ms / 300 ms response time
– Pre-calibrated temperature ranges selectable via DIP-switches

A

Application

- The 3112 temperature converter measures a standard 2-, 3- or 4-wire Pt100 temperature sensor, and provides an isolated analog voltage or current output.
- High 3 port isolation provides surge suppression and protects the control system from transients and noise.
- The 3112 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

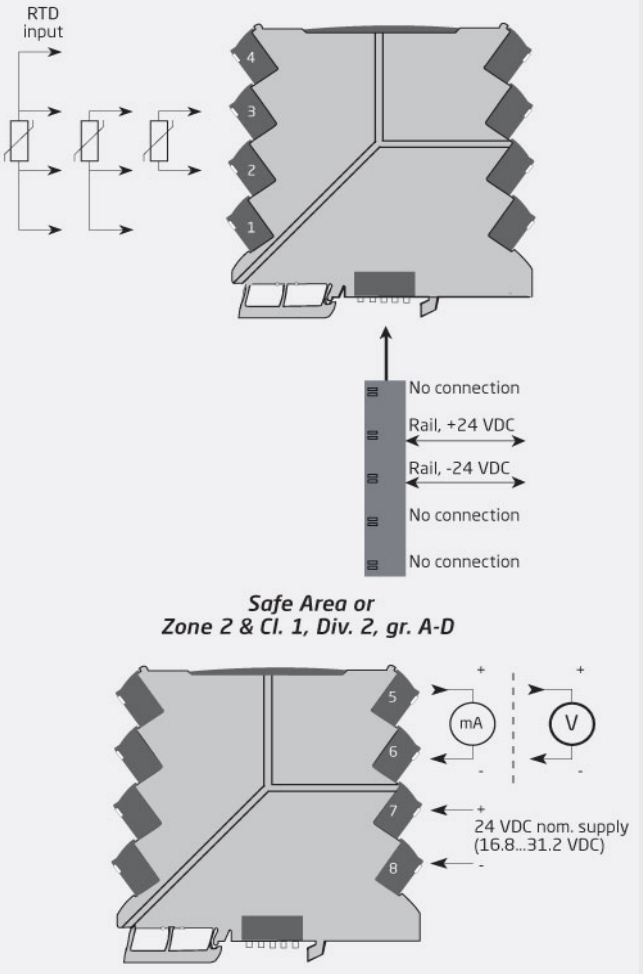
Technical characteristics

- Flexibly powered by 24 VDC (±30%) via power rail or connectors.
- < 30 ms fast response time with simultaneous sensor error detection when selected.
- Selectable 300 ms response time when signal dampening is needed.
- Excellent conversion accuracy in all available ranges, better than 0.05% of span.
- Meeting the NAMUR NE21 recommendations, the 3112 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- A visible green LED indicates operational status of the unit and the input sensor.
- All terminals are protected against overvoltage and polarity error.
- High galvanic isolation of 2.5 kVAC.
- Excellent signal/noise ratio of > 60 dB.

Mounting / installation / programming

- Selectable DIP-settings for easy configuration of more than 1000 factory calibrated measurement ranges.
- The narrow 6 mm housing allows up to 165 units to be mounted per meter of DIN rail, without any air gap between units.
- Wide ambient temperature range of -25...+70°C.

Connections



Order:

Type
3112

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	0.7 W
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Accuracy	Better than 0.05% of selected range
Signal / noise ratio	> 60 dB
Signal dynamics, input	23 bit
Signal dynamics, output	18 bit
Response time (0...90%, 100...10%)	< 30 ms / 300 ms (selectable)
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span
Incorrect DIP-switch setting identification	0 V / 0 mA output; LED 0.5 s / 1 Hz

Input specifications

Temperature range, Pt100	-200...+850°C
Accuracy, RTD: the greater of	Better than 0.05% of span or 0.1°C
Temperature coefficient, RTD: the greater of	0.02°C/°C or ≤ ±0.01%/°C
Sensor current, RTD	< 150 µA
Sensor cable resistance, RTD	< 50 Ω per wire
Effect of sensor cable resistance (3-/4-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Yes - selectable via DIP-switch
Broken sensor detection	> 800 Ω
Shorted sensor detection	< 18 Ω

Output specifications

Programmable current ranges	0 / 4...20 mA
Range limits (0...20 mA)	0...20.5 mA
Sensor error indication (0...20 mA)	0 mA or 23 mA / OFF
Range limits (4...20 mA)	3.8...20.5 mA acc. to NAMUR NE43
Sensor error indication (4...20 mA)	3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load (@ current output)	≤ 600 Ω (12.6 V / 21 mA)
Open output	< 18 V
Updating time	10 ms
Load stability, current output	≤0.01% of span / 100 Ω
Programmable voltage ranges	0/1...5 and 0/2...10 V
Low range	0/1...5 V
Limits, low range	0/0.875...5.125 V
High range	0/2...10 V
Limits, high range	0/1.75...10.25 V
Sensor error indication, voltage output	0 V / 10% above the max. / none
Load (@ voltage output)	≥ 10 kΩ
Current limitation @ low output load	< 60 mA peak / < 4 mA average

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
EAC TR-CU 020/2011	EN 61326-1
UL	UL 61010-1

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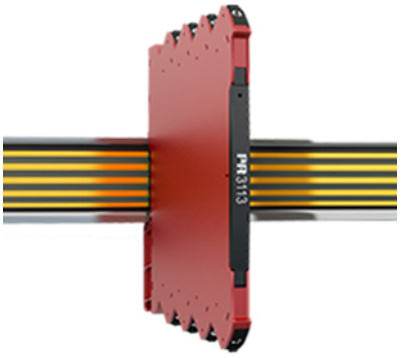


HART 7 temperature converter

3113

– High accuracy, better than 0.05% of span
– Slimline housing of 6 mm
– Excellent EMC performance
– Selectable 60 ms / 60 s response time
– Pre-calibrated temperature ranges selectable via DIP-switches

A

Application

- The 3113 temperature converter measures a standard Pt100, TC J and K temperature sensor, and provides an isolated active analog current and HART® signal output.
- High 3 port isolation provides surge suppression and protects the control system from transients and noise.
- The 3113 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

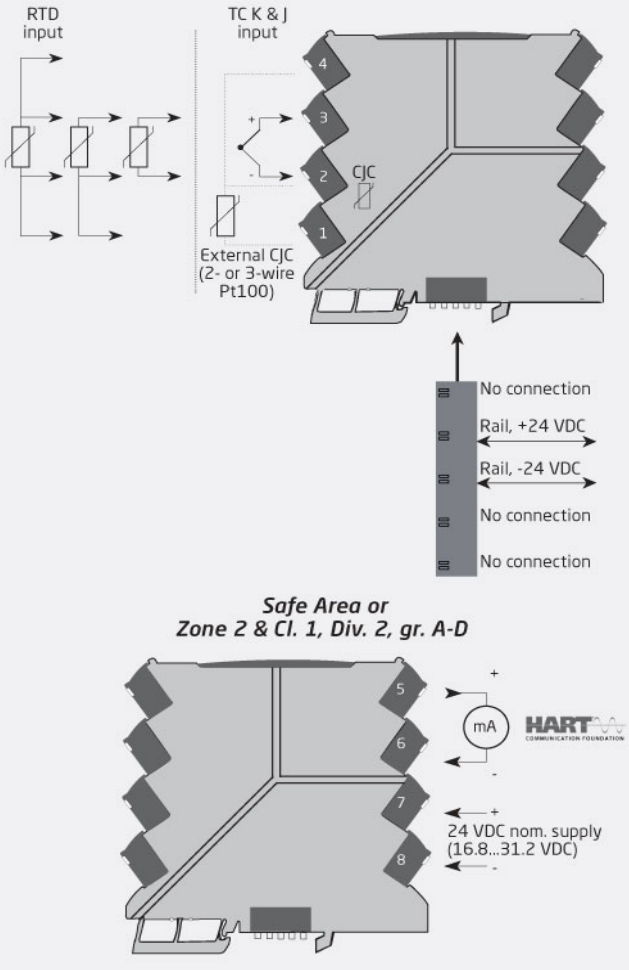
Technical characteristics

- Flexibly powered by 24 VDC (±30%) via power rail or connectors.
- A 60 ms fast response time with simultaneous sensor error detection when selected.
- Selectable internal/external CJC.
- Excellent conversion accuracy in all available ranges, better than 0.05% of span.
- Meeting the NAMUR NE21 recommendations, the 3113 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- A visible green LED indicates operational status of the unit and the input sensor.
- All terminals are protected against overvoltage and polarity error.
- High galvanic isolation of 2.5 kVAC.
- Excellent signal/noise ratio of > 60 dB.

Mounting / installation / programming

- Selectable HART® mode with HART® 7 revision protocol enables extended device programming.
- Selectable DIP-mode for easy configuration of more than 1000 factory calibrated measurement ranges with HART® read only feature.
- The narrow 6 mm housing allows up to 165 units to be mounted per meter of DIN rail, without any air gap between units.
- Wide ambient temperature range of -25...+70°C.

Connections



Order:

Type
3113

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	0.7 W
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Accuracy	Better than 0.05% of selected range
Signal / noise ratio	> 60 dB
Signal dynamics, input	23 bit
Signal dynamics, output	18 bit
Response time, HART® mode, (0...90%, 100...10%)	60 ms...60 s, programmable
Response time, DIP mode, (0...90%, 100...10%)	< 60 ms
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span
Incorrect DIP-switch setting identification	3.5 mA output; LED 0.5 s / 1 Hz

Input specifications

Temperature range, Pt100	-200...+850°C
Accuracy, RTD: the greater of	Better than 0.05% of span or 0.1°C
Temperature coefficient, RTD: the greater of	0.02°C/°C or ≤ ±0.01%/°C
Sensor current, RTD	< 150 µA
Sensor cable resistance, RTD	< 50 Ω per wire
Effect of sensor cable resistance (3-/4-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Yes - selectable via DIP-switch
Broken sensor detection	> 800 Ω
Shorted sensor detection	< 18 Ω
Temperature range, TC J	-100...+1200°C
Temperature range, TC K	-180...+1372°C
Accuracy, TC: the greater of	Better than 0.05% of span or 0.5°C
Temperature coefficient, TC: the greater of	0.1°C/°C or ≤ ±0.01%/°C
Sensor cable resistance, TC	< 5 kΩ per wire
Cold junction compensation (CJC): Accuracy @ external Pt100 intput	Better than ±0.15°C
Cold junction compensation (CJC): Accuracy @ internal CJC	Better than ±2.5°C
Open Thermocouple detection	Yes - selectable via DIP-switch
Internal CJC error detection	Yes
External CJC error detection	Yes - selectable via DIP-switch

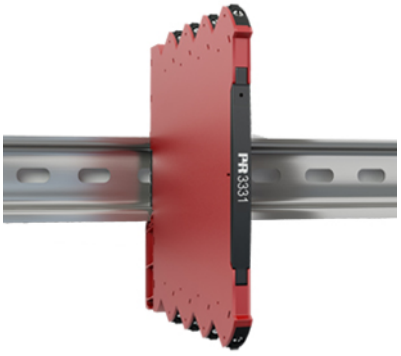
Output specifications

Programmable current ranges	4...20 and 20...4 mA
Range limits	3.8...20.5 mA NAMUR NE43
Sensor error indication	3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load (@ current output)	≤ 600 Ω (23 mA)
Open output	< 20 V
Updating time	10 ms
Load stability, current output	≤0.01% of span / 100 Ω
HART protocol revisions	HART 7

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
EAC TR-CU 020/2011	EN 61326-1
UL	UL 61010-1

A



Temperature converter, loop-powered - isolated

3331

- Excellent accuracy, better than 0.05% of span
- Slimline housing of 6 mm
- Excellent EMC performance and 50/60 Hz noise suppression
- Selectable < 30 ms / 300 ms response time
- Pre-calibrated temperature ranges selectable via DIP-switches

A

Application

- The 3331 temperature converter measures a standard Pt100, TC J and K temperature sensor, and provides an isolated passive analog current output signal.
- High 2 port isolation provides surge suppression and protects the control system from transients and noise.
- The 3331 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

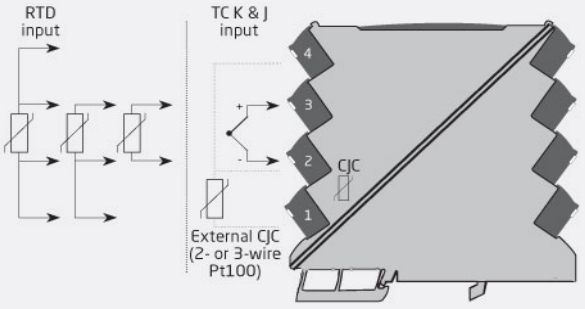
Technical characteristics

- Flexibly loop powered by 5.5...35 VDC via connectors.
- < 30 ms fast response time with simultaneous sensor error detection when selected.
- Selectable 300 ms response time when signal dampening is needed.
- Selectable internal/external CJC.
- Excellent conversion accuracy in all available ranges, better than 0.05% of span.
- Meeting the NAMUR NE21 recommendations, the 3331 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- All terminals are protected against overvoltage and polarity error.
- High galvanic isolation of 2.5 kVAC.
- Excellent signal/noise ratio of > 60 dB.

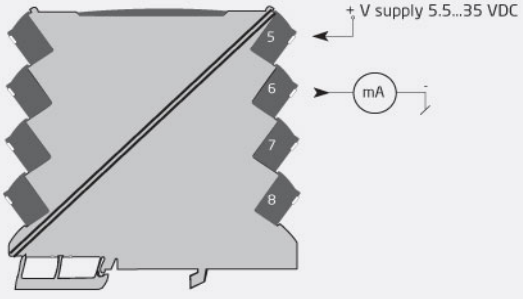
Mounting / installation / programming

- Selectable DIP-settings for easy configuration of more than 1000 factory calibrated measurement ranges.
- The narrow 6 mm housing allows up to 165 units to be mounted per meter of DIN rail, without any air gap between units.
- Wide ambient temperature range of -25...+70°C.

Connections



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



Order:

Type
3331

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	5.5...35 VDC
Voltage drop	5.5 VDC
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
Signal dynamics, input	23 bit
Signal dynamics, output	18 bit
Response time (0...90%, 100...10%)	< 30 ms / 300 ms (selectable)
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span
Incorrect DIP-switch setting identification	3.5 mA

Input specifications

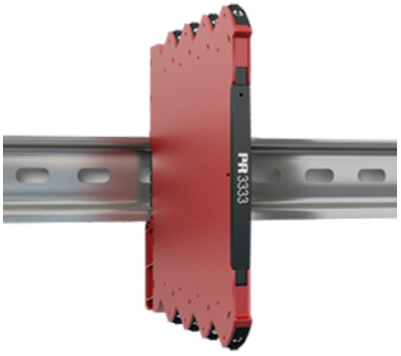
Temperature range, Pt100	-200...+850°C
Accuracy, RTD: the greater of	Better than 0.05% of span or 0.1°C
Temperature coefficient, RTD: the greater of	0.02°C/°C or ≤ ±0.01%/°C
Sensor current, RTD	< 150 µA
Sensor cable resistance, RTD	< 50 Ω per wire
Effect of sensor cable resistance (3-/4-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Yes - selectable via DIP-switch
Broken sensor detection	> 800 Ω
Shorted sensor detection	< 18 Ω
Temperature range, TC J	-100...+1200°C
Temperature range, TC K	-180...+1372°C
Accuracy, TC: the greater of	Better than 0.05% of span or 0.5°C
Temperature coefficient, TC: the greater of	0.1°C/°C or ≤ ±0.01%/°C
Sensor cable resistance, TC	< 5 kΩ per wire
Cold junction compensation (CJC): Accuracy @ external Pt100 intput	Better than ±0.15°C
Cold junction compensation (CJC): Accuracy @ internal CJC	Better than ±2.5°C
Open Thermocouple detection	Yes - selectable via DIP-switch
Internal CJC error detection	Yes
External CJC error detection	Yes - selectable via DIP-switch

Output specifications

Programmable current ranges	4...20 and 20...4 mA
Range limits	3.8...20.5 mA NAMUR NE43
Sensor error indication	3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load resistance, current output	≤ (Vsupply - 5.5) / 0.023 [Ω]
Updating time	10 ms
Load stability, current output	≤0.01% of span / 100 Ω

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
EAC TR-CU 020/2011	EN 61326-1
UL	UL 61010-1



Pt100 converter, loop-powered

3333

– High accuracy, better than 0.1% of span
– Slimline housing of 6 mm
– Excellent EMC performance and 50/60 Hz noise suppression
– Selectable < 30 ms / 300 ms response time
– Pre-calibrated temperature ranges selectable via DIP-switches

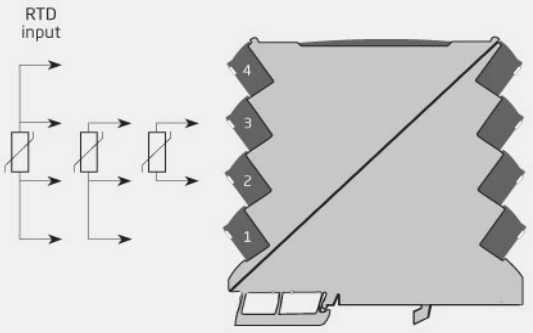
A

Application
- The 3333 temperature converter measures a standard 2-, 3- or 4-wire Pt100 temperature sensor, and provides a passive analog current output signal.
- The 3333 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

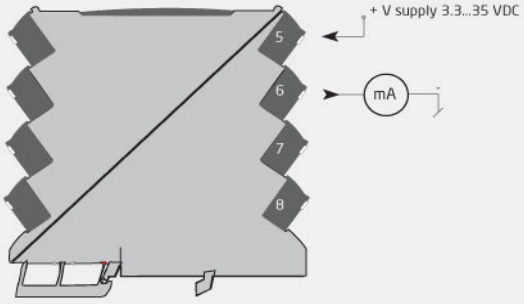
Technical characteristics
- Flexibly loop powered by 3.3...35 VDC via connectors.
- < 30 ms fast response time with simultaneous sensor error detection when selected.
- Selectable 300 ms response time when signal dampening is needed.
- High conversion accuracy in all available ranges, better than 0.1% of span.
- Meeting the NAMUR NE21 recommendations, the 3333 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- All terminals are protected against overvoltage and polarity error.
- Excellent signal/noise ratio of > 60 dB.

Mounting / installation / programming
- Selectable DIP-settings for easy configuration of more than 1000 factory calibrated measurement ranges.
- The narrow 6 mm housing allows up to 165 units to be mounted per meter of DIN rail, without any air gap between units.
- Wide ambient temperature range of -25...+70°C.

Connections



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



Order:

Type
3333

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	3.3...35 VDC
Voltage drop	3.3 VDC
Signal / noise ratio	> 60 dB
Signal dynamics, input	23 bit
Signal dynamics, output	18 bit
Response time (0...90%, 100...10%)	< 30 ms / 300 ms (selectable)
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span
Incorrect DIP-switch setting identification	3.5 mA

Input specifications

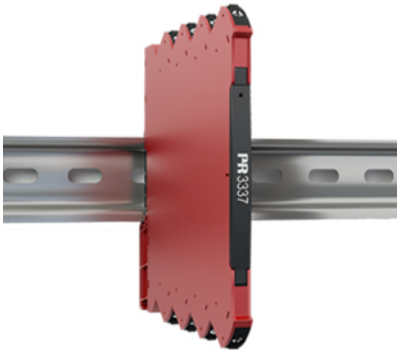
Temperature range, Pt100	-200...+850°C
Accuracy, RTD: the greater of	Better than 0.1% of span or 0.2°C
Temperature coefficient, RTD: the greater of	0.02°C/°C or ≤ ±0.01%/°C
Sensor current, RTD	< 150 µA
Sensor cable resistance, RTD	< 50 Ω per wire
Effect of sensor cable resistance (3-/4-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Yes - selectable via DIP-switch
Broken sensor detection	> 800 Ω
Shorted sensor detection	< 18 Ω

Output specifications

Programmable current ranges	4...20 and 20...4 mA
Range limits	3.8...20.5 mA NAMUR NE43
Sensor error indication	3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load resistance, current output	≤ (Vsupply - 3.3) / 0.023 [Ω]
Updating time	10 ms
Load stability, current output	≤0.01% of span / 100 Ω

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
EAC TR-CU 020/2011	EN 61326-1
UL	UL 61010-1



HART 7 temperature converter, loop-powered

3337

- High accuracy, better than 0.05% of span
- Slimline housing of 6 mm
- Excellent EMC performance
- Selectable 60 ms / 60 s response time
- Pre-calibrated temperature ranges selectable via DIP-switches

A

Application

- The 3337 temperature converter measures a standard Pt100, TC J and K temperature sensor, and provides an isolated passive analog current and HART® signal output.
- High 2 port isolation provides surge suppression and protects the control system from transients and noise.
- The 3337 can be mounted in the safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

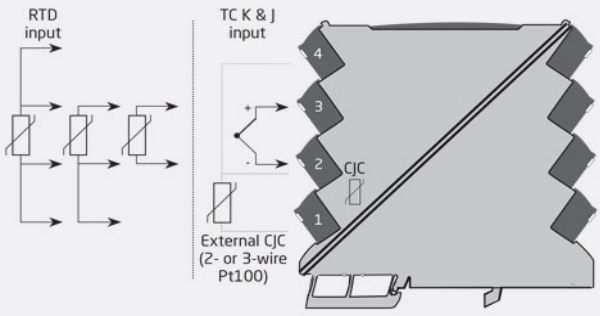
Technical characteristics

- Flexibly loop powered by 6.2...35 VDC via connectors.
- A 60 ms fast response time with simultaneous sensor error detection when selected.
- Selectable internal/external CJC.
- Excellent conversion accuracy in all available ranges, better than 0.05% of span.
- Meeting the NAMUR NE21 recommendations, the 3337 provides top measurement performance in harsh EMC environments.
- The device meets the NAMUR NE43 standard defining out of range and sensor error output values.
- All terminals are protected against overvoltage and polarity error.
- High galvanic isolation of 2.5 kVAC.
- Excellent signal/noise ratio of > 60 dB.

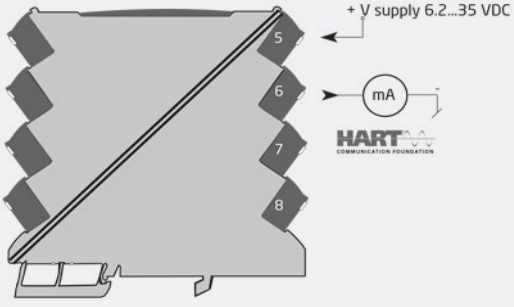
Mounting / installation / programming

- Selectable HART® mode with HART® 7 revision protocol enables extended device programming.
- Selectable DIP-mode for easy configuration of more than 1000 factory calibrated measurement ranges with HART® read only feature.
- The narrow 6 mm housing allows up to 165 units to be mounted per meter of DIN rail, without any air gap between units.
- Wide ambient temperature range of -25...+70°C..

Connections



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



Order:

Type
3337

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	6.2...35 VDC
Voltage drop	6.2 VDC
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
Signal dynamics, input	23 bit
Signal dynamics, output	18 bit
Response time, HART® mode, (0...90%, 100...10%)	60 ms...60 s, programmable
Response time, DIP mode, (0...90%, 100...10%)	< 60 ms
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span
Incorrect DIP-switch setting identification	3.5 mA

Input specifications

Temperature range, Pt100	-200...+850°C
Accuracy, RTD: the greater of	Better than 0.05% of span or 0.1°C
Temperature coefficient, RTD: the greater of	0.02°C/°C or ≤ ±0.01%/°C
Sensor current, RTD	< 150 µA
Sensor cable resistance, RTD	< 50 Ω per wire
Effect of sensor cable resistance (3-/4-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Yes - selectable via DIP-switch
Broken sensor detection	> 800 Ω
Shorted sensor detection	< 18 Ω
Temperature range, TC J	-100...+1200°C
Temperature range, TC K	-180...+1372°C
Accuracy, TC: the greater of	Better than 0.05% of span or 0.5°C
Temperature coefficient, TC: the greater of	0.1°C/°C or ≤ ±0.01%/°C
Sensor cable resistance, TC	< 5 kΩ per wire
Cold junction compensation (CJC): Accuracy @ external Pt100 intput	Better than ±0.15°C
Cold junction compensation (CJC): Accuracy @ internal CJC	Better than ±2.5°C
Open Thermocouple detection	Yes - selectable via DIP-switch
Internal CJC error detection	Yes
External CJC error detection	Yes - selectable via DIP-switch

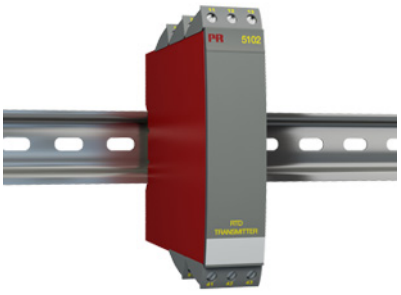
Output specifications

Programmable current ranges	4...20 and 20...4 mA
Range limits	3.8...20.5 mA NAMUR NE43
Sensor error indication	3.5 mA or 23 mA / acc. to NAMUR NE43 or OFF
Load resistance, current output	≤ (Vsupply - 6.2) / 0.023 [Ω]
Updating time	10 ms
Load stability, current output	≤0.01% of span / 100 Ω
HART protocol revisions	HART 7

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
EAC TR-CU 020/2011	EN 61326-1
UL	UL 61010-1

A



RTD transmitter

5102

– Cost effective RTD transmitter
– Input for Pt100, Ni100 or Ohm
– Linearized analog output
– 1- or 2-channel version
– DIN rail mounting

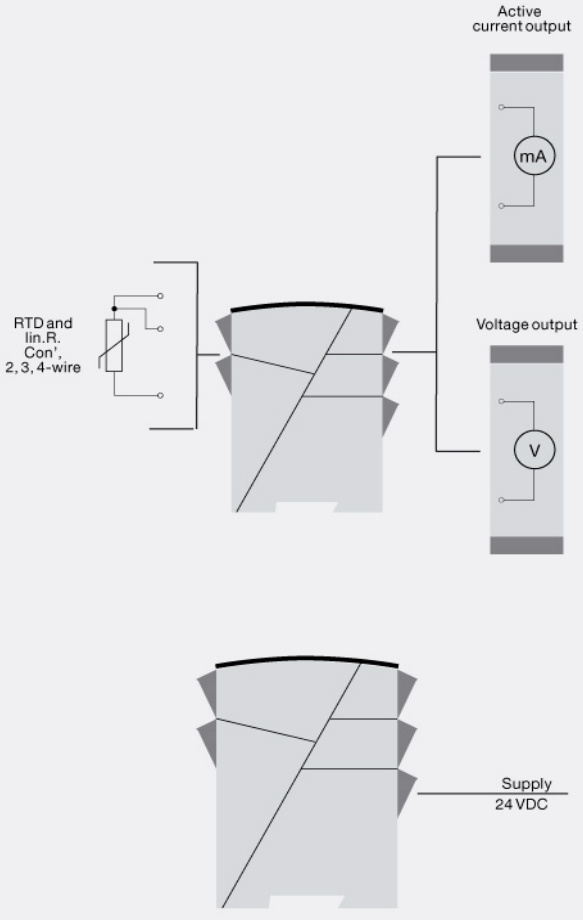
A

Advanced features
- The 5102 transmitter can be configured with the software program PReset 5000 using a DOS-based PC and the Loop Link communications unit.

Application
- Linearized temperature measurement with Pt100 (to IEC 715) or Ni100 (to DIN 43760) sensors.
- Conversion of linear resistance change to standard analog current/voltage signal from for example valves or linear movements with attached potentiometer.
- Signal simulator via externally mounted 10-turn potentiometer, to aid with installation and commissioning the plant.
- 3-wire connection cable compensation or 2-wire connection without cable compensation.
- Sensor error detection with Upscale, Downscale or custom set values.
- Reversible inputs with 0% set to maximum value of the desired input range and 100% set to the minimum value of the desired input range.

Technical characteristics
- Analog current output can be configured to any current within 0...20 mA range.
- Voltage output range is selectable between 0...10 VDC and 0...1 VDC by use of internal jumpers.
- Programming can be performed with or without a power supply.

Connections



Order:

Type	Channels	
5102	1 channel	: A
	2 channels	: B

Environmental Conditions

Specifications range..... -40°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..... 170 g
DIN rail type..... DIN 46277
Screw terminal torque..... 0.5 Nm

Common specifications

Supply voltage..... 19.2...28.8 VDC
Internal consumption..... 1.7 W (2 channels)
Warm-up time..... < 5 min.
Communications interface..... Loop Link
Signal / noise ratio..... Min. 60 dB
Signal dynamics, input..... 17 bit
Signal dynamics, output..... 16 bit
Response time (0...90%, 100...10%)..... < 165 ms
Temperature coefficient..... < ±0.01% /°Camb.
Linearity error..... < 0.1% of span
EMC immunity influence..... < ±0.5% of span

Input specifications

Max. offset..... 50% of selected max. value
RTD input..... Pt100, Ni100, lin. R
Cable resistance per wire (max.), RTD..... 10...50 Ω (programmable)
Sensor current, RTD..... > 0.2 mA, < 0.4 mA
Sensor error detection, RTD..... Upscale

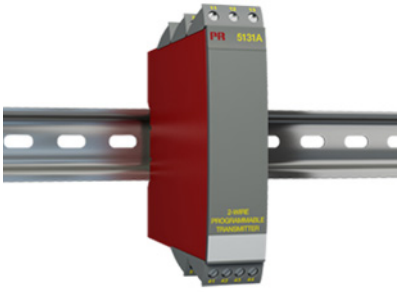
Output specifications

Max. offset..... 50% of selected max. value
Current output: Signal range..... 0...20 mA
Min. signal range..... 5 mA
Voltage output: signal range..... 0...10 VDC
Voltage output, min. signal range..... 250 mV
Load (max.)..... 20 mA/600 Ω/12 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... ≤ 28 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
EAC TR-CU 020/2011..... EN 61326-1

A



2-wire programmable transmitter

5131A

– Input for RTD, TC, mV, linear resistance, mA, and V sample
– 3.75 kVAC galvanic isolation
– 4...20 mA loop output
– 1- or 2-channel version
– DIN rail mounting

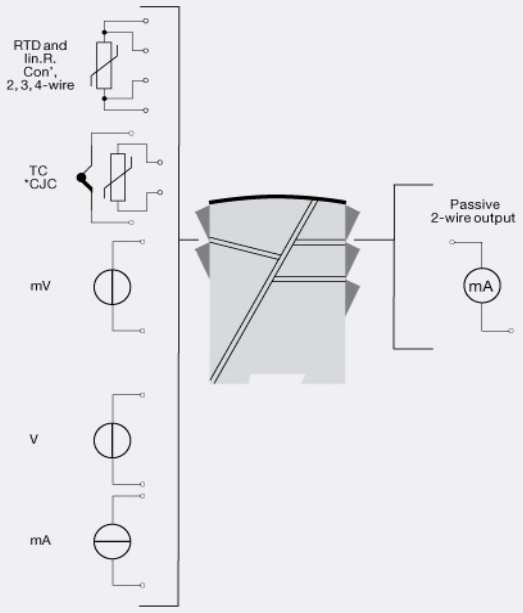
A

Advanced features
- The 5131A transmitter can be configured with the software program PReset using a standard PC and the Loop Link communications unit.

Application
- Independent channel jumper selectable inputs for current/voltage or temperature.
- Current input programmable in range 0...100 mA and voltage inputs in range 0...250 VDC.
- Linearized, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analog current / voltage signal, for example from solenoids and butterfly valves or linear movements with attached potentiometer.
- 4- or 3-wire connection automatic cable compensation or 2-wire connection with programmable cable compensation.
- Configurable sensor error detection including NAMUR NE43.

Technical characteristics
- Programming can be performed with or without a power supply.
- The 2-channel version has full galvanic isolation between the channels.
- Separation of circuits in PELV/SELV installations.

Connections



Order:

Type	Input	Channels
5131A	RTD / TC / R / mA / V / mV : -	Single : A Double : B

***Note!** For TC inputs with internal CJC, remember to order CJC connectors type 5910 (ch. 1) and 5913 (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.	195 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	7.5...35 VDC
Fuse	50 mA SB / 250 VAC
Isolation voltage, test / working	3.75 kVAC / 250 VAC
Communications interface	Loop Link
Signal / noise ratio	Min. 60 dB (0...100 kHz)
Signal dynamics, input	22 bit
Signal dynamics, output	16 bit
Updating time	115 ms (temperature input)
Updating time	75 ms (mA / V / mV input)
Response time (0...90%, 100...10%): Temperature input (programmable)	400 ms...60 s
mA / V input (programmable)	250 ms...60 s
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span
Effect of supply voltage change	< 0.005% of span / VDC

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 = ∞, VDROP < 6 V
Voltage input: Measurement range	-150...+150 mV
Voltage input: Measurement range	0...250 VDC
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	4…20 mA
Min. signal range	10 mA
Load resistance, current output	≤ (Vsupply -7.5)/0.023 [Ω]
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	≤ 28 mA
Sensor error indication, current output	Programmable 3.5…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 2006/95/EC	EN 61010-1
PELV/SELV	IEC 364-4-41 and EN 60742
ATEX 2004/108/EC	DEMKO 99ATEX124572

A

2-wire programmable transmitter

5331A

– RTD, TC, Ohm, or mV input
– Extremely high measurement accuracy
– 1.5 kVAC galvanic isolation
– Programmable sensor error value
– For DIN form B sensor head mounting

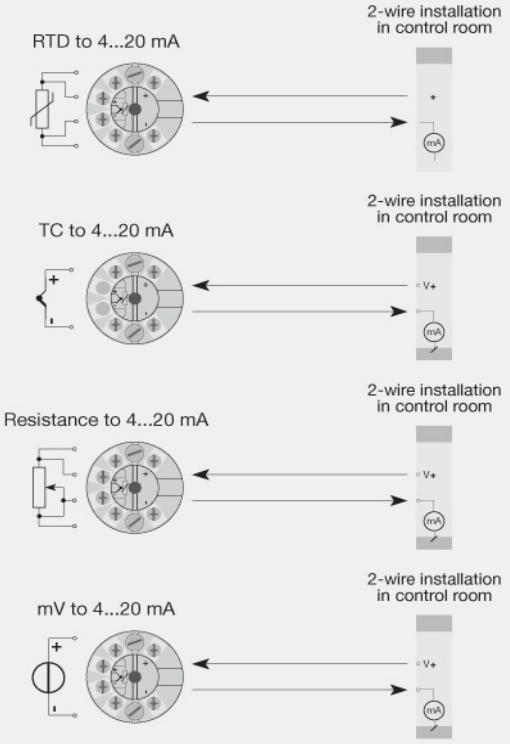
A

Application
- Linearized temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.

Technical characteristics
- Within a few seconds the user can program PR5331A to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- Continuous check of vital stored data for safety reasons.

Mounting / installation
- For DIN form B sensor head or DIN rail mounting with the PR fitting type 8421.

Connections



Order:

Type	Ambient temperature	Galvanic isolation
5331A	-40°C…+85°C : 3	1500 VAC : B

Environmental Conditions

Specifications range	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree (encl./terminal)	IP68 / IP00

Mechanical specifications

Dimensions	Ø 44 x 20.2 mm
Weight approx.	50 g
Wire size	1 x 1.5 mm^2 stranded wire
Screw terminal torque	0.4 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	7.2...35 VDC
Internal consumption	25 mW…0.8 W
Voltage drop	7.2 VDC
Isolation voltage, test / working	1.5 kVAC / 50 VAC
Warm-up time	5 min.
Communications interface	Loop Link
Signal / noise ratio	Min. 60 dB
Response time (programmable)	1...60 s
EEprom error check	< 3.5 s
Accuracy	Better than 0.05% of selected range
Signal dynamics, input	20 bit
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC
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	5 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 detection, TC	Yes
Sensor error current: When detecting / else	Nom. 33 µA / 0 µA
Voltage input: Measurement range	-12...800 mV
Min. measurement range (span), voltage input	5 mV
Input resistance, voltage input	10 MΩ

Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Updating time	440 ms
Load resistance, current output	≤ (Vsupply - 7.2) / 0.023 [Ω]
Load stability, current output	≤0.01% of span / 100 Ω
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 10ATEX0002 X
IECEx	DEK 13.0035X
INMETRO	DEKRA 13.0001 X
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4

2-wire programmable transmitter

5331D

- RTD, TC, Ohm, or mV input
- Extremely high measurement accuracy
- 1.5 kVAC galvanic isolation
- Programmable sensor error value
- For DIN form B sensor head mounting

A

Application

- Linearized temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.

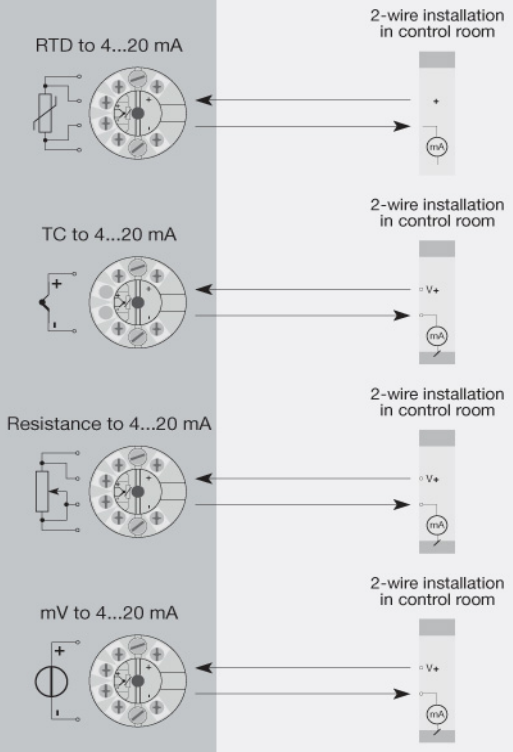
Technical characteristics

- Within a few seconds the user can program PR5331D to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- Continuous check of vital stored data for safety reasons.

Mounting / installation

- For DIN form B sensor head mounting.
- NB: As Ex barrier we recommend 5104B, 5114B, or 5116B.

Connections



Order:

Type	Ambient temperature	Galvanic isolation
5331D	-40°C…+85°C : 3	1500 VAC : B

Environmental Conditions

Specifications range..... -40°C to +85°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree (encl./terminal)..... IP68 / IP00

Mechanical specifications

Dimensions..... Ø 44 x 20.2 mm
Weight approx..... 50 g
Wire size..... 1 x 1.5 mm^2 stranded wire
Screw terminal torque..... 0.4 Nm
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...25 Hz..... ±1.6 mm
Vibration: 25...100 Hz..... ±4 g

Common specifications

Supply voltage..... 7.2...30 VDC
Internal consumption..... 25 mW…0.8 W
Voltage drop..... 7.2 VDC
Isolation voltage, test / working..... 1.5 kVAC / 50 VAC
Warm-up time..... 5 min.
Communications interface..... Loop Link
Signal / noise ratio..... Min. 60 dB
Response time (programmable)..... 1...60 s
EEprom error check..... < 3.5 s
Accuracy..... Better than 0.05% of selected range
Signal dynamics, input..... 20 bit
Signal dynamics, output..... 16 bit
Effect of supply voltage change..... < 0.005% of span / VDC
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..... 5 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 detection, TC..... Yes
Sensor error current: When detecting / else..... Nom. 33 µA / 0 µA
Voltage input: Measurement range..... -12...800 mV
Min. measurement range (span), voltage input..... 5 mV
Input resistance, voltage input..... 10 MΩ

Output specifications

Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Updating time..... 440 ms
Load resistance, current output..... ≤ (Vsupply - 7.2) / 0.023 [Ω]
Load stability, current output..... ≤0.01% of span / 100 Ω
Sensor error indication, current output..... Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale..... 23 mA / 3.5 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 06ATEX0062
IECEx..... DEK 13.0035X
FM..... 2D5A7
CSA..... 1125003
INMETRO..... DEKRA 13.0001 X
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410
DNV Marine..... Stand. f. Certific. No. 2.4

A

2-wire programmable transmitter

5333A

– RTD or Ohm input
– High measurement accuracy
– 3-wire connection
– Programmable sensor error value
– For DIN form B sensor head mounting

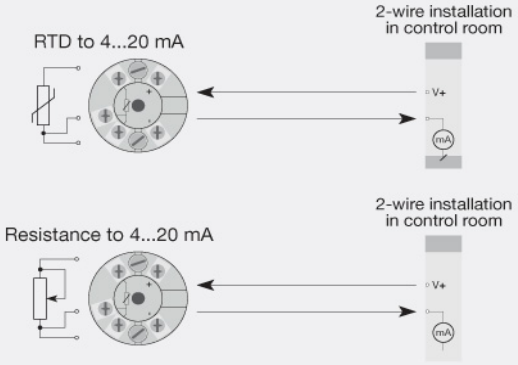
A

Application
- Linearized temperature measurement with Pt100...Pt1000 or Ni100...Ni1000 sensor.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.

Technical characteristics
- Within a few seconds the user can program PR5333A to measure temperatures within all RTD ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 3-wire connection.

Mounting / installation
- For DIN form B sensor head or DIN rail mounting with the PR fitting type 8421.

Connections



Order:

Type
5333A

Environmental Conditions

Specifications range	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree (encl./terminal)	IP68 / IP00

Mechanical specifications

Dimensions	Ø 44 x 20.2 mm
Weight approx.	50 g
Wire size	1 x 1.5 mm^2 stranded wire
Screw terminal torque	0.4 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	8.0...35 VDC
Internal consumption	25 mW…0.8 W
Voltage drop	8.0 VDC
Warm-up time	5 min.
Communications interface	Loop Link
Signal / noise ratio	Min. 60 dB
Response time (programmable)	0.33...60 s
Accuracy	Better than 0.1% of selected range
Signal dynamics, input	19 bit
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC
EMC immunity influence	< ±0.5% 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	> 0.2 mA, < 0.4 mA
Effect of sensor cable resistance (3-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Yes

Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Updating time	135 ms
Load resistance, current output	≤ (Vsupply - 8) / 0.023 [Ω]
Load stability, current output	≤0.01% of span / 100 Ω
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 10ATEX0003 X
IECEx	DEK 13.0036X
INMETRO	DEKRA 13.0002 X
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4

A

2-wire programmable transmitter

5333D

– RTD or Ohm input
– High measurement accuracy
– 3-wire connection
– Programmable sensor error value
– For DIN form B sensor head mounting

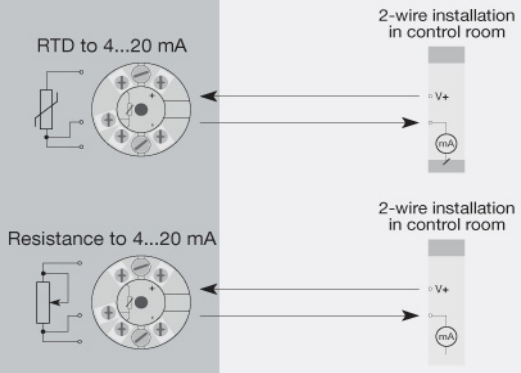
A

Application
- Linearized temperature measurement with Pt100...Pt1000 or Ni100...Ni1000 sensor.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.

Technical characteristics
- Within a few seconds the user can program PR5333D to measure temperatures within all RTD ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 3-wire connection.

Mounting / installation
- For DIN form B sensor head mounting.
- NB: As Ex barrier we recommend 5104B, 5114B, or 5116B.

Connections



Order:

Type
5333D

Environmental Conditions

Specifications range	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree (encl./terminal)	IP68 / IP00

Mechanical specifications

Dimensions	Ø 44 x 20.2 mm
Weight approx.	50 g
Wire size	1 x 1.5 mm^2 stranded wire
Screw terminal torque	0.4 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	8.0...30 VDC
Internal consumption	25 mW…0.8 W
Voltage drop	8.0 VDC
Warm-up time	5 min.
Communications interface	Loop Link
Signal / noise ratio	Min. 60 dB
Response time (programmable)	0.33...60 s
Accuracy	Better than 0.1% of selected range
Signal dynamics, input	19 bit
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC
EMC immunity influence	< ±0.5% 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	> 0.2 mA, < 0.4 mA
Effect of sensor cable resistance (3-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Yes

Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Updating time	135 ms
Load resistance, current output	≤ (Vsupply - 8) / 0.023 [Ω]
Load stability, current output	≤0.01% of span / 100 Ω
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 03ATEX1535 X
IECEx	DEK 13.0036X
FM	2D5A7
CSA	1125003
INMETRO	DEKRA 13.0002 X
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
DNV Marine	Stand. f. Certific. No. 2.4

2-wire programmable transmitter

5334A

– TC input
– High measurement accuracy
– Galvanic isolation
– Programmable sensor error value
– For DIN form B sensor head mounting

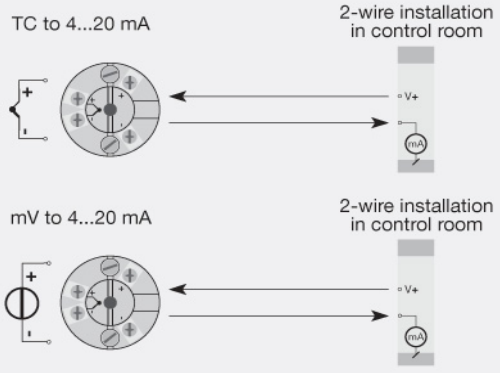
A

Application
- Linearized temperature measurement with TC sensor.
- Amplification of bipolar mV signals to a 4...20 mA signal, optionally linearized according to a defined linearization function.

Technical characteristics
- Within a few seconds the user can program PR5334A to measure temperatures within all TC ranges defined by the norms.
- Cold junction compensation (CJC) with a built-in temperature sensor.
- Continuous check of vital stored data for safety reasons.

Mounting / installation
- For DIN form B sensor head or DIN rail mounting with the PR fitting type 8421.

Connections



Order:

Type	Ambient temperature	Galvanic isolation
5334A	-40°C...+85°C : 3	1500 VAC : B

Environmental Conditions

Specifications range..... -40°C to +85°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree (encl./terminal)..... IP68 / IP00

Mechanical specifications

Dimensions..... Ø 44 x 20.2 mm
Weight approx..... 50 g
Wire size..... 1 x 1.5 mm^2 stranded wire
Screw terminal torque..... 0.4 Nm
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...25 Hz..... ±1.6 mm
Vibration: 25...100 Hz..... ±4 g

Common specifications

Supply voltage..... 7.2...35 VDC
Internal consumption..... 25 mW…0.8 W
Voltage drop..... 7.2 VDC
Isolation voltage, test / working..... 1.5 kVAC / 50 VAC
Warm-up time..... 5 min.
Communications interface..... Loop Link
Signal / noise ratio..... Min. 60 dB
Response time (programmable)..... 1...60 s
EEprom error check..... < 3.5 s
Accuracy..... Better than 0.05% of selected range
Signal dynamics, input..... 18 bit
Signal dynamics, output..... 16 bit
Effect of supply voltage change..... < 0.005% of span / VDC
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
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 detection, TC..... Yes
Sensor error current: When detecting / else..... Nom. 33 µA / 0 µA
Voltage input: Measurement range..... -12...150 mV
Min. measurement range (span), voltage input..... 5 mV
Input resistance, voltage input..... 10 MΩ

Output specifications

Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Updating time..... 440 ms
Load resistance, current output..... ≤ (Vsupply - 7.2) / 0.023 [Ω]
Load stability, current output..... ≤0.01% of span / 100 Ω
Sensor error indication, current output..... Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale..... 23 mA / 3.5 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 10ATEX0002 X
IECEx..... DEK 13.0035X
INMETRO..... DEKRA 13.0001 X
EAC TR-CU 020/2011..... EN 61326-1

A

2-wire programmable transmitter

5334B

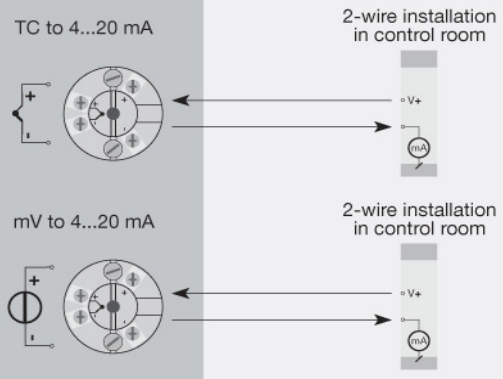
– TC input
– High measurement accuracy
– Galvanic isolation
– Programmable sensor error value
– For DIN form B sensor head mounting

Application
- Linearized temperature measurement with TC sensor.
- Amplification of bipolar mV signals to a 4...20 mA signal, optionally linearized according to a defined linearization function.

Technical characteristics
- Within a few seconds the user can program PR5334B to measure temperatures within all TC ranges defined by the norms.
- Cold junction compensation (CJC) with a built-in temperature sensor.
- Continuous check of vital stored data for safety reasons.

Mounting / installation
- For DIN form B sensor head mounting.
- NB: As Ex barrier we recommend 5104B, 5114B, or 5116B.

Connections



Order:

Type	Ambient temperature	Galvanic isolation
5334B	-40°C...+85°C : 3	1500 VAC : B

Environmental Conditions

Specifications range..... -40°C to +85°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree (encl./terminal)..... IP68 / IP00

Mechanical specifications

Dimensions..... Ø 44 x 20.2 mm
Weight approx..... 50 g
Wire size..... 1 x 1.5 mm^2 stranded wire
Screw terminal torque..... 0.4 Nm
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...25 Hz..... ±1.6 mm
Vibration: 25...100 Hz..... ±4 g

Common specifications

Supply voltage..... 7.2...30 VDC
Internal consumption..... 25 mW…0.8 W
Voltage drop..... 7.2 VDC
Isolation voltage, test / working..... 1.5 kVAC / 50 VAC
Warm-up time..... 5 min.
Communications interface..... Loop Link
Signal / noise ratio..... Min. 60 dB
Response time (programmable)..... 1...60 s
EEprom error check..... < 3.5 s
Accuracy..... Better than 0.05% of selected range
Signal dynamics, input..... 18 bit
Signal dynamics, output..... 16 bit
Effect of supply voltage change..... < 0.005% of span / VDC
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
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 detection, TC..... Yes
Sensor error current: When detecting / else..... Nom. 33 µA / 0 µA
Voltage input: Measurement range..... -12...150 mV
Min. measurement range (span), voltage input..... 5 mV
Input resistance, voltage input..... 10 MΩ

Output specifications

Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Updating time..... 440 ms
Load resistance, current output..... ≤ (Vsupply - 7.2) / 0.023 [Ω]
Load stability, current output..... ≤0.01% of span / 100 Ω
Sensor error indication, current output..... Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale..... 23 mA / 3.5 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 06ATEX0062
IECEx..... DEK 13.0035X
INMETRO..... DEKRA 13.0001 X
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410
DNV Marine..... Stand. f. Certific. No. 2.4

A

2-wire transmitter with HART® protocol

5335A

– RTD, TC, Ohm, or mV input
– Extremely high measurement accuracy
– HART® 5 protocol
– Programmable sensor error value
– For DIN form B sensor head mounting

A

Application

- Linearized temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Difference or average temperature measurement of 2 resistance or TC sensors.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.
- Connection of up to 15 transmitters to a digital 2-wire signal with HART® communication.

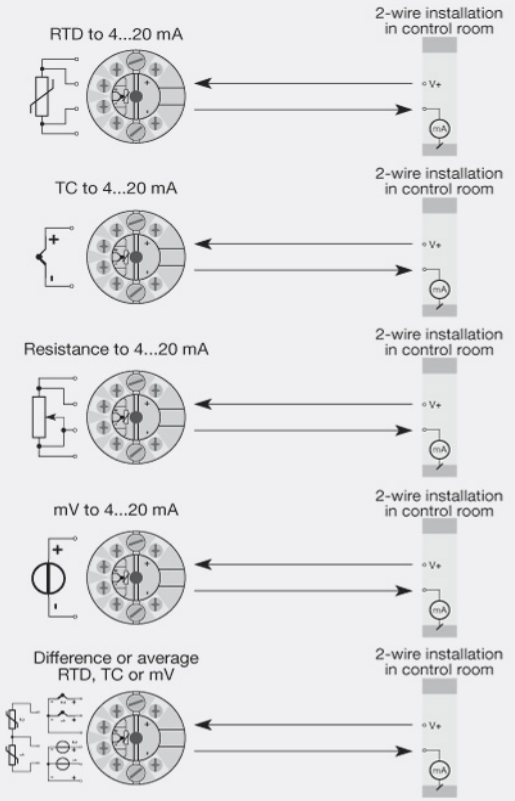
Technical characteristics

- Within a few seconds the user can program PR5335A to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- The 5335A has been designed according to strict safety requirements and is therefore suitable for application in SIL 2 installations.
- Continuous check of vital stored data for safety reasons.
- Sensor error detection according to the guidelines in NAMUR NE89.

Mounting / installation

- For DIN form B sensor head or DIN rail mounting with the PR fitting type 8421.

Connections



Order:

Type
5335A

Environmental Conditions

Specifications range	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree (encl./terminal)	IP68 / IP00

Mechanical specifications

Dimensions	Ø 44 x 20.2 mm
Weight approx.	50 g
Wire size	1 x 1.5 mm^2 stranded wire
Screw terminal torque	0.4 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	8.0...35 VDC
Isolation voltage, test / working	1.5 kVAC / 50 VAC
Warm-up time	30 s
Communications interface	Loop Link & HART®
Signal / noise ratio	Min. 60 dB
Accuracy	Better than 0.05% of selected range
Response time (programmable)	1...60 s
Signal dynamics, input	22 bit
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC
EMC immunity influence	< ±0.1% 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	5 Ω (up to 50 Ω per wire is possible with reduced measurement accuracy)
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
Cold junction compensation (CJC)	< ±1.0°C
Sensor error detection, TC	Yes
Sensor error current: When detecting / else	Nom. 33 µA / 0 µA
Voltage input: Measurement range	-800...+800 mV
Min. measurement range (span), voltage input	2.5 mV
Input resistance, voltage input	10 MΩ

Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Load resistance, current output	≤ (Vsupply - 8) / 0.023 [Ω]
Load stability, current output	≤0.01% of span / 100 Ω
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 03ATEX1508 X
IECEx	KEM 10.0083X
INMETRO	NCC 12.0844 X
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
SIL	Hardware assessed for use in SIL applications

A

2-wire transmitter with HART® protocol

5335D

– RTD, TC, Ohm, or mV input
– Extremely high measurement accuracy
– HART® 5 protocol
– Galvanic isolation
– For DIN form B sensor head mounting

A

Application

- Linearized temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Difference or average temperature measurement of 2 resistance or TC sensors.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.
- Connection of up to 15 transmitters to a digital 2-wire signal with HART® communication.

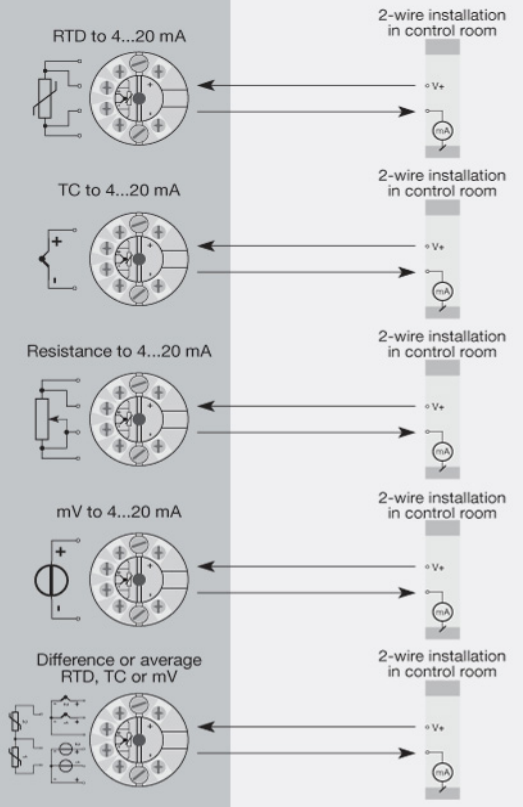
Technical characteristics

- Within a few seconds the user can program PR5335D to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- The 5335D has been designed according to strict safety requirements and is therefore suitable for application in SIL 2 installations.
- Continuous check of vital stored data for safety reasons.
- Sensor error detection according to the guidelines in NAMUR NE89.

Mounting / installation

- For DIN form B sensor head mounting.
- NB: As Ex barrier we recommend 5106B.

Connections



Order:

Type
5335D

Environmental Conditions

Specifications range	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree (encl./terminal)	IP68 / IP00

Mechanical specifications

Dimensions	Ø 44 x 20.2 mm
Weight approx.	50 g
Wire size	1 x 1.5 mm^2 stranded wire
Screw terminal torque	0.4 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	8.0...30 VDC
Isolation voltage, test / working	1.5 kVAC / 50 VAC
Warm-up time	30 s
Communications interface	Loop Link & HART®
Signal / noise ratio	Min. 60 dB
Response time (programmable)	1...60 s
Accuracy	Better than 0.05% of selected range
Signal dynamics, input	22 bit
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC
EMC immunity influence	< ±0.1% 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	5 Ω (up to 50 Ω per wire is possible with reduced measurement accuracy)
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
Cold junction compensation (CJC)	< ±1.0°C
Sensor error detection, TC	Yes
Sensor error current: When detecting / else	Nom. 33 µA / 0 µA
Voltage input: Measurement range	-800...+800 mV
Min. measurement range (span), voltage input	2.5 mV
Input resistance, voltage input	10 MΩ

Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Load resistance, current output	≤ (Vsupply - 8) / 0.023 [Ω]
Load stability, current output	≤0.01% of span / 100 Ω
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 03ATEX1537
IECEx	KEM 10.0083X
FM	2D5A7
CSA	1125003
INMETRO	NCC 12.0844 X
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
DNV Marine	Stand. f. Certific. No. 2.4
SIL	Hardware assessed for use in SIL applications

A

2-wire transmitter with HART® protocol

5337A

– RTD, TC, Ohm, and bipolar mV input
– 2 analogue inputs and 5 device variables with status available
– HART® protocol revision selectable from HART® 5 or HART® 7
– Hardware assessed for use in SIL applications
– Mounting in Safe area or Zone 2/22

A

Application

- Linearized temperature measurement with TC and RTD sensors e.g. Pt100 and Ni100.
- HART® communication and 4...20 mA analog PV output for individual, difference or average temperature measurement of up to two RTD or TC input sensors.
- Conversion of linear resistance to a standard analog current signal, e.g from valves or Ohmic level sensors.
- Amplification of bipolar mV signals to standard 4...20 mA current signals.
- Up to 63 transmitters (HART® 7) can be connected in a multidrop communication setup.

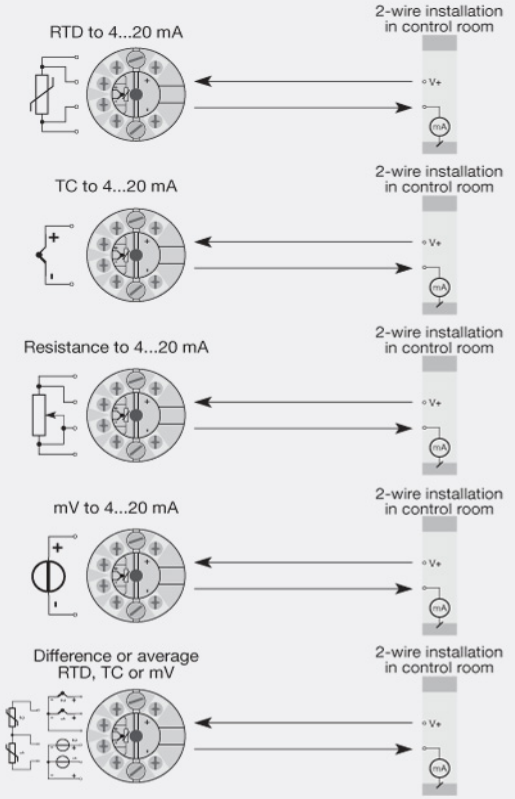
Technical characteristics

- HART® protocol revision can be changed by user configuration to either HART® 5 or HART® 7 protocol.
- The HART® 7 protocol offers: · Long Tag numbers of up to 32 characters.· Enhanced Burst Mode and Event notification with time stamping.· Device variable and status mapping to any dynamic variable PV, SV, TV or QV.· Process signal trend measurement with logs and summary data.· Automatic event notification with time stamps.· Command aggregation for higher communication efficiency.
- 5337A is designed according to strict safety requirements and is therefore suitable for applications in SIL installations.
- Continuous check of vital stored data.
- Meeting the NAMUR NE21 recommendations, the 5337 HART® transmitter ensures top measurement performance in harsh EMC environments. Additionally, the 5337 meets NAMUR NE43 and NE89 recommendations.

Mounting / installation

- For DIN form B sensor head or DIN rail mounting via the PR fitting type 8421.
- Configuration via standard HART® communication interfaces or by PR 5909 Loop Link.

Connections



Order:

Type
5337A

Environmental Conditions

Specifications range	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree (encl./terminal)	IP68 / IP00

Mechanical specifications

Dimensions	Ø 44 x 20.2 mm
Weight approx.	50 g
Wire size	1 x 1.5 mm^2 stranded wire
Screw terminal torque	0.4 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	8.0...35 VDC
Voltage drop	8.0 VDC
Isolation voltage, test / working	1.5 kVAC / 50 VAC
Signal / noise ratio	> 60 dB
Communications interface	Loop Link & HART®
Response time (programmable)	1...60 s
Accuracy	Better than 0.05% of selected range
EMC immunity influence	< ±0.1% 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	Pt50, Pt100, Pt200, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000
Cable resistance per wire (max.), RTD	5 Ω (up to 50 Ω per wire is possible with reduced measurement accuracy)
Sensor current, RTD	Nom. 0.2 mA
TC input: Thermocouple type	B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC)	Constant, internal or external via a Pt100 or Ni100 sensor
Voltage input: Measurement range	-800...+800 mV
Min. measurement range (span), voltage input	2.5 mV
Input resistance, voltage input	10 MΩ

Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Updating time	440 ms
Load resistance, current output	≤ (Vsupply - 8) / 0.023 [Ω]
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
HART protocol revisions	HART 5 and HART 7

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 03ATEX1508 X
IECEx	KEM 10.0083X
INMETRO	NCC 12.0844 X
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
SIL	Hardware assessed for use in SIL applications

2-wire transmitter with HART® protocol

5337D

– RTD, TC, Ohm, and bipolar mV input
– 2 analogue inputs and 5 device variables with status available
– HART® protocol revision selectable from HART® 5 or HART® 7
– Hardware assessed for use in SIL applications
– Mounting in hazardous gas and dust area

A

Application

- Linearized temperature measurement with TC and RTD sensors e.g. Pt100 and Ni100.
- HART® communication and 4...20 mA analog PV output for individual, difference or average temperature measurement of up to two RTD or TC input sensors.
- Conversion of linear resistance to a standard analog current signal, e.g from valves or Ohmic level sensors.
- Amplification of bipolar mV signals to standard 4...20 mA current signals.
- Up to 63 transmitters (HART® 7) can be connected in a multidrop communication setup.

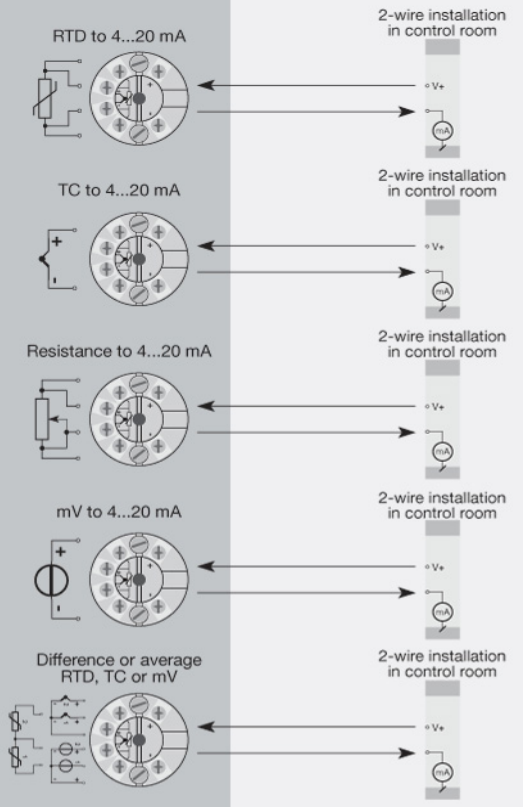
Technical characteristics

- HART® protocol revision can be changed by user configuration to either HART® 5 or HART® 7 protocol.
- The HART® 7 protocol offers: · Long Tag numbers of up to 32 characters.· Enhanced Burst Mode and Event notification with time stamping.· Device variable and status mapping to any dynamic variable PV, SV, TV or QV.· Process signal trend measurement with logs and summary data.· Automatic event notification with time stamps.· Command aggregation for higher communication efficiency.
- 5337D is designed according to strict safety requirements and is therefore suitable for applications in SIL installations.
- Continuous check of vital stored data.
- Meeting the NAMUR NE 21 recommendations, the 5337 HART® transmitter ensures top measurement performance in harsh EMC environments. Additionally, the 5337D meets NAMUR NE43 and NE89 recommendations.

Mounting / installation

- For DIN form B sensor head mounting.
- Configuration via standard HART® communication interfaces or by PR 5909 Loop Link.
- PR 5106B or 9106B is recommended as a barrier for 5337D.

Connections



Order:

Type
5337D

Environmental Conditions

Specifications range	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree (encl./terminal)	IP68 / IP00

Mechanical specifications

Dimensions	Ø 44 x 20.2 mm
Weight approx.	50 g
Wire size	1 x 1.5 mm^2 stranded wire
Screw terminal torque	0.4 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	8.0...30 VDC
Voltage drop	8.0 VDC
Isolation voltage, test / working	1.5 kVAC / 50 VAC
Communications interface	Loop Link & HART®
Signal / noise ratio	> 60 dB
Response time (programmable)	1...60 s
Accuracy	Better than 0.05% of selected range
EMC immunity influence	< ±0.1% 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	Pt50, Pt100, Pt200, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000
Cable resistance per wire (max.), RTD	5 Ω (up to 50 Ω per wire is possible with reduced measurement accuracy)
Sensor current, RTD	Nom. 0.2 mA
TC input: Thermocouple type	B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC)	Constant, internal or external via a Pt100 or Ni100 sensor
Voltage input: Measurement range	-800...+800 mV
Min. measurement range (span), voltage input	2.5 mV
Input resistance, voltage input	10 MΩ

Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Updating time	440 ms
Load resistance, current output	≤ (Vsupply - 8) / 0.023 [Ω]
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
HART protocol revisions	HART 5 and HART 7

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 03ATEX1537
IECEx	KEM 10.0083X
FM	2D5A7
CSA	1125003
INMETRO	NCC 12.0844 X
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
DNV Marine	Stand. f. Certific. No. 2.4
SIL	Hardware assessed for use in SIL applications

A

Profibus PA / Foundation Fieldbus transmitter

5350A

– PROFIBUS® PA ver. 3.0
– FOUNDATION™ Fieldbus ver. ITK 4.6
– Automatic switch between protocols
– Basic or LAS capability with F.F.
– For DIN form B sensor head mounting

A

Application

- Linearized temperature measurement with RTD or TC sensor.
- Difference, average or redundancy temperature measurement with RTD or TC sensor.
- Linear resistance, potentiometer and bipolar mV measurement.

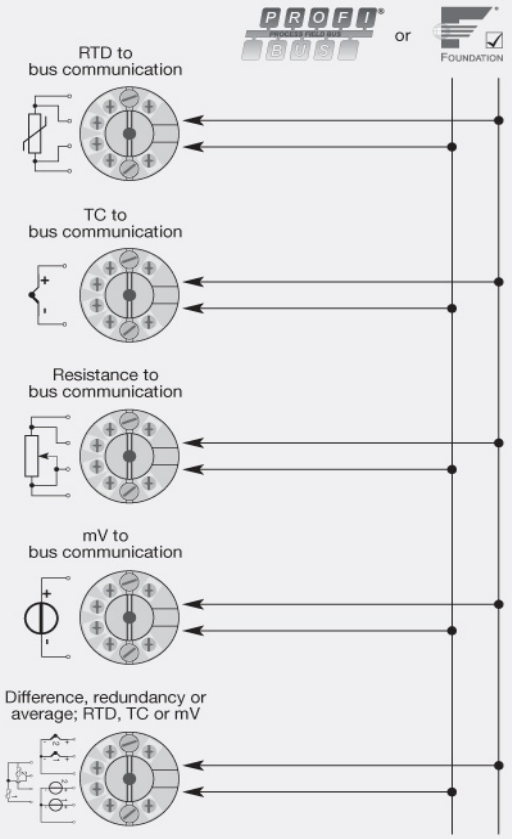
Technical characteristics

- Bus transmitter with both PROFIBUS® PA and FOUNDATION™ Fieldbus communication. A unique switch function ensures automatic shift between the two protocols.
- Set-up for PROFIBUS® PA can be done via Siemens Simatic® PDM®, ABB Melody / Harmony and Metso DNA software and for FOUNDATION™ Fieldbus via Emerson DeltaV, Yokogawa CS 1000 / CS 3000, ABB Melody / Harmony and Honeywell Experion software.
- The simulation mode function can be activated by way of a magnet.
- Polarity-independent bus connection.
- 24 bit A/D converter ensures high resolution.
- PROFIBUS® PA function blocks: 2 analog.
- FOUNDATION™ Fieldbus function blocks:2 analog and 1 PID.
- FOUNDATION™ Fieldbus capability: Basic or LAS.

Mounting / installation

- For DIN form B sensor head or DIN rail mounting with the PR fitting type 8421.

Connections



Order:

Type
5350A

Environmental Conditions

Specifications range	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree (encl./terminal)	IP68 / IP00

Mechanical specifications

Dimensions	Ø 44 x 20.2 mm
Weight approx.	55 g
Screw terminal torque	0.4 Nm
Vibration	DIN class B, IEC 60068-2-6 and IEC 60068-2-64
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	9.0...32 VDC
Internal consumption	< 11 mA
Max. current increase in the event of an error	< 7 mA
Isolation voltage, test	1.5 kVAC for 60 s
Isolation voltage, working	50 VRMS / 75 VDC
Warm-up time	30 s
Signal / noise ratio	Min. 60 dB
Response time (programmable)	1...60 s
Updating time	< 400 ms
Execution time, analog input	< 50 ms
Accuracy	Better than 0.05% of selected range
Signal dynamics, input	24 bit
EMC immunity influence	< ±0.1% of reading
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of reading

Input specifications

RTD input	Pt25…1000, Ni25…1000, Cu10…1000, lin. R, 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
Cold junction compensation (CJC)	< ±0.5°C
Sensor error detection, TC	Yes
Sensor error current: When detecting / else	Nom. 4 µA / 0 µA
Short circuit detection, TC	< 3 mV
Voltage input: Measurement range	-800...+800 mV
Input resistance, voltage input	10 MΩ

Output specifications

PROFIBUS PA protocol	Profile A&B, ver. 3.0
PROFIBUS PA protocol standard	EN 50170 vol. 2
PROFIBUS PA address (at delivery)	126
PROFIBUS PA function blocks	2 analog
FOUNDATION™ Fieldbus protocol	FF protocol
FOUNDATION™ Fieldbus protocol standard	FF design specifications
FOUNDATION™ Fieldbus version	ITK 4.6
FOUNDATION™ Fieldbus capability	Basic or LAS
FOUNDATION™ Fieldbus function blocks	2 analog and 1 PID

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 03ATEX1011 X
CSA	1418937
FM	3015609
NEPSI	GYJ14.1100U
EAC TR-CU 020/2011	EN 61326-1

A

Profibus PA / Foundation Fieldbus transmitter

5350B

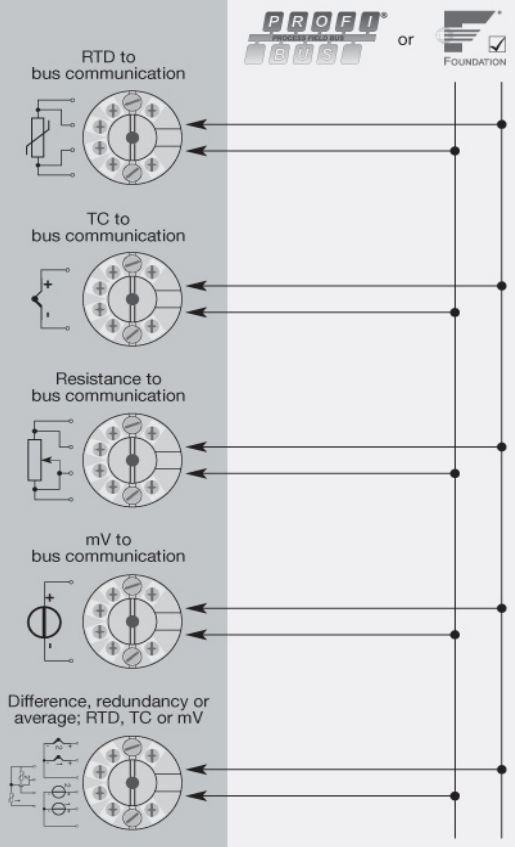
– PROFIBUS® PA ver. 3.0
– FOUNDATION™ Fieldbus ver. ITK 4.6
– Automatic switch between protocols
– FISCO-certified
– Basic or LAS capability with F.F.

Application
- Linearized temperature measurement with RTD or TC sensor.
- Difference, average or redundancy temperature measurement with RTD or TC sensor.
- Linear resistance, potentiometer and bipolar mV measurement.

Technical characteristics
- Bus transmitter with both PROFIBUS® PA and FOUNDATION™ Fieldbus communication. A unique switch function ensures automatic shift between the two protocols.
- Set-up for PROFIBUS® PA can be done via Siemens Simatic® PDM®, ABB Melody / Harmony and Metso DNA software and for FOUNDATION™ Fieldbus via Emerson DeltaV, Yokogawa CS 1000 / CS 3000, ABB Melody / Harmony and Honeywell Experion software.
- The simulation mode function can be activated by way of a magnet.
- Polarity-independent bus connection.
- 24 bit A/D converter ensures high resolution.
- PROFIBUS® PA function blocks: 2 analog.
- FOUNDATION™ Fieldbus function blocks:2 analog and 1 PID.
- FOUNDATION™ Fieldbus capability: Basic or LAS.

Mounting / installation
- For DIN form B sensor head mounting.

Connections



Order:

Type
5350B

Environmental Conditions

Specifications range	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree (encl./terminal)	IP68 / IP00

Mechanical specifications

Dimensions	Ø 44 x 20.2 mm
Weight approx.	55 g
Screw terminal torque	0.4 Nm
Vibration	DIN class B, IEC 60068-2-6 and IEC 60068-2-64
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	9.0...30 VDC
Supply voltage in FISCO installations	9.0...17.5 VDC
Internal consumption	< 11 mA
Max. current increase in the event of an error	< 7 mA
Isolation voltage, test	1.5 kVAC for 60 s
Isolation voltage, working	50 VRMS / 75 VDC
Warm-up time	30 s
Signal / noise ratio	Min. 60 dB
Response time (programmable)	1...60 s
Updating time	< 400 ms
Execution time, analog input	< 50 ms
Accuracy	Better than 0.05% of selected range
Signal dynamics, input	24 bit
EMC immunity influence	< ±0.1% of reading
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of reading

Input specifications

RTD input	Pt25…1000, Ni25…1000, Cu10…1000, lin. R, 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
Cold junction compensation (CJC)	< ±0.5°C
Sensor error detection, TC	Yes
Sensor error current: When detecting / else	Nom. 4 µA / 0 µA
Short circuit detection, TC	< 3 mV
Voltage input: Measurement range	-800...+800 mV
Input resistance, voltage input	10 MΩ

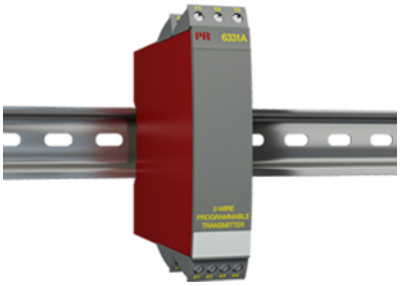
Output specifications

PROFIBUS PA protocol	Profile A&B, ver. 3.0
PROFIBUS PA protocol standard	EN 50170 vol. 2
PROFIBUS PA address (at delivery)	126
PROFIBUS PA function blocks	2 analog
FOUNDATION™ Fieldbus protocol	FF protocol
FOUNDATION™ Fieldbus protocol standard	FF design specifications
FOUNDATION™ Fieldbus version	ITK 4.6
FOUNDATION™ Fieldbus capability	Basic or LAS
FOUNDATION™ Fieldbus function blocks	2 analog and 1 PID

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 02ATEX1318
IECEx	BVS 12.0035X
FM	3015609
CSA	1418937
INMETRO	NCC 12.1009 X
NEPSI	GYJ14.1101X
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410

A



2-wire programmable transmitter

6331A

– RTD, TC, Ohm, or mV input
– Extremely high measurement accuracy
– Galvanic isolation
– Programmable sensor error value
– 1- or 2-channel version

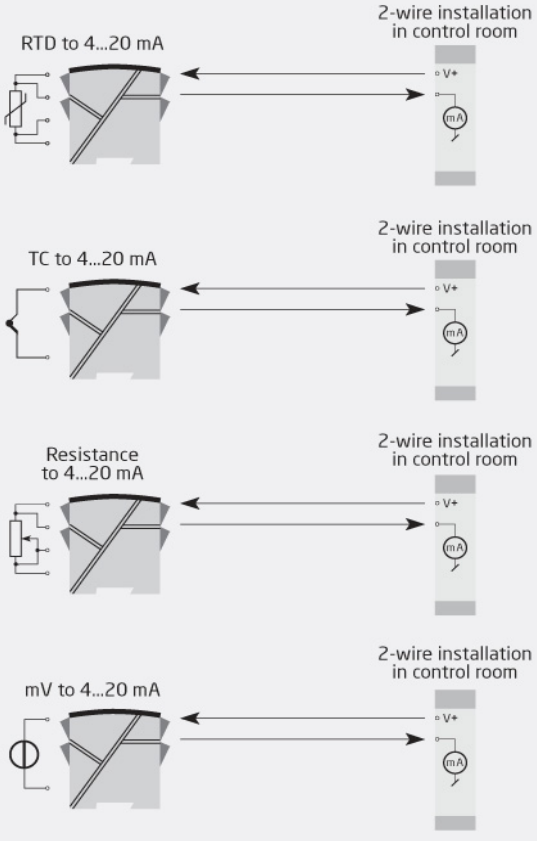
A

Application
- Linearized temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.

Technical characteristics
- Within a few seconds the user can program PR6331A to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- A limit can be programmed on the output signal.
- Continuous check of vital stored data for safety reasons.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. Using the 2-channel version, up to 84 channels can be mounted per meter.

Connections



Order:

Type	Galvanic isolation	Channels
6331A	1500 VAC : 2	Single : A Double : B

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

Environmental Conditions

Specifications range	-40°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
Weight (1 / 2 channels)	145 / 185 g
Wire size	1 x 1.5 mm^2 stranded wire

Common specifications

Supply voltage	7.2...35 VDC
Internal consumption, per channel	0.17...0.8 W
Voltage drop	7.2 VDC
Isolation voltage, test / working	1.5 kVAC / 50 VAC
Isolation voltage, ch. 1 / ch. 2	3.75 kVAC
Warm-up time	5 min.
Communications interface	Loop Link
Signal / noise ratio	Min. 60 dB
Accuracy	Better than 0.05% of selected range
Response time (programmable)	1...60 s
EEprom error check	< 3.5 s
Signal dynamics, input	20 bit
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC
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	5 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 detection, TC	Yes
Sensor error current: When detecting / else	Nom. 33 µA / 0 µA
Voltage input: Measurement range	-12...800 mV
Min. measurement range (span), voltage input	5 mV
Input resistance, voltage input	10 MΩ

Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Updating time	440 ms
Load resistance, current output	≤ (Vsupply - 7.2) / 0.023 [Ω]
Load stability, current output	≤0.01% of span / 100 Ω
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 10ATEX0005 X
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410

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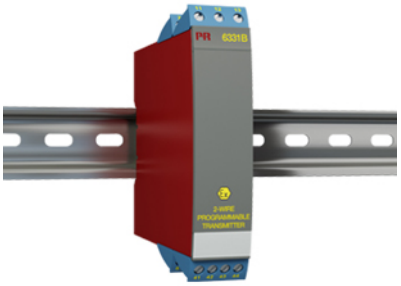


2-wire programmable transmitter

6331B

– RTD, TC, Ohm, or mV input
– Extremely high measurement accuracy
– Galvanic isolation
– Can be installed in Ex zone 0
– 1- or 2-channel version

A

Application

- Linearized temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.

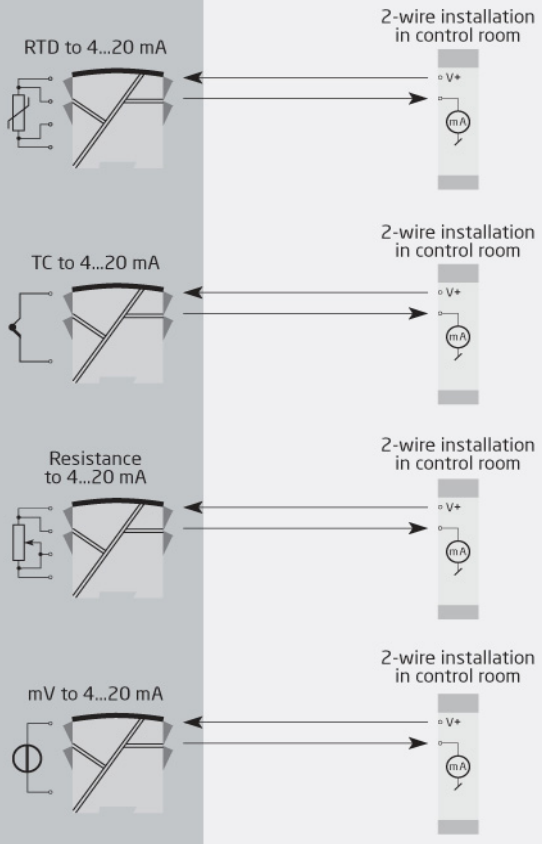
Technical characteristics

- Within a few seconds the user can program PR6331B to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- A limit can be programmed on the output signal.
- Continuous check of vital stored data for safety reasons.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. Using the 2-channel version, up to 84 channels can be mounted per meter.
- NB: As Ex barrier we recommend 5104B, 5114B, or 5116B.

Connections



Order:

Type	Galvanic isolation	Channels
6331B	1500 VAC : 2	Single : A Double : B

***NB!** Please remember to order CJC connectors type 5910Ex (channel 1) and 5913Ex (channel 2) forTC inputs with an internal CJC.

Environmental Conditions

Specifications range..... -40°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
Weight (1 / 2 channels)..... 145 / 185 g
Wire size..... 1 x 1.5 mm^2 stranded wire

Common specifications

Supply voltage..... 7.2...30 VDC
Internal consumption, per channel..... 0.17...0.8 W
Voltage drop..... 7.2 VDC
Isolation voltage, test / working..... 1.5 kVAC / 50 VAC
Isolation voltage, ch. 1 / ch. 2..... 1500 VAC
Warm-up time..... 5 min.
Communications interface..... Loop Link
Signal / noise ratio..... Min. 60 dB
Accuracy..... Better than 0.05% of selected range
Response time (programmable)..... 1...60 s
EEprom error check..... < 3.5 s
Signal dynamics, input..... 20 bit
Signal dynamics, output..... 16 bit
Effect of supply voltage change..... < 0.005% of span / VDC
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..... 5 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 detection, TC..... Yes
Sensor error current: When detecting / else..... Nom. 33 µA / 0 µA
Voltage input: Measurement range..... -12...800 mV
Min. measurement range (span), voltage input..... 5 mV
Input resistance, voltage input..... 10 MΩ

Output specifications

Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Updating time..... 440 ms
Load resistance, current output..... ≤ (Vsupply - 7.2) / 0.023 [Ω]
Load stability, current output..... ≤0.01% of span / 100 Ω
Sensor error indication, current output..... Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale..... 23 mA / 3.5 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 06ATEX0115
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410

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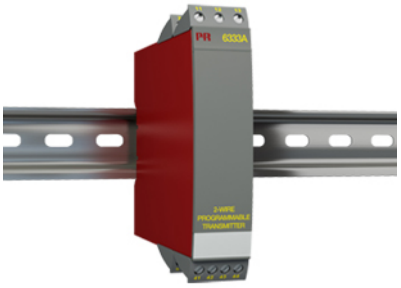


2-wire programmable transmitter

6333A

– RTD or Ohm input
– High measurement accuracy
– 3-wire connection
– Programmable sensor error value
– 1- or 2-channel version

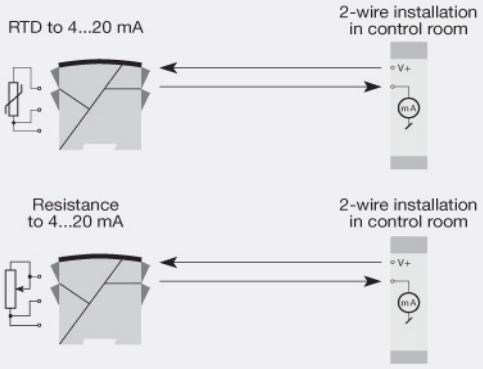
A

Application
- Linearized temperature measurement with Pt100...Pt1000 or Ni100...Ni1000 sensor.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.

Technical characteristics
- Within a few seconds the user can program PR6333A to measure temperatures within all RTD ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 3-wire connection.
- A limit can be programmed on the output signal.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. Using the 2-channel version up to 84 channels per meter can be mounted.

Connections



Order:

Type	Galvanic Isolation	Channels
6333A	None : 1	Single : A Double : B

Environmental Conditions

Specifications range..... -40°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
Weight (1 / 2 channels)..... 145 / 185 g
Wire size..... 1 x 2.5 mm^2 stranded wire

Common specifications

Supply voltage..... 8.0...35 VDC
Internal consumption..... 0.19...0.8 W
Voltage drop..... 8.0 VDC
Isolation voltage, ch. 1 / ch. 2..... 3.75 kVAC
Warm-up time..... 5 min.
Communications interface..... Loop Link
Signal / noise ratio..... Min. 60 dB
Accuracy..... Better than 0.1% of selected range
Response time (programmable)..... 0.33...60 s
Signal dynamics, input..... 19 bit
Signal dynamics, output..... 16 bit
Effect of supply voltage change..... < 0.005% of span / VDC
EMC immunity influence..... < ±0.5% 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..... > 0.2 mA, < 0.4 mA
Effect of sensor cable resistance (3-wire), RTD..... < 0.002 Ω / Ω
Sensor error detection, RTD..... Yes

Output specifications

Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Updating time..... 135 ms
Load resistance, current output..... ≤ (Vsupply - 8) / 0.023 [Ω]
Load stability, current output..... ≤0.01% of span / 100 Ω
Sensor error indication, current output..... Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale..... 23 mA / 3.5 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 10ATEX0007 X
EAC TR-CU 020/2011..... EN 61326-1

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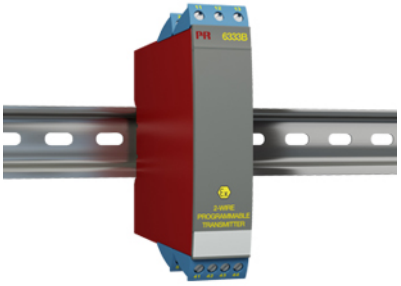


2-wire programmable transmitter

6333B

– RTD or Ohm input
– High measurement accuracy
– 3-wire connection
– Can be installed in Ex zone 0
– 1- or 2-channel version

A

Application

- Linearized temperature measurement with Pt100...Pt1000 or Ni100...Ni1000 sensor.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.

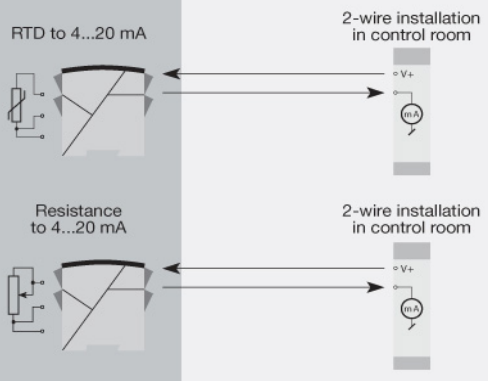
Technical characteristics

- Within a few seconds the user can program PR6333B to measure temperatures within all RTD ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 3-wire connection.
- A limit can be programmed on the output signal.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. Using the 2-channel version, up to 84 channels can be mounted per meter.
- NB: As Ex barrier we recommend 5104B, 5114B, or 5116B.

Connections



Order:

Type	Galvanic Isolation	Channels
6333B	None : 1	Single : A Double : B

Environmental Conditions

Specifications range..... -40°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
Weight (1 / 2 channels)..... 145 / 185 g
Wire size..... 1 x 1.5 mm^2 stranded wire

Common specifications

Supply voltage..... 8.0...30 VDC
Internal consumption..... 0.19...0.8 W
Voltage drop..... 8.0 VDC
Isolation voltage, ch. 1 / ch. 2..... 1500 VAC
Warm-up time..... 5 min.
Communications interface..... Loop Link
Signal / noise ratio..... Min. 60 dB
Accuracy..... Better than 0.1% of selected range
Response time (programmable)..... 0.33...60 s
Signal dynamics, input..... 19 bit
Signal dynamics, output..... 16 bit
Effect of supply voltage change..... < 0.005% of span / VDC

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..... > 0.2 mA, < 0.4 mA
Effect of sensor cable resistance (3-wire), RTD..... < 0.002 Ω / Ω
Sensor error detection, RTD..... Yes

Output specifications

Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Updating time..... 135 ms
Load resistance, current output..... ≤ (Vsupply - 8) / 0.023 [Ω]
Load stability, current output..... ≤0.01% of span / 100 Ω
Sensor error indication, current output..... Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale..... 23 mA / 3.5 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 09ATEX0147
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410

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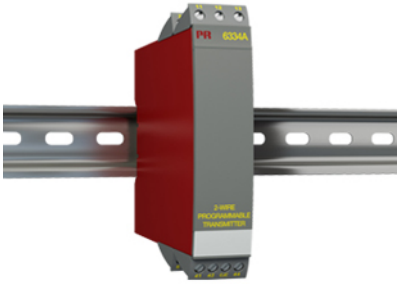


2-wire programmable transmitter

6334A

– TC input
– High measurement accuracy
– Galvanic isolation
– Programmable sensor error value
– 1- or 2-channel version

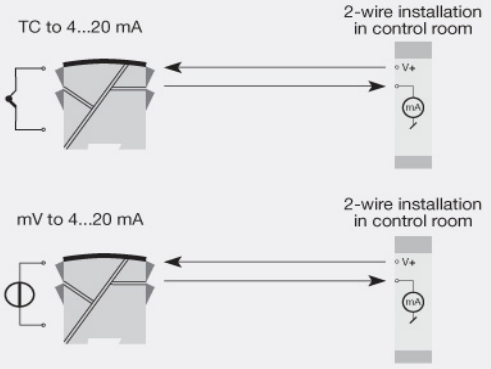
A

Application
- Linearized temperature measurement with TC sensor.
- Amplification of bipolar mV signals to a 4...20 mA signal, optionally linearized according to a defined linearization function.

Technical characteristics
- Within a few seconds the user can program PR6334A to measure temperatures within all TC ranges defined by the norms.
- Cold junction compensation (CJC) with a built-in temperature sensor.
- A limit can be programmed on the output signal.
- Continuous check of vital stored data for safety reasons.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. Using the 2-channel version up to 84 channels can be mounted per meter.

Connections



Order:

Type	Galvanic isolation	Channels
6334A	1500 VAC : 2	Single : A Double : B

Environmental Conditions

Specifications range..... -40°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
Weight (1 / 2 channels)..... 145 / 185 g
Wire size..... 1 x 1.5 mm^2 stranded wire

Common specifications

Supply voltage..... 7.2...35 VDC
Internal consumption..... 0.17...0.8 W
Voltage drop..... 7.2 VDC
Isolation voltage, test / working..... 1.5 kVAC / 50 VAC
Isolation voltage, ch. 1 / ch. 2..... 3.75 kVAC
Warm-up time..... 5 min.
Communications interface..... Loop Link
Signal / noise ratio..... Min. 60 dB
Response time (programmable)..... 1...60 s
EEprom error check..... < 3.5 s
Signal dynamics, input..... 18 bit
Signal dynamics, output..... 16 bit
Effect of supply voltage change..... < 0.005% of span / VDC
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
TC input: Thermocouple type..... B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC)..... < ±1.0°C
Voltage input: Measurement range..... -12...150 mV
Min. measurement range (span), voltage input..... 5 mV
Input resistance, voltage input..... Nom. 10 MΩ

Output specifications

Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Updating time..... 440 ms
Load resistance, current output..... ≤ (Vsupply - 7.2) / 0.023 [Ω]
Sensor error indication, current output..... Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale..... 23 mA / 3.5 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 10ATEX0005 X
EAC TR-CU 020/2011..... EN 61326-1

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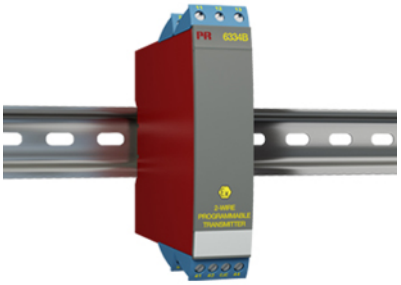


2-wire programmable transmitter

6334B

– TC input
– High measurement accuracy
– Galvanic isolation
– Can be installed in Ex zone 0
– 1- or 2-channel version

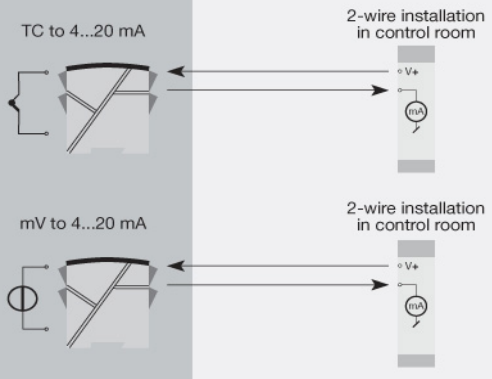
A

Application
- Linearized temperature measurement with TC sensor.
- Amplification of bipolar mV signals to a 4...20 mA signal, optionally linearized according to a defined linearization function.

Technical characteristics
- Within a few seconds the user can program PR6334B to measure temperatures within all TC ranges defined by the norms.
- Cold junction compensation (CJC) with a built-in temperature sensor.
- A limit can be programmed on the output signal.
- Continuous check of vital stored data for safety reasons.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. Using the 2-channel version up to 84 channels can be mounted per meter.
- NB: As Ex barrier we recommend 5104B, 5114B, or 5116B.

Connections



Order:

Type	Galvanic isolation	Channels
6334B	1500 VAC : 2	Single : A Double : B

Environmental Conditions

Specifications range..... -40°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
Weight (1 / 2 channels)..... 145 / 185 g
Wire size..... 1 x 1.5 mm^2 stranded wire

Common specifications

Supply voltage..... 7.2...30 VDC
Internal consumption..... 0.17...0.8 W
Voltage drop..... 7.2 VDC
Isolation voltage, test / working..... 1.5 kVAC / 50 VAC
Isolation voltage, ch. 1 / ch. 2..... 1500 VAC
Warm-up time..... 5 min.
Communications interface..... Loop Link
Signal / noise ratio..... Min. 60 dB
Accuracy..... Better than 0.05% of selected range
Response time (programmable)..... 1...60 s
EEprom error check..... < 3.5 s
Signal dynamics, input..... 18 bit
Signal dynamics, output..... 16 bit
Effect of supply voltage change..... < 0.005% of span / VDC
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
TC input: Thermocouple type..... B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC)..... < ±1.0°C
Voltage input: Measurement range..... -12...150 mV
Min. measurement range (span), voltage input..... 5 mV
Input resistance, voltage input..... 10 MΩ

Output specifications

Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Updating time..... 440 ms
Load resistance, current output..... ≤ (Vsupply - 7.2) / 0.023 [Ω]
Sensor error indication, current output..... Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale..... 23 mA / 3.5 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 06ATEX0115
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410

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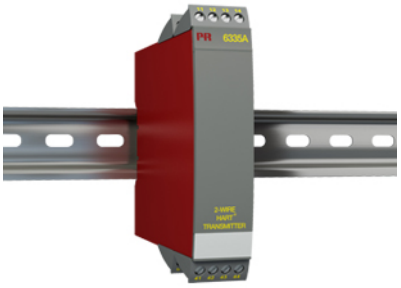


2-wire HART® transmitter

6335A

– RTD, TC, Ohm, or mV input
– Extremely high measurement accuracy
– HART® 5 protocol
– Galvanic isolation
– 1- or 2-channel version

Application

- Linearized temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Difference or average temperature measurement of 2 resistance or TC sensors.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.
- Connection of up to 15 channels to a digital 2-wire signal with HART® communication.

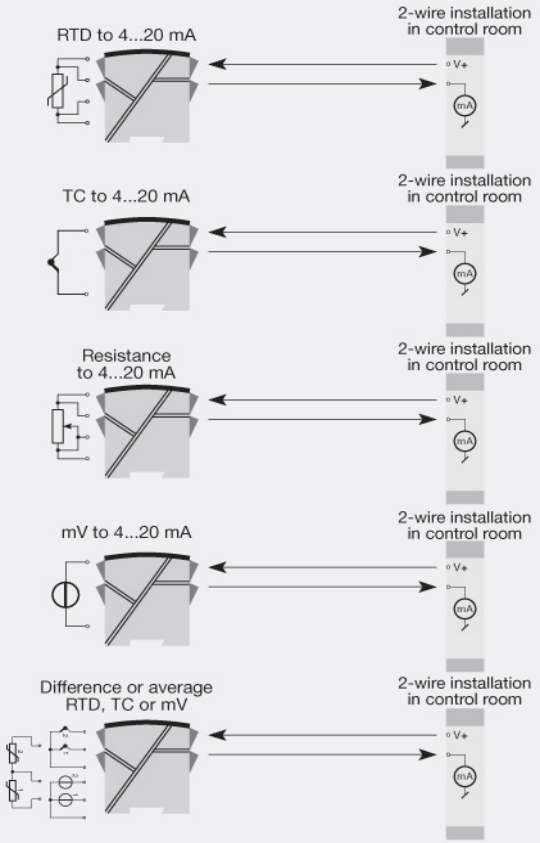
Technical characteristics

- Within a few seconds the user can program PR6335A to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- The 6335A has been designed according to strict safety requirements and is thus suitable for application in SIL 2 installations.
- Continuous check of vital stored data for safety reasons.
- Sensor error detection according to the guidelines in NAMUR NE89.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. As the devices can be mounted without any distance between neighbouring units, up to 84 channels can be mounted per metre.

Connections



Order:

Type	Galvanic isolation	Channels
6335A	1500 VAC : 2	Single : A Double : B

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

Environmental Conditions

Specifications range	-40°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
Weight (1 / 2 channels)	145 / 185 g
Wire size	1 x 1.5 mm^2 stranded wire

Common specifications

Supply voltage	8.0...35 VDC
Voltage drop	8.0 VDC
Isolation voltage, test / working	1.5 kVAC / 50 VAC
Isolation voltage, ch. 1 / ch. 2	3.75 kVAC
Warm-up time	30 s
Communications interface	Loop Link & HART®
Signal / noise ratio	Min. 60 dB
Accuracy	Better than 0.05% of selected range
Response time (programmable)	1...60 s
Signal dynamics, input	22 bit
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC
EMC immunity influence	< ±0.1% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

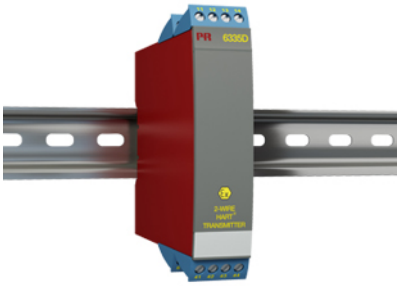
Max. offset	50% of selected max. value
RTD input	Pt100…1000, Ni100...1000, lin. R
Cable resistance per wire (max.), RTD	5 Ω (up to 50 Ω per wire is possible with reduced measurement accuracy)
Sensor current, RTD	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Yes
TC input: Thermocouple type	B, E, J, K, L, N, R, S, T, U, W3, W5
Cold junction compensation (CJC)	< ±1.0°C
Sensor error detection, TC	Yes
Sensor error current: When detecting / else	Nom. 33 µA / 0 µA
Voltage input: Measurement range	-800...+800 mV
Min. measurement range (span), voltage input	2.5 mV
Input resistance, voltage input	10 MΩ

Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Updating time	440 ms
Load resistance, current output	≤ (Vsupply - 8) / 0.023 [Ω]
Load stability, current output	≤0.01% of span / 100 Ω
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 10ATEX0006 X
IECEx	KEM 10.0084X
EAC TR-CU 020/2011	EN 61326-1
SIL	Hardware assessed for use in SIL applications



2-wire HART® transmitter

6335D

– RTD, TC, Ohm, or mV input
– Extremely high measurement accuracy
– HART® 5 protocol
– Can be installed in Ex zone 0
– 1- or 2-channel version

A

Application

- Linearized temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Difference or average temperature measurement of 2 resistance or TC sensors.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.
- Connection of up to 15 channels to a digital 2-wire signal with HART® communication.

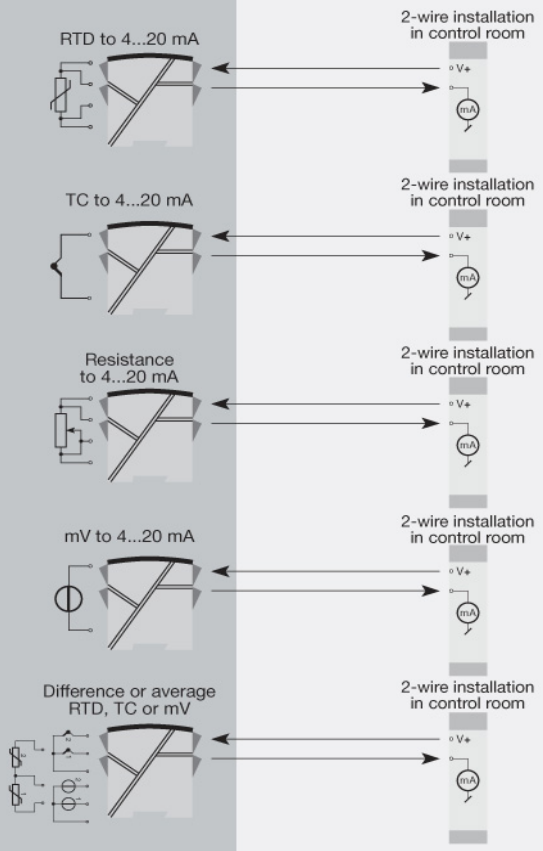
Technical characteristics

- Within a few seconds the user can program PR6335D to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- The 6335D has been designed according to strict safety requirements and is therefore suitable for application in SIL 2 installations.
- Continuous check of vital stored data for safety reasons.
- Sensor error detection according to the guidelines in NAMUR NE89.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. As the devices can be mounted without any distance between neighboring units, up to 84 channels can be mounted per meter.
- NB: As Ex barrier we recommend 5106B.

Connections



Order:

Type	Galvanic isolation	Channels
6335D	1500 VAC : 2	Single : A Double : B

***NB!** Please remember to order CJC connectors type 5910Ex (channel 1) and 5913Ex (channel 2) forTC inputs with an internal CJC.

Environmental Conditions

Specifications range	-40°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
Weight (1 / 2 channels)	145 / 185 g
Wire size	1 x 1.5 mm^2 stranded wire

Common specifications

Supply voltage	8.0...30 VDC
Voltage drop	8.0 VDC
Isolation voltage, test / working	1.5 kVAC / 50 VAC
Isolation voltage, ch. 1 / ch. 2	1500 VAC
Warm-up time	30 s
Communications interface	Loop Link & HART®
Signal / noise ratio	Min. 60 dB
Accuracy	Better than 0.05% of selected range
Response time (programmable)	1...60 s
Signal dynamics, input	22 bit
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC

Input specifications

Max. offset	50% of selected max. value
RTD input	Pt100, Ni100, lin. R
Cable resistance per wire (max.), RTD	5 Ω (up to 50 Ω per wire is possible with reduced measurement accuracy)
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
Cold junction compensation (CJC)	< ±1.0°C
Sensor error detection, TC	Yes
Sensor error current: When detecting / else	Nom. 33 µA / 0 µA
Voltage input: Measurement range	-800...+800 mV
Min. measurement range (span), voltage input	2.5 mV
Input resistance, voltage input	10 MΩ

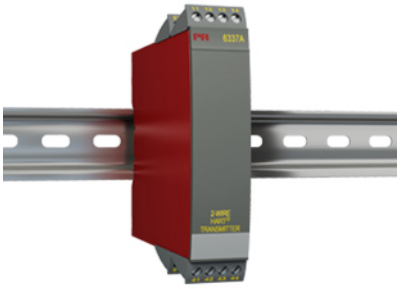
Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Updating time	440 ms
Load resistance, current output	≤ (Vsupply - 8) / 0.023 [Ω]
Load stability, current output	≤0.01% of span / 100 Ω
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 09ATEX0148
IECEx	DEK 11.0084X
FM	2D5A7
CSA	1125003
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
SIL	Hardware assessed for use in SIL applications

A



2-wire HART® transmitter

6337A

– 1- or 2-channel converter for RTD, TC, Ohm, and bipolar mV signals
– 2 analogue inputs and 5 device variables with status available
– HART® protocol revision selectable from HART® 5 or HART® 7
– Hardware assessed for use in SIL applications
– Mounting on a DIN rail in Safe Area or Zone 2/22

A

Application

- Linearized temperature measurement with TC and RTD sensors e.g. Pt100 and Ni100.
- HART® communication and 4...20 mA analog PV output for individual, difference or average temperature measurement of up to two RTD or TC input sensors.
- Conversion of linear resistance to a standard analog current signal, e.g from valves or Ohmic level sensors.
- Amplification of bipolar mV signals to standard 4...20 mA current signals.
- Up to 63 transmitters (HART® 7) can be connected in a multidrop communication setup.

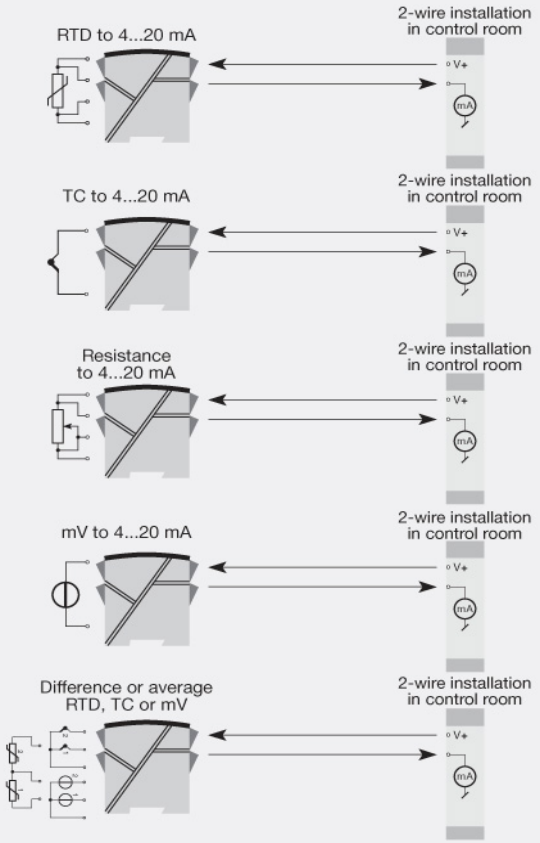
Technical characteristics

- HART® protocol revision can be changed by user configuration to either HART® 5 or HART® 7 protocol.
- The HART® 7 protocol offers: · Long Tag numbers of up to 32 characters.· Enhanced Burst Mode and Event notification with time stamping.· Device variable and status mapping to any dynamic variable PV, SV, TV or QV.· Process signal trend measurement with logs and summary data.· Automatic event notification with time stamps.· Command aggregation for higher communication efficiency.
- 6337A is designed according to strict safety requirements and is therefore suitable for applications in SIL installations.
- Continuous check of vital stored data.
- Meeting the NAMUR NE21 recommendations, the 6337A HART® transmitter ensures top measurement performance in harsh EMC environments. Additionally, the 6337A meets NAMUR NE43 and NE89 recommendations.

Mounting / installation

- DIN rail mounting with up to 84 channels per meter.
- Configuration via standard HART® communication interfaces or by PR 5909 Loop Link.

Connections



Order:

Type	Galvanic isolation	Channels
6337A	1500 VAC : 2	Single : A Double : B

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

Environmental Conditions

Specifications range	-40°C to +60°C
Storage temperature	-40°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
Weight (1 / 2 channels)	150 / 200 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	8.0...35 VDC
Voltage drop	8.0 VDC
Isolation voltage, test / working	1.5 kVAC / 50 VAC
Isolation voltage, ch. 1 / ch. 2	3.75 kVAC
Signal / noise ratio	> 60 dB
Accuracy	Better than 0.05% of selected range
Response time (programmable)	1...60 s
EMC immunity influence	< ±0.1% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

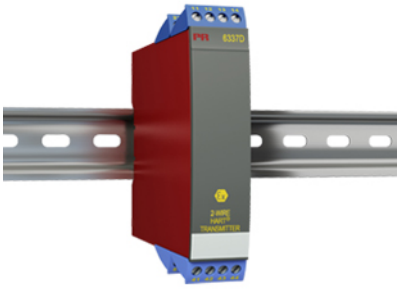
Max. offset	50% of selected max. value
RTD input	Pt50, Pt100, Pt200, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000
RTD input	Linear resistance
Cable resistance per wire (max.), RTD	5 Ω (up to 50 Ω per wire is possible with reduced measurement accuracy)
Sensor current, RTD	Nom. 0.2 mA
TC input: Thermocouple type	B, E, J, K, L, N, R, S, T, U, W3, W5
Cold junction compensation (CJC)	Constant, internal or external via a Pt100 or Ni100 sensor
Voltage input: Measurement range	-800...+800 mV
Min. measurement range (span), voltage input	2.5 mV
Input resistance, voltage input	10 MΩ

Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Updating time	440 ms
Load resistance, current output	≤ (Vsupply - 8) / 0.023 [Ω]
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
HART protocol revisions	HART 5 and HART 7

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 10ATEX0006 X
IECEx	KEM 10.0084X
EAC TR-CU 020/2011	EN 61326-1
SIL	Hardware assessed for use in SIL applications



2-wire HART® transmitter

6337D

– 1- or 2-channel converter for RTD, TC, Ohm, and bipolar mV signals
– 2 analog inputs and 5 device variables with status available
– HART® protocol revision selectable from HART® 5 or HART® 7
– Hardware assessed for use in SIL applications
– Mounting on a DIN rail in hazardous gas and dust area

A

Application

- Linearized temperature measurement with TC and RTD sensors e.g. Pt100 and Ni100.
- HART® communication and 4...20 mA analog PV output for individual, difference or average temperature measurement of up to two RTD or TC input sensors.
- Conversion of linear resistance to a standard analog current signal, e.g from valves or Ohmic level sensors.
- Amplification of bipolar mV signals to standard 4...20 mA current signals.
- Up to 63 transmitters (HART® 7) can be connected in a multidrop communication setup.

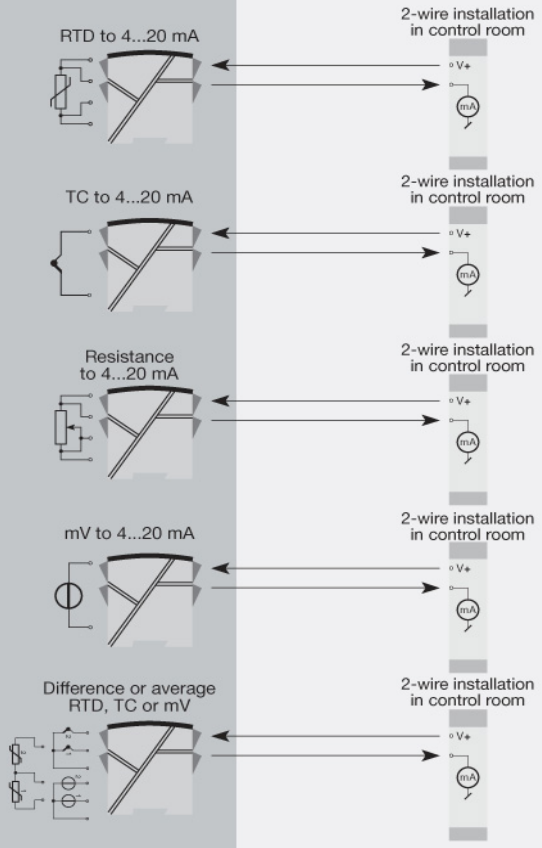
Technical characteristics

- HART® protocol revision can be changed by user configuration to either HART® 5 or HART® 7 protocol.
- The HART® 7 protocol offers: · Long Tag numbers of up to 32 characters.· Enhanced Burst Mode and Event notification with time stamping.· Device variable and status mapping to any dynamic variable PV, SV, TV or QV.· Process signal trend measurement with logs and summary data.· Automatic event notification with time stamps.· Command aggregation for higher communication efficiency.
- 6337D is designed according to strict safety requirements and is therefore suitable for applications in SIL installations.
- Continuous check of vital stored data.
- Meeting the NAMUR NE 21 recommendations, the 6337D HART® transmitter ensures top measurement performance in harsh EMC environments. Additionally, the 6337D meets NAMUR NE43 and NE89 recommendations.

Mounting / installation

- DIN rail mounting with up to 84 channels per meter.
- Configuration via standard HART® communication interfaces or by PR 5909 Loop Link.
- PR 5106B or 9106B is recommended as a barrier for 6337D.

Connections



Order:

Type	Galvanic isolation	Channels
6337D	1500 VAC : 2	Single : A Double : B

***NB!** Please remember to order CJC connectors type 5910Ex (channel 1) and 5913Ex (channel 2) forTC inputs with an internal CJC.

Environmental Conditions

Specifications range..... -40°C to +60°C
Storage temperature..... -40°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
Weight (1 / 2 channels)..... 150 / 200 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..... 8.0...30 VDC
Voltage drop..... 8.0 VDC
Isolation voltage, test / working..... 1.5 kVAC / 50 VAC
Isolation voltage, ch. 1 / ch. 2..... 1500 VAC
Communications interface..... Loop Link & HART®
Signal / noise ratio..... > 60 dB
Response time (programmable)..... 1...60 s
EMC immunity influence..... < ±0.1% 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..... Pt50, Pt100, Pt200, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000
RTD input..... Linear resistance
Cable resistance per wire (max.), RTD..... 5 Ω (up to 50 Ω per wire is possible with reduced measurement accuracy)
Sensor current, RTD..... Nom. 0.2 mA
TC input: Thermocouple type..... B, E, J, K, L, N, R, S, T, U, W3, W5
Cold junction compensation (CJC)..... Constant, internal or external via a Pt100 or Ni100 sensor
Voltage input: Measurement range..... -800...+800 mV
Min. measurement range (span), voltage input..... 2.5 mV
Input resistance, voltage input..... 10 MΩ

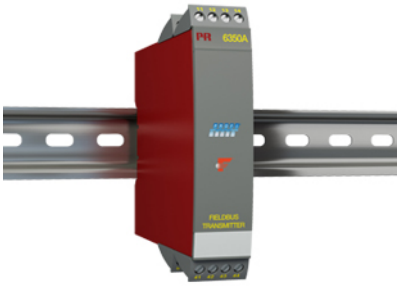
Output specifications

Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Updating time..... 440 ms
Load resistance, current output..... ≤ (Vsupply - 8) / 0.023 [Ω]
Sensor error indication, current output..... Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale..... 23 mA / 3.5 mA
HART protocol revisions..... HART 5 and HART 7

Approvals

EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 09ATEX0148
IECEx..... DEK 11.0084X
FM..... 2D5A7
CSA..... 1125003
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410
SIL..... Hardware assessed for use in SIL applications

A



Profibus PA / Foundation Fieldbus transmitter

6350A

– PROFIBUS® PA ver. 3.0
– FOUNDATION™ Fieldbus ver. ITK 4.6
– Automatic switch between protocols
– Basic or LAS capability with F.F.
– 1- or 2-channel version

A

Application

- Linearized temperature measurement with RTD or TC sensor.
- Difference, average or redundancy temperature measurement with RTD or TC sensor.
- Converts analog mA signals into digital values on the bus communication.
- Linear resistance, potentiometer and bipolar mV measurement.

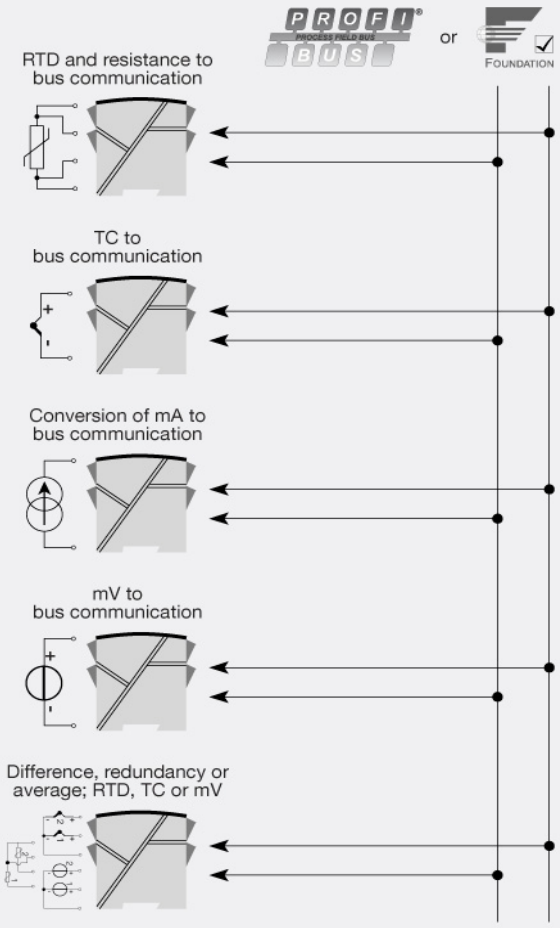
Technical characteristics

- Bus transmitter with both PROFIBUS® PA and FOUNDATION™ Fieldbus communication. A unique switch function ensures automatic shift between the two protocols.
- Set-up for PROFIBUS® PA can be done via Siemens Simatic® PDM®, ABB Melody / Harmony and Metso DNA software and for FOUNDATION™ Fieldbus via Emerson DeltaV, Yokogawa CS 1000 / CS 3000, ABB Melody / Harmony and Honeywell Experion software.
- Built-in simulation mode function.
- Polarity-independent bus connection.
- 24 bit A/D converter ensures high resolution.
- PROFIBUS® PA function blocks: 2 analog.
- FOUNDATION™ Fieldbus function blocks: 2 analog and 1 PID.
- FOUNDATION™ Fieldbus capability: Basic or LAS.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. Using the 2-channel version up to 84 channels per meter can be mounted.

Connections



Order:

Type	Galvanic isolation	Channels
6350A	1500 VAC : 2	Single : A Double : B

Environmental Conditions

Specifications range	-40°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
Weight (1 / 2 channels)	145 / 185 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	9.0...32 VDC
Internal consumption, per channel	< 11 mA
Isolation voltage, test	1.5 kVAC for 60 s
Isolation voltage, working	50 VRMS / 75 VDC
Warm-up time	30 s
Signal / noise ratio	Min. 60 dB
Accuracy	Better than 0.05% of selected range
Response time (programmable)	1...60 s
Updating time	< 400 ms
Execution time, PID controller	< 200 ms
Execution time, analog input	< 50 ms
Signal dynamics, input	24 bit
EMC immunity influence	< ±0.1% of reading
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of reading

Input specifications

RTD input	Pt25…1000, Ni25…1000, Cu10…1000, lin. R, 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
Cold junction compensation (CJC)	< ±0.5°C
Sensor error detection, TC	Yes
Sensor error current: When detecting / else	Nom. 2 µA / 0 µA
Short circuit detection, TC	< 3 mV
Bipolar current input: Measurement range	-100…+100 mA
Input resistance, current input	10 Ω + PTC < 20 Ω
Bipolar voltage input: Measurement range	-800…+800 mV
Min. measurement range (span), voltage input	2.5 mV
Input resistance, voltage input	10 MΩ
Short circuit detection, voltage input	< 3 mV

Output specifications

PROFIBUS PA protocol	Profile A&B, ver. 3.0
PROFIBUS PA protocol standard	EN 50170 vol. 2
PROFIBUS PA address (at delivery)	126
PROFIBUS PA function blocks	2 analog
FOUNDATION™ Fieldbus protocol	FF protocol
FOUNDATION™ Fieldbus protocol standard	FF design specifications
FOUNDATION™ Fieldbus version	ITK 4.6
FOUNDATION™ Fieldbus capability	Basic or LAS
FOUNDATION™ Fieldbus function blocks	2 analog and 1 PID

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 03ATEX1013 X
FM	3015609
CSA	1418937
EAC TR-CU 020/2011	EN 61326-1

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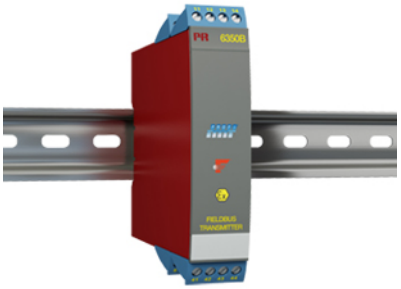


Profibus PA / Foundation Fieldbus transmitter

6350B

– PROFIBUS® PA ver. 3.0
– FOUNDATION™ Fieldbus ver. ITK 4.6
– Automatic switch between protocols
– FISCO-certified
– Basic or LAS capability with F.F.

A

Application

- Linearized temperature measurement with RTD or TC sensor.
- Converts analog mA signals into digital values on the bus communication.
- Difference, average or redundancy temperature measurement with RTD or TC sensor.
- Linear resistance, potentiometer and bipolar mV measurement.

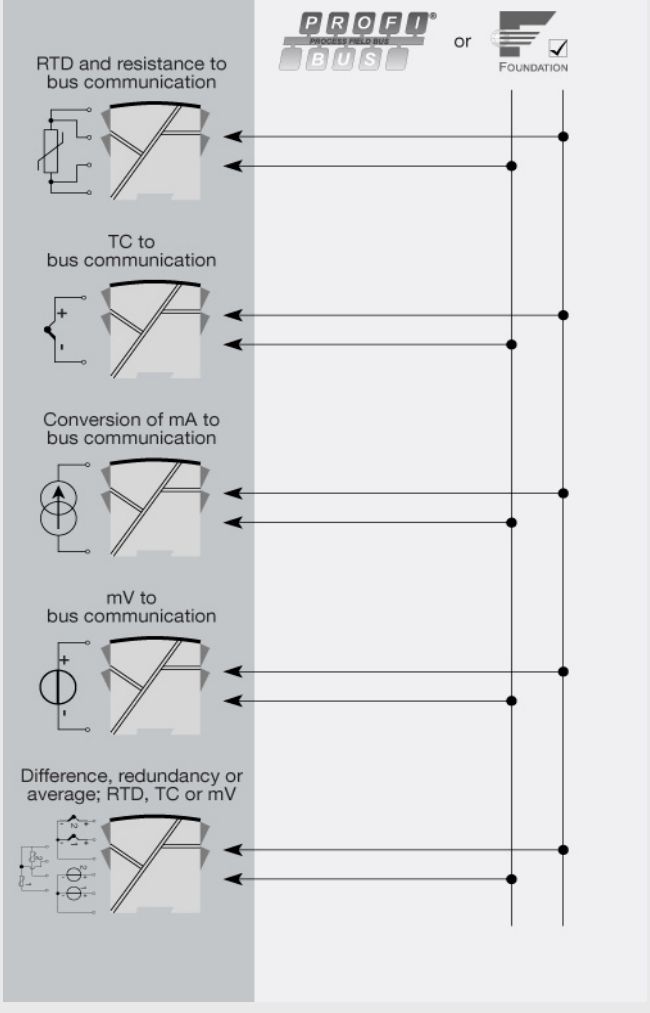
Technical characteristics

- Bus transmitter with both PROFIBUS® PA and FOUNDATION™ Fieldbus communication. A unique switch function ensures automatic shift between the two protocols.
- Set-up for PROFIBUS® PA can be done via Siemens Simatic® PDM®, ABB Melody / Harmony and Metso DNA software and for FOUNDATION™ Fieldbus via Emerson DeltaV, Yokogawa CS 1000 / CS 3000, ABB Melody / Harmony and Honeywell Experion software.
- Built-in simulation mode function.
- Polarity-independent bus connection.
- 24 bit A/D converter ensures high resolution.
- PROFIBUS® PA function blocks: 2 analog.
- FOUNDATION™ Fieldbus function blocks: 2 analog and 1 PID.
- FOUNDATION™ Fieldbus capability: Basic or LAS.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. Using the 2-channel version up to 84 channels per meter can be mounted.

Connections



Order:

Type	Galvanic isolation	Channels
6350B	1500 VAC : 2	Single : A Double : B

Environmental Conditions

Specifications range..... -40°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
Weight (1 / 2 channels)..... 145 / 185 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..... 9.0...30 VDC
Internal consumption, per channel..... < 11 mA
Isolation voltage, test..... 1.5 kVAC for 60 s
Isolation voltage, working..... 50 VRMS / 75 VDC
Warm-up time..... 30 s
Signal / noise ratio..... Min. 60 dB
Accuracy..... Better than 0.05% of selected range
Response time (programmable)..... 1...60 s
Updating time..... < 400 ms
Execution time, PID controller..... < 200 ms
Execution time, analog input..... < 50 ms
Signal dynamics, input..... 24 bit
EMC immunity influence..... < ±0.1% of reading
Extended EMC immunity: NAMUR NE 21, A criterion, burst..... < ±1% of reading

Input specifications

RTD input..... Pt25…1000, Ni25…1000, Cu10…1000, lin. R, 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
Cold junction compensation (CJC)..... < ±0.5°C
Sensor error detection, TC..... Yes
Sensor error current: When detecting / else..... Nom. 2 µA / 0 µA
Short circuit detection, TC..... < 3 mV
Bipolar current input: Measurement range..... -100…+100 mA
Input resistance, current input..... 10 Ω + PTC < 20 Ω
Bipolar voltage input: Measurement range..... -800…+800 mV
Min. measurement range (span), voltage input..... 2.5 mV
Input resistance, voltage input..... 10 MΩ
Short circuit detection, voltage input..... < 3 mV

Output specifications

PROFIBUS PA protocol..... Profile A&B, ver. 3.0
PROFIBUS PA protocol standard..... EN 50170 vol. 2
PROFIBUS PA address (at delivery)..... 126
PROFIBUS PA function blocks..... 2 analog
FOUNDATION™ Fieldbus protocol..... FF protocol
FOUNDATION™ Fieldbus protocol standard..... FF design specifications
FOUNDATION™ Fieldbus version..... ITK 4.6
FOUNDATION™ Fieldbus capability..... Basic or LAS
FOUNDATION™ Fieldbus function blocks..... 2 analog and 1 PID

Approvals

ATEX 2004/108/EC..... KEMA 03ATEX1013 X
FM..... 3015609
CSA..... 1418937
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410

A

Temperature / mA converter

9113A

– Input for RTD, TC and mA
– Active / passive mA output
– 1 or 2 channels
– Can be supplied separately or installed on power rail, PR type 9400
– SIL 2-certified via Full Assessment

A

Advanced features

- Configuration and monitoring by way of detachable display front (PR 4511/4501); process calibration and signal simulation.
- Copying of the configuration from one device to others of the same type via the display front.
- TC inputs can use either the internal CJC or a terminal with a built-in Pt100 sensor (PR 5910, channel 1 / PR 5913, channel 2) for higher accuracy.
- The device automatically detects whether it must supply an active or a passive current signal.
- Advanced monitoring of internal communication and stored data.
- SIL 2 functionality is optional and must be activated in a menu point.

Application

- The device can be mounted in and receive signals from non-classified area and zone 2.
- Conversion and scaling of temperature (Pt, Ni and TC) and active current signals.
- 9113A has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.

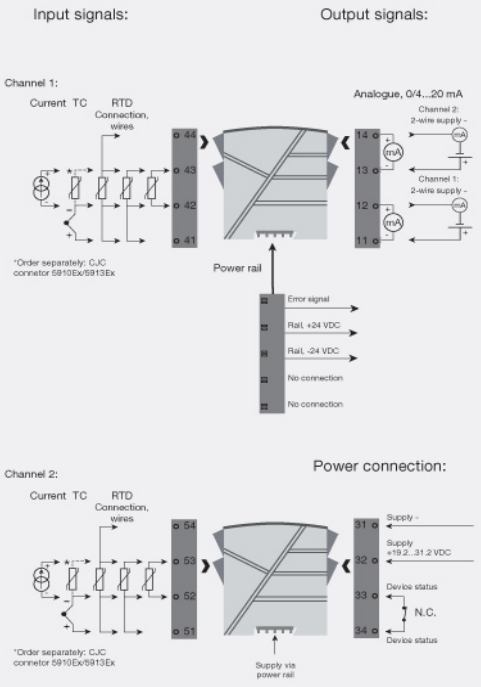
Technical characteristics

- 1 green and 2 red front LEDs indicate operation status and malfunction.
- 2.6 kVAC galvanic isolation between input, output and supply.

Mounting

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

Connections



Order:

Type	Unit channels	
9113A	Single	: A
	Double	: B

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
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz..... ±1 mm
Vibration: 13.2...100 Hz..... ±0.7 g

Common specifications

Supply voltage..... 19.2...31.2 VDC
Fuse..... 400 mA SB / 250 VAC
Max. power consumption..... ≤ 3.5 W (2 channels)
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
Communications interface..... Communication enabler 4511 / Programming front 4501
Signal / noise ratio..... Min. 60 dB (0...100 kHz)
Average response time incl. delay: Temperature input..... ≤ 1 s
mA input..... ≤ 0.4 s
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
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..... Programmable ON / OFF
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..... Programmable ON or OFF (only wire breakage)
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
Sensor error detection, current input..... Programmable ON / OFF

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/600 Ω/12 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
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
2-wire 4…20 mA output: External 2-wire supply range..... 3.5...26 VDC
Signal range..... 4…20 mA
Max. load resistance [Ω]..... (Vsupply - 3.5) / 0.023 A
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. voltage, status relay..... 110 VDC / 125 VAC
Max. current, status relay..... 0.3 ADC / 0.5 AAC
Max. AC power, status relay..... 62.5 VA / 32 W
*of span..... = of the currently selected measurement range

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
UL..... UL 61010-1
EAC TR-CU 020/2011..... EN 61326-1
DNV Marine..... Stand. f. Certific. No. 2.4
SIL..... SIL 2 certified & fully assessed acc. to IEC 61508

A

Pt100 temperature sensor

7400

– Accuracy, IEC 60751 class A
– Terminal head DIN 43.729 form B
– Stainless steel
– Protection tube Ø 9 x 1
– Temperature range -50°C to +400°C

A

Application
- Temperature measurement in industrial systems, eg. in the food, chemical and pharmaceutical industries, district heating, power plants and ships.
- Temperature measurement in gas and floating media.

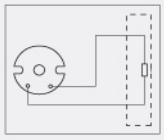
Technical characteristics
- The sensor element is a thin film platinum resistor - Pt100 - trimmed at a laboratory to comply with the resistance values of the standard IEC 60751, class A. The advantage of a thin film element is an ultra short reaction time. The Pt100 element is electrically isolated from the protecting tube and terminal head.
- The protecting tube is Ø 9 x 1 mm stainless, acid-proof steel W no. 1.4571 / AISI 316TI, filled with aluminum oxide powder. A 1/2" RG thread nipple is welded on the protecting tube with a packing sheet of Ø 30 and span 30.
- The terminal head is a standard DIN 43.729 form B housing produced in light-alloy metal, protected against corrosion through strong industrial lacquering. The sensor is available with or without cooling extension to keep the terminal head clear of isolated surfaces.

Electrical connection
- Each sensor is delivered with a three-wire connection which allows cable compensation to the sensor element.

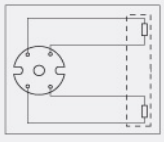
Option
- Pt100 sensor type 7400 is available with a built-in 2-wire programmable transmitter for both standard and I.S. installations.

Connections

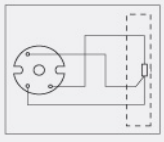
2-wire
1 x Pt100



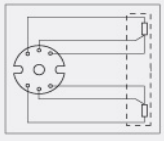
2-wire
2 x Pt100



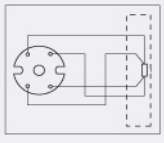
3-wire
1 x Pt100



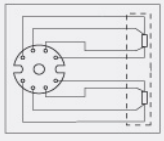
3-wire
2 x Pt100



4-wire
1 x Pt100



4-wire
2 x Pt100



Order:

Type	Pt100 Sensors	Accuracy	Cooling extension	Insertion length
7400	1 x Pt100 : A	Class A : 1	None : A 100 mm : B	50 mm : 1 100 mm : 2 150 mm : 3 200 mm : 4 300 mm : 5 400 mm : 6

Environmental Conditions

Protection degree..... IP54

Mechanical specifications

Max. tightening torque..... 50 Nm
Packing surface..... Ø 30 x Ø 21.5
Max. pressure for insertion length ≤ 250 mm..... 36.5 bar
Max. pressure for insertion length > 250 mm..... 22.5 bar
Cable connection (screwed)..... M20 x 1.5

Common specifications

Recommended sensor current..... ≤ 2 mA
Max. temperature diffusion at 0°C: IEC 60751 class A..... ≤ ±0.15°C
Long-term stability: (≥1000 hours at max. temperature)..... ≤ ±0.05°C

A

A

R/I transmitter

2202

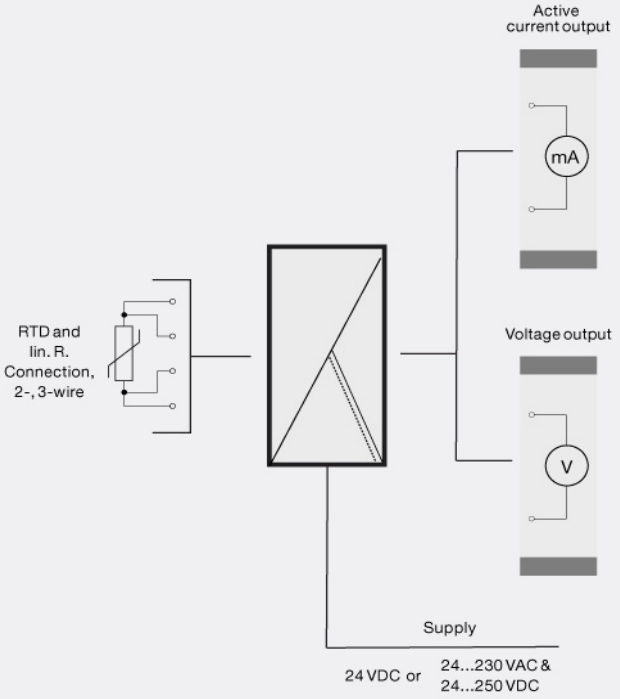
– Input for Pt100, Ni100 or Ohm
– Sensor cable compensation
– Linearized analog output
– 24 VDC or universally supplied
– Individual 0 and 100% adjustment

Advanced features
- 0 and 100% adjustments on the front face can be adjusted individually without interacting.

Application
- Linearized temperature measurement with Pt100 (to IEC 751) or Ni100 (to DIN 43760) sensors.
- Conversion of linear resistance change to standard analog current/voltage signal from for example valves or linear movements with attached potentiometer.
- Signal simulator via externally mounted 10-turn potentiometer, to aid with installation and commissioning plant.
- 3-wire connection cable compensation or 2-wire connection without cable compensation.
- Sensor error detection with Upscale, Downscale or custom set values.
- Reversible inputs with 0% set to maximum value of the desired input range and 100% set to the minimum value of the desired input range.

Technical characteristics
- Analog current and voltage output options include 0/4...20 mA, 0/2...10 VDC and special ranges.
- Galvanic isolation between supply and input / output ground.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



Order:

Type	Input	Output	Supply	Range
2202	Pt100 : L	Spec. : 0	24 VDC : D	Acc. to order
	Ni100 : N	0...20 mA : 1	24...230 VAC & : P	
	Lin. R : R	4...20 mA : 2	24...250 VDC	
	Spec. : X	0...5 mA : 3		
		0...1 V : 4		
		0.2...1 V : 5		
		0...10 V : 6		
		2...10 V : 7		

Environmental Conditions

Specifications range..... -20°C to +60°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP50

Mechanical specifications

Dimensions (HxWxD)..... 80.5 x 35.5 x 84.5 mm (D is without pins)
Weight DC / universally supplied..... 100 g / 150 g

Common specifications

Supply voltage..... 19.2...28.8 VDC
Supply voltage, universal..... 21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Internal consumption..... ≤ 0.9 W (2202 _ _ D)
Internal consumption..... ≤ 1.4 W (2202 _ _ P)
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Accuracy..... Better than 0.1% of selected range
Signal / noise ratio..... Min. 60 dB
Signal dynamics, input..... 17 bit
Response time (0...90%, 100...10%)..... < 165 ms
Signal dynamics, output..... 16 bit
Temperature coefficient..... ±0.01°C/°Camb. (span < 100°C)
Temperature coefficient..... ±0.01% of span/°Camb. (span > 100°C)
Linearity error..... < 0.1% of span
EMC immunity influence..... < ±0.5%

Input specifications

Max. offset..... 50% of max. value
Adjustment acc. to order..... ±2.5...±25% of span
RTD input..... Pt100, Ni100, lin. R
Cable resistance per wire (max.), RTD..... 10 Ω
Sensor current, RTD..... > 0.2 mA, < 0.4 mA

Output specifications

Max. offset..... 50% of max. value
Current output: Signal range..... 0...20 mA
Min. signal range..... 5 mA
Load (max.)..... 20 mA/600 Ω/12 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Sensor error indication, current output..... Upscale / Downscale
Current limit..... ≤ 28 mA
Voltage output: signal range..... 0...10 VDC
Voltage output, min. signal range..... 250 mV
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
EAC TR-CU 020/2011..... EN 61326-1

A

2-wire room temperature transmitter

2914

– Room temperature measurement
– Complete with sensor and transmitter
– 4...20 mA output in 2-wire connection
– Easy mounting
– Measurement range 0...70°C
– Supply 8...35 VDC

A

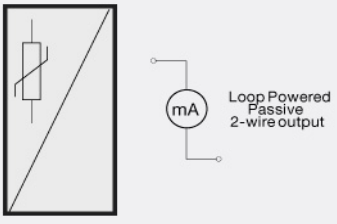
Application

- Electronic temperature measurement in for instance control rooms, offices, heating plants, factories, living rooms, and similar dry rooms.
- Suitable as a transmitter for controllers, trip amplifiers, displays, or superior SCADA systems.

Technical characteristics

- A precision Pt100 sensor with a small mass is mounted on the transmitter input thereby achieving a fast response time.
- The 2-wire output signal of 4...20 mA is proportional and linear to the temperature value that influences the built-in sensor.
- A reversed output signal of 20...4 mA may be ordered.
- A number of different sensor error detection options may be ordered.
- Protected against polarity reversal.
- The bottom of the cabinet can be attached to a wall by two screws.
- Visible or hidden cable access.

Connections



Order:

Type	Measurement range		Output		Sensor error value	
2914	0...50°C	: A	Special	: 0	To max., ≥ 23 mA	: A
	0...70°C	: B	4...20 mA	: 2	To min., ≤ 3.8 mA	: B
	Special	: X	20...4 mA	: 9	Special	: X

Environmental Conditions

Specifications range..... 0°C to +70°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP30

Mechanical specifications

Dimensions (HxWxD)..... 70 x 121 x 25 mm
Weight approx..... 95 g
Wire size..... 1 x 1.5 mm<sup<2</sup>

Common specifications

Supply voltage..... 8.0...35 VDC
Internal consumption..... 25 mW…0.8 W
Voltage drop..... 8.0 VDC
Warm-up time..... 5 min.
Signal / noise ratio..... Min. 60 dB
Response time..... 10 s (@ 0.5 m/s)
Signal dynamics, input..... 17 bit
Signal dynamics, output..... 16 bit
Effect of supply voltage change..... < 0.005% of span / VDC
Temperature coefficient..... < ±0.01% of span / °C
Linearity error..... < 0.1% of span
EMC immunity influence..... < ±0.5%

Input specifications

Max. offset..... 50% of max.°C
Measurement range..... 0...70°C
Min. measurement range..... 25°C (span)
Sensor current, RTD..... > 0.2 mA, < 0.4 mA

Output specifications

Max. offset..... 20% of max. mA
Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Updating time..... 135 ms
Load resistance, current output..... ≤ (Vsupply - 8) / 0.023 [Ω]
Load stability, current output..... ≤0.01% of span / 100 Ω
NAMUR NE 43 Upscale/Downscale..... 23 mA / 3.5 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
EAC TR-CU 020/2011..... EN 61326-1

A

Intrinsically safe isolation barriers and backplanes with full SIL assessment

We deliver the safest signals by validating our products against the toughest safety standards. Through our commitment to innovation, we have made pioneering achievements in developing I.S. interfaces with full SIL assessment that are both efficient and cost-effective.

Our comprehensive range of analog and digital intrinsically safe isolation barriers offers multifunctional inputs and outputs, making PR an easy-to-implement site standard. Our backplanes further simplify large installations and provide seamless integration to standard DCS systems.

I.S. interfaces

HART® transparent repeater

9106B

– 24 VDC supply via power rail or connectors
– Active and passive mA input
– Active or passive output via the same two terminals
– Splitter function - 1 in and 2 out
– SIL2 / SIL3 Full Assessment and certified acc. to IEC 61508

Application

- 9106B is a 1- or 2-channel isolated 1:1 repeater barrier for intrinsic safety applications.
- The device supplies 2-wire SMART transmitters and can also be used for 2-wire SMART current sources. HART® & BRAIN protocols are supported and are transferred bi-directionally.
- 9106B can be mounted in the safe area or in zone 2 / Cl. 1, div. 2 and receive signals from zone 0, 1, 2 and zone 20, 21, 22 including mining / Class I/II/III, Div. 1, Gr. A-G.
- The PR 4501 displays the process value for each channel and can be used to define high and low limits for detection of loop current level. If these limits are exceeded, the status relay will activate.
- In the 1-channel version the status relay can be used as a simple limit switch.
- I.S. splitter application - 1 input and 2 outputs.
- In the dual channel version the 9106B can be implemented in a SIL3 loop.

Advanced features

- The PR 4501 detachable display and the green and red front LEDs indicate operation status for each channel.
- A tag number can be defined for each channel.
- Monitoring of error events and cable breakage on input via the individual status relay and/or a collective electronic signal via the power rail.

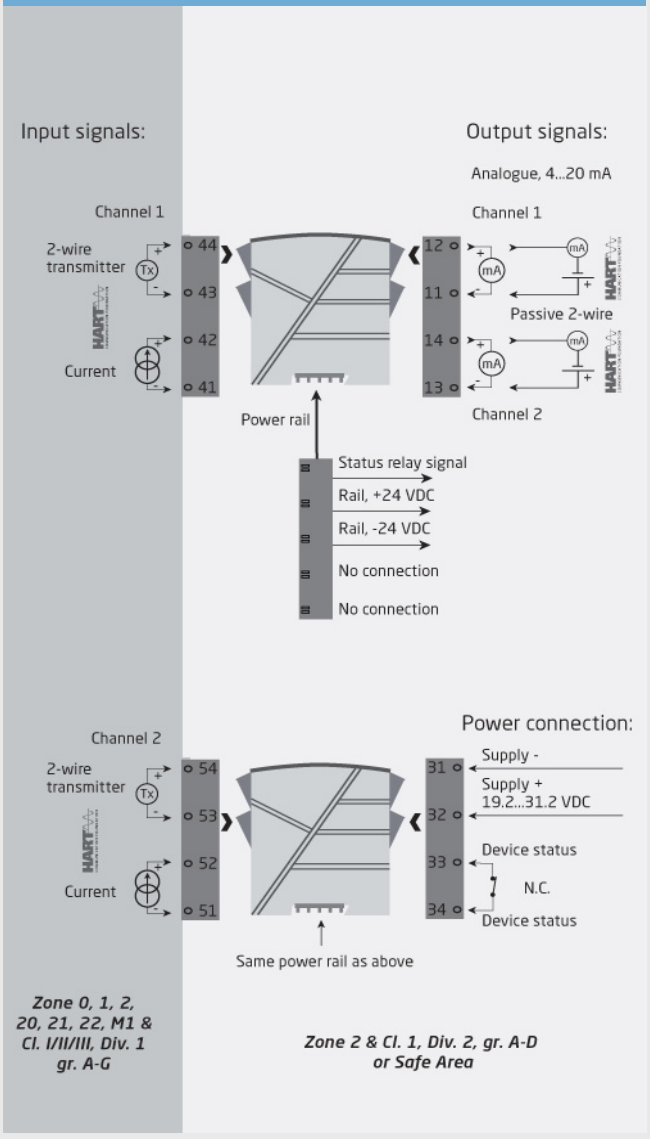
Technical characteristics

- High galvanic isolation of 2.6 kVAC.
- Fast response time <5 ms
- High accuracy better than 0.1%.
- 2-wire transmitter supply >16 V.

Mounting

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

Connections



Order:

Type	Barrier version		Unit channels	
9106B	Uo = 28 V	: 1	Single	: A
	Uo = 25.6 V	: 2	Double	: B

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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

Common specifications

Supply voltage	19.2...31.2 VDC
Fuse	1.25 A SB / 250 VAC
Max. power consumption	≤ 3 W (2 channels)
Max. internal power dissipation	≤ 2 W (2 channels)
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
SMART bi-directional communication frequency range	0.5...7.5 kHz
Signal / noise ratio	> 60 dB
Response time (0...90%, 100...10%)	< 5 ms
Accuracy	Better than 0.1% of selected range
mA, absolute accuracy	≤ ±16 µA
mA, temperature coefficient	≤ ±1.6 µA / °C
Effect of supply voltage change on output (nom. 24 VDC)	< ±10 µA
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Current input: Measurement range	3,5...23 mA
2-wire transmitter supply 9106B1x (Uo = 28 VDC)	>16 V / 20 mA
2-wire transmitter supply 9106B2x (Uo = 25.6 VDC)	>15 V / 20 mA
Sensor error detection: Loop break 4...20 mA	< 1 mA
Input voltage drop, supplied unit	< 4 V @ 23 mA
Input voltage drop, non-supplied unit	< 6 V @ 23 mA

Output specifications

Current output: Signal range	3.5...23 mA
Load (max.)	20 mA/600 Ω/12 VDC
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	≤ 28 mA
Effect of external 2-wire supply voltage variation	< 0.005% of span / V
Max. load resistance [Ω]	(Vsupply - 3.5) / 0.023 A
Max. external 2-wire supply	26 VDC
Status relay output terminal 33-34: Relay function	N.C.
Programmable low setpoint	0...29.9 mA
Programmable high setpoint	0...29.9 mA
Hysteresis for setpoints	0.1 mA
Max. voltage, status relay	110 VDC / 125 VAC
Max. current, status relay	0.3 ADC / 0.5 AAC
Max. voltage - hazardous installation	32 VDC / 32 VAC
Max. current - hazardous installation	1 ADC / 0.5 AAC
*of span	= normal measurement range 4...20 mA

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	DEKRA 11ATEX0244 X
IECEx	DEK 11.0084X
FM	0003044327-C
INMETRO	NCC 12.1302 X
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
DNV Marine	Stand. f. Certific. No. 2.4
CCOE	P337349/1
SIL	SIL 2 / SIL3 certified & fully assessed acc. to IEC 61508

HART® transparent driver

9107B

– 24 VDC supply via power rail or connectors
– Fast response time
– High active output load 725 Ohm / 20 mA
– Output line fault detection via status relay
– SIL2 certified via Full Assessment according to IEC 61508

Application

- 9107B is a 1- or 2-channel isolated 1:1 driver barrier for intrinsic safety applications.
- Operation and drive control of I/P converters, valves and indicators mounted in the hazardous area.
- Operation of HART® devices is possible as the unit transmits HART® communication signals bi-directionally.
- 9107B can be mounted in the safe area or in zone 2 / Cl. 1, div. 2 and transmit signals to zone 0, 1, 2 and zone 20, 21, 22 including mining / Class I/II/III, Div. 1, Gr. A-G.
- The PR 4501 displays the process value for each channel and can be used to define high and low limits for detection of loop current level. If these limits are exceeded, the status relay will activate.
- Dual channel versions can be used for signal splitter applications - 1 in and 2 out.

Advanced features

- The PR 4501 detachable display and the green and red front LEDs indicate operation status for each channel.
- A tag number can be defined for each channel.
- Output line fault detection.
- In the 1-channel version the status relay can be used as a simple limit switch.

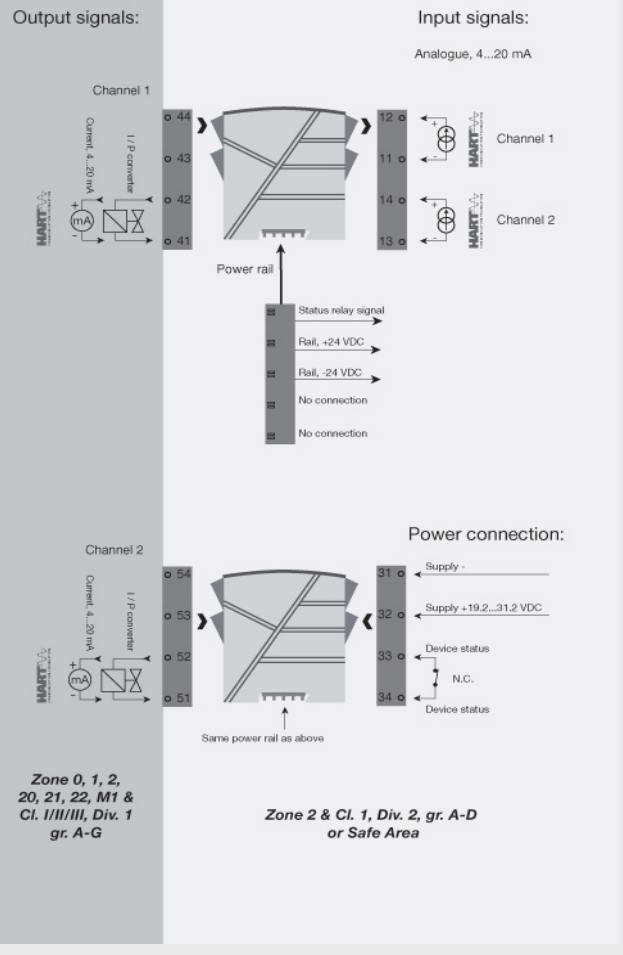
Technical characteristics

- High galvanic isolation of 2.6 kVAC.
- High accuracy better than 0.1%.
- Continuous check of vital stored data for safety reasons.

Mounting

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

Connections



Order:

Type	Unit channels	
9107B	Single	: A
	Double	: B

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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

Common specifications

Supply voltage	19.2...31.2 VDC
Fuse	1.25 A SB / 250 VAC
Max. power consumption	≤ 2 W (2 channels)
Max. internal power dissipation	≤ 2 W (2 channels)
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
HART bi-directional communication frequency range	0.5...7.5 kHz
Signal / noise ratio	> 60 dB
Response time (0...90%, 100...10%)	< 5 ms
Accuracy	Better than 0.1% of selected range
mA, absolute accuracy	≤ ±16 µA
mA, temperature coefficient	≤ ±1.6 µA / °C
Effect of supply voltage change on output (nom. 24 VDC)	< ±10 µA
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Current input: Measurement range	3,5...23 mA
Sensor error detection: Loop break 4...20 mA	< 1 mA
Input voltage drop, supplied unit	< 2 V @ 23 mA
Input voltage drop, non-supplied unit	< 4 V @ 23 mA

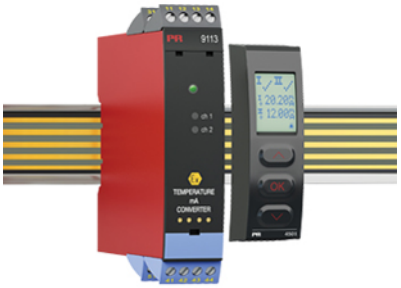
Output specifications

Current output: Signal range	3.5...23 mA
Load (max.)	20 mA/725 Ω/14.5 VDC
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	≤ 28 mA
Status relay output terminal 33-34: Relay function	N.C.
Programmable low setpoint	0...29.9 mA
Programmable high setpoint	0...29.9 mA
Hysteresis for setpoints	0.1 mA
Max. voltage, status relay	110 VDC / 125 VAC
Max. current, status relay	0.3 ADC / 0.5 AAC
Max. voltage - hazardous installation	32 VDC / 32 VAC
Max. current - hazardous installation	1 ADC / 0.5 AAC
*of span	= normal measurement range 4...20 mA

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	DEKRA 11ATEX0247 X
IECEx	DEK 11.0088X
FM	0003044327-C
INMETRO	NCC 12.1300 X
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
CCOE	P337349/2
DNV Marine	Stand. f. Certific. No. 2.4
SIL	SIL 2 certified & fully assessed acc. to IEC 61508

B



Temperature / mA converter

9113B

– Input for RTD, TC and mA
– Active / passive mA output
– 1 or 2 channels
– Can be supplied separately or installed on power rail, PR type 9400
– SIL 2-certified via Full Assessment

B

Advanced features

- Configuration and monitoring by way of detachable display front (PR 4501); process calibration and signal simulation.
- Copying of the configuration from one device to others of the same type via the display front.
- TC inputs can use either the internal CJC or a terminal with a built-in Pt100 sensor (PR 5910Ex, channel 1 / PR 5913Ex, channel 2) for higher accuracy.
- The device automatically detects whether it must supply an active or a passive current signal.
- Advanced monitoring of internal communication and stored data.
- SIL 2 functionality is optional and must be activated in a menu point.

Application

- The device 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 I/II/III, Div. 1, Gr. A-G.
- Conversion and scaling of temperature (Pt, Ni and TC) and active current signals.
- The 9113 has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.

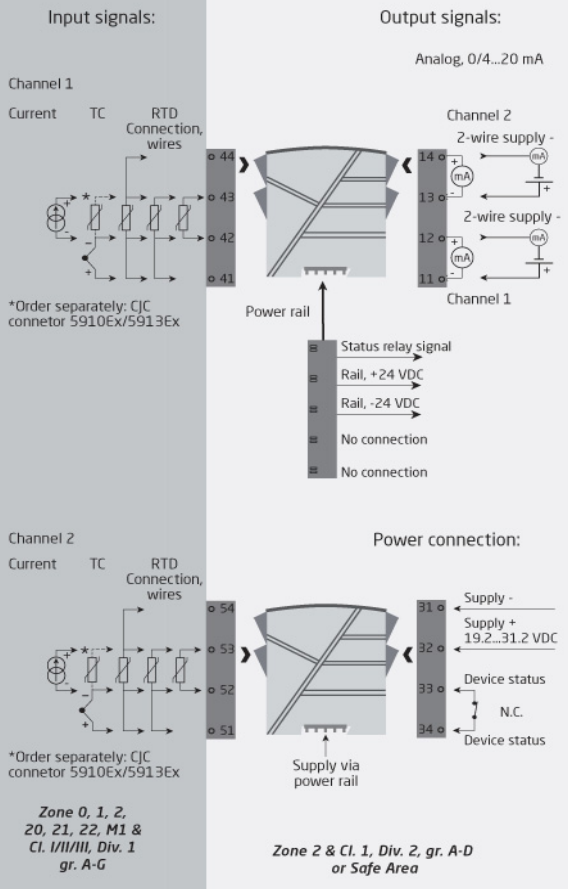
Technical characteristics

- 1 green and 2 red front LEDs indicate operation status and malfunction.
- 2.6 kVAC galvanic isolation between input, output and supply.

Mounting

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

Connections



Order:

Type	Unit channels	
9113B	Single	: A
	Double	: B

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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

Common specifications

Supply voltage	19.2...31.2 VDC
Fuse	400 mA SB / 250 VAC
Max. power consumption	≤ 3.5 W (2 channels)
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
Communications interface	Communication enabler 4511 / Programming front 4501
Signal / noise ratio	Min. 60 dB (0...100 kHz)
Accuracy	Better than 0.1% of selected range
Average response time incl. delay: Temperature input	≤ 1 s
mA input	≤ 0.4 s
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

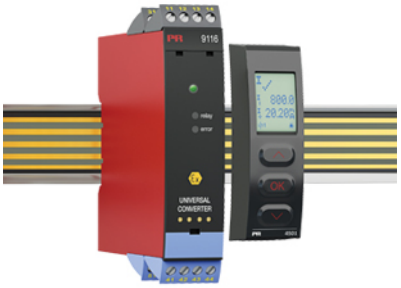
RTD input	Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000
Cable resistance per wire (max.), RTD	50 Ω
Sensor current, RTD	Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD	Programmable ON / OFF
TC input: 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	Programmable ON or OFF (only wire breakage)
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
Sensor error detection, current input	Programmable ON / OFF

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/600 Ω/12 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
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
2-wire 4…20 mA output: External 2-wire supply range	3.5...26 VDC
Signal range	4…20 mA
Max. load resistance [Ω]	(Vsupply - 3.5) / 0.023 A
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. voltage, status relay	110 VDC / 125 VAC
Max. current, status relay	0.3 ADC / 0.5 AAC
Max. AC power, status relay	62.5 VA / 32 W
*of span	= of the currently selected measurement range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 07ATEX0148 X
IECEx	KEM 09.0052X
FM	3038279-C
INMETRO	NCC 12.1310 X
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
DNV Marine	Stand. f. Certific. No. 2.4
CCOE	P337349/3
SIL	SIL 2 certified & fully assessed acc. to IEC 61508



Universal converter

9116B

– 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

B

Advanced features

- Configuration and monitoring by way of detachable display front (PR 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 PR4501.
- Reduced Uo Ex data < 8.3 V for active input signals.
- TC inputs with internal CJC or external CJC for higher accuracy.
- The device automatically detects whether it must supply an active or a passive current signal.

Application

- 9116B 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 I/II/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 9116 has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.

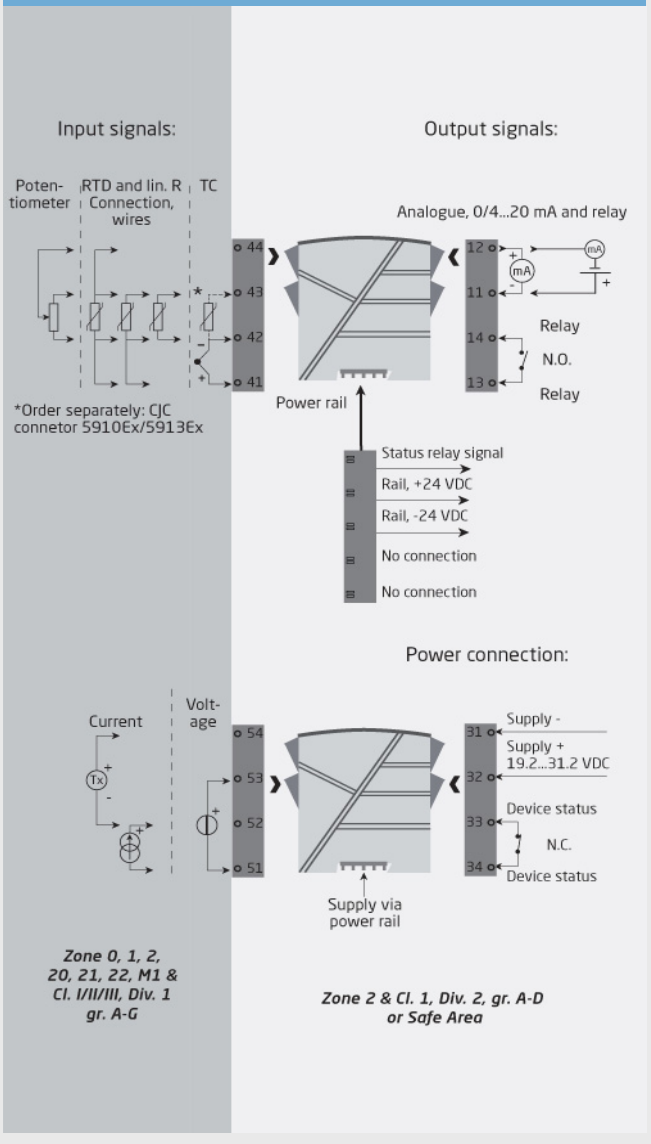
Technical characteristics

- 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.

Connections



Order:

Type	Max. loop voltage	
9116B	Uo 28 VDC	: 1
	Uo 21.4 VDC	: 2

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.	185 g
Weight incl. 4501 / 4511 (approx.)	200 g / 285 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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

Common specifications

Supply voltage	19.2...31.2 VDC
Fuse	1.25 A SB / 250 VAC
Max. power consumption	≤ 3.5 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
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 for 9116B1: 2-wire supply (terminal 54...52)	28...16.5 VDC / 0...20 mA
Auxiliary supplies for 9116B2: 2-wire supply (terminal 54...52)	22...16.5 VDC / 0...20 mA

Input specifications

RTD input	Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000
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	Programmable ON / OFF
Short circuit detection, RTD	Yes
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	Programmable ON or OFF (only wire breakage)
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
Sensor error detection, current input	Loop break 4...20 mA
Voltage input: Measurement range	0...10 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/600 Ω/12 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
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
2-wire 4…20 mA output: External 2-wire supply range	3.5...26 VDC
Signal range	4…20 mA
Max. load resistance [Ω]	(Vsupply - 3.5) / 0.023 A
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
Relay output: Relay functions	Setpoint, Window, Sensor error, Power and Off
Hysteresis, in % of span/display range	0.1...25 / 1...25
ON and OFF delay	0...3600 s
Sensor error reaction	Break / Make / Hold
Max. voltage	250 VAC / 30 VDC
Max. current	2 AAC / 2 ADC
Max. AC power	500 VA / 60 W
Max. voltage, status relay	110 VDC / 125 VAC
Max. current, status relay	0.3 ADC / 0.5 AAC
Max. AC power, status relay	62.5 VA / 32 W
*of span	= of the currently selected measurement range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0053 X
IECEx	KEM 10.0022X
FM	3038267-C
INMETRO	NCC 12.1309 X
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
CCOE	P337349/4

B

Pulse isolator

9202B

– Interface for NAMUR sensors and switches
– Extended self-diagnostics and detection of cable fault
– 1 or 2 channels
– Can be supplied separately or installed on power rail, PR type 9400
– SIL 2-certified via Full Assessment

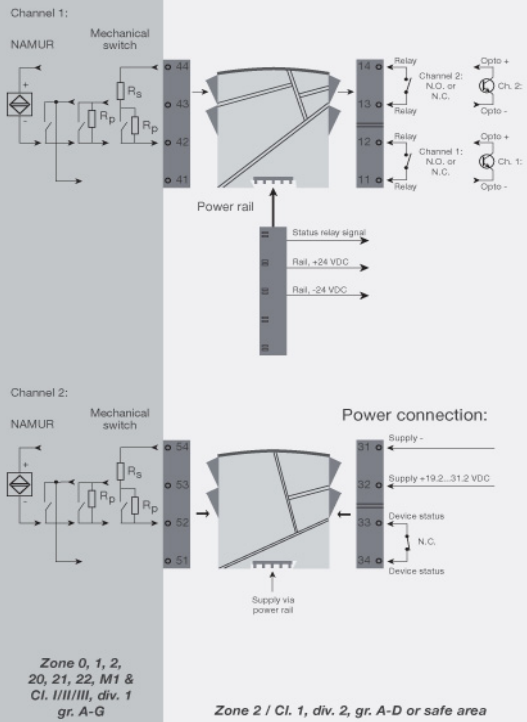
Advanced features
- Configuration and monitoring by way of detachable display front (PR 4501).
- Selection of direct or inverted function for each channel via PR 4501.
- Advanced monitoring of internal communication and stored data.
- Optional redundant supply via power rail and/ or separate supply.
- SIL 2 functionality is optional and must be activated in a menu point.

Application
- 9202B can be mounted in the safe area or in zone 2 / Cl. 1 div. 2 and receive signals from zone 0, 1, 2 and zone 20, 21, 22 including mining / Class I/II/III, Div. 1, Gr. A-G.
- Pulse isolator for transmission of signals to the safe area from NAMUR sensors and mechanical switches installed in the hazardous area.
- Monitoring of error events and cable breakage via the individual status relay and/or a collective electronic signal via the power rail.
- The 9202B has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.

Technical characteristics
- 1 green and 2 yellow/red front LEDs indicate operation status and malfunction.
- 2.6 kVAC galvanic isolation between input, output and supply.

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

Connections



Order:

Type	Switch		Channels	
9202B	Opto	: 1	Single	: A
	Relay N.O.	: 2	Double	: B
	Relay N.C.	: 3		

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.	170 g
Weight incl. 4501 / 4511 (approx.)	185 g / 270 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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

Common specifications

Supply voltage	19.2...31.2 VDC
Fuse	400 mA SB / 250 VAC
Max. power consumption	≤ 3 W (2 channels)
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
Output 1 to output 2	1.5 kVAC / 150 VAC reinforced isolation
Status relay to supply	1.5 kVAC / 150 VAC reinforced isolation
Communications interface	Communication enabler 4511 / Programming front 4501
Response time for cable fault	< 200 ms
Auxiliary supplies: NAMUR supply	8 VDC / 8 mA

Input specifications

Sensor types	NAMUR according to EN 60947-5-6 / mechanical contact
Frequency range	0...5 kHz
Min. pulse length	> 0.1 ms
Input resistance	Nom. 1 kΩ
Trig level, signal	< 1.2 mA, > 2.1 mA
Trig level, cable fault	< 0.1 mA, > 6.5 mA

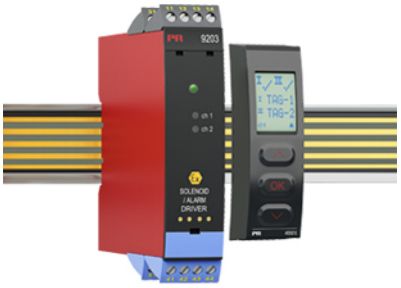
Output specifications

Relay output: Max. switching frequency	20 Hz
Max. voltage	250 VAC / 30 VDC
Max. current	2 AAC / 2 ADC
Max. AC power	500 VA / 60 W
Max. voltage, status relay	110 VDC / 125 VAC
Max. current, status relay	0.3 ADC / 0.5 AAC
Max. AC power, status relay	62.5 VA / 32 W
Opto, NPN outputs: Max. switching frequency	5 kHz
Min. pulse length, NPN output	> 0.1 ms
Max. load, current / voltage	80 mA / 30 VDC
Voltage drop at 80 mA	< 2.5 VDC

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 07ATEX0146 X
IECEx	KEM 06.0039X
FM	3034430-C
INMETRO	NCC 12.1307 X
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
CCOE	P337349/5
DNV Marine	Stand. f. Certific. No. 2.4
SIL	SIL 2 certified & fully assessed acc. to IEC 61508

B



Solenoid / alarm driver

9203B

– Universal Ex driver for solenoids, acoustic alarms and LEDs
– Extended self-diagnostics
– 1 or 2 channels
– Can be supplied separately or installed on power rail, PR 9400
– SIL 2-certified via Full Assessment

B

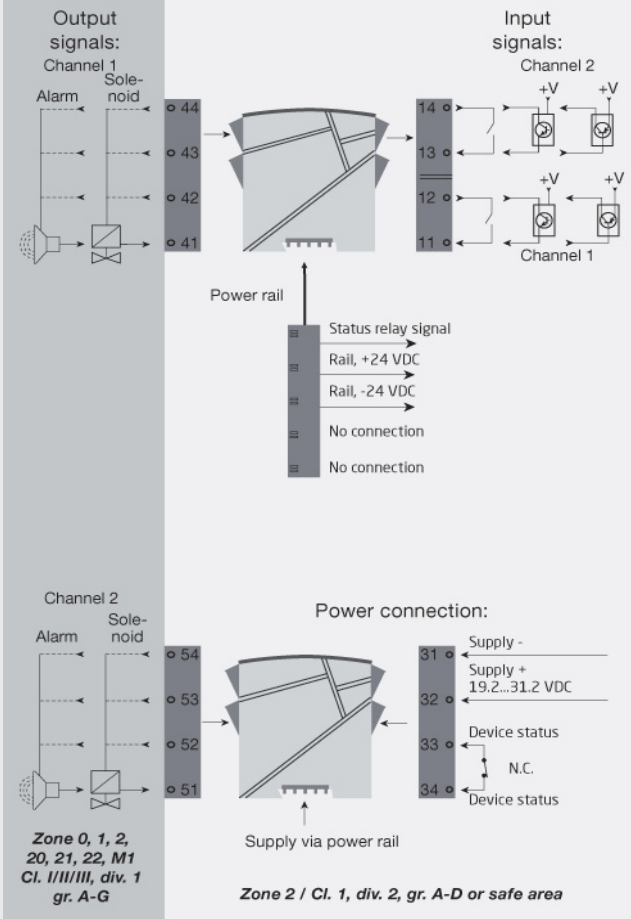
Advanced features
- Universal I.S. driver for the control of solenoids etc. with various I.S. data by way of three built-in I.S. barriers.
- Two hardware versions make it possible to choose either Low (35 mA) or High (60 mA) current output.
- Configuration and monitoring by way of detachable display front (PR 4501).
- Selection of direct or inverted function for each channel via PR 4501 and the possibility of reducing the output current to the hazardous area to suit the application.
- Optional monitoring of the output current to the hazardous area by way of PR 4501.
- Optional redundant supply via power rail and/or separate supply.

Application
- 9203B can be mounted in the safe area or in zone 2 / div. 2 and transmit signals to zone 0, 1, 2 and zone 20, 21, 22 including M1 mining / Class I/II/III, Div. 1, Gr. A-G.
- The 9203B is controlled by an NPN/PNP signal or a switch signal.
- Monitoring of internal error events via the individual status relay and/or a collective electronic signal via the power rail.
- The 9203B has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.

Technical characteristics
- 1 green and 2 yellow/red front LEDs indicate operation status and malfunction.
- 2.6 kVAC galvanic isolation between input, output and supply.

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

Connections



Order:

Type	Ex barrier [Ex ia]		Channels	
9203B	Low current	: 1	Single Double	: A : B
	High current	: 2	Single	: A

Output loads:

	9203B1A (1 channel) / 9203B1B (2 channels)		
Terminal	41-42 / 51-52	41-43 / 51-53	41-44 / 51-54
Vout. no load	Min. 24 V	Min. 24 V	Min. 24 V
Vout. with load	Min. 12.5 V	Min. 13.5 V	Min. 14.5 V
Iout. max	35 mA	35 mA	35 mA

	9203B2A (1 channel)					
Terminal	41-42		41-43		41-44	
Vout. no load	Min. 24 V		Min. 24 V		Min. 24 V	
Vout. with load	Min. 11.5 V	Min. 9 V	Min. 12.5 V	Min. 10 V	Min. 13.5 V	Min. 11 V
Iout. max	50 mA	60 mA	50 mA	60 mA	50 mA	60 mA

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..... 170 g
Weight incl. 4501 / 4511 (approx.)..... 185 g / 270 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
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz..... ±1 mm
Vibration: 13.2...100 Hz..... ±0.7 g

Common specifications

Supply voltage..... 19.2...31.2 VDC
Fuse..... 1.25 A SB / 250 VAC
Max. power consumption..... ≤ 3.5 W (2 channels)
Isolation voltage, test /working:
Input to any..... 2.6 kVAC / 300 VAC reinforced isolation
Output 1 to output 2..... 1.5 kVAC / 150 VAC reinforced isolation
Status relay to supply..... 1.5 kVAC / 150 VAC reinforced isolation
Communications interface..... Communication enabler 4511 / Programming front 4501
EMC immunity influence..... < ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst..... < ±1% of span

Input specifications

Trig level LOW, NPN+switch..... ≤ 2.0 VDC
Trig level HIGH, NPN+switch..... ≥ 4.0 VDC
Max. external voltage, NPN+switch..... 28 VDC
Input impedance, NPN+switch..... 3.5 kΩ
Trig level LOW, PNP..... ≤ 8.0 VDC
Trig level HIGH, PNP..... ≥ 10.0 VDC
Max. external voltage, PNP..... 28 VDC
Input impedance, PNP..... 3.5 kΩ

Output specifications

Output ripple..... < 40 mVRMS
Max. voltage, status relay..... 110 VDC / 125 VAC
Max. current, status relay..... 0.3 ADC / 0.5 AAC
Max. AC power, status relay..... 62.5 VA / 32 W

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
ATEX 2004/108/EC..... KEMA 07ATEX0147 X
IECEx..... KEM 09.0001X
FM..... 3035277-C
INMETRO..... NCC 12.1306 X
UL..... UL 61010-1
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410
DNV Marine..... Stand. f. Certific. No. 2.4
CCOE..... P337349/6
SIL..... SIL 2 certified & fully assessed acc. to IEC 61508

B

System 9000 backplane

7908

- Provides safe, easy wiring between the backplane and non I.S. automation systems using standard prefabricated I/O cables
- Direct, Redundant and Duplicate signalling - including HART I/O
- Robust, compact high-end design solution for 8 system 9000 units
- Digital output and LEDs indicate backplane system status

B

Application

- The 7908 backplane is a compact and robust solution that enables a safe and easy connection of PR system 9000 IS device signals into standard automation systems.
- Standard automation system cables and connectors are used to link the backplane to the I/O cards.
- The backplane can be used for Direct, Redundant, Duplicate signalling including HART I/O System connectivity (HART MUX).
- The system 9000 devices isolate and convert AI, AO, DI and DO signals coming from, or going to the I.S. classified area, and routes those signals to a system automation I/O card.
- The system 9000 units maintain a SIL2 level of functional safety, even when mounted in the backplane solution.oop.

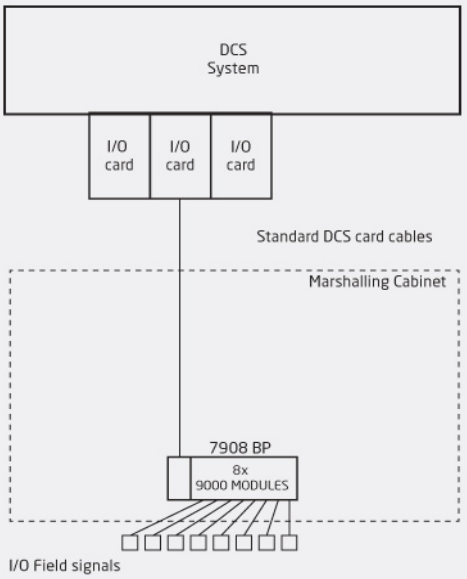
Technical characteristics

- Robust, compact high-end design that holds 8 system 9000 units.
- Digital output indicates status of the 9000 devices and primary/back-up power supplies.
- Flexible 24 VDC supply voltage and redundant power supply connection solution.

Mounting / installation / programming

- Flexible horizontal/vertical panel or wall mounting in the Safe or Zone 2 / Div 2 areas.
- System 9000 devices easily snap ON and OFF using piano keys, and devices can be hot-swapped.
- Tag number and ID labels are easily mounted and read by using the dedicated piano key spacer.
- Wide temperature operation range: -20...+60°C.
- Backplane selection guide can be found at www.prelectronics.com/backplane

Connections



Order:

7908	8 module backplane

Environmental Conditions

Specifications range	-20°C to +60°C
Storage temperature	-40°C to +85°C
Relative humidity	< 95% RH (non-cond.)
Installation in	Pollution degree 2 & measurement / overvoltage cat. II

Mechanical specifications

Dimensions (HxWxD)	144 x 247 x 141 mm
Wire size	2.5 mm^2 / AWG 12
Wire size	(Supply 1 / 2 and status relay connectors)

Common specifications

Supply voltage	20...31.2 VDC (24 DC nom.)
Max. power consumption	≤ 30 W
Replaceable fuses	Fuse F1 & F2: 1.6 A SB, 250 V, type TR5
Isolation voltage, test / working	500 VAC / 50 VAC
Isolation voltage, test / working	(Basic isolation between supply 1 & 2 and status relay)

Output specifications

Max. voltage, status relay	32 V (Zone 2 / Div. 2 area)
Max. voltage, status relay	42 V (Safe area)
Max. current, status relay	100 mA (Zone 2 / Div. 2 area)
Max. current, status relay	100 mA (Safe area)

Approvals

EMC	EN 61326-1
UL	UL 508
EAC TR-CU 020/2011	EN 61326-1
ATEX 2004/108/EC	DEKRA 13ATEX0136X
IECEx	DEK 13.0044X
FM	0003049918-C

System 9000 backplane

7916

– Provides safe, easy wiring between the backplane and non I.S. automation systems using standard prefabricated I/O cables
– Direct, Redundant and Duplicate signalling - including HART I/O
– Robust, compact high-end design solution for 16 system 9000 units
– Digital output and LEDs indicate backplane system status

Application

- The 7916 backplane is a compact and robust solution that enables a safe and easy connection of PR system 9000 IS device signals into standard automation systems.
- Standard automation system cables and connectors are used to link the backplane to the I/O cards.
- The backplane can be used for Direct, Redundant, Duplicate signalling including HART I/O System connectivity (HART MUX).
- The system 9000 devices isolate and convert AI, AO, DI and DO signals coming from, or going to the I.S. classified area, and routes those signals to a system automation I/O card.
- The system 9000 units maintain a SIL2 level of functional safety, even when mounted in the backplane solution.oop.

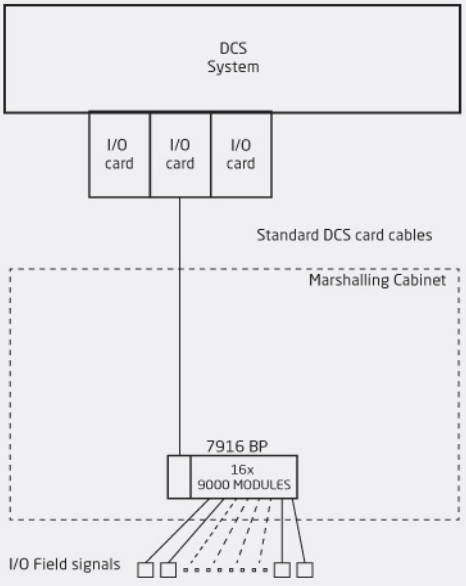
Technical characteristics

- Robust, compact high-end design that holds 16 system 9000 units.
- Digital output indicates status of the 9000 devices and primary/back-up power supplies.
- Flexible 24 VDC supply voltage and redundant power supply connection solution.

Mounting / installation / programming

- Flexible horizontal/vertical panel or wall mounting in the Safe or Zone 2 / Div 2 areas.
- System 9000 devices easily snap ON and OFF using piano keys, and devices can be hot-swapped.
- Tag number and ID labels are easily mounted and read by using the dedicated piano key spacer.
- Wide temperature operation range: -20...+60°C.
- Backplane selection guide can be found at www.prelectronics.com/backplane

Connections



Order:

7916	16 module backplane

Environmental Conditions

Specifications range	-20°C to +60°C
Storage temperature	-40°C to +85°C
Relative humidity	< 95% RH (non-cond.)
Installation in	Pollution degree 2 & measurement / overvoltage cat. II

Mechanical specifications

Dimensions (HxWxD)	144 x 443 x 141 mm
Wire size	2.5 mm^2 / AWG 12
Wire size	(Supply 1 / 2 and status relay connectors)

Common specifications

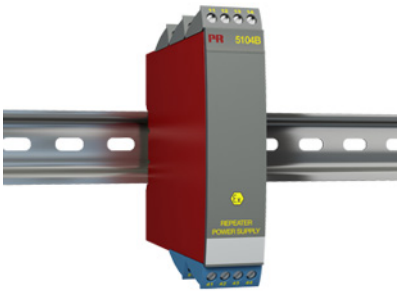
Supply voltage	20...31.2 VDC (24 DC nom.)
Max. power consumption	≤ 60 W
Replaceable fuses	Fuse F1 & F2: 3.15 A SB, 250 V, type TR5
Isolation voltage, test / working	500 VAC / 50 VAC
Isolation voltage, test / working	(Basic isolation between supply 1 & 2 and status relay)

Output specifications

Max. voltage, status relay	32 V (Zone 2 / Div. 2 area)
Max. voltage, status relay	42 V (Safe area)
Max. current, status relay	100 mA (Zone 2 / Div. 2 area)
Max. current, status relay	100 mA (Safe area)

Approvals

EMC	EN 61326-1
UL	UL 508
EAC TR-CU 020/2011	EN 61326-1
ATEX 2004/108/EC	DEKRA 13ATEX0136X
IECEx	DEK 13.0044X
FM	0003049918-C



Ex repeater / power supply

5104B

– 1- or 2-channel version
– 3- / 5-port 3.75 kVAC galvanic isolation
– Loop supply > 17.1 V in hazardous area
– 20 programmable measurement ranges
– Universal supply by AC or DC

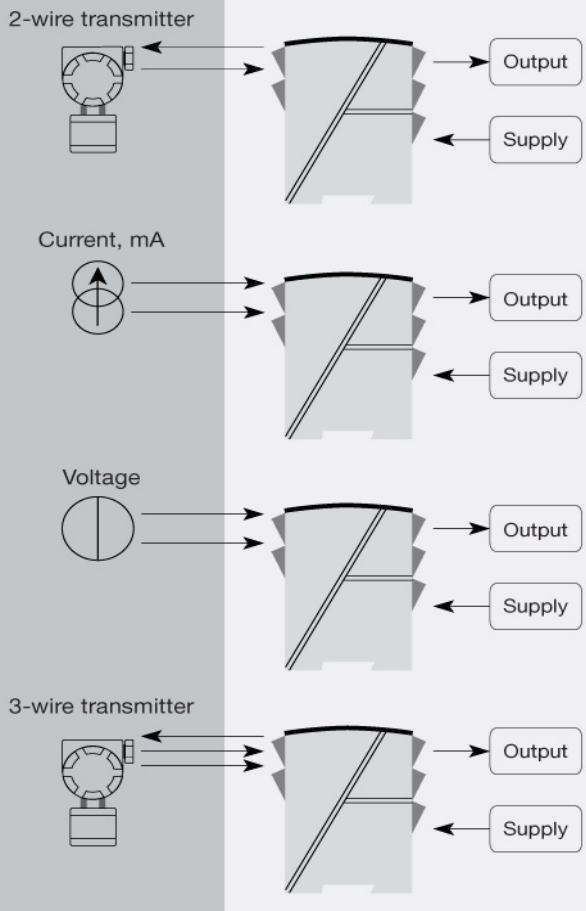
B

Application
- Supply voltage and safety barrier for 2-wire transmitters mounted in a hazardous area.
- Safety barrier for analog current / voltage signals from a hazardous area.
- 1 : 1 or signal conversion of analog current / voltage signals.

Technical characteristics
- The 20 factory-calibrated measurement ranges in the 5104B can be selected by the internal DIP-switches without the need for recalibration. Special measurement ranges can be delivered.
- PR5104B is based on microprocessor technology for gain and offset. The analog signal is transmitted at a response time of less than 25 ms.
- Inputs, outputs, and supply are floating and galvanically separated.
- The output can be connected either as an active current / voltage transmitter or as a 2-wire transmitter.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. By way of the 2-channel version up to 84 channels per meter can be mounted.
- NB: 5104B is recommended as I.S. barrier for 5331D, 5333D, 5334B, 5343B, 6331B, 6333B, and 6334B.

Connections



Order :

Type	Input		Output		Channels	
5104B	0…20 mA	: A	Special	: 0	Single	: A
	4…20 mA	: B	0…20 mA	: 1	Double	: B
	0…10 V	: E	4…20 mA	: 2		
	2…10 V	: F	0…1 V	: 4		
	Special	: X	0.2…1 V	: 5		
			0…10 V	: 6		
			2…10 V	: 7		

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
DIN rail type..... DIN 46277
Weight approx..... 225 g
Wire size..... 1 x 2.5 mm^2 stranded wire
Screw terminal torque..... 0.5 Nm
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...25 Hz..... ±1.6 mm
Vibration: 25...100 Hz..... ±4 g

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
Auxiliary supply: 2-wire supply (pin 44...42 and 54...52)..... 28...17.1 VDC / 0...20 mA
Signal / noise ratio..... Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%)..... < 25 ms
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

Max. offset..... 20% of max. value
Current input: Measurement range..... 0...20 mA
Min. measurement range (span), current input..... 16 mA
Input resistance, current input..... Nom. 10 Ω + PTC 10 Ω
Voltage input: Measurement range..... 0...10 VDC
Min. measurement range (span), voltage input..... 8 VDC
Input resistance, voltage input..... > 2 MΩ

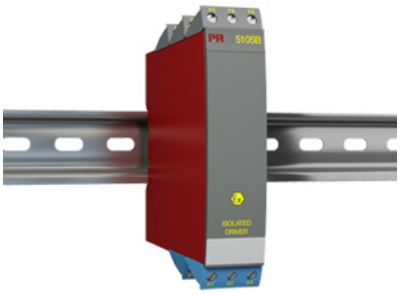
Output specifications

Max. offset..... 20% of max. value
Current output: Signal range..... 0...20 mA
Min. signal range..... 16 mA
Load (max.)..... 20 mA/600 Ω/12 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... ≤ 28 mA
External loop supply..... 29 VDC
Effect of external 2-wire supply voltage variation..... < 0.005% of span / V
Voltage output: signal range..... 0...1 VDC / 0...10 VDC
Voltage output, min. signal range..... 0.8 VDC / 8 VDC
Load (min.)..... 500 kΩ
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
ATEX 2004/108/EC..... DEMKO 99ATEX126013, II (1) GD [EEx ia] IIC
UL..... UL 913, UL 508
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410
DNV Marine..... Stand. f. Certific. No. 2.4

B



Ex-isolated driver

5105B

– 1- or 2-channel version
– 3- / 5-port 3.75 kVAC galvanic isolation
– Driver for Ex / I.S. area
– 20 programmable measurement ranges
– Universal supply by AC or DC

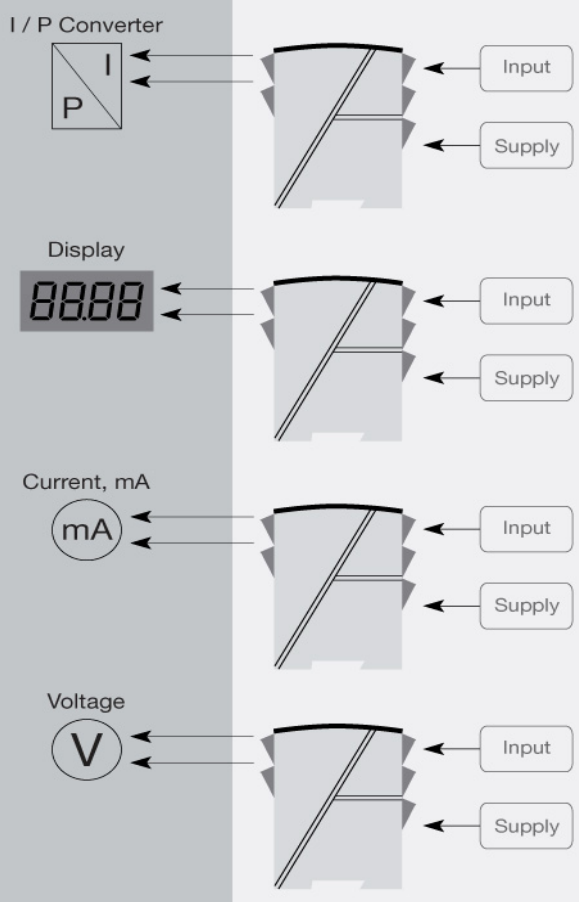
B

Application
- Safety barrier for current signals transmitted to I/P converters and displays mounted in hazardous area.
- Safety barrier for analog current / voltage signals transmitted to hazardous area.
- 1 : 1 or signal conversion of analog current / voltage signals.

Technical characteristics
- The 20 factory-calibrated measurement ranges in the 5105B can be selected by the internal DIP-switches without the need for a recalibration. Special measurement ranges can be delivered.
- PR5105B is based on microprocessor technology for gain and offset. The analog signal is transmitted at a response time of less than 25 ms.
- Inputs, outputs, and supply are floating and galvanically separated.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. By way of the 2-channel version up to 84 channels per meter can be mounted.

Connections



Order:

Type	Input		Output		Channels	
5105B	0...20 mA	: A	Special	: 0	Single	: A
	4...20 mA	: B	0...20 mA	: 1	Double	: B
	0...10 V	: E	4...20 mA	: 2		
	2...10 V	: F	0...1 V	: 4		
	Special	: X	0.2...1 V	: 5		
			0...10 V	: 6		
			2...10 V	: 7		

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
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...25 Hz..... ±1.6 mm
Vibration: 25...100 Hz..... ±4 g

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 W (2 channels)
Internal consumption..... ≤ 2 W (2 channels)
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Signal / noise ratio..... Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%)..... < 25 ms
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

Max. offset..... 20% of max. value
Current input: Measurement range..... 0...20 mA
Min. measurement range (span), current input..... 16 mA
Input resistance, current input..... Nom. 10 Ω + PTC 10 Ω
Voltage input: Measurement range..... 0...10 VDC
Min. measurement range (span), voltage input..... 8 VDC
Input resistance, voltage input..... > 2 MΩ

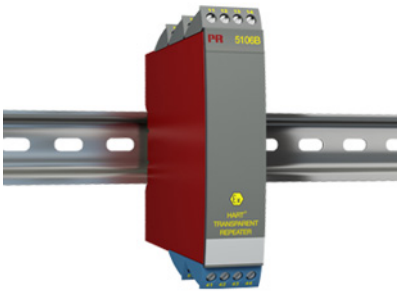
Output specifications

Max. offset..... 20% of max. value
Current output: Signal range..... 0...20 mA
Min. signal range..... 16 mA
Load (max.)..... 20 mA/770 Ω/15.4 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... ≤ 28 mA
Voltage output: signal range..... 0...1 VDC / 0...10 VDC
Voltage output, min. signal range..... 0.8 VDC / 8 VDC
Load (min.)..... 500 kΩ
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
ATEX 2004/108/EC..... DEMKO 99ATEX126014, II (1) GD [EEx ia] IIC
UL..... UL 913, UL 508
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410
DNV Marine..... Stand. f. Certific. No. 2.4

B



HART® transparent repeater

5106B

– 3- / 5-port 3.75 kVAC galvanic isolation
– Low response time
– 2-wire supply > 17 V in Ex / I.S. area
– 1- or 2-channel version
– Universal supply by AC or DC

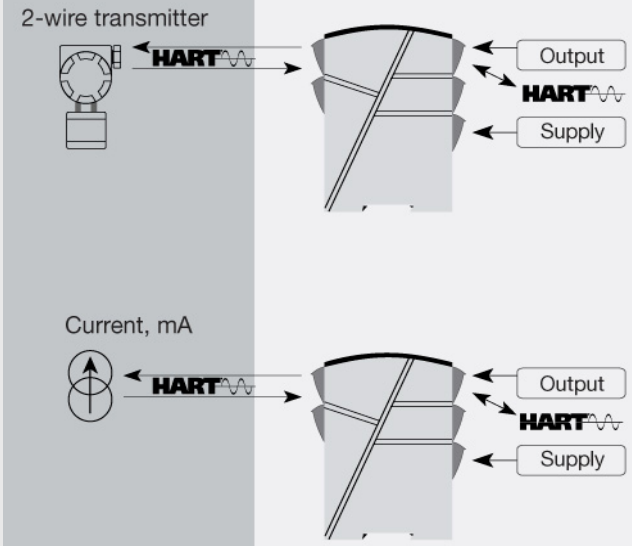
B

Application
- Power supply and Ex / I.S. safety barrier with 2-way HART® communication for 2-wire transmitters installed in the hazardous area.
- Ex / I.S. safety barrier with 2-way HART® communication for supplied current transmitters installed in the hazardous area.
- Signal isolator with low response time on analog current signals from the hazardous area.

Technical characteristics
- PR5106B primarily processes current signals of 4...20 mA.
- PR5106B is based on microprocessor technology for gain and offset. The analog signal is transmitted at a response time of less than 25 ms.
- Inputs, outputs, and supply are floating and galvanically separated.
- The output can be connected either as an active current transmitter or as a 2-wire transmitter.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. As the devices can be mounted without distance between neighboring units, up to 84 channels can be mounted per meter.
- PR5106B is recommended as Ex / I.S. safety barrier for 5335D and 6335D.

Connections



Order:

Type	Input	Output	Channels
5106B	4…20 mA : B	4…20 mA : 2 20…4 mA : 9	Single : A Double : B

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..... 245 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
Signal / noise ratio..... Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%)..... < 25 ms
Accuracy..... Better than 0.1% of selected range
Effect of supply voltage change..... < ±10 µA
Auxiliary supply: 2-wire supply (pin 44...42 and 54...52)..... 25...17 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

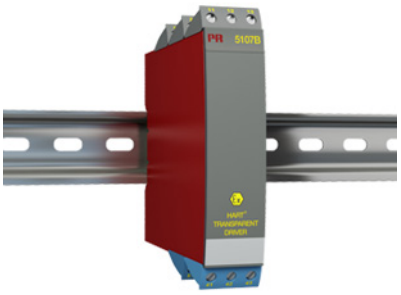
Current input: Measurement range..... 4...20 mA
Min. measurement range (span), current input..... 16 mA
Input resistance: Supplied unit..... Nom. 10 Ω
Input resistance: Non-supplied unit..... Rshunt = ∞, Vdrop < 4 V

Output specifications

Current output: Signal range..... 4…20 mA
2-wire 4...20 mA output: Signal range..... 4...20 mA
Min. signal range..... 16 mA
Load (max.)..... 20 mA/600 Ω/12 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... ≤ 28 mA
Max. external 2-wire supply..... 29 VDC
Effect of external 2-wire supply voltage variation..... < 0.005% of span / V
Output ripple..... < 3 mVRMS on HART communication
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
ATEX 2004/108/EC..... DEMKO 00ATEX127483, II (1) G [EEx ia] IIC
UL..... UL 913, UL 508
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410



HART® transparent driver

5107B

– 1- or 2-channel version
– 3- / 5-port 3.75 kVAC galvanic isolation
– < 1.3 V voltage drop on input
– 16 V driving voltage on Ex / I.S. output
– Universal supply by AC or DC

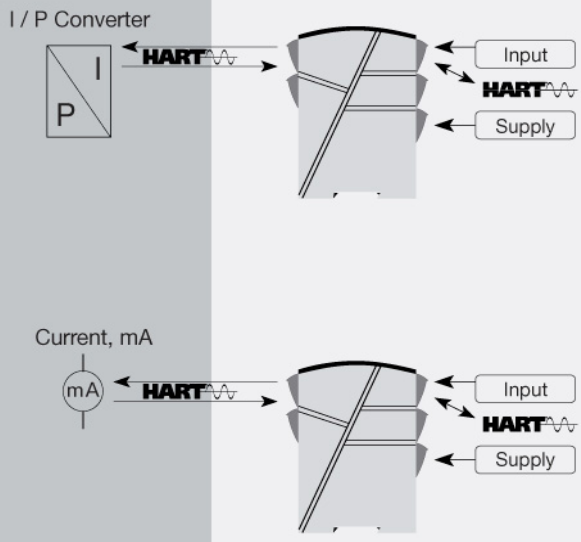
B

Application
- Safety barrier for current signals and 2-way HART® communication transmitted to I/P converters mounted in hazardous area.
- Safety barrier for 2-way HART® communication and analog current signals transmitted to hazardous area.
- Signal isolator with low response time on analog current signals transmitted to hazardous area.

Technical characteristics
- PR's HART® transparent driver primarily processes current signals of 4...20 mA.
- PR5107B is based on microprocessor technology for gain and offset. The analog signal is transmitted at a response time of less than 25 ms.
- Inputs, outputs, and supply are floating and galvanically separated.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. As the devices can be mounted without distance between neighboring units, up to 84 channels can be mounted per meter.

Connections



Order:

Type	Input	Output	Channels
5107B	4…20 mA : B	4…20 mA : 2 20…4 mA : 9	Single : A Double : B

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..... 260 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..... ≤ 2 W (2 channels)
Internal consumption..... ≤ 2 W (2 channels)
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Signal / noise ratio..... Min. 60 dB (0...100 kHz)
Accuracy..... Better than 0.1% of selected range
Response time (0...90%, 100...10%)..... < 25 ms
Long-term stability, better than..... ±0.1% of span / Year
Effect of supply voltage change..... < ±10 µA
EMC immunity influence..... < ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst..... < ±1% of span

Input specifications

Current input: Measurement range..... 4...20 mA
Min. measurement range (span), current input..... 16 mA
Input resistance: Supplied unit..... 10 Ω + PTC, Vdrop < 1.3 V
Input resistance: Non-supplied unit..... Rshunt = ∞, Vdrop < 3.5 V

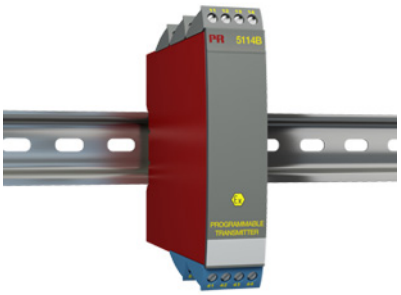
Output specifications

Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Load (max.)..... 20 mA/800 Ω/16 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... ≤ 28 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
ATEX 2004/108/EC..... DEMKO 01ATEX127484, II (1) GD [EEx ia] IIC
UL..... UL 913, UL 508
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410

B



Programmable transmitter

5114B

– 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 in Ex / I.S. zone 0

ATEX

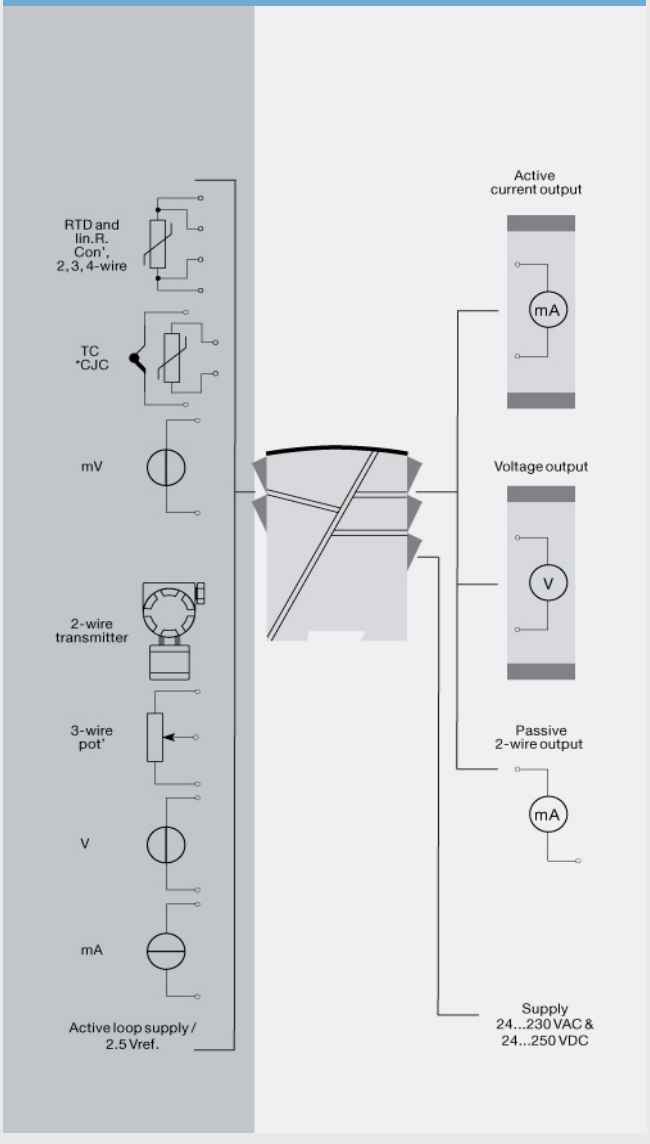
B

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.
- I.S. barrier for temperature sensors, potentiometers, and current / voltage signals.
- I.S. barrier with I.S. power supply for 2-wire transmitters in zone 0, 1, 2, 20, 21 and 2.

Connections



Order:

Type	Version	Input	Channels
5114B	ATEX Ex	RTD / TC / mV / R : 1 mA / V / mV : 2 Channel 1, RTD / TC / mV / R : 3 Channel 2, 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
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...25 Hz..... ±1.6 mm
Vibration: 25...100 Hz..... ±4 g

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)
Accuracy..... Better than 0.05% of selected range
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
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 = ∞, VDROP < 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 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
ATEX 2004/108/EC..... DEMKO 99ATEX124571
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410
DNV Marine..... Stand. f. Certific. No. 2.4

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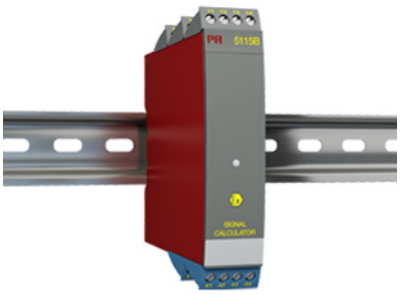


Ex signal calculator

5115B

– 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: (Input 1 * K1) - (Input 2 * K2) + K4
- Example: Average measurement: (Input 1 * 0.5) + (Input 2 * 0.5) + K4
- Example: Different functions on the outputs: Output 1 = input 1 - input 2, and Output 2 = input 1 + input 2
- I.S. safety barrier and power supply for 2-wire transmitters.

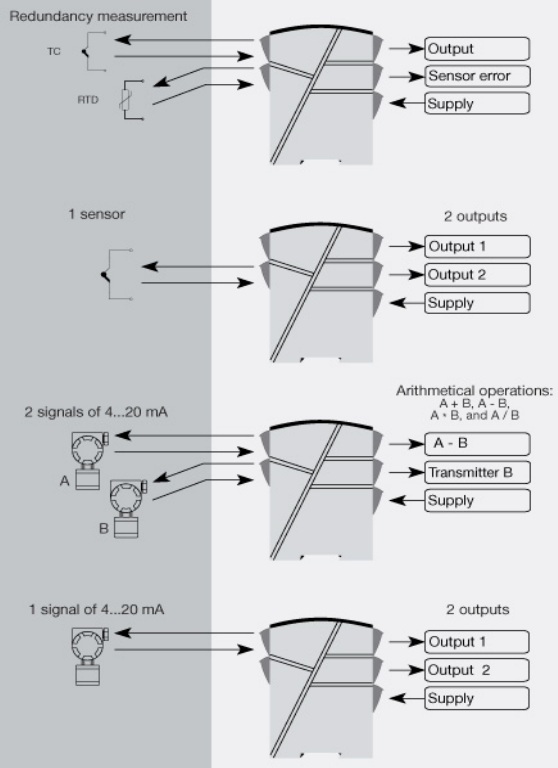
Technical characteristics

- Within a few seconds the user can program PR5115B to a selected application using the configuration program PReset.
- A green front LED indicates normal operation, sensor error on each sensor, and functional error.
- 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	
5115B	RTD / TC / mV / R	: 1
	mA / V / mV	: 2
	Input 1, RTD / TC / mV / R	: 3
	Input 2, mA / V / mV	

***NB!** Please remember to order CJC connectors type 5910EEx (input 1) and 5913EEx (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
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...25 Hz..... ±1.6 mm
Vibration: 25...100 Hz..... ±4 g

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)
Accuracy..... Better than 0.05% of selected range
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)
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 = ∞, VDROP < 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)
Input resistance, voltage input..... Nom. 10 MΩ (mV input)

Output specifications

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 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
ATEX 2004/108/EC..... DEMKO 00ATEX128567
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410
DNV Marine..... Stand. f. Certific. No. 2.4

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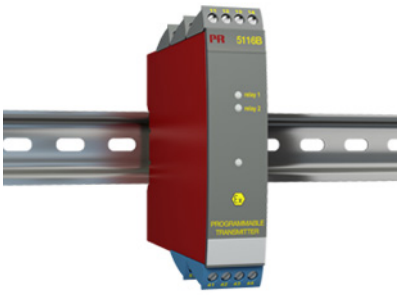


Programmable transmitter

5116B

– Input for RTD, TC, mV, Ohm, potentiometer, mA and V
– 2-wire supply > 16.5 V to Ex zone 0
– 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.

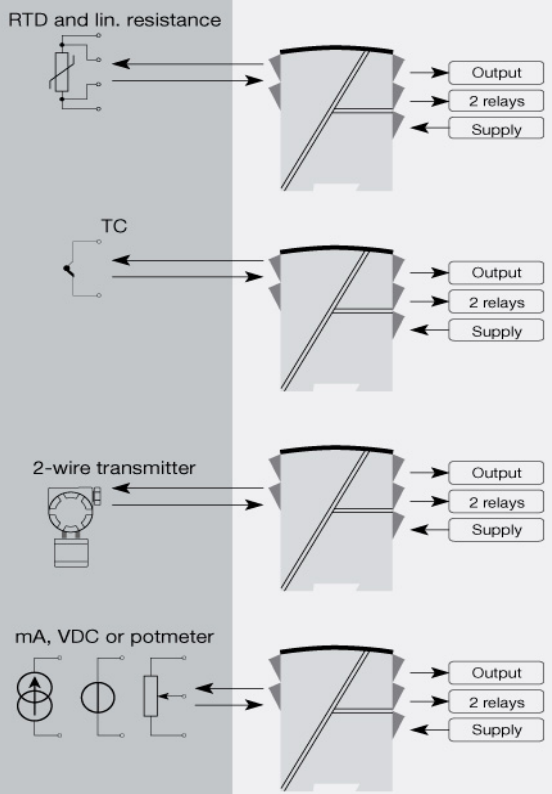
Technical characteristics

- Within a few seconds the user can program PR5116B 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 buttton.
- 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
5116B

*NB! Please remember to order CJC connectors type 5910Ex 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.	235 g
Wire size	1 x 2.5 mm^2 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

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)
Accuracy	Better than 0.05% of selected range
Response time (0...90%, 100...10%): Temperature input (programmable)	400 ms...60 s
mA / V input (programmable)	250 ms...60 s
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

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 = ∞, VDROP < 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

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
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 2006/95/EC	EN 61010-1
PELV/SELV	IEC 364-4-41 and EN 60742
ATEX 2004/108/EC	KEMA 04ATEX1316 X
FM	3023092
UL	UL 508
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
DNV Marine	Stand. f. Certific. No. 2.4

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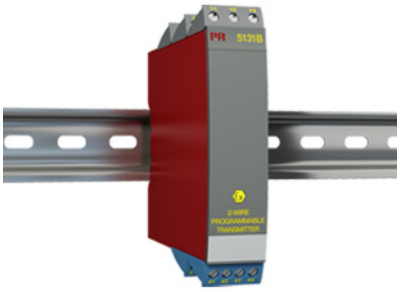


2-wire programmable transmitter

5131B

– Input for RTD, TC, mV, linear resistance, mA, and V
– 3.75 kVAC galvanic isolation
– 4...20 mA loop output
– 1- and 2-channel versions
– ATEX Ex / I.S. version
– DIN rail mounting

ATEX

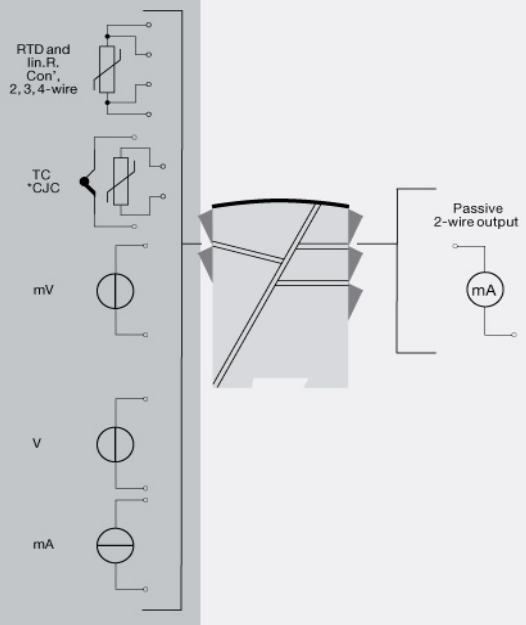
B

Advanced features
- The 5131 transmitter can be configured with a standard PC and the Loop Link communications unit.

Application
- Independent channel jumper selectable inputs for current/voltage or temperature.
- Current input programmable in range the 0...100 mA and voltage inputs in the range 0...250 VDC.
- Linearized, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analog current / voltage signal, for example from solenoids and butterfly valves or linear movements with attached potentiometer.
- 4- or 3-wire connection with automatic cable compensation or 2-wire connection with programmable cable compensation.
- Configurable sensor error detection including NAMUR NE43.

Technical characteristics
- Programming can be performed with or without a power supply.
- The 2-channel version has full galvanic isolation between the channels.
- Separation of circuits in PELV/SELV installations.
- I.S. barrier for temperature sensors, potentiometers and current / voltage signals.

Connections



Order:

Type	Input		Channels	
5131B	RTD / TC / mV / R	: 1	Single	: A
	mA / V / mV	: 2	Double	: B
	Channel 1, RTD / TC / mV / R	: 3		
	Channel 2, mA / V / mV			

***Note!** For TC inputs with internal CJC, remember to order CJC connectors type 5910Ex (ch. 1) and 5913Ex (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..... 195 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..... 7.5...35 VDC
Fuse..... 50 mA SB / 250 VAC
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
Effect of supply voltage change..... < 0.005% of span / VDC
EMC immunity influence..... < ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst..... < ±1% of span

Input specifications

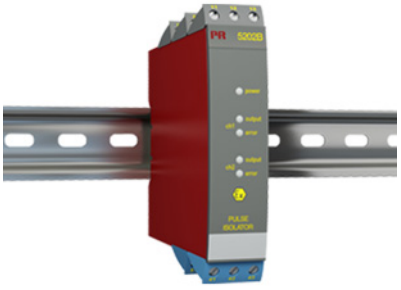
Max. offset..... 50% of selected max. value
RTD input..... Pt100, Ni100, lin. R
Cable resistance per wire (max.), RTD..... 10 Ω
Sensor current, RTD..... Nom. 0.2 mA
Effect of sensor cable resistance (3-/4-wire), RTD..... < 0.002 Ω / Ω
Sensor error detection, RTD..... Yes
TC input: Thermocouple type..... 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 = ∞, VDROP < 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..... 4…20 mA
Min. signal range..... 10 mA
Load resistance, current output..... ≤ (Vsupply -7.5)/0.023 [Ω]
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... ≤ 28 mA
Sensor error indication, current output..... Programmable 3.5…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 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
ATEX 2004/108/EC..... DEMKO 99ATEX124572
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410



Pulse isolator

5202B

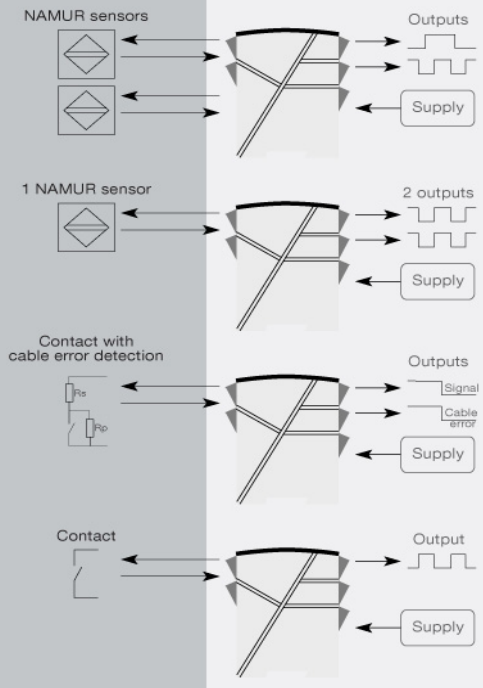
– 2 channels - 2 or 4 outputs
– Dual output
– 5-port 3.75 kVAC galvanic isolation
– Cable error detection
– Universal supply by AC or DC

Application
- Pulse isolator with safety barrier for the supply of NAMUR sensors installed in the hazardous area.
- Pulse isolator with safety barrier for the detection of mechanical contacts installed in the hazardous area.
- One input signal can be used on two separate outputs.
- A cable error alarm can be detected on a separate output.

Technical characteristics
- PR5202B1 and 5202B2 have relays with change-over contacts or open NPN collectors available in the safe area.
- PR5202B4 has 4 SPST relays, which are activated simultaneously two and two, available in the safe area. Each relay can be programmed to the function N.O. or N.C.
- Inputs, outputs and supply are floating and galvanically separated.
- 5202B is designed according to strict safety requirements and is therefore suitable for application in SIL 2 installations.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. Up to 84 channels per meter can be mounted.

Connections



Order:

Type	Output	
5202B	Open collector NPN	: 1
	2x1 relay	: 2
	2x2 relays	: 4

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..... 230 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..... ≤ 1.5 W (2 channels), 5202B1 and 5202B2
Max. power consumption..... ≤ 2.0 W (2 channels), 5202B4
Internal consumption..... ≤ 1.5 W (2 channels), 5202B1 and 5202B2
Internal consumption..... ≤ 2.0 W (2 channels), 5202B4
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Auxiliary supplies: NAMUR supply..... 8 VDC / 8 mA
EMC immunity influence..... < ±0.5%
Extended EMC immunity: NAMUR NE 21, A criterion, burst..... < ±1%

Input specifications

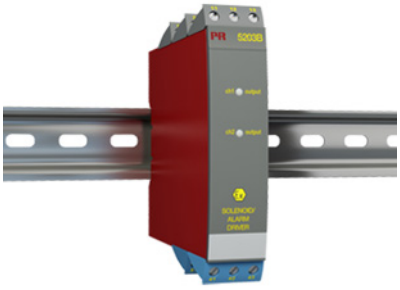
Sensor types..... NAMUR according to EN 60947-5-6 / mechanical contact
Frequency range..... 0...5 kHz
Pulse length..... > 0.1 ms
Input resistance..... 1 kΩ
Trig level, signal..... < 1.2 mA, > 2.1 mA
Trig level, cable fault..... < 0.1 mA, > 6.5 mA

Output specifications

Relay output: Max. switching frequency..... 20 Hz
Max. voltage..... 250 VRMS
Max. current..... 2 AAC
Max. AC power..... 100 VA
Max. load at 24 VDC..... 1 A
Opto, NPN outputs: Max. switching frequency..... 5 kHz
Min. pulse length, NPN output..... > 0.1 ms
Max. load, current / voltage..... 80 mA / 30 VDC
Voltage drop at 25 mA / 80 mA..... < 0.75 VDC / < 2.5 VDC

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
ATEX 2004/108/EC..... DEMKO 99ATEX127186
UL..... UL 913, UL 508
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410



Ex solenoid / alarm driver

5203B

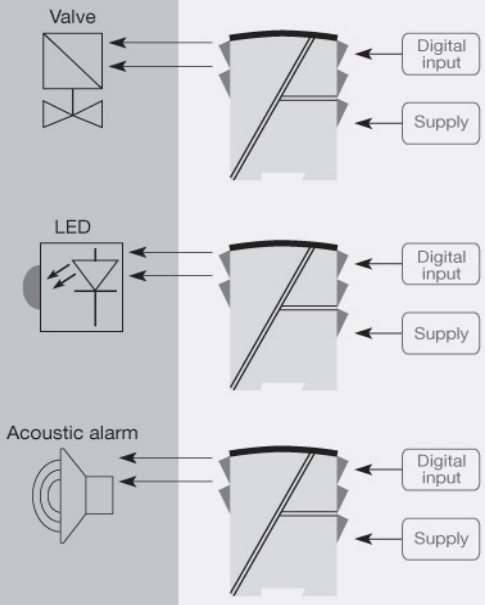
– 1- or 2-channel version
– Solenoid driver for I.S. area
– 3- / 5-port 3.75 kVAC galvanic isolation
– Digitally controlled voltage supply for I.S. area
– Universal supply by AC or DC

Application
- Driver with safety barrier for the control of ON / OFF solenoids mounted in hazardous area.
- Driver with safety barrier for the supply of LEDs and acoustic alarms mounted in hazardous area.
- Voltage supply with ON / OFF control of other equipment.

Technical characteristics
- PR5203B has a digital input per channel for the control of the I.S. output voltage.
- Supply, inputs, and outputs are floating and galvanically separated.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. By way of the 2-channel version up to 84 channels per meter can be mounted.

Connections



Order:

Type	Input	Ex barrier	Channels
5203B	PNP : 1 Switch : 2 NPN : 3	[EEx ia] type : F	Single : 1
		[EEx ia] type : H	Single : 1
		[EEx ia] type : I	Double : 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..... 230 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..... ≤ 4 W (2 channels)
Internal consumption..... ≤ 2 W (2 channels)
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Max. frequency..... 20 Hz
EMC immunity influence..... < ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst..... < ±1% of span

Input specifications

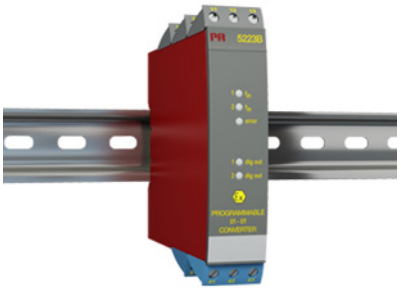
Trig level LOW, NPN+switch..... ≤ 4.0 VDC
Trig level HIGH, NPN+switch..... ≥ 7.0 VDC
Max. external voltage, NPN+switch..... 28 VDC
Input impedance, NPN+switch..... 3.48 kΩ
Trig level LOW, PNP..... ≤ 4.0 VDC
Trig level HIGH, PNP..... ≥ 7.0 VDC
Max. external voltage, PNP..... 28 VDC
Input impedance, PNP..... 3.48 kΩ

Output specifications

Output voltage..... See Ex data in manual
Output current..... See Ex data in manual
Output ripple..... < 40 mVRMS

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
ATEX 2004/108/EC..... DEMKO 99ATEX126257
UL..... UL 913, UL 508
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410



Programmable f/I-f/f converter

5223B

– Pulse calculator / frequency generator
– Galvanic isolation
– ATEX I.S. version
– Analog current and voltage output
– PNP / NPN output, optional relays
– Universal supply

ATEX

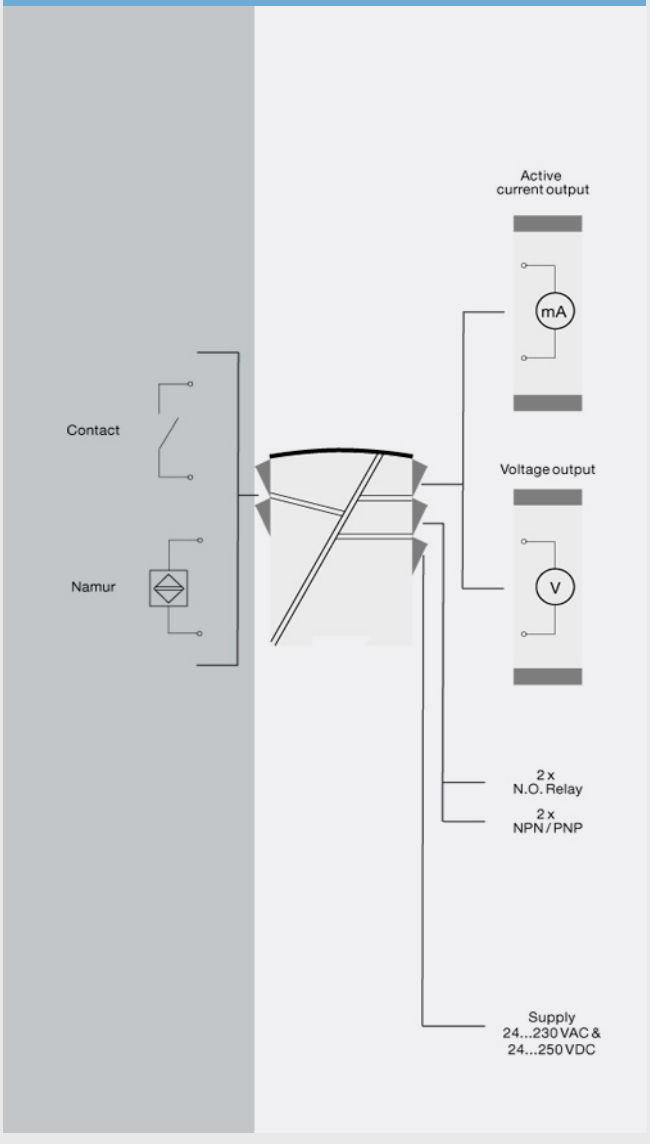
B

Advanced features
- The 5223 transmitter can be configured with a standard PC and the Loop Link communications unit, or delivered fully configured.

Application
- The f/I function performs frequency to current and voltage conversion.
- The f/f function can be used for pulse division or multiplication and as a buffer collecting fast pulse trains.
- A scale factor may be entered in all functions. Using both digital inputs, pulse addition or subtraction are possible.
- The frequency generator function is used as e.g. a time base or clock generator.
- Input and supply polarity reversal protection.
- Current and voltage output signals galvanically separated from the supply and the inputs.
- Programmable digital outputs including NPN, PNP or relay options.
- ATEX units have input for mechanical contact and NAMUR inductive proximity sensor.

Technical characteristics
- 5 front LEDs, indicating f1 and f2 active inputs (not NPN), Dig.out.1 and 2 active outputs, and a programmable error signal.
- Analog current output can be configured to any current within 0...20 mA range.
- Voltage output range is selectable between 0...10 VDC and 0...1 VDC by use of internal jumpers.
- Programming can be performed with or without a power supply.

Connections



Order:

Type	Output	
5223B	Analog + NPN / PNP	: 1
	Analog + relay output	: 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..... 240 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..... 3.5 W
Internal consumption..... 3 W
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Power-up delay..... 0...999 s
Warm-up time..... 1 min.
Communications interface..... Loop Link
Signal / noise ratio..... Min. 60 dB
Response time, analog..... < 60 ms + period
Response time, digital output..... < 50 ms + period
Effect of supply voltage change..... < 0.005% of span / VDC
Temperature coefficient..... < ±0.01% of span / °C
Linearity error..... < 0.1% of span
NAMUR supply I.S. / Ex..... 8.9 VDC ±0.5 VDC / 8 mA
S0 supply..... 17 VDC / 20 mA
NPN / PNP supply..... 17 VDC / 20 mA
Special supply (programmable)..... 5...17 VDC / 20 mA
EMC immunity influence..... < ±0.5%

Input specifications

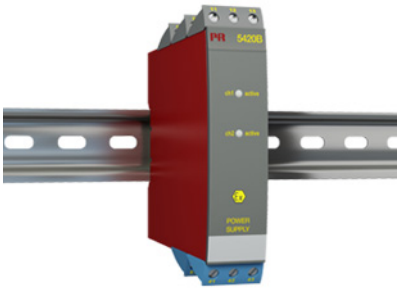
Max. offset..... 90% of selected max. frequency
Measurement range..... 0...20 kHz
Min. measurement range..... 0.001 Hz
Min. pulse length..... 25 µs
Input types..... NAMUR acc. to DIN 19234
Input types..... Tacho
Input types..... NPN / PNP
Input types..... 2-phase encoder
Input types..... TTL
Input types..... S0 acc. to DIN 43864

Output specifications

Max. offset..... 50% of selected max. value
Current output: Signal range..... 0...20 mA
Min. signal range..... 5 mA
Updating time..... 20 ms
Load (max.)..... 20 mA/600 Ω/12 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... < 23 mA
Voltage output through internal shunt..... See manual for details
Voltage output: signal range..... 0...10 VDC
Voltage output, min. signal range..... 250 mV
Load (min.)..... 500 kΩ
Other output types..... Active outputs (NPN / PNP)
Other output types..... f/f converter output
Other output types..... Frequency generator
Relay output: Max. switching frequency..... 20 Hz
Max. voltage..... 250 VRMS
Max. current..... 2 AAC
Max. AC power..... 100 VA (I.S. version 5223B)
Max. load at 24 VDC..... 1 A
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
ATEX 2004/108/EC..... KEMA 04ATEX1001
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410



Ex power supply

5420B

– 2 channels
– 5-port 3.75 kVAC galvanic isolation
– Output voltage > 18 V to I.S. area
– Active current loop detection
– Universal supply by AC or DC

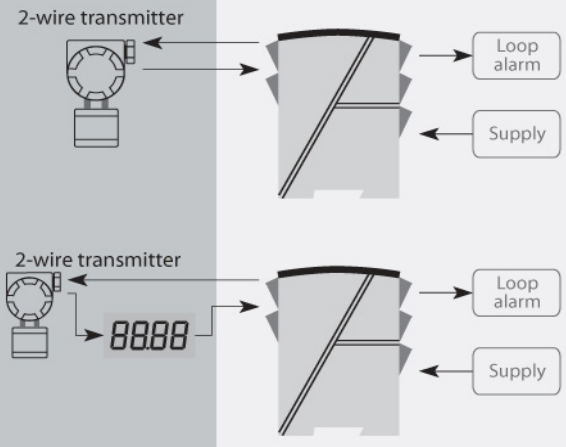
B

Application
- Voltage supply with safety barrier for the supply of equipment mounted in hazardous area.
- Voltage supply with failsafe detection of active current loop from 2-wire transmitters mounted in hazardous area.

Technical characteristics
- PR5420B has a relay with change-over contacts available in the safe area. When the loop current is within the defined limit, the relay is ON.
- Supply and outputs are floating and galvanically separated.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. Up to 84 channels per meter can be mounted.

Connections



Order:

Type	Channels
5420B	Double : 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..... 215 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
Max. power consumption..... ≤ 4 W (2 channels)
Internal consumption..... ≤ 2 W (2 channels)
Fuse..... 400 mA SB / 250 VAC
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
EMC immunity influence..... < ±0.5%
Extended EMC immunity: NAMUR NE 21, A criterion, burst..... < ±1%

Output specifications

Output voltage..... > 18 VDC at 20 mA
Output current..... 28 mA per channel (max.)
Relay outputs: On within limit..... > 3.8...< 20.5 mA
Max. voltage..... 250 VRMS
Max. current..... 2 ARMS
Max. AC power..... 100 VA
Max. load at 24 VDC..... 1 A

Approvals

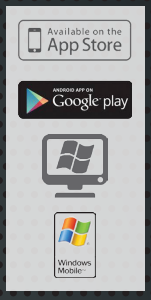
EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
ATEX 2004/108/EC..... DEMKO 99ATEX126256
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410

B

Get attached to better asset management with detachable local or remote operator interfaces

We provide inexpensive, easy-to-use, future-ready communication interfaces that can access your installed and future base of PR products. The detachable 4501 Local Operator Interface (LOI) allows for local monitoring of process values, device configuration, error detection and signal simulation.

The next generation, our 4511 Remote Operator Interface (ROI), does all that and more, adding remote digital communication via Modbus/RTU, while the analog output signals are still available for redundancy. With the 4511 you can further expand connectivity with a gateway which connects to major communication protocols through af Wi-Fi router or directly with the devices using our PR Process Supervisor (PPS) application. The PPS app is available for iOS, Android and Windows.



DNV

c UL us LISTED

FM C US APPROVED

CE

Communication interfaces

C

Communication enabler

4511

– Programming display for system 4000 and 9000 devices
– Modbus RTU protocol interface over RS-485
– Monitor process value from the built-in display
– High 2.5 kV isolation to host unit
– Shielded RJ45 connector on top

C

Application

- The 4511 detachable display adds Modbus RTU RS-485 serial communications to all current and future 4000/9000 units.
- The unit converts a wide array of sensors and analog device signals measured by the system 4000 like uni- and bipolar mA and voltage signals, potentiometer, Lin. R, RTD and TC, to a Modbus communication line signal.
- When mounted on a system 9000 device any signal coming from or going to I.S. classified area, like AI, AO, DI and DO signals, can be converted to a Modbus network.
- All individual unit operating parameters can easily and quickly be configured by using the Modbus communication or by using the front display menu.
- The easily readable 4511 display can be used to read the process signal, simulate the output signal, indicate sensor errors and internal device errors.

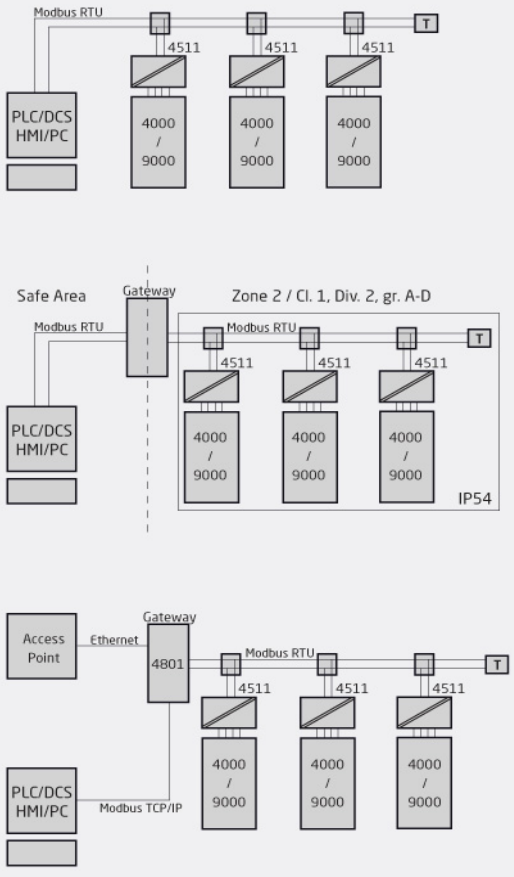
Technical characteristics

- 4511 has full 4501 functionality for unit programming, process signal monitoring and diagnostics handling.
- Modbus RTU protocol is supported using a serial RS-485 communication wiring.
- Multidrop half-duplex connection via shielded RJ45 connector.
- High safe galvanic isolation of 2.5 kVAC between the serial wiring and the connected system 4000/9000 units.
- Modbus parameters such as address, baud rate, stop bit(s), and parity bit are configured from the 4511 display, which also stores parameters.

Mounting / installation / programming

- Mounting in Zone 2 / Div 2.
- The 4511 can be moved from one device to another. The individual system 4000/9000 unit configuration of the first device can be saved and downloaded to subsequent devices.
- Programmed parameters can be protected by a userdefined password.
- When mounted on devices that are installed upside down, a menu item allows the display on the 4511 to be rotated 180° and the up/down buttons to switch function.

Connections



Up to 32 devices per segment without the use of a network repeater

Order:

Type
4511

Environmental Conditions

Specifications range	-20°C to +60°C
Storage temperature	-20°C to +85°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP20
Installation in	Pollution degree 2 & measurement / overvoltage cat. II

Mechanical specifications

Dimensions (HxWxD)	73.2 x 23.3 x 26.5 mm
Dimensions (HxWxD) w/ 4000/9000 unit	109 x 23.5 x 131 mm
Weight approx.	100 g
Connection	RJ45 - shielded

Common specifications

Max. power consumption	≤ 0.15 W
Isolation voltage, test / working	2.5 kVAC / 250 VAC reinforced isolation
Signal / noise ratio	> 60 dB
Response time	< 20 ms
Update rate	> 50 Hz
Extended EMC immunity: NAMUR NE 21, A criterion, burst	No loss of communication
Signal type	RS-485 half duplex
Serial protocol	Modbus RTU
Modbus mode	RTU - slave
Devices on an RS485 line	Up to 32 (w/o a repeater)
Data rates, baud	2400, 4800, 9600, 19200, 38400, 57600, 115200
Automatic baudrate detection	Yes - can be configured ON or OFF
Parity	Even, Odd, None
Stop bit(s)	1 or 2
Digital addressing	1...247
Response delay	0...1000 ms

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
DNV Marine	Stand. f. Certific. No. 2.4
ATEX 2004/108/EC	DEKRA 13ATEX0098 X
IECEx	DEK 13.0026 X
FM	0003049132-C
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1

C

Display / programming front

4501

– Modification of operational parameters in system 4000 and 9000 devices
– Fixed display for visualisation of process data and status
– Password protection
– Scrolling help text in 7 languages
– Clicks on to the front of the device mounted in the process

C

Application
- Communications interface for modification of operational parameters in system 4000 and 9000 devices.
- Can be moved from one devicee to another of the same type and download the configuration of the first device to subsequent devices.
- Fixed display for visualization of process data and status.

Technical characteristics
- LCD display with 4 lines featuring scrolling help text in 7 languages which guides the user effortlessly through all the configuration steps.
- Programming access can be blocked by assigning a password. The password is saved in the device in order to ensure a high degree of protection against unauthorized modifications to the configuration.

Mounting / installation
- Click 4501 onto the front of the device mounted in the process.

Order:

Type
4501

ConfigMate

4590

– Docking station for the PR 4501 display
– Handheld adaptor for programming the PR 3114 universal transmitter via the 4501 display
– Configuration upload and download tool on selected PR System 4000 and 9000 units
– Interfaces with the PR Preset software

Application

- The ConfigMate 4590 is used along with the 4501 programming display.
- 4590 can operate as a docking station for the 4501 display - allowing the 4501 to be connected to a PC and the PR Preset software.
- 4590 works standalone in adaptor mode for programming a PR 3114 unit.
- Upload and download function is for backup and restore purposes on selected PR 4000 and 9000 devices.
- The unit must be used together with PR Preset software to upload and download configuration parameters from a 4501 display.

Technical characteristics

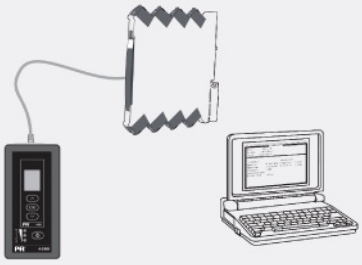
- In docking station mode the 4590 will be powered from the PC's USB power source.
- The included USB-B to a 2.5 mm jack cable must be used for connecting to a PR 3114.
- In adapter mode the included USB-B to USB-A cable must be used for connecting to a PC.
- 3 x 1.5 V AAA batteries must be inserted for powering the 4590 in adapter mode.
- Indication of battery level is displayed via the 3 green front LEDs.
- The 4590 will automatically detect if it is not in use, and will consequently shut itself down to conserve battery power.
- Battery life in adaptor mode is approximately 1 year of daily use, depending upon battery type.

Order:

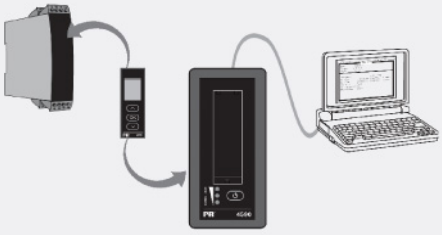
Type
4590

Connections

Connection of 4590 to a PR 3114 device in adaptor mode:



Connection of ConfigMate 4590 to a PR 4000/9000 device:

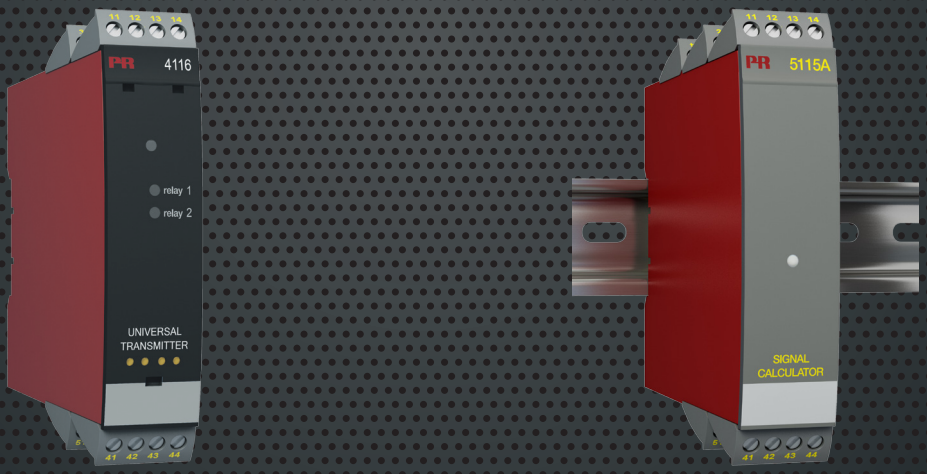


Connection of 4590 to a PC in docking mode:

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

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

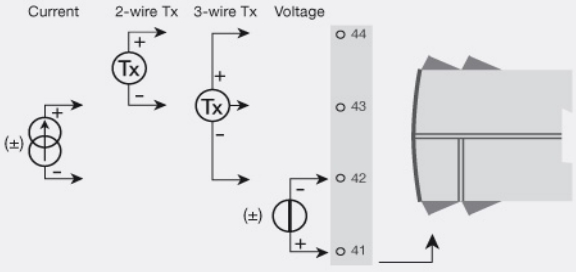
- The latest analog and digital techniques are used to obtain maximum accuracy and immunity to interference.
- The current output can drive up to 800 Ohms, with an adjustable response time of 0.0…60.0 seconds.
- Exceptional mA output load stability of < 0.001% of span/100 Ohm.
- Meets the NAMUR NE21 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

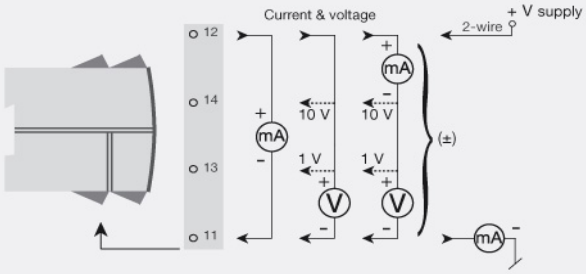
- Very low power consumption means units can be mounted side by side without an air gap – even at 60°C ambient temperature.
- Approved for marine applications.
- Programming, monitoring, and 2-point process calibration is accomplished with the 4501 detachable display.
- All programming can be password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

Connections

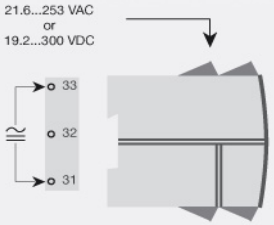
Input signals



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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

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 2006/95/EC	EN 61010-1
UL	UL 508
FM	3025177
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4

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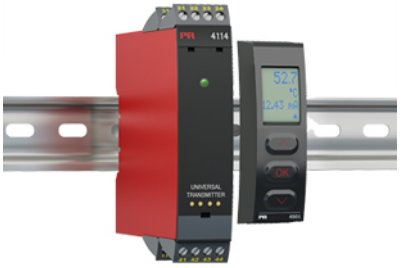


Universal transmitter

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

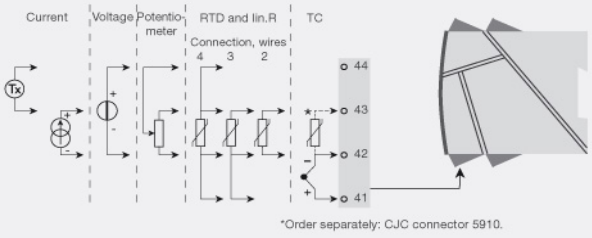
Advanced features
- Programmable by way of detachable display front (4501), process calibration, signal simulation, password protection, error diagnostics and help text available in several languages.

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.

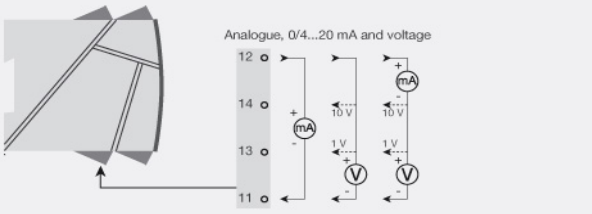
Technical characteristics
- When 4114 is used with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4114 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green / red front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

Connections

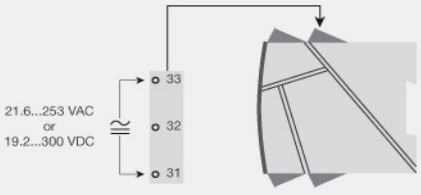
Input signals:



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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

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 2006/95/EC	EN 61010-1
FM	3025177
UL	UL 508
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
SIL	Hardware assessed for use in SIL applications

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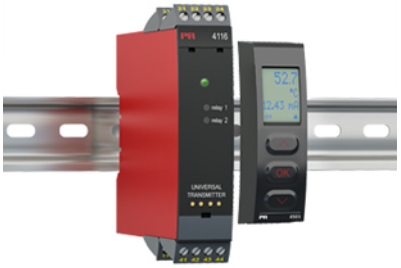


Universal transmitter

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

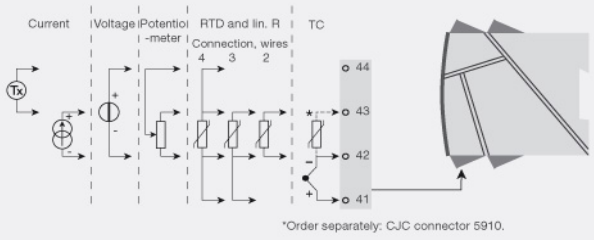
Advanced features
- Programmable via detachable display front (4501), process calibration, signal and relay simulation, password protection, error diagnostics and selection of help text in several languages.

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.

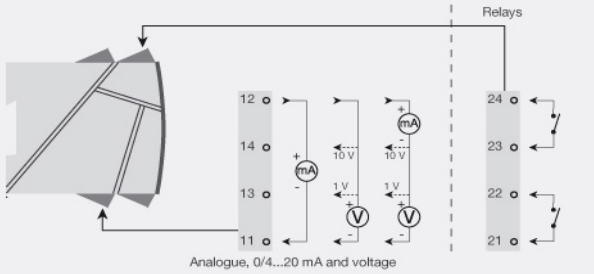
Technical characteristics
- When 4116 is used in combination with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4116 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
-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

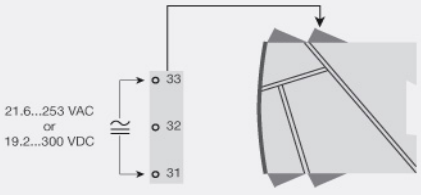
Input signals:



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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

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

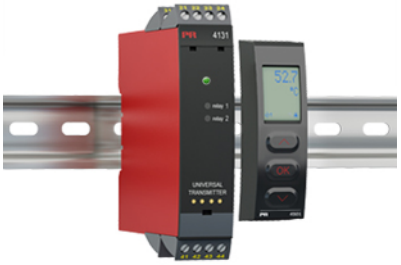
Output specifications

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 2006/95/EC	EN 61010-1
FM	3025177
UL	UL 508
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
SIL	Hardware assessed for use in SIL applications

D



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

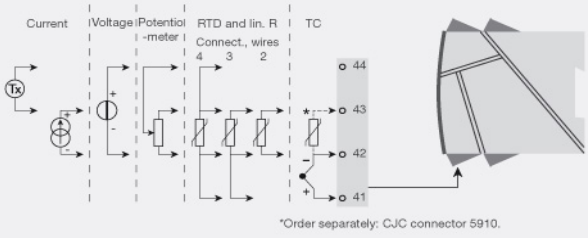
Advanced features
- Programmable via detachable display front (4501), process calibration, relay simulation, password protection, error diagnostics and selection of help text in several languages.

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.

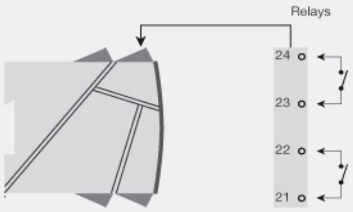
Technical characteristics
- When 4131 is used with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4131 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green front LED 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

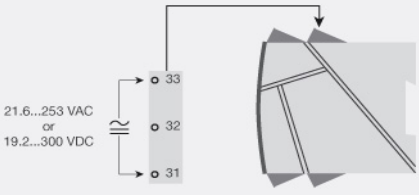
Input signals:



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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

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 2006/95/EC	EN 61010-1
FM	3025177
UL	UL 508
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4

D

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

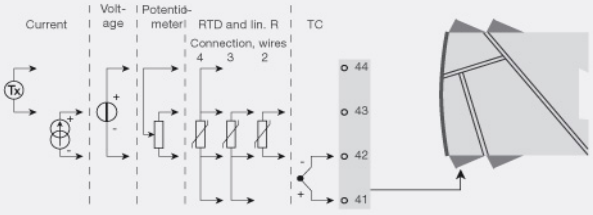
Advanced features
- Programmable via detachable display front (4501), process calibration, signal simulation, password protection, error diagnostics and selection of help text in several languages.

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.

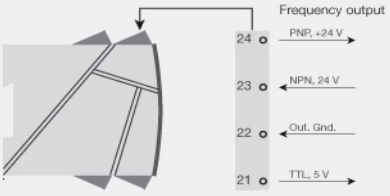
Technical characteristics
- When 4222 is used in combination with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4222 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP switches.
-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

Connections

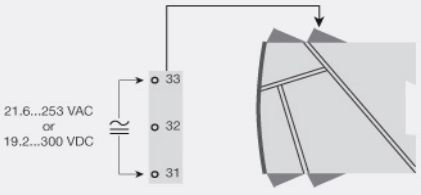
Input signals:



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 2006/95/EC	EN 61010-1
UL	UL 508
EAC TR-CU 020/2011	EN 61326-1

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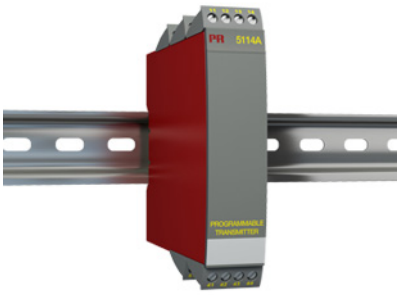


Programmable transmitter

5114A

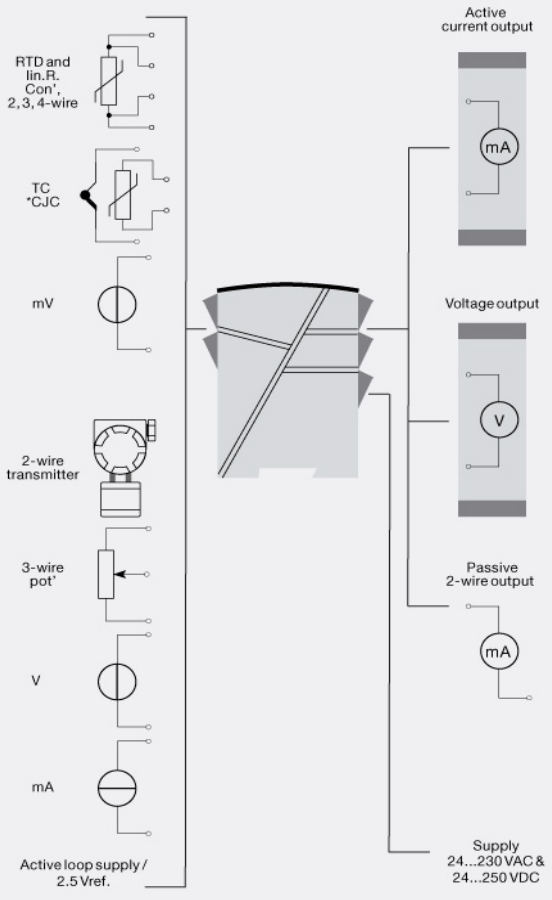
– Input for RTD, TC, mV, linear resistance, mA, and V
– 3-port 3.75 kVAC galvanic isolation
– Current and voltage output
– Universal voltage supply
– 1- and 2-channel versions
– Loop supply > 17.1 V

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 = ∞, VDROP < 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 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011..... EN 61326-1
DNV Marine..... Stand. f. Certific. No. 2.4

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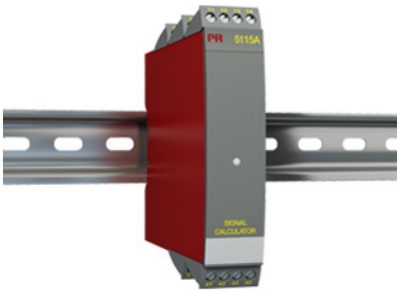


Signal calculator

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: (Input 1 * K1) - (Input 2 * K2) + K4
- Example: Average measurement: (Input 1 * 0.5) + (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.

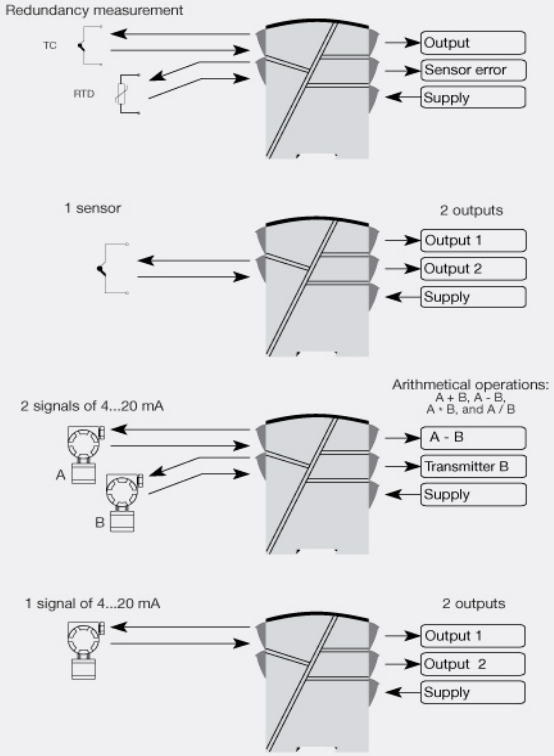
Technical characteristics

- 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 = ∞, VDROP < 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 2006/95/EC	EN 61010-1
PELV/SELV	IEC 364-4-41 and EN 60742
DNV Marine	Stand. f. Certific. No. 2.4
EAC TR-CU 020/2011	EN 61326-1

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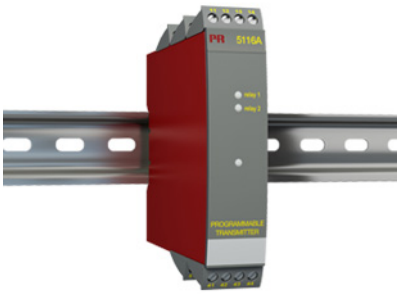


Programmable transmitter

5116A

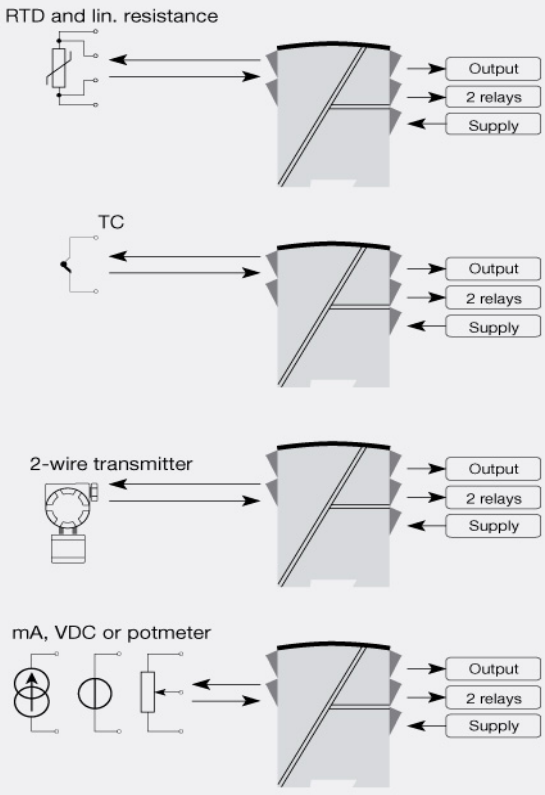
– Input for RTD, TC, mV, Ohm, potentiometer, mA and V
– 2-wire supply > 16.5 V
– Bipolar voltage input
– Output for current, voltage and 2 relays
– Universal supply by AC or DC

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 buttton.
- 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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

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)
Accuracy	Better than 0.05% of selected range
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 = ∞, VDROP < 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 2006/95/EC	EN 61010-1
PELV/SELV	IEC 364-4-41 and EN 60742
UL	UL 508
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4

D

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

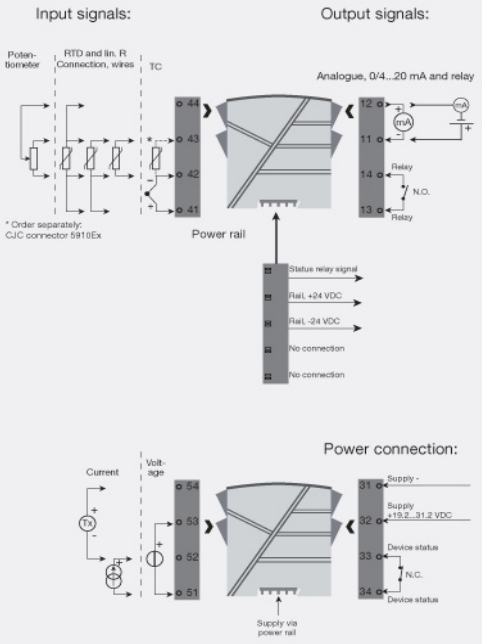
Advanced features
- Configuration and monitoring by way of detachable display front (PR 4511/4501); process calibration, signal and relay simulation.
- Advanced relay configuration, e.g. setpoint, window, delay, sensor error indication and power monitoring.
- Copying of the configuration from one device to others of the same type via the display front.
- TC inputs with internal CJC or external CJC for higher accuracy.
- The device automatically detects whether it must supply an active or a passive current signal.

Application
- The device can be mounted in and receive signals from non-classified area and zone 2.
- 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.

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.

Connections



Order:

Type	Max. loop voltage
9116A	Uo 28 VDC : 1 Uo 21.4 VDC : 2

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.	185 g
Weight incl. 4501 / 4511 (approx.)	200 g / 285 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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

Common specifications

Supply voltage	19.2...31.2 VDC
Fuse	1.25 A SB / 250 VAC
Max. power consumption	≤ 3.5 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
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 for 9116B1: 2-wire supply (terminal 54...52)	28...16.5 VDC / 0...20 mA
Auxiliary supplies for 9116B2: 2-wire supply (terminal 54...52)	22...16.5 VDC / 0...20 mA

Input specifications

RTD input	Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000
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	Programmable ON / OFF
Short circuit detection, RTD	Yes
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	Programmable ON or OFF (only wire breakage)
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
Sensor error detection, current input	Loop break 4...20 mA
Voltage input: Measurement range	0...10 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/600 Ω/12 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
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
2-wire 4…20 mA output: External 2-wire supply range	3.5...26 VDC
Signal range	4…20 mA
Max. load resistance [Ω]	(Vsupply - 3.5) / 0.023 A
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
Relay output: Relay functions	Setpoint, Window, Sensor error, Power and Off
Hysteresis, in % of span/display range	0.1...25 / 1...25
ON and OFF delay	0...3600 s
Sensor error reaction	Break / Make / Hold
Max. voltage	250 VAC / 30 VDC
Max. current	2 AAC / 2 ADC
Max. AC power	500 VA / 60 W
Max. voltage, status relay	110 VDC / 125 VAC
Max. current, status relay	0.3 ADC / 0.5 AAC
Max. AC power, status relay	62.5 VA / 32 W
*of span	= of the currently selected measurement range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
SIL	SIL 2 certified & fully assessed acc. to IEC 61508

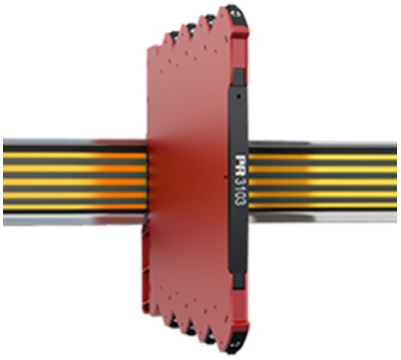
D

Eliminate measurement errors with better isolation. Isolators with exceptional performance for dedicated applications

Our compact, fast and high-quality 6 mm isolators provide you with exceptionally high, safe signal isolation, no matter the type of signal. They can be stacked both vertically and horizontally with no air gap separation required, accommodating up to 50 units or 100 channels in just 30 centimeters.

All our isolators offer high isolation levels and exceptional EMC performance, utilizing our patented technology to provide high basic accuracy, low power consumption, and maximum protection against error due to electromagnetic noise (EMC).

Isolation



Isolated repeater

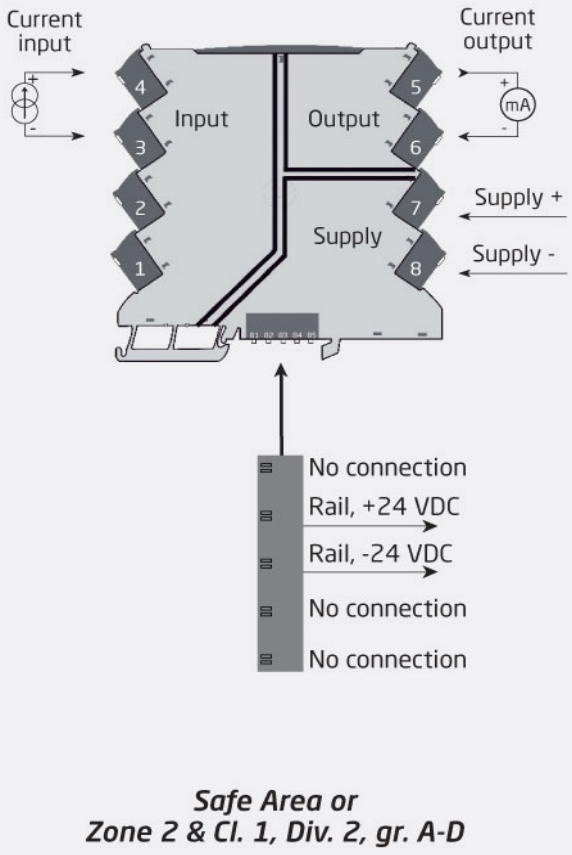
3103

– Isolation and 1:1 conversion of standard current signals
– Slimline housing of 6 mm
– Response time < 7 ms
– Low cost
– Simple - no setup needed

Application
- Isolation and 1:1 conversion of standard current signals.
- Galvanic separation of analog current signals.
- Elimination of ground loops and measurement of floating signals.
- A competitive choice in terms of both price and technology for galvanic isolation of current signals to SCADA systems or PLC equipment.
- Installation in ATEX Ex zone 2 / IECEx Zone 2 / FM division 2.
- Suitable for environments with high vibration stress, e.g. ships.

Technical characteristics
- The input is protected against overvoltage and polarity error.
- Factory-calibrated measurement ranges.
- Inputs and outputs are floating and galvanically separated.

Connections



Order:

Type
3103

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	0.8 W
Internal consumption	0.4 W (typ.) / 0.65 W (max.)
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
Response time (0...90%, 100...10%)	< 7 ms
Accuracy	Better than 0.05% of selected range
Temperature coefficient	< ±0.01% of span / °C
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Current input: Measurement range	0...20.5 mA
Functional range, current input	0...23 mA
Input voltage drop	< 1.5 VDC

Output specifications

Current output: Signal range	0...20.5 mA (span)
Load (max.)	23 mA/600 Ω
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	≤ 28 mA
*of span	= 0...20 mA

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
UL	UL 61010-1
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
CCOE	P337347/1

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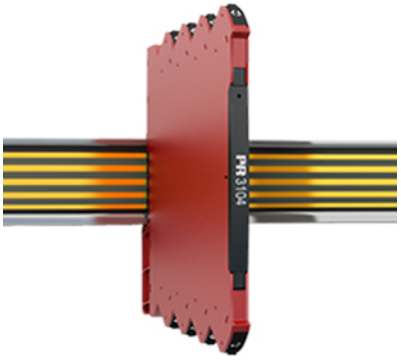


Isolated converter

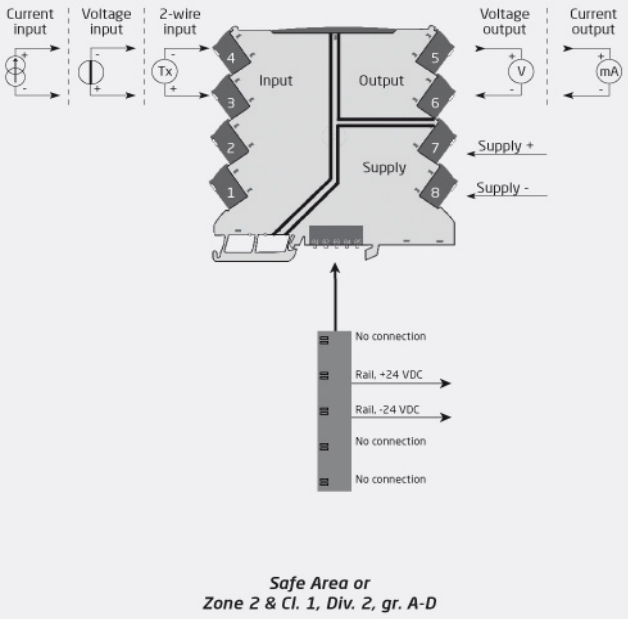
3104

– Isolation and conversion of standard DC signals
– Slimline housing of 6 mm
– Power supply and signal isolator for 2-wire transmitter
– Loop supply >17 V
– DIP-switch configured

Application
- Isolation and conversion of standard DC signals.
- Galvanic separation of analog current and voltage signals.
- Elimination of ground loops and measurement of floating signals.
- A competitive choice in terms of both price and technology for galvanic isolation of current and voltage signals to SCADA systems or PLC equipment.
- Installation in ATEX Ex zone 2 / IECEx zone 2 / FM division 2.
- Suitable for environments with high vibration stress, e.g. ships.

Technical characteristics
- Easy configuration via DIP-switches.
- The input is protected against overvoltage and polarity error.
- Factory-calibrated measurement ranges.
- Inputs and outputs are floating and galvanically separated.

Connections



Order:

Type
3104

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	1.2 W
Internal consumption	0.4 W (typ.) / 0.65 W (max.)
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
Response time (0...90%, 100...10%)	< 7 ms
Accuracy	Better than 0.05% of selected range
Temperature coefficient	< ±0.01% of span / °C
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Current input: Measurement range	0...20.5 mA
Functional range, current input	0...23 mA
Current input: Programmable measurement ranges	0...20 and 4...20 mA
Input voltage drop	< 1.5 VDC
2-wire transmitter supply	> 17 V / 20 mA
Voltage input: Measurement range	0...10.25 V
Functional range, voltage input	0...11.5 V / 0...5.75 V
Programmable measurement ranges, VDC	0/1...5 and 0/2...10 V
Input resistance, voltage input	≥ 500 kΩ

Output specifications

Current output: Signal range	0...20.5 mA (span)
Programmable current ranges	0 / 4...20 mA
Load (max.)	23 mA/600 Ω
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	≤ 28 mA
Voltage output: signal range	0...10 VDC
Programmable voltage ranges	0/1...5 and 0/2...10 V
Load (min.)	> 10 kΩ

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
CCOE	P337347/1

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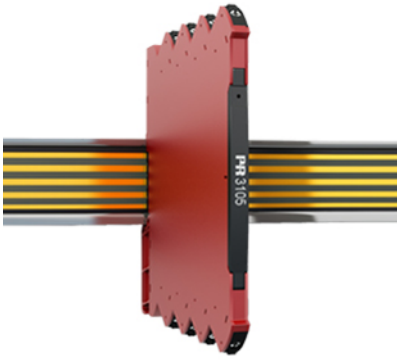


Isolated converter

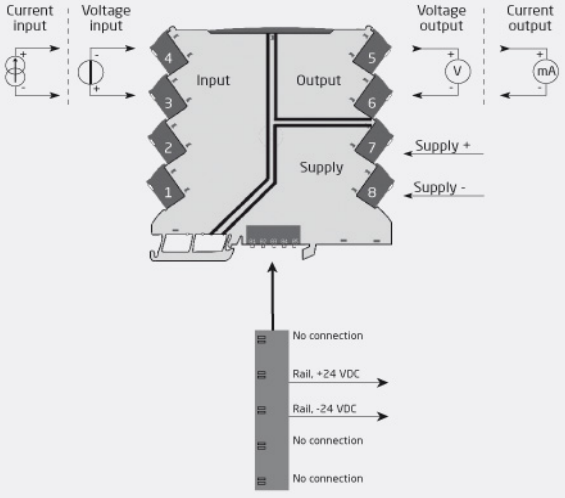
3105

– Isolation and conversion of standard DC signals
– Slimline housing of 6 mm
– Response time <7 ms
– Low cost
– DIP-switch configured

Application
- Isolation and conversion of standard DC signals.
- Galvanic separation of analog current and voltage signals.
- Elimination of ground loops and measurement of floating signals.
- A competitive choice in terms of both price and technology for galvanic isolation of current and voltage signals to SCADA systems or PLC equipment.
- Suitable for environments with high vibration stress, e.g. ships.

Technical characteristics
- Easy configuration via DIP-switches.
- The input is protected against overvoltage and polarity error.
- Factory-calibrated measurement ranges.
- Inputs and outputs are floating and galvanically separated.

Connections



Order:

Type
3105

Environmental Conditions

Specifications range	0°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	0.8 W
Internal consumption	0.4 W (typ.) / 0.65 W (max.)
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC
Signal / noise ratio	> 60 dB
Response time (0...90%, 100...10%)	< 7 ms
Accuracy	Better than 0.2% of selected range
Temperature coefficient	< ±0.015% of span / ˚C
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Current input: Measurement range	0...20.5 mA
Functional range, current input	0...23 mA
Current input: Programmable measurement ranges	0...20 and 4...20 mA
Input voltage drop	< 1.5 VDC
Voltage input: Measurement range	0...10.25 V
Functional range, voltage input	0...11.5 V / 0...5.75 V
Programmable measurement ranges, VDC	0/1...5 and 0/2...10 V
Input resistance, voltage input	≥ 500 kΩ

Output specifications

Current output: Signal range	0...20.5 mA (span)
Programmable current ranges	0 / 4...20 mA
Load (max.)	23 mA/600 Ω
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	≤ 28 mA
Voltage output: signal range	0...10 VDC
Programmable voltage ranges	0/1...5 and 0/2...10 V
Load (min.)	> 10 kΩ
*of span	= of the DIP-switch selected output range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
UL	UL 508

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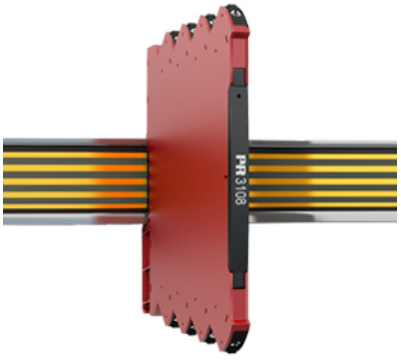


Isolated repeater / splitter

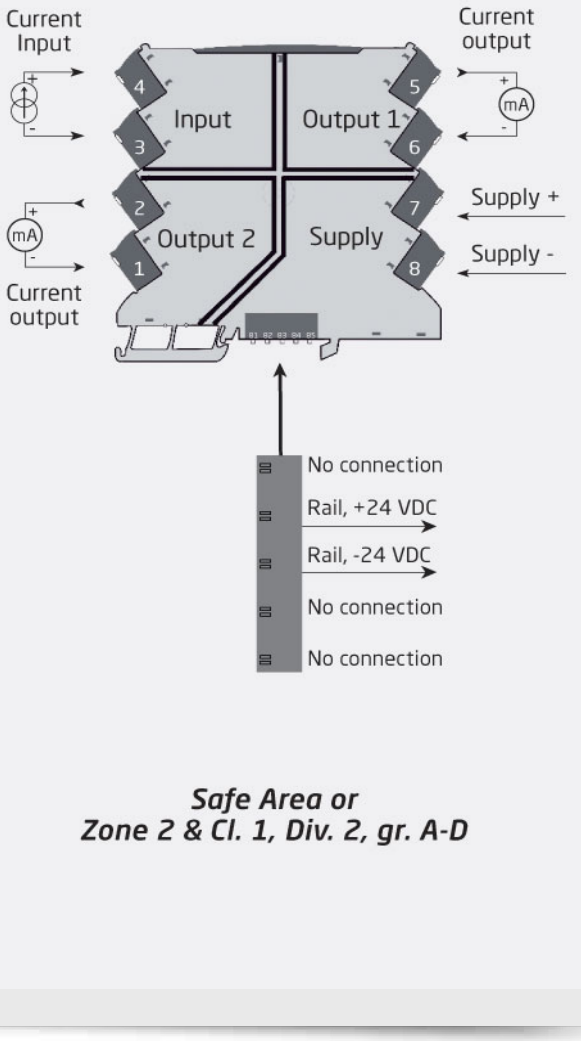
3108

- Isolation and conversion of current signals
- Slimline housing of 6 mm
- Response time <7 ms
- Splitter function: 1 in - 2 out
- Simple - no setup needed

Application
- Isolation and conversion of standard DC signals.
- Galvanic separation of analog current signals.
- Elimination of ground loops and measurement of floating signals.
- A competitive choice in terms of both price and technology for galvanic isolation of current signals to SCADA systems or PLC equipment.
- Installation in ATEX Ex zone 2 / IECEx Zone 2 / FM division 2.
- Suitable for environments with high vibration stress, e.g. ships.

Technical characteristics
- The input is protected against overvoltage and polarity error.
- Factory-calibrated measurement ranges.
- Inputs and outputs are floating and galvanically separated.

Connections



Order:

Type
3108

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	0.8 W
Internal consumption	0.4 W (typ.) / 0.65 W (max.)
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
Response time (0...90%, 100...10%)	< 7 ms
Accuracy	Better than 0.05% of selected range
Temperature coefficient	< ±0.01% of span / °C
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Current input: Measurement range	0...20.5 mA
Functional range, current input	0...23 mA
Input voltage drop	< 1.5 VDC

Output specifications

Current output: Signal range	0...20.5 mA (span)
Load (max.)	23 mA/300 Ω
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	≤ 28 mA
*of span	= 0...20 mA

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
CCOE	P337347/1

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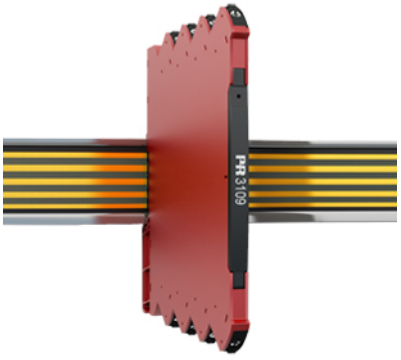


Isolated converter / splitter

3109

– Isolation and conversion of standard DC signals
– Slimline housing of 6 mm
– Power supply and signal isolator for 2-wire transmitter
– Splitter function: 1 in - 2 out
– DIP-switch configured

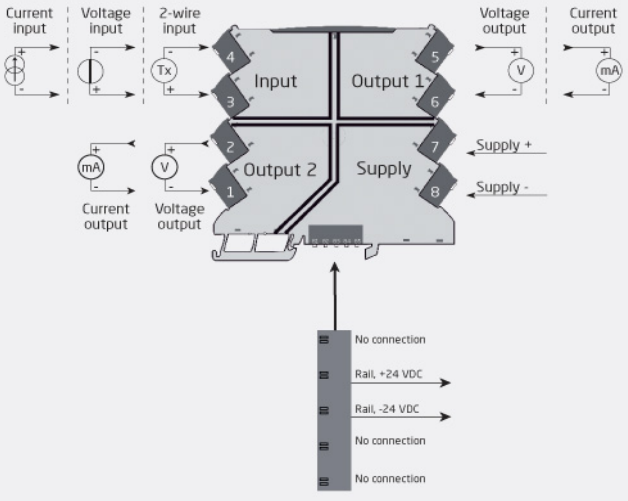
Application

- Isolation and conversion of standard DC signals.
- Galvanic separation of analog current and voltage signals.
- Elimination of ground loops and measurement of floating signals.
- A competitive choice in terms of both price and technology for galvanic isolation of current and voltage signals to SCADA systems or PLC equipment.
- Installation in ATEX Ex zone 2 / IECEx zone 2 / FM division 2.
- Suitable for environments with high vibration stress, e.g. ships.

Technical characteristics

- Easy configuration via DIP-switches.
- The input is protected against overvoltage and polarity error.
- Factory-calibrated measurement ranges.
- Inputs and outputs are floating and galvanically separated.

Connections



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

Order:

Type
3109

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	1.2 W
Internal consumption	0.4 W (typ.) / 0.65 W (max.)
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
Response time (0...90%, 100...10%)	< 7 ms
Accuracy	Better than 0.05% of selected range
Temperature coefficient	< ±0.01% of span / °C
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Current input: Measurement range	0...20.5 mA
Functional range, current input	0...23 mA
Current input: Programmable measurement ranges	0...20 and 4...20 mA
Input voltage drop	< 1.5 VDC
2-wire transmitter supply	> 17 V / 20 mA
Voltage input: Measurement range	0...10.25 V
Programmable measurement ranges, VDC	0/1...5 and 0/2...10 V
Functional range, voltage input	0...11.5 V / 0...5.75 V
Input resistance, voltage input	≥ 500 kΩ

Output specifications

Current output: Signal range	0...20.5 mA (span)
Programmable current ranges	0 / 4...20 mA
Load (max.)	23 mA/300 Ω
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	≤ 28 mA
Voltage output: signal range	0...10 VDC
Programmable voltage ranges	0/1...5 and 0/2...10 V
Load (min.)	> 10 kΩ

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
CCOE	P337347/1

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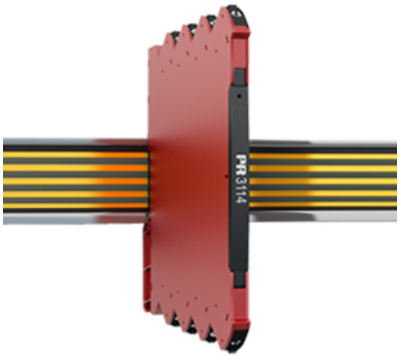


Isolated universal converter

3114

- Input for RTD, TC, Ohm, potentiometer, mA and V
- Slimline housing of 6 mm
- 2-wire supply >15 V
- Output for current and voltage
- Can be supplied separately or installed on power rail, PR 9400

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 device can be mounted in Safe area or in Zone 2 and Cl. 1 Div 2. area.

Advanced features

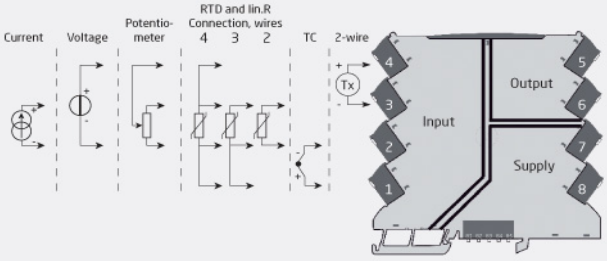
- When 3114 is used in combination with the 4501 display / programming front and ConfigMate 4590, all operational parameters can be modified to suit any application. As the 3114 is designed with electronics hardware switches, it is not necessary to open the device for setting of DIP-switches.

Technical characteristics

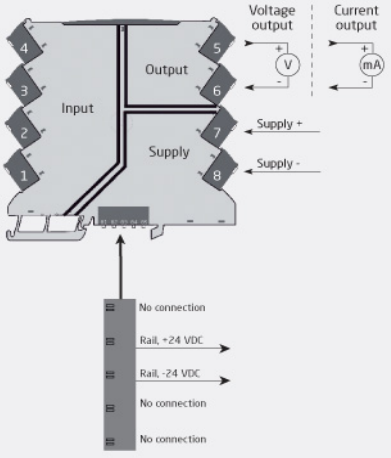
- A green / red front LED indicates normal operation and malfunction.
- 3-port 2.5 kVAC galvanic isolation.

Connections

Input signals:



Output signals and power supply:



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

Order:

Type
3114

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	16.8...31.2 VDC
Fuse	400 mA SB / 250 VAC
Max. power consumption	1.2 W
Internal consumption	0.4 W (typ.) / 0.65 W (max.)
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
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
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
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
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
2-wire transmitter supply	> 15 V / 20 mA
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 (span)
Programmable current ranges	0...20 / 4...20 / 20...0 and 20...4 mA
Load (max.)	20 mA/600 Ω/15 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.)	> 10 kΩ
*of span	= of the currently selected measurement range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
CCOE	P337347/1

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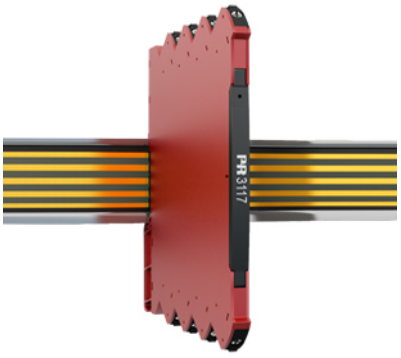


Bipolar isolated converter

3117

– Conversion of voltage and current bipolar process signals to unipolar signals
– Multiple signal ranges are selectable via DIP-switches
– Fast response time < 7 ms and high output load stability
– Excellent accuracy, better than 0.05 % of selected range
– Slimline 6 mm housing

Application

- The 3117 is an isolating converter which can be used for signal conversion of standard bipolar analog process signals into a unipolar analog signal.
- The unit offers 3-port isolation and provides surge suppression and protects control systems from transients and noise.
- The 3117 also eliminates ground loops and can be used for measuring floating signals.
- Mounting of the 3117 can be in Safe area or in Zone 2 and Cl. 1 Div 2 area and is approved for marine applications.

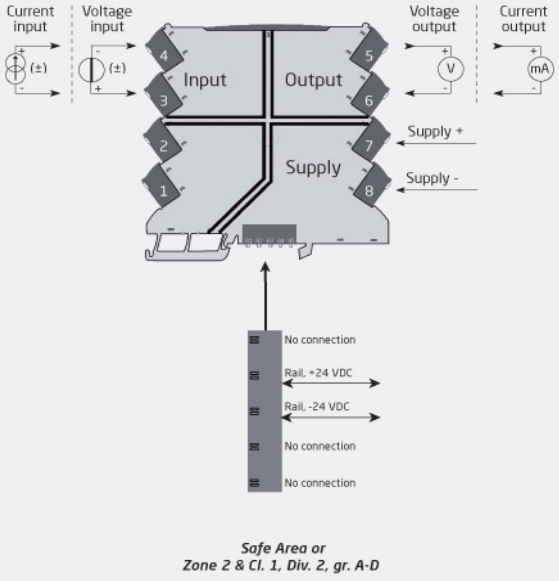
Technical characteristics

- Flexible 24 VDC (±30%) supply via power rail or connectors.
- Excellent conversion accuracy, better than 0.05% of selected range.
- Inputs and outputs are floating and galvanically separated.
- A green front LED indicates operation status for the device.
- All terminals are protected against overvoltage and polarity error.
- Meeting the NAMUR NE21 recommendations, the 3117 ensures top measurement performance in harsh EMC environments.
- High galvanic isolation of 2.5 kVAC.
- Fast input to output response time < 7 ms / > 100 Hz – 10 Hz bandwidth damping possible via DIP-switch.
- Excellent signal/noise ratio > 60 dB.

Mounting / installation / programming

- Fast and easy configuration of factory calibrated measurement ranges via DIP-switches.
- A very low power consumption allows DIN rail mounting without the need for any air gap.
- Wide temperature operation range: -25...+70°C.

Connections



Order:

Type
3117

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	0.8 W
Internal consumption	0.4 W (typ.) / 0.65 W (max.)
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
MTBF, acc. to IEC 61709 (SN29500)	> 241 years
Signal / noise ratio	> 60 dB
Cut-off frequency (3 dB)	> 100 Hz or 10 Hz (selectable via DIP-switch)
Response time (0...90%, 100...10%)	< 7 ms or < 44 ms
Accuracy	< ±0.05% of span
Temperature coefficient	< ±0.01% of span / °C
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Current input: Programmable measurement ranges	± 10 and ± 20 mA
Functional range, current input	-23...+23 mA
Input voltage drop	< 1 VDC @ 23 mA
Voltage input: Programmable ranges	±5 and ±10 V
Functional range, voltage input	-11.5...+11.5 V
Input resistance, voltage input	≥ 1 MΩ

Output specifications

Programmable current ranges	0 / 4...20 mA
Functional range, current output	0...23 mA
Load (max.)	23 mA/600 Ω
Load stability, current output	≤ 0.002% of span / 100 Ω
Current limit	≤ 28 mA
Programmable voltage ranges	0/1...5 and 0/2...10 V
Functional range, voltage output	0...11.5 V
Load (min.)	> 10 kΩ
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
UL	UL 61010-1

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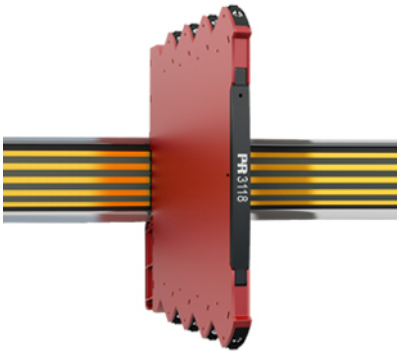


Bipolar isolated converter / splitter

3118

– Conversion of voltage and current bipolar process signals to
 uni-/bipolar signals
– Multiple signal ranges are selectable via DIP-switches
– Splitter function: 1 signal in and 2 signals out
– Excellent accuracy, better than 0.05 % of selected range and high output load stability

Application

- The 3118 is an isolating converter and splitter which can be used for signal conversion of standard bipolar analog process signals into two individual unipolar analog signals.
- The unit offers 4-port isolation and provides surge suppression and protects control systems from transients and noise.
- The 3118 also eliminates ground loops and can be used for measuring floating signals.
- Mounting of the 3118 can be in Safe area or in Zone 2 and Cl. 1 Div 2 area and is approved for marine applications.
- The analog output can be easily configured and programmed to be bipolar in the ranges ±10 mA and ±20 mA (*special setup).

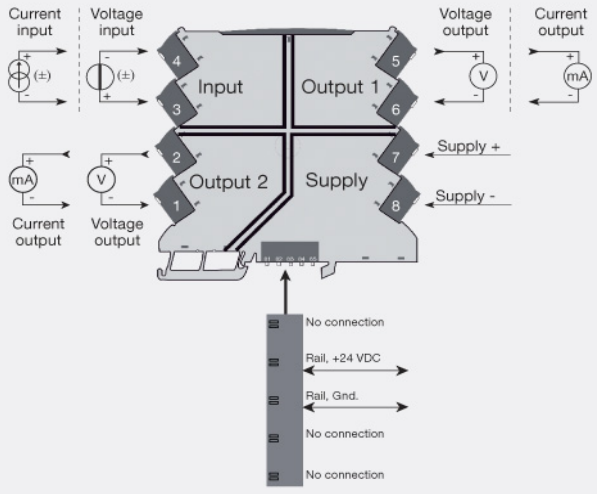
Technical characteristics

- Flexible 24 VDC (±30%) supply via power rail or connectors.
- Excellent conversion accuracy, better than 0.05% of selected range.
- A green front LED indicates operation status for the device.
- All terminals are protected against overvoltage and polarity error.
- Meeting the NAMUR NE21 recommendations, the 3118 ensures top measurement performance in harsh EMC environments.
- High galvanic isolation of 2.5 kVAC.
- Fast input to output response time < 7 ms / > 100 Hz – 10 Hz bandwidth damping possible via DIP-switch.
- Excellent signal/noise ratio > 60 dB.

Mounting / installation / programming

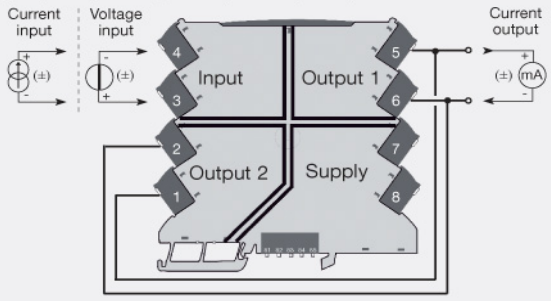
- Easy configuration of factory calibrated measurement ranges via DIP-switches.
- A very low power consumption allows DIN rail mounting without the need for any air gap.
- Wide temperature operation range: -25...+70°C.

Connections



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

(*) Bipolar Input to bipolar output wiring set-up:



Order:

Type
3118

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm

Common specifications

Supply voltage	16.8...31.2 VDC
Max. power consumption	0.8 W
Internal consumption	0.4 W (typ.) / 0.65 W (max.)
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
MTBF, acc. to IEC 61709 (SN29500)	> 187 years
Signal / noise ratio	> 60 dB
Cut-off frequency (3 dB)	> 100 Hz or 10 Hz (selectable via DIP-switch)
Response time (0...90%, 100...10%)	< 7 ms or < 44 ms
Accuracy	< ±0.05% of span
Temperature coefficient	< ±0.01% of span / °C
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Current input: Programmable measurement ranges	± 10 and ± 20 mA
Functional range, current input	-23...+23 mA
Input voltage drop	< 1 VDC @ 23 mA
Voltage input: Programmable ranges	±5 and ±10 V
Functional range, voltage input	-11.5...+11.5 V
Input resistance, voltage input	≥ 1 MΩ

Output specifications

Programmable current ranges	0 / 4...20 mA
Functional range, current output	0...23 mA
Load (max.)	23 mA / 300 Ω / per ch.
Load stability, current output	≤ 0.002% of span / 100 Ω
Current limit	≤ 28 mA
Programmable voltage ranges	0/1...5 and 0/2...10 V
Functional range, voltage output	0...11.5 V
Load (min.)	> 10 kΩ
Bipolar wiring and programming set-up	±10 and ± 20 mA
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
UL	UL 61010-1

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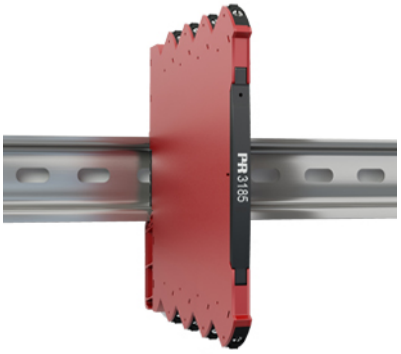


Loop powered isolator

3185

– 1 or 2 channel input loop powered isolator
– Signal 1:1 functional range 0...23 mA
– Low input voltage drop and fast response time
– Excellent accuracy and high load stability
– Slimline 6 mm housing

Application

- 1:1 input loop powered isolator of current signals in the range 0(4)...20 mA.
- 3185 is an easy mounting DIN rail unit.
- A very competitive choice in terms of both price and technology for galvanic isolation of current signals.
- Provides surge suppression and protects control systems from transients and noise.
- 3185 eliminates ground loops and can be used for measuring floating signals.
- The device can be mounted in Safe area or in Zone 2 and Cl. 1 Div 2. area.

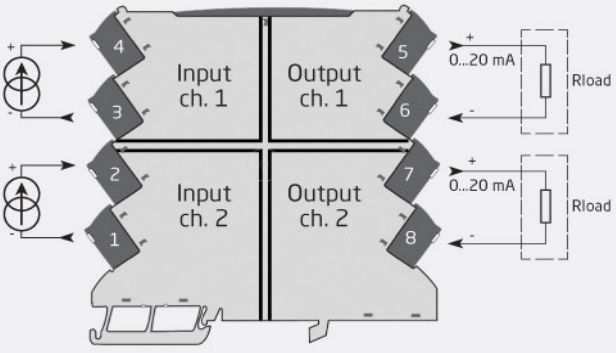
Technical characteristics

- 3185 is powered by the analog input current signal loop.
- Low input voltage drop, typ 1.35 V + Vout.
- Excellent conversion accuracy, better than 0.1% in the range 0…20.5 mA.
- Functional range is 0...23 mA which means that 3185 is NAMUR NE43 compliant.
- Inputs and outputs are floating and galvanically separated.
- The output is voltage limited to 17.5 VDC.
- High galvanic isolation of 2.5 kVAC.
- Fast response time < 5 ms.
- Excellent signal/noise ratio > 60 dB.

Mounting / installation / programming

- DIN rail mounting with up to 330 channels per meter.
- Temperature operation range is from -25...+70°C.

Connections



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

Order:

Type	Unit channels
3185A1	1
3185A2	2

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm

Common specifications

Internal consumption, per channel	30 mW
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
Cut-off frequency (3 dB)	100 Hz
Response time (0...90%, 100...10%)	< 5 ms
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Signal range, input to output	0...20.5 mA
Signal conversion	1:1
Functional range, current input	0...23 mA
Start up current, typ	10 uA
Current input overload, max	50 mA
Input to output voltage drop, typ	1.25 V + (0.015 x Vout.)
Input to output voltage drop, typ	(Vout. = Iout.xRoutput load)
Input voltage drop	(Unit voltage drop) + Vout.

Output specifications

Output load, max	600 Ω
Output load stability	< 0.01% of span / 100 Ω
Voltage limit	17.5 V
*of span	= 0...20 mA

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
UL	UL 61010-1

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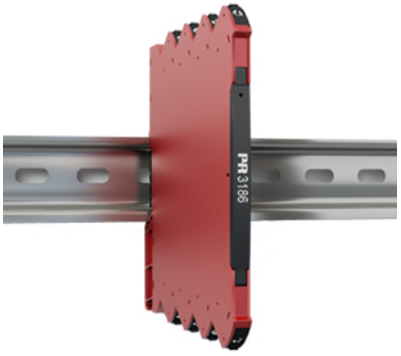


2-wire transmitter isolator

3186

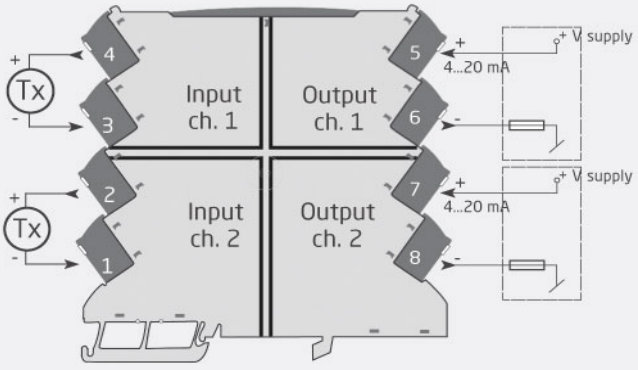
– 1 or 2 channel 2-wire transmitter isolator
– Signal 1:1 functional range 3.5...23 mA
– Low channel voltage drop and fast response time
– Excellent accuracy
– Slimline 6 mm housing

Application
- 1:1 output loop powered isolator of 2-wire transmitter 4...20 mA signals.
- 3186 is an easy mounting DIN rail unit.
- A very competitive choice in terms of both price and technology for galvanic isolation of 2-wire transmitter signals.
- Provides surge suppression and protects control systems from transients and noise.
- 3186 eliminates ground loops and can be used for measuring floating signals.
- The device can be mounted in Safe area or in Zone 2 and Cl. 1 Div 2. area.

Technical characteristics
- 3186 is powered by the host loop voltage.
- Wide supply range from 6...35 V.
- Low input to output voltage drop typ. 2.5 V.
- Excellent conversion accuracy, better than 0.05% in the range 3.8…20.5 mA.
- Functional range is 3.5...23 mA which means that 3186 is NAMUR NE43 compliant.
- Inputs and outputs are floating and galvanically separated.
- High galvanic isolation of 2.5 kVAC.
- Fast response time < 5 ms.
- Excellent signal/noise ratio > 60 dB.

Mounting / installation / programming
- DIN rail mounting with up to 330 channels per meter.
- Temperature operation range is from -25...+70°C.

Connections



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

Order:

Type	Unit channels	
3186A	Single	1
	Double	2

Environmental Conditions

Specifications range	-25°C to +70°C
Storage temperature	-40°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)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715/35 mm
Wire size	0.13 x 2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm

Common specifications

Supply voltage	6...35 VDC
Internal consumption, per channel	50 mW
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
Cut-off frequency (3 dB)	100 Hz
Response time (0...90%, 100...10%)	< 5 ms
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Available 2-wire transmitter (Tx) supply	3.5...32.5 V
Signal range, input to output	3.8...20.5 mA
Signal conversion	1:1
Functional range, current input	3.5...23 mA

Output specifications

Output loop current limitation, typ.	24 mA
Current output overload, max.	50 mA
*of span	= 4...20 mA

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx	KEM 10.0068X
FM	3041043-C
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2
UL	UL 61010-1

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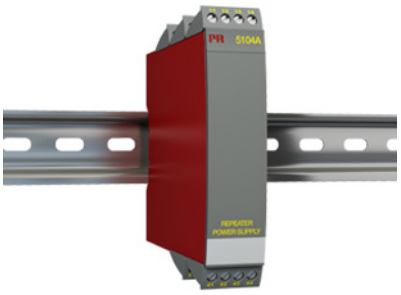


Repeater / power supply

5104A

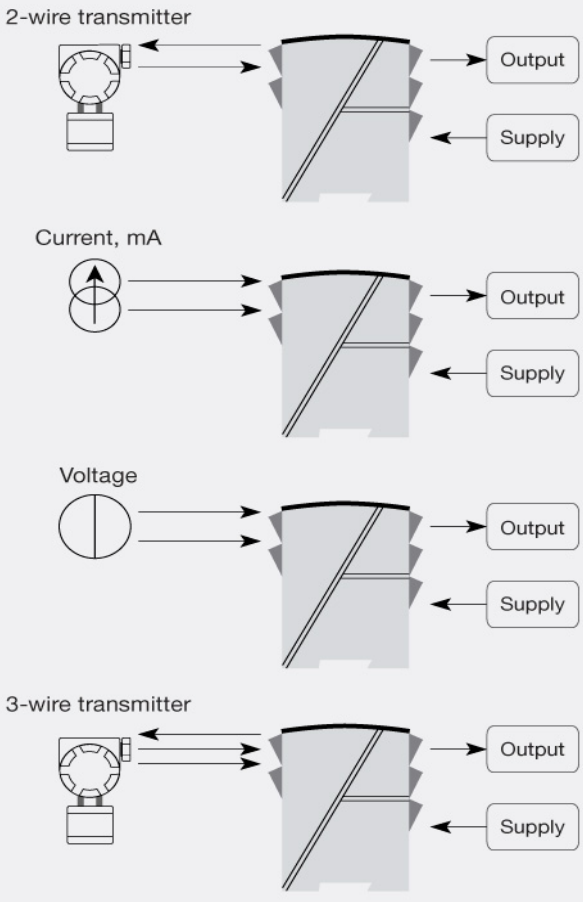
– 1- or 2-channel version
– 3- / 5-port 3.75 kVAC galvanic isolation
– Loop supply > 17.1 V
– 20 programmable measurement ranges
– Universal supply by AC or DC

Application
- Power supply and signal isolator for 2-wire transmitters.
- Signal isolator for analog current / voltage signals.
- 1 : 1 or signal conversion of analog current / voltage signals.

Technical characteristics
- The 20 factory-calibrated measurement ranges in the 5104A can be selected by the internal DIP-switches without the need for recalibration. Special measurement ranges can be delivered.
- PR5104A is based on microprocessor technology for gain and offset. The analog signal is transmitted at a response time of less than 25 ms.
- Inputs, outputs, and supply are floating and galvanically separated.
- The output can be connected either as an active current / voltage transmitter or as a 2-wire transmitter.

Mounting / installation
- Mounted vertically or horizontally on a DIN rail. By way of the 2-channel version up to 84 channels per meter can be mounted.

Connections



Order:

Type	Input		Output		Channels	
5104A	0...20 mA	: A	Special	: 0	Single	: A
	4...20 mA	: B	0...20 mA	: 1	Double	: B
	0...10 V	: E	4...20 mA	: 2		
	2...10 V	: F	0...1 V	: 4		
	Special	: X	0.2...1 V	: 5		
			0...10 V	: 6		
			2...10 V	: 7		

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
Signal / noise ratio..... Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%)..... < 25 ms
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..... 20% of max. value
Current input: Measurement range..... 0...20 mA
Min. measurement range (span), current input..... 16 mA
Input resistance, current input..... Nom. 10 Ω + PTC 10 Ω
Voltage input: Measurement range..... 0...10 VDC
Min. measurement range (span), voltage input..... 8 VDC
Input resistance, voltage input..... > 2 MΩ

Output specifications

Max. offset..... 20% of max. value
Current output: Signal range..... 0...20 mA
Min. signal range..... 16 mA
Load (max.)..... 20 mA/600 Ω/12 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... ≤ 28 mA
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...1 VDC / 0...10 VDC
Voltage output, min. signal range..... 0.8 VDC / 8 VDC
Load (min.)..... 500 kΩ
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
UL..... UL 508
EAC TR-CU 020/2011..... EN 61326-1
DNV Marine..... Stand. f. Certific. No. 2.4

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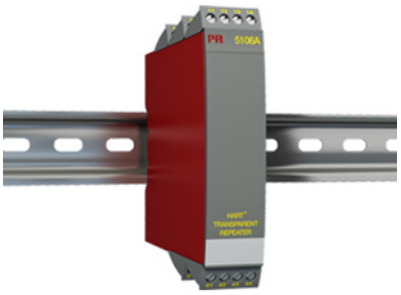


HART® transparent repeater

5106A

– 3- / 5-port 3.75 kVAC galvanic isolation
– Low response time
– 2-wire supply > 17 V
– 1- or 2-channel version
– Universal supply by AC or DC

Application

- Power supply and signal isolator with 2-way HART® communication for 2-wire transmitters installed in the hazardous area.
- Signal isolator with 2-way HART® communication for supplied current transmitters installed in the hazardous area.
- Signal isolator with low response time on analog current signals.

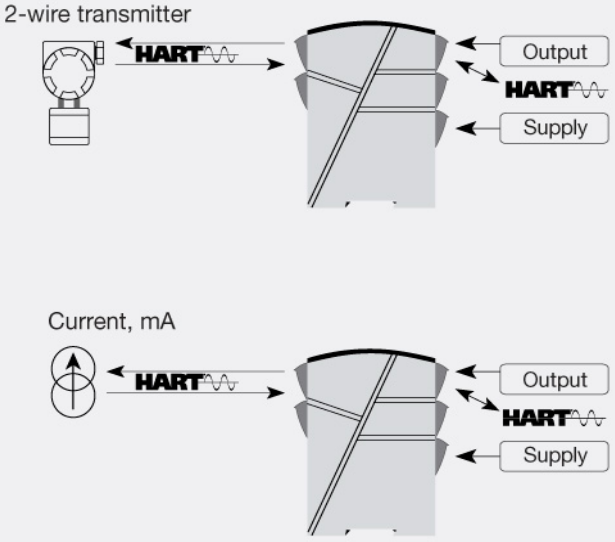
Technical characteristics

- PR5106A primarily processes current signals of 4...20 mA.
- PR5106A is based on microprocessor technology for gain and offset. The analog signal is transmitted at a response time of less than 25 ms.
- Inputs, outputs, and supply are floating and galvanically separated.
- The output can be connected either as an active current transmitter or as a 2-wire transmitter.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. As the devices can be mounted without distance between neighboring units, up to 84 channels can be mounted per meter.

Connections



Order:

Type	Input	Output	Channels
5106A	4…20 mA : B	4…20 mA : 2 20…4 mA : 9	Single : A Double : B

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..... 65 g
Weight approx..... 245 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
Signal / noise ratio..... Min. 60 dB (0...100 kHz)
Accuracy..... Better than 0.1% of selected range
Response time (0...90%, 100...10%)..... < 25 ms
Effect of supply voltage change..... < ±10 µA
Auxiliary supply: 2-wire supply (pin 44...42 and 54...52)..... 25...17 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

Current input: Measurement range..... 4...20 mA
Min. measurement range (span), current input..... 16 mA
Input resistance: Supplied unit..... Nom. 10 Ω
Input resistance: Non-supplied unit..... Rshunt = ∞, Vdrop < 4 V

Output specifications

Current output: Signal range..... 4…20 mA
2-wire 4...20 mA output: Signal range..... 4...20 mA
Min. signal range..... 16 mA
Load (max.)..... 20 mA/600 Ω/12 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... ≤ 28 mA
Effect of external 2-wire supply voltage variation..... < 0.005% of span / V
Output ripple..... < 3 mVRMS on HART communication
Max. external 2-wire supply..... 29 VDC
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
UL..... UL 508
EAC TR-CU 020/2011..... EN 61326-1

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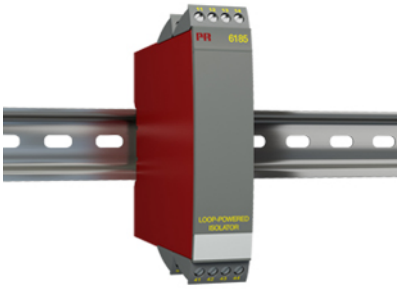


Loop-powered isolator

6185

– 1-, 2- and 4-channel galvanic isolation
– Slimline channel width of less than 6 mm
– No separate supply necessary
– Low response time
– High noise suppression

Application

- Galvanic separation of analog current signals.
- Elimination of ground loops and measurement of floating signals.
- A competitive choice in terms of both price and technology for galvanic isolation of current signals to SCADA systems or PLC equipment.
- Especially useful in applications necessitating an unproblematic transmission of current signals according to NAMUR (sensor error detection).

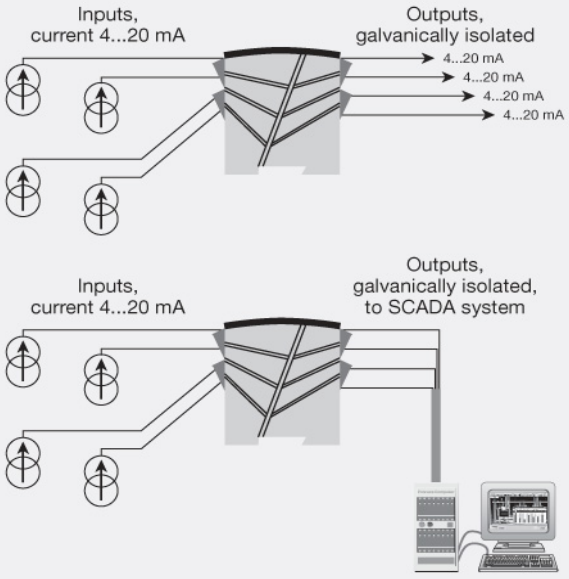
Technical characteristics

- PR 6185 is powered by the measured signal and loads the loop with max. 1.8 VDC.
- The input is protected against overvoltage and polarity error.
- The drop voltage for each channel can be calculated according to the following expression: Vdrop = 1.8 + (Iout. * Rload).
- The output is voltage-limited to 15 VDC.
- Inputs and outputs are floating and galvanically separated.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. As the devices can be mounted without distance between neighboring units, up to 168 channels can be mounted per meter.

Connections



Order:

Type	Channels	
6185	1 channel	: A
	2 channels	: B
	4 channels	: D

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
Weight approx..... 155 / 180 / 230 g (1 / 2 / 4 channels)
DIN rail type..... DIN 46277
Wire size..... 1 x 2.5 mm^2 stranded wire
Screw terminal torque..... 0.5 Nm

Common specifications

Internal consumption, per channel..... 40 mW
Voltage drop..... < 1.8 VDC, min.
Voltage drop..... 1.8 V + (Iout.*Rload), max.
Isolation voltage, test..... 2 kVAC
Signal / noise ratio..... Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%)..... < 4 ms
EMC immunity influence..... < ±0.5% of span

Input specifications

Current input: Measurement range..... 0...23 mA
Input resistance, current input..... ≈ 90 Ω + Rload (@ 20 mA)

Output specifications

Current output: Signal range..... 0...23 mA
Min. signal range..... 1:1
Load (max.)..... 20 mA/600 Ω/12 VDC
Load stability, current output..... < 0.03% of span / 100 Ω
Current limit..... 50 mA
Voltage limit..... 15 VDC
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
EAC TR-CU 020/2011..... EN 61326-1

E

HART® transparent repeater

9106A

– 24 VDC supply via power rail or connectors
– Active and passive mA input
– Active or passive output via the same two terminals
– Splitter function - 1 in and 2 out
– SIL2 / SIL3 Full Assessment and certified acc. to IEC 61508

Application

- 9106A is a 1- or 2-channel isolated 1:1 repeater.
- The device supplies 2-wire SMART transmitters and can also be used for 2-wire SMART current sources. HART® & BRAIN protocols are supported and are transferred bi-directionally.
- 9106A can be mounted in and receive signals from non-classified area or zone 2.
- The PR 4511/4501 displays the process value for each channel and can be used to define high and low limits for detection of loop current level. If these limits are exceeded, the status relay will activate.
- In the 1-channel version the status relay can be used as a simple limit switch.
- Splitter application - 1 input and 2 outputs.
- In the dual channel version the 9106A can be implemented in a SIL3 loop.

Advanced features

- The detachable display and the green and red front LEDs indicate operation status for each channel.
- A tag number can be defined for each channel.
- Monitoring of error events and cable breakage on input via the individual status relay and/or a collective electronic signal via the power rail.

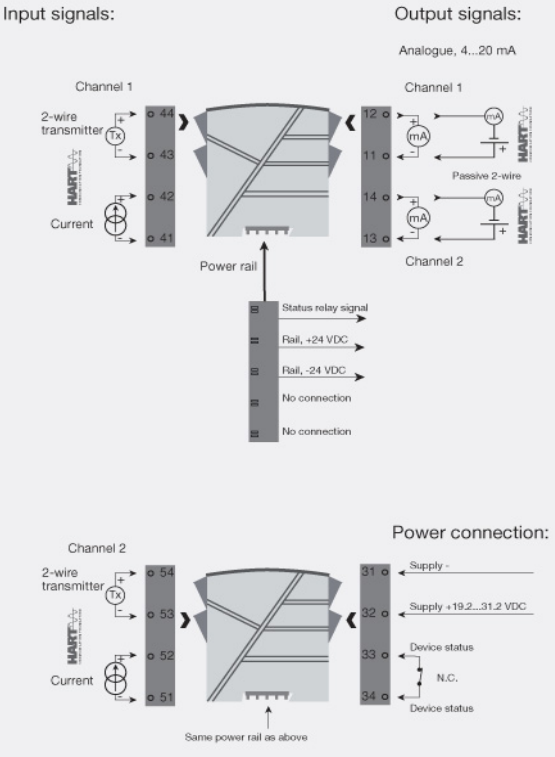
Technical characteristics

- High galvanic isolation of 2.6 kVAC.
- Fast response time <5 ms
- High accuracy better than 0.1%.
- 2-wire transmitter supply >16 V.

Mounting

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

Connections



Order:

Type	Barrier version		Unit channels	
9106A	Uo = 28 V	: 1	Single	: A
	Uo = 25.6 V	: 2	Double	: B

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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

Common specifications

Supply voltage	19.2...31.2 VDC
Fuse	1.25 A SB / 250 VAC
Max. power consumption	≤ 3 W (2 channels)
Max. internal power dissipation	≤ 2 W (2 channels)
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
SMART bi-directional communication frequency range	0.5...7.5 kHz
Signal / noise ratio	> 60 dB
Response time (0...90%, 100...10%)	< 5 ms
Accuracy	Better than 0.1% of selected range
mA, absolute accuracy	≤ ±16 µA
mA, temperature coefficient	≤ ±1.6 µA / °C
Effect of supply voltage change on output (nom. 24 VDC)	< ±10 µA
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Current input: Measurement range	3,5...23 mA
2-wire transmitter supply 9106B1x (Uo = 28 VDC)	>16 V / 20 mA
2-wire transmitter supply 9106B2x (Uo = 25.6 VDC)	>15 V / 20 mA
Sensor error detection: Loop break 4...20 mA	< 1 mA
Input voltage drop, supplied unit	< 4 V @ 23 mA
Input voltage drop, non-supplied unit	< 6 V @ 23 mA

Output specifications

Current output: Signal range	3.5...23 mA
Load (max.)	20 mA/600 Ω/12 VDC
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	≤ 28 mA
Effect of external 2-wire supply voltage variation	< 0.005% of span / V
Max. load resistance [Ω]	(Vsupply - 3.5) / 0.023 A
Max. external 2-wire supply	26 VDC
Status relay output terminal 33-34: Relay function	N.C.
Programmable low setpoint	0...29.9 mA
Programmable high setpoint	0...29.9 mA
Hysteresis for setpoints	0.1 mA
Max. voltage, status relay	110 VDC / 125 VAC
Max. current, status relay	0.3 ADC / 0.5 AAC
Max. voltage - hazardous installation	32 VDC / 32 VAC
Max. current - hazardous installation	1 ADC / 0.5 AAC
*of span	= normal measurement range 4...20 mA

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
SIL	SIL 2 / SIL3 certified & fully assessed acc. to IEC 61508

E

HART® transparent driver

9107A

– 24 VDC supply via power rail or connectors
– Fast response time
– High active output load 725 Ohm / 20 mA
– Output line fault detection via status relay
– SIL2 certified via Full Assessment according to IEC 61508

Application

- 9107A is a 1- or 2-channel isolated 1:1 driver.
- Operation and drive control of I/P converters, valves and indicators.
- Operation of HART® devices is possible as the unit transmits HART® communication signals bi-directionally.
- The device can be mounted in and transmit signals to non-classified area and zone 2.
- The PR 4511/4501 displays the process value for each channel and can be used to define high and low limits for detection of loop current level. If these limits are exceeded, the status relay will activate.
- Dual channel versions can be used for signal splitter applications - 1 in and 2 out.

Advanced features

- The PR 4511/4501 detachable display and the green and red front LEDs indicate operation status for each channel.
- A tag number can be defined for each channel.
- Output line fault detection.
- In the 1-channel version the status relay can be used as a simple limit switch.

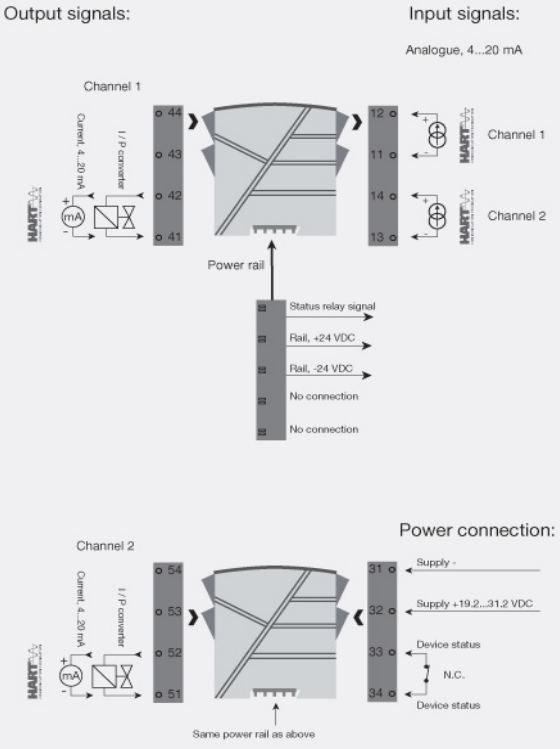
Technical characteristics

- High galvanic isolation of 2.6 kVAC.
- High accuracy better than 0.1%.
- Continuous check of vital stored data for safety reasons.

Mounting

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

Connections



Order:

Type	Unit channels	
9107A	Single	: A
	Double	: B

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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

Common specifications

Supply voltage	19.2...31.2 VDC
Fuse	1.25 A SB / 250 VAC
Max. power consumption	≤ 2 W (2 channels)
Max. internal power dissipation	≤ 2 W (2 channels)
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
HART bi-directional communication frequency range	0.5...7.5 kHz
Signal / noise ratio	> 60 dB
Response time (0...90%, 100...10%)	< 5 ms
Accuracy	Better than 0.1% of selected range
mA, absolute accuracy	≤ ±16 µA
mA, temperature coefficient	≤ ±1.6 µA / °C
Effect of supply voltage change on output (nom. 24 VDC)	< ±10 µA
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Current input: Measurement range	3,5...23 mA
Sensor error detection: Loop break 4...20 mA	< 1 mA
Input voltage drop, supplied unit	< 2 V @ 23 mA
Input voltage drop, non-supplied unit	< 4 V @ 23 mA

Output specifications

Current output: Signal range	3.5...23 mA
Load (max.)	20 mA/725 Ω/14.5 VDC
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	≤ 28 mA
Status relay output terminal 33-34: Relay function	N.C.
Programmable low setpoint	0...29.9 mA
Programmable high setpoint	0...29.9 mA
Hysteresis for setpoints	0.1 mA
Max. voltage, status relay	110 VDC / 125 VAC
Max. current, status relay	0.3 ADC / 0.5 AAC
Max. voltage - hazardous installation	32 VDC / 32 VAC
Max. current - hazardous installation	1 ADC / 0.5 AAC
*of span	= normal measurement range 4...20 mA

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
SIL	SIL 2 certified & fully assessed acc. to IEC 61508

E

Pulse isolator

9202A

– Interface for NAMUR sensors and switches
– Extended self-diagnostics and detection of cable fault
– 1 or 2 channels
– Can be supplied separately or installed on power rail, PR type 9400
– SIL 2-certified via Full Assessment

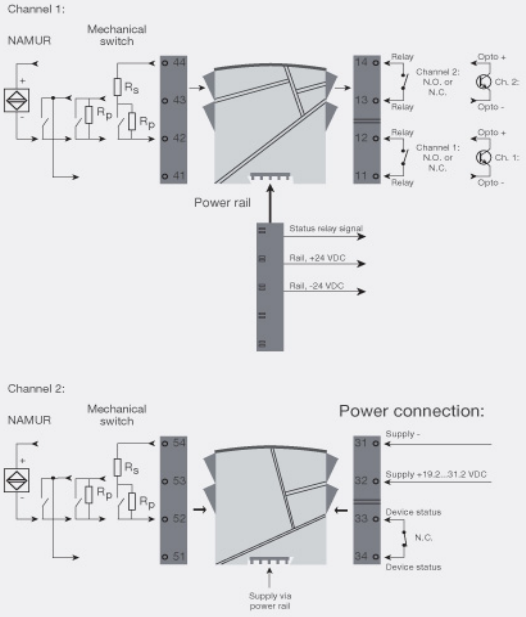
Advanced features
- Configuration and monitoring by way of detachable display front (PR 4511/4501).
- Selection of direct or inverted function for each channel via PR 4511/4501.
- Advanced monitoring of internal communication and stored data.
- Optional redundant supply via power rail and/ or separate supply.
- SIL 2 functionality is optional and must be activated in a menu point.

Application
- The device can be mounted in and receive signals from non-classified area and zone 2.
- Pulse isolator for transmission of signals from NAMUR sensors and mechanical switches.
- Monitoring of error events and cable breakage via the individual status relay and/or a collective electronic signal via the power rail.
- The 9202A has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.

Technical characteristics
- 1 green and 2 yellow/red front LEDs indicate operation status and malfunction.
- 2.6 kVAC galvanic isolation between input, output and supply.

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

Connections



Order:

Type	Switch		Channels	
9202A	Opto	: 1	Single	: A
	Relay N.O.	: 2	Double	: B
	Relay N.C.	: 3		

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.	170 g
Weight incl. 4501 / 4511 (approx.)	185 g / 270 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
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz	±1 mm
Vibration: 13.2...100 Hz	±0.7 g

Common specifications

Supply voltage	19.2...31.2 VDC
Fuse	400 mA SB / 250 VAC
Max. power consumption	≤ 3 W (2 channels)
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
Output 1 to output 2	1.5 kVAC / 150 VAC reinforced isolation
Status relay to supply	1.5 kVAC / 150 VAC reinforced isolation
Communications interface	Communication enabler 4511 / Programming front 4501
Response time for cable fault	< 200 ms
Auxiliary supplies: NAMUR supply	8 VDC / 8 mA

Input specifications

Sensor types	NAMUR according to EN 60947-5-6 / mechanical contact
Frequency range	0...5 kHz
Min. pulse length	> 0.1 ms
Input resistance	Nom. 1 kΩ
Trig level, signal	< 1.2 mA, > 2.1 mA
Trig level, cable fault	< 0.1 mA, > 6.5 mA

Output specifications

Relay output: Max. switching frequency	20 Hz
Max. voltage	250 VAC / 30 VDC
Max. current	2 AAC / 2 ADC
Max. AC power	500 VA / 60 W
Max. voltage, status relay	110 VDC / 125 VAC
Max. current, status relay	0.3 ADC / 0.5 AAC
Max. AC power, status relay	62.5 VA / 32 W
Opto, NPN outputs: Max. switching frequency	5 kHz
Min. pulse length, NPN output	> 0.1 ms
Max. load, current / voltage	80 mA / 30 VDC
Voltage drop at 80 mA	< 2.5 VDC

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
SIL	SIL 2 certified & fully assessed acc. to IEC 61508

E

Solenoid / alarm driver

9203A

– Universal driver for solenoids, acoustic alarms and LEDs
– Extended self-diagnostics
– 1 or 2 channels
– Can be supplied separately or installed on power rail, PR 9400
– SIL 2-certified via Full Assessment

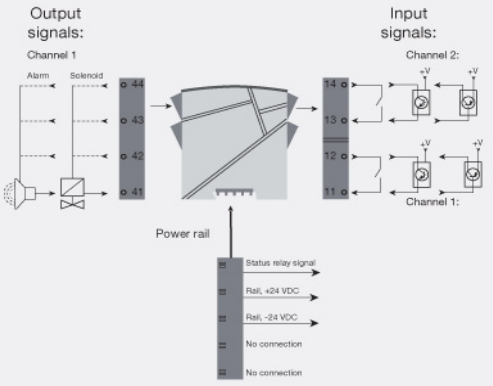
Advanced features
- Universal driver for the control of solenoids etc.
- Two hardware versions make it possible to choose either Low (35 mA) or High (60 mA) current output.
- Configuration and monitoring by way of detachable display front (PR 4511/4501).
- Selection of direct or inverted function for each channel via PR 4511/4501 and the possibility of reducing the output current to suit the application.
- Optional monitoring of the output current by way of PR 4511/4501.
- Optional redundant supply via power rail and/or separate supply.

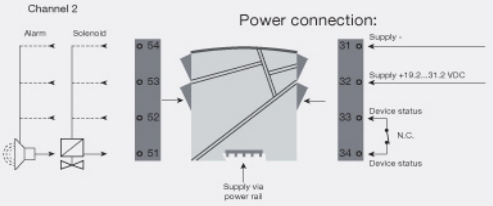
Application
- The device can be mounted in and transmit signals to non-classified area and zone 2.
- Control of ON / OFF solenoids, acoustic alarms and LEDs.
- The 9203A is controlled by an NPN/PNP signal or a switch signal.
- Monitoring of internal error events via the individual status relay and/or a collective electronic signal via the power rail.
- The 9203A has been designed, developed and certified for use in SIL 2 applications according to the requirements of IEC 61508.

Technical characteristics
- 1 green and 2 yellow/red front LEDs indicate operation status and malfunction.
- 2.6 kVAC galvanic isolation between input, output and supply.

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

Connections





Order:

Type	Current output	Channels
9203A	Low current : 1	Single : A Double : B
	High current : 2	Single : A

Output loads:

	9203A1A (1 channel) / 9203A1B (2 channels)		
Terminal	41-42 / 51-52	41-43 / 51-53	41-44 / 51-54
Vout. no load	Min. 24 V	Min. 24 V	Min. 24 V
Vout. with load	Min. 12.5 V	Min. 13.5 V	Min. 14.5 V
Iout. max	35 mA	35 mA	35 mA

	9203A2A (1 channel)					
Terminal	41-42		41-43		41-44	
Vout. no load	Min. 24 V		Min. 24 V		Min. 24 V	
Vout. with load	Min. 11.5 V	Min. 9 V	Min. 12.5 V	Min. 10 V	Min. 13.5 V	Min. 11 V
Iout. max	50 mA	60 mA	50 mA	60 mA	50 mA	60 mA

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..... 170 g
Weight incl. 4501 / 4511 (approx.)..... 185 g / 270 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
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz..... ±1 mm
Vibration: 13.2...100 Hz..... ±0.7 g

Common specifications

Supply voltage..... 19.2...31.2 VDC
Fuse..... 1.25 A SB / 250 VAC
Max. power consumption..... ≤ 3.5 W (2 channels)
Isolation voltage, test /working:
Input to any..... 2.6 kVAC / 300 VAC reinforced isolation
Output 1 to output 2..... 1.5 kVAC / 150 VAC reinforced isolation
Status relay to supply..... 1.5 kVAC / 150 VAC reinforced isolation
Communications interface..... Communication enabler 4511 / Programming front 4501
EMC immunity influence..... < ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst..... < ±1% of span

Input specifications

Trig level LOW, NPN+switch..... ≤ 2.0 VDC
Trig level HIGH, NPN+switch..... ≥ 4.0 VDC
Max. external voltage, NPN+switch..... 28 VDC
Input impedance, NPN+switch..... 3.5 kΩ
Trig level LOW, PNP..... ≤ 8.0 VDC
Trig level HIGH, PNP..... ≥ 10.0 VDC
Max. external voltage, PNP..... 28 VDC
Input impedance, PNP..... 3.5 kΩ

Output specifications

Output ripple..... < 40 mVRMS
Max. voltage, status relay..... 110 VDC / 125 VAC
Max. current, status relay..... 0.3 ADC / 0.5 AAC
Max. AC power, status relay..... 62.5 VA / 32 W

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
UL..... UL 61010-1
DNV Marine..... Stand. f. Certific. No. 2.4
SIL..... SIL 2 certified & fully assessed acc. to IEC 61508

E

Isolation amplifier

2204

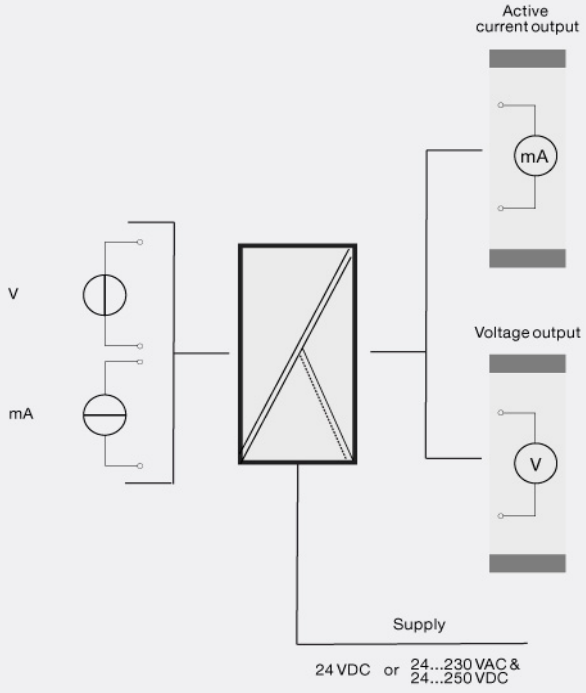
– Input galvanically separated from output and supply
– Current or voltage input
– Signal conversion
– Current and voltage output
– 24 VDC supply or universally supplied
– Applicable in PELV/SELV circuits

Advanced features
- Factory-calibrated measurement ranges for input and outputs in the 2204 can be selected by the internal DIP-switches without the need for recalibration.

Application
- Signal isolator for analog current / voltage signals.
- 1 : 1 or signal conversion of analog current /voltage signals within the ranges: 0...10 VDC or 0...50 mA on the input and 0...20 mA and 0...10 VDC in fixed ranges on the output.
- Analog signal conditioning with microprocessor based gain and zero offset giving a response time of less than 25 ms.

Technical characteristics
- Universally supplied units have a 3-port galvanic separation between input, supply, and output.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



Order:

Type	Input		Output		Supply	
2204	0...20 mA	: A	Special	: 0	24 VDC	: D
	4...20 mA	: B	0...20 mA	: 1	24...230 VAC &	: P
	0...1 V	: C	4...20 mA	: 2	24...250 VDC	
	0.2...1 V	: D	0...5 mA	: 3		
	0...10 V	: E	0...1 V	: 4		
	2...10 V	: F	0.2...1 V	: 5		
	Special	: X	0...10 V	: 6		
			2...10 V	: 7		

Environmental Conditions

Specifications range..... -20°C to +60°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP50

Mechanical specifications

Dimensions (HxWxD)..... 80.5 x 35.5 x 84.5 mm (D is without pins)
Weight DC / universally supplied..... 110 g / 160 g

Common specifications

Supply voltage..... 19.2...28.8 VDC
Supply voltage, universal..... 21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Internal consumption..... ≤ 1.3 W (2204--D)
Internal consumption..... ≤ 1.8 W (2204--P)
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Accuracy..... Better than 0.1% of selected range
Signal / noise ratio..... Min. 60 dB
Response time (0...90%)..... < 25 ms
Temperature coefficient..... < ±0.01% of span / °C
Linearity error..... < 0.1% of span
Effect of supply voltage change..... < ±0.002% of span / %V
EMC immunity influence..... < ±0.5% of span

Input specifications

Max. offset..... 20% of max. value
Current input: Measurement range..... 0...50 mADC
Min. measurement range (span), current input..... 4 mA
Input resistance, current input..... Nom. 50 Ω
Voltage input: Measurement range..... 0...10 VDC
Min. measurement range (span), voltage input..... 0.2 VDC
Input resistance, voltage input..... 10 MΩ

Output specifications

Max. offset..... 20% of max. value
Current output: Signal range..... 0...5 mA / 0...20 mA
Min. signal range..... 4 mA / 16 mA
Load (max.)..... 20 mA/600 Ω/12 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... 23...28 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011..... EN 61326-1

E

AC / DC transmitter

2279

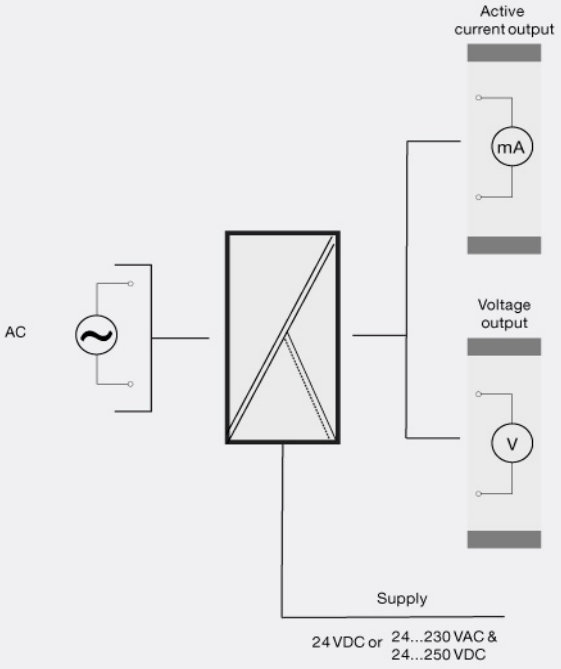
– Input galvanically separated from output and supply
– AC current measurement
– AC voltage measurement
– Current and voltage output
– 24 VDC supply or universally supplied
– Applicable in PELV/SELV circuits

Advanced features
- ±20% adjustment of the 0 and the 100% measurement range is possible at the front panel.
- Input and output ranges are programmable by use of internal DIP-switches.

Application
- AC current measurement e.g. in connection with a current transformer or a current clamp.
- Direct AC voltage measurement.

Technical characteristics
- Analog signal conditioning with microprocessor based gain and zero offset.
- Signals in the ranges 0.5...250 VRMS sinusoidal voltage can be connected directly to the input, ranges are programmed via DIP-switches and jumpers.
- Analog standard current output of 0/4...20 mA or standard voltages of 0...1 or 0...10 VDC ranges are programmed via DIP-switches and jumpers.
- Special currents and voltages within the signal range.
- Signal reversal e.g. 20...4 mA is possible in a special version.
- Universally supplied units have a 3-port galvanic separation between input, supply, and output.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



Order:

Type	Input		Output		Supply	
2279	0...0.5 VRMS	: A	Special	: 0	24 VDC	: D
	0...1 VRMS	: B	0...20 mA	: 1	24...230 VAC &	: P
	0...2.83 VRMS	: C	4...20 mA	: 2	24...250 VDC	
	(0...4 V peak)		0...1 V	: 4		
	0...5 VRMS	: D	0.2...1 V	: 5		
	0...120 VRMS	: E	0...10 V	: 6		
	0...230 VRMS	: F	2...10 V	: 7		
	0...0.5 ARMS	: G				
	0...1 ARMS	: H				
	Special	: X				

Environmental Conditions

Specifications range..... -20°C to +60°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP50

Mechanical specifications

Dimensions (HxWxD)..... 80.5 x 35.5 x 84.5 mm (D is without pins)
Weight DC / universally supplied..... 100 g / 160 g

Common specifications

Supply voltage..... 19.2...28.8 VDC
Supply voltage, universal..... 21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Max. power consumption..... ≤ 1.3 W (2279--D)
Max. power consumption..... ≤ 2.7 W (2279--P)
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Signal / noise ratio..... Min. 60 dB
Response time (0...90%)..... < 1.5 s
Effect of supply voltage change..... < 0.005% of span / VDC
Temperature coefficient..... < ±0.01% of span / °C
Linearity error..... < ±1% of span
EMC immunity influence..... < ±0.5% of span

Input specifications

Max. offset..... 50% of max. value
Current input: Measurement range..... 0...1 ARMS / 40...400 Hz
Min. measurement range (span), current input..... 500 mARMS
Input resistance, current input..... Nom. 1 Ω
Voltage input: Measurement range..... 0...250 VRMS / 40...400 Hz
Min. measurement range (span), voltage input..... 0.5 VRMS
Input resistance, voltage input..... > 1 MΩ

Output specifications

Max. offset..... 20% of max. value
Current output: Signal range..... 0...5 mA / 0...20 mA
Min. signal range..... 4 mA / 16 mA
Load (max.)..... 20 mA/600 Ω/12 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... 23...28 mA
Voltage output through internal shunt..... See manual for details
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011..... EN 61326-1

E

Isolation amplifier

2284

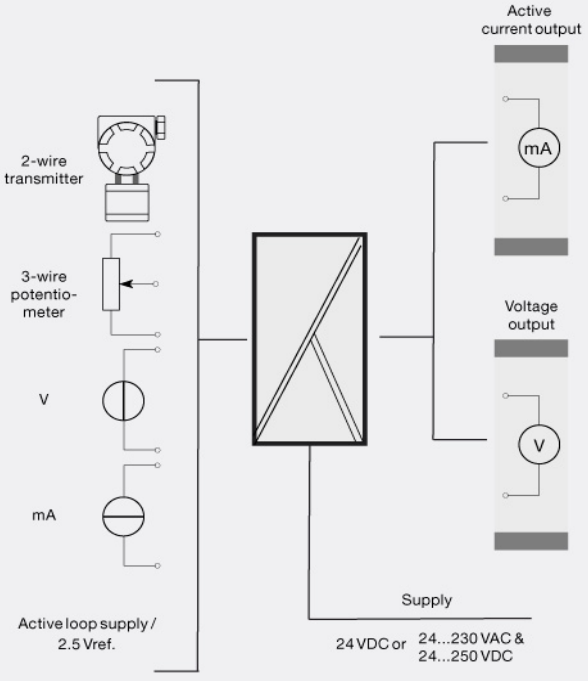
– Galvanically separated input, output, and supply
– Bipolar current / voltage input
– Signal conversion
– Current and voltage output
– 24 VDC supply or universally supplied
– Applicable in PELV/SELV circuits

Advanced features
- Programmable input and output ranges using internal DIP-switches.
- Front panel fine adjustment of 0 and 100% values for special ranges.

Application
- Galvanic separation of analog signals.
- Measurement of floating signals.

Technical characteristics
- Analog signal conditioning with microprocessor based gain and zero offset with a fast response time of less than 25 ms.
- Signal conversion within the ranges: -250...+250 VDC or -50...+50 mA on the input and 0...10 (20) VDC and 0...20 mA on the output.
- Galvanically separated between input, supply, and output.
- 2-wire transmitter supply and a reference voltage of 2.5 VDC, max. 15 mA for short circuit-protected supply of potentiometers.
- Buffered voltage output 0...20 V, 10 mA.
- The output can be ordered for standard 0/4...20 mA, and 0/1...5mA or special currents and selectable voltages within the signal range 0...1 VDC or and ranges 0...10 VDC.
- Output signal reversal.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



Order:

Type	Input	Output	Supply	Output type
2284	0...20 mA : A	Special : 0	24 VDC : D	Standard : 1
	4...20 mA : B	0...20 mA : 1	24...230 VAC : P	Buffered
	0...1 V : C	4...20 mA : 2	& 24...250 VDC	voltage : 2
	0.2...1 V : D	0...5 mA : 3		
	0...10 V : E	0...1 V : 4		
	2...10 V : F	0.2...1 V : 5		
	0...2.5 V : G	0...10 V : 6		
	-10...+10 V : H	2...10 V : 7		
	Special : X	0...2.5 V : 8		

Environmental Conditions

Specifications range..... -20°C to +60°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP50

Mechanical specifications

Dimensions (HxWxD)..... 80.5 x 35.5 x 84.5 mm (D is without pins)
Weight DC / universally supplied..... 125 g / 165 g

Common specifications

Supply voltage..... 19.2...31.2 VDC
Supply voltage, universal..... 21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Max. power consumption..... ≤ 2.4 W (2284--D)
Max. power consumption..... ≤ 2.5 W (2284--P)
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Signal / noise ratio..... Min. 60 dB
Response time (0...90%)..... < 25 ms
Effect of supply voltage change..... < 0.005% of span / VDC
2-wire transmitter supply (pin 7...5)..... 19...28 VDC / 20...0 mA
Auxiliary voltages: Reference voltage..... 2.5 VDC ±0.5% / 15 mA
Temperature coefficient..... < ±0.01% of span / °C
Linearity error..... < 0.1% of span
EMC immunity influence..... < ±0.5% of span

Input specifications

Max. offset..... 50% of max. value
Current input: Measurement range..... -50...+50 mADC
Min. measurement range (span), current input..... 0.53 mADC
Input resistance, current input..... Nom. 50 Ω
Voltage input: Measurement range..... -250...+250 VDC
Min. measurement range (span), voltage input..... 27 mVDC
Input resistance, voltage input..... >1 MΩ...<10 MΩ

Output specifications

Max. offset..... 20% of max. value
Current output: Signal range..... 0...20 mA
Min. signal range..... 4 mA
Load (max.)..... 20 mA/1000 Ω/20 VDC
Load stability, current output..... ≤0.01% of span / 100 Ω
Current limit..... 23...28 mA
Voltage output through internal shunt..... See manual for details

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011..... EN 61326-1

E

Complete range of panel meters

Our display range is characterized by its flexibility and stability. The devices meet nearly every demand for display readout of process signals and have universal input and power supply capabilities. They provide a real-time measurement of your process value no matter the industry and are engineered to provide a user-friendly and reliable relay of information, even in demanding environments.

Displays

F

Loop-powered LCD indicator

5531

– 4 digit 1/8 DIN (48 x 96 mm) loop-powered LCD display
– Easy push-button configuration
– Backlit LCD display is readable in low light conditions
– Display can be mounted in the safe area or in I.S. / Ex zone 2

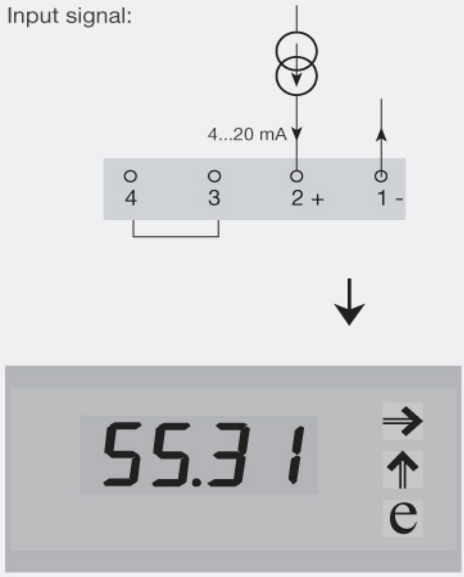
ATEX

Application
- The 5531 indicator is powered by the 4 to 20 mA current loop and is easily scaled to display the correct process value.
- Because it does not require separate power wiring, the 5531 is perfect for remote display of process loops.
- The 5531A display can be panel mounted in the safe area or I.S. / Ex Zone 2 (gas).

Technical characteristics
- With a full measurement range of 3.6 to 23 mA, the 5531 is NAMUR NE43 compliant.
- The display can be push-button scaled to any range between -9999 to 9999, and reverse display action is possible.
- The LCD backlight can be set to half or full intensity for easy viewing in low light conditions.
- The display only requires 1.5 VDC, (75 Ω loop load), with the backlight turned off.
- The input is HART® transparent.
- The front push-buttons can be disabled to prevent unauthorized adjustment.

Mounting / installation
- Once panel mounted with the included gasket, the 5531 provides IP65 ingress protection.

Connections



F

Order:

Type	Input signal area classification	Field enclosure
5531A	4...20 mA from safe and zone 2	No

Environmental Conditions

Specifications range..... -20°C to +60°C
Storage temperature..... -20°C to +60°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP65, from front

Mechanical specifications

Dimensions (HxWxD)..... 48 x 96 x 120 mm
Cut out dimensions..... 44.5 x 91.5 mm
Weight approx..... 200 g
Wire size, connector terminal 1 - 4..... 0.13...2.08 mm^2 / AWG 26...14 stranded wire
Screw terminal torque..... 0.5 Nm
Cable glands and cable diameter..... M16 x 1.5 / Ø 5...8 mm

Common specifications

Supply voltage..... Input loop-powered
Signal / noise ratio..... > 60 dB
Response time (0...90%, 100...10%)..... < 1 s
Updating time..... 500 ms
EMC immunity influence..... < ±0.5% of span

Input specifications

Input range..... 4...20 mA
Measurement range..... 3.6...23 mA
Input voltage drop, without backlight..... < 1.5 V @ 20 mA
Input voltage drop, with full backlight..... < 10.5 V @ 20 mA
Loop error detection, 4...20 mA: Low..... ~ < 3 mA
Loop error detection, 4...20 mA: High..... ~ > 24 mA

Approvals

LVD 2006/95/EC..... EN 61010-1
EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 05ATEX1044 X (5531A/B1)
EAC TR-CU 020/2011..... EN 61326-1

Output specifications

Display readout..... ± 9999 (4 digits)
Digit height..... 16 mm

F

Loop-powered LCD indicator

5531B

– 4 digit 1/8 DIN (48 x 96 mm) loop-powered LCD display
– Easy push-button configuration
– Backlit LCD display is readable in low light conditions
– Display can be mounted in the safe area or in I.S. / Ex zone

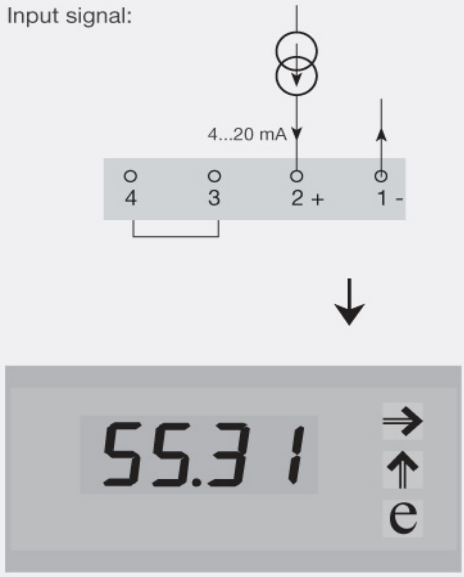
ATEX

Application
- The 5531 indicator is powered by the 4 to 20 mA current loop and is easily scaled to display the correct process value.
- Because it does not require separate power wiring, the 5531 is perfect for remote display of process loops.
- The 5531B can be mounted in Ex Zone 1.

Technical characteristics
- With a full measurement range of 3.6 to 23 mA, the 5531 is NAMUR NE43 compliant.
- The display can be push-button scaled to any range between -9999 to 9999, and reverse display action is possible.
- The LCD backlight can be set to half or full intensity for easy viewing in low light conditions.
- The display only requires 1.5 VDC, (75 Ω loop load), with the backlight turned off.
- The input is HART® transparent.
- The front push-buttons can be disabled to prevent unauthorized adjustment.

Mounting / installation
- Once panel mounted with the included gasket, the 5531 provides IP65 ingress protection.

Connections



F

Order:

Type	Input signal area classification	Field enclosure
5531B1	4...20 mA from safe, zone 2 and 22	Yes
5531B	4...20 mA from zone 0	No
5531B2	4...20 mA from zone 0 and 20	Yes

Environmental Conditions

Specifications range..... -20°C to +60°C
Storage temperature..... -20°C to +60°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP65, from front

Mechanical specifications

Dimensions (HxWxD)..... 48 x 96 x 120 mm
Cut out dimensions..... 44.5 x 91.5 mm
Weight approx..... 200 g
Cable glands and cable diameter..... M16 x 1.5 / Ø 5...8 mm
Wire size, connector terminal 1 - 4..... 0.13...2.08 mm^2 / AWG 26...14 stranded wire

Common specifications

EMC immunity influence..... < ±0.5% of span
Supply voltage..... Input loop-powered
Signal / noise ratio..... > 60 dB
Response time (0...90%, 100...10%)..... < 1 s
Updating time..... 500 ms

Input specifications

Current input: Measurement range..... 3.6...23 mA
Input voltage drop, without backlight..... < 1.5 V @ 20 mA
Input voltage drop, with full backlight..... < 10.5 V @ 20 mA
Loop error detection, 4...20 mA: Low..... ~ < 3 mA
Loop error detection, 4...20 mA: High..... ~ > 24 mA

Output specifications

Display readout..... ± 9999 (4 digits)
Digit height..... 16 mm

Approvals

EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 05ATEX1044 X (5531A/B1)
ATEX 2004/108/EC..... KEMA 05ATEX1105 X (5531B/B2)
EAC TR-CU 020/2011..... EN 61326-1
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410

F

Programmable LED indicator

5714

– 4-digit 14-segment LED display
– Input for mA, V, Ohm, RTD, TC and potentiometer
– 2 relays and analog output
– Universal supply
– Front key programmable

Application

- Display for digital readout of current / voltage / resistance / temperature or potentiometer signals.
- Process control with 2 potential-free relays and / or analog output.
- For local readout in extremely wet atmospheres with a specially designed splash-proof cover.

Technical characteristics

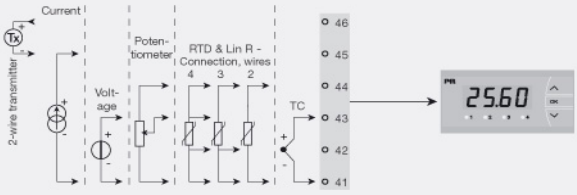
- 4-digit LED indicator with 13.8 mm 14-segment characters. Max. display readout -1999...9999 with programmable decimal point and relay ON / OFF indication.
- All standard operational parameters can be adjusted to any application by way of the front function keys.
- Help texts in eight languages can be selected via a menu item.
- PR5714 is available fully-configured according to specifications ready for process control and visualization.
- In versions with relay outputs the user can minimize the installation test time by activating / deactivating each relay independently of the input signal.

Mounting / installation

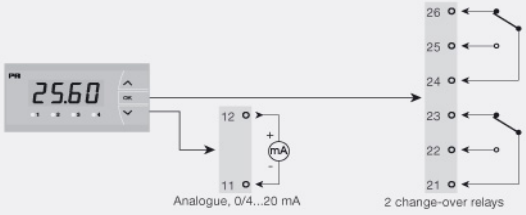
- To be mounted in panel front. The included rubber packing must be mounted between the panel cutout hole and the display front to obtain a protection degree of IP65 (type 4X). For extra protection in extreme environments, PR5714 can be delivered with a specially designed splash-proof cover as accessory.

Connections

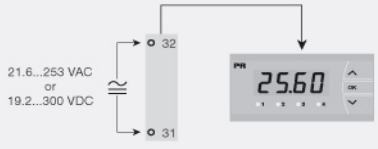
Input signals:



Output signals:



Supply:



Order:

Type	Version	
5714	Standard	: A
	2 relays	: B
	Analog output	: C
	Analog output and 2 relays	: D

Environmental Conditions

Specifications range..... -20°C to +60°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree (mounted in panel)..... IP65 / Type 4X, UL50E

Mechanical specifications

Dimensions (HxWxD)..... 48 x 96 x 120 mm
Cut out dimensions..... 44.5 x 91.5 mm
Weight approx..... 230 g
Wire size, pin 41-46 (max.)..... 1 x 1.5 mm^2 stranded wire
Wire size, others, max..... 1 x 2.5 mm^2 stranded wire
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...25 Hz..... ±1.6 mm
Vibration: 25...100 Hz..... ±4 g

Common specifications

Supply voltage, universal..... 21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Max. power consumption..... 2.5 W (5714A)
Max. power consumption..... 3.0 W (5714B/C)
Max. power consumption..... 3.5 W (5714D)
Internal consumption..... 2.2 W (5714A)
Internal consumption..... 2.7 W (5714B/C)
Internal consumption..... 3.2 W (5714D)
Isolation voltage, test / working..... 2.3 kVAC / 250 VAC
Signal / noise ratio..... Min. 60 dB (0...100 kHz)
Accuracy..... Better than 0.1% of selected range
Response time (0...90%, 100...10%): Temperature input (programmable)..... 1...60 s
mA / V input (programmable)..... 0.4...60 s
Auxiliary supply: 2-wire supply (pin 46...45)..... 25...15 VDC / 0...20 mA
EMC immunity influence..... < ±0.5% of readout

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
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 25 Ω
Sensor error detection, current input..... Loop break 4...20 mA
Voltage input: Measurement range..... 0...12 VDC
Programmable measurement ranges, VDC..... 0/0.2...1; 0/2...10 VDC
Input resistance, voltage input..... Nom. 10 MΩ

Output specifications

Display readout..... -1999...9999 (4 digits)
Decimal point..... Programmable
Digit height..... 13.8 mm
Display updating..... 2.2 times / s
Input outside input range is indicated by..... Explanatory text
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
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
Relay output: Relay functions..... Setpoint
Hysteresis..... 0...100%
ON and OFF delay..... 0...3600 s
Sensor error reaction..... Break / Make / Hold
Max. voltage..... 250 VRMS
Max. current..... 2 AAC
Max. AC power..... 500 VA
Max. load at 24 VDC..... 1 A

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
EAC TR-CU 020/2011..... EN 61326-1
DNV Marine..... Stand. f. Certific. No. 2.4
UL..... UL 508

F

Programmable LED indicator

5715

- 4-digit 14-segment LED display
- Input for mA, V, Ohm, RTD, TC and potentiometer
- 4 relays and analog output
- Universal supply
- Programmable via front keys and PC

Application

- Display for digital readout of current / voltage / resistance / temperature or 3-wire potentiometer signals.
- Process control with 4 pairs of potential-free change-over relays and analog output.
- For tank level control, with the possibility of customer linearization ensuring correct level measurement and control in non-linear tanks.

Technical characteristics

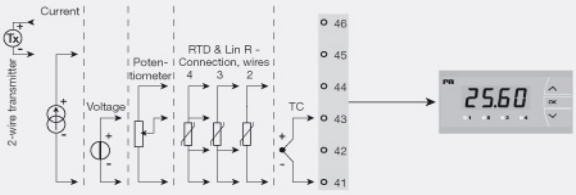
- 4-digit LED indicator with 13.8 mm 14-segment characters. Max. display readout -1999...9999 with programmable decimal point and relay ON / OFF indication.
- All standard operational parameters can be adjusted to any application by way of the front function keys. When programming is carried out by way of a PC and the configuration program PReset, additional configuration options are available, such as customer-defined linearization and special input signals.
- Help texts in eight languages can be selected via a menu item.
- A menu item allows the user to minimize the installation test time for the relay outputs by activating / deactivating each relay independently of the input signal.

Mounting / installation

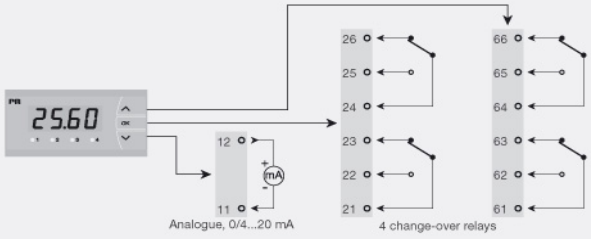
- To be mounted in panel front. The included rubber packing must be mounted between the panel cutout hole and the display front to obtain a protection degree of IP65 (type 4X). For extra protection in extreme environments, PR5715 can be delivered with a specially designed splash-proof cover as accessory.

Connections

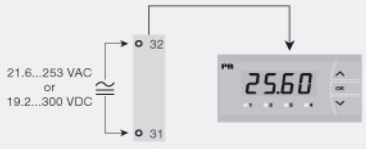
Input signals:



Output signals:



Supply:



Order:

Type	Version	
5715	4 relays	: B
	Analog output and 4 relays	: D

Environmental Conditions

Specifications range..... -20°C to +60°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree (mounted in panel)..... IP65 / Type 4X, UL50E

Mechanical specifications

Dimensions (HxWxD)..... 48 x 96 x 120 mm
Cut out dimensions..... 44.5 x 91.5 mm
Weight approx..... 260 g
Wire size, pin 41-46 (max.)..... 1 x 1.5 mm^2 stranded wire
Wire size, others, max..... 1 x 2.5 mm^2 stranded wire
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...25 Hz..... ±1.6 mm
Vibration: 25...100 Hz..... ±4 g

Common specifications

Supply voltage, universal..... 21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Max. power consumption..... 3.3 W (5715B)
Max. power consumption..... 3.8 W (5715D)
Internal consumption..... 3.0 W (5715B)
Internal consumption..... 3.5 W (5715D)
Isolation voltage, test / working..... 2.3 kVAC / 250 VAC
Signal / noise ratio..... Min. 60 dB (0...100 kHz)
Accuracy..... Better than 0.1% of selected range
Communications interface..... USB Loop Link
Response time (0...90%, 100...10%): Temperature input..... ≤ 1 s
Response time (0...90%, 100...10%): mA / V input..... ≤ 400 ms
Auxiliary supply: 2-wire supply (pin 46...45)..... 25...15 VDC / 0...20 mA
EMC immunity influence..... < ±0.5% of readout

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
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 25 Ω
Sensor error detection, current input..... Loop break 4...20 mA
Voltage input: Measurement range..... 0...12 VDC
Programmable measurement ranges, VDC..... 0/0.2...1; 0/2...10 VDC
Input resistance, voltage input..... Nom. 10 MΩ

Output specifications

Display readout..... -1999...9999 (4 digits)
Decimal point..... Programmable
Digit height..... 13.8 mm
Display updating..... 2.2 times / s
Input outside input range is indicated by..... Explanatory text
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
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
Relay output: Relay functions..... Setpoint
Hysteresis..... 0...100%
ON and OFF delay..... 0...3600 s
Sensor error reaction..... Break / Make / Hold
Max. voltage..... 250 VRMS
Max. current..... 2 AAC
Max. AC power..... 500 VA
Max. load at 24 VDC..... 1 A

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
EAC TR-CU 020/2011..... EN 61326-1
DNV Marine..... Stand. f. Certific. No. 2.4
UL..... UL 508

F

Programmable frequency indicator

5725

– Measures NPN, PNP, Contact, NAMUR, S0, Tacho and TTL sensors
– Programmable frequency input span of 0.001 Hz to 50 kHz
– The 5725D has two SPDT relays and one analog output
– Easy to read 4-digit, 14-segment LED display with scrolling help text
– Universally powered by 21.5…253 VAC or 19.2… 300 VDC

Application

- The 5725 measures, scales, and displays frequency signals found in many process speed and flow rate applications.
- The indicator can measure the period of the frequency, useful for displaying the elapsed time between events.
- The 5725D has two SPDT setpoint contacts and a 0/4...20 mA output for process control.
- The installed display provides IP65 environmental sealing, and additional protection is provided by the optional 8335 splash proof cover.

Technical characteristics

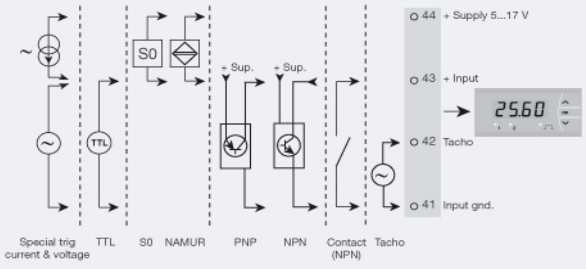
- 4-digit display with 13.8 mm high, 14-segment LED digits and adjustable decimal point.
- Indicator is scalable from -1999 to 9999.
- Scrolling help text makes programming easy.
- Customizable trigger levels allow measurement of nearly any pulse sensor.
- Built-in excitation source for measuring NPN, PNP, NAMUR and S0 sensors.
- Fast response time of 1 cycle + 100 ms, and excellent accuracy of better than 0.05% of selected range.
- The analog output current on the 5725D can be dampened from 0.1 to 60 seconds, and can handle up to 800 Ohms loop load.
- The 5725 meets NAMUR NE21 recommendations for high performance in harsh EMC environments.
- High 2.3 kVAC galvanic isolation, and an excellent signal/noise ratio of > 60dB.

Mounting / installation / programming

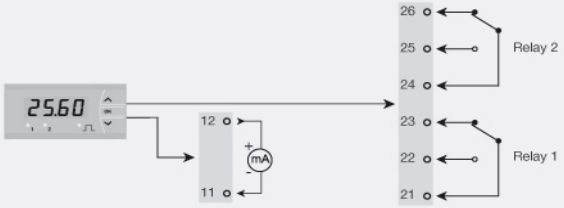
- Easy to mount 1/8 DIN (48x96 mm) panel meter with IP65 (type 4X) sealing.
- Approved for marine applications.
- Fully push-button programmable.
- Password-protected.

Connections

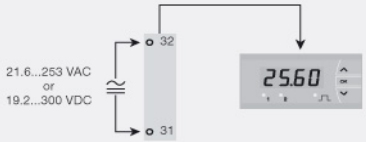
Input signals:



Output signals:



Supply:



F

Order:

Type	Version	
5725	Standard	: A
	Analog output and 2 relays	: D

Environmental Conditions

Specifications range	-20°C to +60°C
Storage temperature	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP20
Protection degree (mounted in panel)	IP65 / Type 4X, UL50E
Installation in	Pollution degree 2 & measurement / overvoltage cat. II

Mechanical specifications

Dimensions (HxWxD)	48 x 96 x 120 mm
Cut out dimensions	44.5 x 91.5 mm
Weight approx	230 g
Wire size, pin 11-12 & 41-44, max	1 x 1.5 mm^2/ AWG 30...16 stranded wire
Wire size, others, max	1 x 2.5 mm^2/ AWG 30...12 stranded wire
Terminal connection	Spring-cage
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage, universal	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Max. power consumption	< 2.8 W (5725A)
Max. power consumption	< 3.6 W (5725D)
Isolation voltage, test / working	2.3 kVAC / 250 VAC
Signal / noise ratio	> 60 dB
Accuracy	Better than 0.05% of selected range
Response time (0...90%, 100...10%)	< 1 period + 100 ms
EMC immunity influence	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications

Frequency range, f/I conversion function	0.001 Hz to 50 kHz
Low cut-off frequency	0.0009 Hz (default value)
Max. frequency, with input filter ON	50 Hz
Time range, period time function	999.9 s to 20 µs
Low cut off period time (time-out)	1111 s
Min. period time with input filter ON	20 ms
Input types	NAMUR acc. to EN 60947-5-6
Input types	Tacho
Input types	NPN / PNP
Input types	TTL
Input types	S0 acc. to DIN 43864
Input types	Special voltage
Input types	Special current

Output specifications

Display readout	-1999...9999 (4 digits)
Decimal point	Programmable
Digit height	13.8 mm
Display updating	2.2 times / s
Input outside input range is indicated by	Explanatory text
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
Current limit	≤ 28 mA
Sensor error indication, current output	0 / 3.5 / 23 mA / none
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
Relay output: Relay functions	Setpoint
Hysteresis, in % / display counts	0...100% / 0...9999
ON and OFF delay	0...3600 s
Power On delay	0...60 s
Sensor error reaction	Break / Make / Hold
Max. voltage	250 VRMS
Max. current	2 AAC
Max. AC power	500 VA
Max. load at 24 VDC	1 A

Approvals

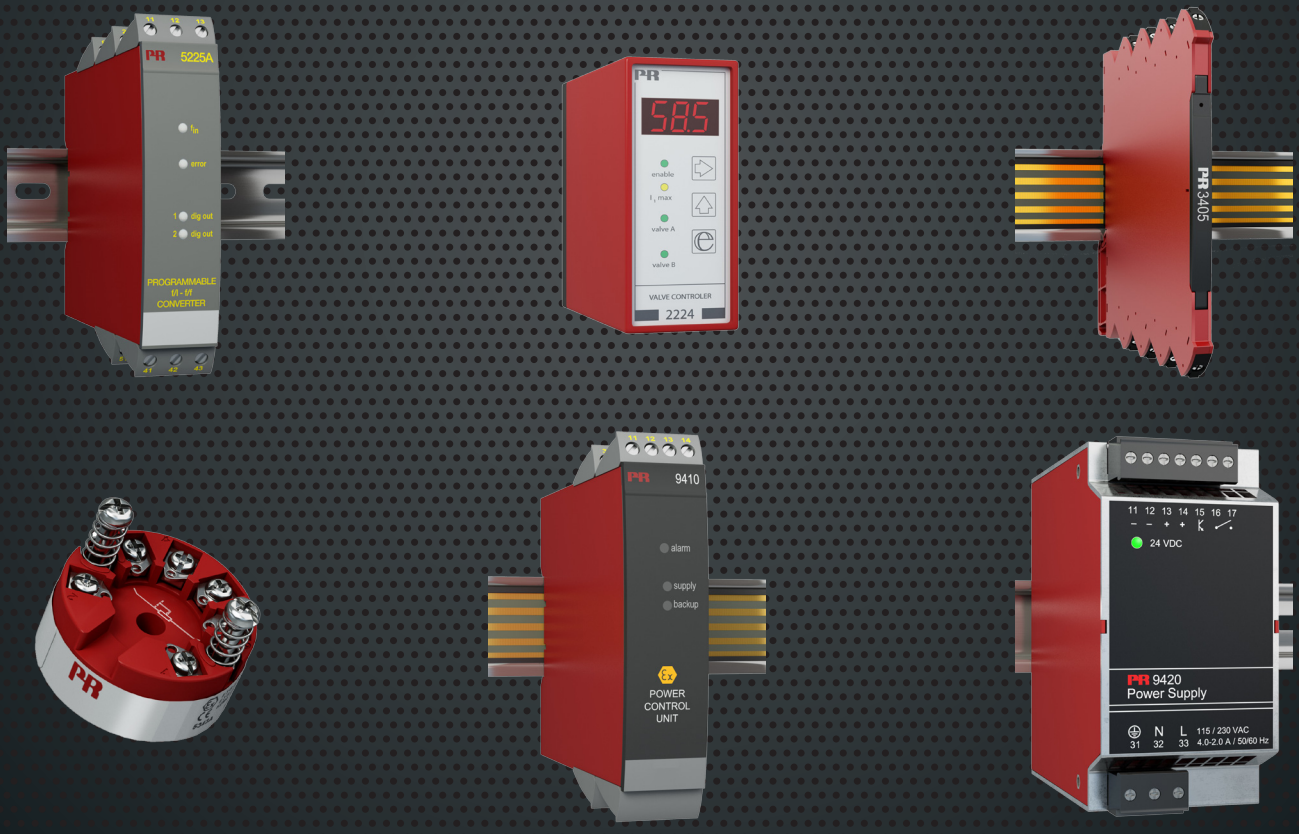
EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4
UL	UL 508

F

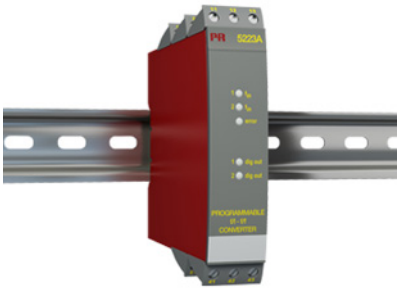
Devices for special applications

Since 1974, we have provided the process industry with ingenious devices for special applications. We have done this in close cooperation with our customers, ensuring that the designs provide the optimal smart solutions for their industry standard.

These special devices include: valve controllers, transmitters, ramp generators, up-down ramp controls, limit switches, trip amplifiers, load cell amplifiers, power supplies, etc.



Special devices



Programmable f/I-f/f converter

5223A

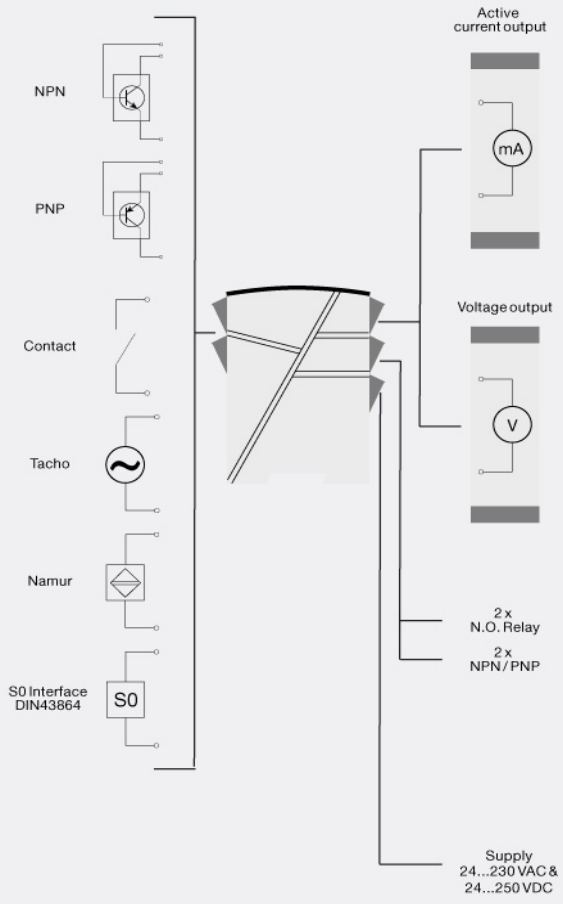
– Pulse calculator
– Frequency generator
– Galvanic isolation
– Analog current and voltage output
– PNP / NPN output, optional relays
– Universal supply

Advanced features
- The 5223 transmitter can be configured with a standard PC and the Loop Link communications unit, or delivered fully configured.

Application
- The f/I function performs frequency to current and voltage conversion.
- The f/f function can be used for pulse division or multiplication and as a buffer collecting fast pulse trains.
- A scale factor may be entered in all functions. Using both digital inputs, pulse addition or subtraction are possible.
- The frequency generator function is used as e.g. a time base or clock generator.
- Input and supply polarity reversal protection.
- Current and voltage output signals galvanically separated from the supply and the inputs.
- Programmable digital outputs including NPN, PNP or relay options.

Technical characteristics
- 5 front LEDs, indicating f1 and f2 active inputs (not NPN), Dig.out.1 and 2 active outputs, and a programmable error signal.
- Analog current output can be configured to any current within 0...20 mA range.
- Voltage output range is selectable between 0...10 VDC and 0...1 VDC by use of internal jumpers.
- Programming can be performed with or without a power supply.

Connections



Order:

Type	Output	
5223A	Analog + NPN / PNP	: 1
	Analog + relay output	: 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.	240 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	3.5 W
Internal consumption	3 W
Isolation voltage, test / working	3.75 kVAC / 250 VAC
Power-up delay	0...999 s
Warm-up time	1 min.
Communications interface	Loop Link
Signal / noise ratio	Min. 60 dB
Response time, analog	< 60 ms + period
Response time, digital output	< 50 ms + period
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC
Auxiliary voltage: NAMUR supply	8.3 VDC ±0.5 VDC / 8 mA
S0 supply	17 VDC / 20 mA
NPN / PNP supply	17 VDC / 20 mA
Special supply (programmable)	5...17 VDC / 20 mA
Temperature coefficient	< ±0.01% of span / °C
Linearity error	< 0.1% of span
EMC immunity influence	< ±0.5%

Input specifications

Max. offset	90% of selected max. frequency
Measurement range	0...20 kHz
Min. measurement range	0.001 Hz
Max. frequency, with input filter ON	50 Hz
Min. period time with input filter ON	20 ms
Input types	NAMUR acc. to DIN 19234
Input types	Tacho
Input types	NPN / PNP
Input types	2-phase encoder
Input types	TTL
Input types	S0 acc. to DIN 43864

Output specifications

Max. offset	50% of selected max. value
Current output: Signal range	0...20 mA
Min. signal range	5 mA
Updating time	20 ms
Load (max.)	20 mA/600 Ω/12 VDC
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	< 23 mA
Voltage output through internal shunt	See manual for details
Voltage output: signal range	0...10 VDC
Voltage output, min. signal range	250 mV
Load (min.)	500 kΩ
Other output types	Active outputs (NPN / PNP)
Other output types	f/f converter output
Other output types	Frequency generator
Relay output: Max. switching frequency	20 Hz
Max. voltage	250 VRMS
Max. current	2 AAC
Max. AC power	100 VA
Max. load at 24 VDC	1 A
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
PELV/SELV	IEC 364-4-41 and EN 60742
ATEX 2004/108/EC	KEMA 04ATEX1001
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410

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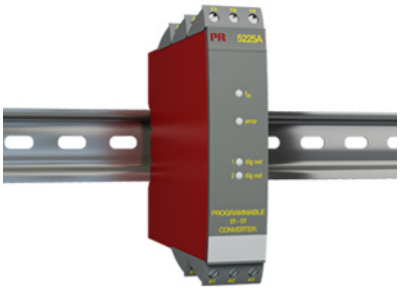


Programmable f/I-f/f converter

5225

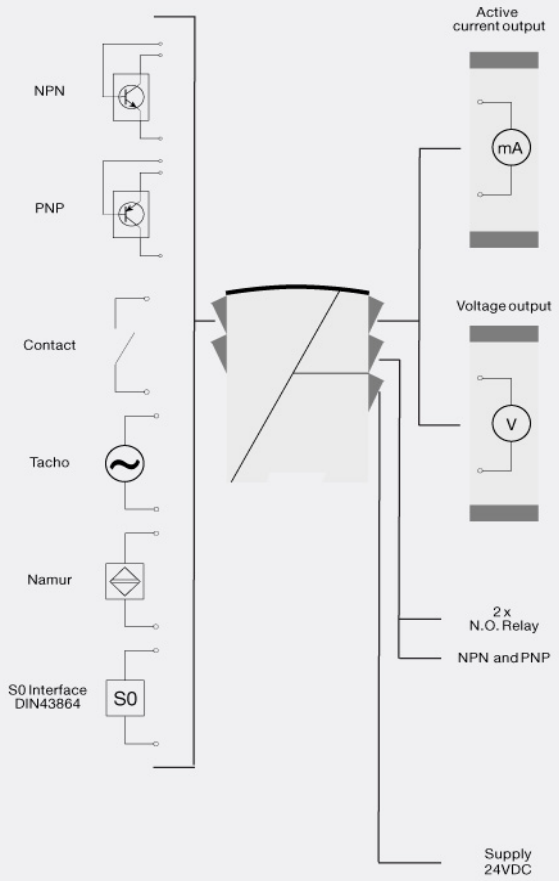
– Pulse conditioning
– Frequency generator
– Concurrent f/I and f/f function
– Analog current and voltage output
– PNP / NPN output, optional relays
– Programmable by PC and Loop Link

Advanced features
- The 5225 transmitter can be configured with a standard PC and the Loop Link communications unit, or delivered fully configured.

Application
- The f/I function performs frequency to current and voltage conversion.
- The f/f function can be used for pulse division or multiplication and as a buffer collecting fast pulse trains.
- The concurrent f/I and f/f functions enable a scaled digital output signal in conjunction with the analog output.
- The frequency generator function is used as e.g. a time base or clock generator.
- Input and supply polarity reversal protection.
- Current and voltage output signals galvanically separated from the supply and the inputs.
- Programmable digital outputs including NPN, PNP or relay options.

Technical characteristics
- 4 front LEDs, indicating f in active inputs (not NPN), Dig.out.1 (NPN or relay 1) and Dig.out 2 (relay 2) outputs, and a NAMUR input error signal.
- Analog current output can be configured to any current within 0...20 mA range.
- Voltage output range is selectable between 0...10 VDC and 0...1 VDC by use of internal jumpers.
- Programming can be performed with or without a power supply.

Connections



Order:

Type	Output	
5225	Analog + NPN / PNP	: 1
	Analog + relay output	: 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.	190 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	19.2...28.8 VDC
Max. power consumption	3.5 W
Internal consumption	1.7 W
Warm-up time	30 s
Power-up delay	0...999 s
Communications interface	Loop Link
Signal / noise ratio	Min. 60 dB
Response time, analog	< 60 ms + period
Response time, digital output	< 50 ms + period
Response time, concurrent f/I and f/f	< 80 ms + period
Signal dynamics, output	16 bit
Effect of supply voltage change	< ±0.002% of span / %V
Auxiliary voltage: NAMUR supply	8.3 VDC ±0.5 VDC / 8 mA
S0 supply	17 VDC / 20 mA
NPN / PNP supply	17 VDC / 20 mA
Special supply (programmable)	5...17 VDC / 20 mA
Temperature coefficient	< ±0.01% of span / °C
Linearity error	< 0.1% of span
EMC immunity influence	< ±0.5%

Input specifications

Max. offset	90% of selected max. frequency
Measurement range	0...20 kHz
Min. measurement range	0.001 Hz
Low cut-off frequency	0.001 Hz
Max. frequency, with input filter ON	50 Hz
Min. period time with input filter ON	20 ms
Input types	NAMUR acc. to DIN 19234
Input types	Tacho
Input types	NPN / PNP
Input types	TTL
Input types	S0 acc. to DIN 43864

Output specifications

Max. offset	50% of selected max. value
Current output: Signal range	0...20 mA
Min. signal range	5 mA
Updating time	20 ms
Updating time	40 ms for concurrent f/I and f/f
Load (max.)	20 mA/600 Ω/12 VDC
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	< 23 mA
Voltage output through internal shunt	See manual for details
Other output types	Active outputs (NPN / PNP)
Other output types	f/f converter output
Other output types	Frequency generator
Relay output: Max. switching frequency	20 Hz
Relay output: Isolation, test / working	3.75 kVAC / 250 VAC
Max. voltage	250 VRMS
Max. current	2 AAC
Max. AC power	500 VA
Max. load at 24 VDC	1 A
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
PELV/SELV	IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011	EN 61326-1

G

Trip amplifier

2231

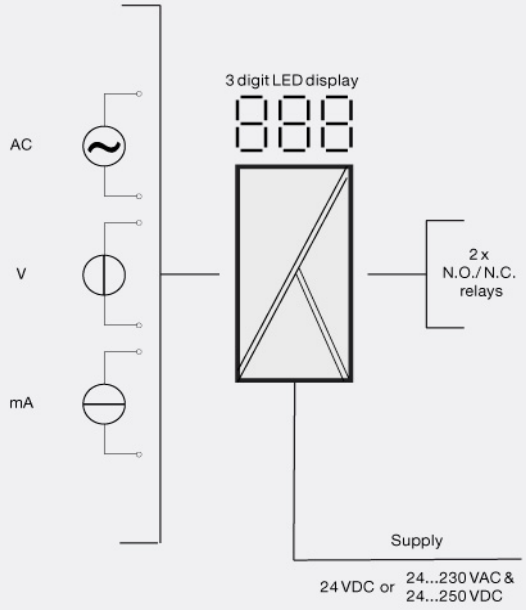
– AC/DC trip amplifier
– 2 adjustable alarm limits
– Galvanically isolated 3.75 kVAC
– Front-programmable
– 3-digit LED display
– 24 VDC or universal supply

Advanced features
- The front-operated push buttons are used for programming the different standard functions.
- A password can prevent access for changing parameters.

Application
- Alarm detector in connection with measurement of AC/DC current or voltage signals.
- The unit is used where accurate setpoint setting and different alarm functions are required.
- The unit can be used as a single or dual trip amplifier.
- Used in applications where programmable parameters such as hysteresis, setpoint, reset, active relay for increasing or decreasing signal, delay and input signal need to be set.

Technical characteristics
- 3-digit display showing the input signal in %.
- Two LED indicating relay status.
- 3 pushbuttons for programming.
- Standard DC current input signals in the range 0...20 mA.
- DC voltage signals in the range 0...250 VDC.
- AC current signals up to 1 A.
- True RMS measurement of AC voltage signals in the range 0...250 VAC.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



Order:

Type	Supply
2231	24 VDC : D 24...230 VAC / : P 24...250 VDC

Environmental Conditions

Specifications range	-20°C to +60°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP50

Mechanical specifications

Dimensions (HxWxD)	80.5 x 35.5 x 84.5 mm (D is without pins)
Weight DC / universally supplied	125 g / 175 g

Common specifications

Supply voltage	19.2...28.8 VDC
Supply voltage, universal	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Internal consumption	1.5 W (2231D)
Internal consumption	2 W (2231P)
Isolation voltage, test / working	3.75 kVAC / 250 VAC
Response time (programmable)	0.25...60 s (DC)
Response time (programmable)	0.75...60 s (AC)
Updating time	100 ms
Accuracy	Better than 0.1% of selected range
Signal dynamics, input	16 bit
Effect of supply voltage change	< ±0.002% of span / %V
Temperature coefficient	< ±0.01% of span /°C (DC signals)
Temperature coefficient	< ±0.02% of span /°C (AC signals)
Linearity error	< 0.1% of span
Linearity error	< ±0.35% of span 50...1000 Hz (AC sine wave signals)
EMC immunity influence	< ±0.5%

Input specifications

Max. offset	50% of selected max. value
Current input: Measurement range	0...20 mA
Min. measurement range (span), current input	10 mA
Input resistance, current input	50 Ω
AC current input: Measurement range	0...1 ARMS
Min. measurement range (span), AC current	0.5 ARMS
Input resistance, AC current	1 Ω / 2 W
Voltage input: Measurement range	0...250 VDC
Min. measurement range (span), voltage input	0.5 VDC
Input resistance, voltage input	Nom. 5 MΩ
AC voltage input: Measurement range	0...250 VRMS
Min. measurement range (span), AC voltage	0.5 VRMS
Input resistance, AC voltage	Nom. 5 MΩ

Output specifications

Relay outputs: Setpoint setting	0...99.9% of span
Hysteresis	0...99.9% of span
Updating time	100 ms
ON and OFF delay	0.0...99.9 s
Max. voltage	250 VRMS
Max. current	2 AAC
Max. AC power	500 VA
Max. load at 24 VDC	1 A
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
PELV/SELV	IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011	EN 61326-1

G

f/I-f/f converter

2255

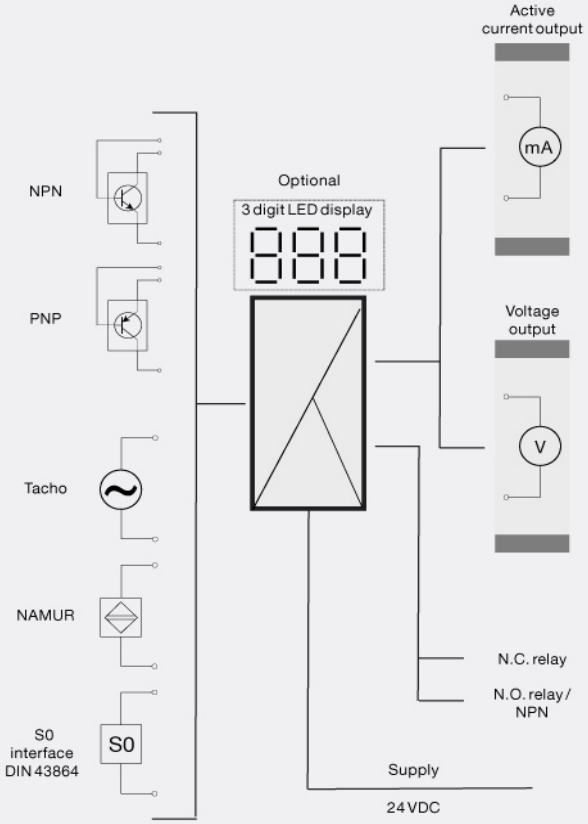
– Programmable f/I converter
– Programmable decimal divider / decimal multiplier
– Programmable frequency generator
– Relay output as option
– Supply voltage 24 VDC

Advanced features
- The user programmable version has a multifunction user interface consisting of three pushbuttons and a 3-digit LED displays.

Application
- Typical signalling devices may be pulse generators, for instance flow meters, tacho-generators or inductive sensors.
- The f/I function is used for frequency to current / voltage conversion.
- The f/f function is used for division or multiplication of pulses and as a buffer for fast pulse trains.
- A frequency generator function e.g. used as a time base or a clock generator.

Technical characteristics
- 3 front LEDs, indicating f.in active input (not NPN), Dig.out (NPN or relay 1) active output and a NAMUR input error signal.
- Analog current output can be configured within 0...20 mA range.
- Voltage output range is selectable between 0...10 VDC by use of internal jumpers.
- Feature include input filter, contact filter and an auxiliary supply for sensor such as NAMUR and S0.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



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Order:

Type	Version	Output
2255	Programmable : B	Analog + NPN output : 1 Analog + relay output : 2

Environmental Conditions

Specifications range	-20°C to +60°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP50

Mechanical specifications

Dimensions (HxWxD)	80.5 x 35.5 x 84.5 mm (D is without pins)
Weight approx.	125 g

Common specifications

Supply voltage	19.2...28.8 VDC
Internal consumption	2.4 W
Isolation voltage, test / working	1.4 kVAC / 150 VAC
Warm-up time	1 min.
Signal / noise ratio	Min. 60 dB
Response time (programmable)	60 ms to 999 s + period time
Accuracy	Better than 0.1% of selected range
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC
Temperature coefficient	< ±0.01% of span / °C
Linearity error	< 0.1% of span
S0 supply	15 VDC / 25 mA
Special supply (programmable)	5...15 VDC / 30 mA (acc. to order)
EMC immunity influence	< ±0.5%

Input specifications

Max. offset	90% of selec. max. value
Measurement range	0...20 kHz
Min. measurement range	0.001 Hz
Low cut-off frequency	0.001 Hz
Min. pulse length	25 µs
Input types	NAMUR acc. to DIN 19234
Input types	Tacho
Input types	NPN / PNP
Input types	TTL
Input types	S0 acc. to DIN 43864

Output specifications

Max. offset	50% of selected max. value
Current output: Signal range	0...20 mA
Min. signal range	5 mA
Updating time	20 ms
Load (max.)	20 mA/600 Ω/12 VDC
Load stability, current output	≤0.01% of span / 100 Ω
Voltage output through internal shunt	See manual for details
Max. current, NPN output	130 mA
Max. voltage, NPN output	28 VDC
Frequency output range	0...1000 Hz
Min. pulse length	500 µs
Max. pulse length	999 ms
Max. duty cycle	50%
Frequency generator: Pulse length f < 50 Hz	Min. 10 ms
Frequency generator: Pulse length f < 50 Hz	Max. 999 s
Pulse length f ≥ 50 Hz	50% duty cycle
Relay output: Max. switching frequency	20 Hz
Max. voltage	150 VRMS
Max. current	2 AAC
Max. AC power	300 VA
Max. load at 24 VDC	1 A
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
EAC TR-CU 020/2011	EN 61326-1

G

Switchmode power supply

2220

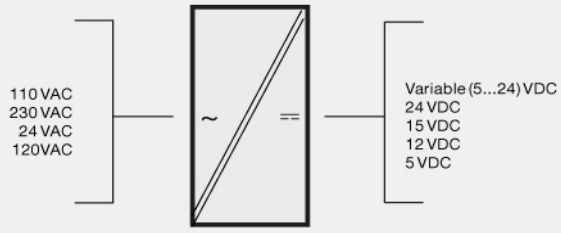
– Mains voltage input
– Isolation 3.75 kVAC
– Short-circuit protection
– Thermal overload protection
– Standard 11-pole relay socket

Advanced features
- The power supply is based on secondary switchmode technology to achieve a high efficiency.
- The output is adjustable from front potentiometer in the range 5...24 VDC.

Application
- General power supply for smaller measurement systems requiring fixed stabilized 24 VDC, or supply for any other sensors, transmitters or as a general variable power supply 5 to 24 VDC.
- Two units may be connected in series for plus / minus or higher output voltage.
- Suitable for PELV/SELV applications.

Technical characteristics
- A green LED indicates active output.
- Double-isolated safety transformer.
- Isolation test voltage between input and output is 3.75 kVAC.
- The input circuit is protected with a thermal fuse.
- Output short circuit protection with current limiter.

Connections



Order:

Type	Version		Output	
2220	110 VAC	: A	Special (5...24 V)	: 0
	230 VAC	: B	24 VDC	: 1
	24 VAC	: D	15 VDC	: 2
	120 VAC	: F	12 VDC	: 3
			5 VDC	: 4

Environmental Conditions

Specifications range..... -20°C to +60°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP50

Mechanical specifications

Dimensions (HxWxD)..... 80.5 x 35.5 x 84.5 mm (D is without pins)
Weight approx..... 425 g

Common specifications

Internal consumption..... 4 W
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Transformer..... EN 60742
Effect of supply voltage change..... < ±30 mV (±10%)
Transient stability (10%-max. load)..... < 250 mV
Temperature coefficient..... 0.05% / °C
EMC immunity influence..... < ±0.5%

Input specifications

Input voltage (AC)..... 21.6...26.4 VAC
Input voltage (AC)..... 99...121 VAC
Input voltage (AC)..... 108...132 VAC
Input voltage (AC)..... 207...253 VAC
Frequency..... 50...60 Hz

Output specifications

Output voltage..... 4.75...25.2 VDC
Output power..... Max. 7 W
Output current..... 1 A / 5 VDC
Output current..... 0.55 A / 12 VDC
Output current..... 0.45 A / 15 VDC
Output current..... 0.3 A / 24 VDC
Load effect (10%-max. load)..... < 1.5% / A
Current limit..... Typ. 2.2 A (short circuit)
Output ripple..... < 20 mVRMS

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011..... EN 61326-1

G

Switchmode power supply

2222

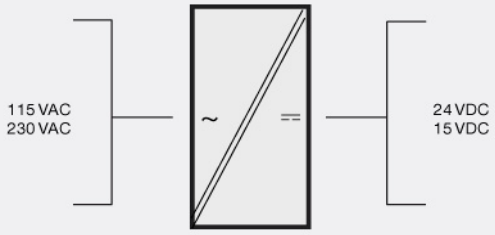
– 230 or 115 VAC primary voltage
– 24 or 15 VDC output voltage
– Double isolation by 3.75 kVAC
– 48 Watt output power, short circuit-protected
– Thermal protection against overload

Advanced features
- The power supply is based on primary switchmode technology to achieve a high efficiency.
- An internally mounted potentiometer allows for a ±5% adjustment of the output voltage.

Application
- General 24 or 15 VDC supply for equipment that requires a stabilised DC voltage.
- Two units can be connected in series to achieve a plus / minus supply or a higher output voltage.
- Separation of circuits in safety installations according to the PELV/SELV norm.
- Galvanic isolation between the primary and the secondary voltage is achieved through the double-isolated safety transformer.

Technical characteristics
- A green LED in the front of the module indicates an active primary voltage.
- Input circuit protected with a thermal fuse.
- DC output short circuit protection with current limiter.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



Order:

Type	Input		Output	
2222	115 VAC	: A	24 VDC	: 1
	230 VAC	: B	15 VDC	: 2

Environmental Conditions

Specifications range..... -20°C to +60°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP30

Mechanical specifications

Dimensions (HxWxD)..... 80.5 x 35.5 x 84.5 mm (D is without pins)
Weight approx..... 210 g

Common specifications

Fuse..... 1 A SB / 250 VAC
Max. power consumption..... 60 VA
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Effect of supply voltage change..... < 1% (±10%)
Efficiency..... ≥ 80%
Thermal overload protection..... 100°C
Power derating..... 1% / °Camb. (Tamb. > 40°C)
Transient stability (10%-max. load)..... < 500 mV
Temperature coefficient..... 0.05% / °C
EMC immunity influence..... < ±0.5%

Input specifications

Supply voltage..... 207...253 VAC
Supply voltage..... 102.4...132.2 VAC
Frequency..... 50...60 Hz

Output specifications

Output voltage..... 24 or 15 VDC
Adjustment..... ±5%
Output power..... 48 W (max.)
Output current..... 2 A / 24 VDC
Output current..... 2 A / 15 VDC
Load effect, (0-max. load)..... < 1.5% / A
Current limit..... Nom. 2.5 A (electronic)
Output ripple..... ≤ 40 mVRMS (100 kHz)

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011..... EN 61326-1

G

Dual switchmode power supply

2223

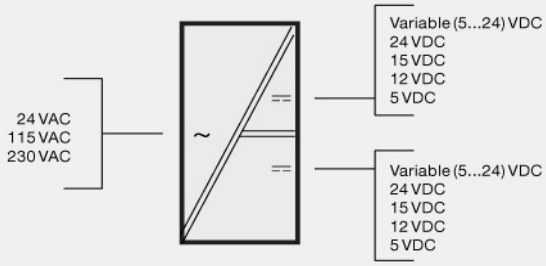
– 24 / 115 / 230 VAC supply voltage
– 3.75 kVAC isolation
– 2 adjustable 5...24 VDC outputs
– Output: ±5...24 VDC, 10...48 VDC
– Short-circuit protection
– Thermal protection against overload

Advanced features
- The power supply is based on primary switch mode technology to achieve a high efficiency.
- The outputs are adjustable by 2 front potentiometers in the ranges 5...24 VDC.

Application
- Supply for small measuring systems that demand 2 stabilized voltages.
- Either as a combination of positive and negative voltages, or as 2 separate supplies as required.
- The two supplies are galvanically separated with 500 VAC test voltage and can be connected in series or used as two independent supplies with or without common gnd.
- Separation of circuits in safety installations according to PELV/SELV.
- Galvanic isolation between the primary and the secondary voltage is achieved through the double-isolated safety transformer.

Technical characteristics
- Two green LEDs, Power ON 1 and Power ON 2, indicate active outputs.
- By connecting the two outputs in series, 10...48 VDC or ±5...24 VDC can be achieved.
- The Input circuit is protected with a bimetal thermal fuse.
- DC output short circuit protection with current limiter.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



G

Order:

Type	Version	Output 1	Output 2
2223	115 VAC : A 230 VAC : B 24 VAC : D	Special (5...24 VDC) : 0 24 VDC : 1 15 VDC : 2 12 VDC : 3 5 VDC : 4	Special (5...24 VDC) : 0 24 VDC : 1 15 VDC : 2 12 VDC : 3 5 VDC : 4

Environmental Conditions

Specifications range..... -20°C to +60°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP30

Mechanical specifications

Dimensions (HxWxD)..... 80.5 x 35.5 x 84.5 mm (D is without pins)
Weight approx..... 400 g

Common specifications

Internal consumption..... 4 W
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Isolation output 1 / 2, test / working..... 500 VAC / 50 VAC (75 VDC)
Effect of supply voltage change..... < ±30 mV (±10%)
Transformer..... EN 60742
Transient stability (10%-max. load)..... < 250 mV
Temperature coefficient..... 0.05% / °C
EMC immunity influence..... < ±0.5%

Input specifications

Supply voltage..... 21.6...26.4 VAC
Supply voltage..... 103.5...126.5 VAC
Supply voltage..... 207...253 VAC
Frequency..... 50...60 Hz

Output specifications

Output voltage..... 4.75...25.2 VDC
Output power..... Max. 7.5 W (total)
Output current, per channel..... 0.5 A / 5 VDC (2.5 W)
Output current, per channel..... 0.37 A / 12 VDC (4.5 W)
Output current, per channel..... 0.30 A / 15 VDC (4.5 W)
Output current, per channel..... 0.18 A / 24 VDC (4.3 W)
Load effect (10%-max. load)..... < 1.5% / A
Current limit..... Typ. 100 mA (short circuit)
Output ripple..... < 20 mVRMS

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011..... EN 61326-1

G

Switchmode voltage regulator

2229

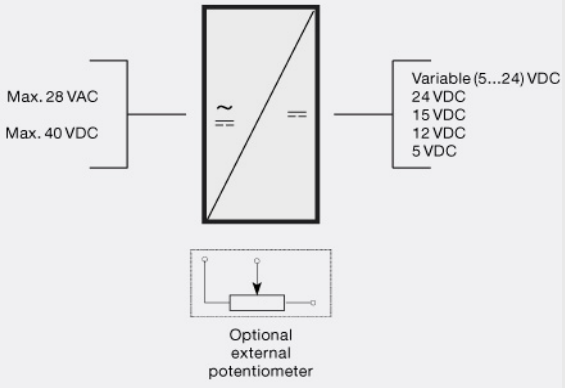
– AC/DC input voltage
– Adjustable output 5...24 VDC, max. 40 W
– Adjustable from external potentiometer
– Short-circuit protection
– Thermal overload protection
– Standard 11-pole relay socket

Advanced features
- The regulator is based on primary switchmode technology to achieve a high efficiency.
- The outputs are adjustable from a front potentiometer in the range 5...24 VDC or from an external potentiometer.

Application
- General voltage regulator for external transformer used in connection with measurement systems requiring fixed stabilized 24 VDC.
- Supply for any other sensors, transmitters or a general variable voltage regulator in the range 5...24 VDC.
- Used as a power efficient pre-regulator for 5 VDC linear regulator (e.g. from 32 V to 8 V).
- Used as adjustable power supply controlled from external potentiometer.

Technical characteristics
- A green LED indicates active output.
- AC or DC input voltages.
- A rectifier bridge allows free choice of polarity for the DC input.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



G

Order:

Type	Version		Output	
2229	AC or DC	: A	Special (5...24 V)	: 0
			24 VDC	: 1
			15 VDC	: 2
			12 VDC	: 3
			5 VDC	: 4

Environmental Conditions

Specifications range..... -20°C to +60°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP30

Mechanical specifications

Dimensions (HxWxD)..... 80.5 x 35.5 x 84.5 mm (D is without pins)
Weight approx..... 170 g

Common specifications

Internal consumption..... 10 W
Transient stability (10%-max. load)..... < 250 mV
Temperature coefficient..... 0.05% / °C
EMC immunity influence..... < ±0.5%

Input specifications

Input voltage (AC)..... Max. 28 VAC
Input voltage (AC)..... Min. VAC = (Vout. + 5) / 1.2
Input voltage (DC)..... Max. 40 VDC
Input voltage (DC)..... Min. VDC = (Vout. + 5)
Frequency..... 50...60 Hz

Output specifications

Output voltage..... 4.5...26.4 VDC
Output power..... Max. 40 W
Output current..... Max. 2.5 A / 5 VDC
Output current..... Max. 2.5 A / 12 VDC
Output current..... Max. 2.5 A / 15 VDC
Output current..... Max. 1.7 A / 24 VDC
Load effect, (0-max. load)..... < 1.5% / A
Current limit..... Typ. 5.8 A (short circuit)
Output ripple..... < 20 mVRMS

Approvals

EMC..... EN 61326-1
EAC TR-CU 020/2011..... EN 61326-1

G

Transformer

2240

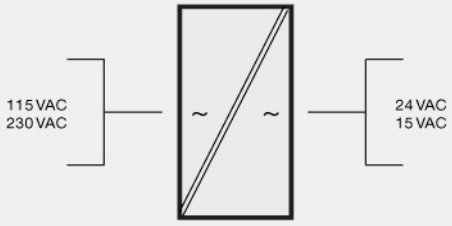
– Double-isolated transformer
– 3.75 kVAC isolation voltage
– 30 VA ring core transformer
– Thermal overload protection
– 12 or 24 VAC secondary voltage
– Standard 11-pole relay socket

Advanced features
- Two transformers may be paralleled for higher output power.

Application
- Transformer for supply of components with 12 or 24 VAC supply voltage.
- Transformer for stabilized DC power supplies, e.g. type 2229.

Technical characteristics
- Standard primary input voltages of 115 or 230 VAC with special primary voltages to order.
- Standard secondary voltages of 12 or 24 VAC with special secondary voltages to order.
- Ring core transformer with separate 3.75 kVAC isolation voltage between primary and secondary windings.
- Fitted with a thermal fuse.
- The device is supplied with a retention clip for a safe attachment to the relay socket.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



Order:

Type	Input		Output	
2240	115 VAC	: A	Special	: 0
	230 VAC	: B	24 VAC	: 1
	Special	: X	12 VAC	: 2

Environmental Conditions

Specifications range..... -20°C to +60°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP50

Mechanical specifications

Dimensions (HxWxD)..... 80.5 x 35.5 x 84.5 mm (D is without pins)
Weight approx..... 600 g

Common specifications

Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Power derating..... Tamb. > 25°C, 0.4 VA/°C
EMC immunity influence..... < ±0.5% of span

Input specifications

Primary voltage..... 207...253 VAC
Primary voltage..... 97.75...132.25 VAC
Frequency..... 50...60 Hz

Output specifications

Secondary voltage (loaded)..... 24 VAC / 1.25 A
Secondary voltage (unloaded)..... 28 VAC
Secondary voltage (loaded)..... 12 VAC / 2.50 A
Secondary voltage (unloaded)..... 14 VAC
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
PELV/SELV..... IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011..... EN 61326-1

G

Valve controller

2224

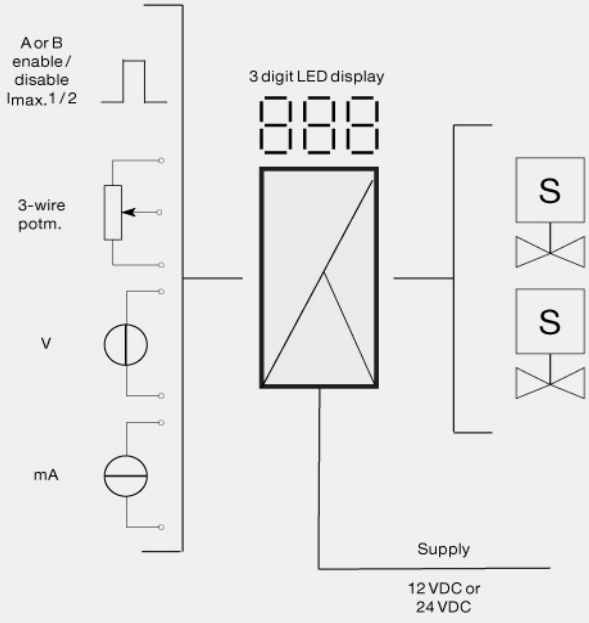
– Front-programmable
– mA, V, and Ω programmable input
– Ramp times, jump values, reversal, chopper frequency, and deadband
– 3-digit LED display shows I-valve % value
– 1 or 2 channels

Advanced features
- Multifunction user interface consisting of three pushbuttons and a 3-digit LED display.
- All parameters are protected against unauthorized changes with a password.

Application
- Control and regulation of single- or double-coil hydraulic and pneumatic proportional valves used for accurate oil flow regulation, linear soft acceleration and deceleration, modulated output signal, and programmable deadband.
- Is highly suitable for joystick regulation of A/B movements.
- Where changes to A and B need to be selected directly or according to the value of an input signal.

Technical characteristics
- During operation the display shows the present output signal as a % of the I valve.
- Programmable current or voltage input for standard signals acc. to order schedule, joystick / potentiometer or a special non-programmable input.
- Digital inputs for external control functions.
- A pulsating current output prevents the connected valve from sticking.
- Optional programming of the modulation frequency (PWM) between 8 and 400 Hz.
- Multiple adjustable parameters such as output currents, ramp times, jump values, chopper frequency, reversal, deadband, and ON/OFF functions.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



G

Order:

Type	Input		Supply		Option	
2224	0...20 mA	: A	12 V	: 1	Single valve (A)	: A
	4...20 mA	: B	24 V	: 2	Double valve (A/B)	: B
	0...1 V	: C				
	0.2...1 V	: D				
	0...10 V	: E				
	2...10 V	: F				
	±10 V potentiometer	: G				
	0...10 V potentiometer	: H				

Environmental Conditions

Specifications range..... -20°C to +60°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP50

Mechanical specifications

Dimensions (HxWxD)..... 80.5 x 35.5 x 84.5 mm (D is without pins)
Weight approx..... 130 g

Common specifications

Supply voltage..... 9.6...14.4 or 19.2...28.8 VDC
Internal consumption..... 2 W / 24 V
Internal consumption..... 1,8 W / 12 V
Communication..... Front-programmable
Updating time..... 30 ms
Temperature coefficient..... 0.01%/°C
Linearity error..... 0.2%
EMC immunity influence..... < 2% of span

Input specifications

Current input: Measurement range..... 0...20 mA
Current input: Measurement range..... 4...20 mA
Input resistance, current input..... 50 Ω + PTC (54 Ω)
Voltage input: Measurement range..... 0/0.2...1 V and 0/2...10 V
Input resistance, voltage input..... 10 MΩ
Potentiometer input..... 0...10 V or ±10 V / 10 kΩ
Operation / shutdown..... PNP / 2.2 kΩ, 12 / 24 V
Imax.1 & Imax.2..... PNP / 2.2 kΩ, 12 / 24 V
A / B channel..... PNP / 2.2 kΩ, 12 / 24 V
Deadband..... 0...99.9% of input span

Output specifications

Output voltage..... Supply voltage-0.5 V (max.)
Output power..... 36 W (max.)
Output current..... 3000 mA mean
Current peak..... 7 A
Reference voltage..... 10 VDC (A valve)
Reference voltage..... ±10 VDC (A & B valve)
Ramp up & down..... Time 0...10.0 s
PWM frequency..... 8...400 Hz in steps of 1 Hz
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
EAC TR-CU 020/2011..... EN 61326-1

G

mV transmitter

2261

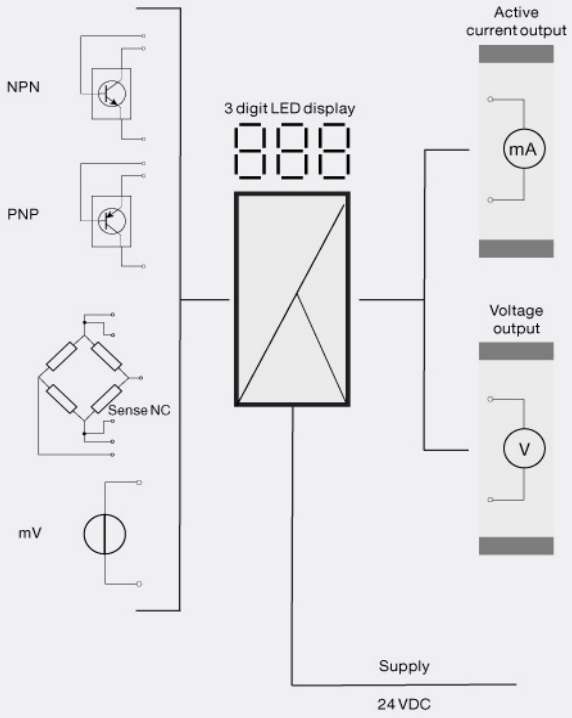
– Load cell amplifier
– mV to current / voltage conversion
– Front-programmable / LED display
– Relative calibration of input span
– NPN / PNP input for external taring
– Supply for standard transducers

Advanced features
- A multifunction user interface consisting of three pushbuttons and a 3-digit LED display for programming.

Application
- The 2261 converts bipolar mV signals from transducers supplied directly by the device to standard current / voltage signals.
- The 2261 is suitable for load cell application as well as other applications such as tank filling and draining, weighing with a taring function, measurement of cable tensile force, level control, signal conversion / amplification etc.

Technical characteristics
- Front error LED.
- The analog input can be programmed for voltage in the range -40...100 mVDC.
- The digital signal can be selected as either NPN or PNP.
- Taring can either be by way of the digital input or from the front interface.
- The analog output can be programmed to current in the range 0...20 mA or voltage in the range 0...10 VDC.
- Short circuit protected transducer supply which can be programmed to 5...13 VDC from the front.
- Sense input (with transducer supply used) for compensation for cable resistance to the transducer.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



G

Order:

Type
2261

Environmental Conditions

Specifications range	-20°C to +60°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP50

Mechanical specifications

Dimensions (HxWxD)	80.5 x 35.5 x 84.5 mm (D is without pins)
Weight approx.	130 g

Common specifications

Supply voltage	19.2...28.8 VDC
Max. power consumption	7.2 W
Internal consumption	2.2 W
Signal / noise ratio	Min. 60 dB
Response time (programmable)	0.06...999 s
Updating time	20 ms
Signal dynamics, input	17 bit
Signal dynamics, output	16 bit
Effect of supply voltage change	< ±0.002% of span / %V
Temperature coefficient	< ±0.01% of span / °C
Linearity error	< 0.1% of span
Auxiliary voltage: Transducer supply	5...13 VDC
Load (max.)	230 mA
EMC immunity influence	< ±0.5% of span

Input specifications

Max. offset	70% of selec. max. value
Voltage input: Measurement range	-40...100 mV
Min. measurement range (span), voltage input	10 mV
Input resistance, voltage input	> 10 MΩ
Overrange	0...999% of selected measurement range
NPN, digital input	Pull up 24 VDC / 6.9 mA
PNP, digital input	Pull down 0 VDC / 6.9 mA
Trig level low, NPN/PNP	< 6 VDC
Trig level high, NPN/PNP	> 10.5 VDC
Pulse length	> 30 ms

Output specifications

Max. offset	50% of selected max. value
Current output: Signal range	0...20 mA
Min. signal range	5 mA
Load (max.)	20 mA/600 Ω/12 VDC
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	< 23 mA
Voltage output through internal shunt	See manual for details
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
EAC TR-CU 020/2011	EN 61326-1

G

Ramp generator

2281

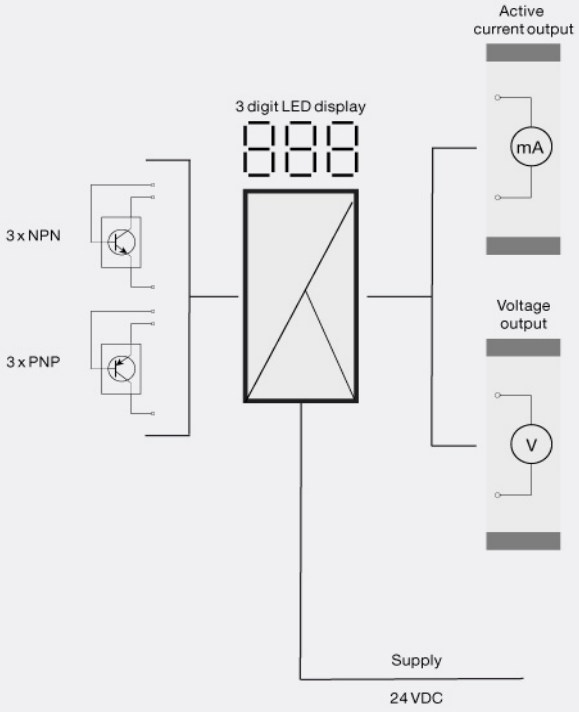
– Multiple functions
– Programmable from front
– 3-digit LED display
– NPN and PNP inputs
– Internal ramp time or external pulses
– Reset or preset function

Advanced features
- The user interface consists of a 3-digit display and 3 function keys in the front to change a function, ramp time or an output signal range.

Application
- To convert digital signals to a time-controlled analog signal with either internally entered up/down time or with external pulses for up/down function.
- 2-phase encoder.
- Ramp generator with internal time measurement.
- Ramp generator with external pulses.

Technical characteristics
- LED's for up, reset and down.
- 6 digital inputs make it possible to choose reset and up/down functions as either NPN or PNP input (+24 VDC).
- Via an analog switch the up and down inputs can be switched between input filters for a pulse length > 10 ms or > 0.5 ms. The 10 ms filter is used for elimination of contact-bounce.
- Analog standard current output of 0/4...20 mA or jumper selectable 0/2...10 mA, and standard voltages of 0/0.2...1 VDC, 0/2...10 VDC or special.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



Order:

Type
2281

Environmental Conditions

Specifications range	-20°C to +60°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP50

Mechanical specifications

Dimensions (HxWxD)	80.5 x 35.5 x 84.5 mm (D is without pins)
Weight approx.	120 g

Common specifications

Supply voltage	19.2...28.8 VDC
Max. power consumption	2.7 W
Internal consumption	2.4 W
Signal / noise ratio	Min. 60 dB
Response time	< 60 ms
Signal dynamics, output	16 bit
Up ramp time	0.1...999999 s
Down ramp time	0.1...999999 s
External pulses	1...15,615,744
Effect of supply voltage change	< 0.005% of span / VDC
Temperature coefficient	< ±0.01% of span / °C
Linearity error	< 0.1% of span
EMC immunity influence	< ±0.5%

Input specifications

Digital input	Up / down inputs
NPN, digital input	Pull up 24 VDC / 6.9 mA
PNP, digital input	Pull down 0 VDC / 6.9 mA
Pulse length	>10 ms / > 0.5 ms (programmable)
Input frequency	50 Hz / 1 kHz (max.)
Digital input	Reset inputs
Pulse length	> 30 ms
Input frequency	16 Hz

Output specifications

Max. offset	50% of selected max. value
Current output: Signal range	0...20 mA
Min. signal range	5 mA
Load (max.)	20 mA/600 Ω/12 VDC
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	20.5 mA
Voltage output through internal shunt	See manual for details
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
EAC TR-CU 020/2011	EN 61326-1

G

Signal controller

2286

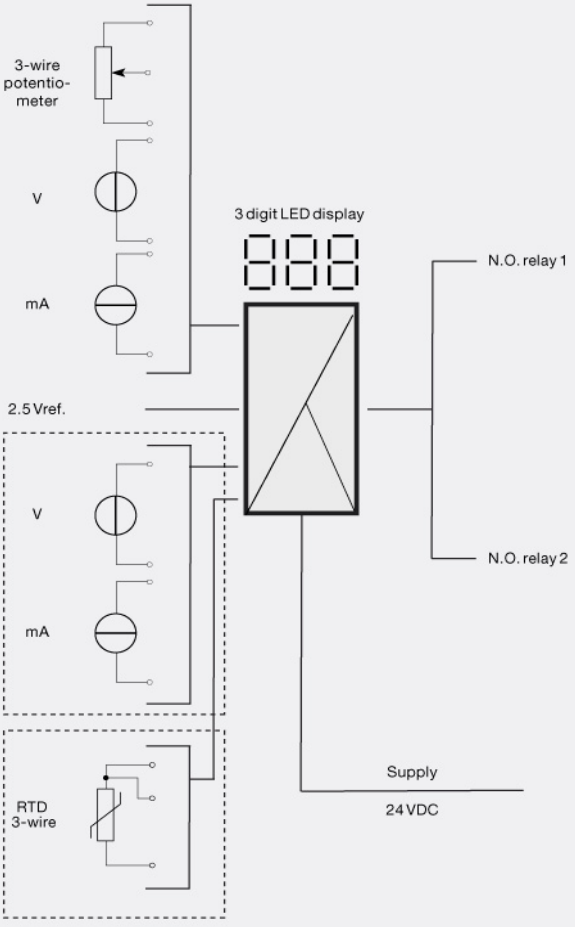
– Multiple functions
– Programmable from front
– 3-digit LED display
– Analog or Pt100 input
– Relay outputs
– Max. 50% offset

Advanced features
- Programmed via the user interface which consists of a 3-digit display and 3 function keys in the front panel.

Application
- PID on/off controller, PI step controller or 3-band controller with analog or Pt100 input.
- As trip amplifier with setpoint adjustment through external current / voltage signal with neutral zone surrounding the setpoint.

Technical characteristics
- The A and B channels can be freely programmed via the front keys and JP1 and JP2 to current in the range 0...20 mA or voltage in the range 0...10 VDC.
- Linearized Pt100 temperature input in the range with 3-wire connection.
- PID on/off controller with accurate setting of the regulation parameters XP (proportional band), TI (integrating time) and TD (differentiating time).
- Functions include PI step and-band controller, dI/dt function and comparator or trip amplifier with an external setpoint.
- 2 relay outputs with a make contact connected to a common point.
- Relay outputs can be installed in PELV/SELV circuits.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying.

Connections



Order:

Type	Input	
2286	Voltage / current	: A
	Temperature	: B

Environmental Conditions

Specifications range..... -20°C to +60°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP50

Mechanical specifications

Dimensions (HxWxD)..... 80.5 x 35.5 x 84.5 mm (D is without pins)
Weight approx..... 140 g

Common specifications

Supply voltage..... 19.2...28.8 VDC
Max. power consumption..... 3 W
Internal consumption..... 2.5 W
Isolation voltage, test / working..... 3.75 kVAC / 250 VAC
Signal / noise ratio..... Min. 60 dB
Response time..... < 60 ms
Signal dynamics, input..... 20 bit
Effect of supply voltage change..... < ±0.002% of span / %V
Proportional band (XP)..... 0.01...999%
Gain, 1/XP =..... 0.1...10000
Integrating time (TI)..... 0...999 s
Differentiating time (TD)..... 0...999 s
Neutral zone (nEU)..... 0...99.9 %
Pulse time (TP)..... 0.01...400 s
Min. pulse time (TP)..... 0.01...10 s
Auxiliary voltages: Reference voltage..... 2.5 VDC ±0.5% / 15 mA
Temperature coefficient..... < ±0.01% of span / °C
Linearity error..... < 0.1% of span
EMC immunity influence..... < ±0.5%

Input specifications

Max. offset..... 50% of selected max. value
Current input: Measurement range..... 0...20 mA
Min. measurement range (span), current input..... 4 mA
Input resistance, current input..... 50 Ω
Voltage input: Measurement range..... 0...10 VDC
Min. measurement range (span), voltage input..... 200 mV
Input resistance, voltage input..... Nom. 10 MΩ
RTD input..... Pt100 (2286B)
Cable resistance per wire (max.), RTD..... 25 Ω
Sensor current, RTD..... Nom. 1.25 mA

Output specifications

Relay output: Relay functions..... Setpoint
Max. voltage..... 250 VRMS
Max. current..... 2 AAC
Max. AC power..... 500 VA
Max. load at 24 VDC..... 1 A
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
PELV/SELV..... IEC 364-4-41 and EN 60742
EAC TR-CU 020/2011..... EN 61326-1

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Signal calculator

2289

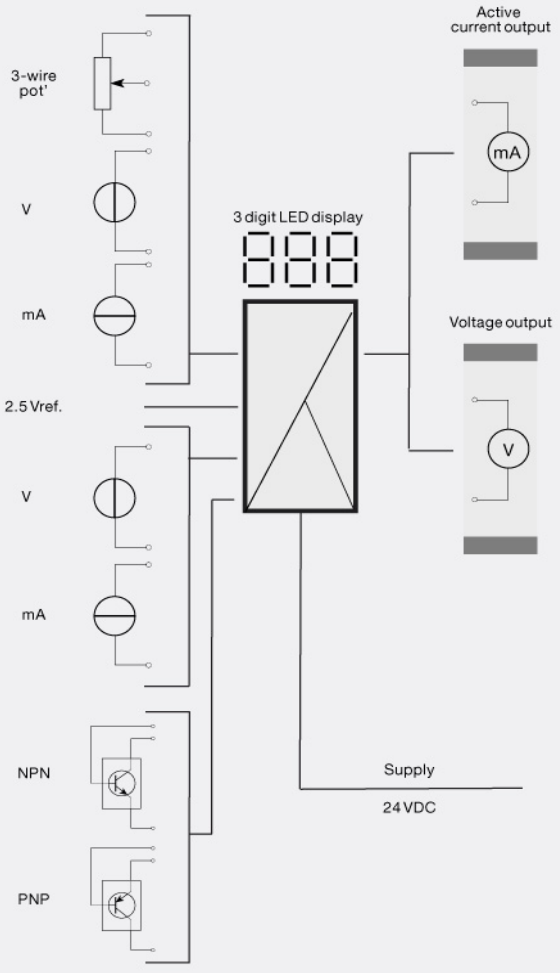
– Two analog inputs
– Multiple functions
– Front-programmable
– 3-digit LED display
– Version with a Pt100 input
– Analog output

Advanced features
- Programmed via the user interface which consists of a 3-digit display and 3 function keys in the front panel.

Application
- Operates as a PID controller with an analog or a Pt100 input.
- Functions include a manual / automatic controller, an analog calculator with a scale function on both inputs, a samplehold transmitter, a peak-hold transmitter, a delay transmitter, a signal limiter, averaging of noisy signals, monitoring of a signal's slope, or an analog multiplexer.

Technical characteristics
- The A and B inputs can be programmed to receive current signals in the range 0...20 mA (eg. 4...20 mA), or voltage signals in the range 0...10 VDC.
- Input A is a linearized Pt100 with a 3-wire connection. input B is an analog current / voltage input.
- Digital inputs are jumper selectable NPN or PNP.
- Analog standard current / voltage output of 0/4...20 mA / 0/2...10 VDC.
- Both the input signals and the output signal can be inverted.
- Mounting for a standard 11-pole socket which can be adapted for DIN rail or plate use with PR's 7023 adaptor and 7024 mounting keying. In environments with strong vibrations the PR 7002 can be mounted as an additional safety catch for system 2200 devices on the relay socket.

Connections



Order:

Type	Input		
2289	Current / voltage	:	A
	Pt100 & current / voltage	:	B

Environmental Conditions

Specifications range	-20°C to +60°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP50

Mechanical specifications

Dimensions (HxWxD)	80.5 x 35.5 x 84.5 mm (D is without pins)
Weight approx.	130 g

Common specifications

Supply voltage	19.2...28.8 VDC
Max. power consumption	2.7 W
Internal consumption	2.4 W
Signal / noise ratio	Min. 60 dB
Response time	< 60 ms
Updating time	20 ms
Signal dynamics, input	20 bit
Signal dynamics, output	16 bit
Proportional band (XP)	0.01...999%
Gain, 1/XP =	0.1...10000
Integrating time (TI)	0...999 s
Differentiating time (TD)	0...999 s
Effect of supply voltage change	< ±0.002% of span / %V
Auxiliary voltages: Reference voltage	2.5 VDC ±0.5% / 15 mA
Temperature coefficient	< ±0.01% of span / °C
Linearity error	< 0.1% of span
EMC immunity influence	< ±0.5%

Input specifications

Max. offset	50% of selected max. value
Current input: Measurement range	0...20 mA
Min. measurement range (span), current input	4 mA
Input resistance, current input	Nom. 50 Ω
Voltage input: Measurement range	0...10 VDC
Min. measurement range (span), voltage input	200 mV
Input resistance, voltage input	Nom. 10 MΩ
NPN, digital input	Pull up 24 VDC / 6.9 mA
PNP, digital input	Pull down 0 VDC / 6.9 mA
Pulse length	> 50 ms
RTD input	Pt100 (2289B)
Cable resistance per wire (max.), RTD	25 Ω
Sensor current, RTD	Nom. 1.25 mA

Output specifications

Max. offset	50% of selected max. value
Current output: Signal range	0...20 mA
Min. signal range	5 mA
Load (max.)	20 mA/600 Ω/12 VDC
Load stability, current output	≤0.01% of span / 100 Ω
Current limit	20.5 mA
Voltage output through internal shunt	See manual for details
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
EAC TR-CU 020/2011	EN 61326-1

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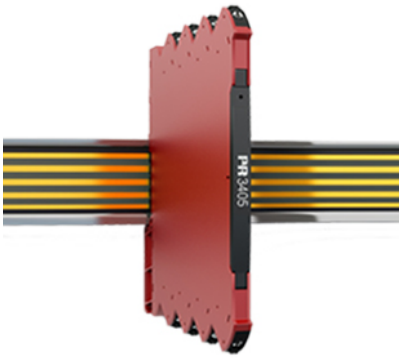


Power connector unit

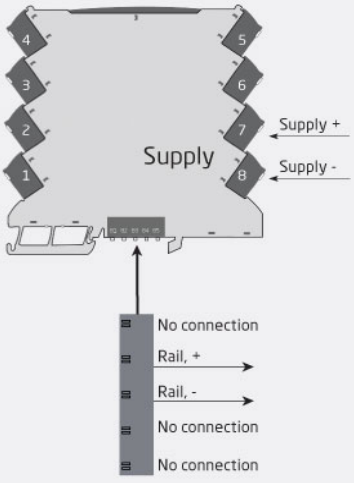
3405

– Slimline housing of 6 mm
– Supplies DIN rail from supply terminals
– Can pass up to 2.5 A
– Up to 100 units can be powered
– User-friendly label design

Applications
- Power can be connected to the DIN rail from supply terminals.
- Alternatively a powered DIN rail can supply power to the terminals
- Installation in ATEX Ex zone 2 / IECEx zone 2 / FM division 2.
- Suitable for environments with high vibration stress, e.g. ships.

Technical characteristics:
- 3405 can pass up to 2.5 A
- With 3405, up to 100 units can be powered.

Connections



G

Order:

Type
3405

Environmental Conditions

Specifications range..... -25°C to +70°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree..... IP20

Mechanical specifications

Dimensions (HxWxD)..... 113 x 6.1 x 115 mm
Weight approx..... 65 g
DIN rail type..... DIN EN 60715/35 mm
Wire size..... 0.13 x 2.5 mm^2 stranded wire
Screw terminal torque..... 0.5 Nm

Common specifications

Supply voltage..... 16.8...31.2 VDC
Internal consumption..... 0.25 W (max.)
Required external fuse..... 2.5 A

Approvals

EMC..... EN 61326-1
LVD 2006/95/EC..... EN 61010-1
ATEX 2004/108/EC..... KEMA 10ATEX0147 X, II 3 G Ex nA IIC T4 Gc
IECEx..... KEM 10.0068X
FM..... 3041043-C
UL..... UL 61010-1
DNV Marine..... Stand. f. Certific. No. 2.4
GL..... V1-7-2
EAC Ex TR-CU 012/2011..... RU C-DK.GB08.V.00410

G

2-wire level transmitter

5343A

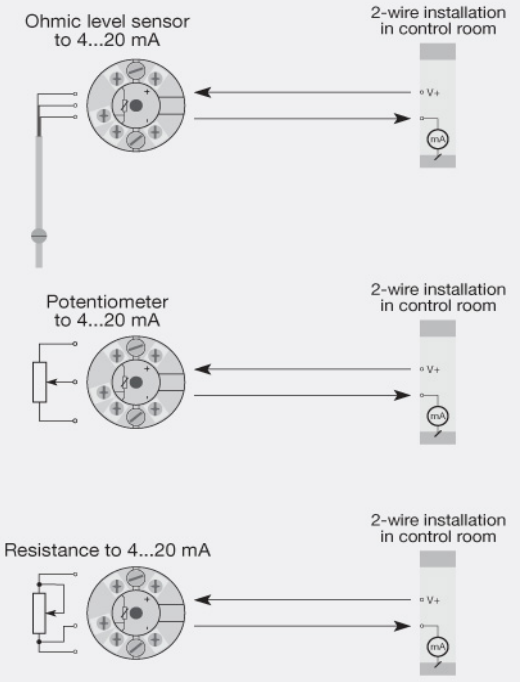
– Potentiometer or Ohmic input
– Programmable sensor error value
– High measurement accuracy
– Unique process calibration function
– Programmable via standard PC

Application
- Conversion of resistance variation to standard analog current signals, e.g. from Ohmic level sensors or valve positions.
- User-defined linearization function can be activated.

Technical characteristics
- Within a few seconds the user can program PR5343A to measure within the defined Ohmic values.
- Continuous check of vital stored data for safety reasons.
- The transmitter is protected against polarity reversal.
- PR5343A is configured to the current task by way of a PC, the PReset software and the communications interface Loop Link.
- The PRelevel configuration tool included in the PReset software has been developed specifically for the configuration of level applications. Among other things, it contains a function for ”on line” measurement of input span as well as a linearization function for volume linear output from horizontal cylindrical tanks.

Mounting / installation
- For DIN form B sensor head or DIN rail mounting with a special fitting.

Connections



G

Order:

Type
5343A

Environmental Conditions

Specifications range..... -40°C to +85°C
Calibration temperature..... 20...28°C
Relative humidity..... < 95% RH (non-cond.)
Protection degree (encl./terminal)..... IP68 / IP00

Mechanical specifications

Dimensions..... Ø 44 x 20.2 mm
Weight approx..... 50 g
Wire size..... 1 x 1.5 mm^2 stranded wire
Screw terminal torque..... 0.4 Nm
Vibration..... IEC 60068-2-6 : 2007
Vibration: 2...25 Hz..... ±1.6 mm
Vibration: 25...100 Hz..... ±4 g

Common specifications

Supply voltage..... 8.0...35 VDC
Internal consumption..... 25 mW…0.8 W
Voltage drop..... 8.0 VDC
Warm-up time..... 5 min.
Communications interface..... Loop Link
Signal / noise ratio..... Min. 60 dB
Accuracy..... Better than 0.1% of selected range
Response time (programmable)..... 0.33...60 s
Signal dynamics, input..... 19 bit
Signal dynamics, output..... 16 bit
Effect of supply voltage change..... < 0.005% of span / VDC
EMC immunity influence..... < ±0.5% of span

Input specifications

Max. offset..... 50% of selected max. value
Linear resistance input: Measurement range / min. range (span)..... 0...100 kΩ / 1 kΩ
Min. measurement range..... 1 kΩ
Cable resistance per wire (max.), lin. R..... 100 Ω
Sensor current, lin. R..... > 25 µA, < 120 µA
Effect of sensor cable resistance (3-wire), lin R..... < 0.002 Ω / Ω
Sensor error detection, lin. R..... Yes

Output specifications

Current output: Signal range..... 4…20 mA
Min. signal range..... 16 mA
Updating time..... 135 ms
Load resistance, current output..... ≤ (Vsupply - 8) / 0.023 [Ω]
Load stability, current output..... ≤0.01% of span / 100 Ω
Sensor error indication, current output..... Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale..... 23 mA / 3.5 mA
*of span..... = of the presently selected range

Approvals

EMC..... EN 61326-1
ATEX 2004/108/EC..... KEMA 10ATEX0004 X
IECEx..... DEK 13.0036X
INMETRO..... DEKRA 13.0002 X
EAC TR-CU 020/2011..... EN 61326-1
DNV Marine..... Stand. f. Certific. No. 2.4
GL..... V1-7-2

G

2-wire level transmitter

5343B

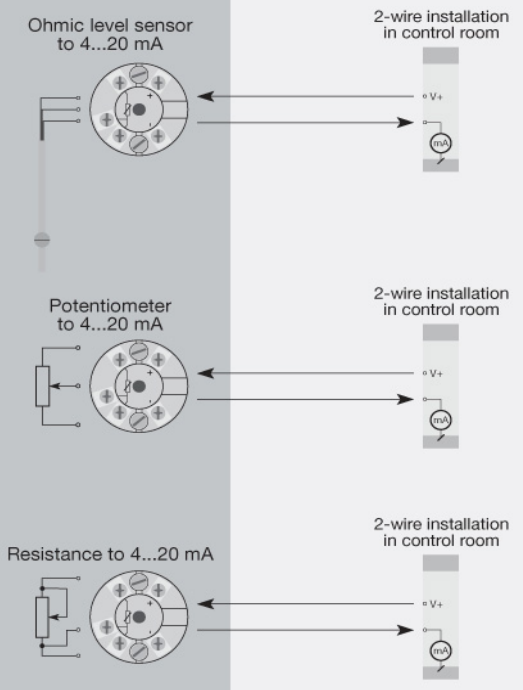
– Potentiometer or Ohmic input
– Programmable sensor error value
– High measurement accuracy
– Unique process calibration function
– Programmable via standard PC

Application
- Conversion of resistance variation to standard analog current signals, e.g. from Ohmic level sensors or valve positions.
- User-defined linearization function can be activated.

Technical characteristics
- Within a few seconds the user can program PR5343B to measure within the defined Ohmic values.
- Continuous check of vital stored data for safety reasons.
- The transmitter is protected against polarity reversal.
- PR5343B is configured to the current task by way of a PC, the PReset software and the communications interface Loop Link.
- The PRelevel configuration tool included in the PReset software has been developed specifically for the configuration of level applications. Among other things, it contains a function for ”on line” measurement of input span as well as a linearization function for volume linear output from horizontal cylindrical tanks.

Mounting / installation
- For DIN form B sensor head or DIN rail mounting with a special fitting.
- NB: As I.S. / Ex barrier for 5343B we recommend 5104B, 5114B or 5116B.

Connections



Order:

Type
5343B

Environmental Conditions

Specifications range	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree (encl./terminal)	IP68 / IP00

Mechanical specifications

Dimensions	Ø 44 x 20.2 mm
Weight approx.	50 g
Wire size	1 x 1.5 mm^2 stranded wire
Screw terminal torque	0.4 Nm
Vibration	IEC 60068-2-6 : 2007
Vibration: 2...25 Hz	±1.6 mm
Vibration: 25...100 Hz	±4 g

Common specifications

Supply voltage	8.0...30 VDC
Internal consumption	25 mW…0.8 W
Voltage drop	8.0 VDC
Warm-up time	5 min.
Communications interface	Loop Link
Signal / noise ratio	Min. 60 dB
Response time (programmable)	0.33...60 s
Accuracy	Better than 0.1% of selected range
Signal dynamics, input	19 bit
Signal dynamics, output	16 bit
Effect of supply voltage change	< 0.005% of span / VDC
EMC immunity influence	< ±0.5% of span

Input specifications

Max. offset	50% of selected max. value
Linear resistance input: Measurement range / min. range (span)	0...100 kΩ / 1 kΩ
Min. measurement range	1 kΩ
Cable resistance per wire (max.), lin. R	100 Ω
Sensor current, lin. R	> 25 µA, < 120 µA
Effect of sensor cable resistance (3-wire), lin R	< 0.002 Ω / Ω
Sensor error detection, lin. R	Yes

Output specifications

Current output: Signal range	4…20 mA
Min. signal range	16 mA
Updating time	135 ms
Load resistance, current output	≤ (Vsupply - 8) / 0.023 [Ω]
Load stability, current output	≤0.01% of span / 100 Ω
Sensor error indication, current output	Programmable 3.5…23 mA
NAMUR NE 43 Upscale/Downscale	23 mA / 3.5 mA
*of span	= of the presently selected range

Approvals

EMC	EN 61326-1
ATEX 2004/108/EC	KEMA 03ATEX1538
FM	2D5A7
IECEx	DEK 13.0036X
INMETRO	DEKRA 13.0002 X
EAC TR-CU 020/2011	EN 61326-1
EAC Ex TR-CU 012/2011	RU C-DK.GB08.V.00410
DNV Marine	Stand. f. Certific. No. 2.4
GL	V1-7-2

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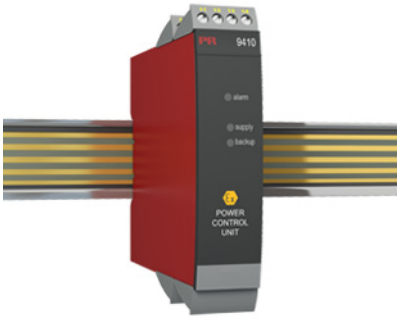


Power control unit

9410

– Distributes supply voltage to the power rail
– Optional connection of backup supply
– Approved for installation in I.S. / Ex zone 2 / Div. 2
– Optional redundant supply for the power rail
– Must be installed on power rail, PR type 9400

Application and advanced features

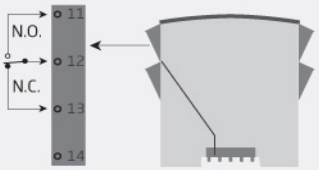
- The power control unit detects errors from any of the devices mounted on the power rail and transmits a collective alarm to the control system via the internal status relay.
- Optional connection of two power supplies - a primary supply and a backup supply.
- Redundant supply for the power rail can be obtained by mounting two 9410 devices connected to 2 separate power supplies (e.g. PR 9420).

Technical characteristics

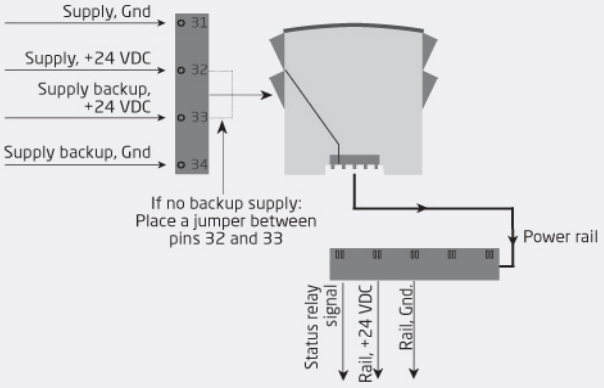
- The status relay will be energised when the following three conditions are met: 1. Supply voltage is present on pins 31 and 32. 2. Backup supply voltage is present on pins 34 and 33. (If the backup supply is not in use, a jumper must be placed between pins 32 and 33 - the jumper is delivered with the device). 3. There are no error messages from the devices connected to the power rail.
- When a collective alarm is activated via the power rail, the status relay in the 9410 will be de-energized (pins 11, 12 and 13).
- Two green front LEDs indicate connection of supply and backup.
- A red LED indicates error status.

Connections

Device status relay from power rail



Power connections



Zone 2 / FM Cl. 1, div. 2 or safe area

G

Order:

Type
9410

Environmental Conditions

Specifications range	-20°C to +60°C
Storage temperature	-20°C to +85°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP20

Mechanical specifications

Dimensions (HxWxD)	109 x 23.5 x 104 mm
Weight approx.	140 g
Wire size	0.13...2.08 mm^2 AWG 26...14 stranded wire
Screw terminal torque	0.5 Nm

Common specifications

Max. power consumption	96 W
Internal consumption	2 W (max.)
Efficiency	> 97.9%

Input specifications

Supply voltage	21.6...26.4 VDC (double / reinforced isolation)
Backup supply	21.6...26.4 VDC

Output specifications

Output voltage	Input voltage-0.5 VDC (@ 4 A)
Output power	96 W (max.)
Output current	4 A (max.)
Output ripple	Same as input ripple
Max. voltage, status relay	250 / 30 VDC
Max. current, status relay	2 AAC / 2 ADC
Max. AC power, status relay	500 VA / 60 W

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	KEMA 07ATEX0152 X
IECEx	KEM 08.0025X
FM	3034431-C
INMETRO	NCC 12.1308 X
UL	UL 61010-1
EAC TR-CU 020/2011	EN 61326-1
DNV Marine	Stand. f. Certific. No. 2.4

Power supply

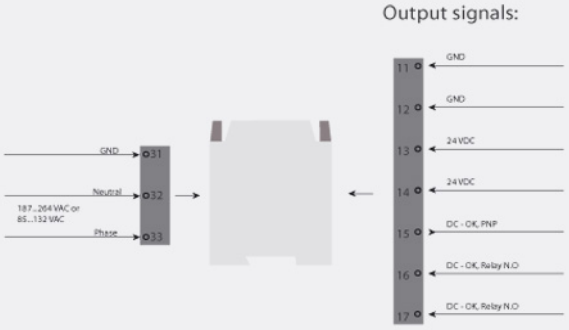
9420

– Supply voltage 85...132 VAC or 187...264 VAC
– Optional connection of backup supply
– Approved for installation in I.S. / Ex zone 2 / Div. 2
– Active signal output
– Optional parallel connection

Application
- 2 DC-OK outputs for monitoring of device functions.
- Floating signal contacts and an active DC-OK signal are available.
- The DC-OK LED enables visual evaluation of the function locally in the process.

Technical characteristics
- The 85...264 VAC connection is made by using pin no. 31, 32 and 33
- The 24 VDC connection is made using the “+” and “-“ connections.
- 22 VDC ±2 VDC is applied on “DC-OK” - pin 15, 20 mA max. This signal output is referenced to –Vout (gnd.) and signals when the output voltage drops between 18 and 22 VDC.
- Maximum 5 devices of the same type can be connected in parallel to enable increased output power.
- The DC-OK LED is a two colour LED which indicates the status of the output and enables visual evaluation of the function locally in the control cabinet.
- DC-OK LED green – normal operation. DC-OK LED red – output failure if input mains is still present.

Connections



Zone 2. FM Cl. 1, div. 2 or safe area

G

Order:

Type
9420

Environmental Conditions

Specifications range	-10°C to +60°C
Storage temperature	-20°C to +85°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP20

Mechanical specifications

Dimensions (HxWxD)	110 x 54 x 114 mm
Weight approx.	700 g
Weight approx.	260 g
Wire size	0.5...2.50 mm^2 / AWG 24...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6: 1 g, 10...55 Hz, 3 axis sine sweep
Vibration	Shock, IEC 60068-2-27: 15 g, 3 axis half sine, 11 ms

Common specifications

Max. power consumption	350 VA
Fuse	4 A H / 250 VAC
Inrush current, max. (at 25°C, <2 ms)	25.0 AAC
Efficiency	Typ. 88%
Thermal overload protection	Automatic restart
Effect of supply voltage change	< 0.5% (Vin. min....Vin. max.)
Temperature coefficient	0.02%/°C

Input specifications

Supply voltage	187...264 VAC or 85...132 VAC (auto-range)
Frequency	50...60 Hz

Output specifications

Output voltage	24 VDC
Output power	120 W (max.)
Output current	5 A
Load stability (10%...max. load)	< 0.5 %
Output ripple	≤ 200 mV pk-pk (Vin nom. and Iout max.)

Approvals

EMC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 2004/108/EC	BUREAU VERITAS 08-002X
CSA	1893479
UL	UL 508

G

EMC

PR electronics has always been a pioneer in EMC. In 1991, we created our own in-house EMC laboratory and since then we have made significant advancements in designing products for high EMC performance. PR is thus not depending on using shielded enclosures.

Through a combination of:

- sophisticated printed circuit board layout where wanted and unwanted signals are being intelligently routed and,
- filters protecting from DC to GHz – from uV to kV and from uA to A and,
- the fact that our EMC performance is a maximum deviation of 0.5% of the specified range

we guarantee that each product achieves our renowned EMC standards.

Beyond our rigorous design process, we also subject our devices to more stringent testing than many of our competitors:

- We test by 20V/m (the EMC Directive only says 10V/m).
- We test against A criteria (supply and output) and B criteria (input) mixing the toughest requirements for both emission and immunity.

The result is an exceptional EMC performance, ensuring stable and accurate signal conditioning throughout your process. PR devices remain your safest EMC choice today and in the future.

Power Consumption

One of PR's core competences is our ability to design and manufacture high precision technology with low power consumption. Our high performance devices with minimal power budget not only deliver a positive impact on the environment, but also bring you tangible operational savings. Because they consume less power, they also emit less heat.

We are near you, *all over the world*

Our trusted red boxes are supported wherever you are

All our devices are backed by expert service and a 5-year warranty. With each product you purchase, you receive personal technical support and guidance, day-to-day delivery, repair without charge within the warranty period and easily accessible documentation.

We are headquartered in Denmark, and have offices and authorized partners the world over. We are a local business with a global reach. This means that we are always nearby and know your local markets well.
We are committed to your satisfaction and provide PERFORMANCE MADE SMARTER all around the world.

For more information on our warranty program, or to meet with a sales representative in your region, visit prelectronics.com.

Benefit today from
PERFORMANCE MADE SMARTER

PR electronics is the leading technology company specialized in making industrial process control safer, more reliable and more efficient. Since 1974, we have been dedicated to perfecting our core competence of innovating high precision technology with low power consumption. This dedication continues to set new standards for products communicating, monitoring and connecting our customers' process measurement points to their process control systems.

Our innovative, patented technologies are derived from our expansive R&D facilities and from having a great understanding of our customers' needs and processes. We are guided by principles of simplicity, focus, courage and excellence, enabling some of the world's greatest companies to achieve PERFORMANCE MADE SMARTER.

1090EN (1507)