PERFORMANCE
MADE
SMARTER

Product manual
9202
Pulse isolator



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

No. 9202V107-UK
Product version: 9202-003

PR electronics

6 Product Pillars
to meet your every need

Individually outstanding, unrivalled in combination

With our innovative, patented technologies, we make signal conditioning smarter and simpler. Our portfolio is composed of six product areas, where we offer a wide range of analog and digital devices covering over a thousand applications in industrial and factory automation. All our products comply with or surpass the highest industry standards, ensuring reliability in even the harshest of environments and have a 5-year warranty for greater peace of mind.



Temperature

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 communications 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.



I.S. Interface

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 SIL 2 Full 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.



Communication

We provide inexpensive, easy-to-use, future-ready communication interfaces that can access your PR installed base of products. All the interfaces are detachable, have a built-in display for readout of process values and diagnostics, and can be configured via push-buttons. Product specific functionality includes communication via Modbus and Bluetooth and remote access using our PR Process Supervisor (PPS) application, available for iOS and Android.



Multifunction

Our unique range of single devices covering multiple applications is easily deployable as your site standard. 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, immunity to electrical noise and simple programming.



Isolation

Our compact, fast, high-quality 6 mm isolators are based on microprocessor technology to provide exceptional performance and EMC-immunity for dedicated applications at a very low total cost of ownership. They can be stacked both vertically and horizontally with no air gap separation between units required.



Display

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.

Pulse isolator

9202

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Warning



The following operations should only be carried out on a disconnected device and under ESD-safe conditions:

General mounting, wire connection and disconnection.
Troubleshooting the device.

Repair of the device and replacement of circuit breakers must be done by PR electronics A/S only.

Warning



Do not open the front plate of the device as this will cause damage to the connector for the display / programming front PR 45xx.
This device contains no DIP-switches or jumpers.

Symbol identification



Triangle with an exclamation mark: Read the manual before installation and commissioning of the device in order to avoid incidents that could lead to personal injury or mechanical damage. arning/ demand. Potentially lethal situations.



The CE mark proves the compliance of the device with the essential requirements of the directives.



The double insulation symbol shows that the device is protected by double or reinforced insulation.



Ex devices have been approved acc. to the ATEX directive for use in connection with installations in explosive areas. See installation drawings in appendix.

Safety instructions

Definitions

Hazardous voltages have been defined as the ranges: 75 to 1500 Volt DC, and 50 to 1000 Volt AC.
Technicians are qualified persons educated or trained to mount, operate, and also trouble-shoot technically correct and in accordance with safety regulations.
Operators, being familiar with the contents of this manual, adjust and operate the knobs or potentiometers during normal operation.

Receipt and unpacking

Unpack the device without damaging it and check whether the device type corresponds to the one ordered. The packing should always follow the device until this has been permanently mounted.

Environment

Avoid direct sun light, dust, high temperatures, mechanical vibrations and shock, and rain and heavy moisture. If necessary, heating in excess of the stated limits for ambient temperatures should be avoided by way of ventilation.
The device must be installed in pollution degree 2 or better.
The device is designed to be safe at least under an altitude up to 2 000 m.

Mounting

Only technicians, who are familiar with the technical terms, warnings, and instructions in the manual and who are able to follow these, should connect the device. Should there be any doubt as to the correct handling of the device, please contact your local distributor or, alternatively,

PR electronics A/S
www.prelectronics.com

The use of stranded wires is not permitted for mains wiring except when wires are fitted with cable ends.

Descriptions of input / output and supply connections are shown in the block diagram and on the side label.

The device is provided with field wiring terminals and shall be supplied from a Power Supply having double / reinforced insulation. A power switch shall be easily accessible and close to the device. The power switch shall be marked as the disconnecting unit for the device.

For installation on Power Rail 9400 the power is supplied by Power Control Unit 9410.

Year of manufacture can be taken from the first two digits in the serial number.

Calibration and adjustment

During calibration and adjustment, the measuring and connection of external voltages must be carried out according to the specifications of this manual. The technician must use tools and instruments that are safe to use.

Normal operation

Operators are only allowed to adjust and operate devices that are safely fixed in panels, etc., thus avoiding the danger of personal injury and damage. This means there is no electrical shock hazard, and the device is easily accessible.

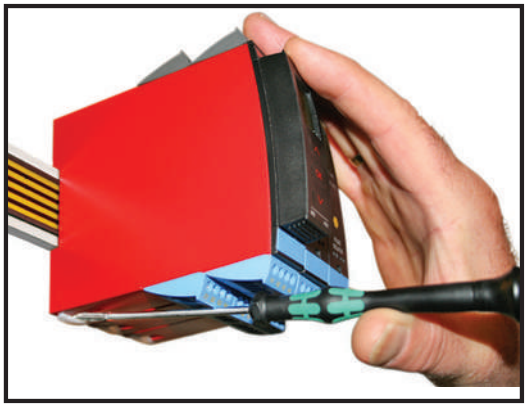
Cleaning

When disconnected, the device may be cleaned with a cloth moistened with distilled water.

Liability

To the extent the instructions in this manual are not strictly observed, the customer cannot advance a demand against PR electronics A/S that would otherwise exist according to the concluded sales agreement.

How to demount system 9000



Picture 1:
By lifting the bottom lock, the device is detached from the DIN rail.

Pulse isolator
9202

- 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 Assessmentnt

Advanced features

- Configuration and monitoring by way of detachable display front (PR 45xx).
- Selection of direct or inverted function for each channel via PR 45xx.
- 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.

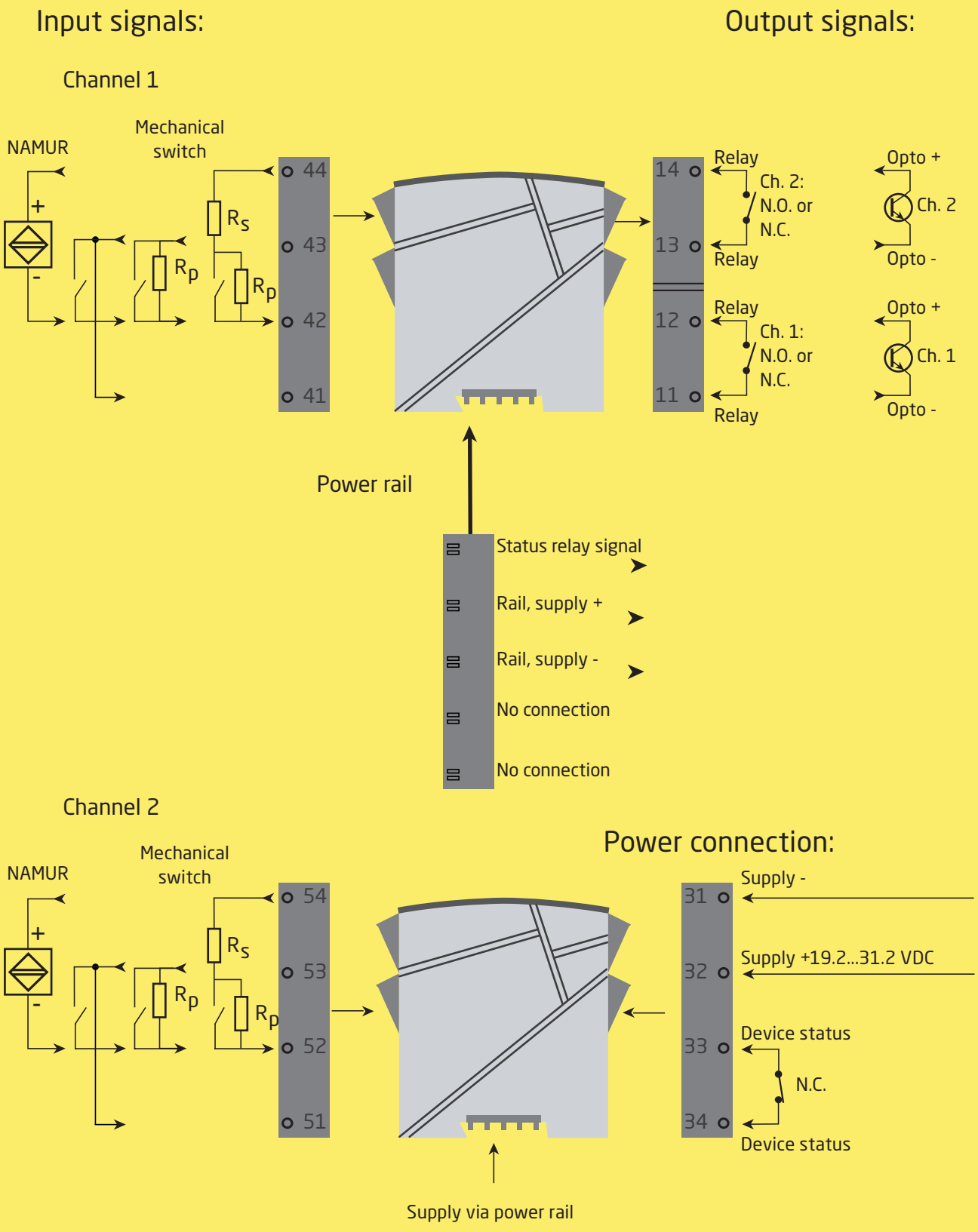
Application

- 9202Axxx can be mounted in the safe area and in zone 2 / Class 1, Division 2, Group A, B, C, D.
- 9202Bxxx can be mounted in the safe area and in zone 2 / Class 1, Division 2 and receive signals from zone 0, 1, 2 and zone 20, 21, 22 including M1 / Class I/II/III, Division 1, Group 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 9202 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.

Applications - 9202Axxx

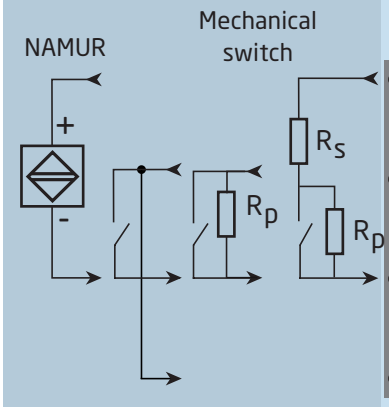


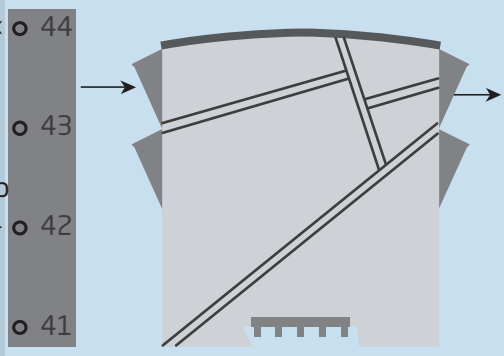
Zone 2 & Cl. 1, Div. 2, gr. A-D or Safe Area

Applications - 9202Bxxx

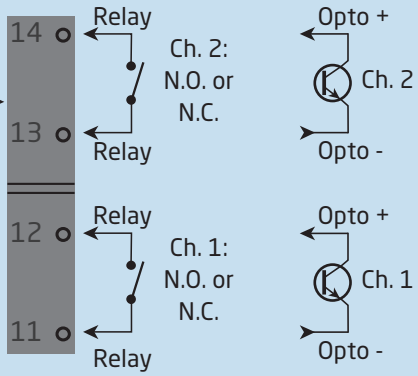
Input signals:

Channel 1

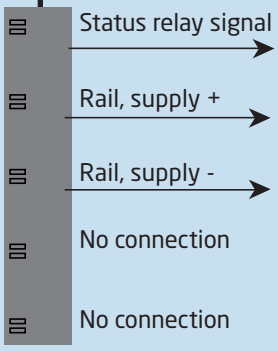




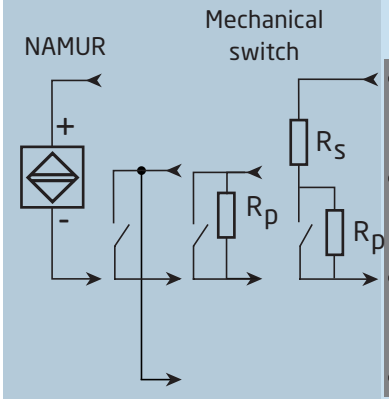
Output signals:

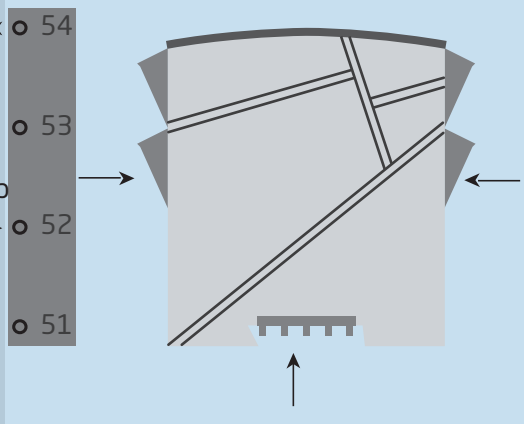


Power rail

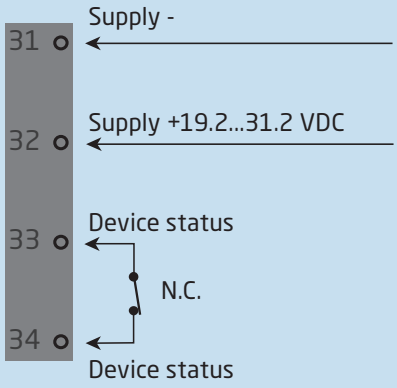


Channel 2





Power connection:



Zone 0, 1, 2, 20, 21, 22, M1 & Cl. I/II/III, Div. 1 gr. A-G

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

PR 45xx display / programming front



Functionality

The simple and easily understandable menu structure and the explanatory help texts guide you effortlessly and automatically through the configuration steps, thus making the product very easy to use. Functions and configuration options are described in the section "Configuration / operating the function keys".

Application

- Communications interface for modification of operational parameters in 9202.
- When mounted in the process, the display shows process values and device status.

Technical characteristics

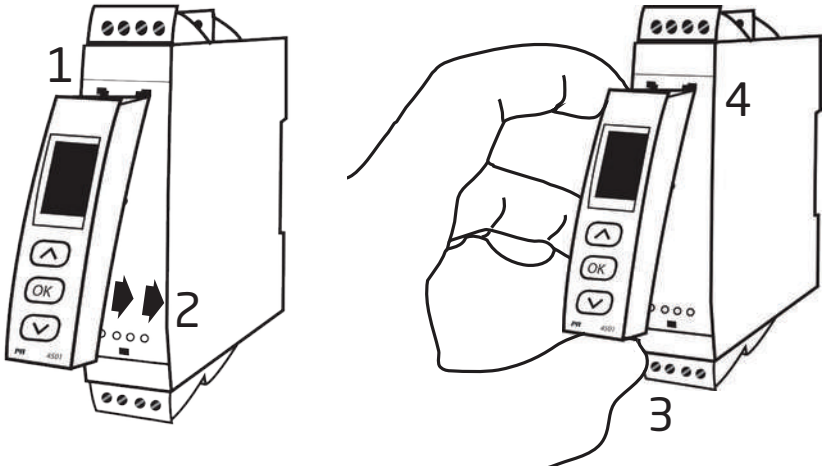
- LCD display with 4 lines:
  Line 1 (H=5.57 mm) shows status for each channel (OK or error).
  Line 2 (H=3.33 mm) shows output for channel 1 (ON / OFF).
  Line 3 (H=3.33 mm) shows output for channel 2 (ON / OFF).
  Line 4 shows whether the device is SIL-locked. Static dot = SIL-locked and flashing dot = not SIL-locked.
  Line 4 also indicates status for relay 1 and relay 2.
- In order to protect the configuration against unauthorised changes, access to the menus can be blocked by a password.

Mounting / demounting the PR 45xx

1: Insert the tabs of the PR 45xx into the holes at the top of the device.
2: Hinge the PR 45xx down until it snaps into place.

Demounting of the PR 45xx

3: Push the release button on the bottom of the PR 45xx and hinge the the PR 45xx out and up.
4: With the PR 45xx hinged up, remove from holes at the top of the device.



Order

Type	Associated apparatus	Version	Unit channels	Approvals
9202	No : A Yes : B	Opto : 1 Relay N.O. : 2 Relay N.C. : 3	Single : A Double : B	ATEX, IECEx, FM, INMETRO, EAC-Ex : - cULus, ATEX, IECEx, FM, INMETRO, EAC-Ex : -U9

Example: 9202B2B

Accessories

4501 = Display / programming front
4511 = Communication enabler
9400 = Power rail
9404 = Module stop for rail
9410 = Power control unit
9421 = Power supply 24 V - Ex nA nC

Technical data

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 & overvoltage category II.

Mechanical specifications:

Dimensions (HxWxD) . . . . . 109 x 23.5 x 104 mm
Dimensions (HxWxD) w/ 4501 / 451x . . . . . 109 x 23.5 x 116 / 131 mm
Weight approx. . . . . 170 g
Weight incl. 4501 / 451x (approx.) . . . . . 185 g / 200 g
DIN rail type . . . . . DIN EN 60715 - 35 mm
Wire size . . . . . 0.13...2.08 mm² / AWG 26...14 stranded wire
Screw terminal torque . . . . . 0.5 Nm
Vibration . . . . . IEC 60068-2-6
2...13.2 Hz . . . . . ±1 mm
13.2...100 Hz . . . . . ±0.7 g

Common electrical specifications:

Supply voltage . . . . . 19.2...31.2 VDC
Fuse . . . . . 400 mA SB / 250 VAC

Type	Description	Max. power dissipation	Max. required power
9202x1Ax	1 ch., opto	≤ 1.2 W	≤ 1.1 W
9202x1Bx	2 ch., opto	≤ 1.6 W	≤ 1.5 W
9202x2Ax	1 ch., relay N.O.	≤ 1.2 W	≤ 1.3 W
9202x2Bx	2 ch., relay N.O.	≤ 1.8 W	≤ 1.9 W
9202x3Ax	1 ch., relay N.C.	≤ 1.2 W	≤ 1.3 W
9202x3Bx	2 ch., relay N.C.	≤ 1.8 W	≤ 1.9 W

Max. required power is the maximum power needed at terminals 31 and 32.
Max. power dissipation is the maximum power dissipated by the device.
If the 9202 is used with the 45xx, then add 40 mW to the max. power dissipation and 70 mW to the max. required power for each device with the 45xx.

Isolation - test / working:	
Inputs / outputs / 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
Programming	Communication enabler 4511 / Programming front 4501
Response time for cable fault	< 200 ms
Auxiliary supplies:	
NAMUR supply	8 VDC / 8 mA

Inputs:

Sensor types:	
NAMUR according to.	EN 60947-5-6
Mechanical switch with series (Rs) and parallel (Rp) resistance:	
Rs.	Nom. 750 Ω
Rp	Nom. 15 kΩ
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

Outputs:

Relay outputs in safe area:

Max. switch frequency	20 Hz
Max. voltage	250 VAC / 30 VDC
Max. current.	2 A AC / 2 A DC
Max. power	500 VA / 60W

Status relay in safe area:

Max. voltage	125 VAC / 110 VDC
Max. current.	0.5 A AC / 0.3 A DC
Max. power	62.5 VA / 32 W

Opto, NPN outputs:

Max. switch frequency	5 kHz
Min. pulse length.	> 0,1 ms
Max. load, current / voltage.	80 mA / 30 VDC
Voltage drop at 80 mA	< 2.5 VDC

Observed authority requirements:

EMC.	2014/30/EU
LVD	2014/35/EU
ATEX	2014/34/EU
RoHS	2011/65/EU

Approvals:

DNV-GL, Ships & Offshore	Standard for Certification No. 2.4
ClassNK	TA18527M
c UL us, Standard for Safety	UL 61010-1
EAC	TR-CU 020/2011
EAC Ex	TR-CU 012/2011

I.S. / Ex:

ATEX	KEMA 07ATEX0146X
IECEx	IECEx KEM 06.0039X
c FM us.	FM19US0055X / FM19CA0028X
INMETRO	DEKRA 16.0005X
cULus (only 9202xxx-U9)	20190801-E233311
EAC Ex	RU C-DK.GB08.V.00410

Functional Safety:

SIL2 Certified & Fully Assessed acc. to IEC 61508

Configuration of cable fault check

Diagnostics

Cable fault check, independent detection and visualisation for each channel:		
Device:	Configuration, common for both channels	Cable fault detection:
9202	CA.BR = Yes or CA.SH = Yes	OFF
	Else:	ON

Cable fault detection

Cable fault detection (CA.BR, CA.SH):			
Input	Event	Readout	Limit
All	Cable break	CA.BR	< 0.1 mA
All	Short-circuited cable	CA.SH	> 6.5 mA

Hardware / software error

Readout at hardware error		
Error search	Readout	Cause
Communications test 45xx and 9202	NO.CO	Connection error
EEprom error - check configuration	FL.ER	Configuration error or crc mismatch, recovery configuration is loaded
Hardware error	DE.ER	Invalid recovery configuration in device
Hardware error	FC.ER	Invalid code checksum in 45xx
EEprom error - check configuration	CO.ER	Invalid configuration (CRC or data)
Hardware error	CA.ER	Factory calibration error
Hardware error	HW.ER	HW setup - configuration mismatch
Hardware error	OC.ER	Main output controller communication error
Hardware error	MS.ER	Main internal supply out of bounds
Hardware error	MI.ER	Main initialisation selftest failed
Hardware error	MC.ER	Main flash or ram selftest failed

! All error indications in the display flash once per second. The help text explains the error. In case of cable fault the backlight also flashes. This can be reset by pressing the OK key.
Errors affecting both channels are shown as error on channel 1 - and the line showing channel 2 is blank.
Hardware error can be reset in two ways. Either step through the menus (if the other channel is to stay in operation) or power cycle the device.

Function description

Examples of connections in connection drawing and block diagram (1)...(4)

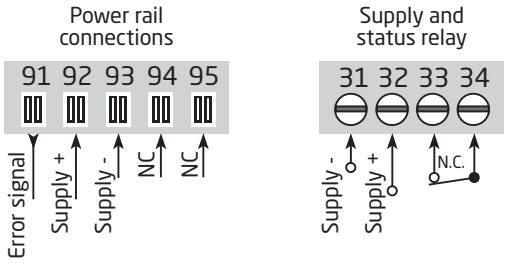
(1) NAMUR sensor with cable error detection in case of cable disconnection or short-circuit.

(2) Mechanical contact with cable error detection in case of cable disconnection or short-circuit, when Rs and Rp are mounted on the contact.

(3) Mechanical contact with cable error detection in case of cable disconnection, when Rp is mounted on the contact.

(4) Mechanical contact without cable error detection.

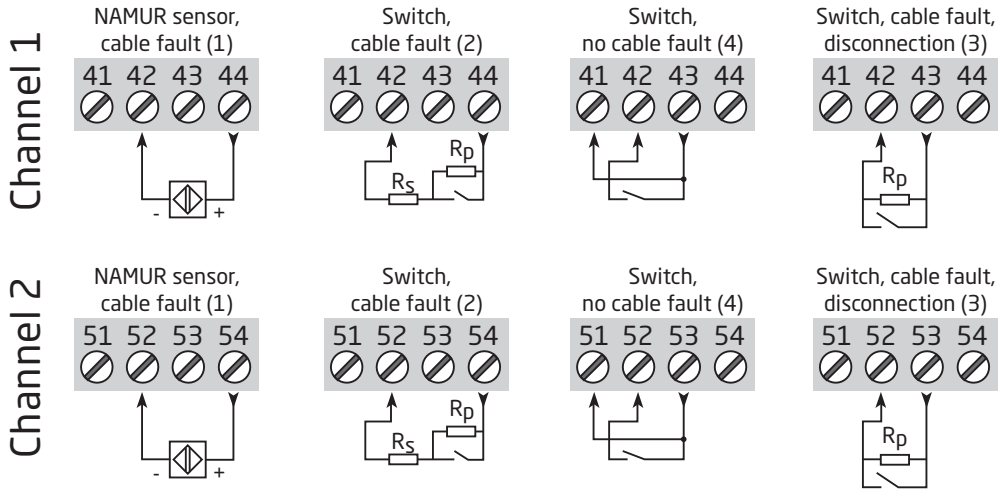
Connections



NC = no connection

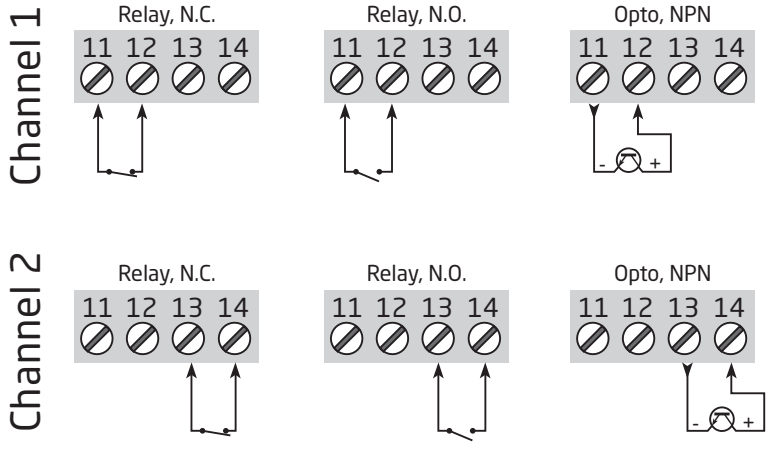
Inputs:

(1)...(4) = See function description on page 12

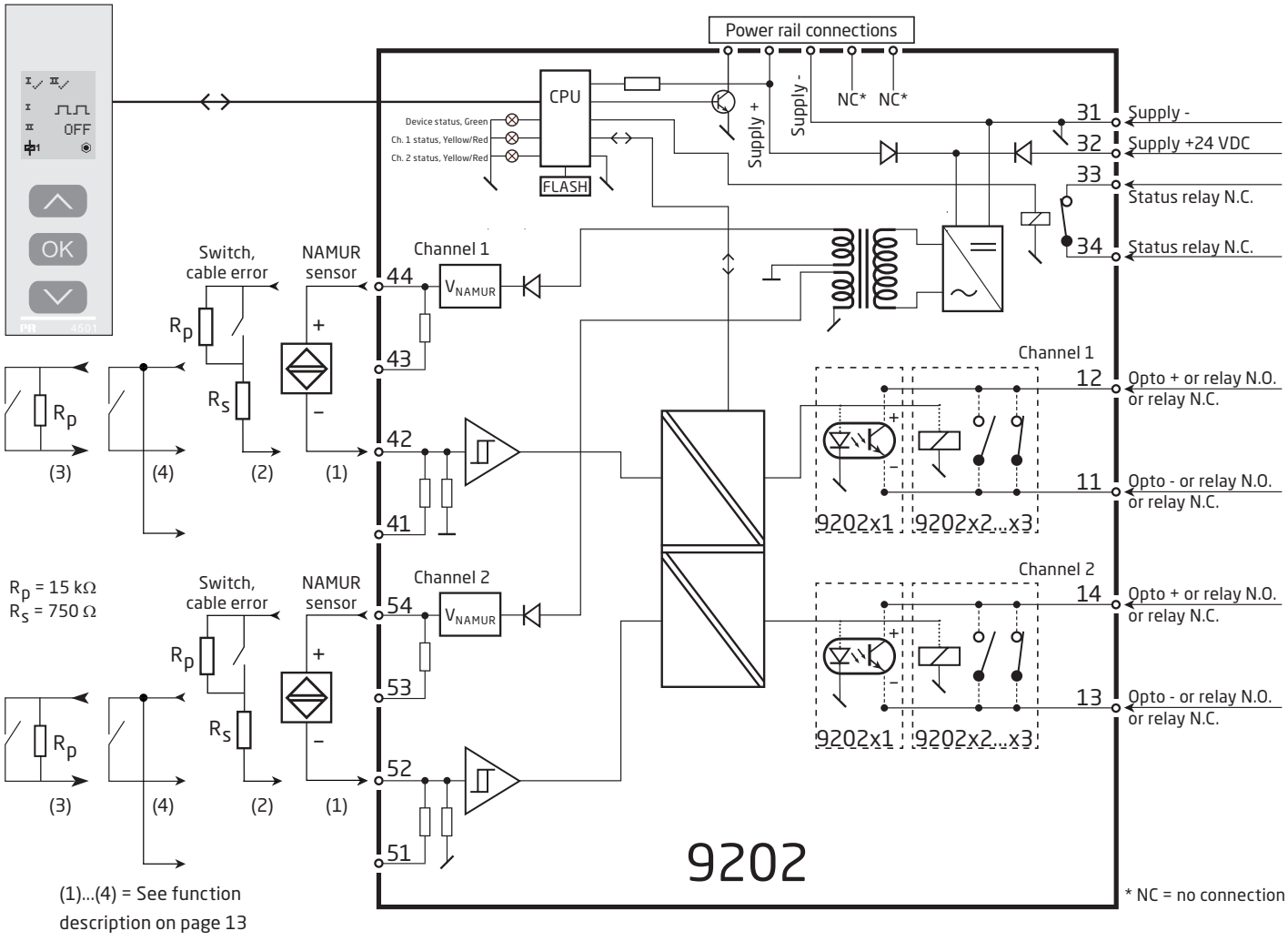


R_P = 15 kΩ
R_S = 750 Ω

Outputs:



Block diagram



(1)...(4) = See function description on page 13

Signal error and cable fault indications without display front

List of LED and error signal indications					
Condition	Green LED	Ch. 1: Yellow / Red	Ch. 2: Yellow / Red	Status relay, N.C.	Power rail signal status
Device OK	Flashing			Energized	OFF
No supply	OFF	OFF	OFF	De-energized	ON
Device defective	OFF	Red	Red	De-energized	ON
Channel 1, relay energised	Flashing	Yellow		Energized	OFF
Channel 1, relay de-energised at cable fault	Flashing	Red flashing		De-energized	ON (if activated)
Channel 1, relay de-energised	Flashing	OFF		Energized	OFF
Channel 2, relay energised	Flashing		Yellow	Energized	OFF
Channel 2, relay de-energised at cable fault	Flashing		Red flashing	De-energized	ON (if activated)
Channel 2, relay de-energised	Flashing		OFF	Energized	OFF

Configuration / operating the function keys

Documentation for routing diagram.

In general

When configuring the 9202, you will be guided through all parameters and you can choose the settings which fit the application. For each menu there is a scrolling help text which is automatically shown in line 3 on the display.

Configuration is carried out by use of the 3 function keys:

- ⌃ will increase the numerical value or choose the next parameter
- ⌄ will decrease the numerical value or choose the previous parameter
- OK will save the chosen value and proceed to the next menu

When configuration is completed, the display will return to the default state 1.0. Pressing and holding OK will return to the previous menu or return to the default state (1.0) without saving the changed values or parameters.

If no key is activated for 1 minute, the display will return to the default state (1.0) without saving the changed values or parameters.

Further explanations

Password protection: 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 unauthorised modifications to the configuration. If the configured password is not known, please contact PR electronics support - www.prelectronics.com/contact.

Cable fault information via display front 45xx

Cable fault (see limits in the table) is displayed as CA.BR (cable break) or CA.SH (cable short-circuited). Cable fault is shown independently for each channel but the configuration is common for both channels. In case of cable fault the backlight flashes. This can be reset by pressing the OK key. When the cable fault has been remedied, the module will return to normal operation.

Advanced functions

The unit gives access to a number of advanced functions which can be reached by answering "Yes" to the point "ADV.SET".

Display setup: Here you can adjust the brightness contrast and the backlight. Setup of TAG numbers with 5 alphanumerics. Selection of functional readout in line 2 and 3 of the display - choose between readout of digital output or tag no. When selecting "ALT" the readout toggles digital output and tag no.

Password: Here you can choose a password between 0000 and 9999 in order to protect the unit against unauthorised modifications to the configuration. The unit is delivered default without password.

Language: In the menu "LANG" you can choose between 7 different language versions of help texts that will appear in the menu. You can choose between UK, DE, FR, IT, ES, SE and DK.

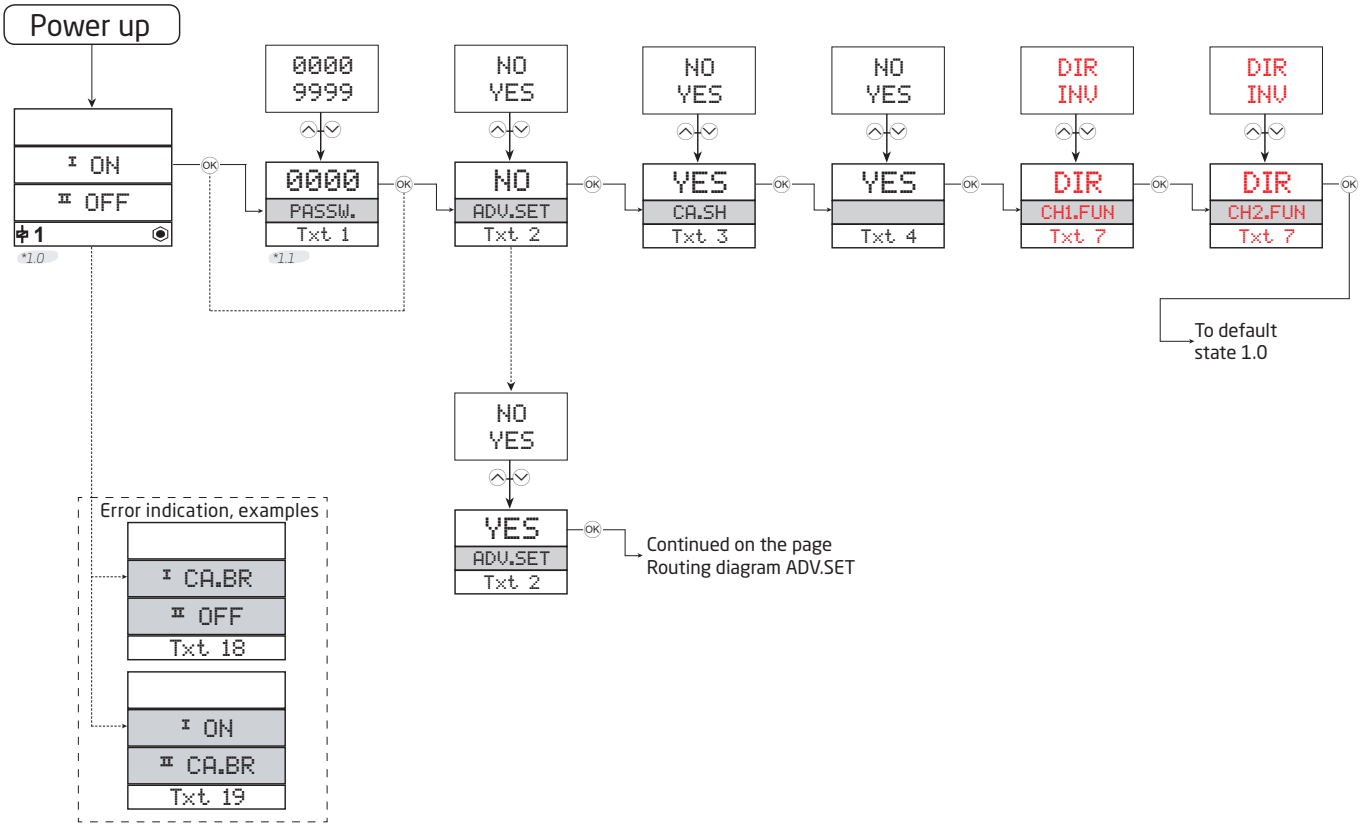
Power rail: In the menu "RAIL" you can choose if errors in the module are transmitted to the central surveillance in the PR 9410 power control unit.

Safety Integrity Level (SIL): See Safety Manual for details.

PR SIL 2 IEC 61508 CERTIFIED Full assessment

Routing diagram

If no key is activated for 1 minute, the display will return to the default state 1.0 without saving configuration changes.
▲ Increase value / choose next parameter
▼ Decrease value / choose previous parameter
OK Save the chosen value and proceed to the next menu
Hold OK Back to previous menu / return to menu 1.0 without saving.



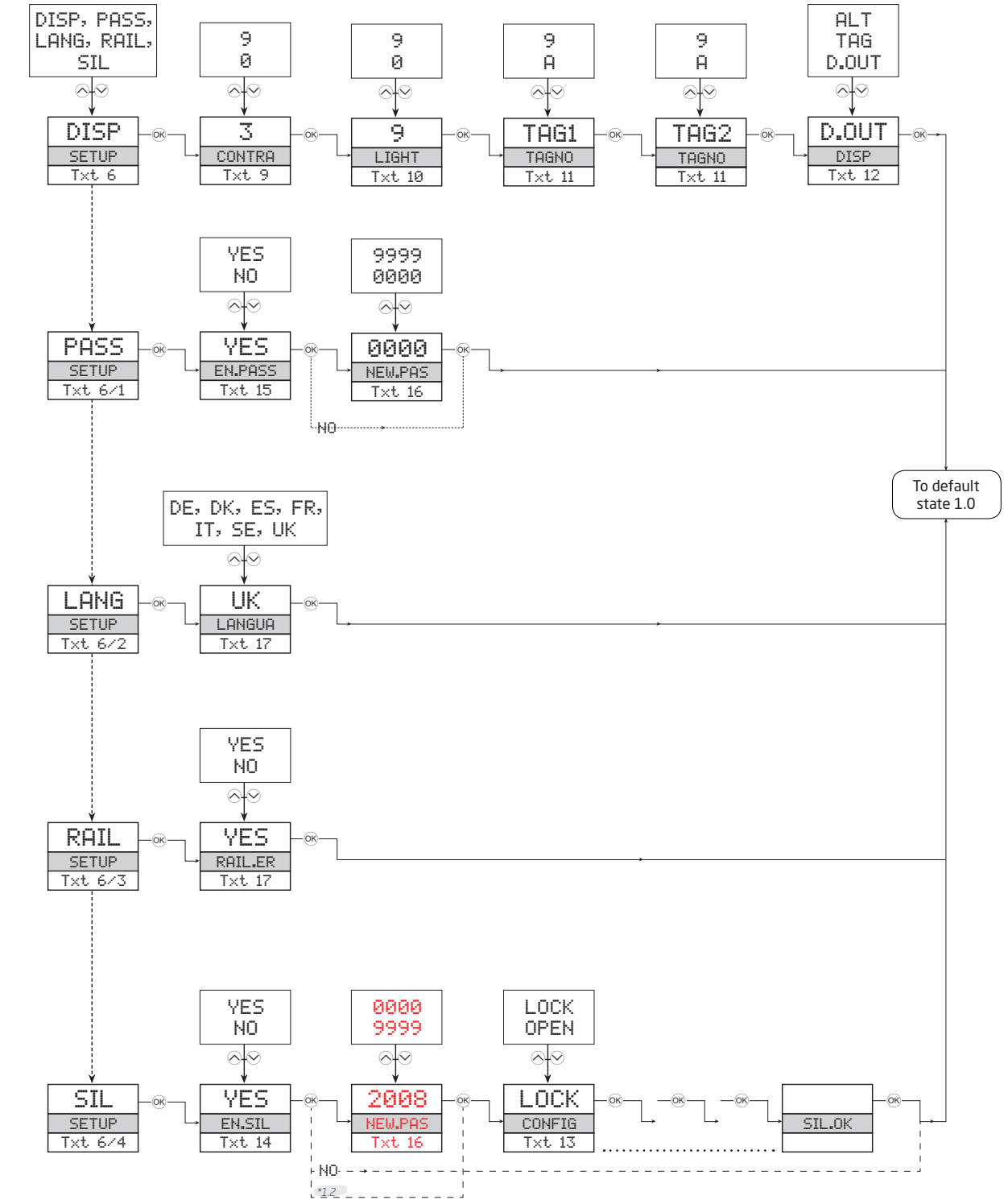
*1.0 Default state.
Line 1 shows status for channel 1 and channel 2.
Line 2 shows status for sensor 1.
Line 3 shows status for sensor 2.
Line 4 indicates whether the device is SIL-locked.

*1.1 Only if password-protected.

Line 1 symbols:
I✓ = OK. Flashing II! = error.
Line 2 and 3 symbols:
Input frequency > 1 Hz = I ⎍⎍
Line 4 symbols:
Static dot = SIL-locked
Flashing dot = Not SIL-locked

Red text signifies safety parameters in a SIL configuration. See safety manual for details

Routing diagram, advanced settings (ADV.SET)



*1,2 If password has been set.

Help text overview

[01] Set correct password [PASS]
[02] Enter advanced setup [ADV.SET]
[03] Enable cable short circuit error indication [CA.SH]
[04] Enable cable breakage error indication? [CA.BR]
[05] Enable rail status signal output? [RAIL.ER]
[06] Enter language setup [SETUP]
[6/1] Enter password setup [SETUP]
[6/2] Enter display setup [SETUP]
[6/3] Enter rail setup [SETUP]
[6/4] Enter SIL setup [SETUP]
[07] Select Direct channel function [CH1.FUN] [CH2.FUN]
Select Inverted channel function [CH1.FUN] [CH2.FUN]
[09] Adjust LCD contrast [CONTRA]
[10] Adjust LCD backlight [LIGHT]
[11] Write a 5-character channel TAG ['TAGON] ["TAGON]
[12] Show Output state in display [D.OUT]
Show TAG in display
Alternate information shown in display
[13] Configuration SIL status (Open / Locked) [CONFIG]
[14] Enable SIL configuration lock [EN.SIL]
[15] Enable Password protection [EN.PASS]
[16] Set New password [NEW.PAS]
[17] Select Language [LANGUA]
[18] Cable short circuit [^{I}CA.SH] [^{II}OFF]
[19] Cable breakage [^{I}ON] [^{II}CA.BR]

LERBAKKEN 10, 8410 RØNDE DENMARK

ATEX Installation drawing

For safe installation of 9202 the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.
Year of manufacture can be taken from the first two digits in the serial number.

For Installation in Zone 2 / Division 2 the following must be observed.
The 4501 programming module is to be used solely with PR electronics modules. It is important that the module is undamaged and has not been altered or modified in any way. Only 4501 modules free of dust and moisture shall be installed.

ATEX Certificate KEMA 07 ATEX 0146 X

Marking 9202Bxx

II (1) G [Ex ia Ga] IIC/IIB/IIA
II 3G Ex nA nC IIC T4 Gc
I (1) D [Ex ia Da] IIIC
I (M1) [Ex ia Ma] I

Marking 9202Axx II 3G Ex nA nC IIC T4 Gc

Standards EN 60079-0 : 2012, EN 60079-11 : 2012, EN 60079-15 : 2010

Supply terminal (31,32)

Voltage : 19.2 – 31.2 VDC

Status Relay. terminal (33,34)		Zone 2 Installation
Voltage max:	125 VAC / 110 VDC	32 VAC / 32 VDC
Power max:	62,5 VA / 32 W	16 VA / 32 W
Current max:	0.5 A AC / 0.3 ADC	0.5 A AC / 1 ADC

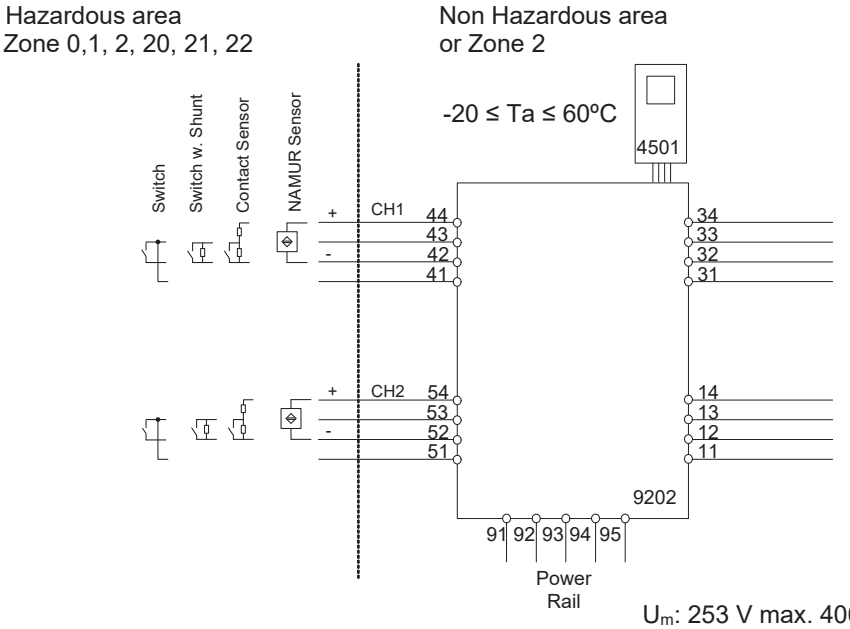
Installation notes:
Install in pollution degree 2, overvoltage category II as defined in EN 60664-1

Do not separate connectors when energized and an explosive gas mixture is present.
Do not mount or remove modules from the Power Rail when an explosive gas mixture is present.
Disconnect power before servicing.
The wiring of unused terminals is not allowed.

In type of protection [Ex ia Da] the parameters for intrinsic safety for gas group IIB are applicable.

For installation in Zone 2, the module shall be installed in an enclosure in type of protection Ex n or Ex e, providing a degree of protection of at least IP54. Cable entry devices and blanking elements shall fulfill the same requirements.

For installation on Power Rail in Zone 2, only Power Rail type 9400 supplied by Power Control Unit type 9410 (Type Examination Certificate KEMA 07ATEX0152 X) is allowed.



U_o:10.6 VDC
I_o: 12 mADC
P_o: 32 mW
Lo/Ro:1150 µH/Ω

U_m: 253 V max. 400 Hz

Supply / Output:
(terminal 11,12,13,14)
(terminal 31,32,33,34)
(terminal 91,92,93,94,95)

	IIC	IIB	IIA	I
C_o	2.0 µF	6.0 µF	18 µF	90 µF
L_o	260 mH	780 mH	1000 mH	1000 mH

Ex input:
CH1 (terminal 41,42,43,44)
CH2 (terminal 51,52,53,54)

Terminal CH1(11,12) CH2(13,14)

Digital output:	**NPN output:**
Voltage max	30 VDC
Current max	80 mA

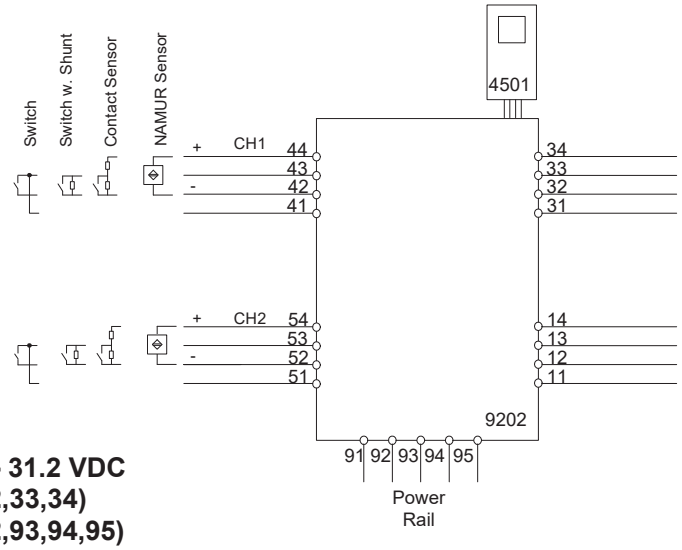
Terminal CH1(11,12) CH2(13,14)

Relay output:	**Non Hazardous location**	**Zone 2 installation**
Voltage max.	250 VAC / 30 VDC	32 VAC / 30 VDC
Power max.	500 VA / 60 W	64 VA / 60 W
Current max.	2 AAC / 2 ADC	2 AAC / 2ADC

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9202Axx Installation:

Non Hazardous area or Zone 2 -20 ≤ Ta ≤ 60ºC



Supply: 19.2 – 31.2 VDC
(terminal 31,32,33,34)
(terminal 91,92,93,94,95)

Input: Namur sensor, Contact Sensor, Switch
CH1 (terminal 41,42,43,44)
CH2 (terminal 51,52,53,54)

Output:
Terminal CH1(11,12) CH2(13,14)

Digital output:	**NPN output:**
Voltage max.	30 VDC
Current max.	80 mA

Terminal CH1(11,12) CH2(13,14)

Relay output:	**Non Hazardous location**	**Zone 2 installation**
Voltage max.	250 VAC / 30 VDC	32 V AC / 30 VDC
Power max.	500 VA / 60 W	64 VA / 60 W
Current max.	2 AAC / 2 ADC	2 AAC / 2 ADC

For installation in Zone 2, the module shall be installed in an enclosure in type of protection Ex n or Ex e, providing a degree of protection of at least IP54. Cable entry devices and blanking elements shall fulfill the same requirements.

For installation on Power Rail in Zone 2, only Power Rail type 9400 supplied by Power Control Unit type 9410 (Type Examination Certificate KEMA 07ATEX0152 X) is allowed.

For Installation in Zone 2 / Division 2 the following must be observed.
The 4501 programming module is to be used solely with PR electronics modules. It is important that the module is undamaged and has not been altered or modified in any way. Only 4501 modules free of dust and moisture shall be installed.

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IECEx Installation drawing

For safe installation of 9202 the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.
Year of manufacture can be taken from the first two digits in the serial number.

For Installation in Zone 2 / Division 2 the following must be observed.
The 4501 programming module is to be used solely with PR electronics modules. It is important that the module is undamaged and has not been altered or modified in any way. Only 4501 modules free of dust and moisture shall be installed.

IECEx Certificate	KEM 06.0039 X
Marking 9202Bxx	[Ex ia Ga] IIC/IIB/IIA Ex nA nC IIC T4 Gc [Ex ia Da] IIIC [Ex ia Ma] I
Marking 9202Axx	Ex nA nC IIC T4 Gc
Standards	IEC60079-15 :2005, IEC60079-11:2011, IEC60079-0: 2011

Supply terminal (31,32)

Voltage: 19.2 – 31.2 VDC

Status Relay. terminal (33,34)		Zone 2 Installation
Voltage max:	125 VAC / 110 VDC	32 VAC / 32 VDC
Power max:	62.5 VA / 32 W	16 VA / 32 W
Current max:	0.5 AAC / 0.3A DC	0.5 AAC / 1 ADC

Installation notes.

Install in pollution degree 2, overvoltage category II as defined in IEC60664-1

Do not separate connectors when energized and an explosive gas mixture is present.
Do not mount or remove modules from the Power Rail when an explosive gas mixture is present.
Disconnect power before servicing.
The wiring of unused terminals is not allowed.

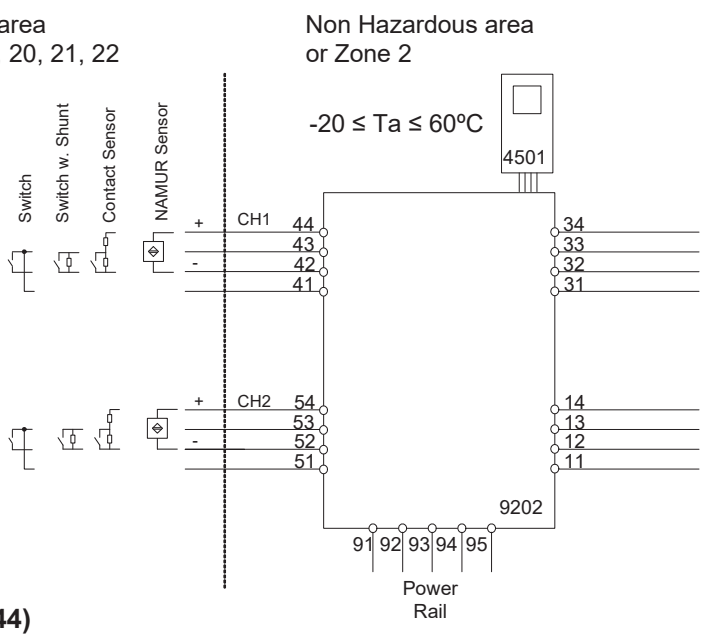
In type of protection [Ex ia Da] the parameters for intrinsic safety for gas group IIB are applicable.

For installation in Zone 2, the module shall be installed in an enclosure in type of protection Ex n or Ex e, providing a degree of protection of at least IP54. Cable entry devices and blanking elements shall fulfill the same requirements.

For installation on Power Rail in Zone 2, only Power Rail type 9400 supplied by Power Control Unit type 9410 (Type Examination Certificate KEMA 07ATEX0152 X) is allowed.

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9202Bxx Installation:



Ex input:
CH1 (terminal 41,42,43,44)
CH2 (terminal 51,52,53,54)

U_o:10.6 VDC
I_o: 12 mADC
P_o: 32 mW
Lo/Ro:1150 µH/Ω

U_m: 253 V max. 400 Hz

Supply / Output:
(terminal 11,12,13,14)
(terminal 31,32,33,34)
(terminal 91,92,93,94,95)

	IIC	IIB	IIA	I
C_o.	2.0 µF	6.0 µF	18 µF	90 µF
L_o.	260 mH	780 mH	1000 mH	1000 mH

Terminal CH1(11,12) CH2(13,14)

Digital output:	**NPN output:**
Voltage max.	30 VDC
Current max.	80 mA

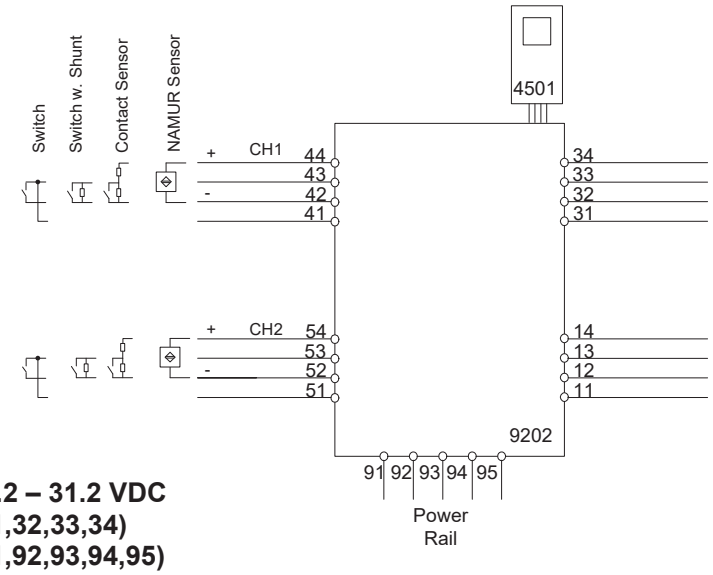
Terminal CH1(11,12) CH2(13,14)

Relay output:	**Non Hazardous location**	**Zone 2 installation**
Voltage max.	250 VAC / 30 VDC	32 V AC / 30 VDC
Power max.	500 VA / 60 W	64 VA / 60 W
Current max.	2 AAC / 2 ADC	2 AAC / 2 ADC

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9202Axx Installation:

Non Hazardous area or Zone 2 -20 ≤ Ta ≤ 60ºC



Supply: 19.2 – 31.2 VDC
(terminal 31,32,33,34)
(terminal 91,92,93,94,95)

Input: Namur sensor, Contact Sensor, Switch
CH1 (terminal 41,42,43,44)
CH2 (terminal 51,52,53,54)

Output:
Terminal CH1(11,12) CH2(13,14)

Digital output:	**NPN output:**
Voltage max.	30 VDC
Current max.	80 mA

Terminal CH1(11,12) CH2(13,14)

Relay output:	**Non Hazardous location**	**Zone 2 installation**
Voltage max.	250 VAC / 30 VDC	32 V AC / 30 VDC
Power max.	500 VA / 60 W	64 VA / 60 W
Current max.	2 AAC / 2 ADC	2 AAC / 2 ADC

For installation in Zone 2, the module shall be installed in an enclosure in type of protection Ex n or Ex e, providing a degree of protection of at least IP54. Cable entry devices and blanking elements shall fulfill the same requirements.

For installation on Power Rail in Zone 2, only Power Rail type 9400 supplied by Power Control Unit type 9410 (Type Examination Certificate IECEx 08.0052X) is allowed.

For Installation in Zone 2 / Division 2 the following must be observed.
The 4501 programming module is to be used solely with PR electronics modules. It is important that the module is undamaged and has not been altered or modified in any way. Only 4501 modules free of dust and moisture shall be installed.

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FM Installation drawing

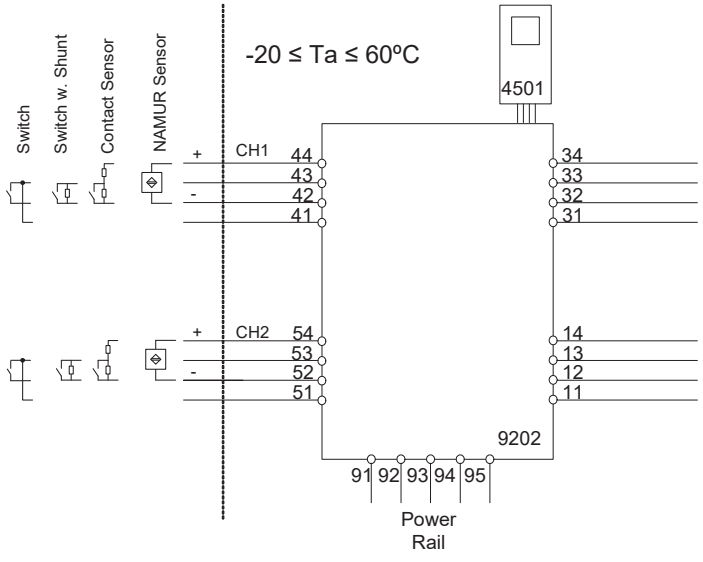
For safe installation of 9202B the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

For Installation in Zone 2 / Division 2 the following must be observed.
The 4501 programming module is to be used solely with PR electronics modules. It is important that the module is undamaged and has not been altered or modified in any way. Only 4501 modules free of dust and moisture shall be installed.

Hazardous Classified Location
Class I/II/III, Division 1, Group A,B,C,D,E,F,G
or Class I, Zone 0/1 Group IIC, [AEx ia] IIC
or Group IIC, [Ex ia Ga] IIC Gc

Unclassified Location or Hazardous Classified Location
Class I, Division 2, Group A,B,C,D T4
or Class I Zone 2 Group IIC T4 Gc

Simple Apparatus or
Intrinsically safe apparatus
with entity parameters:
Vmax (Ui) ≥ Vt (Uo)
Imax (Ii) ≥ It (Io)
Pi ≥ Pt(Po)
Ca(Co) ≥ Ccable + Ci
La(Lo) ≥ Lcable + Li



U_o / Vt: 10.6 V
I_o / Isc: 12 mA
P_o/P_t: 32 mW
Lo/Ro La/Ra: 1150 µH/Ω

Group	IIC	IIB	IIA
Group	A,B	C,E,F	D,G
C_o/C_a	2.0 µF	6.0 µF	18 µF
L_o/L_a	260 mH	780 mH	1000 mH

Terminal CH1(44,42) CH2(54,52)

U_m: 253 V max. 400 Hz

Supply / Output
(terminal 11,12,13,14)
(terminal 31,32,33,34)
(terminal 91,92,93,94,95)

Terminal (31,32)
Supply:

Voltage	19.2 – 31.2 VDC
Power	max. 3 W

Terminal (33,34)

Status Relay:	**Non Hazardous location:**	**Division 2 or Zone 2 installation:**
Voltage max.	125 VAC / 110 VDC	32 VAC / 32VDC
Power max.	62.5 VA / 32 W	16 VA / 32 W
Current max.	0.5 AAC / 0.3 ADC	0.5 AAC / 1 ADC

Terminal CH1(11,12) CH2(13,14)

Digital output:	**NPN output:**
Voltage max.	30 VDC
Current max.	80 mA

Terminal CH1(11,12) CH2(13,14)

Relay output:	**Non Hazardous location:**	**Division 2 or Zone 2 installation:**
Voltage max.	250 VAC / 30VDC	32 VAC / 30VDC
Power max.	500 VA / 60W	64 VA / 60 W
Current max.	2 AAC / 2ADC	2 AAC / 2 ADC

Installation notes:

In Class I, Division 2 installations, the subject equipment shall be mounted within a too-secured enclosure which is capable of accepting one or more of the Class I, Division 2 wiring methods specified in the National Electrical Code (ANSI/NFPA 70), or the Canadian Electrical Code (C22.1).

In Class I, Zone 2 installations, the subject equipment shall be mounted within a tool secured enclosure which is capable of accepting one or more of the Class I, Zone 2 wiring methods specified in the National Electrical Code (ANSI/NFPA 70), or the Canadian Electrical Code (C22.1). Where installed in outdoor or potentially wet locations, the enclosure shall, at a minimum, meet the requirements of IP54.

In Class I, Zone 2 installations, the installer shall ensure protection of supply terminals against transient voltages exceeding 140% of the rated supply voltage.

Install in environments rated Pollution Degree 2 or better; overvoltage category I or II.

The installation and wiring shall be in accordance with the Canadian Electrical Code for Canada and National Electrical Code NFPA 70, Article 500 or 505 for installation in USA.

The module must be supplied from a Power Supply having double or reinforced insulation.

The use of stranded wires is not permitted for mains wiring except when wires are fitted with cable ends.

For installation on the 9400 Power Rail the power must be supplied from Power Control Module Unit 9410.

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The module must be installed in an enclosure suitable for the environment for which it is used.

The module is galvanically isolated and does not require grounding.

Use 60 / 75 ºC copper conductors with wire size AWG: (26-14).

Warning: Substitution of components may impair intrinsic safety and / or suitability for Div. 2 / Zone 2.

Warning: To prevent ignition of explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.
Warning: Do not mount or remove modules from the Power Rail when an explosive gas mixture is present.

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UL Installation drawing

For safe installation of the Process Control Equipment (Associated Apparatus) 9202 the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

For Installation in DIV2/Zone2 the following must be observed.
The 4501 programming module is to be used solely with PR electronics modules. It is important that the module is undamaged and has not been altered or modified in any way. Only 4501 modules free of dust and moisture shall be installed

9202A1A-U9 and 9202B1A-U9: One channel Opto output
9202A1B-U9 and 9202B1B-U9: Two channel Opto output
9202A2A-U9 and 9202B2A-U9: One channel N.O. Relay output
9202A2B-U9 and 9202B2B-U9: Two channel N.O. Relay output
9202A3A-U9 and 9202B3A-U9: One channel N.C. Relay output
9202A3B-U9 and 9202B3B-U9: Two channel N.C. Relay output

9202abc-U9 where
a: A or B See below
b: 1=Opto, 2=N.O. Relay, 3= N.C. Relay
c: A= One Channel, B= Two Channel

Marking:

c UL us LISTED
E233311
Um=253V

Proc. Cont. Eq. for Use in Haz. Loc.
Install in CL I DIV2 GP A-D T4 provide IS circuits to CL I-III DIV 1 GP A-G
or CL I Zn2 Gp IIC T4 provides IS circuits for CL I Zn0 Gp IIC/Zn20 Gp IIIC
[Exia] Installation Drawing: 9202QU01

The 9202Bxx is galvanically isolating associated apparatus intended for installation in non-hazardous locations or Class I, Division 2, Groups A – D hazardous locations with intrinsically safe connections to Class I, II and III hazardous locations.

c UL us LISTED
E233311

Proc. Cont. Eq. for Use in Haz. Loc.
Install in CL I DIV2 GP A-D T4
or CL I Zn2 Gp IIC T4
Installation Drawing: 9202QU01

The 9202Axx equipment is intended for installation in non-hazardous locations or Class I,Division 2, Groups A – D or Zone 2 Croup IIC hazardous locations.

Standards:

- UL 121201 NONINCENDIVE ELECTRICAL EQUIPMENT FOR USE IN CLASS I AND II, DIVISION 2 AND CLASS III, DIVISIONS 1 AND 2 HAZARDOUS (CLASSIFIED) LOCATIONS Edition 9 - Revision Date 2018/08/31
- CSA C22.2 NO. 213 NONINCENDIVE ELECTRICAL EQUIPMENT FOR USE IN CLASS I AND II, DIVISION 2 AND CLASS III, DIVISIONS 1 AND 2 HAZARDOUS (CLASSIFIED) LOCATIONS- Edition 3 - Issue Date 2017/09/01
- UL 913 STANDARD FOR INTRINSICALLY SAFE APPARATUS AND ASSOCIATED APPARATUS FOR USE IN CLASS I, II, III, DIVISION 1, HAZARDOUS (CLASSIFIED) LOCATIONS- Edition 8 - Revision Date 2015/10/16
- CSA C22.2 NO. 60079-0 EXPLOSIVE ATMOSPHERES — PART 0: EQUIPMENT — GENERAL REQUIREMENTS- Edition 3 - Issue Date 2015/10/01
- CSA C22.2 NO. 60079-11:14 EXPLOSIVE ATMOSPHERES — PART 11: EQUIPMENT PROTECTION BY INTRINSIC SAFETY “I”- Edition 2 - Issue Date 2014/02/01

Installation notes 9202Axx and 9202Bxx

The module must be installed in a tool-secured enclosure suitable for the application in accordance with the National Electrical Code (ANSI/NFPA 70) for installation in the United States, the Canadian Electrical Code for installations in Canada, or other local codes, as applicable.

The module is galvanically isolated and does not require grounding.

Terminal 41, 42, 43, 44 are internally connected to CH1.
Terminal 51, 52, 53, 54 are internally connected to CH2.

Install in pollution degree 2, overvoltage category II in accordance with IEC 60664-1.

Use minimum 75 ºC copper conductors with wire size AWG: (26-14)

Warning: Substitution of components may impair intrinsic safety.
Avertissement : La substitution des composants peut nuire à la sécurité intrinsèque'.

There are no serviceable parts in the equipment and no component substitution is permitted

Warning: To prevent ignition of the explosive atmospheres, disconnect power before servicing and do not separate connectors, install or remove module from Power Rail when energized and an explosive gas mixture is present.

Avertissement : Pour éviter l'inflammation d'atmosphères explosibles, déconnectez l'alimentation avant les opérations d'entretien. Ne montez pas ou n'enlevez pas les connecteurs quand le module est sous tension et en présence d'un mélange de gaz. Ne montez pas ou n'enlevez pas les modules du rail d'alimentation en présence d'un mélange de gaz.

Installation notes 9202Bxx:

Associated Equipment /Appareillage Associé [Ex ia]

The Ex output current of this associated apparatus is limited by a resistor such that the output voltage-current plot is a straight line drawn between open-circuit voltage and short-circuit current.

Selected intrinsically safe equipment must be third party listed as intrinsically safe for the application, and have intrinsically safe entity parameters conforming withTable 1 below.

TABLE 1:

I.S. Equipment		Associated Apparatus
V max (or Ui)	≥	Voc or Vt (or Uo)
I max (or Ii)	≥	Isc or It (or Io)
P max, Pi	≥	Po
Ci + Ccable	≤	Ca (or Co)
Li + Lcable	≤	La (or Lo)

The module may also be connected to a simple apparatus as defined in Article 504.2 and installed and temperature classified in accordance with Article 504.10(D) of the National Electrical Code (ANSI/NFPA 70), or other local codes, as applicable.

Capacitance and inductance of the field wiring from the intrinsically safe equipment to the associated apparatus shall be calculated and must be included in the system calculations as shown in Table 1. Cable capacitance, Ccable, plus intrinsically safe equipment capacitance, Ci must be less than the marked capacitance, Ca (or Co), shown on any associated apparatus used. The same applies for inductance (Lcable, Li and La or Lo, respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used: Ccable = 60 pF/ft., Lcable = 0.2 µH/ft.

Where multiple circuits extend from the same piece of associated apparatus, they must be installed in separate cables or in one cable having suitable insulation. Refer to Article 504.30(B) of the National Electrical Code (ANSI/NFPA 70) and Instrument Society of America Recommended Practice ISA RP12.06 for installing intrinsically safe equipment.

Intrinsically safe circuits must be wired and separated in accordance with Article 504.20 of the National Electrical Code (ANSI/NFPA 70) or other local codes, as applicable.

The module has not been evaluated for use in combination with another associated apparatus.

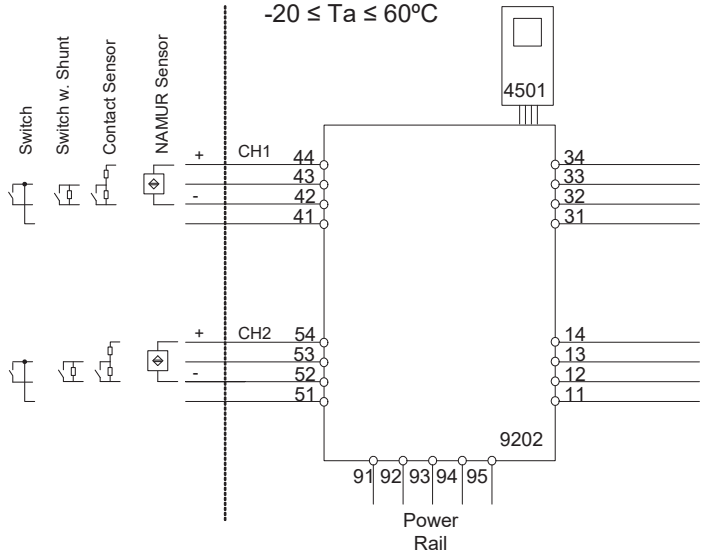
For installations in which both the Ci and Li of the intrinsically safe apparatus exceeds 1% of the Ca (or Co) and La (or Lo) parameters of the associated apparatus (excluding the cable), then 50% of Ca (or Co) and La (or Lo) parameters are applicable and shall not be exceeded. The reduced capacitance shall not be greater than 1 µF for Groups C and/or D, and 600 nF for Groups A and B. The values of Ca (or Co) and La (or Lo) determined by this method shall not be exceeded by the sum of all of Ci plus cable capacitances and the sum of all of the Li plus cable inductances in the circuit respectively.

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9202Bxx Installation:

Hazardous Classified Location
Class I/II/III, Division 1, Group A,B,C,D,E,F,G
Zone 0,1, 2 Group IIC, IIB, IIA or
Zone 20, 21

Unclassified Location or
Hazardous Classified Location
Class I, Division 2, Group ABCD T4
Class I Zone 2 Group IIC T4



Supply terminal (31,32)
Voltage: 19.2 – 31.2 VDC

Status relay, terminal (33,34)
Class I Division 2 or
Zone 2 installation:
Voltage max: 32 VAC/ 32 VDC
Power max: 16 VA / 32 W
Current max: 0.5 A AC / 1 A DC

(terminal 11,12,13,14)
(terminal 31,32,33,34)
(terminal 91,92,93,94,95)
U_m: 253 V max. 400 Hz

9202B1x
Terminal CH1(11,12) CH2(13,14)
Digital output: NPN output:
Voltage max. 30 VDC
Current max. 80 mA

9202B2x and 9202B3x
Relay output:
Terminal CH1(11,12) CH2(13,14)
Class I, Division 2
Zone 2 installation
Voltage max. 32 V AC / 30 VDC
Power max. 64 VA / 60 W
Current max. 2 AAC / 2 ADC

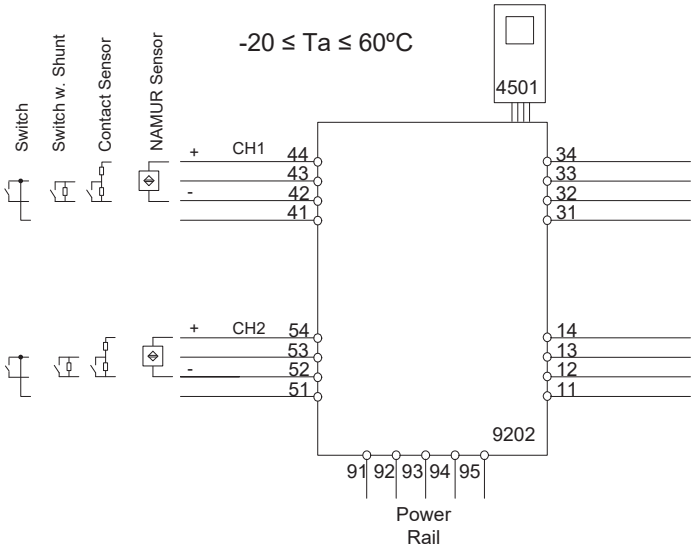
Ex input:
CH1 (terminal 41,42,43,44)
CH2 (terminal 51,52,53,54)

Uo: 10.6 VDC
Io: 12 mADC
Po: 32 mW
Lo/Ro: 1150µH/Ω

	IIC or A,B	IIB or C,E,F	IIA or D,G
Ca or C_o	2.0 µF	6.0 µF	18 µF
La or L_o	260 mH	780 mH	1000 mH

9202Axx and 9202Bxx Installation:

Non Hazardous area or
Class I, Division 2, Group ABCD T4
or Zone 2 Group IIC T4



Supply terminal (31,32)
Voltage: 19.2 – 31.2 VDC

Status relay, terminal (33,34)

Class I Division 2 or Zone 2 installation:

Voltage max:	32 VAC/ 32 VDC
Power max:	16 VA / 32 W
Current max:	0.5 A AC / 1 A DC

(terminal 11,12,13,14)
(terminal 31,32,33,34)
(terminal 91,92,93,94,95)

9202x1x
Terminal CH1(11,12) CH2(13,14)

Digital output:	**NPN output:**
Voltage max.	30 VDC
Current max.	80 mA

9202x2x and 9202x3x
Terminal CH1(11,12) CH2(13,14)

Relay output:	**Class I Division 2 Zone 2 installation**
Voltage max.	32 V AC / 30 VDC
Power max.	64 VA / 60 W
Current max.	2 AAC / 2 ADC

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INMETRO Desenhos para Instalação

Para instalação segura do 9202B o manual seguinte deve ser observado. O módulo deve ser instalado somente por profissionais qualificados que estão familiarizados com as leis nacionais e internacionais, diretrizes e normas que se aplicam a esta área.
Ano de fabricação pode ser obtido a partir dos dois primeiros dígitos do número de série.

Para a instalação na Zona 2 o seguinte deve ser observado. O módulo de programação de 4501, deve ser utilizado apenas com os módulos PRelectronics. É importante que o módulo esteja intacto e não tenha sido alterado ou modificado de qualquer maneira. Apenas os módulos 4501 livres de poeira e umidade devem ser instalados.

INMETRO Certificado ……	**DEKRA 16.0005X**
Marcasão	[Ex ia Ga] IIC/IIB/IIA Ex nA nC IIC T4 Gc [Ex ia Da] IIIC [Ex ia Ma] I
Normas:	ABNT NBR IEC 60079-0:2013, ABNT NBR IEC60079-11:2013, ABNT NBR IEC60079-15:2012

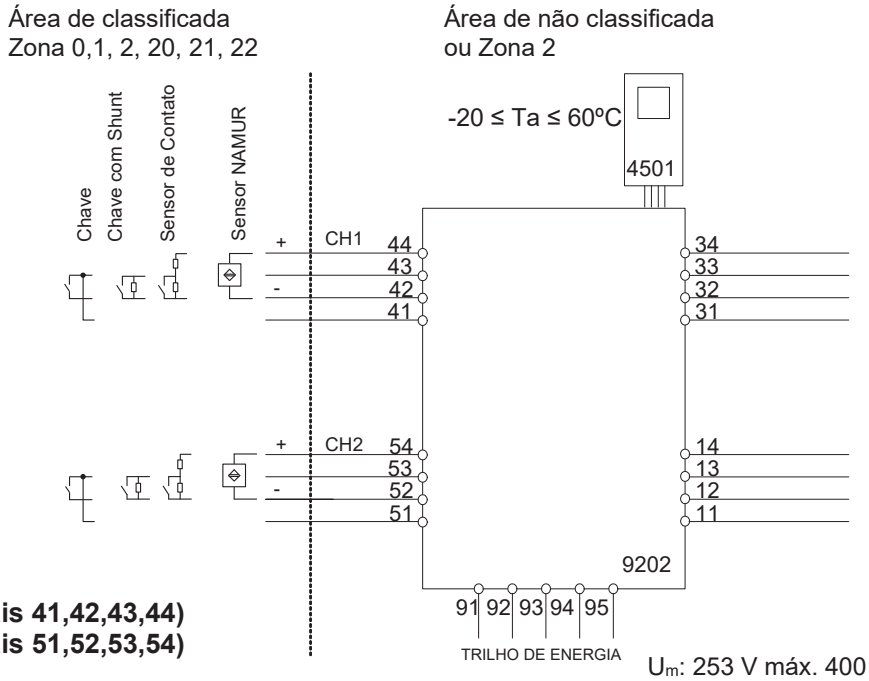
Terminais de fonte de alimentação (31,32)

Voltagem:	19.2 – 31.2 VDC

Relê de estado. terminais (33,34)		Instalação Zona 2
Voltagem máx.:	125 VAC / 110 VDC	32 VAC / 32 VDC
Potência máx.:	62,5 VA / 32 W	16 VA / 32 W
Corrente máx.:	0,5 A AC / 0,3 ADC	0,5 A AC / 1 ADC

Notas de instalação:

Instalação em grau de poluição 2, categoria de sobretensão II conforme definido no IEC 60664-1.
Os circuitos não intrinsecamente seguros só pode ser connectado para sobretensão limitado ao categoria I/II como definido na IEC 60664-1
Não separe conectores quando energizado ou quando uma mistura de gás explosivo estiver presente.
Não monte ou remova módulos do trilho de alimentação quando uma mistura de gás explosivo estiver presente.
Desligue a alimentação antes da manutenção.
A fiação de terminais sem uso não é permitida.
A fonte de Loop e terminais de entrada de corrente para o mesmo canal não deve ser aplicada ao mesmo tempo.
Em tipo de proteção [Ex ia Da] os parâmetros para a segurança intrínseca para grupo de gás IIB são aplicáveis.
Para a instalação em Zona 2, o módulo deve ser instalado em um invólucro conformidade com o tipo de proteção ‘Ex n’ ou ‘Ex e’, fornecendo no mínimo grau de proteçao IP54
Dispositivos de entrada de cabo e elementos de vedação devem cumprir com os mesmos requisitos.
Para a instalação de trilho de energia na Zona 2, apenas o trilho de alimentação Rail 9400 fornecido pela Unidade de Controle de Potência 9410 é permitido.



Entrada Ex:
CN1 (terminais 41,42,43,44)
CN2 (terminais 51,52,53,54)

U_o:10,6 VDC
I_o: 12 mADC
P_o: 32 mW
Lo/Ro:1150 µH/Ω

U_m: 253 V máx. 400 Hz

Fonte / Saída:
(terminais 11,12,13,14)
(terminais 31,32,33,34)
(terminais 91,92,93,94,95)

	IIC	IIB	IIA	I
C_o.	2,0 µF	6,0 µF	18 µF	90 µF
L_o.	260 mH	780 mH	1000 mH	1000 mH

Terminais CN1(11,12) CN2(13,14)

Saída Digital:	**Saída NPN:**
Voltagem máx.	30 VDC
Corrente máx.	80 mA

Terminais CN1(11,12) CN2(13,14)

Saída relê:	**Área de não classificada**	**Instalação ZONA 2**
Voltagem máx..	250 VAC / 30 VDC	32 V AC / 30 VDC
Potência máx..	500 VA / 60 W	64 VA / 60 W
Corrente máx..	2 AAC / 2 ADC	2 AAC / 2 ADC

Document history

The following list provides notes concerning revisions of this document.

Rev. ID	Date	Notes
106	1907	Specifications for max. required power added. ATEX and IECEx installation drawings updated. New INMETRO certificate and installation drawing.
107	1941	9202A-version included in manual. Variant with UL 913 approval added. CCOE approval discontinued. New FM certificate and installation drawing.

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