PULSE ISOLATOR

- **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.

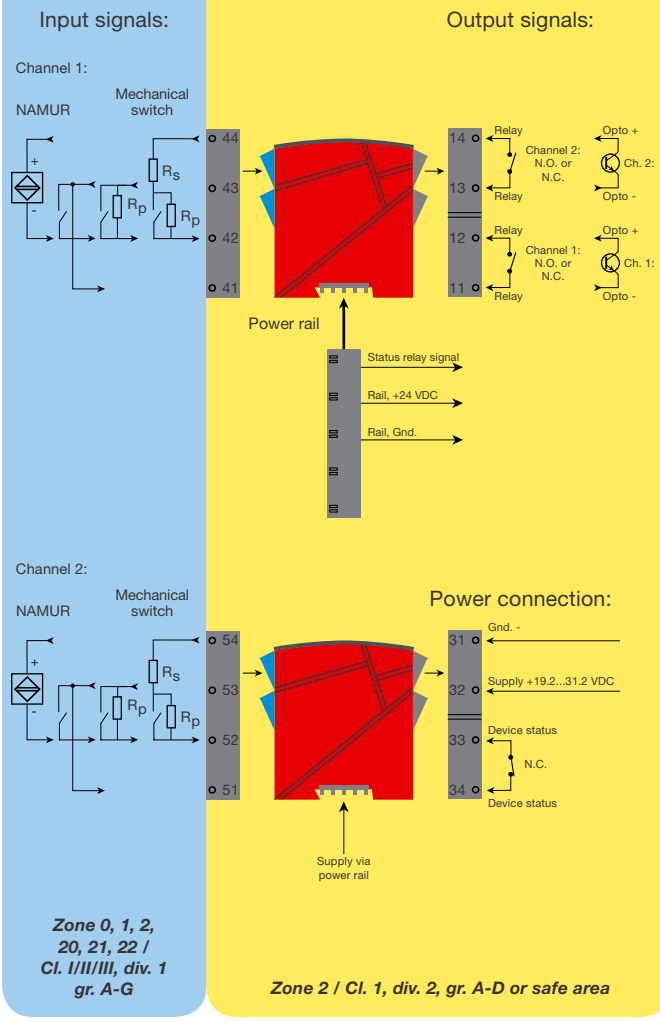
Application:

- The device can be mounted in the safe area and in zone 2 / div. 2 and receive signals from zone 0, 1, 2, 20, 21 and 22 / 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 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



Order 9202B

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

Order codes:

4501 = Display / programming front
9400 = Power rail

PR 4501 Display / programming front

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) and 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 / installation:

- Click 4501 onto the front of 9202.

Electrical specifications:

Specifications range	-20...+60°C
Storage temperature	-20...+85°C
Common specifications:	
Supply voltage, DC	19.2...31.2 VDC
Max. consumption	≤ 3 W (2 channels)
Fuse	400 mA SB / 250 VAC
Isolation voltages, test / operation	
Inputs / outputs / supply	2.6 kVAC / 300 VAC reinforced
Output 1 to output 2	1.5 kVAC / 150 VAC reinforced
Status relay to supply	1.5 kVAC / 150 VAC reinforced
Communications interface	Programming front 4501
Response time for cable fault	< 200 ms
Calibration temperature	20...28°C
Auxiliary supplies:	
NAMUR supply	8 VDC / 8 mA
Vibration, IEC 60068-2-6	Test Fc, 1 g, 2...100 Hz
Vibration, continuous, IEC 60068-2-64	Test Fh, 1 g, 3...100 Hz
Wire size	0.13...2.08 mm^2 / AWG 26...14 stranded wire
Screw terminal torque	0.5 Nm
Relative humidity	< 95% RH (non-cond.)
Dimen., without PR 4501 (HxBxD)	109 x 23.5 x 104 mm
Dimensions, with PR 4501 (HxBxD)	109 x 23.5 x 116 mm
Protection degree	IP20
Weight	170 g / 185 g with 4501
Inputs:	
Sensor types:	
NAMUR according to	EN 60947-5-6
Mechanical switch with series (R_S) and parallel (R_P) resistance:	
R_S	Nom. 750 Ω
R_P	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:

Status relay:	
Max. voltage	125 VAC / 110 VDC
Max. current	0.5 A AC / 0.3 A DC
Max. power	62.5 VA / 32 W
Relay outputs:	
Max. switching frequency	20 Hz
Max. voltage	250 VAC / 30 VDC
Max. current	2 A AC / 2 A DC
Max.power	500 VA / 60 W
Opto, NPN outputs:	
Max. switching 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
Ex / I.S. approvals:	
IECEx certificate	KEM 06.0039 X
ATEX certificate	KEMA 07ATEX0146 X
FM certificate	3034430 / 3034430C
Marine approval:	
Det Norske Veritas, Ships & Offshore	Pending
GOST R approval:	
VNIIFTRI, Cert No.	Pending
SIL certification:	
exida, Cert. No	PREI 070902 P0002 C01
Observed authority requirements:	**Standard:**
EMC 2004/108/EC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
ATEX 94/9/EC	EN 60079-0, -11, -15, -26 and EN 61241-0, -11
IECEx	IEC 60079-0, -11, -15, -26 IEC 61241-0 and -11
c FM us	UL 60079-0, -11, -15 EN 60079-0, -11, -15 FM 3600, 3610, 3611, 3810 CSA 22.2-157, -213
UL, Standard for Safety	UL 61010-1
SIL	IEC 61508

			IEC 61326		NAMUR NE21 : 2007		IEC 61326-3-1		PR standard specifications	
Port	Phenomenon	Test standard	Test value	Criterion	Test value	Criterion	Test value for safety funtions	Criterion	Test value	Criterion
Enclosure	ESD input terminals	IEC 61000-4-2	4 kV Contact	B	6 kV Contact	B	6 kV Contact	FS	6 kV Contact	B
	ESD	IEC 61000-4-2	4 kV / 8 kV Contact / Air	B	6 kV / 8 kV Contact / Air	A	6 kV / 8 kV Contact / Air	FS	6 kV / 8 kV Contact / Air	A 1%
	HF field	IEC 61000-4-3	10 V/m, 80...1000 MHz 3 V/m, 1.4...2 GHz 1 V/m, 2...2.7 GHz	A	10 V/m, 80...1000 MHz 3...10 V/m, 1.4...2 GHz	A	20 V/m, 80...1000 MHz 10 V/m, 1.4...2 GHz 3 V/m, 2...2.7 GHz	FS	20 V/m, 80...1000 MHz 10 V/m, 1.4...2 GHz 3 V/m, 2...2.7 GHz	A 0.5%
	Magnetic field	IEC 61000-4-8	30 A/m	A	100 A/m	A	30 A/m	FS	30 A/m	A 0.5%
DC power	Burst	IEC 61000-4-4	2 kV	B	2 kV	A	4 kV	FS	4 kV	A 1.0%
	Surge	IEC 61000-4-5	1 kV / 2 kV, Diff. / Comm. 0 Ω/10 Ω	B	0.5 kV / 1 kV, Diff. / Comm. 0 Ω/10 Ω	A	1 kV / 2 kV, Diff. / Comm. 0 Ω/10 Ω	FS	1 kV / 2 kV, Diff. / Comm. 0 Ω / 10 Ω	A 1.0%
	Conducted RF	IEC 61000-4-6	3 V, 150 kHz...80 MHz	A	10 V, 10 kHz...80 MHz Covers RF + LF	A	10 V, 150 kHz...80 MHz	FS	10 V, 150 kHz...80 MHz	A 0.5%
	Interruptions	IEC 61000-4-29	60% for 10 ms 100% for 20 ms	B	100% for 20 ms	B	60% for 10 ms 100% for 20 ms	FS	60% for 10 ms 100% for 20 ms	B
	Conducted LF	IEC 61000-4-16	Not required		Not required		1,5...15 kHz, 1...10 V 15....150 kHz, 10 V 50/60 Hz, 100 V	FS	15 Hz....150 kHz, 10 V 50 Hz, 300 Ω, 230 V	A 0.5%
I/O signal	Burst	IEC 61000-4-4	2 kV	B	2 kV	A	15....150 kHz, 10 V	FS	2 kV	A 1.0%
	Surge input	IEC 61000-4-5	1 kV / 2 kV, Diff. / Comm. 40 Ω	B	0.5 kV / 1 kV, Diff. / Comm. 40 Ω	B	50/60 Hz, 100 V	FS	1 kV / 2 kV Diff. / Comm. 40 Ω	B
	Surge output	IEC 61000-4-5	1 kV / 2 kV, Diff. / Comm. 40 Ω	B	0.5 kV / 1 kV, Diff. / Comm. 40 Ω	B	2 kV Comm. 40 Ω	FS	1 kV / 2 kV Diff. / Comm. 40 Ω	A 1.0%
	Conducted RF	IEC 61000-4-6	3 V	A	10 V, 10 kHz...150 kHz	A	10 V, 150 kHz...80 MHz	FS	10 V 150 kHz...100 MHz	A 0.5%
	Conducted LF	IEC 61000-4-16	Not required		Not required		1,5...15 kHz, 1...10 V 15....150 kHz, 10 V 50/60 Hz, 100 V	FS	15 Hz....150 kHz, 10 V 50 Hz, 300 Ω, 230 V	A 0.5%

9000 EMC specifications - immuninty:

	Essential operation (functional safety)	Continuous unmonitored operation	Continuous monitored operation	Non-continuous operation
ESD IEC 61000-4-2	A	B	B	C
EM IEC 61000-4-3	A	A	A	B
Burst IEC61000-4-4	A	B	B	B
Surge IEC 61000-4-5	A	B	B	C
Conducted RF IEC 61000-4-6	A	A	A	C
Voltage interrupts IEC 61000-4-11	A	B	C	C
Note For type testing, it is highly recommended that performance criteria A be chosen for all phenomena and all tests. However, performance criteria B and/or C may be accepted provided that both the specification and the test report highlight such deviation(s) for the relevant combination(s) of function and test.				

Specified function	Normal test level	Increased test level
Normal function	Normal specification (performance criteria A; B; C)	May fail
Safety function	Performance criteria - A, or - B + observed deviation + recovery time to be documented in the data sheet, or - C + observed behaviour documented in the data sheet	Performance criteria FS (i.e. no effect outside the specification, or defined state)

A: During testing, normal performance within the specification limits.

B: During testing, temporary degradation, or loss of function or performance which is self recovering.

C: During testing, temporary degradation, or loss of function or performance which requires operator intervention or system reset occurs.

9000 EMC specifications - emission:

Class B equipment		Standard CISPR 22	
Disturbance	Test method	Frequency range	Limits
Radiated	Quasi-peak	30 to 230 MHz	30 dB (µV/m)
		230 to 1000 MHz	37 dB (µV/m)
Conducted	Quasi-peak	0.15...0.50 MHz	40 to 30 dB (µA)
	Average		30 to 20 dB (µA)
	Quasi-peak	0.50 to 30 MHz	30 dB (µA)
	Average		20 dB (µA)