

Isolators

Switching repeater

Ex i field circuit

9170/11-11-21s Art. No. 203290



- For use up to SIL 2 (IEC/EN 61508)
- A wire breakage and short-circuit monitoring system, which can be disconnected and includes messages
- Variants with line fault transparency: The device notifies the control system directly of any field-side line faults via the signal output

MY R. STAHL 9170A



The Series 9170 Ex i switching repeaters are used to operate contacts, NAMUR proximity switches and optocouplers. Models are available with one or two channels. The intrinsically safe digital input is always galvanically separated from the output and auxiliary power. The channels in the two-channel devices are galvanically separated. Certain variants transmit frequencies of up to 10 kHz, and the output signal can be inverted.

Technical Data

Explosion Protection	
Ex interface zone	0, 1, 2, 20, 21, 22
IECEEx gas certificate	IECEEx BVS 09.0041 X
IECEEx gas certificate	IECEEx BVS 09.0041 X
IECEEx gas explosion protection	Ex [Ex ia Ga] IIC
IECEEx dust certificate	IECEEx BVS 09.0041 X
IECEEx dust explosion protection	[Ex ia Da] IIIC
IECEEx firedamp certificate	IECEEx BVS 09.0041X
IECEEx firedamp protection	[Ex ia Ma] I
ATEX gas certificate	DMT 02 ATEX E 195 X
ATEX gas certificate	DMT 02 ATEX E 195 X
ATEX gas explosion protection	Ex II (1) G Ex [Ex ia Ga] IIC
ATEX dust certificate	DMT 02 ATEX E 195 X
ATEX dust explosion protection	Ex II (1) D [Ex ia Da] IIIC
ATEX firedamp certificate	DMT 02 ATEX E 195 X
ATEX firedamp protection	Ex I (M1) [Ex ia Ma] I
FMus certificate	FM16US0122X
cFM certificate	FM16CA0067X
Marking cFMus	AIS Class I,II,III, Div. 1, Groups A,B,C,D,E,F,G; Class I, Zone 0, [AEx ia]/[Ex ia] IIC T4 at Ta = 70°C See Doc. 91 706 02 31 1
Certificates	ATEX (BVS), Brazil (ULB), Canada (FM), Canada (UL), IECEEx (BVS), India (PESO), Korea (KGS), SIL (exida), USA (FM), USA (UL)
Ship approval	CCS, EU RO MR (DNV)
Declaration of conformity	ATEX (EUK), China (CCC)
Installation	In safe areas

Explosion Protection

Further information	See relevant certificate and operating instructions
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Safety Data

Max. voltage U_o	9.6 V
Max. current I_o	10 mA
Max. power P_o	24 mW
Max. permissible external capacity C_o for IIC	3.6 μ F
Max. permissible external inductance L_o for IIC	350 mH
Max. permissible external capacity C_o for IIB	26 μ F
Max. permissible external inductance L_o for IIB	1000 mH
Max. permissible external capacity C_o for IIIC	26 μ F
Max. permissible external inductance L_o for IIIC	1000 mH
Max. permissible external inductance L_o for I	1000 mH
Max. voltage U_o parallel	9.6 V
Max. current I_o parallel	20 mA
Max. power P_o parallel	48 mW
Safety-related max. voltage	253 V

Functional Safety

SIL	2
HFT	0
SFF	84%
Lambda SD	8 FIT
Lambda SU	139 FIT
Lambda DD	1 FIT
Lambda DU	28 FIT
PFD _{avg} at T _{proof} 1 year	1,34E-04
PFD _{avg} at T _{proof} 2 years	2,55E-04
PFD _{avg} at T _{proof} 5 years	6,19E-04
Further information	See safety manual and test report

Electrical Data

Number of channels	1
LFD relay	No
Max. short-circuit current	8.2 mA

Auxiliary Power

Auxiliary power	110 to 230 V AC
Min. auxiliary power nominal voltage	120 V
Max. auxiliary power nominal voltage	230 V
Auxiliary power voltage range	96 ... 253 V
Nominal current	12 mA
Power consumption	1.8 W

Auxiliary Power

Power consumption at U_N	120 V AC: 1.4 VA 230 V AC: 1.8 VA
Max. power dissipation	1.3 W
Power dissipation	120 V AC: 1 W 230 V AC: 1.3 W
Undervoltage monitoring	Yes
Operation indication	LED
HE frequency range	48 ... 62 Hz

Galvanic Isolation

Test voltage as per standard	EN IEC 60079-11
Ex i input to output	1.5 kV AC
Ex i input to auxiliary power	1.5 kV AC
Ex i input to fault message contact	1.5 kV AC
Test voltage as per standard	EN 50178
Output to auxiliary power	1,1 kV AC

Input

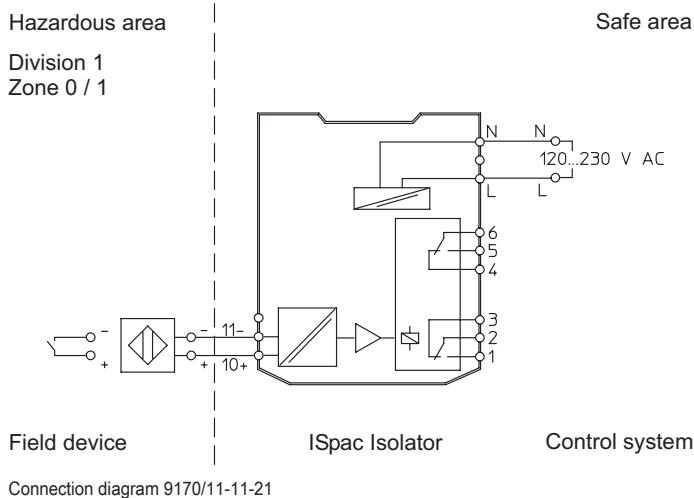
Input signal	As per EN 60947-5-6 (NAMUR)
Input current for ON	≥ 2.1 mA
Input current for OFF	≤ 1.2 mA
Hysteresis	Approx. 0.2 mA
Input internal resistance R_i	1000 Ω
Input for open-circuit voltage U_a	8,2 V
Short-circuit current	≤ 8.2 mA

Output

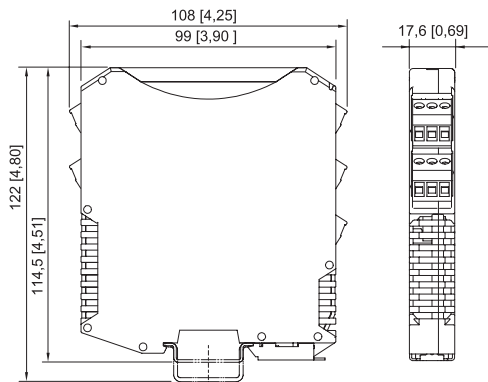
Output per channel	2 change-over contacts – signal relay
Output	Change-over cont. – sig. rel.
Min. output load condition	1 V / 0.1 mA
Max. output DC load condition	125 V / 1 A
Max. output AC load condition	125 V / 1 A
Output switching capacity	25 W / 50 VA
Output switching frequency	15 Hz
Switching delay ON/OFF	5 ms
Switching delay OFF/ON	5 ms
INV switch user adjustment	Activated/deactivated
Output electrical service life	5×10^5 at 24 V/1 A
Electrical service life note	Resistive load
Output mechanical service life	1×10^8 operating cycles
Recommended back-up fuse	$\leq F 1$ A AC/DC
Switching state indication	LED
LF switch user adjustment	Activated/deactivated
Wire breakage error detection input	$I_E < 0.05$ to 0.35 mA
Short circuit error detection input	$R_E < 100$ to 360 ohm
Behaviour of the output at line fault	OFF
Line fault indication	LED
Fault message contact switching capacity	30 V / 100 mA

Output	
Line fault and loss of power signalisation	-
Ambient Conditions	
Ambient temperature	-20 °C ... +70 °C (Single device) -20 °C ... +60 °C (Group assembly)
Ambient temperature	-4 °F ... +158 °F (Single device) -4 °F ... +140 °F (Group assembly)
Note	Installation conditions influence the ambient temperature. Please observe the "Cabinet installation guide".
Storage temperature	-40 °C ... +80 °C
Storage temperature	-40 °F ... +176 °F
Maximum relative humidity	95%
Use at the height of	< 2000 m
Electromagnetic compatibility	Tested to the following standards and regulations: EN 61326-1 For use in industrial areas; NAMUR NE 21
Mechanical Data	
Degree of protection (IP)	IP30
Degree of protection (IP) terminals	IP20
Fire resistance (UL 94)	V0
Enclosure material	Polyamide
Grid dimension	17.6 mm
Width	17.6 mm
Width, inches	0.69 in
Height	114.5 mm
Height in inches	4.51 in
Length	108 mm
Length in inches	4.25 in
Weight	180 g
Weight	0.4 lb
Mounting / Installation	
Mounting type	DIN rail NS35/15, NS35/7.5
Mounting orientation	Vertical Horizontal
Connection type	Screw terminal
Min. rigid conductor cross section	0.2 mm ²
Max. rigid conductor cross section	2.5 mm ²
Min. flex conductor cross section	0.2 mm ²
Max. flex conductor cross section	2.5 mm ²
Connection cross-section AWG	24 ... 14

Technical Drawings – Subject to Alterations



Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



ISpac Series 9143, 9146, 9147, 9160, 9162, 9163, 9165, 9167, 9170, 9172, 9175, 9176, 9180, 9182, 9193, ISbus Series 9412 with screw terminal

Accessories

Screw terminal with test tap

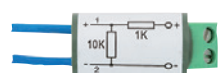


Additional connection of contacts also in hazardous areas to enable short-circuit and wire breakage detection.
Mounting on DIN rail.

Art. No.

272381

Resistive coupling element



Additional connection of contacts also in hazardous areas to enable short-circuit and wire breakage detection

Art. No.

105944

We reserve the right to make alterations to the technical data, dimensions, weights, designs and products available without notice. The illustrations cannot be considered binding.