

# Isolators

## Switching repeater

Ex i field circuit

9170/21-14-12s Art. No. 203153



- Can be used up to SIL 2 (IEC/EN 61508)
- Wire-breakage and short-circuit monitoring signalization, which can be disabled
- Optional line fault transparency version available: The device notifies the control system directly of any field-side line faults via the signal output.

WebCode 9170A



9170 series switching repeaters can be used for intrinsically safe operation of contacts, NAMUR proximity sensors or 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

Application range (zones)	2
Ex interface zone	0 1 2 20 21 22
IECEX gas certificate	IECEX BVS 09.0041 X
IECEX gas explosion protection	Ex nA nC [ja Ga] IIC T4 Gc
IECEX dust certificate	IECEX BVS 09.0041 X
IECEX dust explosion protection	[Ex ia Da] IIIC
ATEX gas certificate	DMT 02 ATEX E 195 X
ATEX gas explosion protection	⊕ II 3 (1) G Ex nA nC [ja Ga] IIC T4 Gc
ATEX dust certificate	DMT 02 ATEX E 195 X
ATEX dust explosion protection	⊕ II (1) D [Ex ia Da] IIIC
FMus certificate	FM16US0122X
cFM certificate	FM16CA0067X
Marking cFMus	Class I, Div. 2, Groups A,B,C,D; Class I, Zone 2, Group IIC 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
EAC certificate	EAEU RU S-DE.HA91.B.00100/20
EAC gas explosion protection	⊕ 2 Ex nA nC [ja Ga] IIC T4 Gc X
EAC dust explosion protection	⊕ [Ex ia Da] IIIC X

#### Explosion Protection

Certificates	ATEX (BVS), Brazil (ULB), Canada (FM), EAC (ENDCE), IECEx (BVS), India (PESO), Korea (KGS), SIL (exida), USA (FM)
Ship approval	CCS, EU RO MR (DNV GL)
Notes	CCC, UKCA certificate available from 2022 onward
Installation	in Zone 2, Division 2 and in the safe area
Further information	see respective certificate and operating instructions

#### 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 $\mu$ F
Max. permissible external capacity $C_o$ for IIB	26 $\mu$ F
Max. permissible external inductance $L_o$ for IIC	350 mH
Max. permissible external inductance $L_o$ for IIB	1000 mH
Internal capacitance	2.42 nF
Internal inductance	Negligible
Safety-related max. voltage	253 V

#### Functional Safety

SIL	2
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#### Electrical Data

Number of channels	2
LFD relay	Yes

#### Auxiliary Power

Auxiliary power	24 V DC
Auxiliary power voltage range	18 to 31.2 V
Voltage range residual ripple	$\leq 3,6 V_{SS}$
Nominal current	40 mA
Power consumption	0.96 W
Max. power dissipation	0.96 W
Polarity reversal protection	Yes
Undervoltage monitoring	Yes
Operation indication	Green "PWR" LED

#### Galvanic Isolation

Test voltage as per standard	IEC EN 60079-11
Ex i input to output	1.5 kV AC
Ex i input to auxiliary power	1.5 kV AC
Galv.sep. Ex i input to FMC	1.5 kV AC
Ex i input to Ex i input	500 V AC
Test voltage as per standard	EN 50178
Output to auxiliary power	1,1 kV AC
Output to output	1,1 kV AC
Fault message contact to auxiliary power	350 V AC

#### Galvanic Isolation

Galv. separation FMC to output	1,1 kV AC
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#### Input

Input signal	As per EN 60947-5-6 (NAMUR)
Input current for ON	$\geq 2.1$ mA
Input current for OFF	$\leq 1.2$ mA
Hysteresis	Approx. 0.2 mA
Input internal resistance $R_i$	1000 $\Omega$
Input for open-circuit voltage $U_a$	8,2 V
Short-circuit current	$\leq 8.2$ mA
Min. pulse duration (ON/OFF)	50 $\mu$ s

#### Output

Output per channel	1 LFT electronic output
Output	1 LFT electronic output
Line fault transparency	Yes
Max. output DC load condition	35 V / 50 mA
Output switching capacity	1,75 W
Overload-proof	Yes
Max. voltage drop	2 V
Output electrical service life	$> 10^9$ at 35 V/50 mA
Output switching frequency	10 kHz
Switching delay ON/OFF	60 $\mu$ s
Switching delay OFF/ON	50 $\mu$ s
INV switch user adjustment	Activated/deactivated
Switching state indication	Yellow "OUT" LED per channel
Fault message contact switching capacity	30 V / 100 mA
LF switch user adjustment	Activated/deactivated
Indication of line fault	Red "LF" LED for each channel
Wire breakage error detection	$I_E < 0.05$ to 0.35 mA
Short circuit error detection	$R_E < 100$ to 360 ohm
Line fault and loss of power signalisation	- contact (30 V / 100 mA) closed to ground in case of fault - contact in the output circuit (35 V / 50 mA) opens in case of fault - pac-Bus, floating contact (30 V / 100 mA)

#### 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)
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 Use in industrial environment; NAMUR NE 21

#### Mechanical Data

Degree of protection (IP)	IP30
Degree of protection (IP) terminals	IP20

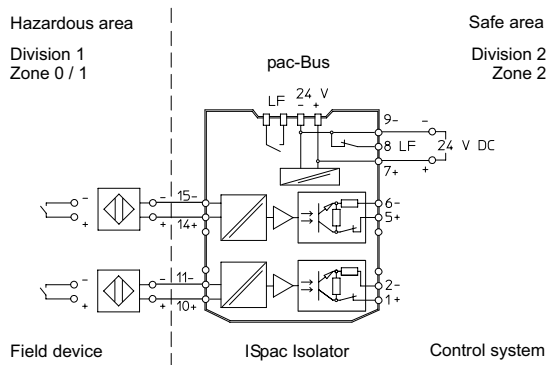
#### Mechanical Data

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, inches	4.51 in
Length	108 mm
Length, inches	4.25 in
Weight	0.18 kg
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 <sup>2</sup>
Max. rigid conductor cross section	2.5 mm <sup>2</sup>
Min. flex conductor cross section	0.2 mm <sup>2</sup>
Max. flex conductor cross section	2.5 mm <sup>2</sup>
Connection cross-section AWG	24 – 13

#### Technical Drawings – Subject to Alterations



Connection diagram 9170/21-14-12

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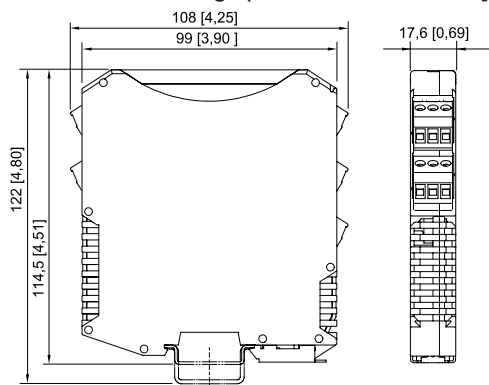
Switching repeater

Ex i field circuit

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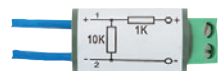
## Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



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

## Accessories

### Resistance coupling element



Connection of additional contacts in the Ex area as well, in order to enable short circuit and open circuit 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.