

# Isolators

Switching repeater

Ex i field circuit

9170/21-14-11k Art. No. 171469



- 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 [ia 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 [ia Ga] IIC T4 Gc
ATEX dust certificate	DMT 02 ATEX E 195 X
ATEX dust explosion protection	⊕ II (1) D [Ex ia Da] IIIC
Certificate FMus	FM16US0122X
Certificate cFM	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 [ia 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
Installation	in Zone 2, Division 2 and in the safe area
Further information	see respective certificate and operating instructions

#### Safety Data

Maximum voltage $U_o$	9.6 V
Maximum current $I_o$	10 mA
Maximum power $P_o$	24 mW
Max. permissible external capacitance $C_o$ for IIC	3.6 $\mu$ F
Max. permissible external capacitance $C_o$ 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 $C_i$	2.42 nF
Internal inductance $L_i$	Negligible
Safety-related maximum 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 ... 31.2 V
Voltage range residual ripple	$\leq 3,6 V_{ss}$
Nominal current	40 mA
Power consumption	0.96 W
Power dissipation max.	0.96 W
Polarity reversal protection	Yes
Undervoltage monitoring	Yes
Operation indication	Green "PWR" LED

#### Galvanic Isolation

Test voltage according to standard	IEC EN 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
Galvanic isolation Ex i input to Ex i input	500 V AC
Test voltage according to 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

Fault message contact to output	1,1 kV AC
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#### Input

Input signal	In accordance with EN 60947-5-6 (NAMUR)
Input current for ON	$\geq 2,1$ mA
Input current for OFF	$\leq 1.2$ mA
Hysteresis	ca. 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 electronic output
Output	1 electronic output
Output max. load DC	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 ON/OFF	50 $\mu$ s
Switch user adjustment inverting	Activated / deactivated
Switching state indication	Yellow LED "OUT" per channel
Switching capacity fault message contact	30 V / 100 mA
Switch user adjustment line fault	Activated / deactivated
Indication of line fault	Red LED "LF" for each channel
Error detection wire breakage	$I_E < 0.05 \dots 0.35$ mA
Short circuit error detection	$R_E < 100 \dots 360$ $\Omega$

#### 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
Relative humidity max.	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
Terminal degree of protection (IP)	IP20
Fire resistance (UL 94)	V0
Enclosure material	Polyamide
Grid dimension	17.6 mm

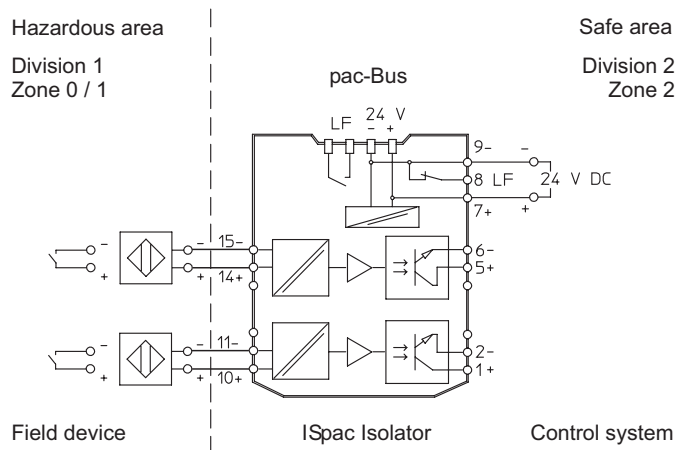
#### Mechanical Data

Width	17.6 mm
Width inches	0.69 in
Height	114.5 mm
Height inches	4.51 in
Length	128 mm
Length inches	5.04 in
Weight	0.18 kg
Weight	0.4 lb

#### Mounting / Installation

Mounting type	NS35/15, NS35/7.5 DIN rail
Mounting position	Vertical Horizontal
Connection type	Spring clamp terminal
Conductor cross-section rigid min.	0.2 mm <sup>2</sup>
Conductor cross-section solid max.	2.5 mm <sup>2</sup>
Conductor cross-section flexible min.	0.2 mm <sup>2</sup>
Conductor cross-section flexible max.	2.5 mm <sup>2</sup>
Connection cross-section AWG	24 – 13

#### Technical Drawings – Subject to Alterations



Connection diagram 9170/21-14-11

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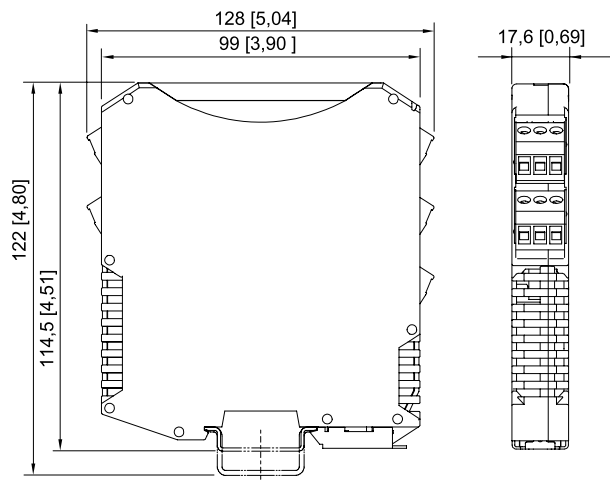
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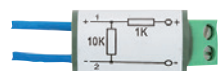
## Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



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