

# Isolators

## Switching repeater

Ex i field circuit

9170/11-12-11k Art. No. 203286



- 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

Ex interface zone	0 1 2 20 21 22
IECEX gas certificate	IECEX BVS 09.0041 X
IECEX gas explosion protection	Ex [Ex ia Ga] IIC
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	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
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
EAC certificate	EAEU RU S-DE.HA91.B.00100/20
EAC gas explosion protection	Ex [Ex ia Ga] IIC X
EAC dust explosion protection	Ex [Ex ia Da] IIIC X
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

#### Explosion Protection

Installation	in 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	1
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	33 mA
Power consumption	0.8 W
Max. power dissipation	0.8 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
Test voltage as per standard	EN 50178
Output to auxiliary power	1,1 kV AC
Fault message contact to auxiliary power	350 V AC
Galv. separation FMC to output	1,1 kV AC

#### 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

#### Input

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

#### Output

Output per channel	1 change-over contact – power relay
Output	1 change-over contact – power relay
Min. output load condition	12 V / 0.1 mA
Max. output DC load condition	250 V / 2 A
Max. output AC load condition	250 V / 4 A
Output switching capacity	50 W / 1000 VA
Output electrical service life	1 x 10 <sup>5</sup> operating cycles at 250 V/4 A
Output mechanical service life	15 x 10 <sup>6</sup> operating cycles
Recommended back-up fuse	$\leq F 4$ A AC/2 A DC
Output switching frequency	6 Hz
Switching delay ON/OFF	10 ms
Switching delay OFF/ON	10 ms
INV switch user adjustment	Activated/deactivated
Switching state indication	Yellow "OUT" LED
Fault message contact switching capacity	30 V / 100 mA
LF switch user adjustment	Activated/deactivated
Indication of line fault	Red "LF" LED
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 - 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
Fire resistance (UL 94)	V0
Enclosure material	Polyamide
Grid dimension	17.6 mm
Width	17.6 mm
Width, inches	0.69 in

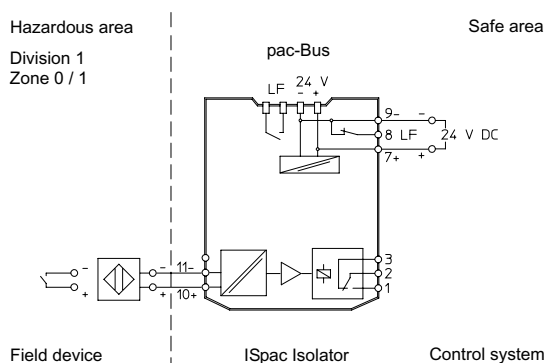
#### Mechanical Data

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

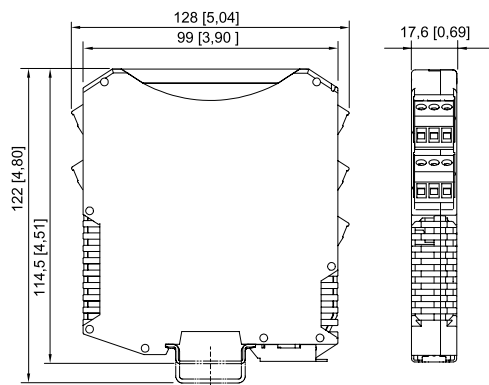
Mounting type	DIN rail NS35/15, NS35/7.5
Mounting orientation	Horizontal Vertical
Connection type	Spring clamp terminal
Min. rigid conductor cross section	0.2 mm <sup>2</sup>
Max. rigid conductor cross section	2.5 mm <sup>2</sup>
Min. flex conductor cross section	0.2 mm <sup>2</sup>
Max. flex conductor cross section	2.5 mm <sup>2</sup>
Connection cross-section AWG	24 – 13

#### Technical Drawings – Subject to Alterations



Connection diagram 9170/11-12-11

#### 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

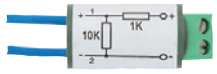
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Connection of additional contacts in the Ex area as well, in order to enable short circuit and open circuit detection.

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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.