

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 [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 μ F |
| Max. permissible external capacity C_o for IIB | 26 μ 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 |
|-----|---|

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 |
|--------------------------------|-----------|

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 |
| Min. pulse duration (ON/OFF) | 50 μ s |

Output

| | |
|--|-------------------------------|
| Output per channel | 1 electronic output |
| Output | 1 electronic output |
| 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 μ s |
| Switching delay OFF/ON | 50 μ 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 |

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 |

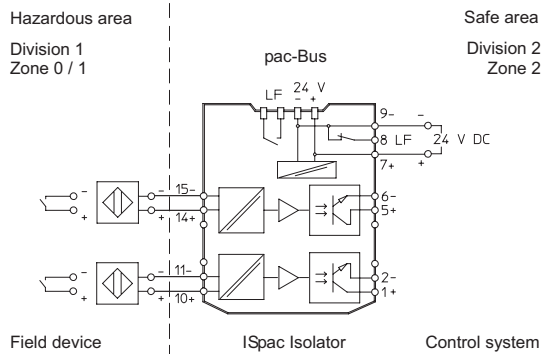
Mechanical Data

| | |
|----------------|----------|
| 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

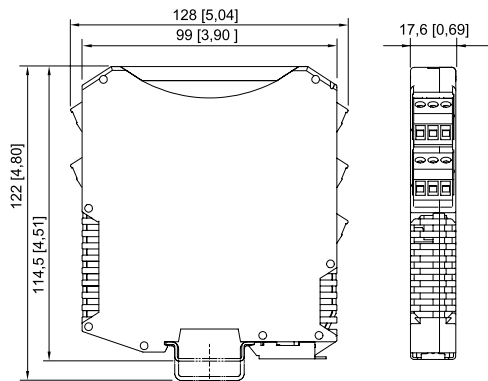
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|------------------------------------|----------------------------|
| Mounting type | DIN rail NS35/15, NS35/7.5 |
| Mounting orientation | Vertical Horizontal |
| Connection type | Spring clamp terminal |
| Min. rigid conductor cross section | 0.2 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 – 13 |

Technical Drawings – Subject to Alterations



Connection diagram 9170/21-14-11

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

Isolators

Switching repeater

Ex i field circuit

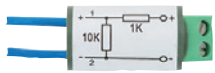
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Accessories

Resistance coupling element

Art. No.



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.