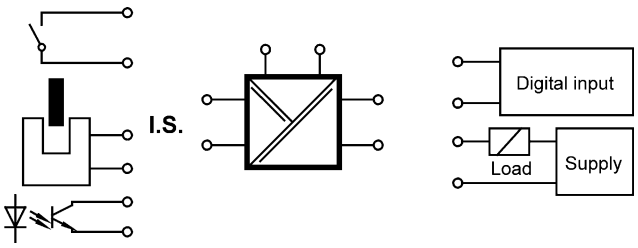
# I.S. Isolators


**Switching Repeater**
**Type 9170**

- Intrinsically safe input [EEx ia] IIC
- 1 and 2 channels
- Galvanic isolation between input, output and power supply
- Open-circuit / short-circuit monitoring and messaging (can be switched off)
- Inversion of output signal can be set
- Transmission frequency up to 10 kHz
- Installation possible in Zone 2 and Div. 2
- Can be used up to SIL 2 (relay - output) or SIL 3 (electronic - output) (IEC 61508)

Basic function: binary / digital input, 1 and 2 channels.
The switching repeaters are suitable typically for intrinsically safe operation of contacts, proximity switches to EN 60947-5-6 (NAMUR), optocoupler outputs etc.




09362E02

Zone 2

## Selection table

| Version | Channels | Power supply | Output / channel | Ordering code |
|---|---|---|---|---|
| Switching Repeater Type 9170 | 1 | 24 V DC | 2 changeover (125 V / 1 A) | **9170/10-11-11.** |
| | | | 1 changeover (250 V / 4 A) | **9170/10-12-11.** |
| | | | 1 electronic output (35 V / 50 mA) | **9170/10-14-11.** |
| | 2 | 24 V DC | 1 changeover (125 V / 1 A) | **9170/20-10-11.** |
| | | | 2 normally open (125 V / 1 A) | **9170/20-11-11.** |
| | | | 1 changeover (250 V / 4 A) | **9170/20-12-11.** |
| | | | 1 electronic output (35 V / 50 mA) | **9170/20-14-11.** |
| | 1 | 120 V ... 230 V AC | 2 changeover (125 V / 1 A) | **9170/10-11-21.** |
| | | | 1 changeover (250 V / 4 A) | **9170/10-12-21.** |
| | | | 2 changeover (250 V / 4 A) | **9170/10-13-21.** |
| | 2 | 120 V ... 230 V AC | 1 changeover (125 V / 1 A) | **9170/20-10-21.** |
| | | | 2 normally open (125 V / 1 A) | **9170/20-11-21.** |
| | | | 1 changeover (250 V / 4 A) | **9170/20-12-21.** |

## Add. to ordering code

| | | |
|---|---|---|
| | Screw terminal | **9170/..-...-..s** |
| | Spring clamp terminal | **9170/..-...-..k** |
| | Insulation displacement connectors | **9170/..-...-..q** |

## Technical Data

| | | | |
|---|---|---|---|
| Certificates | DMT 02 ATEX E 195 X | | |
| Other certificates | USA (FM, UL), Canada (CSA), Russia (VNIIEF), Belarus (Promatomnadzor), Shipping (DNV), Brazil (UL do Brasil) | | |
| Explosion protection | ⟨Ex⟩ II (1) GD [EEx ia] IIC/IIB and ⟨Ex⟩ II 3 G EEx nAC II T4 *) | | |
| Installation | in Zone 2, Div 2*) and in save area | | |
| | *) Zone 2 and Div. 2 only for types 9170/.0-10-11., 9170.0-11-11. and 9170/.0-14-11. | | |
| Safe maximum values (CENELEC) | Inputs | channels single | 2 channels parallel |
| | Max. voltage $U_o$ | 10.6 V | 10.6 V |
| | Max. current $I_o$ | 24 mA | 48 mA |
| | Max. power $P_o$ | 64 mW | 128 mW |
| | Max. connectable capacitance IIC/IIB | 2.32 µF / 16.2 µF | 2.32 µF / 16.2 µF |
| | Max. connectable inductance IIC/IIB | 63 mH / 230 mH | 16 mH / 61 mH |
| | Intern. capacitance $C_i$ and inductance $L_i$ | 2.42 nF / negligible | 4.84 nF / negligible |
| | Insulation voltage $U_m$ | 250 V | 250 V |
| | Further information and combinations of values, see certification. | | |
| Power supply | | 9170/.0-1.-11. | 9170/.0-14-11. |
| | Nominal voltage $U_N$ | 24 V DC | 24 V DC |
| | Voltage range | 18 V ... 31.2 V | 18 V ... 31.2 V |
| | Residual ripple | < 3.26 $V_{SS}$ | < 3.26 $V_{SS}$ |
| | Nominal current at$U_N$ 1 / 2 channels | 33 mA / 55 mA | 26 mA / 36 mA |
| | Power consumption at $U_N$ 1 / 2 channels | 0.8 W / 1.3 W | 0.6 W / 1.9 W |
| | Max. power losses 1 / 2 channels | 0.8 W / 1.3 W | 0.6 W / 1.9 W |
| | Polarity reversal protection | yes | yes |
| | | 9170/.0-1.-21. (120 V AC) | 9170/.0-1.-21. (230 V AC) |
| | Nominal voltage $U_N$ | 120 V ... 230 V AC | 120 V ... 230 V AC |
| | Voltage range | 96 V ... 253 V | 96 V ... 253 V |
| | Frequency range | 48 Hz ... 62 Hz | 48 Hz ... 62 Hz |
| | Nominal current at $U_N$ 1 / 2 channels | 12 mA / 18 mA | 12 mA / 18 mA |
| | Power consumption at $U_N$ 1 / 2 channels | 1.4 VA / 2.2 VA | 1.8 VA / 2.8 VA |
| | Max. power losses 1 / 2 channels | 1.0 W / 1.6 W | 1.3 W / 2.0 W |
| | Indication | LED green „PWR“ | |
| | Undervoltage monitoring | yes (no faulty module / output states) | |

# Switching Repeater
# Type 9170

## Technical Data

| | | | | |
|---|---|---|---|---|
| I.S. input | Input signal | on regulations EN 60947-5-6 (NAMUR) | | |
| | current for ON / OFF | ≥ 2.1 mA / ≤ 1.2 mA | | |
| | Hysteresis | approx. 0.2 mA | | |
| | No-load voltage | 8.2 V | | |
| | Short-circuit current | 8.2 mA | | |
| | Input resistance $R_i$ | 1000 Ω | | |
| Output | | 9170/.0-10-.1.<br>9170/.0-11-.1. | 9170/.0-12-.1.<br>9170/10-13-21. | 9170/.0-14-11. |
| | Versions | Signal relay | Power relay | Electronic |
| | minimum load | 1 V / 100 µA | 12 V / 100 µA | |
| | maximum load DC | 125 V / 1 A | 250 V / 2 A | 35 V / 50 mA ADC |
| | maximum load AC | 125 V / 1 A | 250 V / 4 A | - - |
| | maximum switching power | 25 W / 50 VA | 50 W / 1000 VA | 1.75 W |
| | Overload protected | - - | - - | yes |
| | Voltage drop | - - | - - | < 2 |
| | electrical life time | at 24 V / 1 A | at 250 V / 4 A | at 35 V / 50 mA |
| | resistive load | 5 x $10^5$ cycles | 1 x $10^5$ cycles | > $10^9$ cycles |
| | Mechanical life time | 1 x $10^8$ cycles | 15 x $10^6$ cyles | - - |
| | recommended back-up fuse | ≤ F 1 A AC / DC | ≤ F 4 A AC / 2 A DC | - - |
| | maximum switching frequency | 15 Hz | 6 Hz | 10 kHz |
| | Switching delay ON / OFF | 5 ms | 10 ms | 15 µs |
| | Switching delay OFF / ON | 5 ms | 10 ms | 30 µs |
| | Settings (switch INV) | Inversion of operating mode | | |
| | Indication | LED yellow „OUT“ perchannel | | |
| Error detection I.S. input | Open-circuit (EN 60947-5-6) | $I_E$ < | 0.05 mA ... 0.35 mA | |
| | Short-circuit (EN 60947-5-6) | $R_E$ < | 100 Ω ... 360 Ω | |
| | Behaviour of output | | OFF | |
| | Settings (Switch LF) | | activated / deactivated | |
| | Error detection | | LED red „LF“ each channel | |
| | Error messaging and power supply failure | | - Contact (30 V / 100 mA) *)<br>close to ground in case of error<br>- pac-Bus, floating contact<br>(30 V / 100 mA) *) | |
| | *) not at 9170/.0-1.-21 | | | |
| Galvanic isolation | Test voltage under regulations EN 50020 | | | |
| | I.S. input to output | | 1.5 kV AC | |
| | I.S. input to power supply | | 1.5 kV AC | |
| | I.S. Inputs to each other | | 500 V AC | |
| | I.S. input to error-contact | | 1.5 kV AC | |
| | Test voltage under regulations EN 50178 | | | |
| | Output to power supply | | 1.1 kV AC | |
| | Outputs to each other | | 1.1 kV AC | |
| | Error-contact to power supply | | 350 V AC | |
| | Error-contact to outputs | | 1.1 kV AC | |
| Electromagnetic compatibility | Tested under the following standards and regulations:<br>EN 61326 (IEC/EN 61000-4-1...6 and 11; EN 55022 Class B);<br>NAMUR NE 21 (IEC/EN 61000-4-1...6, 8 and 11; EN 55022 Class B) | | | |
| Ambient conditions | Ambient temperature | | - 20 °C ... + 60 °C / + 70 °C<br>(watch instructions) | |
| | Storage temperature | | - 40 °C ... + 80 °C | |
| | Relative humidity (no condensation) | ≤ | 95 % | |

## Technical Data

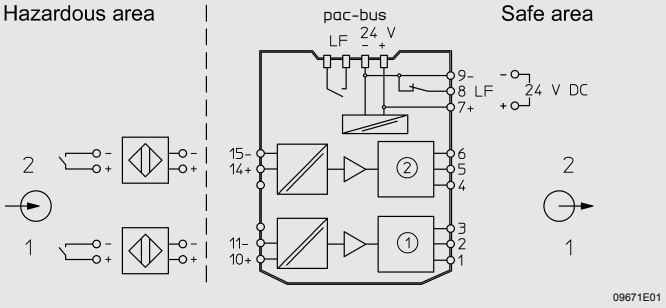
### Mechanical data

| | Screw terminals | Spring clamp terminals | Insulation displacement connectors |
|---|---|---|---|
| Connection one wire | | | |
| - rigid | 0.2 ... 2.5 mm² | 0.2 ... 2.5 mm² | - - |
| - flexible | 0.2 ... 2.5 mm² | 0.2 ... 2.5 mm² | 0.5 ... 1 mm² |
| - flexible, end covering sleeves (without / with plastic sleeving) | 0.25 ... 2.5 mm² | 0.25 ... 2.5 mm² | - - |
| Connection two wires | | | |
| - rigid | 0.2 ... 1 mm² | - - | - - |
| - flexible | 0.2 ... 1.5 mm² | - - | - - |
| - flexible, end covering sleeves | 0.25 ... 1 mm² | 0.5 ... 1 mm² | - - |

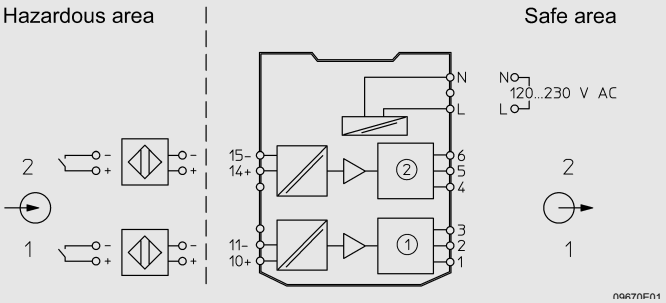
| | |
|---|---|
| Weight | approx. 160 g |
| Mounting type | on DIN rail acc. to EN 50022 (NS35/15; NS35/7.5) or in pac-Carrier |
| Mounting position | horizontal or vertical |
| Casing protection class | IP 30 |
| Terminal protection class | IP 20 |
| Casing material | PA 6.6 |
| Fire protecting class (UL-94) | V0 |

### Connection diagram

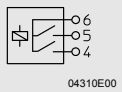
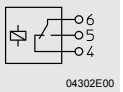
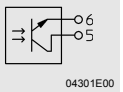
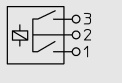
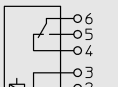
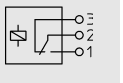
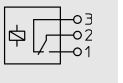
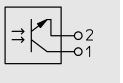
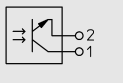
at 24 V DC




at 120 / 230 V AC




### Configuration output

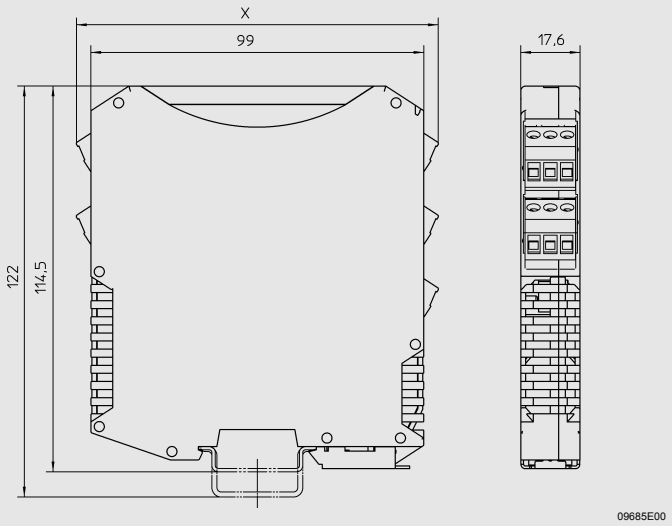
| 9170/... | /20-11-.1. | /10-11-.1. /10-13-21. | /20-10-.1. /20-12-.1. | /10-12-.1. | /20-14-.1. | /10-14-.1. |
|---|---|---|---|---|---|---|
| Channel 2 ② |  04310E00 | |  04302E00 | |  04301E00 | |
| Channel 1 ① |  04297E00 |  04298E00 |  04300E00 |  04300E00 |  04299E00 |  04299E00 |

## Accessories and spare parts

| Designation | Description | Ordering code |
|---|---|---|
| Resistance coupling element | Allows to detect short circuit or open circuit if simple contact is applied. | **3296050** |

# Switching Repeater
# Type 9170

**Dimension drawings** (all dimensions in mm) - subject to alterations




| | Dimension X |
|---|---|
| Screw terminals | 108 mm |
| Spring clamp terminals | 128 mm |
| Insulation displacement connectors | 131 mm |

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