

Isolators

Switching repeater

Ex i field circuit

9170/11-14-12s Art. No. 203288



- Extensive portfolio – outputs with relays or electronics
- Wire breakage and short-circuit monitoring
- Robust design for challenging environments

MY R. STAHL 9170A



The Series 9170 Ex i switching repeaters are used to operate contacts, NAMUR proximity switches and 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 ec nC [ia Ga] IIC T4 Gc
IECEX dust certificate	IECEX BVS 09.0041 X
IECEX dust explosion protection	[Ex ia Da] IIIC
IECEX firedamp certificate	IECEX BVS 09.0041X
IECEX firedamp protection	[Ex ia Ma] I
ATEX gas certificate	DMT 02 ATEX E 195 X
ATEX gas explosion protection	II 3 (1) G Ex ec 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
ATEX firedamp certificate	DMT 02 ATEX E 195 X
ATEX firedamp protection	I (M1) [Ex ia Ma] I
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/Ex ia] IIC T4 at Ta = 70°C See Doc. 91 706 02 31 1
Certificates	ATEX (BVS), Brazil (ULB), Canada (FM), IECEX (BVS), Korea (KGS), SIL (exida), USA (FM)
Ship approval	CCS, EU RO MR (DNV)
Declaration of conformity	ATEX (EUK), China (CCC)
Installation	In Zone 2, Division 2 and safe areas

Explosion Protection

Further information	See relevant certificate and operating instructions
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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 inductance L_o for IIC	350 mH
Max. permissible external capacity C_o for IIB	26 μ F
Max. permissible external inductance L_o for IIB	1000 mH
Max. perm. ext. capacit. IIIC	26 μ F
Max. permis. ext. induct. IIIC	1000 mH
Max. permissible ext. capac. I	99 μ F
Max. permissible external inductance L_o for I	1000 mH
Max. voltage U_o parallel	9.6 V
Max. current I_o parallel	20 mA
Max. power P_o parallel	48 mW
Safety-related max. voltage	253 V

Functional Safety

Further information	See safety manual and test report
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Electrical Data

Number of channels	1
LFD relay	Yes
Max. short-circuit current	8.2 mA

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	28 mA
Power consumption	0.67 W
Max. power dissipation	0.67 W
Polarity reversal protection	Yes
Undervoltage monitoring	Yes
Operation indication	Green "PWR" LED

Galvanic Isolation

Test voltage as per standard	EN IEC 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
Test voltage as per standard	EN 50178
Output to auxiliary power	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	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 LFT electronic output
Output	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 switching frequency	10 kHz
Switching delay ON/OFF	60 μ s
Switching delay OFF/ON	50 μ s
INV switch user adjustment	Activated/deactivated
Output electrical service life	$> 10^9$ at 35 V/50 mA
Electrical service life note	Resistive load All specifications given for switching times and frequencies apply to a load of 24 V, 1 mA to 50 mA DC
Switching state indication	Yellow "OUT" LED
LF switch user adjustment	Activated/deactivated
Wire breakage error detection input	$I_E < 0.05$ to 0.35 mA
Short circuit error detection input	$R_E < 100$ to 360 ohm
Behaviour of output during LF	OFF
Behaviour of the output at line fault note	Due to the special output circuit, line faults are transmitted directly via the signal channel to the downstream control level. Electronic output closed: $R = 2.4$ k Ω Electronic output open: $R > 13$ k Ω Error case (fault message contact open): $R > 100$ k Ω
Line fault indication	Red "LF" LED
Fault message contact switching capacity	30 V / 100 mA
Line fault and loss of power signalisation	- Contact in the output circuit (35 V / 50 mA) opens in case of fault - Contact (30 V/100 mA), closed against earth in case of error - pac-Bus, potential-free 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)

Ambient Conditions

Note	Installation conditions influence the ambient temperature. Please observe the "Cabinet installation guide".
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 For use in industrial areas; 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
Height	114.5 mm
Height in inches	4.51 in
Length	108 mm
Length in inches	4.25 in
Weight	180 g
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 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 ... 14

