

Isolators

Isolating repeater Without auxiliary power

Ex i field circuit ISpac

9167/23-11-00k Art. No. 160248



- Compact loop-powered one- and two-channel Ex i output isolating repeater
- Suitable for fire and gas detectors
- For use up to SIL 3 (IEC 61508)

MY R. STAHL 9167A



The Series 9167 Ex i isolating repeaters for field circuits operate without auxiliary power and can be used for the intrinsically safe operation of control valves, I/P converters, analogue indicators and fire or gas detectors, for example. The devices have one or two channels and transmit HART signals (0/4 to 20 mA) via the analogue output. The devices transmit superimposed HART communication signals in both directions.

Technical Data

Explosion Protection	
Application range (zones)	2
Ex interface zone	0, 1, 2, 20, 21, 22
IECEX gas certificate	IECEX BVS 11.0089 X
IECEX gas explosion protection	Ex nA [ia Ga] IIC T4 Gc
IECEX dust certificate	IECEX BVS 11.0089 X
IECEX dust explosion protection	[Ex ia Da] IIIC
ATEX gas certificate	BVS 04 ATEX E 082 X
ATEX gas explosion protection	⊕ II 3 (1) G Ex nA [ia Ga] IIC T4 Gc
ATEX dust certificate	BVS 04 ATEX E 082 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. 91 676 01 31 1
Certificate ULus	E81680V1S7
Marking ULus	providing intrinsically safe circuits for use in Class I,II,III, GROUPS A,B,C,D,E,F,G; See Doc. 91 676 01 31 3
Certificates	ATEX (BVS), Canada (FM), IECEX (BVS), SIL (exida), USA (FM), USA (UL)
Ship approval	CCS, EU RO MR (DNV)
Declaration of conformity	ATEX (EUK)
Installation	In Zone 2, Division 2 and safe areas
Further information	See relevant certificate and operating instructions

Safety Data

Max. voltage U_o	25 V
Max. current I_o	99 mA
Max. power P_o	613 mW
Max. permissible external capacity C_o for IIC	0.11 μ F
Max. permissible external inductance L_o for IIC	2.5 mH
Max. permissible external capacity C_o for IIB	0.84 μ F
Max. permissible external inductance L_o for IIB	11 mH
Max. permissible external capacity C_o for IIIC	0.84 μ F
Max. permissible external inductance L_o for IIIC	11 mH
Internal capacitance	Negligible
Internal inductance	Negligible
Safety-related max. voltage	253 V

Functional Safety

SIL	3
HFT	0
SFF	92,27%
Lambda SD	0 FIT
Lambda SU	43 FIT
Lambda DD	0 FIT
Lambda DU	3 FIT
PFD _{avg} at T _{proof} 1 year	2,23E-04
PFD _{avg} at T _{proof} 3 years	4,34E-04
PFD _{avg} at T _{proof} 5 years	6,46E-04
PFDavg at Tproof 10 years	1,17E-03
Further information	See test report

Electrical Data

Number of channels	2
LFD relay	No
Communication signal	HART

Auxiliary Power

Auxiliary power	without
Nominal voltage	Loop-powered
Auxiliary power voltage range	Loop-powered
Max. power dissipation at 20 mA	0.4 W
Max. power dissipation at 40 mA	1.2 W
Polarity reversal protection	Yes

Galvanic Isolation

Test voltage as per standard	EN IEC 60079-11
Ex i output to input	1.5 kV AC
Ex i output to Ex i output	350 V AC

Galvanic Isolation

Test voltage as per standard	EN 50178
Input to input	500 V AC

Input

Input	0/4 ... 20 mA with HART
Input signal	0/4 to 20 mA with HART
Function range input	0 – 40 mA
Input voltage UE	≤ 31.2 V
Max. effective voltage	23.6 V
Internal resistance R_i at 20 mA	380 Ω
Internal resistance R_i at 40 mA	330 Ω
Additional voltage drop	1 V
Internal consumption	≤ 10 μA
Behaviour of the input with DB	≤ 1 mA

Output

Output	0/4 to 20 mA with HART
Output signal	0/4 to 20 mA with HART
Function range output	0 – 40 mA
Output short-circuit current	≤ 60 mA
Open-circuit voltage U_o	25 V
Current residual ripple	≤ 0.5%
Load resistance R_L	0 ... 800 Ω
Settling time 10-90%	≤ 1 ms
Cross-talk channel 1 / channel 2	Not measurable
Wire break. err detection OFF	IA = 0 mA
Deviations / error note	Information in % of the measuring range (20 mA) at U_N , 23 °C
Average measurement fault	0,35%
Temperature influence error limits	≤ 0.1%/10 K

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)
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

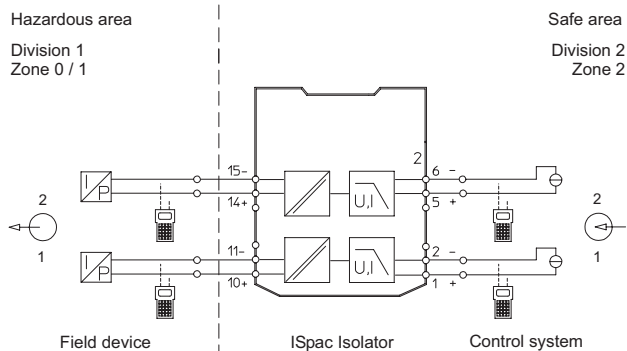
Mechanical Data

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	128 mm
Length in inches	5.04 in
Weight	182 g
Weight	0.4 lb

Mounting / Installation

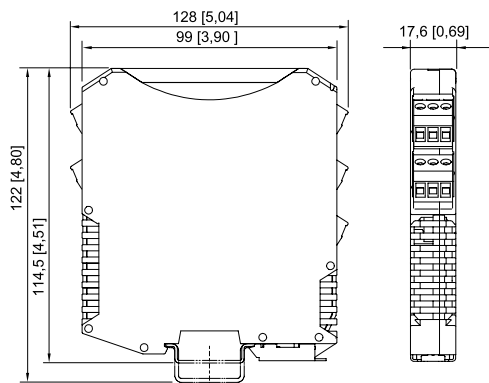
Mounting type	DIN rail NS35/15, NS35/7.5
Mounting orientation	Horizontal Vertical
Connection type	Spring clamp terminal
Min. rigid conductor cross section	0.2 mm ²
Max. rigid conductor cross section	2.5 mm ²
Min. flex conductor cross section	0.2 mm ²
Max. flex conductor cross section	2.5 mm ²
Connection cross-section AWG	24 ... 14

Technical Drawings – Subject to Alterations



Connection diagram 9167/2

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

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Accessories

Transparent cover

Art. No.



For 91xx ISpac modules
Yellow, transparent
Clear identification of the device for SIL applications.
(Packaging unit: 10 pieces)

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