

# Isolator Barriers

Isolating repeater

Ex i field circuit ISpac

9165/16-11-11s Art. No. 201270



- Compact one- and two-channel Ex i output isolating repeater
- Variants with wire-breakage and short-circuit monitoring system, which can be disconnected and features a signalling contact
- Can be used up to SIL 2 (IEC/EN 61508)

WebCode 9165A



9165 series Ex i isolating repeaters can be used for the intrinsically safe operation of control valves, I/P transducers or indicators. They transmit superimposed HART communication signals in both directions. The input, output and auxiliary power are galvanically separated from one another. The two channels in the two-channel variants are galvanically separated from one another.

## Technical Data

### Explosion Protection

Application range (Zones)	2
Ex interface zone	0 1 2 20 21 22
IECEX gas certificate	IECEX BVS 10.0011 X
IECEX gas explosion protection	Ex nA nC [ja Ga] IIC T4 Gc
IECEX dust certificate	IECEX BVS 10.0011 X
IECEX dust explosion protection	[Ex ia Da] IIIC
ATEX gas certificate	DMT 03 ATEX E 012 X
ATEX gas explosion protection	⊕ II 3 (1) G Ex nA nC [ja Ga] IIC T4 Gc
ATEX dust certificate	DMT 03 ATEX E 012 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, AEx/Ex nA nC 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. 91 656 01 31 1
EAC certificate	TS RU S-DE.GB04.B.00353
EAC gas explosion protection	⊕ 2 Ex nA nC [ja Ga] IIC T4 Gc X
EAC dust explosion protection	⊕ [Ex ia Da] IIIC
Certificates	ATEX (BVS), Canada (FM), EAC (ENDCE), IECEX (BVS), India (PESO), Korea (KTL), Russia (Meteorological certificate), SIL (exida), USA (FM)

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## Explosion Protection

Ship approval	CCS, EU RO MR (DNV GL)
Notes	CCC, UKCA certificate available from 2022 onward

## Safety Data

Max. voltage $U_o/V_{oc}$	25.6 V
Max. current $I_o/I_{sc}$	96 mA
Max. power $P_o$	605 mW
Max. permissible external capacitance $C_o/C_a$ for IIC	0.103 $\mu$ F
Max. permissible external capacitance $C_o/C_a$ for IIB	0.8 $\mu$ F
Max. permissible external inductance $L_o/L_a$ for IIC	1.9 mH
Max. permissible external inductance $L_o/L_a$ for IIB	11 mH
Internal capacitance	Negligible
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
Communication signal	HART

## Auxiliary Power

Auxiliary power	24 V DC
Nominal voltage $V_{nom}$	24 V DC
Auxiliary power voltage range	18 to 31.2 V
Voltage range residual ripple	$\leq 3,6 V_{SS}$
Nominal current	55 mA
Power consumption	1.3 W
Max. power dissipation	1.1 W
Polarity reversal protection	Yes
Operation indication	Green "PWR" LED

## Galvanic Isolation

Test voltage as per standard	IEC EN 60079-11
Ex i output to fault message contact	1.5 kV AC
Ex i output to auxiliary power	1.5 kV AC
Ex i output to input	1.5 kV AC
Test voltage as per standard	EN 50178
Fault message contact to auxiliary power	350 V AC
Input to auxiliary power	350 V AC
Fault message contact to input	350 V AC

## Input

Input	0/4 to 20 mA with HART
Input signal	0/4 to 20 mA with HART

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#### Input

Function range input	0 – 24 mA
Maximum input current	50 mA
Input resistance	175/400 $\Omega$
LF response threshold	$I_E > 3.6$ mA
Behaviour of the input with LF	$RE \geq 100$ k $\Omega$

#### Output

Output	0/4 to 20 mA with HART
Output signal	0/4 to 20 mA with HART
Function range output	0 – 24 mA
Max. load resistance $R_L$	800 $\Omega$
Min. $R_L$ for KS detection	150 $\Omega$
Output residual ripple	$\leq 50$ mV
Open-circuit voltage $U_a$	22,5 V
Settling time 10-90%	$\leq 100$ $\mu$ s
Average measurement fault	0,10%
Temperature influence error limits	$\leq 0.05\%/10$ K
LF switch user adjustment	Activated/deactivated
Indication of line fault	Red "LF" LED
Wire breakage error detection	$U_A > 16$ V
Short circuit error detection	$R_L < 50$ ohm
Line fault and loss of power signalization	Contact (30 V / 100 mA) closed to ground in case of fault pac-Bus, floating contact (30 V / 100 mA)

#### Ambient Conditions

Ambient temperature $^{\circ}$ C	-20 $^{\circ}$ C ... +70 $^{\circ}$ C (Single device) -20 $^{\circ}$ C ... +60 $^{\circ}$ C (Group assembly)
Ambient temperature $^{\circ}$ F	-4 $^{\circ}$ F ... +158 $^{\circ}$ F (Single device) -4 $^{\circ}$ F ... +140 $^{\circ}$ F (Group assembly)
Storage temperature $^{\circ}$ C	-40 $^{\circ}$ C ... +80 $^{\circ}$ C
Storage temperature $^{\circ}$ F	-40 $^{\circ}$ F ... +176 $^{\circ}$ F
Max. 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

#### 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, inches	4.51 in
Length	108 mm
Length, inches	4.25 in

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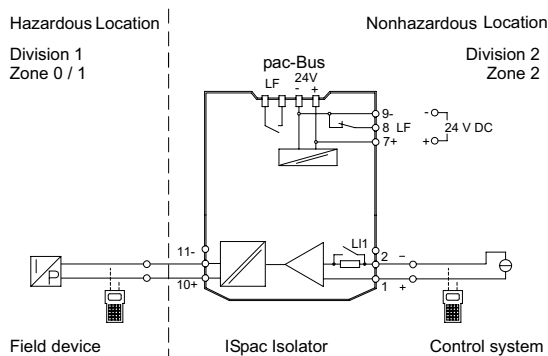
## Mechanical Data

Weight	0.18 kg
Weight	0.4 lb

## Mounting / Installation

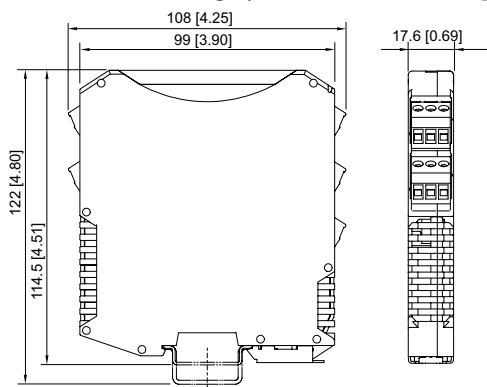
Mounting type	DIN rail NS35/15, NS35/7.5
Mounting orientation	Horizontal Vertical
Connection type	Screw terminal
Min. rigid conductor cross section	0.2 mm <sup>2</sup>
Max. rigid conductor cross section	2.5 mm <sup>2</sup>
Min. flex conductor cross section	0.2 mm <sup>2</sup>
Max. flex conductor cross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

## Technical Drawings – Subject to Alterations



Connection diagram 9165/16-11-11

## 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 screw terminal

## Accessories

### Front cover

for ISpac modules 91xx yellow, transparent Clear marking of the device for SIL applications. (Packaging unit: 10 pieces)	<b>Art. No.</b> 200914
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