

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
- 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	1 2 20 21 22
IECEX certificate Gas	IECEX BVS 10.0011 X
IECEX gas explosion protection	Ex nA nC [ia 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	Ex II 3 (1) G Ex nA nC [ia Ga] IIC T4 Gc
ATEX dust certificate	DMT 03 ATEX E 012 X
ATEX dust explosion protection	Ex II (1) D [Ex ia Da] IIIC
Certificate FMus	FM16US0122X
Certificate cFM	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	Ex II 2 Ex nA nC [ia 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)
Ship approval	CCS, EU RO MR

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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 μ F
Max. permissible external capacitance C_o/C_a for IIB	0.8 μ 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 C_i	Negligible
Internal inductance L_i	Negligible
Safety-related maximum voltage	253 V

Functional Safety

SIL	2
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Electrical Data

Signal types	Analog output
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 ... 31.2 V
Voltage range residual ripple	$\leq 3,6 V_{SS}$
Nominal current	55 mA
Power consumption	1.3 W
Power dissipation max.	1.1 W
Polarity reversal protection	Yes
Operation indication	Green "PWR" LED

Galvanic Isolation

Test voltage according to standard	IEC EN 60079-11
Test voltage according to standard 2	EN 50178
Galvanic isolation fault message contact to auxiliary power	350 V AC
Galvanic isolation input to auxiliary power	350 V AC
Galvanic isolation fault message contact to input	350 V AC

Input

Input	0/4 ... 20 mA with HART
Input signal	0/4 ... 20 mA with HART
Input functional range	0 – 24 mA
Internal resistance R_i at 20mA	0 Ω
Internal resistance R_i at 40mA	0 Ω
Voltage drop additional	0 V

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Input

Input resistance	175 / 400 Ω
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)

Output

Output	0/4 ... 20 mA with HART
Output signal	0/4 ... 20 mA with HART
Output residual ripple	≤ 50 mV
Output functional range	0 – 24 mA
Load resistance R_L	0 ... 800 Ω
Load resistance R_L max.	800 Ω
Settling time 10 ... 90 %	≤ 100 μ s
Open-circuit voltage U_a	22,5 V
Switch user adjustment line fault	Activated / deactivated
Indication of line fault	"LF" LED, red
Error detection wire breakage	$U_A > 16$ V
Short circuit error detection	$R_L < 50$ Ω
Average measurement fault	0,10%

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
Terminal degree of protection (IP)	IP20
Fire resistance (UL 94)	V0
Connection cross-section	0.2-2.5 mm ² rigid 0.25-2.5 mm ² flexible core end sleeve 0.2-2.5 mm ² flexible
Enclosure material	Polyamide
Clamping range AWG	24 – 12
Connection cross-section AWG	24 ... 12
Grid dimension	17.6 mm
Width inches	4.25 in
Length inches	0.69 in
Mounting depth inches	4.51 in
Weight	0.18 kg
Weight	0.4 lb

Mounting / Installation

Mounting type	DIN rail (NS35/15, NS35/7.5)
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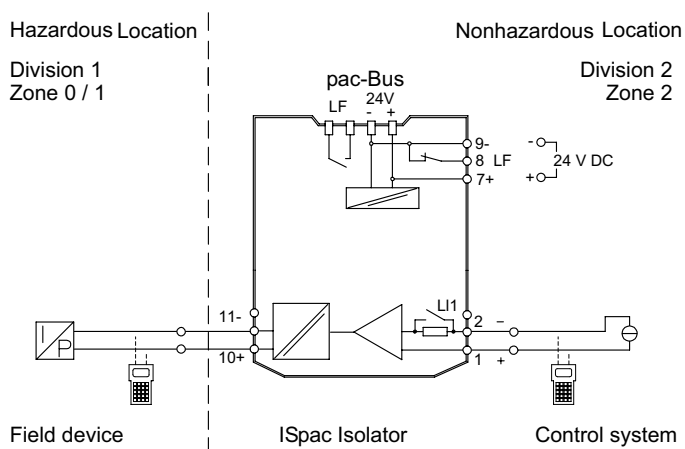
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Mounting / Installation

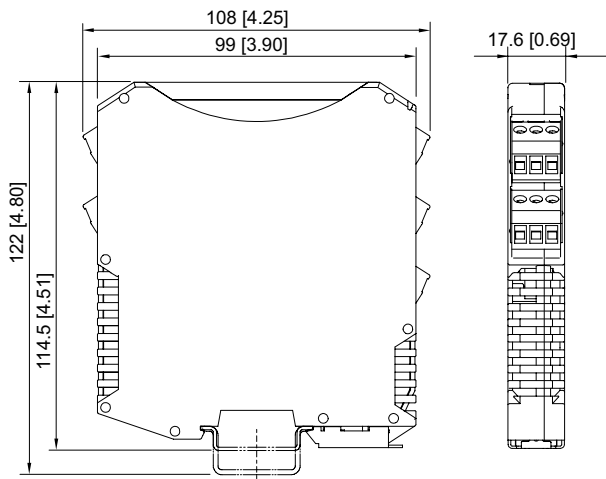
Mounting position	Horizontal Vertical
Connection type	Screw terminal
Conductor cross-section solid min.	0.2 mm ²
Conductor cross-section solid max.	2.5 mm ²
Conductor cross-section flexible min.	0.2 mm ²
Conductor cross-section flexible max.	2.5 mm ²

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 with screw terminal

Accessories and Spare Parts

Screw terminal



3-pole plug, screw connector
thread: M3
stripping length: 7 mm
color: green

Art. No.

112817

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	3-pole plug, screw connector thread: M3 stripping length: 7 mm color: black	112816
	3-pole plug, screw connector thread: M3 stripping length: 7 mm color: blue	112818
Screw terminal with test tap		Art. No.
	3-pole plug with test tap, screw connector thread: M3 stripping length: 7 mm colour: black	113005
	3-pole plug with test tap, screw connector thread: M3 stripping length: 7 mm colour: blue	113004
Spring clamp terminal		Art. No.
	3-pole plug with test tap, spring clamp connection stripping length: 10 mm color: green	112825
	3-pole plug with test tap, spring clamp connection stripping length: 10 mm color: black	112824
	3-pole plug with test tap, spring clamp connection stripping length: 10 mm color: blue	112826
Front cover		Art. No.
	for ISpac modules 91xx yellow, transparent Clear marking of the device for SIL applications. (Packaging unit: 10 pieces)	200914

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