

08577E00

- > For HART output signals 0/4 ... 20 mA
- > Intrinsically safe output [Ex ia] IIC
- > Galvanic isolation between inputs and outputs
- > Without power supply
- > Very low internal resistance
- > HART communication signal transmitting, bidirectionally
- > For use up to SIL 3 (IEC 61508)

A3



The Isolating Repeaters loop powered are used for intrinsically safe operation of control valves, i/p-converters, analog and digital indicators, fire & gas detectors etc.  
The modules transmit the HART communication signal bidirectionally.  
A separate power supply is not required.



	ATEX / GOST						NEC 505						NEC 506						NEC 500																						
	0	1	2	20	21	22	Class I						Class II						Class III																						
Zone							Zone	0	1	2	20	21	22	Division	1	2	1	2	1	2	Ex i interface	x	x	x	x	x	x	Ex i interface	x	x	x				Ex i interface	x	x	x	x	x	x
Installation in			x <sup>*)</sup>			x <sup>*)</sup>	Installation in			x <sup>*)</sup>			x <sup>*)</sup>	Installation in			x <sup>*)</sup>			x <sup>*)</sup>	Installation in			x <sup>*)</sup>			x <sup>*)</sup>	Installation in			x <sup>*)</sup>			x <sup>*)</sup>							

<sup>\*)</sup> Restrictions see table explosion protection

WebCode 9167A

**Isolating Repeater Loop Powered  
Field Circuit Ex i**  
Series 9167/..-11-00



**Selection Table**

Version	Channels	I.S. output $U_o / I_o / P_o$	max. load resistance $R_L$	Order number
Isolating Repeater, Loop Powered Series 9167, Field Circuit Ex i	1	15.7 V / 60 mA / 233 mW	360 $\Omega$	<b>9167 / 11 - 11 - 00s</b>
		25 V / 99 mA / 613 mW	800 $\Omega$	<b>9167 / 13 - 11 - 00s</b>
		18.8 / 107 mA / 503 mW	590 $\Omega$	<b>9167 / 14 - 11 - 00s</b>
	2	15.7 V / 60 mA / 233 mW	360 $\Omega$	<b>9167 / 21 - 11 - 00s</b>
		25 V / 99 mA / 613 mW	800 $\Omega$	<b>9167 / 23 - 11 - 00s</b>
		18.8 / 107 mA / 503 mW	590 $\Omega$	<b>9167 / 24 - 11 - 00s</b>

Note The order numbers listed in the table are for transducers equipped with screw terminals.  
For transducers equipped with spring clamp terminals, replace the ending "s" for screw terminals with "k" for spring clamp terminals.

<b>Explosion Protection</b>				
<b>Global (IECEX)</b>				
Gas and dust	IECEX BVS 11.0089X Ex nA [ja Ga] IIC T4 Gc [Ex ia Da] IIIC			
<b>Europe (ATEX)</b>				
Gas and dust	BVS 04 ATEX E 082 X ⊕ II 3 (1) G Ex nA [ja Ga] IIC T4 Gc ⊕ II (1) D [Ex ia Da] IIIC			
<b>USA (NEC)</b>				
Gas and dust	3017145 (FM) CL. I, DIV. 2, GP. A,B,C,D CL. I, ZONE 2, GP. IIC AIS CL. I,II,III, DIV. 1, GP. A,B,C,D,E,F,G CL. I, ZONE 0 [AEX ia] IIC, T4 at Ta = 70 °C E81680 (UL) CL. I, GR. ABCD CL. II, GR. EFG CL. III			
<b>Russia (Gost-R)</b>				
Gas	2ExnA[ia]IICT4X 2ExnAIIT4X			
<b>Certificates and approvals</b>				
Certificates	IECEX, ATEX, Brazil (INMETRO), India (PESO), Canada (CSA), Kazakhstan (GOST-K), Korea (KTL) only for 9167/14-11-00, Russia (GOST-R), Serbia (SRPS), Ukraine (GOST-U), USA (FM, UL), Belarus (GOST-B)			
Other approvals	ship approval (DNV)			
<b>Safety data</b>				
<b>Version</b>	<b>9167/1-11-00, max. 360 Ω</b>	<b>9167/3-11-00, max. 800 Ω</b>	<b>9167/4-11-00, max. 590 Ω</b>	
Max. voltage $U_0 / V_{oc}$	15.7V	25V	18.8V	
Max. current $I_0 / I_{sc}$	60mA	99mA	107mA	
Max. power $P_0$	233mW	613mW	503mW	
Max. connectable capacitance $C_0 / C_a$				
IIC	487 nF	110 nF	266 nF	
IIB	2950 nF	840 nF	503 nF	
Max. connectable inductance $L_0 / L_a$				
IIC	10 mH	2.5 mH	3 mH	
IIB	40 mH	11 mH	12 mH	
internal capacitance $C_i$	negligible	negligible	negligible	
internal inductance $L_i$	negligible	negligible	negligible	
Rated insulation voltage $U_m$	253 V AC	253 V AC	253 V AC	
<b>Further parameters</b>				
Installation	in Zone 2, Div. 2 and in the safe area			
Further information	see respective certificate and operating instructions			
<b>Functional safety (IEC 61508)</b>				
Test report	Exida Stahl 04/04-03-R005			
Max. SIL	3			
Safe Failure Fraction SFF	97 %			
MTBF	1019 years			
PFD <sub>AVG</sub> at T <sub>[Proof]</sub>	T <sub>[Proof]</sub>	1 year	5 years	10 years
	PFD <sub>AVG</sub>	1.17 x 10 <sup>-5</sup>	5.87 x 10 <sup>-5</sup>	1.17 x 10 <sup>-4</sup>
Further information	see test report			

### Technical Data

#### Electrical data

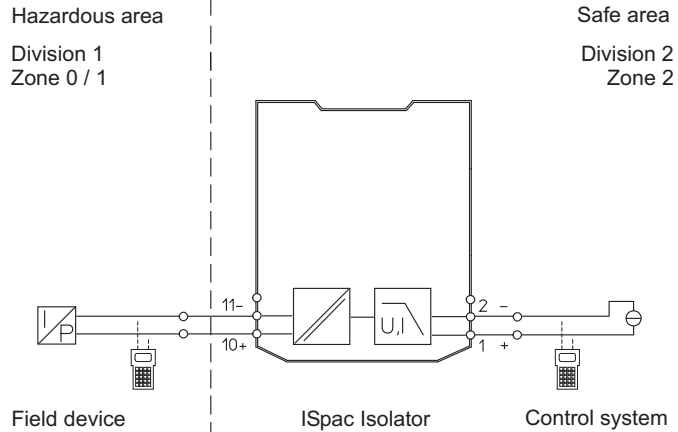
Version	9167/1-11-00, max. 360 Ω	9167/3-11-00, max. 800 Ω	9167/4-11-00, max. 590 Ω
Auxiliary power			
Supply	without	without	without
Max. power losses per channel			
20 mA	0.2W	0.2W	0.2W
40 mA	0.6W	0.6W	0.6W
Galvanic isolation			
Test voltages			
Acc. to standard	EN 60079-11	EN 60079-11	EN 60079-11
Ex i output to input	1.5 kV AC	1.5 kV AC	1.5 kV AC
Ex i outputs to each other	350 V AC	350 V AC	350 V AC
Acc. to standard	EN 50178	EN 50178	EN 50178
Inputs to each other	500 V AC	500 V AC	500 V AC
Input from nonhazardous location			
Input signal $I_E$	0/4 ... 20 mA with HART	0/4 ... 20 mA with HART	0/4 ... 20 mA with HART
Input_Function range	0 ... 40 mA	0 ... 40 mA	0 ... 40 mA
Internal resistance $R_i$			
(at 20 mA)	410 Ω	380 Ω	320 Ω
(at 40 mA)	360 Ω	330 Ω	270 Ω
additional constant voltage drop $\Delta U$	1 V	1 V	1 V
Own consumption	$\leq 10 \mu A$	$\leq 10 \mu A$	$\leq 10 \mu A$
Input voltage $U_E$	$\leq 31.2 V$	$\leq 31.2 V$	$\leq 31.2 V$
Max. effective voltage $U_{E\text{ eff}}$	15.4 V	23.6 V	18.2 V
Polarity reversal protection	yes	yes	yes
Ex i output			
Output signal	0/4 ... 20 mA with HART	0/4 ... 20 mA with HART	0/4 ... 20 mA with HART
Function range	0 ... 40 mA	0 ... 40 mA	0 ... 40 mA
Max. Load resistance $R_L$ (at $I_{out} = 20 \text{ mA}$ , $U_{E\text{ eff}}$ )	360 Ω	800 Ω	590 Ω
Residual ripple of current	$\leq 0.5 \%$	$\leq 0.5 \%$	$\leq 0.5 \%$
No-load voltage	15.7 V	25 V	18.8 V
Short-circuit current	$\leq 60 \text{ mA}$	$\leq 60 \text{ mA}$	$\leq 60 \text{ mA}$
Response time (10 ... 90 %)	$\leq 1 \text{ ms}$	$\leq 1 \text{ ms}$	$\leq 1 \text{ ms}$
Error detection (LFD)			
Open-circuit	0 mA	0 mA	0 mA
Behaviour of output current at open-circuit	$\leq 1.0 \text{ mA}$	$\leq 1.0 \text{ mA}$	$\leq 1.0 \text{ mA}$
Fault limits			
Linearity fault at $R_L = 0 \Omega$	Accuracy, typical data expressed as % of calibrated span 0 ... 20 mA at $U_N$ , 23 °C		
Temperature effect	$\leq 0.25 \%$		
Influence of load resistance	$\leq 0.1 \%$ / 10 K		
Cross-talk channel 1 / channel 2	$\leq 0.1 \%$ / 10 Ω		
Electromagnetic compatibility	cannot be measured		
	Tested under the following standards and regulations: EN 61326-1 (Use in industrial environment) NAMUR NE 21		
<b>Ambient conditions</b>			
Ambient temperature			
Single device	-20 ... +70 °C / -4 ... +158 °F		
Group assembly	-20 ... +60 °C / -4 ... +140 °F		
	The installation conditions affect the ambient temperature. Observe operating instructions		
Storage temperature	-40 ... +80 °C / -40 ... +176 °F		
Relative humidity (no condensation)	$\leq 95 \%$		

**Technical Data**

**Electrical connection**

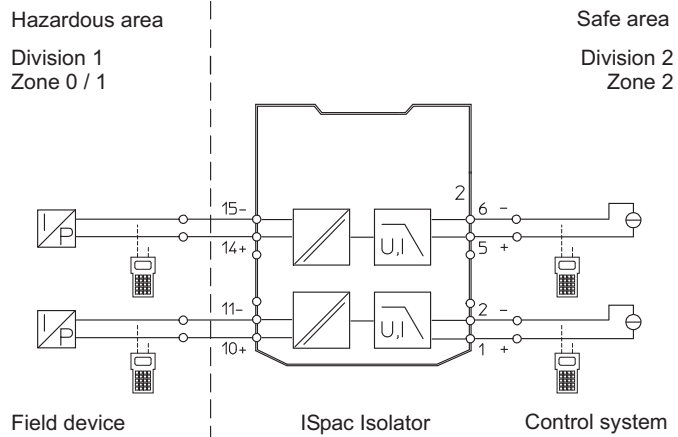
Connection diagram

**1 channel  
9167/1**



06691E01

**2 channels  
9167/2**



06692E01

**Technical Data**

**Mechanical data**

Connection

Screw terminals

Spring clamp terminals

Connection single-wire

- rigid	0.2 ... 2.5 mm <sup>2</sup> / 24 ... 14 AWG	0.2 ... 2.5 mm <sup>2</sup> / 24 ... 14 AWG
- flexible	0.2 ... 2.5 mm <sup>2</sup> / 24 ... 14 AWG	0.2 ... 2.5 mm <sup>2</sup> / 24 ... 14 AWG
- flexible, end covering sleeves (without / with plastic sleeving)	0.25 ... 2.5 mm <sup>2</sup> / 22 ... 14 AWG	0.25 ... 2.5 mm <sup>2</sup> / 22 ... 14 AWG

Connection two wires

- rigid	0.2 ... 1 mm <sup>2</sup> / 24 ... 14 AWG	--
- flexible	0.2 ... 1.5 mm <sup>2</sup> / 24 ... 16 AWG	--
- flexible, end covering sleeves	0.25 ... 1 mm <sup>2</sup> / 22 ... 16 AWG	0.5 ... 1 mm <sup>2</sup> / 20 ... 16 AWG

Weight

approx. 160 g

Installation type

on DIN rail (NS35/15, NS35/7.5) or in pac-Carrier

Installation position

vertical or horizontal

Enclosure

IP30

Terminals

IP20

Enclosure material

PA 6.6

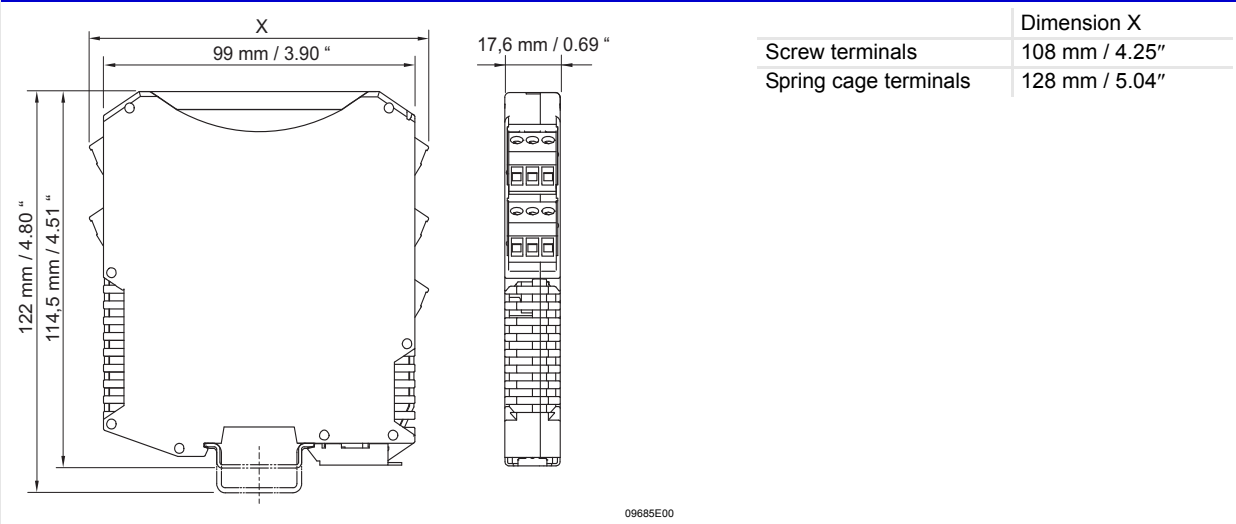
Fire resistance (UL-94)

V0

**Isolating Repeater Loop Powered  
Field Circuit Ex i**  
Series 9167/..-11-00



**Dimensional Drawings** (All Dimensions in mm / inch) - Subject to Alterations



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