

Transmitter Supply Unit with 0/4 ... 20 mA Output, Active / Source
Field Circuit Non-Ex i
 Series 9160



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- > Galvanic isolation between input, output and power supply
- > Open-circuit and short-circuit monitoring and messaging for input and output (can be switched off)
- > For use up to SIL 2 (IEC 61508)

A3



06290E00

Basic function: 0/4 mA ... 20 mA analogue input, 1 and 2 channels. Measuring transmitter supply units are used for operation of 2- and 3-wire measuring transmitters or for connection to mA sources. 2- and 3-wire measuring transmitters are supplied with power by the measuring transmitter supply unit. In 2-wire measuring transmitters, the devices transmit a HART communication signal bidirectionally.



Zone	ATEX / IECEx / GOST					
	0	1	2	20	21	22
Installation in			x ¹⁾			x ¹⁾

¹⁾ For restrictions, see Explosion Protection table

WebCode 9160B

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Selection Table

Output version (control)	Channels	Input	Output A	Output B	Order number
0/4 ... 20 mA active / source with HART	1	0/4 ... 20 mA with HART	0/4 ... 20 mA with HART	-- 0/4 ... 20 mA	9160/13-11-61s 9160/19-11-61s
	2	0/4 ... 20 mA with HART	0/4 ... 20 mA with HART	0/4 ... 20 mA with HART	9160/23-11-61s
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.				

Explosion Protection

Global (IECEX)	
Gas	IECEX BVS 08.0050X Ex nA nC II T4 Gc
Europe (ATEX)	
Gas	BVS 07 ATEX E 176 X ⊕ II 3 G Ex nA nC II T4
Russia (Gost-R)	
Gas	2ExnAnCIIT4X
Certificates and approvals	
Certificates	IECEX, ATEX, Kazakhstan (GOST-K), Russia (GOST-R), Serbia (SRPS), Ukraine (GOST-U), Belarus (GOST-B)
Other approvals	ship approval (DNV)
Further parameters	
Installation	in Zone 2 and in the safe area
Further information	see respective certificate and operating instructions
Functional safety (IEC 61508)	
Test report	Exida Stahl 05/08-34-R008
Max. SIL	2
Safe Failure Fraction SFF	73 %
MTBF	250 years
PFD _{AVG} at T _[Proof]	T _[Proof] 1 year 5 years 10 years PFD _{AVG} 4.46 x 10 ⁻⁴ 2.23 x 10 ⁻⁴ 4.45 x 10 ⁻³
Further information	see test report

Technical Data

Electrical data	
Auxiliary power	
Nominal voltage U _N	24 V DC
Voltage range	18 ... 31.2 V
Residual ripple	≤ 3.6 V _{SS}
Nominal current at U _N , 20 mA	
1 channel	70 mA
2 channels	125 mA
Power consumption at U _N , 20 mA	
1 channel	1.7 W
2 channels	3 W
Power dissipation at U _N , R _L = 250 Ω	
1 channel	1.3 W
2 channels	2.2 W
Reverse polarity protection	yes
Operation indication	LED green "PWR"
Undervoltage monitoring	yes (no faulty module / output states)
Galvanic isolation	
Test voltages	
Input to output	1.5 kV AC
Input to power supply	1.5 kV AC
Input to error contact	1.5 kV AC
mutually between inputs	500 V AC
Acc. to standard	EN 50178
Output to auxiliary power	350 V AC
Outputs interconnected	350 V AC
Error contact to power supply and outputs	350 V AC

Technical Data

Electrical data

Input from nonhazardous location	
Input signal	0/4 ... 20 mA with HART
Input_Function range	0 ... 24 mA
Max. input current for mA-sources	50 mA
Supply voltage for transmitter	≥ 16 V at 20 mA
Residual ripple of supply voltage	≤ 25 mV _{eff}
No-load voltage	≤ 26 V
Short-circuit current	≤ 35 mA
Input resistance	≈ 500 Ω
(AC-Impedance HART)	
Input resistance for mA sources	30 Ω
Communication signal	bi-directional HART transmission, 0.5 ... 10 kHz (at 2-wire transformer)
Output	
Output signal	type variant 9160/3-11-61. 0/4 ... 20 mA with HART type variant 9160/19-11-61. Output A 0/4 ... 20 mA with HART Output B 0/4 ... 20 mA without HART
Load resistance R _L	0 ... 600 Ω (terminal 1+ / 2- or 5+ / 6-) 0 ... 379 Ω (terminal 3+ / 2- or 4+ / 6-) (with internal 221 Ω resistor for HART)
Residual ripple	≤ 40 μA _{eff}
No-load voltage	≤ 15.5 V
Communication signal	bi-directional HART transmission, 0.5 ... 30 kHz (with 9160/19, only for output A)
Response time (10 ... 90 %)	≤ 25 ms
Fault detection input	
Open-circuit	< 2 mA
Short-circuit	< 22 mA
Behaviour of the output	= Input signal
Output current at I _{in} = 0	I _{out} = 0 mA
Fault detection output	
Open-circuit	< 2 mA
Fault message input/output	
Settings (switch LF)	activated / deactivated
Indication line fault	LED red „LF“ per channel
Signalization of faulty line and power supply failure	- Contact (30 V / 100 mA) closed to ground in case of fault - pac-Bus, floating contact (30 V / 100 mA)
Fault limits	
Accuracy, typical data expressed as % of calibrated span at U _N , 23 °C	
Linearity error	≤ 0.1 %
Offset error	≤ 0.1 %
Temperature effect	≤ 0.1 % / 10 K
Power supply effect within voltage range	≤ 0.01 %
effect load resistance	≤ 0.02 %
Cross-talk channel 1 / channel 2	≤ 0.01 %
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326-1 Use in industrial environment
Ambient conditions	
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)	≤ 95 %

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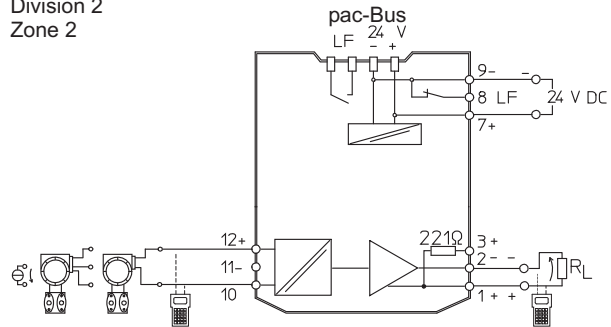
Technical Data

Electrical connection

Connection diagram

1 channel, output A:
 active / source
9160/13-11-61.

Safe area
 Division 2
 Zone 2



Field device

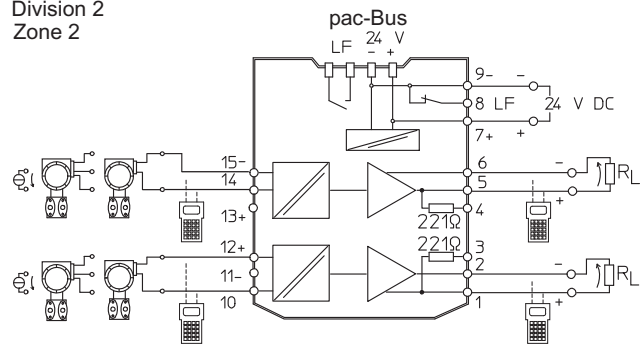
ISpac Isolator

Control system

07653E02

2 channels, outputs
 active / source
9160/23-11-61.

Safe area
 Division 2
 Zone 2



Field device

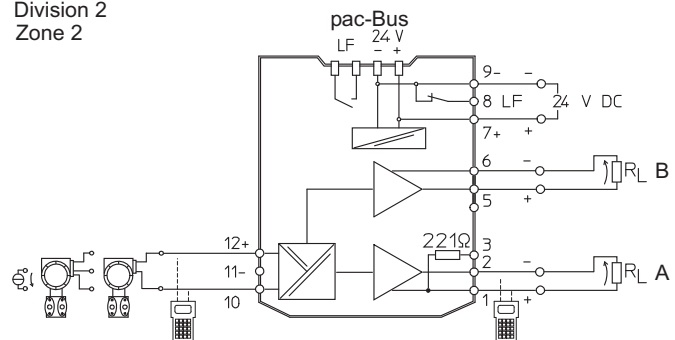
ISpac Isolator

Control system

06672E02

1 channel, output A:
 active / source,
 output B: active
 (without HART)
9160/19-11-61.

Safe area
 Division 2
 Zone 2



Field device

ISpac Isolator

Control system

06472E02

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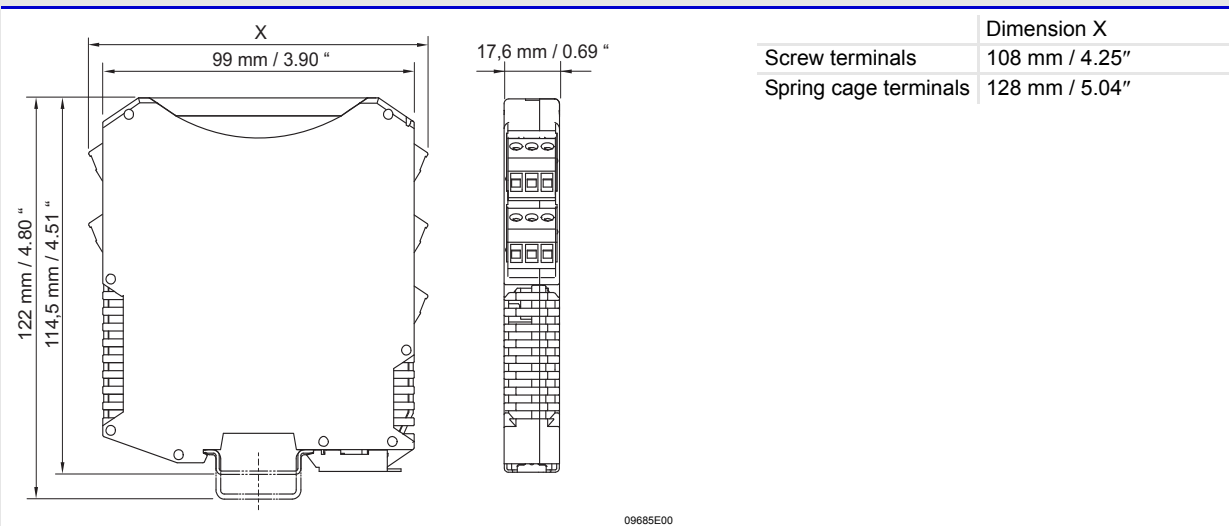
Technical Data

Mechanical data

Connection	Screw terminals	Spring clamp terminals
Connection single-wire		
- rigid	0.2 ... 2.5 mm ² / 24 ... 14 AWG	0.2 ... 2.5 mm ² / 24 ... 14 AWG
- flexible	0.2 ... 2.5 mm ² / 24 ... 14 AWG	0.2 ... 2.5 mm ² / 24 ... 14 AWG
- flexible, end covering sleeves (without / with plastic sleeving)	0.25 ... 2.5 mm ² / 22 ... 14 AWG	0.25 ... 2.5 mm ² / 22 ... 14 AWG
Connection two wires		
- rigid	0.2 ... 1 mm ² / 24 ... 14 AWG	--
- flexible	0.2 ... 1.5 mm ² / 24 ... 16 AWG	--
- flexible, end covering sleeves	0.25 ... 1 mm ² / 22 ... 16 AWG	0.5 ... 1 mm ² / 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	

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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.