



09738E00

### Transmitter Supply Unit Type 9160

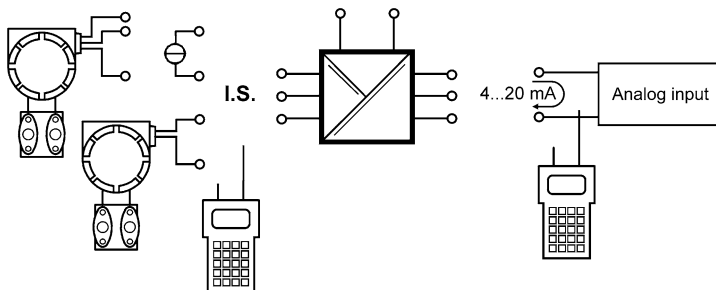
- Suitable for 2-, 3-wire transmitter, 2-wire HART transmitter and mA-sources
- Intrinsically safe input [EEx ia] IIC
- 1 and 2 channels
- Galvanic isolation between input, output and power supply
- Open-circuit and short-circuit monitoring and messaging for input and output (can be switched off)
- Installation possible in Zone 2 and Div. 2
- Can be used up to SIL 2 (IEC 61508)



Basic function: analog input 0/4 mA ... 20 mA, 1 and 2 channels. The transmitter supply units are used for intrinsically safe operation of 2- and 3- wire transmitters or for connection to intrinsically safe mA-sources.

The 2- and 3-wire transmitters are supplied with power from the transmitter supply unit.

For 2-wire transmitters the isolators transfer the HART communication signal bi-directionally.



09363E02

# Zone 2

Selection table					
Version	Channels	Input	Output A	Output B	Ordering code
Transmitter supply unit type 9160	1	0/4 mA ... 20 mA with HART	0/4 mA ... 20 mA with HART	--	<b>9160/13-11-11.</b>
				0/4 mA ... 20 mA	<b>9160/19-11-11.</b>
			passive with HART	--	<b>9160/13-10-11.</b>
				passive	<b>9160/19-10-11.</b>
	2	0/4 mA ... 20 mA with HART	0/4 mA ... 20 mA with HART	--	<b>9160/23-11-11.</b>
			passive with HART	--	<b>9160/23-10-11.</b>
Add. to ordering code					
Screw terminal					<b>9160/...-...-...s</b>
Spring clamp terminal					<b>9160/...-...-...k</b>
Insulation displacement connectors					<b>9160/...-...-...q</b>

Technical Data																							
Certificates	DMT 03 ATEX E 010 X																						
Other certificates	USA (FM, UL), Canada (CSA), Russia (VNIIEF), Belarus (Promatomnadzor), Brazil (UL do Brasil), Ukraine (ISCVE), Shipping (DNV)																						
Explosion protection	⊕ II (1) GD [EEx ia] IIC/IIB and ⊕ II 3 G EEx nAC II T4																						
Installation	In Zone 2, Div. 2 and in the safe area																						
Safe maximum values (CENELEC)	<table border="0"> <tr><td>Max. voltage <math>U_o</math></td><td>27 V</td></tr> <tr><td>Max. current <math>I_o</math></td><td>88 mA</td></tr> <tr><td>Max. power <math>P_o</math></td><td>576 mW</td></tr> <tr><td>Max. connectable capacitance <math>C_o</math> for IIC / IIB</td><td>90 nF / 705 nF</td></tr> <tr><td>Max. connectable inductance <math>L_o</math> for IIC / IIB</td><td>2.3 mH / 14 mH</td></tr> <tr><td>Internal capacitance <math>C_i</math> and inductance <math>L_i</math></td><td>negligible</td></tr> <tr><td>Insulation voltage <math>U_m</math></td><td>250 V</td></tr> </table> <p>When connecting mA sources:</p> <table border="0"> <tr><td>Max. output voltage <math>U_o</math></td><td>4.1 V</td></tr> <tr><td>Max. connectable voltage <math>U_i</math></td><td>30 V</td></tr> <tr><td>Max. connectable current <math>I_i</math></td><td>100 mA</td></tr> <tr><td>Internal capacitance <math>C_i</math> and inductance <math>L_i</math></td><td>negligible</td></tr> </table> <p>Further information and combinations of values, see certification.</p>	Max. voltage $U_o$	27 V	Max. current $I_o$	88 mA	Max. power $P_o$	576 mW	Max. connectable capacitance $C_o$ for IIC / IIB	90 nF / 705 nF	Max. connectable inductance $L_o$ for IIC / IIB	2.3 mH / 14 mH	Internal capacitance $C_i$ and inductance $L_i$	negligible	Insulation voltage $U_m$	250 V	Max. output voltage $U_o$	4.1 V	Max. connectable voltage $U_i$	30 V	Max. connectable current $I_i$	100 mA	Internal capacitance $C_i$ and inductance $L_i$	negligible
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**Technical Data**

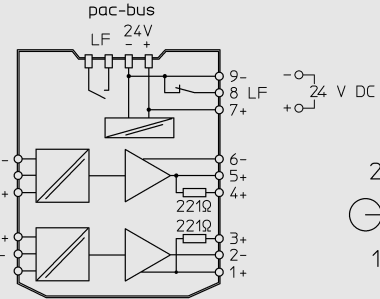
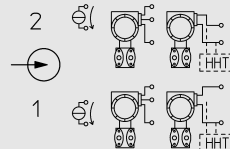
Output	Output signal			
	- Type variant 9160/3-11-11.			0/4 mA .. 20 mA with HART
	- Type variant 9160/19-11-11.	output A:		0/4 mA ... 20 mA with HART
		output B:		0/4 mA ... 20 mA without HART
	- Type variant 9160/3-10-11.			Current sink up, max. 30 V with HART
	- Type variant 9160/19-10-11.	output A:		Current sink up, max. 30 V with HART
		output B:		Current sink up, max. 30 V without HART
	Load resistance $R_L$ at 9160/...-11-11.			0 $\Omega$ ... 600 $\Omega$ (terminal 1+/- or 5+/-) 0 $\Omega$ ... 379 $\Omega$ (terminal 3+/- or 4+/-) (with internal 221 $\Omega$ resistor for HART)
	Minimum load resistance $R_L$ at 9160/...-10-11.			0 $\Omega$ for 5 V ... 15 V 500 $\Omega$ for 24 V 800 $\Omega$ for 30 V
	Residual ripple	$\leq$		40 $\mu A_{eff}$
No-load voltage	$\leq$		15.5 V	
Communication signal (at 9160/19 only output A)			HART transmission bi-directionale	
Response time (10 % ... 90 %)	$\leq$		25 ms	
Error detection I.S. input	Open-circuit	$<$		2 mA
	Short-circuit	$>$		22 mA
	Behaviour of output	$=$		Input signal
	Output current at $I_E = 0$	$I_A =$		0 mA
Error detection output	Open-circuit	$<$		2 mA
Error messaging I.S. input / output	Settings (switch LF)			activated / deactivated
	Error detection			LED red „LF“ each channel
	Error messaging and power supply failure			- Contact (30 V, 100 mA), closed to ground in case of error - pac-Bus, floating contact (30 V, 100 mA)
Error limits	Accuracy, typical data expressed as % of calibrated span at $U_N$ , 23 °C			
	Linearity error	$\leq$		0.1 %
	Offset error	$\leq$		0.1 %
	Temperature influence	$\leq$		0.1 % / 10 K
	Power supply effect within voltage range	$\leq$		0.01 %
	Load resistance effect	$\leq$		0.02 %
Cross-talk channel 1 / channel 2	$\leq$		0.01 %	
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326 (IEC/EN 61000-4-1...6 and 11; EN 55022 Class B)			
Ambient conditions	Ambient temperature			- 20 °C ... + 60 °C / + 70 °C (watch instructions)
	Storage temperature			- 40 °C ... + 80 °C
	Relative humidity (no condensation)	$\leq$		95 %
Mechanical data		Screw terminals	Spring clamp terminals	Insulation displacement connectors
	Connection one wire			
	- rigid	0.2 ... 2.5 mm <sup>2</sup>	0.2 ... 2.5 mm <sup>2</sup>	--
	- flexible	0.2 ... 2.5 mm <sup>2</sup>	0.2 ... 2.5 mm <sup>2</sup>	0.5 ... 1 mm <sup>2</sup>
	- flexible, end covering sleeves (without / with plastic sleeving)	0.25 ... 2.5 mm <sup>2</sup>	0.25 ... 2.5 mm <sup>2</sup>	--
	Connection two wires			
	- rigid	0.2 ... 1 mm <sup>2</sup>	--	--
	- flexible	0.2 ... 1.5 mm <sup>2</sup>	--	--
	- flexible, end covering sleeves	0.25 ... 1 mm <sup>2</sup>	0.5 ... 1 mm <sup>2</sup>	--
	Weight			approx. 160 g
	Mounting type			on DIN rail acc. to EN 50022 (NS35/15; NS35/7.5) or in pac-Carrier
	Mounting position			horizontal or vertical
	Casing protection class			IP 30
Terminal protection class			IP 20	
Casing material			PA 6.6	
Fire protecting class (UL-94)			V0	

### Technical Data

Connection diagram

for types  
9160/3-10-11. and  
9160/3-11-11.

Hazardous area



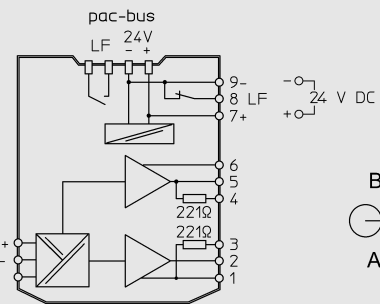
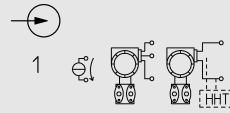
Safe area



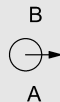
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for types  
9160/19-10-11. and  
9160/19-11-11.

Hazardous area



Safe area



09764E03

Configuration output

	9160/3-11-11.	9160/3-10-11.	9160/19-11-11.	9160/19-10-11.
Channel 2 / Output B	09742E00	09741E00	09740E00	04813E00
Channel 1 / Output A	09744F00	09743F00	09744F00	09743F00



### Dimension drawings (all dimensions in mm) - subject to alterations

	Dimension X
Screw terminals	108 mm
Spring clamp terminals	128 mm
Insulation displacement connectors	131 mm

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