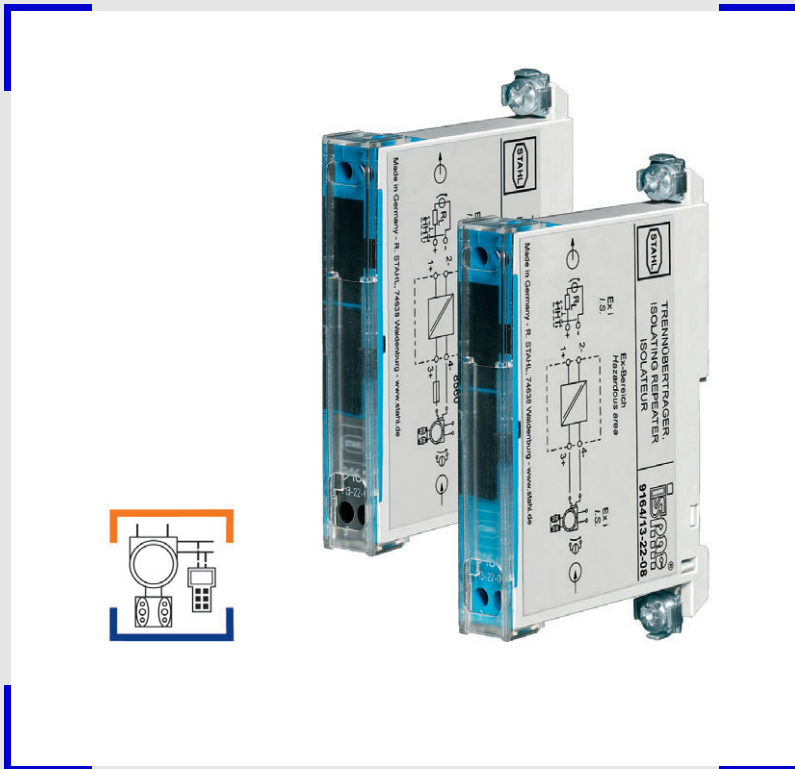


# mA - Isolating Repeater Series 9164



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- > Interconnection of two mA-sources and active 2-wire inputs is possible
- > Ideal solution for integrating 4-conductor measuring transmitters into analogue input supplies.
- > Intrinsically safe input (Ex i) or increased safety protection Ex e version
- > Bidirectional HART transmission 4 ... 20 mA
- > Galvanic isolation between input and output
- > Installation in Zone 1

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Basic function: Analog signal transmission 4 mA ... 20 mA for 4-wire transmitters with HART communication, 1 channel.

The mA - isolating repeaters are used for connection of 4-wire transmitters to active 2-wire inputs (source) as well as to galvanic isolation.

The 4-wire transmitters can optionally be equipped with an intrinsically safe or increased safety protection output circuit.

The devices bidirectionally transfer a superimposed HART communications signal.



Zone	ATEX / IECEx					
	0	1	2	20	21	22
Ex i interface	x	x	x	x	x	x
Installation in		x	x			x

**WebCode 9164A**

# mA - Isolating Repeater

## Series 9164



### Selection Table

Version	Channels	Input	Output	Order number
mA - Isolating repeater Series 9164	1	Ex e: 4 ... 20 mA HART (sink)	Ex i: passive HART (sink)	9164 / 13-20-06
		Ex i: 4 ... 20 mA HART (sink)	Ex i: passive HART (sink)	9164 / 13-20-08

Note The transmission of the HART signal can be deactivated by means of a DIP switch.

### Explosion Protection

Design	9164/13-20-06 (Ex e Input)	9164/13-20-08 (Ex i Input)
<b>Global (IECEX)</b>		
Gas and dust	IECEX BVS 15.0062X Ex e mb [ia Ga] IIC T4 Gb [Ex ia Da] IIIC	IECEX BVS 15.0062X Ex ib [ia Ga] IIC T4 Gb [Ex ia Da] IIIC
<b>Europe (ATEX)</b>		
Gas and dust	BVS 15 ATEX E 068 X ⊕ II 2 (1) G Ex e mb [ia Ga] IIC T4 Gb ⊕ II (1) D [Ex ia Da] IIIC	BVS 15 ATEX E 068 X ⊕ II 2 (1) G Ex ib [ia Ga] IIC T4 Gb ⊕ II (1) D [Ex ia Da] IIIC
<b>Certifications and certificates</b>		
Certificates	IECEX, ATEX	IECEX, ATEX
Ship approval	DNV GL	DNV GL
<b>Further parameters</b>		
Installation	In Zone 1, Zone 2 and in the safe area	In Zone 1, Zone 2 and in the safe area
Further information	see respective certificate and operating instructions	see respective certificate and operating instructions

### Technical Data

Design	9164/13-20-08 (Ex i Input)
<b>Safety data</b>	
Input	
Max. voltage $U_o$	0 V
Max. current $I_o$	0 A
Max. power $P_o$	0 W
Max. voltage $U_i$	30 V
Max. current $I_i$	150 mA
Max. power $P_i$	1 W
Internal capacitance $C_i$	negligible
Internal inductance $L_i$	negligible
Output	
Max. voltage $U_o$	0 V
Max. current $I_o$	0 A
Max. power $P_o$	0 W
Max. voltage $U_i$	30 V
Max. current $I_i$	150 mA
Max. power $P_i$	1 W
Internal capacitance $C_i$	negligible
Internal inductance $L_i$	negligible
	Further information and combinations of values, see certification.
<b>Electrical data</b>	
Galvanic separation	
Test voltages	
acc. to standard	EN 60079-11
Ex i input to Ex i output	500 V AC
Auxiliary power	without
Max. power dissipation	3.7 V x 20 mA + 20 mA x (supply voltage - $R_L$ x 20 mA)

# mA - Isolating Repeater Series 9164

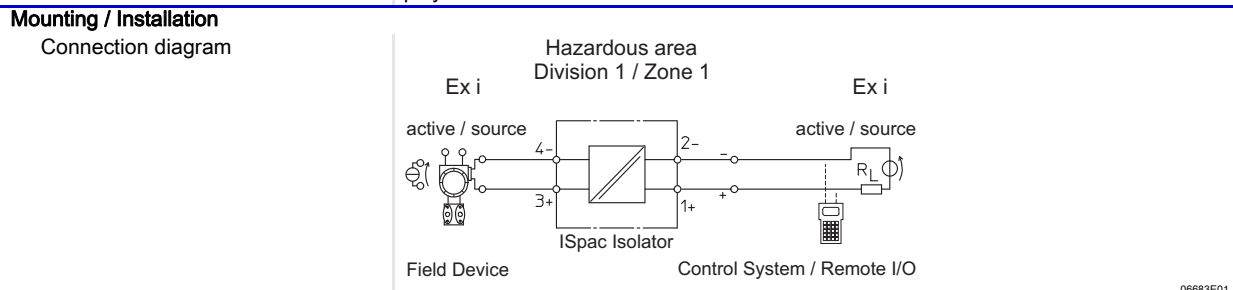


## Technical Data

<b>Design</b>	<b>9164/13-20-08 (Ex i Input)</b>
<b>Electrical data</b>	
<b>Ex i Input</b>	
Version	passive (current sink)
Input signal	3.8 ... 20.5 mA with / without HART
Functional range	3.6 ... 25 mA
Constant voltage drop	≤ 3.7 V
Input resistance	at 0.5 ... 5 kHz (AC-Impedance HART) = load resistance at the output
Communication signal	HART FSK transmission bidirectional
Polarity reversal protection	yes
<b>Ex i output</b>	
Version	passive (current sink)
Output signal	3.8 ... 20.5 mA with HART
Area around supply voltage of 2-wire input (active)	5 ... 30 V
Response time (10 ... 90 %)	≤ 1 ms
Input resistance	> 10 k Ω
Communication signal	HART FSK transmission bidirectional
Polarity reversal protection	yes
<b>Error detection, input I<sub>e</sub> ~ 0</b>	
Open circuit	Output current < 3.6 mA
Short-circuit	Output current < 3.6 mA
<b>Error limits</b>	
Deviation	Accuracy, typical data expressed as % of calibrated span (16 mA) at 23 °C ≤ 0.1 %
Temperature influence	≤ 0.05 % / 10 K
Linearity error	≤ 0.05 %
Offset error	≤ 0.05 %
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326-1 Use in industrial environment, NAMUR NE21

<b>Ambient conditions</b>	
Ambient temperature	-40 ... +75 °C
Storage temperature range	-40 ... +80 °C
Relative humidity (no condensation)	≤ 90 %

<b>Mechanical data</b>	
Connection type	4 cage terminals, each maximum 1.5 mm <sup>2</sup> flexible / solid
Degree of protection	
Enclosure	IP30
Terminals	IP20
Weight	approx. 65 g
Enclosure material	polyamide 6GF



# mA - Isolating Repeater

## Series 9164



### Technical Data

**Design** 9164/13-20-06 (Ex e Input)

#### Safety data

Input	
Nominal voltage $U_N$	30 V
Nominal current $I_N$	30 mA
Max. current	45 mA
Safety-related maximum voltage	253 V AC
Output	
Max. voltage $U_o$	0 V
Max. current $I_o$	0 A
Max. power $P_o$	0 W
Max. voltage $U_i$	30 V
Max. current $I_i$	150 mA
Max. power $P_i$	1 W
Internal capacitance $C_i$	negligible
Internal inductance $L_i$	negligible
	If installed in Zone 1: the isolating repeater has to be fitted into an enclosure which meets the requirements of IEC/EN 60079-7 (Ex e)
	If installed in Zone 2: the isolating repeater has to be fitted into an enclosure which meets the requirements of IEC/EN 60079-15
	Furhter information and combinations of values, see certification.

#### Electrical data

Galvanic separation	
Test voltages	
acc. to standard	EN 60079-11
Ex e input to Ex i output	1500 V AC
Auxiliary power	without
Max. power dissipation	4 V x 20 mA + 20 mA x (supply voltage - $R_L$ x 20 mA)
Ex e Input	
Version	passive (current sink)
Input signal	3.8 ... 20.5 mA with / without HART
Functional range	3.6 ... 25 mA
Constant voltage drop	$\leq 4$ V
Input resistance	at 0.5 ... 5 kHz (AC-Impedance HART) = load resistance at the output
Communication signal	HART FSK transmission bidirectional
Polarity reversal protection	yes
Ex i output	
Version	passive (current sink)
Output signal	3.8 ... 20.5 mA with HART
Area around supply voltage of 2-wire input (active)	5 ... 30 V
Response time (10 ... 90 %)	$\leq 1$ ms
Input resistance	$> 10$ k $\Omega$
Communication signal	HART FSK transmission bidirectional
Polarity reversal protection	yes
Error detection, input $I_e \sim 0$	
Open circuit	Output current $< 3,6$ mA
Short-circuit	Output current $< 3,6$ mA
Error limits	
	Accuracy, typical data expressed as % of calibrated span (16 mA) at 23 °C
Deviation	$\leq 0,1$ %
Temperature influence	$\leq 0,05$ % / 10 K
Linearity error	$\leq 0,05$ %
Offset error	$\leq 0,05$ %
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326 Use in industrial environment

# mA - Isolating Repeater Series 9164

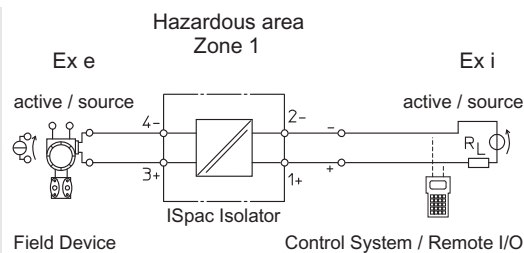


## Technical Data

<b>Design</b>	<b>9164/13-20-06 (Ex e Input)</b>
<b>Ambient conditions</b>	
Ambient temperature	-40 ... +75 °C
Storage temperature range	-40 ... +80 °C
Relative humidity (no condensation)	≤ 90 %
<b>Mechanical data</b>	
Connection type	4 cage terminals, each maximum 1.5 mm <sup>2</sup> flexible / solid
Degree of protection	IP30
Enclosure	IP30
Terminals	IP30
Weight	approx. 107 g
Enclosure material	polyamide 6GF

## Mounting / Installation

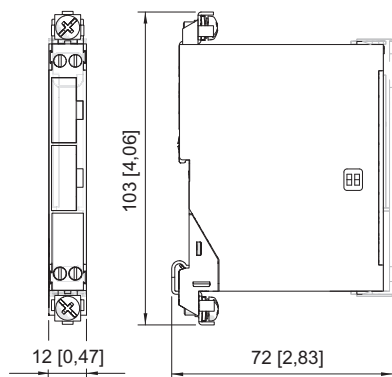
Connection diagram



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## Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



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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.