



14793E00

- > For vibration, acceleration and speed sensors in 2- and 3-wire design
- > Space-saving dual-channel version
- > Signal frequencies up to 50 kHz
- > Easy setting by means of front-side rotary switch
- > Galvanic isolation between inputs and outputs and auxiliary power
- > For use up to SIL 2 (IEC 61508)

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The vibration transducer supply unit is used for intrinsically safe operation of vibration sensors, speed and acceleration sensors. The isolator supplies the sensor with auxiliary power and transmits the measurement signal from the measuring transmitter or sensor galvanically isolated to the output. The isolator can be used for 2- and 3-wire sensors.



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

<sup>1)</sup> Restrictions see table explosion protection

WebCode 9147A

# Vibration Transducer Supply Unit

## Series 9147



### Selection Table

Version	Channels	Order number	Weight kg
Vibration transducer supply unit Series 9147	1	<b>9147/10-99-10s</b>	0.150
	2	<b>9147/20-99-10s</b>	0.210
Note	The order numbers listed in the table are for devices equipped with screw-type terminals. For devices equipped with spring-type terminals, replace the ending "s" for screw-type terminals with "k" for spring-type terminals.		

### Explosion Protection

#### Global (IECEX)

Gas, dust and mining	IECEX BVS 12.0001 X Ex nA [ia Ga] IIC T4 Gc [Ex ia Da] IIIC [Ex ia Ma] I
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#### Europe (ATEX)

Gas, dust and mining	BVS 12 ATEX E 007 X ⊕ II 3 (1)G Ex nA [ia Ga] IIC T4 Gc ⊕ II (1)D [Ex ia Da] IIIC ⊕ I (M1) [Ex ia Ma] I
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### Certifications and certificates

Certificates	IECEX, ATEX, Brazil (INMETRO), Canada (FMc), Kazakhstan (GOST K), Russia (GOST R), USA (FM)
Ship approval	DNV

### Safety data

Max. voltage $U_o$	26.3 V
Max. current $I_o$	88.3 mA
Max. power $P_o$	579 mW
Max. connectable capacitance $C_o$	
IIC	97 nF
IIB	740 nF
IIA	2.51 $\mu$ F
I	3.95 $\mu$ F
Max. connectable inductance $L_o$	
IIC	2.2 mH
IIB	17 mH
IIA	28 mH
I	40 mH
Insulation voltage $U_m$	253 V
Internal capacitance $C_i$	2.4 nF
Internal inductance $L_i$	negligible

### Further parameters

Installation	in Zone 2
Further information	see respective certificate and operating instructions

### Functional safety (IEC 61508)

Test report	Exida STAHL 13/06-082 R025			
Max. SIL	2			
Safe Failure Fraction SFF	2-wire operation: 66 % 3-wire operation: 69 %			
PFD <sub>AVG</sub> at T <sub>[Proof]</sub>	2-wire operation		3-wire operation	
	T <sub>[Proof]</sub>	PFD <sub>AVG</sub>	T <sub>[Proof]</sub>	PFD <sub>AVG</sub>
	1 Jahr	7.95 x 10 <sup>-4</sup>	1 Jahr	6.7 x 10 <sup>-4</sup>
	2 Jahre	1.17 x 10 <sup>-3</sup>	2 Jahre	9.86 x 10 <sup>-4</sup>
	5 Jahre	2.29 x 10 <sup>-3</sup>	5 Jahre	1.93 x 10 <sup>-3</sup>
Further information	For further information see safety test report.			

## Technical Data

### Electrical data

Version	1 channel 9147/10-99-10	2 channels 9147/20-99-10
<b>Auxiliary power</b>		
Nominal voltage $U_N$	24 V DC	24 V DC
Voltage range	18 ... 31.2 V	18 ... 31.2 V
Residual ripple within voltage range	$\leq 3.6 V_{SS}$	$\leq 3.6 V_{SS}$
Nominal current at $U_N$		
1 channel	75 mA	--
2 channels	--	88 mA
<b>Power consumption at <math>U_N</math></b>		
1 channel	1.8 W	--
2 channels	--	2.1 W
<b>Power dissipation at <math>U_N</math></b>		
1 channel	1.4 W	--
2 channels	--	1.8 W
Polarity reversal protection	yes	yes
Operation indication	LED green "PWR"	LED green "PWR"
Undervoltage monitoring	yes (no faulty devices / output states)	yes (no faulty devices / output states)
<b>Galvanic separation</b>		
<b>Test voltages</b>		
acc. to standard	EN 60079-11	
Ex i input to output	1.5 kV AC	
Ex i input to auxiliary power	1.5 kV AC	
Ex i inputs interconnected	500 V AC	
acc. to standard	EN 50178	
Output to auxiliary power	350 V AC	
Outputs interconnected	350 V AC	
<b>Ex i input</b>		
Input resistance	10 k $\Omega$	
Input signal	-20 ... -0.5 V	
Functional range	-24 ... 0 V	
Output current		
For 3-wire operation	10 mA           at -21 V 20 mA           at -18 V	
For 2-wire operation	2.6 / 4.3 / 7.9 mA   at -10 V	
<b>Output</b>		
Output signal	-20 ... -0.5 V	
Internal resistance	< 30 $\Omega$	
Load resistance		
1 channel	> 2 k $\Omega$	
2 channels	> 10 k $\Omega$	
<b>Signal transmission</b>		
Delay input / output	< 7 $\mu$ s	
Phase fluctuation	< 0.6 % / period	
Transferable frequency range	0 ... 50 kHz	
Ripple at a load resistance of 10 k $\Omega$	< 60 mV $_{SS}$	
<b>Error limits</b>		
	relative to the measuring span -0.5 ... -20 V	
Temperature influence	< 0.05 % / 10 K	
Auxiliary power influence	< 0.05 %	
Load resistance influence		
At $R_L = 3 \dots 10 \text{ k}\Omega$	< 0.35 % / k $\Omega$	
DC transmission fault		
At $U_N$ and 20 °C	< 0.5 %	

**Technical Data**

**Electrical data**

Error limits

AC transmission fault  
At  $U_N$  and 20 °C

Frequency	Phase fault	Amplitude fault
0 ... 200 Hz	$\leq 0.5^\circ$	$\pm 1 \%$
< 400 Hz	$\leq 1.0^\circ$	$\pm 1 \%$
> 600 Hz	$\leq 1.5^\circ$	$\pm 1 \%$
< 1 Hz	$\leq 2.5^\circ$	$\pm 1 \%$
< 10 kHz	$\leq 25^\circ$	+1 / -5 %
< 20 kHz	$\leq 50^\circ$	+1 / -5 %
< 50 kHz	$\leq 125^\circ$	-30 %

Electromagnetic compatibility

Tested to the following standards and regulations:  
EN 61326-1 Use in industrial environment

**Ambient conditions**

Ambient temperature

Single device

-20 ... +70 °C

Group assembly

-20 ... +60 °C

The installation conditions affect the ambient temperature.  
Observe the "Cabinet installation guide".

Storage temperature

-40 ... +80 °C

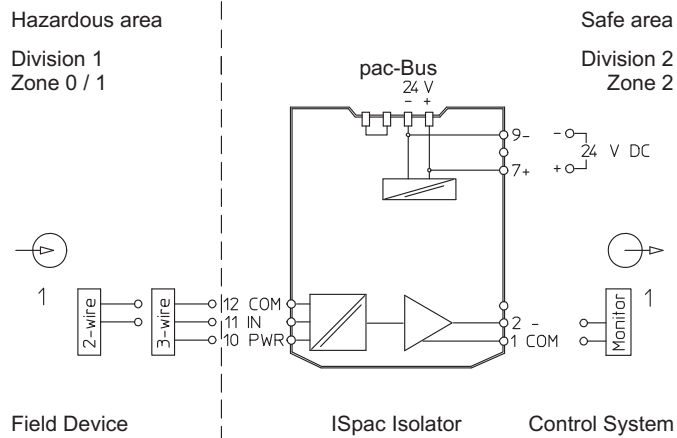
Relative humidity  
(no condensation)

$\leq 95 \%$

**Electrical connection**

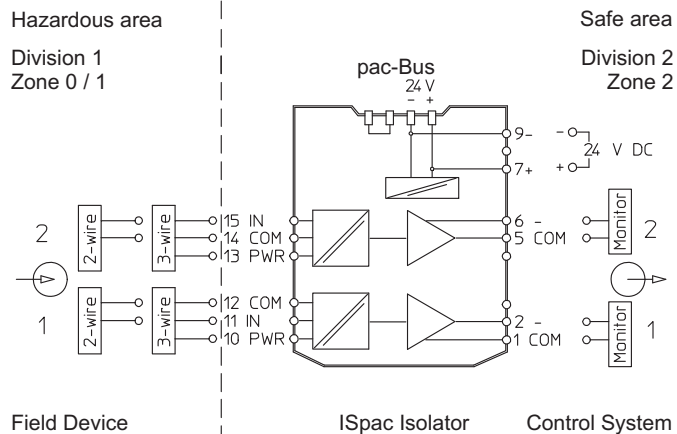
Connection diagram

**1 channel  
9147/10-99-10**



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**2 channels  
9147/20-99-10**



14839E02

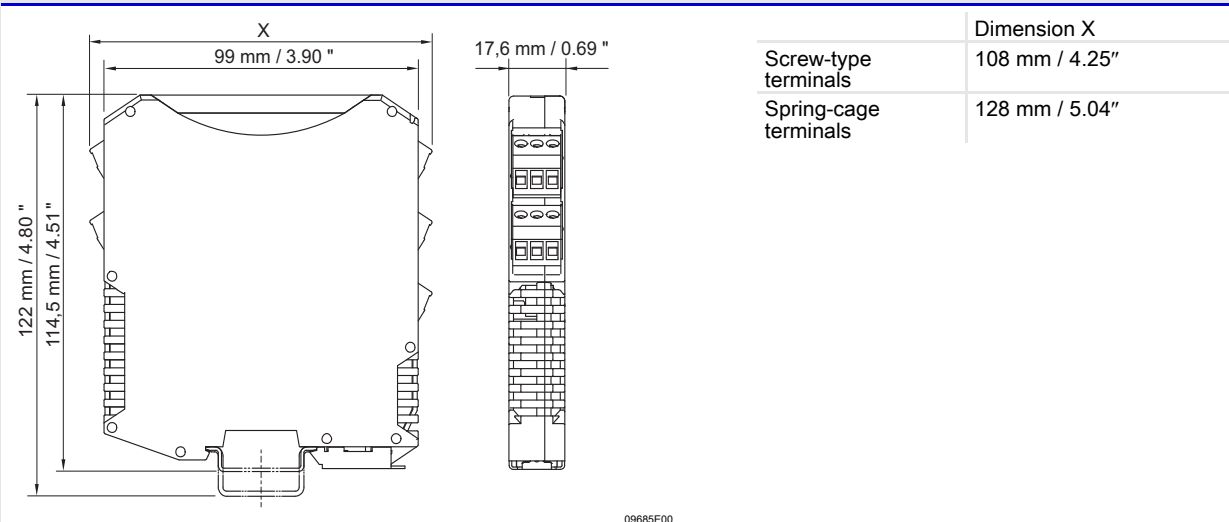
**Technical Data**

**Mechanical data**

Connection		Screw-type terminals	Spring-type terminals
	Single-wire connection		
	- 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>
	- flexible with core end sleeves (without / with plastic sleeve)	0.25 ... 2.5 mm <sup>2</sup>	0.25 ... 2.5 mm <sup>2</sup>
	Two-wire connection		
	- rigid	0.2 ... 1 mm <sup>2</sup>	--
	- flexible	0.2 ... 1.5 mm <sup>2</sup>	--
	- flexible with core end sleeves	0.25 ... 1 mm <sup>2</sup>	0.5 ... 1 mm <sup>2</sup>
Mounting type	on top hat rail (NS35/15, NS35/7.5) or in pac-Carrier		
Mounting orientation	horizontal or vertical		
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



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