

Vibration Transducer Supply Unit
 Series 9147



www.stahl.de



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)

A3



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 ¹⁾			x ¹⁾

¹⁾ 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	9147/10-99-10s	0.150
	2	9147/20-99-10s	0.210
Note	The order numbers listed in the table are for devices equipped with screw terminals. For devices equipped with springclamp terminals, replace the ending "s" for screw terminals with "k" for spring clamp 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
----------------------	---

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
----------------------	--

Certifications and certificates

Certificates	IECEX, ATEX, Brazil (INMETRO), India (PESO), Canada (cFM), Kazakhstan (TR), Russia (TR), USA (FM), Belarus (TR)
Ship approval	DNV GL

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 μ F
I	3.95 μ F
Max. connectable inductance L_o	
IIC	2.2 mH
IIB	17 mH
IIA	28 mH
I	40 mH
Internal capacitance C_i	2.4 nF
Internal inductance L_i	negligible
Safety-related maximum voltage	253 V

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 _{AVG} at T _[Proof]	2-wire operation		3-wire operation	
	T _[Proof]	PFD _{AVG}	T _[Proof]	PFD _{AVG}
	1 Jahr	7.95 x 10 ⁻⁴	1 Jahr	6.7 x 10 ⁻⁴
	2 Jahre	1.17 x 10 ⁻³	2 Jahre	9.86 x 10 ⁻⁴
	5 Jahre	2.29 x 10 ⁻³	5 Jahre	1.93 x 10 ⁻³

Further information For further information see safety test report.

Technical Data

Version	1 channel 9147/10-99-10	2 channels 9147/20-99-10
Electrical data		
Auxiliary power		
Nominal voltage U_N	24V DC	24V DC
Voltage range	18 ... 31.2 V	18 ... 31.2 V
Residual ripple within voltage range	3.6 V_{SS}	3.6 V_{SS}
Nominal current at U_N		
1 channel	75 mA	--
2 channels	--	88 mA
Power consumption at U_N		
1 channel	1.8 W	--
2 channels	--	2.1 W
Power dissipation at U_N		
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)
Galvanic separation		
Test voltages		
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	
Ex i input		
Input resistance	10 k Ω	
Input signal	-20 ... -0.5 V	
Functional range	-24 ... 0 V	
Output current		
For 3-wire operation	10 mA	at -20 V
	20 mA	at -17 V
For 2-wire operation	2.6 / 4.3 / 7.9 mA	at -10 V; (specification for $T_{Amb} < 23 \text{ }^\circ\text{C}$; deviation 0,25 V / 10 K)
Output		
Output signal	-20 ... -0.5 V	
Internal resistance	< 30 Ω	
Load resistance		
1 channel	> 2 k Ω	
2 channels	> 10 k Ω	
Signal transmission		
Delay input / output	< 7 μs	
Phase fluctuation	< 0.6 % / period	
Transferable frequency range	0 ... 50 kHz	
Ripple at a load resistance of 10 k Ω	< 60 mV $_{SS}$ at a bandwidth of 20 MHz	
Error limits		
	relative to the measuring span -20 ... -0.5 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 Ω	

Electrical data

Error limits

DC transmission fault At U_N and 20 °C	< 0.5 %
AC transmission fault At U_N and 20 °C and an offset of 10 V	

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 ... +70 °C

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

Storage temperature

-40 ... +80 °C

Relative humidity (no condensation)

Use at the height of

< 2000 m

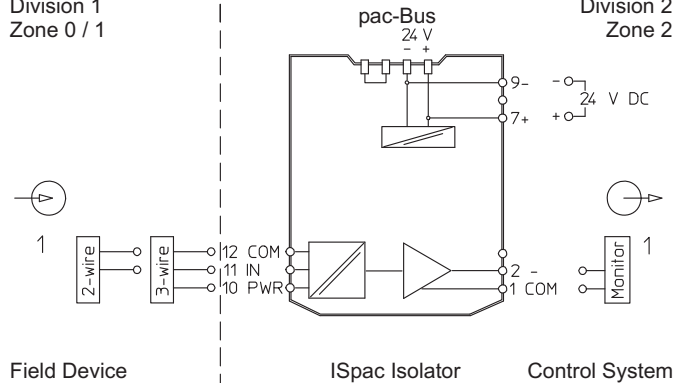
Electrical connection

Connection diagram

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

Hazardous area
Division 1
Zone 0 / 1

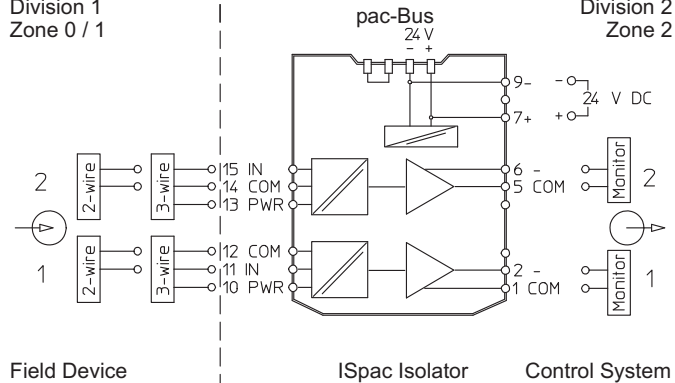
Safe area
Division 2
Zone 2



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

Hazardous area
Division 1
Zone 0 / 1

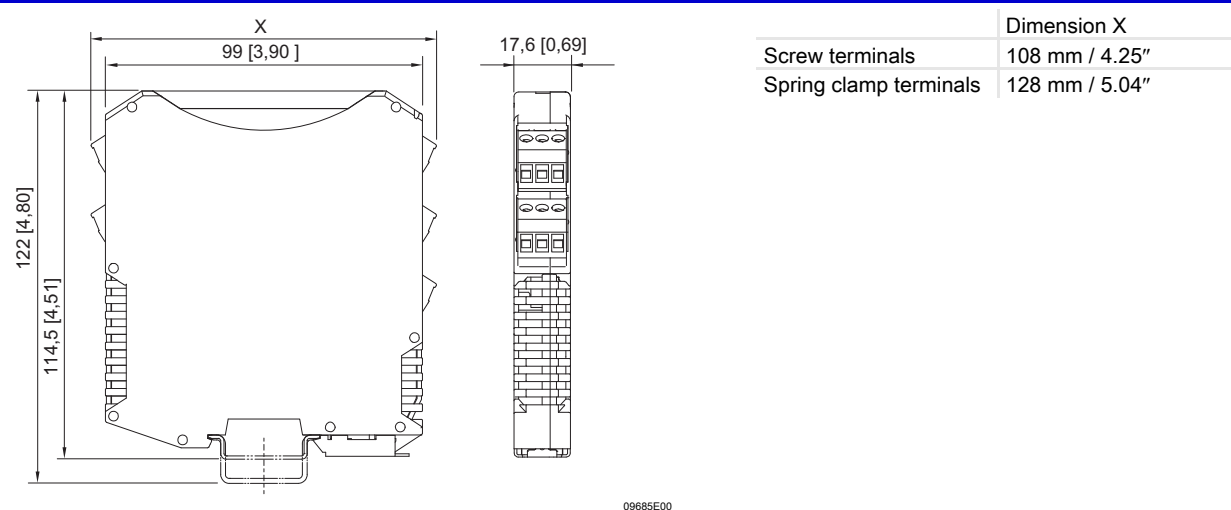
Safe area
Division 2
Zone 2



Mechanical data

Connection	<p>Single-wire connection</p> <ul style="list-style-type: none"> - rigid - flexible - flexible with core end sleeves (without / with plastic sleeve) <p>two-wire connection</p> <ul style="list-style-type: none"> - rigid - flexible - flexible with core end sleeves 	<p>Screw terminals</p> <ul style="list-style-type: none"> 0.2 ... 2.5 mm² 0.2 ... 2.5 mm² 0.25 ... 2.5 mm² 0.2 ... 1 mm² 0.2 ... 1.5 mm² 0.25 ... 1 mm² 	<p>Spring clamp terminals</p> <ul style="list-style-type: none"> 0.2 ... 2.5 mm² 0.2 ... 2.5 mm² 0.25 ... 2.5 mm² – – 0.5 ... 1 mm²
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		

Dimensional drawings (all dimensions in mm [inches]) – 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.