Release date: 2024-04-18 Date of issue: 2024-04-18 Filename: 70141684-100007_eng.pdf

Vibration sensor

VIM82PL-S1V16-22E-I422V19



- Suitable for SIL2/Pld applications
- Rugged stainless steel housing
- Vibration velocity in mm/s via root mean square formation (rms)
- Suitable for use in harzadous area up to Zone 2/21 with type of protection increased safety and for Class I/II and Division 2

Vibration sensor with safety function both for the analog current output and for the 2 relay outputs with adjustable swichting thresholds

















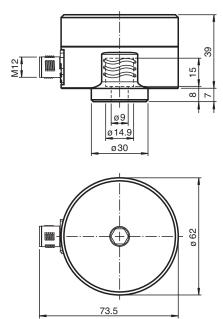
Function

The vibration sensor determines the vibration quantity using rms (root mean square) averaging. This form of quadratic averaging or pre-filtering enables precise trend statements about the condition of the application.

The vibration sensor has a safety integrity level (SIL 2) for usage in functional safety applications.

For monitoring tasks within the scope of functional safety, 2 relay outputs with adjustable switching thresholds are available. With simultaneous evaluation of both relay outputs by a controller, monitoring of a pre-alarm and main alarm thus is possible, e.g. as part of Condition Monitoring. Furthermore there is an approval for the use of the sensor in hazardous areas.

Dimensions



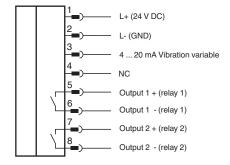
Technical Data

General specifications	
Туре	Vibration sensor
Measuring technology	MEMS

Greater than 8 mm/s	Technical Data		
Measured variable Vibration velocity Measurement range Vibration velocity Vmms 0 16 mm/s Measurement accuracy 0 16 mm/s 0 16 mm/s Measurement accuracy 2 .0.1 mm/s (calibration point: 90% of the measuring range; 159.2 Hz) Complies with the tolerance requirements of DNI SIO 2984 for measurement range greater than 8 mm/s Cross-sensitivity < 5 % of the partial lateral acceleration, which acts exactly 90° to the measuring axis frequency range			
Measurement range Vibration velocity Measurement accuracy Measurement accuracy Cross-sensitivity Cross-			
Weature velocity	Measured variable		Vibration velocity
ms	Measurement range		
Conglies with the tolerance requirements of DIN ISO 2954 for measurement range greater than 8 min's Cross-sensitivity	Vibration velocity		0 16 mm/s
Frequency range 101000 Hz Averaging time for v-ms: 2 s For found a stety related parameters For the property of the parameters Safety Integrity Level (SIL) SIL 2 Performance level (PL) PL d Cata 2 MTFF, 329 a Mission Time (T _N) 10 a Diagnostic Coverage (DC) min. 90 % Indicators/operating means 5 LEDs for operating states Control elements 4 rolary switches and 1 push button for programming Electrical specifications external fuse is required; 3 A, semi-time-lag, 30 V DC Operating voltage Ug 24 V DC + 7 % / - 10 % Operating voltage Ug 24 V DC + 7 % / - 10 % Ourset consumption Pa 2.6 W Time delay before availability tg 15 s (initially self-lest functions are executed before safe measured values are available at the output) Surge protection pa 2.6 W Switching function Normally open (NO) Switching function Normally open (NO) Switching function Normally open (NO) Switching function Norm	Measurement accuracy		Complies with the tolerance requirements of DIN ISO 2954 for measurement range
Averaging time for v-rms: 2 s	Cross-sensitivity		$<\!5\%$ of the partial lateral acceleration, which acts exactly 90° to the measuring axis
Safety Integrity Level (SIL) SIL 2	Frequency range		10 1000 Hz
Safety Integrity Level (SIL) SIL 2 Performance level (PL) Pt d Cataegory Cat. 2 MTTFa 329 a Mission Time (Ta) 10 a Diagnostic Coverage (DC) min. 90 % Indicators/operating means Status indicator Status indicator 6 LEDs for operating states Control elements 4 rotary switches and 1 push button for programming Electrical specifications washer of the size required: 3 A, semi-time-lag, 30 V DC Operating voltage Ua 24 V Dc + 7 % / - 10 % Current consumption max. 100 mA Power consumption Po 2.6 W Surge protection up to 2 kV Usual type relay Switching function Normally open (NO) Switching function max. 30 V DC Switching current max. 30 V DC Switching function Normally open (NO) Switching function Normally open (NO) Switching function Normally open (NO) Switching current max. 1 A Output type relay	Averaging time		for v-rms: 2 s
Performance level (PL) PL d Category Cat. 2 MTTF₀ 329 a Mission Time (T₂) 10 a Diagnostic Coverage (DC) min. 90 % midicators/operating means 6 LEDs for operating states Status indicator 6 LEDs for operating states Control elements 4 rotary switches and 1 push button for programming Electrical specifications external fuse is required: 3 A , semi-time-lag , 30 V DC Operating voltage Ua 24 V DC + 7 % / - 10 % Current consumption max. 100 mA Power consumption Po 2.6 W Time delay before availability t, 5 c (initially self-tast functions are executed before safe measured values are available if the output) Surge protection up to 2 kV Dutput 1 velay Switching voltage max. 30 V DC Switching current max. 1 A Dutput type relay Switching function Normally open (NO) Switching current max. 1 A Dutput type relay Switching function none controlled to the vibrat	Functional safety related parameters		
Cate gory Cat. 2 MTTF ₄ 329 a Mission Time (T _M) 10 a Diagnostic Coverage (DC) min. 90 % ndicators/operating means Status indicator Control elements 4 rotary switches and 1 push button for programming Electrical specifications external fuse is required: 3 A , semi-time-lag , 30 V DC Operating voltage U _B 24 V DC + 7 % / - 10 % Current consumption max. 100 mA Power consumption P ₀ 2.6 W Time delay before availability t ₁ 15 s (initially self-test functions are executed before safe measured values are available at the output) Surge protection up to 2 kV Dutput 1 1 Output type relay Switching function Normally open (NO) Switching ourset max. 3 V DC Switching urgent max. 30 V DC Switching voltage max. 30 V DC Switching urgent analog output, current Outpu	Safety Integrity Level (SIL)		SIL 2
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Mission Time (T _{IN}) 10 a Diagnostic Coverage (DC) min. 90 % midicators/operating means 6 LEDs for operating states Status indicator 6 LEDs for operating states Control elements 4 rotary switches and 1 push button for programming Electrical specifications Fusing Fusing external fuse is required: 3 A , semi-time-lag , 30 V DC Operating voltage U _B 24 V DC + 7 % / - 10 % Current consumption po 2.6 W Power consumption P ₀ 2.6 W Furner consumption po 2.6 W Surge protection up to 2 kV Surge protection up to 2 kV Output type relay Switching function Mormally open (NO) Switching voltage max. 30 V DC Switching current max. 1 A Output type relay Switching function Normally open (NO) Switching current max. 1 A Dutput type relay Switching current max. 1 A Dutput type analog output, current output of the vibration variable <td>Category</td> <td></td> <td>Cat. 2</td>	Category		Cat. 2
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Fusing external fuse is required: 3 A , semi-time-lag , 30 V DC Operating voltage U _B 24 V DC + 7 % / - 10 % Current consumption P _O 2.6 W Time delay before availability t _V 15 s (initially self-test functions are executed before safe measured values are available at the output) Surge protection up to 2 kV Dutput 1 Output type relay Switching function Normally open (NO) Switching current max. 1 A Dutput 2 Output 1 Output type relay Switching function Normally open (NO) Switching function Normally open (NO) Switching current max. 1 A Dutput 2 Output type switching function Normally open (NO) Switching outrage max. 30 V DC Switching current max. 1 A Dutput 3 Output type analog output, current output of the vibration variable Output current A 20 mA Load resistor ≤ 500 Ω Standard conformity Degree of protection Din En 80529, IP66, IP67 Shock resistance Din En 80068-2-27, 60 g, 6 ms Din En 80068-2-27, 80 g, 6 ms	Control elements		4 rotary switches and 1 push button for programming
Fusing external fuse is required: 3 A , semi-time-lag , 30 V DC Operating voltage U _B 24 V DC + 7 % / - 10 % max. 100 mA Power consumption P _O 2.6 W Time delay before availability I _V 35 (initially self-test functions are executed before safe measured values are available at the output) Surge protection up to 2 kV Output type relay Switching function Normally open (NO) Switching current max. 30 V DC Switching current max. 1 A Output type relay Switching function Normally open (NO) Switching current max. 30 V DC Switching function Normally open (NO) Switching current max. 30 V DC Output type analog output, current Output durrent a. 20 mA Load resistor ≤ 500 Ω Standard conformity Degree of protection DIN EN 60529, IP66, IP67 Shock resistance DIN EN 600	Electrical specifications		
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Power consumption P₀ 2.6 W Time delay before availability t, 15 s (initially self-test functions are executed before safe measured values are available at the output) Surge protection up 2 kV Output 1 relay Switching function Normally open (NO) Switching outrage max. 30 V DC Switching current max. 1 A Output by P relay Switching function Normally open (NO) Switching voltage max. 30 V DC Switching ourrent max. 30 V DC Switching current max. 1 A Output 3 analog output, current output of the vibration variable Output type analog output, current output of the vibration variable Output current 4 20 mA Load resistor ≤ 500 Ω Standard conformity Degree of protection DIN EN 60529, IP66, IP67 Shock resistance DIN EN 6068-2-27, 60 g, 6 ms Vibration resistance DIN EN 60068-2-26, 16.5 g, 10 1000 Hz Functional safety DIN EN IEC 61508, SIL 2 EN IEC 61508, SI	, , ,	- 5	
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Load resistor ≤ 500 Ω Standard conformity Degree of protection DIN EN 60529, IP66, IP67 Shock resistance DIN EN 60068-2-27, 60 g, 6 ms Vibration resistance DIN EN 60068-2-6, 16.5 g, 10 1000 Hz Functional safety DIN EN IEC 61508 , SIL 2 EN ISO 13849 , PL d Approvals and certificates IECEx approval Equipment protection level Gc IECEx ULD 22.0031X			
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Degree of protection DIN EN 60529, IP66, IP67 Shock resistance DIN EN 60068-2-27, 60 g, 6 ms Vibration resistance DIN EN 60068-2-6, 16.5 g, 10 1000 Hz Functional safety DIN EN IEC 61508, SIL 2 EN ISO 13849, PL d Approvals and certificates IECEx approval Equipment protection level Gc IECEx ULD 22.0031X			≤ 500 Ω
Degree of protection DIN EN 60529, IP66, IP67 Shock resistance DIN EN 60068-2-27, 60 g, 6 ms Vibration resistance DIN EN 60068-2-6, 16.5 g, 10 1000 Hz Functional safety DIN EN IEC 61508, SIL 2 EN ISO 13849, PL d Approvals and certificates IECEx approval Equipment protection level Gc IECEx ULD 22.0031X	Standard conformity		
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Vibration resistance DIN EN 60068-2-6, 16.5 g, 10 1000 Hz Functional safety DIN EN IEC 61508 , SIL 2 EN ISO 13849 , PL d Approvals and certificates IECEx approval Equipment protection level Gc IECEx ULD 22.0031X			
Functional safety DIN EN IEC 61508 , SIL 2 EN ISO 13849 , PL d Approvals and certificates IECEx approval Equipment protection level Gc IECEx ULD 22.0031X			-
Approvals and certificates IECEx approval Equipment protection level Gc IECEx ULD 22.0031X			DIN EN IEC 61508, SIL 2
Equipment protection level Gc IECEx ULD 22.0031X	Approvals and certificates		
Equipment protection level Dc IECEx ULD 22.0031X			
ATEX approval			IECEx ULD 22.0031X

Technical Data	
Equipment protection level Gc	UL 22 ATEX 2870 X
Equipment protection level Dc	UL 22 ATEX 2870 X
UL approval	
Ordinary Location	E468231 cULus Listed, Class III Power Source and limited energy , if UL marking is marked on the product. For use in NFPA 70 Applications only. adapters providing field wiring on request
Hazardous Location	E106378
Maximum permissible ambient temperature	max. 60 °C (max. 140 °F)
Control drawing	116-0493
Ambient conditions	
Ambient temperature	-40 60 °C (-40 140 °F)
Measuring head temperature	-40 85 °C (-40 185 °F) directly at the mounting point
Storage temperature	-40 60 °C (-40 140 °F)
Mechanical specifications	
Connection type	plug
Housing material	Stainless steel 1.4305 / AISI 303
Degree of protection	IP66 / IP67 only in connected state and correctly mounted housing cover
Connector	
Threading	M12
Number of pins	8
Mass	approx. 500 g
Dimensions	
Height	46 mm
Width	62 mm
Length	73.5 mm
General information	
Scope of delivery	1 x allen head screw M8 x 20 1 x spring washer M8 1 x seal label
Use in the hazardous area	see instruction manuals Only use accessories specified by the manufacturer.

Connection



Accessories

Accessories for this product can be found on the internet at www.pepperl-fuchs.com.

Installation

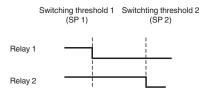
Further Documentation
The sensor manual is also available as detailed overall documentation. Among other things, installation, grounding concepts and mounting are described there in detail.

You can access the manual via the product detail page at www.pepperl-fuchs.com.

The correct electrical connection and the selection of the appropriate grounding concept are crucial for malfunction-free operation of the sensor. For detailed information you may refer to the manual of the sensor.

Programming

Adjustable relay outputs



critical state = pre-alarm from SP1/main alarm from SP2 = relay is open = like de-energized state