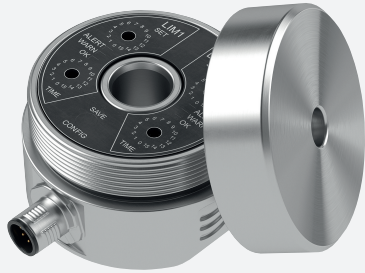# Vibration sensor

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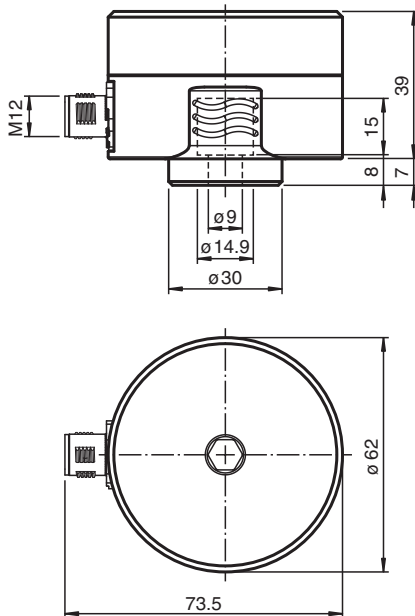
Vibration sensor with safety function both for the analog current output and for the 2 relay outputs with adjustable swichting thresholds

$C \in$ Ex IEC IECEx **SIL 2** c(UL)us UKCA TÜV SÜD

Function

The vibration sensor determines the vibration quantity using rms (root meas 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

M12

39
15
8
7

ø9
ø 14.9
ø30

ø 62

73.5

Technical Data

General specifications

Type	Vibration sensor
Measuring technology	MEMS

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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Technical Data

Series		Performance Line
Measured variable		Vibration velocity
Measurement range		
Vibration velocity	v-rms	0 ... 16 mm/s
Measurement accuracy		± 0.1 mm/s (calibration point: 90% of the measuring range; 159.2 Hz) Complies with the tolerance requirements of DIN ISO 2954 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		10 ... 1000 Hz
Averaging time		for v-rms: 2 s
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Performance level (PL)		PL d
Category		Cat. 2
$MTTF_d$		329 a
Mission Time (T_M)		10 a
Diagnostic Coverage (DC)		min. 90 %
Indicators/operating means		
Status indicator		6 LEDs for operating states
Control elements		4 rotary switches and 1 push button for programming
Electrical specifications		
Fusing		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_v	15 s (initially self-test functions are executed before safe measured values are available at the output)
Surge protection		up to 2 kV
Output 1		
Output type		relay
Switching function		Normally open (NO)
Switching voltage		max. 30 V DC
Switching current		max. 1 A
Output 2		
Output type		relay
Switching function		Normally open (NO)
Switching voltage		max. 30 V DC
Switching current		max. 1 A
Output 3		
Output type		analog output, current output of the vibration variable
Output rated operating current		4 ... 20 mA
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
Equipment protection level Dc		IECEx ULD 22.0031X
ATEX approval		

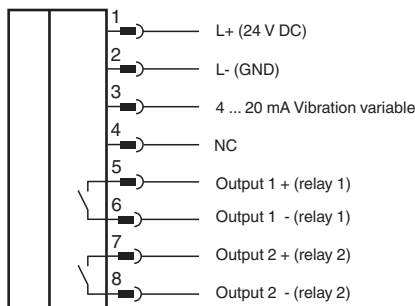Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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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
Housing length	73.5 mm
Housing width	62 mm
Housing height	46 mm
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
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


```
1   L+ (24 V DC)
2   L- (GND)
3   4 ... 20 mA Vibration variable
4   NC
5   Output 1 + (relay 1)
6   Output 1 - (relay 1)
7   Output 2 + (relay 2)
8   Output 2 - (relay 2)
```

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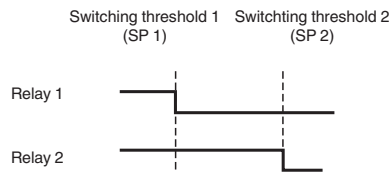You can access the manual via the product detail page at www.pepperl-fuchs.com.

Note
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.

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Programming

Adjustable relay outputs

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

Accessories

	RSL8-CS-SC-M55P200	Protective rubber sleeve for VIM8* vibration sensors against ingress of moisture and mechanical effects
	V19-G-BK2M-PUR-U/ABG	Female cordset single-ended M12 straight A-coded, 8-pin, PUR cable black, shielded, UL approved, drag chain suitable
	V1-G-BK5M-PUR-U-V1-G	Cordset M12 socket straight to M12 plug straight A-coded, 4-pin, PUR cable black, UL-approved, drag chain suitable, torsion resistant
	V1-G-BK10M-PUR-U-V1-G	Cordset M12 socket straight to M12 plug straight A-coded, 4-pin, PUR cable black, UL-approved, drag chain suitable, torsion resistant
	MONAD-M08-1,25-M08-1,25K/368	Mounting adapter for VIM3*/VIM6*/VIM8* vibration sensors, internal thread M8 x 1.25 x 10, external thread M8 x 1.25, screw-in depth 19.5
	MONAD-M08-1,25-M30-3,5/368	Mounting adapter for VIM3*/VIM6*/VIM8* vibration sensors, internal thread M8 x 1.25 x 10, external thread M30 x 3.5, screw-in depth 45
	MONAD-M08-1,25-M20-2,5/368	Mounting adapter for VIM3*/VIM6*/VIM8* vibration sensors, internal thread M8 x 1.25 x 10, external thread M20 x 2.5, screw-in depth 34
	MONAD-M08-1,25-M10-1,5/8	Mounting adapter for VIM3*/VIM6* vibration sensors, internal thread M8 x 1.25 x 10, external thread M10 x 1.5, screw-in depth 18
	MONAD-M08-1,25-M12-1,75/8	Mounting adapter for VIM8* vibration sensors, internal thread M8 x 1.25 x 10, external thread M12 x 1.75, screw-in depth 21
	MONAD-M08-1,25-M16-2,0/368	Mounting adapter for VIM3*/VIM6*/VIM8* vibration sensors, internal thread M8 x 1.25 x 10, external thread M16 x 2.0, screw-in depth 27
	MONAD-M08-1,25-M24-3,0/368	Mounting adapter for VIM3*/VIM6*/VIM8* vibration sensors, internal thread M8 x 1.25 x 10, external thread M24 x 3.0, screw-in depth 40

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