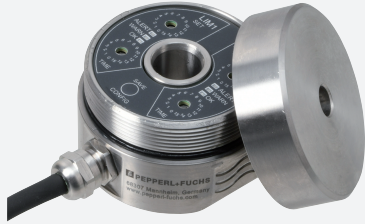# Vibration sensor

VIM82PP-S1V16-21E-I422C28

- 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 1/21 with type of protection explosionproof enclosure
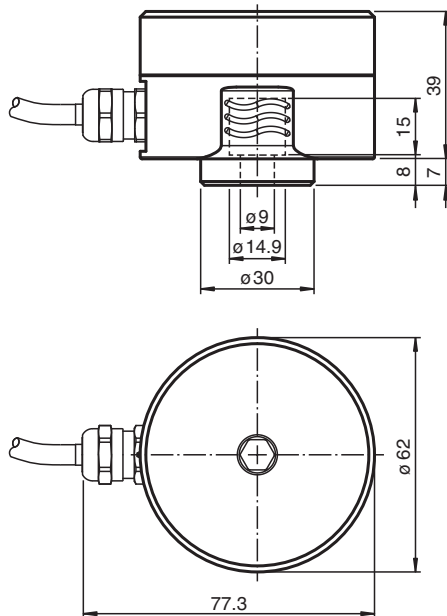
Vibration sensor with safety function both for the analog current output and for the 2 relay outputs with adjustable swichting thresholds

Function

The vibration sensor determines the vibration quantity using rms (root 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

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 Plus 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 Gb		IECEx ULD 22.0031X
Equipment protection level Db		IECEx ULD 22.0031X
ATEX approval		

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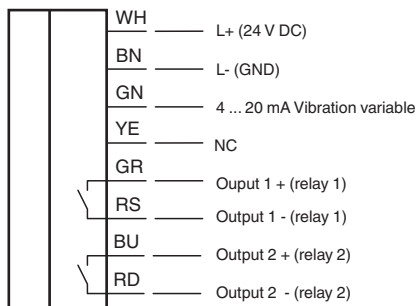
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Technical Data

Equipment protection level Gb		UL 22 ATEX 2869 X
Equipment protection level Db		UL 22 ATEX 2869 X
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		cable
Housing material		Stainless steel 1.4305 / AISI 303
Housing length		77.3 mm
Housing width		62 mm
Housing height		46 mm
Degree of protection		IP66 / IP67 only in connected state and correctly mounted housing cover
Cable		
Number of cores		8
Length	L	2 m
Mass		880 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

WH	L+ (24 V DC)
BN	L- (GND)
GN	4 ... 20 mA Vibration variable
YE	NC
GR	Ouput 1 + (relay 1)
RS	Output 1 - (relay 1)
BU	Output 2 + (relay 2)
RD	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.
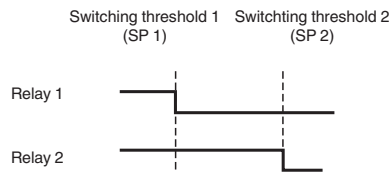You can access the manual via the product detail page at www.pepperl-fuchs.com.

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

Switching threshold 1 (SP 1)   Switchting threshold 2 (SP 2)

Relay 1

Relay 2

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
	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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