

# Vibration sensor

## VIM82PU-S0V16-20E-I422V19



- Suitable for SIL2/PId applications
- Rugged stainless steel housing
- Vibration velocity in mm/s (rms) acc. to DIN ISO 10816/20816
- 2 relays outputs for safety functions with adjustable switching thresholds, allowing pre- and main alarm

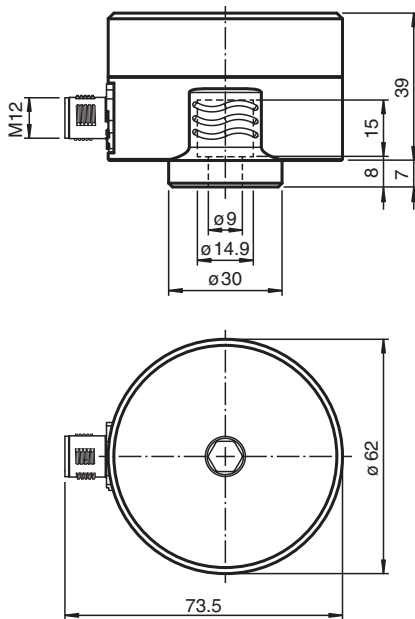
Vibration sensor with safety function both for the analog current output and for the 2 relay outputs with adjustable switching thresholds



### 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.

### Dimensions



### Technical Data

#### General specifications

Type	Vibration sensor
Measuring technology	MEMS
Series	Pure Line

Release date: 2024-05-21 Date of issue: 2024-05-21 Filename: 70141684-100010\_eng.pdf

## Technical Data

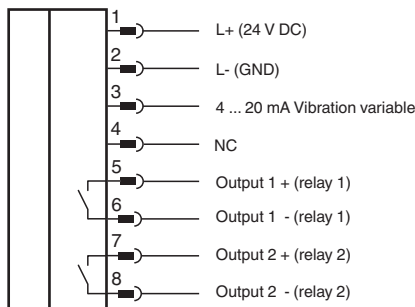
Measured variable		Vibration velocity
Measurement range		
Vibration velocity	v-rms	0 ... 16 mm/s
Measurement accuracy		± 0.1 mm/s (calibration point: 90% of the measuring range; 159.2 Hz) Complies with the tolerance requirements of DIN ISO 2954 for measurement range greater than 8 mm/s
Cross-sensitivity		< 5 % of the partial lateral acceleration, which acts exactly 90° to the measuring axis
Frequency range		1 ... 1000 Hz
Averaging time		for v-rms: 2 s
<b>Functional safety related parameters</b>		
Safety Integrity Level (SIL)		SIL 2
Performance level (PL)		PL d
Category		Cat. 2
MTTF <sub>d</sub>		329 a
Mission Time (T <sub>M</sub> )		10 a
Diagnostic Coverage (DC)		min. 90 %
<b>Indicators/operating means</b>		
Status indicator		6 LEDs for operating states
Control elements		4 rotary switches and 1 push button for programming
<b>Electrical specifications</b>		
Fusing		external fuse is required: 3 A , semi-time-lag , 30 V DC
Operating voltage	U <sub>B</sub>	24 V DC + 7 % / - 10 %
Current consumption		max. 100 mA
Power consumption	P <sub>0</sub>	2.6 W
Time delay before availability	t <sub>v</sub>	15 s (initially self-test functions are executed before safe measured values are available at the output)
Surge protection		up to 2 kV
<b>Output 1</b>		
Output type		relay
Switching function		Normally open (NO)
Switching voltage		max. 30 V DC
Switching current		max. 1 A
<b>Output 2</b>		
Output type		relay
Switching function		Normally open (NO)
Switching voltage		max. 30 V DC
Switching current		max. 1 A
<b>Output 3</b>		
Output type		analog output, current output of the vibration variable
Output current		4 ... 20 mA
Load resistor		≤ 500 Ω
<b>Standard conformity</b>		
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
Vibration evaluation		DIN ISO 10816/20816
Functional safety		DIN EN IEC 61508 , SIL 2 EN ISO 13849 , PL d
<b>Approvals and certificates</b>		
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
Maximum permissible ambient temperature		max. 60 °C (max. 140 °F)

Release date: 2024-05-21 Date of issue: 2024-05-21 Filename: 70141684-100010\_eng.pdf

## Technical Data

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

## Connection



## Accessories

Accessories for this product can be found on the internet at [www.pepperl-fuchs.com](http://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.

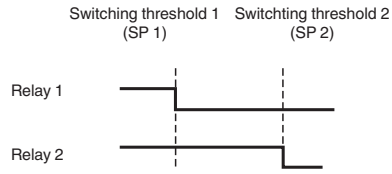
You can access the manual via the product detail page at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

### 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.

# Programming

## Adjustable relay outputs



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

Release date: 2024-05-21 | Date of issue: 2024-05-21 | Filename: 70141684-100010\_eng.pdf