

# Vibration sensor

# VIM32PL-E1V16-0RE-I421V14

- Analog current output
- Screw-in thread for simple installation
- Simple electrical commissioning
- Rugged stainless steel housing
- Vibration velocity in mm/s via root mean square formation (rms)
- Switching output

Vibration sensor with switching output and analog current output

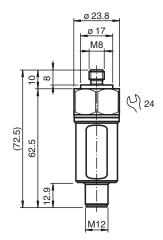


#### **Function**

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.

In addition, a switching output with preset switching characteristics is included. This means a permanent monitoring of the vibration measured value is not required, because a necessary maintenance of the plant is signalized directly. The switching characteristics are provided with a preset response time. Thus, the output is only set if the vibration event lasts longer than this time. Short-time vibration events are hence filtered out. The simple mounting allows for commissioning in any application.

## Dimensions



### **Technical Data**

General specifications		
Туре		Vibration sensor
Measuring technology		MEMS
Series		Performance Line
Measured variable		Vibration velocity
Measurement range		
Vibration velocity	v- rms	0 16 mm/s
Measurement accuracy		$\pm$ 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 $90^{\circ}$ to the measuring axis

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Surge protection       up to 2 kV         Output 1       output of the vibration variable         Output type       analog output, current output of the vibration variable         Output type       4 20 mA         Lead resistor       < 500 Ω         Output 2       PNP         Output type       PNP         Switching function       Normally closed (NC)         Operating current       < 100 mA         Voltage drop       < 2 V         Switching threshold       1.6 mm/s (10 % of the measuring range )         Preset response time       2 s (minimum time for a vibration event above the switching threshold so that the output switches)         Short-circuit protection       yes         Standard conformity       DIN EN 60529, IP66, IP67         Shock resistance       DIN EN 60582-27, 60 g, 6 ms         Vibration resistance       DIN EN 60568-2-27, 60 g, 6 ms         Vibration resistance       DIN EN 60568-2-27, 60 g, 6 ms         UL approval       marked on the product. For use in NFPA 70 Applications only adapters providing field witing on request         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 witing on request         Maximum permissible ambient temperature       r40	Technical Data		
Averaging time         for Y-rms: 2 s           Functional statty related parameters         529 a           Mission Time (T <sub>M</sub> )         329 a           Diagnostic Coverage (DC)         0 %           Electrical specifications	Frequency range		10 1000 Hz
MTFFd       329 a         Mission Time (T <sub>0</sub> )       20 a         Diagnostic Coverage (DC)       0 %         Electrical specifications       external fuse is required: 1 A, fast acting , 30 V DC         Operating voltage       Ua         18 30 V DC       current consumption         Power consumption       max. 220 mA         Power consumption       Power consumption         Power consumption       Power consumption         Time delay before availability       t,         V       2 % ms filter is calculated initially with measurement data before they are available the output)         Surge protection       up to 2 kV         Output 1       anelog output, current         Output type       output of the vibration variable         Output type       output output output of the vibration variable         Output type       PNP         Switching function       Normally closed (NC)         Operating current       < 100 mA	Averaging time		for v-rms: 2 s
Mission Time (T <sub>k</sub> )         20 a           Diagnostic Coverage (DC)         C           Electrical specifications         Electrical specifications           Fusing         external fuse is required: 1 A, fast acting , 30 V DC           Operating voltage         Ua         1830 V DC           Current consumption         max. 220 mA           Power consumption         P         max. 6.6 W           Time delay before availability         tv         2 s (rms filter is calculated initially with measurement data before they are available the output)           Surge protection         up to 2 kV           Output 1	Functional safety related parameters		
Diagnostic Coverage (DC)       0 %         Electrical specifications       external fuse is required: 1 A, fast acting, 30 V DC         Operating voltage       Ua       1830 V DC         Current consumption       Pomer consumption       Pomer consumption         Power consumption       Pomer state acting is a consumption       Pomer consumption         Time delay before availability       t,       2 s (ms filter is calculated initially with measurement data before they are available the output)         Surge protection       up to 2 kV         Output 1       analog output, current output of the vibration variable         Output protection       s 500 Ω         Output 2       output filter         Output gurrent       s 100 mA         Voltage drop       PNP         Switching function       Normally closed (NC)         Operating ournent       s 100 mA         Voltage drop       < 2 V	MTTF <sub>d</sub>		329 a
Electrical specifications         external fuse is required: 1 A, fast acting , 30 V DC           Operating voltage         Ug         18 30 V DC           Current consumption         max. 220 mA           Power consumption         Po         max. 6.6 W           Time delay before availability         t, et the output?         2 s (rms filter is calculated initially with measurement data before they are available to output?           Output 1         analog output, current output of the vibration variable         0utput type           Output type         analog output, current output of the vibration variable         0utput type           Output turrent         4 20 mA         2 s (max 220 mA           Load resistor         < 500 Ω	Mission Time ( $T_M$ )		20 a
Electrical specifications         Fusing         Certain specifications           Fusing voltage         Ua         18 30 V DC           Current consumption         max. 220 mA           Power consumption         Power consumption         Power consumption           Time delay before availability         t,         2 s (rms filter is calculated initially with measurement data before they are available the output)           Surge protection         Up to 2 kV           Output 1         Output of the vibration variable           Output type         analog output, current output of the vibration variable           Coutput current         2 s (fm Silter is calculated initially with measurement data before they are available the vibration variable           Output type         analog output, current output of the vibration variable           Output type         PNP           Switching function         Normally closed (NC)           Operating current         ≤ 100 mA           Voltage drop         < 2 V	Diagnostic Coverage (DC)		0 %
Fusing         external fuse is required: 1 A, fast acting, 30 V DC           Operating voltage         Up         1830 V DC           Current consumption         max. 20 mA           Power consumption         Pp         max. 6.6 W           Time delay before availability         tv         2 s (rms filter is calculated intially with measurement data before they are available the output)           Surge protection         up to 2 kV           Output 1         analog output, current output of the vibration variable           Output current         4 20 mA           Load resistor         < 500 Ω			
Operating voltageUg1830 V DCCurrent consumptionmax. 220 m APower consumptionPoTime delay before availabilityt,2 s (rms filter is calculated initially with measurement data before they are available the output)Surge protectionup to 2 kVOutput 1Output typeoutput of the vibration variableOutput typeoutput of the vibration variableOutput typeSo $\Omega$ Output 2Output typePNPSwitching functionNormally closed (NC)Operating ourent< 100 mA	-		external fuse is required: 1 A, fast acting, 30 V DC
Current consumption         Poe         max. 220 mA           Power consumption         Poe         max. 6.6 W           Time delay before availability         I,         2 s (rms filter is calculated initially with measurement data before they are available the output)           Surge protection         up to 2 kV           Output 1	Ũ	U <sub>B</sub>	· · · · · · · · · · · · · · · · · · ·
Power consumption         Po         max. 6.6 W           Time delay before availability         t,         2 s (rms filter is calculated intially with measurement data before they are available the output)           Surge protection         up to 2 kV           Output 1         analog output, current output of the vibration variable           Output tourent         4 20 mA           Load resistor         500 Ω           Output 2         Voutput 2           Output ype         PNP           Switching function         Normally closed (NC)           Operating current         ≤ 100 mA           Voltage drop         < 2 V		- 0	
Time delay before availabilityt, the output)2 c (rms filter is calculated intially with measurement data before they are available the output)Surge protectionup to 2 kVOutput 1analog output, current output of the vibration variableOutput current4 20 mALoad resistor $\leq 500 \Omega$ Output 19pePNPSwitching functionMormally closed (NC)Operating current $\leq 100 \text{ mA}$ Voltage drop $< 2 V$ Switching function1.6 mm/s (10 % of the measuring range )Preset response time2 s (minimu time for a vibration event above the switching threshold so that the output switches)Short-circuit protectionyesStandard conformityDegree of protectionDIN EN 60529, IP66, IP67Shock resistanceDIN EN 60068-2-27, 69 g, 6 msVibration resistanceDIN EN 60068-2-60 g, 6 msVibration resistanceDIN EN 60068-2-80 g, 6 msVibration resistanceDIN EN 60068-2-80 g, 6 msVibration resistanceDIN EN 60068-2-87 g, 60 g, 6 msVibration resistanceDIN EN 60068-2-80 g, 6 msUL approval $\mathcal{L}_{4000000000000000000000000000000000000$		Po	
Output type       analog output, current output output diversed output ou			2 s (rms filter is calculated intially with measurement data before they are available at
Output type       analog output, current output of the vibration variable         Output current       4 20 mA         Load resistor       ≤ 500 Ω         Output 2          Output type       PNP         Switching function       ≤ 100 mA         Operating current       ≤ 100 mA         Voltage drop       ≤ 100 mA         Voltage drop       ≤ 2 V         Switching threshold       1.6 mm/s (10 % of the measuring range)         Preset response time       2 s (minimum time for a vibration event above the switching threshold so that the output switches)         Short-circuit protection       yes         Standard conformit       yes         Degree of protection       DIN EN 60529, IP66, IP67         Shock resistance       DIN EN 60529, IP66, IP67         Vibration resistance       DIN EN 60068-2-27, 60 g, 6 ms         Vibration resistance       DIN EN 60068-2-27, 60 g, 6 ms         Vibration resistance       DIN EN 60068-2-16, 16.5 g, 10 1000 Hz         Approvals       DIN EN 60068-2-27, 60 g, 6 ms         Vibration resistance       DIN EN 60068-2-16, 16.5 g, 10 1000 Hz         Approvals       andertificates         UL approval	Surge protection		up to 2 kV
Output type         analog output, current output of the vibration variable           Output current         4 20 mA           Load resistor         ≤ 500 Ω           Output 2         PNP           Output type         PNP           Switching function         ≤ 100 mA           Voltage drop         ≤ 100 mA           Voltage drop         ≤ 2 V           Switching threshold         1.6 mm/s (10 % of the measuring range)           Preset response time         2 s (minimum time for a vibration event above the switching threshold so that the output switches)           Short-circuit protection         yes           Standard conformity         U           Degree of protection         DIN EN 60529, IP66, IP67           Shock resistance         DIN EN 60568-2-27, 60 g, 6 ms           Vibration resistance         DIN EN 60068-2-27, 60 g, 6 ms           Vibration resistance         DIN EN 60068-2-06, 16.5 g, 10 1000 Hz           Approval         Tordinary Location sonly. adapters providing field wing on request           Maximum permissible ambient temperature         max. 80 °C (max. 176 °F)			
Load resistor       ≤ 500 Ω         Output type       PNP         Switching function       Mormally closed (NC)         Operating current       ≤ 100 mA         Voltage drop       < 2 V	•		analog output, current output of the vibration variable
Output 2         PNP           Switching function         INormally closed (NC)           Operating current         ≤ 100 mA           Voltage drop         I < 2 V	Output current		4 20 mA
Output type       PNP         Switching function       Normally closed (NC)         Operating current       ≤ 100 mA         Voltage drop       << 2 V	Load resistor		≤ 500 Ω
Switching function       Normally closed (NC)         Operating current       ≤ 100 mA         Voltage drop       < 2 V	Output 2		
Operating current       ≤ 100 mA         Voltage drop       < 2 V	Output type		PNP
Voltage drop       < 2 V	Switching function		Normally closed (NC)
Switching threshold       1.6 mm/s (10 % of the measuring range )         Preset response time       2 s (minimum time for a vibration event above the switching threshold so that the output switches)         Short-circuit protection       yes         Standard conformity       DIN EN 60529, IP66, IP67         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         Approvals and certificates       UL approval         UL approval       Vibration request         Maximum permissible ambient temperature       max. 80 °C (max. 176 °F)         Ambient temperature       -40 85 °C (-40 185 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Mechanical specifications       plug         Housing material       Stainless steel 1.4305 / AISI 303	Operating current		≤ 100 mA
Switching threshold       1.6 mm/s ( 10 % of the measuring range )         Preset response time       2 s (minimum time for a vibration event above the switching threshold so that the output switches)         Short-circuit protection       yes         Standard conformity       DIN EN 60529, IP66, IP67         Degree of protection       DIN EN 6068-2-27, 60 g, 6 ms         Short-circuit protection       DIN EN 60068-2-6, 16.5 g, 10 1000 Hz         Approvals and certificates       UL approval         UL approval       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. 80 °C (max. 176 °F)         Ambient temperature       -40 85 °C (-40 185 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Mechanical specifications       -40 85 °C (-40 185 °F)         Mechanical specifications       -40 85 °C (-40 185 °F)         Connection type       plug         Housing material       Stainless steel 1.4305 / AISI 303	Voltage drop		< 2 V
Short-circuit protection       yes         Standard conformity       Degree of protection         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         Approvals and certificates       UL approval         UL approval       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. 80 °C (max. 176 °F)         Ambient temperature       -40 85 °C (-40 185 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Connection type       plug         Housing material       Stainless steel 1.4305 / AISI 303	- · · ·		1.6 mm/s (10 % of the measuring range)
Standard conformity       DIN EN 60529, IP66, IP67         Degree of protection       DIN EN 60068-2-27, 60 g, 6 ms         Shock resistance       DIN EN 60068-2-67, 60 g, 6 ms         Vibration resistance       DIN EN 60068-2-67, 60 g, 6 ms         Vibration resistance       DIN EN 60068-2-6, 16.5 g, 10 1000 Hz         Approvals and certificates       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. 80 °C (max. 176 °F)         Ambient conditions       -40 85 °C (-40 185 °F)         Machanical specifications       -40 85 °C (-40 185 °F)         Connection type       plug         Housing material       Stainless steel 1.4305 / AISI 303	Preset response time		2 s (minimum time for a vibration event above the switching threshold so that the output switches)
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Approvals and certificates       Image: Constraint of the proval         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. 80 °C (max. 176 °F)         Ambient conditions       -40 85 °C (-40 185 °F)         Storage temperature       -40 85 °C (-40 185 °F)         Mechanical specifications       -40 85 °C (-40 185 °F)         Connection type       plug         Housing material       Stainless steel 1.4305 / AISI 303	Shock resistance		DIN EN 60068-2-27, 60 g, 6 ms
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Mechanical specifications       Connection type     plug       Housing material     Stainless steel 1.4305 / AISI 303	Ambient temperature		
Connection type     plug       Housing material     Stainless steel 1.4305 / AISI 303	Storage temperature		-40 85 °C (-40 185 °F)
Housing material Stainless steel 1.4305 / AISI 303	Mechanical specifications		
5	Connection type		plug
	Housing material		Stainless steel 1.4305 / AISI 303
Degree of protection IP66 / IP67 only in connected state	Degree of protection		IP66 / IP67 only in connected state
Connector	Connector		
Threading M12	Threading		M12
Number of pins 4	Number of pins		4
Mass approx. 100 g	Mass		approx. 100 g
Dimensions	Dimensions		
Length 72.5 mm	Length		72.5 mm
Diameter 23.8 mm	Diameter		23.8 mm

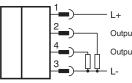
Release date: 2024-01-24 Date of issue: 2024-01-24 Filename: 70146714-100000\_eng.pdf

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

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#### Connection



Output 1 (4 ... 20 mA Vibration variable) Output 2 (Switching signal)

#### **Connection Assignment**



#### Accessories

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

#### Installation

#### **Further Documentation**

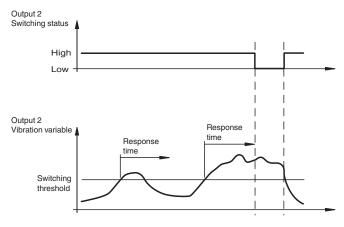
The sensor manual is also available as detailed overall documentation. Among other things, installation, grounding concepts and mounting are described there in detail. You can access the manual via the product detail page at www.pepperl-fuchs.com.

#### 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.

### Operation

#### **Switching Characteristics**



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

3