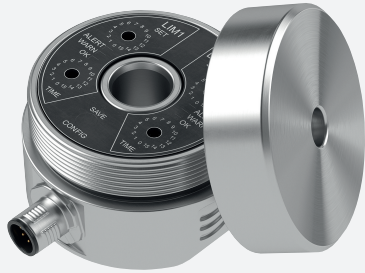# Vibration sensor

# VIM82PU-S1G10-20E-I42WV19

- Suitable for SIL2/Pld applications
- Rugged stainless steel housing
- Vibration acceleration in g via root mean square formation (rms)
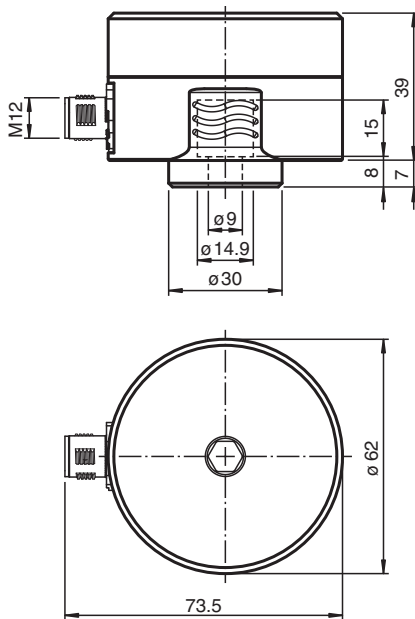- 2 relays outputs for safety functions with adjustable switching tresholds, allowing monitoring of a window area

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

$C \epsilon$  **SIL 2**  ℅⑪℠  **UK CA**  ⑧

## 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 window area is thus possible, e.g. as part of Condition Monitoring.

## Dimensions



## Technical Data

### General specifications

| | |
|---|---|
| Type | Vibration sensor |
| Measuring technology | MEMS |
| Series | Pure Line |

**PEPPERL+FUCHS**

## Technical Data

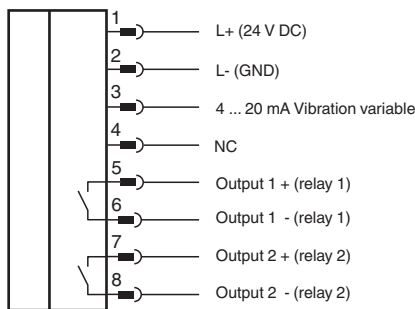| | | |
|---|---|---|
| Measured variable | | Vibration acceleration |
| **Measurement range** | | |
|   Vibration acceleration | a-rms | 0 ... 10  g rms |
| Measurement accuracy | | ± 0.01  g (calibration point: 90% of the measuring range; 159.2 Hz) Complies with the tolerance requirements of DIN ISO 2954 |
| Cross-sensitivity | | < 5 % of the partial lateral acceleration, which acts exactly 90° to the measuring axis |
| Frequency range | | 10 ... 1000 Hz |
| Averaging time | | for a-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** | | |
|   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) |
| **Ambient conditions** | | |
|   Ambient temperature | | -40 ... 60 °C (-40 ... 140 °F) |

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

Pepperl+Fuchs Group    USA: +1 330 486 0001    Germany: +49 621 776 1111    Singapore: +65 6779 9091
www.pepperl-fuchs.com    fa-info@us.pepperl-fuchs.com    fa-info@de.pepperl-fuchs.com    fa-info@sg.pepperl-fuchs.com

PEPPERL+FUCHS    2

## Technical Data

| | |
|---|---|
| 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<br>1 x spring washer M8<br>1 x seal label |

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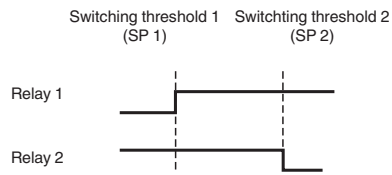You can access the manual via the product detail page at www.pepperl-fuchs.com.

**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.

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

Pepperl+Fuchs Group    USA: +1 330 486 0001    Germany: +49 621 776 1111    Singapore: +65 6779 9091
www.pepperl-fuchs.com    fa-info@us.pepperl-fuchs.com    fa-info@de.pepperl-fuchs.com    fa-info@sg.pepperl-fuchs.com    **PEPPERL+FUCHS**    3

## Programming

**Adjustable relay outputs**



critical state = out of window (SP1, SP2) = relay is open = like de-energized state

## Accessories

| | | |
|---|---|---|
| | **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 |
| | **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 |
| | **V19-G-BK5M-PUR-U/ABG** | Female cordset single-ended M12 straight A-coded, 8-pin, PUR cable black, shielded, UL approved, drag chain suitable |
| | **V19-G-BK10M-PUR-U/ABG** | Female cordset single-ended M12 straight A-coded, 8-pin, PUR cable black, shielded, UL approved, drag chain suitable |
| | **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 |

**PEPPERL+FUCHS**